Synthetic stone can be a very durable and effective covering. However, like synthetic stucco, synthetic stones must be installed using the guidelines set by the manufacturer of the stones. Some areas of concern that are common with all synthetic stone manufactures are:

1. Stones should not be at ground level.
2. Drip screeds should be used to properly drain water from behind and away from stones.
3. Flexible caulking used at window and door openings.
4. The base coat should not be visible.

Below is an installation guideline, typical of most stone manufacturers.

Black Bear is a synthetic stone manufacturer. The information in the Black Bear installation guidelines is for the use of Black Bear products only. However, we have learned that the installation guidelines are typical of any synthetic stone application. The local code requirement, in regard to synthetic stone installation, may vary but, most local code guidelines refer back to the manufacturer guidelines. We always recommend referring to the guidelines as they apply to the manufacturer of the synthetic stone used.

INSTALLATION INSTRUCTIONS

PART 1 INTRODUCTION

1.1 OVERVIEW

The attached installation instructions are intended for use with Black Bear manufactured stone veneer. Building requirements can vary from area to area - please check with your local jurisdiction for building code requirements that apply.

1.2 PROJECT SITE CONDITIONS

A Environmental Requirements

1) Surface shall be completely free of moisture determined by sight, touch or measuring instruments. Do not apply stone veneer to surfaces which have visible traces of ice or frost.
2) If ambient temperatures are below freezing (32 degrees F), follow cold weather masonry procedures as called for ACI-530/ ASCE 6-95/ TMS 602-95.

B Safety Requirements

1) Construct and maintain scaffolding in strict conformity with manufacturer's recommendations and OSHA regulations.
2) In accordance with OSHA regulations, provide fall protection for installers exposed to fall hazards.
3) Confirm installer compliance with OSHA regulations by reviewing written safety programs and training documentation.

PART 2 MATERIAL REQUIREMENTS

2.1 STONE VENEER UNITS

1) Black Bear stone veneer is engineered from Portland cement, expanded shale fine, expanded shale medium, mineral iron oxide color and various other chemical additives. The product is engineered to achieve a specified strength, color and texture and resistance to effects of weathering.
2) Black Bear stone veneer is engineered in various shapes and patterns to simulate natural stone and are installed in a non-load bearing veneer and trim capacity e.g. drip ledge and quoins, caps, etc.
3) Thickness: 1 inch to 2-1/2 inches
4) Weight: maximum of 15lbs per square foot
5) Density to be determined under ASTM C 567
6) Compressive Strength: Minimum of 1800 PSI when tested in accordance with ATSM C 192
7) Water Absorption: less than 18% when tested in accordance with ASTM C-140 or UBC standard 15-5
8) Freeze-Thaw: less than 3% mass loss when tested in accordance with ASTM C 67
9) Shear Bond Strength: minimum of 50 PSI when conducted in accordance with ASTM C 482
10) Thermal Resistance: R >_.865 when tested at a thickness of 1.0 inch(25.4 mm) in accordance with ASTM C 518
11) Smoke and fuel contribution: UL listed 0/0
12) Flexural Strength: tested in accordance with ASTM C 348, Section 4.4
13) Tensile Strength: tested in accordance with ASTM C 190, Section 4.5
14) Weather Resistance: Mix design proven by test results to be resistant to degradation by weather

2.2 Weather Resistive Barrier (”WRB”)

ASTM D 226, No. 15 non -perforated asphalt-saturated organic felt paper or a house-wrap product supported by a current evaluation report showing equivalency to Grade D building paper.

2.3 Reinforcing (Lath)

Corrosion resistance minimum 2.5 lbs per square yard expanded metal lath that complies with ASTM C 847, or, corrosion resistant minimum 18 gauge woven wire mesh that complies with ASTM C 1032. For open studs and non solid sheathing (e.g. rigid insulation board) use corrosion resistant minimum 3.4 lbs per square yard, 3/8 inch paper backed lath (paper backing shall meet requirements of ASTM D226 to be considered a substitute for Weather Resistance Barrier). Any alternative lath material shall carry an evaluation report that rates the lath as an acceptable substitute to the above listed materials.

2.4 Fasteners

Galvanized steel fasteners (nails, staples or screws), for wood stud applications (open, rigid sheathing, rigid foam insulation) should penetrate the stud a minimum of 3/4 inch. Spacing of these fasteners should be a maximum of 6” vertical and should be 16” horizontal (on the studs). These fasteners should be a minimum of 1 1/4” long, 11 gage nails having 7/16 inch head or 7/8 inch long, 16 gage staples. Corrosion resistant screws should have a 7/16 inch head and should penetrate the metal stud a minimum of 3/8 inch. Refer to governing code for information on specific fastener penetration depth.

In the case of rigid sheathing, care should be taken to avoid excessive fasteners applied between wall framing. In the case of exterior gypsum sheathing (e.g DensGlass), fasteners should only be applied into wall framing unless additional fasteners are approved by the design professional.

