

STUC-O-FLEX

THERMAL-FLEX "ICF"
INSULATED CONCRETE FORMS

COATING ASSEMBLY TO ICF BLOCK
MANUFACTURERS SPECIFICATIONS / SECTION 07240

PART 1 - GENERAL

1.01 DESCRIPTION

A. Provide all labor, materials and equipment necessary to install the "THERMAL-FLEX" Coating Assembly from STUC-O-FLEX. The assembly consists of PRM or Stuc-O-Base, a polymer modified cement adhesive / base coat, reinforcing fiberglass mesh, and Stuc-O-Flex finish applied to Insulated Concrete Forms (ICF).

B. Related work specified elsewhere:
1. Sealant section 07900.

C. Terms and Definitions:

1. Thermal-Flex Assembly

Consists of STUC-O-FLEX reinforcing fiberglass mesh, adhesive / base coat, and finish coat, applied to expanded polystyrene insulation.

2. PRM or Stuc-O-Base Adhesive / Base Coat

Cementitious, co-polymer base and adhesive, field mixed for use as an adhesive for approved insulation and base coat for reinforcing fiberglass mesh.

3. Insulation Board (ICF Blocks) and/or insulation listed below for Architectural Elements: Expanded Polystyrene (EPS) Board with an average density of 1.0 pcf, a flame spread rating of less than 25, a smoke development index of less than 450 and an R-value of 3.85 per inch at 75 degrees F. It must conform to ASTM C 578-85 Class A.

Option

Fiberglass faced Polyisocyanurate Insulation Board with an average density of 2.0 pcf, a flame spread rating of less than 25, a smoke development index of less than 450, and an R-value of 6.3 per inch at 75 degrees F. It must conform to ASTM C 578-85 Class A

4. Reinforcing Fiberglass Mesh - Balanced open weave reinforcing fiberglass mesh treated for compatibility with other materials of the system. The fabric shall not be less than 4.4 oz (\pm 10%) per square yard.

**** High Impact Resistant (Recommended for first floors, for high traffic areas, and areas subject to abuse). This consists of an additional layer of Light Armor (15 oz.) Mesh or Armor (21 oz.) mesh embedded into STUC-O-FLEX PRM base coat. The heavier mesh is always installed under the lighter mesh. In no case should Armor mesh be used without the regular mesh (4.4 oz) over it.

5. Base coat - PRM (Polymer Reinforced Mortar) Base or Stuc-O-Base is a fiber reinforced, 100% acrylic polymer modified cement base coat that has good water resistance and vapor permeability.

6. Finish Coat - Functions as the weathering surface. It is a factory mixed Finish supplied by STUC-O-FLEX in various colors, finishes and textures.

1.02 QUALITY ASSURANCE

- A. Applicator Requirements
 - 1. Applicator shall be licensed, insured and competent to accurately install the assemblies consistent with construction documents and specifications. Manufacturer is not responsible for application.
- B. Approvals
 - 1. The assembly shall be recognized for the intended use by the applicable building codes.
- C. Design Consideration
 - 1. Deflection of the Substrate system shall not exceed $l/240$.
 - 2. Minimum slope shall be 4 : 12 pitch.
 - 3. Expansion Joint Requirements:
 - a. Where building or substrate expansion joints occur.
 - b. Where dissimilar substrates occur.
 - c. Locations where the system abuts alternate building materials.
 - d. As determined by design professional
 - 4. Stuc-O-Flex Coating material terminations to windows, doors, air conditioning units, electrical boxes, etc. shall provide adequate space for proper waterproof transition. Under no circumstances shall Stuc-O-Flex be responsible for integrity or design.
 - 5. Stuc-O-Flex Coatings shall terminate at a minimum 8" inches above grade.
 - 6. Sealant system shall be compatible with Stuc-O-Flex base Coat and adjacent building product. Consult sealant manufacturers for recommendations
 - 7. All insulation board not applied to ICF or cementitious surfaces shall incorporate a mechanism for water drainage between insulation and substrate.

Note: All Stuc-O-Flex transitions to adjacent building materials shall be professionally designed and executed to prevent water intrusion behind the coating materials, this is normally achieved by incorporating a nominal $\frac{1}{2}$ wide backer rod & sealant joint. The integrity of this water tight detail must be maintained. Stuc-O-Flex International, Inc. is not responsible for design.

1.03 SUBMITTALS

- A. Samples:
 - 1. The applicator shall, before the project commences, provide the owner or the architect, a sample of suitable size of each color and texture as specified for the project for the purpose of obtaining approvals.
 - 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.

