



HardWall 2 with PermaLath® Reinforcement and Penn Crete® Exterior Stucco Finish

A stucco system comprised of PermaLath, 3/8"–1/2" thick base coat
and Penn Crete Exterior Stucco Finish

Introduction

This document can enable the design professional to select or delete sections to suit the project requirements and is intended to be used in conjunction with SonoWall™ HardWall 2 typical details, bulletins, etc.

Air Seals at any joints/gaps between adjoining components (penetrations, etc.) are of primary importance to maintain continuity of the air barrier system and must be considered by the design professional in the overall wall assembly design.

This specification is intended for applications on the following substrates: PermaBase Cement-Board and other cement-boards conforming with ASTM C1325 (Type A-exterior); poured concrete/unit masonry; Fiberock Aqua-Tough Sheathing; DensGlass Gold sheathing (ASTM C1177); gypsum sheathing (ASTM C1396); exposure I or exterior plywood; or exposure I OSB.

Technical Support

Consult our Technical Services Department for specific recommendations concerning all other applications. Consult the SonoWall website, www.sonowall.BASF.com, for additional information about products and systems and for updated literature.

Part 1 - General

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. System Description: Composite wall system consisting of SonoWall StuccoBase™, PermaLath® and SonoWall finish coat.
- C. 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 SonoWall HardWall 2 System with PermaLath Reinforcement and Penn Crete Exterior Stucco Finish as manufactured by BASF Construction Chemicals, LLC - Wall Systems (herein after to referred to as "BASF Wall Systems"), Jacksonville, Florida.

1.02 RELATED SECTIONS

- A. Section 03300 Concrete
- B. Section 04200 Masonry
- C. Section 05400 Cold-formed metal framing: Light gauge load-bearing metal framing
- D. Section 06100 Rough carpentry: Wood framing
- E. Section 07900 Sealants
- F. Section 08000 Doors and windows
- G. Section 09100 Metal support systems
- H. Section 09110 Non-load-bearing wall framing: Non-load-bearing metal framing systems
- I. Section 09250 Gypsum substrates

1.03 REFERENCES

- A. ASTM C150-99a Standard Specification for Portland Cement
- B. NER-676 ICC-ES, Legacy Report
- C. ASTM C926-98a Standard Specification for Application of Portland Cement-Based Plaster
- D. ASTM C1063-99 Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster
- E. ICBO AC11 Cementitious Exterior Wall Coatings
- F. ESR-1064 ICC-ES, ES Report

1.04 SUBMITTALS

- A. Submit manufacturer's product brochures with product specifications and installation requirements for each component of the system.
- B. Samples
 - 1. Submit a 18.8 cm x 18.8 cm (7" x 7") sample for each finish color specified.
 - 2. Each sample shall be prepared using the same tools and techniques as required for the actual application.
 - 3. An approved sample shall be available and maintained at the job site.
- C. Shop drawings
 - 1. The applicator shall prepare and submit schedules and complete shop drawings to the Architect for approval.
 - 2. The drawings shall show all details, sizes, types, finishes, anchorage and sealant joints and other items as required or specified so that a proper evaluation can be made of the proposed materials and construction.