2.5 Weep Screed

Foundation Weep Screed shall be corrosion resistant and a minimum 0.019-inch (No. 26 galvanized sheet gauge, fabricated plastic or vinyl material) with a minimum vertical attachment of 3 1/2 inches. Weep screed should have holes with a minimum diameter of 3/16 inch spaced at a maximum of 33 inches on center. Refer to governing building code for information on weep screed use.

2.6 Concrete Bonding Agent

Concrete bonding agents shall meet the requirements of ASTM C 1059 or ASTM C 932.

2.7 Mortar

To be mixed with potable water clean and free from injurious amounts of oils, acids, alkais, salts, organic materials or other deleterious substances.

Parts by Volume					
	Portland or Blended Cement ASTM C150	Masonry Cement Type N ASTM C91	Masonry Cement Type S ASTM C91	Lime ASTM C207	Sand ASTM C144
Mix 1	1	1			2.25-3
Mix 2	1			1	4.5
Mix 3			1		2.25-3
Mix 4		1			2.25-3
Mix 5	Mix 1 part Type S Mortar Mix with volume of water indicated on instructions				

2.8 Flashing, Caulk and Sealant

Shall meet local building code requirements.

2.9 Metal Accessories

All galvanized finish unless otherwise noted.

PART 3 EXECUTION REQUIREMENTS

3.1 EXECUTION AND COORDINATION

3.1.1 Before commencing, review all adjacent products and other subcontractor's work that precedes the installtion of manufactured stone veneer to ensure that proper conditions exist and there are no recognizable deficiencies or errors.

3.1.2 Immediately notify appropriate customer project contact or supervisor of any variations, inconsistencies, omissions or conflicts between the installation of manufactured stone veneer and other products or in the design of the project or local building codes.

3.2 PREPARATION

3.2.1 Before commencing any work activity around or adjacent to exterior openings and penetrations, ensure that flashing, caulking or sealants have been applied (by responsible party).

3.2.2 As appropriate, mask and protect windows, doors, hardware, trim, fixtures and similar items prior to placing mortar. Do not remove any items without authorization from the customer project or contact supervisor.

3.3 INSTALLATION AND APPLICATION

3.3.1 **Material Sourcing:** Furnish manufactured stone veneer, related accessories and installation materials to the project in take-off quantities that include an allowance for appropriate breakage and waste. Consult with BuildDirect for instructions on how to estimate take-off quantities.

3.3.2 **Weather Resistant Barrier ("WRB"):**

3.3.2.1 Install weather resistive barrier (per manufacturer's instructions) over all exterior surfaces designated to receive stone veneer and require waterproofing.

3.3.2.2 WRB may be installed in two layers for added water/moisture protection (optional per customer specifications).

3.3.2.3 WRB shall be applied horizontally with the upper layer lapped over the lower layer at not less than 2 inches. Lap weather-resistive barrier not less than 6 inches at the vertical joints. in the case of applications with two layers, start with two horizontal layers at the bottom of exterior wall or structure.

3.3.3 **Flashing, Caulk and Sealant:**

3.3.3.1 Inspect and verify that all flashing, caulking and sealants have been properly installed to the best of your knowledge. Before proceeding, notify customer project contact or supervisor of any issues related to these items so that proper installation can be verified and any issues addressed.

3.3.3.2 WRB shall be integrated with all flashing materials in such a manner so as to prevent water penetration into structure.

3.3.4 **Concrete Bonding Agent:**

3.3.4.1 Concrete bonding agent may be used on new poured concrete or old concrete surfaces that have been properly cleaned and prepared.

3.3.4.2 Surface applied bonding agents: apply bonding agent over concrete surface with a brush or roller per manufacturer's instructions. Ensure that complte and uniform coverage is achieved.

3.3.4.3 Integral applied concrete bonding agens: mix concrete bonding agent into mortar per manufacturer's instructions. Any mortar which utilizes an integral bonding agent shall achieve minimum shear bond strength of 50 PSI when tested in accordance with ASTM C482.

3.3.4.4 A combination of surface applied bonding agent and integral bonding agent (mixed in the mortar) can be utilized so long as use in this manner is approved by the manufacturer of each respective agent.

3.3.4.5 Alternatively, metal lath may be installed on new or old poured concrete surfaces as well as masonry surfaces using approved fasteners for these applications provided that the concrete or masonry surfaces are in acceptable condition so as to not jeopardize the structural or aesthetic integrity.

3.3.5 **Metal Lath and Accessories**

3.3.5.1 Install metal lath using approved fasteners (see section titled “Fasteners”) with the long dimension perpedndicular to the supports. Lap lath not less than 2 inches all around vertically and horizontally.

3.3.5.2 Terminate lath a minimum of 2 inches on the foundation and/or flange of the weep screed or as directed by project specifications and or local building codes.

3.3.5.3 Metal lath can be installed with the small cups pointing upward to better capture mortar scratch coat (though this is not required).