1.04. PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver all material supplied by the manufacturer in original, unopened packages with legible manufacturer's identification and labels intact.
- B. Store all products supplied by STUC-O-FLEX in a cool dry place, out of direct sunlight, protected from weather and other damage. In addition, the materials shall be stored in tightly sealed containers at a temperature of not less than 40°F at all times.

1.05 JOB CONDITIONS

- A. Weather and Environmental Conditions
 - 1. Application of Stuc-O-Flex Coatings shall not take place during inclement weather unless appropriate protection is employed.
 - 2. Base Coat materials and Stuc-O-Flex Elastomeric Finish shall be protected against freezing temperatures, rain, or water splash for a period of at least 48 hours. The job should be tented and a heat source provided if there is a projected drop in the temperature below 40°F during the first 24 hours after application of Base coat or Finish coat.

1.06 COORDINATION AND SCHEDULING

- A. The work in this section requires close coordination with related sections and trades.
- B. The tops of all walls must immediately be protected to prevent water infiltration behind the exterior wall assembly. The cap flashing should be installed immediately after the Finish coat has been cured.
- C. Sealant and waterproofing materials shall be installed in a timely manner as to prevent water intrusion behind the Stuc-O-Flex coatings.

1.07 MAINTENANCE

- A. Sealant and other components of the structure must be inspected periodically to confirm performance as originally installed. Corrections shall be made at once.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

All Stuc-O-Flex Coating products shall be obtained from STUC-O-FLEX INTERNATIONAL, INC., as manufacturer, or its authorized supplier or distributor. Contact:

Stuc-O-Flex International, Inc.
17639 NE 67th Court
Redmond, WA 98052
800-305-1045
info@stucoflex.com www.stucoflex.com

2.02 MATERIALS

- A. Insulated Concrete Forms (ICF) and/or Insulation Board (architectural elements)
Expanded Polystyrene (EPS) Board with an average density of 1.0 pcf, a flame spread rating of less than 25, a smoke development index of less than 450, and an R-value of 3.85 per inch at 75 degrees F. It must conform to ASTM C 578-85 Class A.
Option
Fiberglass faced Polyisocyanurate Insulation Board with an average density of 2.0 pcf, a flame spread rating of less than 25, a smoke development index of less than 450, and an R-value of 6.3 per inch at 75 degrees F. It must conform to ASTM C 578-85 Class A.

- B. Fiberglass Reinforcing Mesh - Balanced open weave fiberglass reinforcing mesh, treated for compatibility with other materials of the system. The fabric shall not be less than 4.4 oz (\pm 10%) per square yard.

High Impact Resistant System (Recommended for first floors, for high traffic areas, and areas subject to abuse). This assembly consists of an additional layer of Light Armor (15 oz.) Mesh or Armor (21 oz.) mesh embedded in STUC-O-FLEX PRM base coat. The heavier mesh is always installed under the lighter mesh. In no case should the Armor mesh be used without the regular mesh (4.4 oz) over it.

- C. Base coat - PRM (Polymer Reinforced Mortar) Base or Stuc-O-Base is a fiber reinforced, 100% acrylic polymer modified cement base coat that has good water resistance and vapor permeability.
- D. Finish Coat functions as the weathering surface. It is a factory mixed Finish supplied by STUC-O-FLEX in various colors, finishes and textures.
- E. Water - shall be clean and potable.

2.03 PROPERTIES

The Stuc-O-Flex coatings comply with following test standards:
 Contact Stuc-O-Flex Technical center for additional details 1-800-305-1045.

TEST	METHOD	RESULT
ELONGATION % (FINISH)		105 Percent
WATER VAPOR TRANSMISSION	ASTM-E96	14 GRAINS PER HOUR / SQ. FT. (AVERAGE)
SALT SPRAY RESISTANCE	B-117	300 HOURS NO DELETERIOUS EFFECTS
ACCELERATED WEATHERING	G-23-81	2000 HOURS NO DELETERIOUS EFFECTS
ABSORPTION FREEZE THAW	60 CYCLES	NO CRACKING, CHECKING
TENSILE BOND	ASTM C-297	127.9 PSF
WATER PENETRATION TEST	ASTM-E-331	NO WATER PENETRATION OCCURRED ON SUBSTRATE
WATER RESISTANCE TEST	ASTM D-2247	NO CRACKING, BLISTERING, PEELING OR COMPROMISE
MILDEW / FUNGUS RESISTANCE	810 B	NO MOLD OR MILDEW GROWTH DURING TEST
WIND DRIVEN RAIN		NO DELAMINATION, NO WATER INTRUSION
FIRE TESTING TUNNEL TEST	ASTM E-84	FLAME SPREAD < 25 SMOKE DEVELOPED < 450 CLASS "A" FIRE RATED