1.05 QUALITY ASSURANCE

- A. Manufacturer: More than 5 years supplying wall systems, with more than 500 completed projects.
- B. Applicator: Proven ability in performing work of this Section.
- C. Regulatory requirements: Conform to applicable code requirements for finish system.
- D. Field samples
 - 1. Construct one field sample panel for each color, illustrating method of attachment, surface finish, color, prepared using the same tools and techniques to be used for the actual application.
 - 2. Locate sample panel where directed.
- E. Designing and detailing a system.
 - 1. General
 - a. The system shall be installed in strict accordance with current recommended published details and product specifications from the system's manufacturer.
 - b. Sealants and backer rod as required at dissimilar materials and expansion joints within the system shall provide a complete watertight system.
 - c. The use of dark colors must be considered in relation to wall surface temperature as a function of local climate conditions.
 - d. Minimum slope for all projections shall be 1:2 with a maximum length of 30.5 cm (12") [e.g. 15 cm in 30.5 cm (6" in 12")], unless other manufacturer-approved detailing is shown on the construction documents.
 - 2. Substrate systems
 - a. Deflection of the substrate systems shall not exceed L/360.
 - b. Acceptable substrates are water-resistant core exterior grade gypsum sheathing (ASTM C1396), DensGlass Gold® sheathing (ASTM C1177), GlasRoc sheathing (ASTM C1177), fiberboard ANSI/AHA A 194-85, exposure 1 (Grade C-D or better) plywood, expanded polystyrene insulation board ASTM C578, exposure 1 oriented strand board, PermaBase cement board or other ASTM C1325 Type A-exterior cement board, poured concrete, and masonry units.
 - c. Painted and otherwise coated surfaces of brick, unit masonry, stucco and concrete shall be inspected and prepared as approved by BASF Wall Systems before application. Paint-on surface consolidants or primers shall not be used to bond system to painted surfaces.
 - d. Other substrates shall be approved by the system's manufacturer in writing prior to the application.
 - e. The applicator shall verify that the proposed substrate is acceptable prior to the system installation.
 - f. The substrate systems shall be engineered with regard to structural performance by others.
 - 3. System joints
 - a. Expansion joints in the system are required at building expansion joints, at prefabricated panel joints, where substrates change and where structural movement is anticipated. Control joints are required at a minimum of every 13 m² (144 ft²) of wall surface area and where specified by the design professional. The maximum uncontrolled length or width is 5.5 lineal meters (18 lineal feet) and a maximum uncontrolled length to width ratio of 2 1/2 : 1.
 - b. Reference construction documents for specific locations.
 - 4. Coordination with other trades
 - Architect shall evaluate adjacent materials such as windows, doors, etc. for conformance to manufacturer's details. Adjacent trades shall provide scaled shop drawings for review.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver to the job site all materials in unopened, undamaged containers, clearly marked and identified with the system manufacturer's name and description of contents.
- B. Store materials inside, or under cover and off the ground and keep them dry, protected from the weather, direct sunlight, surface contamination, damaging temperatures, damage from construction traffic and other causes.
- C. Stack insulation board flat, a minimum of 30.5 cm (12") above the ground, and protected from the sun.

1.07 SEQUENCING AND SCHEDULING

- A. Coordinate and schedule installation of 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.
- C. Coordinate and schedule installation of windows, doors, A/C units, air seals etc.

1.08 PROJECT/SITE CONDITIONS

- A. Existing conditions
The contractor shall refer to Section 01010 for project requirements and this contractor's responsibility thereunder.
- B. Environmental requirements
The contractor under this section shall verify site conditions to assure that the requirements of storage of materials and installation procedures conform to the system manufacturer's current product storage and application requirements as applicable to warranty conditions.
- C. Protection of work
 - 1. Protect surrounding areas and surfaces during the application of the system.
 - 2. The system shall be protected when work ceases for the day or when an area is completed so that water will not infiltrate behind the system.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

All components of the system shall be obtained from the system manufacturer or through an authorized distributor.

2.02 MATERIALS

- [A. Insulation Board: expanded polystyrene, tongue and groove not to exceed 1.5 lb density. Thickness of EPS shall not exceed 1 1/2".]
- B. SonoWall StuccoBond™ substrate bonding agent: an acrylic-based, non-reemulsifiable bonding agent.
- C. PermaLath®: Open weave, three dimensional, self furred, nominal 1/8" thick glass fiber reinforcing lath.
- [D. Plaster sand: Must be clean and free from deleterious amounts of loam, clay, silt, soluble salts and organic matter. Sampling and testing must comply with ASTM C897. Plaster sand must be graded within the following limits:

Percent retained by weight]
Retained on ± 2 Percent
U.S. Standard Sieve Min. Max.
No. 4 - 0
No. 8 0 10
No. 16 10 40
No. 30 30 65
No. 50 70 90
No. 100 95 100

E. Water: Clean and potable without foreign matter.

F. System base coat:

[1. SonoWall StuccoBase™: Factory-blended stucco mixture of Portland cement, reinforcing fibers, and proprietary ingredients; supplied by BASF Wall Systems for scratch and brown coats.]

-OR-

[1. SonoWall StuccoBase™ Premix: Factory-blended stucco mixture of Portland cement, reinforcing fibers, sand, and proprietary ingredients; supplied by BASF Wall Systems for scratch and brown coats.]

G. Penn Crete® Exterior Stucco; precision blend of Portland cement, sand, hydrated lime, pure oxide pigments and specialty additives.

