

## Senerflex Vulcan NC – Section 07 24 19

*Water-drainage polymer-based EIFS incorporating mineral wool insulation, vertical drainage channels and an air/water-resistive barrier*

### INTRODUCTION

This specification has been assembled to enable the design professional to select or delete sections to suit the project requirements and is intended to be used in conjunction with Senergy® typical details, product bulletins, technical bulletins, etc.

### DESIGN RESPONSIBILITY

It is the responsibility of both the specifier and the purchaser to determine if a product is suitable for its intended use. The designer selected by the purchaser shall be responsible for all decisions pertaining to design, detail, structural capability, attachment details, shop drawings and the like. The Senergy® brand of Master Builders Solutions Construction Systems US, LLC (herein referred to as “Master Builders Solutions”) has prepared guidelines in the form of specifications, typical application details, and product bulletins to facilitate the design process only. Master Builders Solutions is not liable for any errors or omissions in design, detail, structural capability, attachment details, shop drawings or the like, whether based upon the information provided by Master Builders Solutions or otherwise, or for any changes which the purchasers, specifiers, designers or their appointed representatives may make Master Builders Solutions published comments.

### Designing and Detailing a Senerflex Vulcan NC Wall System

General: The system shall be installed in strict accordance with current recommended published details and product specifications from the system’s manufacturer.

#### A. Wind Load

1. Maximum deflection not to exceed L/240 under positive or negative design loads.
2. Design for wind load in conformance with local code requirements.

#### B. Substrate Systems

1. Acceptable substrates are: PermaBase® Cement Board and other cement-boards conforming with ASTM C1325 (Type A-exterior); poured concrete/unit masonry; ASTM C1177 type sheathings, including, Weather Defense™ Platinum sheathing, GreenGlass® sheathing, eXP™ sheathing, GlasRoc® sheathing, Securock™ glass-mat sheathing, and DensGlass® exterior sheathing DensElement (sheathing only); gypsum sheathing (ASTM C79/C1396); Huber Zip (sheathing only) Exposure I or exterior plywood (Grade C/D or better); or Exposure I OSB; fire treated wood sheathing: Pyro-Guard® and Dricon® plywood and FlameBlock® OSB.
2. Painted and otherwise coated surfaces of brick, unit masonry, stucco and concrete shall be inspected and prepared as approved by Master Builders Solutions before application. The applicator shall verify that the proposed substrate is acceptable prior to the Senerflex Vulcan NC Wall System installation.
3. The substrate systems shall be engineered with regard to structural performance by others.

#### C. Moisture Control

1. Prevent the accumulation of water behind the EIFS, either by condensation or leakage through the wall construction, in the design and detailing of the wall assembly.
  - a. Provide flashing to direct water to the exterior where it is likely to penetrate components in the wall assembly, including, above window and door heads, beneath window and door sills, at roof/wall intersections, decks, abutments of lower walls with higher walls, above projecting features, and at the base of the wall and anywhere else required by local code.
  - b. Air Leakage Prevention: Provide continuity of air barrier system at foundation, roof, windows, doors and other penetrations through the system with connecting and compatible air barrier components to minimize condensation and leakage caused by air movement.
  - c. Vapor Diffusion and Condensation: Perform a dew point analysis of the wall assembly to determine the potential for accumulation of moisture in the wall assembly as a result of water vapor diffusion and condensation. Adjust insulation thickness and/or other wall assembly

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components accordingly to minimize the risk of condensation. Avoid the use of vapor retarders on the interior side of the wall in warm, humid climates.

**D. Impact Resistance:** Provide ultra-high impact resistance to a minimum height of 6' (1.8m) above finished grade at all areas accessible to pedestrian traffic and other areas exposed to abnormal stress or potential impact. Indicate the areas with impact resistance requirements other than "Standard" on contract drawings.

### E. System Joints

1. Typical locations for system expansion joints are at building expansion joints, at prefabricated panel joints, floor lines of wood frame construction or where slip tracks are used in steel frame construction, where substrates change and where structural movement is anticipated. It is the sole responsibility of the project design team, including the architect, engineer, etc., to ultimately determine specific expansion joint placement, width and design. Detail specific locations in construction drawings.
2. Sealant joints are required at all penetrations through the Senerflex Vulcan NC Wall System (windows, doors, etc.)
3. Specify compatible closed cell backer rod and acceptable sealant that has been evaluated in accordance with ASTM C 1382, "Test Method for Determining Tensile Adhesion Properties of Sealants When Used in Exterior Insulation and Finish System (EIFS) Joints," and that meets minimum 50% elongation after conditioning.
4. The system must be properly terminated (back wrapped a min. of 2", properly sealed, flashed) at all penetrations, lighting fixtures, electrical outlets, hose bibs, dryer vents, etc.

**F. Grade Condition:** The Senerflex Vulcan NC Wall System is not intended for use below grade or on surfaces subject to continuous or intermittent immersion in water or hydrostatic pressure. Ensure a minimum 6" (152 mm) clearance above grade or as required by code, a minimum 1" (25 mm) clearance above finished grade (sidewalk/concrete flatwork).

### G. Trim, Projecting Architectural Features

**(NOTE TO SPECIFIER: Installation of the Senergy Wall System outside the slope guidelines referenced in this specification may still qualify for a standard warranty; however, low sloping EIFS conditions are subject to extreme heat, increased maintenance and premature deterioration of the system shall be expected and any deleterious effects caused by the lack of slope will not be the responsibility of Master Builders Solutions. Senergy Wall Systems are designed and tested to be applied to vertical surfaces. The design professional has the option to build according to his/her project needs. The design professional must also consider geography, climate, building orientation, wall orientation and adjacent building components when designing with EIFS. The slope guidelines referenced below are provided to assist the owner and/or design professional. Final design of any building is the responsibility of the design professional.)**

1. Minimum slope for all projections shall be 1:2 (27°) with a maximum length of 12" (30.5 cm) [6" in 12" (e.g. 15 cm in 30.5 cm)]. Increase slope for northern climates to prevent accumulation of ice/snow on the surface.
2. Mineral wool feature bands are applied over the base layer of mineral wool insulation and attached with Senergy adhesive and Wind-Lock ULP-302 plates and fasteners, into supporting structure. Reinforced base coat shall be applied continuously across the feature band. Thickness of the bands will be limited by available fastener lengths.
3. Other features with more complicated profiles such as cornices are typically manufactured from EPS insulation – these shapes must be pre-wrapped with Senergy base coat and reinforcing mesh. Cornice features are limited to 12" (305 mm) thickness and attached with Senergy adhesive to the mineral wool insulation. Supplemental mechanical attachment may be required based on the shape configuration, verify availability of fasteners for adequate fastening prior to start of work. Ensure reinforced base coat is applied in a continuous manner from mineral wool onto feature.