PART 3 - EXECUTION

3.01 INSPECTION

- A. Prior to proceeding, carefully inspect preparatory and installed work of other trades and verify that such work is correct and completed to the point where this installation may properly proceed.
- B. Substrate shall be dry, sound and free of release agents (silicones, oils, etc.), paint and other residue or coatings.
- C. The substrate shall have no planar irregularities greater than 1/4" in 8 feet.
- D. Notifications - The General Contractor and the Architect shall be advised of any discrepancies. Work shall not proceed until all unsatisfactory conditions are corrected and the substrate is acceptable, clean and free of any contaminants, including completion of all appropriate flashing and other waterproofing details.

3.02 INSTALLATION

- A. Adhesive and Insulation Board
The following adhesives may be used to attach insulation board to ICF substrates:
 - 1. STUC-O-FLEX PRM (polymer modified mortar) adhesive / base coat
 - a. Mix material in a pail with approximately 2 gallons of clean, potable water until a buttery consistency is attained. As in other cementitious mortar mixes, retemper the mixture after about 10 minutes from the time the adhesive was originally mixed.
 - 2. STUC-O-BASE should be mixed 1:1 by weight with fresh, dry Portland Cement type I or II. Product should be allowed to sit for 10 minutes, then remixed use immediately
 - b. After mixing apply Stuc-O-Base or PRM Adhesive/Base coat to the entire back surface of the board using a 3/8" inch notched trowel.
 - c. Install insulation board on the substrate and apply equal pressure over the entire board surface to ensure uniform contact and solid adhesion.
 - d. Butt all joints tightly to ensure a flat, flush and level surface. Use straight edge as necessary to align and check.
 - e. For installation details at rooflines, windows and joints with other materials, refer to construction documents & details.
Any irregularity of the insulation surfaces greater than 1/16" must be sanded flush.
- B. Base coat and Reinforcing Fabric
 - 1. Apply STUC-O-FLEX PRM (polymer reinforced mortar) or STUC-O-BASE, Base coat Using a stainless steel trowel, apply a minimum 1/16" thickness of PRM to the entire surface of insulation.
 - 2. Install Reinforcing Fabric
 - a. Immediately place the reinforcing fabric against the wet Base coat and by troweling from the center to the edges, embed the fabric into the Base coat.
 - b. The reinforcing fabric must be continuous, free of wrinkles and be fully embedded in the Base coat. All corners and overlaps shall be at least 2 1/2" .
 - c. For construction not detailed with control joints at door, window and other openings, additional "butterfly" strips of 9" x 12" regular reinforcing mesh

- will be embedded within the PRM coat at a 45 degree angle at each corner during base coat application.
- d. Allow at least 24 hours drying time. Additional time may be required at low temperatures or with high humidity conditions.
 - e. Where shown on plans, the High Impact System is to be installed as follows: the Armor Mesh is first embedded into the Base coat. The Base coat is allowed to dry for 24 hours. Then another coat of Base coat is applied over the first application to embed the regular reinforcing mesh.

C. Finish Coat

- 1. Thoroughly mix the STUC-O-FLEX factory mixed Finish coat. Use a high-speed mixer and stir until a uniform consistency is obtained. If necessary, add small amounts of clean, potable water (not to exceed 10 oz. per pail) to adjust workability.
- 2. Use Finish color and texture as it conforms to previously submitted and approved sample.
- 3. Use clean stainless steel trowels to apply Finish coat directly over the Base coat. (Some finishes may be spray applied -- please consult STUC-O-FLEX).
- 4. Special texture and grain effects are obtained by troweling. Consistent troweling techniques by all mechanics on the job must be used to achieve uniformity of appearance.

D. Sealants

- 1. Properly installed Sealant system must be incorporated to prevent water intrusion behind Stuc-O-Flex Coating materials

3.04 JOB SITE CLEAN UP

- A. All excess STUC-O-FLEX wall coating materials shall be removed from the job site by the STUC-O-FLEX applicator.

STUC-O-FLEX

“THERMAL-FLEX (ICF) ”

Coating Materials Application

APPLICATION INSTRUCTIONS

Prior to any installation work, the following conditions must be met:

1. Check that the framing/sheathing is structurally sound, dry, and clean.
2. The framing/sheathing is in accordance with contract documents and specifications.
3. Check that the moisture content of the sheathing does not exceed 17%.
4. Check that all roof terminations, mechanical equipment, decks, windows and doors are appropriately flashed to protect against water intrusion.
5. Code compliant “Weather Resistive Barrier” is properly installed to prevent potential moisture penetration to substrate is mandatory for compliance, when not applied to cementitious surfaces.