2.03 ACCESSORIES

- A. Trim: Casing bead, corner bead, expansion joint and weep screed accessories shall meet the requirements of ASTM C1063. Accessories shall be: vinyl, meeting ASTM D1784; galvanized, meeting ASTM A525 and ASTM A526; or zinc, meeting ASTM B69. Zinc accessories are recommended where highly humid or salt-laden service conditions exist.
 - 1. Foundation weep screed: Beveled edge designed to terminate finish system and drain internal moisture.
 - 2. Casing bead: Square edge style.
 - 3. Corner bead: Small radius nose style.
 - 4. Control joints: W-shaped accordion profile style.
 - 5. Expansion joints: [Two piece type slip-joint design] or [pair of casing beads spaced for application of sealant bead].
- B. Fastener system appropriate for application and substrate, as recommended by BASF Wall Systems.
- C. Secondary Moisture Protection Barrier (Not required on unit masonry/non-insulated concrete substrates surfaces to receive StuccoBase).
 - 1. Acceptable Secondary Moisture Protection Barriers include polymeric weather resistive barriers such as Tyvek® StuccoWrap and acceptable equals that comply with and are recognized by local building codes. Grade D and other asphalt saturated building papers are not recommended with systems incorporating PermaLath unless separated by a layer of expanded polystyrene insulation board. SonoWall trowel/roller applied weather barriers can be used provided a subsequent layer of a polymeric weather resistive barrier such as Tyvek Stuccowrap or equal is applied over the trowel/roller applied weather barrier.
 - 2. Install the Secondary Moisture Protection Barrier over the substrate and according to manufacturer's specifications and applicable building code requirements.
 - 3. The Secondary Moisture Protection Barrier shall be free of any damage such as holes or breaks, and must be applied to all surfaces to receive the StuccoBase.
 - 4. Wrap the Secondary Moisture Protection Barrier into rough openings (doors, windows, etc.) to protect the building frame and interior.
 - 5. Coordinate work with other trades to assure proper sequencing, detailing and installation of materials.
- D. SonoWall Flashing Primer: water-based primer for use prior to application of SonoWrap on all approved surfaces.
- E. SonoWrap™: 4" or 9" wide, 20 mil thick, self-sealing, self-healing rubberized asphalt laminated to a polyethylene film.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify project site conditions under provisions of Section [01039] [].
- B. Walls
 - 1. Substrates
 - a. Acceptable substrates: exposure 1 or exterior grade plywood sheathing (Grade C-D or better); exposure 1 OSB; cement boards conforming with ASTM C1325 Type A-exterior; poured concrete/unit masonry; DensGlass Gold sheathing (ASTM C1177); GlasRoc sheathing (ASTM C1177); Fiberock Aqua-Tough Sheathing (ASTM C79 and C1278); or gypsum sheathing (ASTM C1396). Consult BASF Wall Systems' Technical Service Department for all other applications.
 - b. Wall sheathings must be securely fastened per applicable building code requirements.
 - c. Examine surfaces to receive system and verify that substrate and adjacent materials are dry, clean, and sound. Verify substrate surface is flat, free of fins or planar irregularities greater than 6 mm in 3 m (1/4" in 10').
 - 2. Flashings
 - a. Heads, jambs and sills of all openings must be flashed with a minimum 230 mm (9") strip of secondary moisture barrier prior to window/door, HVAC, etc. installation.
 - b. Windows and openings shall be flashed according to design and building code requirements.
 - c. Individual windows that are ganged to make multiple units require continuous head flashing and/or the joints between the units must be fully sealed.
 - 3. Utilities
 - The system must be properly terminated (back-wrapped, sealed, flashed) at all lighting fixtures, electrical outlets, hose bibs, dryer vents, etc.
 - 4. Decks
 - Wood decks must be properly flashed prior to system application. The system must be terminated a minimum of 25 mm (1") above all decks, patios, sidewalks, etc.
 - 5. Secondary moisture barrier
 - Verify that the secondary moisture barrier is installed over the substrate per applicable building code requirements, manufacturer's specifications prior to application of the system.

6. Roof
Verify that all roof flashings have been installed in accordance with the guidelines set by the Asphalt Roofing Manufacturers Association (ARMA).
7. Kick-out flashing
Kick-out flashing must be installed where required. The kick-out flashing must be leak-proof and angled (min 100°) to allow for proper drainage and water diversion.
- C. Unsatisfactory conditions shall be reported to the general contractor and/or builder and/or architect and/or owner. Do not proceed until all unsatisfactory conditions have been corrected.

3.02 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 with soap and water immediately after use.