### H. Coordination with other trades

1. Evaluate adjacent materials such as windows, doors, etc. for conformance to manufacturer's details. Adjacent trades shall provide scaled shop drawings for review.
2. Air seals at any joints/gaps between adjoining components (penetrations, etc.) are of primary importance to maintain continuity of an air barrier system and must be considered by the design professional in the overall wall assembly design. Install air seals between the primary air/water-

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resistive barrier and other wall components (penetrations, etc.) in order to maintain continuity of an air barrier system.

3. Provide site grading such that Senerflex Vulcan NC Wall System terminates a minimum of 6" (152 mm) above grade or as required by code.
4. Provide protection of rough openings in accordance with Senergy's *Air/Water-Resistive/Vapor Barrier Application Guidelines* before installing windows, doors, and other penetrations through the wall.
5. Install copings and sealant immediately after installation of the Senerflex Vulcan NC Wall System and when Senergy coatings are completely dry.

### TECHNICAL INFORMATION

Consult Master Builders Solutions' Technical Services Department for specific recommendations concerning all other applications. Consult the Senergy website, [senergy.master-builders-solutions.com](http://senergy.master-builders-solutions.com), for additional information about products, systems and for updated literature.

### PART 1 GENERAL

**NOTE TO SPECIFIER: Items in blue/underlined indicate a system option or choice of options. Throughout the specification, delete those which are not required or utilized.**

#### 1.01 SECTION INCLUDES

- A. Refer to all drawings and other sections of this specification to determine the type and extent of work therein affecting the work of this section, whether or not such work is specifically mentioned herein.
- B. Senerflex Vulcan NC Wall System: Composite wall Exterior Insulation and Finish System consisting of air/water-resistive barrier, adhesive, mineral wool insulation, base coat, reinforcing mesh, and finish coat (except insulation, all materials must be produced by Master Builders Solutions).
- C. Senergy products are listed in this specification to establish a standard of quality. Any substitutions to this specification shall be submitted to and receive approval from the Architect at least 10 days before bidding. Proof of equality shall be borne by the submitter.
- D. The system type shall be Senergy Senerflex Vulcan NC Wall System as manufactured by Master Builders Solutions, Shakopee, MN.

#### 1.02 RELATED SECTIONS

- A. Section 03 00 00 Concrete substrate
- B. Section 04 00 00 Masonry substrate
- C. Section 05 40 00 Cold-formed metal framing
- D. Section 06 16 00 Sheathing
- E. Section 06 11 00 Wood framing
- F. Section 07 27 00 Air barriers
- G. Section 07 62 00 Sheet Metal Flashing and Trim
- H. Section 07 65 00 Flexible flashing
- I. Section 07 90 00 Joint protection
- J. Section 08 00 00 Openings
- K. Section 09 22 00 Supports for plaster and gypsum board
- L. Section 09 22 16 Non-structural metal framing
- M. Section 09 29 00 Gypsum board

#### 1.03 DEFINITIONS

- A. Exterior Insulation and Finish System: Exterior assembly comprised of adhesive, rigid insulation, base coat, reinforcing mesh, and finish coat.
- B. Class PB Systems: A class of EIFS where the base coat varies in thickness depending upon the number of layers or thickness of reinforcing mesh. The reinforcing material is glass fiber mesh, which is embedded into the base coat at the time of installation. The base coat shall be applied to achieve reinforcing mesh embedment with no reinforcing mesh color visible, nominal thickness of 1/16" (1.6 mm). Protective finish coats, of various thicknesses, in a variety of textures and colors, are applied over the base coat.
- C. Water-Drainage EIFS: A wall cladding design with an exterior surface for primary weather protection

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and aesthetics, which incorporates an inner secondary air/water-resistive barrier to accommodate incidental moisture and direct it to the exterior.

### 1.04 SUBMITTALS

- A. Submit under provisions of Section [01 33 00]
- B. Code Compliance : Provide manufacturer's applicable code compliance report.
- C. Samples: Submit [\[two\]](#) [\[x\]](#) [\[millimeter\]](#) [\[inch\]](#) size samples of Senerflex Vulcan NC Wall System illustrating finish coat color and texture range.
- D. Certificate: System manufacturer's approval of applicator.
- E. Sealant: Sealant manufacturer's certificate of compliance with ASTM C1382.
- F. System manufacturer's current specifications, typical details, system overview and related product literature which indicate preparation required, storage, installation techniques, jointing requirements and finishing techniques.

### 1.05 QUALITY ASSURANCE

- A. Manufacturer: More than 10 years in the EIFS industry, with more than 1000 completed EIFS projects.
- B. Applicator: Approved by Master Builders Solutions in performing work of this section.
- C. Regulatory Requirements: Conform to applicable code requirements for EIFS.
- D. Field Samples
  1. Provide under provisions of Section [\[01 43 36\]](#) [\[01 43 39\]](#).
  2. Construct one field sample panel for each color and texture, [\[x\]](#) [\[meters\]](#) [\[feet\]](#) in size of system materials illustrating method of attachment, surface finish color and texture.
  3. Prepare each sample panel using the same tools and techniques to be used for the actual application.
  4. Locate sample panel where directed.
  5. Accepted sample panel [\[may\]](#) [\[may not\]](#) remain as part of the work.
  6. Field samples shall be comprised of all wall assembly components including substrate, air/water-resistive barrier, insulation board, base coat, reinforcing mesh, primer (if specified), finish coat, and typical sealant/flashing conditions.
- E. Testing:
  1. General Air/Water-Resistive Barrier Minimum Performance:

TEST	METHOD	CRITERIA	RESULTS
Water-resistive barrier coatings used under EIFS	ASTM E2570		Meets all performance requirements
Air Leakage of Air Barrier Assemblies	ASTM E2357	0.04 cfm/ft <sup>2</sup> @ 1.57 psf (0.2 l / (s.m <sup>2</sup> ) @75 Pa)	0.0001 cfm/ft <sup>2</sup> @ 1.57 psf (0.0007 l/s.m <sup>2</sup> @ 75 Pa) positive / post conditioning 0.0003 cfm/ft <sup>2</sup> @ 1.57 psf (0.0014 l/s.m <sup>2</sup> @ 75 Pa) negative / post conditioning
Air Permeance of Building Materials	ASTM E2178	0.004 cfm/ft <sup>2</sup> @ 1.57 psf (0.02 l / (s.m <sup>2</sup> ) @75 Pa)	0.00098 cfm/ft <sup>2</sup> @ 1.57 psf (0.0049 l/s.m <sup>2</sup> @ 75 Pa)
Rate of Air Leakage	ASTM E283		0.0185 l/s.m <sup>2</sup> @ 75 Pa (0.0037 cfm/ft <sup>2</sup> @ 1.57 psf)
Water Vapor Transmission	ASTM E96	Report value	Senershield-R - 18 Perms (grains/Hr. in Hg. ft <sup>2</sup> ) @ 10 mils wet film thickness Senershield-RS 18 Perms (grains/Hr. in Hg. ft <sup>2</sup> ) @ 12 mils wet film thickness Senershield-R/RS - 14 Perms (grains/Hr. in Hg. ft <sup>2</sup> ) @ 20 mils wet film thickness Senershield-VB - 0.09 Perms (grains/Hr. in Hg. ft <sup>2</sup> ) @ 26 mils wet film thickness
Pull-Off Strength of Coatings	ASTM D4541	Min. 110 kPa (15.9 psi) or substrate failure	Pass - Tested over exterior gypsum sheathing, ASTM C1177 glass-mat sheathing, cement board, OSB, plywood; pvc and galvanized flashing
Nail Sealability (without Sheathing Fabric)	ASTM D1970	No water penetration at galvanized roofing nail penetration under 127 mm (5") head of water after 3 days at 4° C (40° F)	Pass
Surface Burning	ASTM E84	Flame Spread < 25 Smoke Development < 450	Meets Class A: Flame spread =15 Smoke developed = 95

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### 2. Air/Water-Resistive Barrier ICC-ES AC-212:

TEST	METHOD	CRITERIA	RESULTS
Sequential Testing: 1. Structural 2. Racking 3. Restrained Environmental Conditioning 4. Water Penetration	1. ASTM E 1233 Procedure A 2. ASTM E 72 3. ICC-ES AC-212 4. ASTM E 331	No cracking at joints or interface of flashing No water penetration after 15 min @ 137 Pa (2.86 psf)	Pass - Tested over OSB and gypsum sheathing No water penetration after 90 min @ 299 Pa (6.24 psf)
Sequential Testing: 1. UV Light Exposure 2. Accelerated Aging 3. Hydrostatic Pressure Test	1. ICC-ES AC-212 2. ICC-ES AC-212 3. AATCC 127-1985	No cracking or bond failure to substrate No water penetration after 21.7 in (550 mm) water for 5 hours	Pass
Freeze-Thaw	ASTM E 2485 (Method B)	No sign of deleterious effects after 10 cycles	Pass - Tested over exterior gypsum sheathing, ASTM C1177 glass-mat sheathing, cement board, OSB, plywood
Water Resistance	ASTM D 2247	No deleterious effects after 14-day exposure	Pass - Tested over exterior gypsum sheathing, ASTM C1177 glass-mat sheathing, cement board, OSB, plywood
Tensile Bond	ASTM C 297	Minimum 103 kPa (15 psi)	Pass - Tested over exterior gypsum sheathing, ASTM C1177 glass-mat sheathing, cement board, OSB, plywood, CMU; pvc and galvanized flashing
Tensile Bond (after freeze-thaw)	ASTM C 297	Minimum 103 kPa (15 psi) avg; no failure after 10 cycles freeze-thaw	Pass

### 3. Air/Water-Resistance Barrier ICC-ES AC 148:

TEST	METHOD	CRITERIA	RESULTS
Sequential Testing: 1. UV Light Exposure 2. Accelerated Aging 3. Hydrostatic Pressure Test	1. ICC-ES AC 148 2. ICC-ES AC 148 3. AATCC 127-1985	No cracking or bond failure to substrate No water penetration after 21.7 in (550 mm) water for 5 hours	Pass
Peel Adhesion	ASTM D 3330 Method F	After UV Exposure After Accelerated Aging After Elevated Temperature Exposure After Water Immersion	Pass - tested over ASTM C1177 glass-mat sheathing, OSB, plywood, PVC and uncoated aluminum
Nail Sealability after Thermal Cycling	ASTM D 1970 (Modified), AAMA 711	No water penetration at galvanized roofing nail penetration under 31 mm (1.2") head of water after 24 hours at 4° C (40° F)	Pass
Tensile Strength after UV Exposure	ASTM D 5034, AAMA 711	Minimum 0.5 N/mm (2.9 lbs./in)	Pass
Cold Temperature Pliability	ASTM D 1970, AAMA 711	No cracking after bending around a 25 mm (1") mandrel after 2-hour exposure to -18° C (0° F)	Pass
Resistance to Peeling	AAMA 711	No signs of distress or failure after 24 hours of exposure at room temperature, 50° C (122° F), 65° C (149° F), 80° C (176° F)	Pass

### 4. Senerflex Vulcan NC Wall System and Component Performance:

TEST	METHOD	CRITERIA	RESULTS
EIFS and EIFS with Drainage	ASTM E2568 and ICC-ES AC 235		Meets all performance requirements
Drainage Efficiency	ASTM E2273	90% Minimum	Pass - 92%
Transverse Wind-load	ASTM E330	Steel stud framing (18 gauge x 3 5/8") 16"o.c., 1/2" gypsum sheathing, 4" Sheathing Fabric over sheathing joints, Senershield-R/-RS/-VB, Senergy Adhesive, mineral wool insulation board (9 fasteners per board), Senergy Base Coat, Flexguard 4 Reinforcing Mesh and Senergy Finish.	Average ultimate loads <sup>1</sup> : - 115 psf (5506 Pa) + 176 psf (8426 Pa)