3.3.5.4 Double lap metal lath around all inside and outside corners to provide an adequate overlap based on wall construction and fastening method. Do not pull lath too tightly at corners or edges.

3.3.6 **Weep Screed:** Install foundation Weep Screed per manufacturer’s instructions and integrate with WRB and metal lath. Weep screed shall have a minimum of 3 1/2 inches attachment flange at or below the foundation plate line on exterior walls in accor dance with ASTM C926. The exterior lath shall cover and terminate on the attachment flange of the weep screed. Weep holes should not be covered during installation.

3.3.7 **Clearances and Special Installation Considerations:** On exterior stud walls, weep screed or other base flashings should be held a minimum of 4 inches above finished grade or 2 inches above paved surfaces or as per local code and building practices. Weep screed and/or stone should be held a minimum of 1/2 inch if the paved surface is a walking surface supported by the same foundation supporting the wall or as per local code and building practices.

Where manufactured stone veneer is applied over an exterior concret or CMU wall, maintain 2 inch clearance from grade or 1/2 inch from a paved surface.

3.3.8 **Mortar Scratch Coat:**

3.3.8.1 Apply mortar scratch coat with sufficient pressure to form full keys through and embed into the metal lath with sufficient thickness of material to cover teh metal with a uniform layer (a minimum of 3/8 inch).

3.3.8.2 In the case of paperbacked, 3.4 lb 3/8 inch lath applied to open studs, mortar scratch coat total thickness is to be betweend a minimum of 3/8 inch. Permit the mortar scratch coat to cure to a point where manufactured stone veneer can be applied without damage. Cure time varies with ambient temperature and humidity. Measure coat thickness from the back plane of the lath or from the front face of the solid backing to the outer surface exclusive of texture variations, voids, dimples or ribs.

3.3.8.3 Scoring the surface of the mortar scratch coat (once it becomes firm) in a horizontal directions may be performed to increase the surface bonding properties when manufactured stone is applied. This is an optimal procedure.

3.3.8.4 When installing a mortar scratch coat over masonry or concrete surfaces, pre-wet surface to a damp condition to avoid excessive absorption of moisture from the mortar scratch coat. This will help ensure full hydration of mortar cement and a sufficient bond as well as minimize the risk of mortar shrinkage and cracking.

3.3.8.5 Install masonry control joints if called for by architectural plans and specifications or local code.

3.3.9 **Manufactured Stone Veneer**

3.3.9.1 If mortar scratch coat is completely dry or ambient conditions cause rapid drying conditions, then re-wet with water so that the surface is damp. There shall not be any free water on the surface when the manufactured stone veneer is applied

3.3.9.2 Apply 1/2 inch thick layer of mortar to the entire inside surface area of the stone.

3.3.9.3 Press stone firmly into place with pressure to ensure tight contact with and complete coverage of the base coat allowing mortar to fill texture and voids on teh back of the unit. Work the units with slight lateral motion while applying pressure to improve bonding.

3.3.9.4 Terminate the stone a minimum of 4 inches above the finished grade., 2 inches above the paved surfaces and 1/2 inch above paved walking surfaced that is supported by the same foundation supporting the wall or as per local code and building practices. When weep screed is utilized, terminate the stone as stated in section 3.3.6 of this document.

3.3.9.5 Grout Joints:

3.3.9.5.1 Standard Joints:

3.3.9.5.1.1 Mortar shall be a type and quality consistent with that specified in the Material Requirements section of this document.

3.3.9.5.1.2 Fill joints with mortar (mortar bag) forcing mortar into all voids.

3.3.9.5.1.3 Allow mortar to become thumb print hard.

3.3.9.5.1.4 Tool mortar joint to desired shape and finish using a pointing tool, wooden stick, brush or other tool to the desired depth.

3.3.9.5.1.5 Once mortar is sufficiently set, use a dry brush to clean excess mortar. Do not use a wet brush to clean excess mortar. Do not use any acid or chemical based products to clean excess mortar.

3.3.9.5.2 Joint less or dry stack conditions:

3.3.9.5.2.1 No mortar joint is necessary when stone has been properly applied per instructions above. Manufactured stone veneer should be installed in a tight fitting, random ashlar pattern with minimum voids and each stone veneer unit closely resting on top of adjacent pieces. Pieces should be cut using a masonry saw or cutting toold. Pieces with exposed cuts should be placed within courses and pointed away from view at entries and exits to a building.

3.4 QUALITY CONTROL

3.4.1 Each project should be inspected on a periodic basis to ensure that installation is being performed per these instructions as well as any local building codes or project specifiactions.

3.5 CLEAN-UP

3.5.1 All masonry debris and installation materials shall be removed from the ground, window wells, concrete surfaces and other areas not intended for stone veneer.

3.5.2 Manufactured stone veneer and related installation material debris shall be cleaned-up per procedures and conditions called for at the jobsite.