- A. SonoWall™ base coat: StuccoBase™
 1. Use mixer which is clean and free of foreign substances.
 2. Add 18.9–22.7 liters (5–6 gallons) of clean potable water to mixer per one bag of SonoWall StuccoBase.
 3. Add one bag of SonoWall StuccoBase.
 4. Add one half 45.4–54.4 kg (100–120 lbs) of the required plaster sand (ASTM C144 or ASTM C897).
 5. Mix for 3–4 minutes at normal mixing speed while adding the remainder 45.4–54.4 kg (100–120 lbs) of the plaster sand. Allow material to set for 2–4 minutes, then remix adding water to achieve desired consistency.
- B. Penn Crete® Exterior Stucco
 1. For best results Penn Crete Exterior Stucco must be trowel applied to a smooth, saturated, uniform base.
 2. Carefully monitor mixing procedure. Mix 5.7 L (1 1/2 gallons) of clean water per bag. After 4–5 minutes slight addition of water may be necessary to achieve desired consistency. Variation in water addition between mixes will affect color and uniformity. Do not mix more material than can be applied in 1 hour. Do not retemper. Apply finish coat at a thickness of no more than 3 mm (1/8").
 3. Do not apply additional water during floating as uneven color will result. Uniform saturation of base coat and prompt floating will prevent the need for additional water.
 4. Plan work so that joinings (stops) occur at natural breaks or will be hidden by downspouts or ornamental items. Carefully avoid overlapping fresh stucco over previously dried areas.
 5. Plastering work should be performed in accordance with the latest edition of the Portland Cement Association's Plasterer's Manual and ASTM C926 Standard Specification for "Application of Portland Cement-Based Plaster".

3.03 APPLICATION

General: Apply system materials in accordance with specifications.

- A. Apply to approved substrates in accordance with manufacturer's instruction and government code requirements.
- B. Apply StuccoBond™ substrate bonding agent (required for non-insulated concrete/unit masonry substrates) as per specifications to areas that will receive stucco base mixture within 12 hours.
- C. Secondary weather barrier (Not required on unit masonry/non-insulated concrete substrates).
 1. Installation should be in accordance with the secondary weather barrier manufacturer's specifications and applicable building code requirements. Alternative methods may be used to wrap openings. Contact the secondary weather barrier supplier for specific details.
 2. The secondary weather barrier shall be free of any damage such as holes or breaks, and must be applied to all surfaces to receive the system.
 3. Wrap the secondary weather barrier into rough openings (doors, windows, etc.) to increase the level of protection to the building frame and interior.
 4. Coordinate work with other trades to assure proper sequencing, detailing and installation of materials.
 5. Expanded polystyrene insulation board (Optional)
The expanded polystyrene insulation board (2' x 8' nominal 1.5 PCF density, tongue and groove) shall be placed horizontally with the tongue facing upward and temporarily held in place with galvanized staples, roofing nails or (metal framing) self tapping screws.
- D. PermaLath®
 1. Apply PermaLath over substrate with minimum 3" overlap at vertical and horizontal edges and overlap on flange of trim accessories. PermaLath can be applied horizontally or vertically and should be applied such that it is flat and free of ripples, wrinkles, etc. Fastener System: type appropriate for application and substrate, as recommended by BASF Wall Systems.

2. PermaLath Fasteners: ULP-302 or "Legless Lath Locks" Mechanical Fastening Systems by Wind-Lock Corp.
 - a. Masonry: masonry type [M] expansion fastener with ULP 302 (1 3/4") diameter washer; or Legless Lath Locks 25 mm (1") minimum penetration into masonry. Fastener spacing 6" o.c. vertically and 16" o.c. horizontally.
 - b. Light Gauge Steel Framing/Furring (20 Gauge): light metal type [LM] bugle head screws with ULP 302 (1 3/4") diameter washer or Legless Lath Locks 16 mm (5/8") minimum penetration into framing 6" o.c. vertically and 16" o.c. horizontally.
 - c. Heavy Gauge Steel Framing (20 to 12 Gauge maximum): metal type [S] bugle head screws with ULP 302 (1 3/4") diameter washer or Legless Lath Locks; 16 mm (5/8") minimum penetration into framing 6" o.c. vertically and 16" o.c. horizontally.
 - d. Wood framing: wood type [W] bugle head screws with ULP 302 (1 3/4") diameter washer or Legless Lath Locks; 16 mm (5/8") minimum penetration into framing or minimum 16 gauge wire staples with minimum 3/4" crown and minimum 3/4" penetration into framing.

NOTE: Supplemental fasteners, in the framing or sheathing, can be used to secure the stucco mesh prior to application of StuccoBase. Fastening systems/tools for staples are available through Senco (www.senco.com) and other manufacturers.