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Transverse Wind-load	ASTM E330	Wood assembly (2" x 4") 16"o.c., 7/16" Exposure 1 OSB, 4" Sheathing Fabric over sheathing joints, Senershield-R/-RS/-VB, Senergy Adhesive, mineral wool insulation board (9 fasteners per board), Senergy Base Coat, Flexguard 4 Reinforcing Mesh, Senergy Finish.	Average ultimate loads <sup>1</sup> : - 194 psf (9288 Pa) + 142 psf (6798 Pa)
Tensile Bond	ASTM C297/E2134	Minimum 15 psi (103 kPa)	Pass
Water Penetration	ASTM E 331	No water penetration after 15 minutes @ 2.86 psf (137 Pa) Additional testing performed for 2 hours @ 6.24 psf (299 Pa)	Pass, no water penetration for both durations and pressures
Fire Endurance	ASTM E119	Maintain fire resistance of existing rated assembly	Does not detract from the existing fire rating of base wall construction
Radiant Heat Exposure	NFPA 268	Not Applicable, based on previous testing with foam plastic insulation and the substitution of noncombustible mineral wool insulation	
Intermediate Scale Multi-Story Fire Test	NFPA 285 / UBC Standard 26-9	Not Applicable, based on previous testing with foam plastic insulation and the substitution of noncombustible mineral wool insulation	
Surface Burning	ASTM E84 / UL 723	Flame spread < 25 Smoke developed < 450	All components of the system meet Class A performance (FS < 25; SD < 450)
Abrasion Resistance	ASTM D968	No Cracking or loss of film integrity at 528 qt. (500L) of sand	Finish Coat not worn through after 686 liters of falling sand
Accelerated Weathering	ASTM G 155	No deleterious effects after 2000 hours, viewed under 5x magnification.	Pass
Accelerated Weathering (Lamina)	ASTM G 154 (formerly G53)	No deleterious effects after 2000 hours.	Pass - No deleterious effects after 7500 hours.
Freeze-Thaw	ASTM E2485	No deleterious effects after 10 cycles, viewed under 5 x magnification	Pass
Mildew Resistance	Mil Std 810B Method 508	No fungus growth after 28 days	Pass
Salt Fog Resistance	ASTM B117	No deleterious effects after 300 hours	Pass
Water Resistance of Coating in 100% R.H.	ASTM D 2247	No deleterious effects after 14 days exposure	Pass

<sup>1</sup> No failure in the Senergy materials; failure in framing and/or sheathing connections

### 5. Reinforcing Mesh Testing and Impact Resistance over Mineral Wool Insulation

TEST	METHOD	CRITERIA	RESULTS
Alkali Resistance of Reinforcing Mesh	ASTM E 2098	Greater than 120 pli (21 dN/CM) retained tensile strength	Pass (all mesh)
FLEXGUARD 4	ASTM E2486 (formerly EIMA 101.86)	25-49 inch-lbs. (2.8-5.6 j)	Pass
INTERMEDIATE 6	ASTM E2486 (formerly EIMA 101.86)	50-89 inch-lbs. (5.7-10.1 j)	Pass
INTERMEDIATE 12	ASTM E2486 (formerly EIMA 101.86)	50-89 inch-lbs. (5.7-10.1 j)	Pass
INTERMEDIATE 12 & FLEXGUARD 4	ASTM E2486 (formerly EIMA 101.86)	90-150 inch-lbs. (10.2-17.0 j)	Pass
STRONG 15 & FLEXGUARD 4	ASTM E2486 (formerly EIMA 101.86)	150 inch-lbs. (17 j)	Pass
HI-IMPACT 20 & FLEXGUARD 4	ASTM E2486 (formerly EIMA 101.86)	150 inch-lbs. (17 j)	Pass

### 1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle products under provisions of Section [01 65 00] [01 66 00] [ ].
- B. Deliver Master Builders Solutions materials in original unopened packages with manufacturer's labels

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intact.

- C. Protect Master Builders Solutions materials during transportation and installation to avoid physical damage.
- D. Store Master Builders Solutions materials in cool, dry place protected from freezing. Store at no less than 40°F/4°C (50°F/10°C ALUMINA finish).
- E. Store MAXFLASH at a minimum of 40°F. In cold weather, keep containers at room temperature for at least 24 hours before using.
- F. Store insulation boards flat.
- G. Store Reinforcing Mesh, SHEATHING FABRIC and MASTERSEAL AWB 970 NP flexible flashing in cool, dry place protected from exposure to moisture.

### 1.07 PROJECT/SITE CONDITIONS

- A. Do not apply Master Builders Solutions material in ambient temperatures below 40°F/4°C (50°F/10°C for ALUMINA Finish). Provide properly vented, supplementary heat during installation and drying period when temperatures less than 40°F/4°C (50°F/10°C for ALUMINA Finish) prevail.
- B. Do not apply in ambient temperature above 100°F (38°C) or surface temperature above 120°F (49°C)
- C. Do not apply materials to frozen surfaces.
- D. Maintain ambient temperature at or above 40°F/4°C (50°F/10°C for ALUMINA Finish) during and at least 24 hours after Senerflex Vulcan NC Wall System installation and until dry.

### 1.08 SEQUENCING AND SCHEDULING

- A. Coordinate and schedule installation of Senerflex Vulcan NC Wall System with related work of other sections.
- B. Coordinate and schedule installation of trim, flashing, and joint sealers to prevent water infiltration behind the system.

### 1.09 WARRANTY

- A. Provide Master Builders Solutions standard warranty for Senerflex Vulcan NC Wall System installations under provisions of Section [01 70 00].
- B. Comply with Master Builders Solutions project review requirements and notification procedures to assure qualification for warranty.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

- A. Senergy Senerflex Vulcan NC Wall System (Class PB System) manufactured by Master Builders Solutions.

### 2.02 MATERIALS

**NOTE TO SPECIFIER: Items in blue/underlined indicate a system option or choice of options. Throughout the specification, delete those which are not required or utilized. Contact Master Builders Solutions Technical Service Department for further assistance.**

#### A. Air/Water-Resistive Barrier Components:

1. Air/Water-Resistive Barrier: **(Required, Select a, b or c)**
  - a. SENERSHIELD-R: A one-component fluid-applied vapor permeable air/water-resistive barrier.
  - b. SENERSHIELD-RS: A one-component fluid-applied vapor permeable air/water-resistive barrier for use with airless spray equipment.
  - c. SENERSHIELD-VB: A one-component fluid-applied vapor impermeable air/water-resistive barrier.
2. Rough Opening and Joint Treatment: **(Required, Select a or b)**
  - a. SHEATHING FABRIC: A spun-bonded non-woven reinforced polyester web for use with Senergy fluid applied air/weather-resistive barriers.
  - b. MAXFLASH: A one-component elastomeric material for use as a flexible flashing membrane.
3. MASTERSEAL AWB 970 NP Transitional Membrane / Expansion Joint Flashing: A 20-mil thick self-adhering and self-sealing composite membrane of polyester fabric and butyl adhesive. Compatible with Senergy liquid air/weather resistive barriers.

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### B. Adhesives/Base Coats: ***(Required, Select One or More)***

1. [ALPHA Base Coat: A 100% acrylic base coat, field-mixed with Type I or Type II Portland cement. It has a creamy texture that is easily spread.](#)
2. [ALPHA DRY Base Coat: A dry-mix polymer adhesive and base coat containing Portland cement, and requiring only water for mixing.](#)
3. [XTRA-STOP Base Coat: A 100% acrylic-based, water-resistant base coat, field-mixed with Type I or Type II Portland cement.](#)
4. [ALPHA GENIE Base Coat: A 100% acrylic, fiber-reinforced base coat, adhesive and leveler that is field-mixed with Type I or Type II Portland cement.](#)

**NOTE TO SPECIFIER: Portland cement is not required if ALPHA DRY Base Coat is specified.**

C. **Portland cement:** Conform to ASTM C150, Type I, II, or I/II, grey or white; fresh and free of lumps.

D. **Water:** Clean and potable without foreign matter.

### E. Noncombustible Mineral Wool Insulation Board: ***(Required, Select One or More)***

1. [ROCKWOOL:](#) ASTM C612 Type IVA; non-combustible per ASTM E136; Flame Spread 0, Smoke Developed  $\leq 15$  per ASTM E84; R-value @ 75°F (24°C) = 4.0 per inch; Size: 2' x 4' (0.6 m x 1.22 m). Length, width and thickness: tolerance of plus or minus 1/2" (12.7 mm) length, 1/4" (6.4 mm) width and 1/8" (3.2 mm) thickness.

#### a. [Frontrock™ DD \(Dual Density\):](#)

ASTM C165 – Compressive Strength: 522 psf (25 kPa) @ 10% compression	
Minimum Thickness 2.5" <sup>1</sup>	Maximum Thickness 4" <sup>1</sup>

<sup>1</sup>Thickness as indicated on drawings

#### b. [Frontrock™ Mono Density:](#)

ASTM C165 – Compressive Strength: 940 psf (45 kPa) @ 10% compression	
Minimum Thickness 1.5" <sup>1</sup>	Maximum Thickness 4" <sup>1</sup>

<sup>1</sup>Thickness as indicated on drawings

2. [Mineral Wool, ASTM C612 Type IVA; minimum compressive strength of 522 psf \(25 kPa\) @ 10% compression per ASTM C165; Flame Spread <25, Smoke Developed < 450 per ASTM E84; Non-combustible per ASTM E136; R-value @ 75°F \(24°C\) = 4.0 per inch. Thickness as indicated on drawings \[minimum 1.5" \(38 mm\), maximum 4" \(101mm\)\]. Size: 2' x 4' \(0.6 m x 1.22 m\). Length, width and thickness: tolerance of plus or minus 1/2" \(12.7 mm\) length, 1/4" \(6.4 mm\) width and 1/8" \(3.2 mm\) thickness.](#) Consult Master Builders Solutions' Technical Services Department on other insulation types before application.

F. **Mechanical Fasteners:** ULP-302 by Wind-Lock Corp high density plastic washers, 1 3/4 inches (44 mm) in diameter, used in combination with corrosion resistant screws that are suitable for the substrate.

- Steel: minimum 3/8" (10mm) and 3 thread penetration of steel with threads engaged with steel.
- Wood: minimum 3/4" (19mm) into wood framing.
- Masonry: minimum 1" (25mm).

G. **Senergy Reinforcing Mesh:** Balanced, open-weave glass, fiber reinforcing mesh, twisted multi-end strands treated for compatibility with Senergy Base Coats. ***(Required, Select One or More)***

1. [FLEXGUARD 4: Standard weight, 4 oz.](#)
2. [INTERMEDIATE 6: Medium weight, 6 oz.](#)
3. [INTERMEDIATE 12: Intermediate weight, 12 oz.](#)
4. [STRONG 15: Heavy weight, 15 oz. used only in combination with FLEXGUARD 4 or INTERMEDIATE 6.](#)
5. [HI-IMPACT 20: Heavy weight, 20 oz. used only in combination with FLEXGUARD 4 or INTERMEDIATE 6.](#)
6. [CORNER MESH: Intermediate weight, pre-marked for easy bending, for reinforcing at exterior corners.](#)

H. **COLOR COAT by Master Builders Solutions Coating (Optional):** A 100% acrylic-based coating. It is designed for spray, roller or brush-application over EIFS, for use in sealant joints over reinforced base coat or over finish coat with minimum change in finish texture or sheen.

I. **TINTED PRIMER by Master Builders Solutions Primer (Optional):** A 100% acrylic-based primer that helps alleviate shadowing and enhances performance of the Senergy Wall Systems. Color to closely match the selected Senergy Finish Coat color.



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### J. Senergy Finish Coat: (Required, Select One or More Finishes and Textures)

**NOTE: Use of smooth/fine finish textures is not advised, however if desired to achieve design requirements, a large-scale mock-up is recommended.**

1. SENERFLEX Finish: 100% acrylic polymer finishes with advanced technology to improve long-term performance and dirt pick-up resistance; air cured, compatible with base coat; Senergy finish color [ ] as selected; finish texture:
  - a. CLASSIC: Has a medium “worm-holed” appearance which is achieved by the random aggregate sizes in the Finish. The “worm-holed” look can be circular, random, vertical or horizontal.
  - b. FINE: utilizes uniformly sized aggregates for a uniform, fine texture.
  - c. TEXTURE: can achieve a wide variety of free-formed, textured appearances, including stipple and skip-trowel
  - d. SAHARA: Provides a uniform, “pebble” appearance.
2. SENERFLEX TERSUS Finish: Modified acrylic-based finish with water repellent properties, compatible with base coat; Senergy Finish color [ ] as selected; finish texture:
  - a. F1.0: A 1.0 mm uniform aggregate creating a fine texture.
  - b. M1.5: A 1.5 mm uniform aggregate creating a medium sand texture.
  - c. T0.5: can achieve a wide variety of free-formed, textured appearances, including stipple and skip-trowel
  - e. R1.5: Has a medium “worm-holed” appearance which is achieved by the random aggregate sizes in the Finish. The “worm-holed” look can be circular, random, vertical or horizontal.
3. Specialty Finishes: 100% acrylic polymer finishes that can be hand-troweled to simulate stone or create a time-honored, mottled tone-on-tone look that achieves a soft and weathered patina over time.
  - a. ENCAUSTO VERONA: Utilizes uniformly sized aggregate to achieve a free-formed, flat texture. It can be used to achieve a mottled look and unlimited tone on tone designs by combining multiple colors.
  - b. METALLIC: Has a pearlescent appearance. It utilizes uniformly sized aggregates for a uniform fine texture.
  - c. ALUMINA: Is a factory-mixed, reflective stone finish consisting of colored aggregate and large black mica flakes in a 100% acrylic transparent binder that provides a classic granite or marble-like textured finished appearance.
4. CHROMA Finish: 100% acrylic polymer-based finish with integrated high performance colorants for superior fade resistance, compatible with base coat; Senergy Finish color [ ] as selected; finish texture:
  - a. F1.0: Utilizes uniformly sized aggregates for a uniformly fine texture.
  - b. M1.5: Provides a uniform “pebble” appearance.
  - c. R1.5: Has a medium “worm-holed” appearance which is achieved by the random aggregate sizes in the Finish. The “worm-holed” look can be circular, random, vertical or horizontal.