3. Apply StuccoBase within 60 days of PermaLath application

E. Trim junction

1. When two pieces of trim abut:
 - a. Set intersection of trim in a minimum 100 mm (4") bed of acceptable trim sealant.
 - b. Allow 3–5 mm (1/8"–3/16") gap between the abutting trim pieces. Do not overlap trim.
 - c. Attach the trim in accordance with manufacturer's specifications. True expansion joints must be fastened to the structural substrate.
2. When two or more pieces of trim intersect:
 - a. The vertical trim piece shall be continuous with all horizontal pieces.
 - b. Miter all corners at intersections of trim.
 - c. Set intersection of trim in a minimum 100 mm (4") bed of acceptable trim sealant.
 - d. Allow 3–5 mm (1/8"–3/16") gap between the intersecting trim pieces. Do not overlap the trim.
 - e. Attach the trim in accordance with manufacturers' specifications. True expansion joints must be fastened to the structural substrate.

NOTE: Control joints are required at a minimum of every 13.4 m² (144 ft²) and as specified by the design professional. The maximum uncontrolled length or width is 5.5 lineal meters (18 lineal feet) and a maximum uncontrolled length to height ratio of 2 1/2 : 1.

F. StuccoBase™ base coat

1. Apply mixed SonoWall StuccoBase to approved substrate by hand troweling or machine spraying in one or two coats to a minimum thickness of 9.5 mm (3/8") and a maximum thickness (2 coats) of 1/2". If applied in a two coat scratch brown application, the thickness is a minimum 3/16"–1/4" per coat for a total thickness of 1/2". Ensure the first coat is sufficiently rigid to resist cracking prior to application and leveling of the second coat. For localized areas, a slightly thicker application is acceptable. Level surface using rod or darby. Trowel SonoWall StuccoBase into trim to seat trim. The lath shall be embedded in the coating and shall be completely covered.

Note: Recommended method of stucco application is double back or scratch and brown. Use of tighter (less water) stucco mix in initial double back or scratch coat can ease stucco application.

2. After surface has sufficiently hardened, use sponge or hard rubber float as required to fill voids, holes or imperfections, leaving the surface ready to receive Penn Crete® Exterior Stucco.
3. Cure completed StuccoBase by fog spraying with clean, potable water once or twice daily for 48 hours under normal conditions; fog spray more frequently if hot, dry conditions exist.
4. Allow SonoWall StuccoBase to cure 6 days prior to finish coat application.

G. Penn Crete® Exterior Stucco

1. For best results Penn Crete Exterior Stucco must be trowel applied to a smooth, saturated, uniform base.
2. Do not apply additional water during floating as uneven color will result. Uniform saturation of base coat and prompt floating will prevent the need for additional water.
3. Plan work so that joinings (stops) occur at natural breaks or will be hidden by downspouts or ornamental items. Carefully avoid overlapping fresh stucco over previously dried areas.
4. Plastering work should be performed in accordance with the latest edition of the Portland Cement Association's Plasterer's Manual and ASTM C926 Standard Specification for "Application of Portland Cement-Based Plaster".

3.04 CLEANING

- A. Clean material from adjacent surfaces as recommended by manufacturer.
- B. Remove surplus material and debris, including field sample, from site.

3.05 PROTECTION

Protect base coat from rain, snow and frost for 48–72 hours following application.

3.06 SCHEDULES

Penn Crete Exterior Stucco
COLOR LOCATION

- A. _____
- B. _____
- C. _____
- D. _____

Note

BASF Wall Systems is an operating unit of BASF Construction Chemicals, LLC. (herein after referred to as "BASF Wall Systems")

Residential Policy

On one and two-family residential framed construction, BASF Wall Systems requires that the wall system selected be one that includes provisions for moisture drainage. The choices include water drainage EIFS, SonoWall Stucco Wall Systems, and SonoWall Cement-Board Stucco™ Wall Systems. SonoWall Exterior Surfacing Systems for insulating concrete forms are also acceptable. There are no exceptions to this policy. Under no circumstances will BASF Wall Systems warrant the use of any other system on this type of construction without expressed written authorization from BASF Wall Systems [Residential construction using EIFS on masonry (CMU) or poured concrete does not require the additional water management provisions described above.]

See the SonoWall *Residential Policy Bulletin* for a more detailed discussion of this topic. Consult BASF Wall Systems Technical Services Department for specific recommendations concerning all other applications. Consult the SonoWall web site, www.sonowall.BASF.com for additional information about products and systems and for updated literature.

Disclaimer

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