### 2.03 ACCESSORIES

- A. Window/Door Drip Edge:** Rigid polyvinyl chloride (PVC), UV resistant for exterior use, with a drip edge, as furnished by Plastic Components, Inc. or equal. PVC accessories shall conform to ASTM D1784 and D4216; Sheet metal flashing conforming to ASTM A653

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Site Conditions:** Verify project site conditions under provisions of Section [01 00 00].

**B. Walls:**

1. Substrates:
  - a. Acceptable substrates are: PermaBase® Cement Board and other cement-boards conforming with ASTM C1325 (Type A-exterior); poured concrete/unit masonry; ASTM C1177 type sheathings, including, Weather Defense™ Platinum sheathing, GreenGlass® sheathing, eXP™ sheathing, GlasRoc® sheathing, Securock™ glass-mat sheathing, and DensGlass® exterior sheathing DensElement (sheathing only); gypsum sheathing (ASTM C79/C1396); Huber Zip (sheathing only) Exposure I or exterior plywood (Grade C/D or better); or Exposure I OSB; fire

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- treated wood sheathing: Pyro-Guard® and Dricon® plywood and FlameBlock® OSB. Consult the Master Builders Solutions Technical Services Department for all other applications.
- b. Wall sheathing must be securely fastened per applicable building code and sheathing manufacturer's requirements.
  - c. Examine surfaces to receive Senerflex Vulcan NC Wall System and verify that substrate and adjacent materials are dry, clean, sound, and free of releasing agents, paint, or other residue or coatings. Verify substrate is flat, free of fins or planar irregularities greater than 1/4" in 10' (6.4 mm in 3 m).
2. Flashings:
- a. All flashings are by others and must be installed in accordance with specific manufacturer's requirements. Where appropriate, end-dams must be provided.
  - b. Openings must be flashed prior to window/door, HVAC, etc. installation. Refer to MASTERSEAL AWB 970 NP product bulletin and Senergy's *Moisture Protection Guidelines for Senerflex Wall Systems* bulletin for further information.
  - c. Windows and openings shall be flashed according to design and Building Code Requirements.
  - d. Individual windows that are ganged to make multiple units require continuous head flashing and the joints between the units must be fully sealed.
3. Roof: Verify that all roof flashings have been installed in accordance with the guidelines set by the Asphalt Roofing Manufacturers Association (ARMA).
4. Kick-out flashing: Kick-out flashing must be installed leak-proof and angled (min 100°) to allow for proper drainage and water diversion.
5. Do not proceed until all unsatisfactory conditions have been corrected.

### 3.02 PREPARATION

- A.** Protect all surrounding areas and surfaces from damage and staining during application of Senerflex Vulcan NC Wall System materials.
- B. Finish:** Protect finished work at end of each day to prevent water penetration.
- C. Substrate preparation:** Prepare substrates in accordance with Senergy instructions.

### 3.03 MIXING

General: No additives are permitted unless specified in product mixing instructions. Close containers when not in use. Prepare in a container that is clean and free of foreign substances. Do not use a container which has contained or been cleaned with a petroleum-based product. Clean tools and equipment with water immediately after use. Dried material can only be removed mechanically.

**NOTE TO SPECIFIER: Keep only the products in this section which were selected in Section 2.02. Delete those not to be utilized.**

#### **A. Air/Water-Resistive Barriers:**

1. SENERSHIELD-R/RS/VB: Mix with a clean, rust-free paddle and drill until thoroughly blended. Do not add water.

#### **B. Senergy Base Coat:**

1. ALPHA Base Coat: Mix base coat with a clean, rust-free paddle and drill until thoroughly blended, before adding Portland cement. Mix one-part (by weight) Portland cement with one-part base coat. Add Portland cement in small increments, mixing until thoroughly blended after each additional increment. Clean, potable water may be added to adjust workability.
2. XTRA-STOP Base Coat: Mix base coat with a clean, rust-free paddle and drill until thoroughly blended, before adding Portland cement. Mix one-part (by weight) Portland cement with one-part base coat. Add Portland cement in small increments, mixing until thoroughly blended after each additional increment. Clean, potable water may be added to adjust workability.
3. ALPHA GENIE Base Coat: Mix base coat with a clean, rust-free paddle and drill until thoroughly blended, before adding Portland cement. Mix one-part (by weight) Portland cement with one-part base coat. Add Portland cement in small increments, mixing until thoroughly blended after each additional increment. Clean, potable water may be added to adjust workability.
4. ALPHA DRY Base Coat: Mix and prepare each bag in a 5-gallon (19-liter) pail. Fill the container with approximately 1.5-gallons (5.6-liters) of clean, potable water. Add base coat in small increments, mixing after each additional increment. Mix base coat and water with a clean, rust-free paddle and drill until thoroughly blended. Additional ALPHA DRY Base Coat or water may be added

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to adjust workability.

- C. COLOR COAT:** Mix the factory-prepared material with a clean, rust-free paddle and drill until thoroughly blended. A small amount of clean, potable water may be added to adjust workability. Do not overwater.
- D. TINTED PRIMER:** Mix the factory-prepared material with a clean, rust-free paddle and drill until thoroughly blended. A small amount of clean, potable water may be added to adjust workability. Do not overwater.
- E. Senergy Finishes - SENERFLEX, SENERFLEX TERSUS, CHROMA, and ENCAUSTO VERONA Finish:** Mix the factory-prepared material with a clean, rust-free paddle and drill until thoroughly blended. A small amount of clean, potable water may be added to adjust workability. Do not overwater.
- F. Specialty Finishes - ALUMINA Finish:** Gently mix the contents of the pail for 1 minute using a low RPM ½" drill equipped with a mixing paddle such as a Demand Twister or a Wind-Lock B-MEW, B-M1 or B-M9.

### 3.04 APPLICATION

**A. Accessories:** Attach Window/Door Drip Edge level and per manufacturer's instructions.

**NOTE TO SPECIFIER:** Keep only the products in this section which were selected in Section 2.02. Delete those not to be utilized.

#### **B. Air/Water-Resistive Barrier:**

1. All sheathing joints and windows/openings must be protected, and the air/water-resistive barrier applied in accordance with *Air/Water-Resistive/Vapor Barrier Application Guideline* technical bulletin.
2. Substrate shall be dry, clean, sound, and free of releasing agents, paint, or other residue or coatings. Verify substrate is flat, free of fins or planar irregularities greater than 6.4 mm in 3 m (¼" in 10').
3. Unsatisfactory conditions shall be corrected before application of the Senergy air/water-resistive barriers.
4. Apply the SHEATHING FABRIC and Senergy air/water-resistive barrier in accordance with the Senergy air/water-resistive barrier product bulletin.
5. Apply the MAXFLASH in accordance with the MAXFLASH product bulletin.
6. Installed materials shall be checked before continuing system application.
7. Ensure SHEATHING FABRIC Senergy air/water-resistive barrier or MAXFLASH overlaps the top flange of the starter track.
8. Installed materials shall be checked before continuing system application.

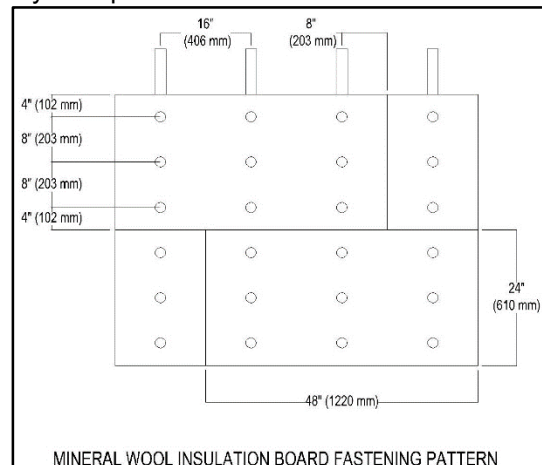
#### **C. Mineral Wool Insulation Board:**

1. **General:** Begin at base of wall with firm, temporary support or spacer. Stagger joints horizontally in a running bond pattern offset a minimum of 6" (152 mm). Pre-cut insulation board to fit openings and projections. Insulation board must be a single piece around corners of openings. Stagger vertical joints and corners. Stagger insulation and sheathing board joints. Offset insulation board joints from sheathing joints by a minimum of 8" (203 mm). Backwrap or pre-backwrap the terminating edges of the insulation application to properly encapsulate the insulation. Pre-backwrapping should be done at drainage terminations to ensure drainage path is not impeded.

- Fasteners: 9 fasteners are required per 2' x 4' (610 mm x 1220 mm) piece of insulation board. Install mechanical fasteners at not more than 8" (203mm) o.c. vertically and 16" (406) mm o.c. horizontally

2. **Adhesive:**

- a. Apply mixed Senergy Base Coat to entire surface of insulation board using a stainless-steel notched trowel with 1/2"x 1/2" (13 mm x 13 mm) notches spaced 2" (50 mm) apart. Ribbons of adhesive must be applied parallel to the 2' (610 mm) dimension of the insulation board to ensure they



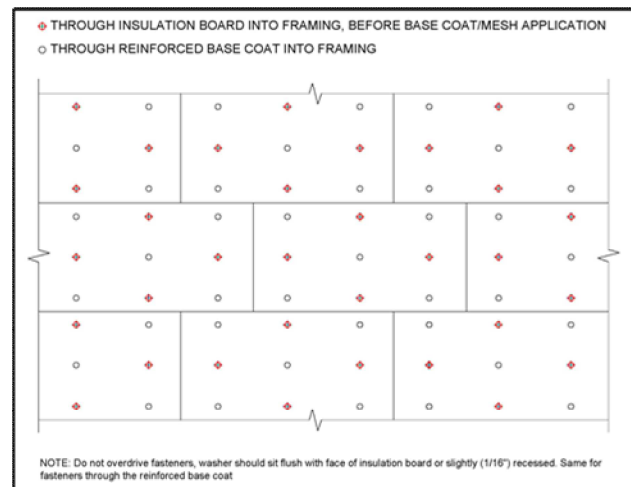
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are vertical when the insulation board is applied to the substrate. Keep the trowel clean to avoid adhesive build-up between adhesive ribbons, remove or scrape off any excess adhesive left between ribbons.

- b. Immediately set board into place and apply pressure over entire surface of board to ensure positive uniform contact and high initial grab. Do not slide board into place. Do not allow base coat to dry prior to installing.
- c. Abut all joints tightly to prevent gaps and ensure overall flush level surface.
- d. Interlock boards at inside and outside corners
- e. Fill gaps in the insulation board 1/8" (3 mm) or greater with slivers of mineral wool insulation
- f. The straight edge of a trowel can be used to shave high spots in the mineral wool insulation to create an even plane
- g. Preplan location of reveals so that they do not coincide with fastener locations or insulation board joints. Maintain a minimum 1" (25 mm) thickness of insulation board at the back of the reveal; bottom of reveal should have 6:12 slope
- h. Allow adhesive application of insulation board to dry (minimum 8 to 10 hours) prior to installation of mechanical fasteners.

### 3. Fasteners 1 of 2:

- a. Install 4 fasteners per insulation board after adhesive application of the insulation board
- b. Install fasteners along termination points within 4" (102 mm) of the horizontal edge and 8" (203 mm) vertical edge.
- c. Reference details for spacing/placement
- d. Where installation occurs over frame construction, ensure fasteners are installed into the framing members.
- e. Install fasteners to a depth to leave the ULP-302 plate flush or slightly recessed from the surface of the insulation, maximum recess of 1/16" (1.6 mm).



### 4. Base Coat and Reinforcing Mesh:

- a. Base coat shall be applied to achieve reinforcing mesh embedment with no reinforcing mesh color visible. Follow reinforcing mesh installation instructions below. Allow base coat to dry completely.

### 5. Fasteners 2 of 2:

- a. Install remaining 5 fasteners per board after the installation of the reinforced base coat. Follow same application guidelines as the initial fastener installation. Do not overdrive fasteners, ULP-302 plate should be flush or slightly recessed from the surface of the base coat.

### 6. Final Base Coat:

- a. Spot all exposed fasteners (fasteners on outside of reinforced base coat) with Senergy base coat prior to application of final skim coat layer of base coat. Multiple coats of base coat may be required to achieve a flat surface.

**NOTE TO SPECIFIER: Indicate on drawings the required locations of standard, medium, high or ultra-high impact reinforcing mesh.**

**D. Senergy Base Coat/Reinforcing Mesh:** Base coat shall be applied to achieve reinforcing mesh embedment with no reinforcing mesh color visible.

### E. Senergy CORNER MESH:

1. Install at corners, prior to application of reinforcing mesh.
2. Apply mixed Senergy Base Coat to insulation board at outside corners using a stainless-steel trowel. Immediately place mesh against the wet base coat and embed into the base coat by troweling from the corner; butt edges and avoid wrinkles.
3. After base coat is dry and hard, apply a layer of FLEXGUARD 4, INTERMEDIATE 6 or 12 Reinforcing Mesh over the entire surface of the CORNER MESH in accordance with 3.04 F.

**F. Standard Impact or Medium Impact Resistance Reinforcing Mesh:** FLEXGUARD 4 INTERMEDIATE 6 and INTERMEDIATE 12

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1. Install Senergy Reinforcing Mesh where indicated on drawings.
2. Apply mixed Senergy Base Coat to entire surface of insulation board with a stainless-steel trowel to embed the reinforcing mesh.
3. Immediately place Senergy Reinforcing Mesh against wet base coat and embed the reinforcing mesh into the base coat by troweling from the center to the edges.
4. Lap reinforcing mesh 2 ½" (64 mm) minimum at edges.
5. Ensure reinforcing mesh is continuous at corners, void of wrinkles and embedded in base coat so that no reinforcing mesh color is visible.
6. If required, apply a second layer of base coat to achieve total nominal base coat/reinforcing mesh thickness of 1/16" (1.6 mm).
7. Allow base coat with embedded reinforcing mesh to dry hard (normally 8 to 10 hours).

### **G. High Impact or Ultra High Impact Resistance Reinforcing Mesh:** INTERMEDIATE 12, STRONG 15 and HI-IMPACT 20

**NOTE TO SPECIFIER: Where STRONG 15 or HI-IMPACT 20 is specified, FLEXGUARD 4 or INTERMEDIATE 6 must be specified also.**

1. Install Senergy Reinforcing Mesh where indicated on drawings.
2. Apply mixed Senergy Base Coat to entire surface of insulation board with a stainless-steel trowel to embed the reinforcing mesh.
3. Immediately place Senergy Reinforcing Mesh against wet base coat and embed the reinforcing mesh into the base coat by troweling from the center to the edges.
4. Butt Senergy Reinforcing Mesh at all adjoining edges; do not use to backwrap or bend around corners.
5. Butt Senergy Reinforcing Mesh at adjoining edges of CORNER MESH.
6. Ensure reinforcing mesh is free of wrinkles and embedded in base coat so that no reinforcing mesh color is visible.
7. After base coat with embedded reinforcing mesh is dry and hard (normally 8 to 10 hours), apply a layer of FLEXGUARD 4 or INTERMEDIATE 6 Reinforcing Mesh over the entire surface in accordance with 3.04 F to achieve total nominal base coat/ reinforcing mesh thickness of 3/32" (2.4 mm).

### **H. COLOR COAT:**

1. Apply material to the base coat/reinforcing mesh in sealant joints with a high-quality, latex-type paintbrush. Work material continuously until a uniform appearance is obtained.
2. Allow to dry thoroughly (approximately 24 hours) prior to application of sealant primer and sealant.

### **I. TINTED PRIMER:**

1. Apply Primer to the base coat/reinforcing mesh with a sprayer, ¾" (10 mm) nap roller, or good quality latex paint brush at a rate of approximately 150-250 ft<sup>2</sup> per gallon (3.6-6.1m<sup>2</sup> per liter).
2. Primer shall be dry to the touch before proceeding to the Senergy Finish coat application.

### **J. Senergy Finish Coat:** SENERFLEX, SENERFLEX TERSUS and CHROMA.

1. Apply Senergy Finish directly to the base coat with a clean, stainless steel trowel.
2. Apply and level Senergy Finish during the same operation to minimum obtainable thickness consistent with uniform coverage.
3. Maintain a wet edge on Senergy Finish by applying and texturing continually over the wall surface.
4. Work Senergy finish to corners, joints or other natural breaks and do not allow material to set up within an uninterrupted wall area.
5. Float Senergy Finish to achieve final texture.

### **K. Specialty Finish:**

1. ALUMINA Finish:
  - a. Apply TINTED PRIMER by Master Builders Solutions to substrate in accordance with current product bulletin. Primer shall be of corresponding color for selected ALUMINA Finish color. Allow Primer to dry to the touch before proceeding Finish application.
  - b. Apply a tight coat of finish with a clean, stainless steel trowel.
  - c. Maintain a wet edge on finish by applying and leveling continually over the wall surface.
  - d. Work finish to corners, joints or other natural breaks and do not allow material to set up within an uninterrupted wall area. Allow first coat to set until surface is completely dry prior to applying a second coat of finish
  - e. Use a stainless-steel trowel and apply the second coat of finish. Achieve final texture using

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circular motions

- f. Total thickness of finish may be between 1/16" (1.6 mm) and 1/8" (3.2 mm).

### **3.05 CLEANING**

- A. Clean work under provisions of Section [01 74 00] [ ].
- B. Clean adjacent surfaces and remove excess material, droppings, and debris.

### **3.06 PROTECTION**

- A. Protect materials from rain, snow and frost for 48–72 hours following application.
- B. Protect installed construction under provisions of Section [01 76 00] [ ].

**END OF SECTION**

## **Senergy Channeled Adhesive CI Design Wall System**

### **WARRANTY**

Master Builders Solutions Construction Systems US, LLC (hereinafter "Master Builders Solutions") warrants this product to be free from manufacturing defects and to meet the technical properties on the current Product Bulletin, if used as directed within shelf life. Satisfactory results depend not only on quality products but also upon many factors beyond our control. MASTER BUILDERS SOLUTIONS MAKES NO OTHER WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PRODUCTS. The sole and exclusive remedy of Purchaser for any claim concerning this product, including but not limited to, claims alleging breach of warranty, negligence, strict liability or otherwise, is shipment to purchaser of product equal to the amount of product that fails to meet this warranty or refund of the original purchase price of product that fails to meet this warranty, at the sole option of Master Builders Solutions. In the absence of an extended warranty issued by Master Builders Solutions, any claims concerning this product must be received in writing within one (1) year from the date of shipment and any claims not presented within that period are waived by Purchaser. Master Builders Solutions WILL NOT BE RESPONSIBLE FOR ANY SPECIAL, INCIDENTAL, CONSEQUENTIAL (INCLUDING LOST PROFITS) OR PUNITIVE DAMAGES OF ANY KIND.

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