Note: Flashings, weather resistant barriers, and waterproof transitions from Stuc-O-Flex Finish to adjacent materials along with good construction practice are critical to long-term performance of the exterior wall coatings

If any of the conditions above are not properly met, immediately notify the General Contractor, Architect, or Owner. Work should not continue until such time that all unsatisfactory conditions are corrected.

Step One - Installing Insulation Boards (optional - architectural details)

1. Prior to installation of any insulation board, detail mesh shall be placed around the perimeter of the openings by stapling mesh to substrate. This step provides for proper encapsulation of insulation board.
2. Insulation board joints shall not coincide with corners of windows, doors, or other penetrations. This will reduce any potential for cracks in these locations.
3. Insulation board may be cut by one of the following methods:
 - A. Razor knife and straight edge.
 - B. Fine toothed handsaw.
 - C. Radial arm saw or table saw with a fine-toothed plywood blade.
 - D. Hot wire cutting machine.

4. Insulation board should be held back from edges when not placed in casing bead with weep holes to allow for appropriate caulking details (Check Architectural Details and Construction Documents).
5. If insulation boards do not abut tightly and there is a gap in the joint, the joint must be filled with a piece of properly adhered EPS board. Under NO CIRCUMSTANCES are joints to be filled with Adhesive/Base coat.
6. Rasping of EPS insulation board: All irregular seams in the EPS board are to be rasped smooth. Generally, the whole board and/or area of wall will require rasping or sanding. This can be achieved with Stanley Sur-Form rasp or #16 Grit sandpaper stapled to a 2" x 4" or other suitable tool.
7. While rasping, use a 4-foot straight edge to check the uniformity and smoothness of the wall. Rasping and sanding the EPS board is one of the most important steps in the application. Any irregularities in the EPS board may telegraph through to the finish.
8. All aesthetic joints can now be produced. Route the joint to the predetermined depth, apply adhesive, then embed fiberglass mesh.

Note: In the case of router grooves the thickness of insulation board remaining shall not be less than 3/4" in any area of the wall surface.

9. Reinforcing fabric is to be wrapped around all edges of insulation board where it will abut caulks, foundations, doorjambes, window frames, expansion joints and dissimilar materials. Fabric is to be wrapped over the edge and 3 inches up the front of the insulation board.

Step Two - Embedding Fiberglass Mesh

1. Exterior and interior corners
 - A. Pre-cut fabric to 12" width or use STUC-O-FLEX supplied 6" rolls of detail mesh.
 - B. Apply PRM Adhesive/Base coat 1/16" to 1/8" thick on EPS board at the corner.
 - C. The use of STUC-O-FLEX approved corner mesh is strongly recommended to achieve a sharp and impact resistant corner.
 - D. Embed fabric with a stainless steel trowel. (The fabric will act as a screen.)
 - E. Final thickness of the adhesive mesh fabric layer shall be approximately 1/16".
 - F. Let cure 24 hours before the next stage of installation.
2. Embedding the reinforcing fiberglass mesh
 - A. Pre-cut the mesh to workable lengths.
 - B. Apply 1/16" to 1/8" of Base coat to the insulation board.
 - C. Trowel mesh vertically into the PRM Adhesive/Base coat STARTING IN THE MIDDLE OF THE MESH AND EMBEDDING TOWARD THE EDGES.
 - D. Fiberglass mesh should be applied vertically and lapped at least 2 1/2" at all edges.
 - E. Embed reinforcing 9" x 12" butterfly mesh at a 45° angle at all corners of openings where construction details do not provide for joints.
 - F. Let cure for a minimum of 24 hours before application of the finish. Weather conditions will affect time needed to cure.

Notes: Before application of the STUC-O-FLEX Finish:

- 1) Make sure the Base coat & Fiberglass mesh layer is dry and hard. Moisture content must be 19 percent or less. Check, using moisture meter.
- 2) Remove any irregularities (trowel marks) with a Goldblatt Sand Stone.
- 3) In some instances it may be necessary to skim-coat hollows if the EPS board was not perfectly flat.

Step Three - Application of STUC-O-FLEX Finishes

Mixing Instructions for all STUC-O-FLEX Finishes

Open pail. Mix thoroughly with Jiffler mixer, taking care to avoid excessive up and down motion with drill and blade. Too much vertical motion will introduce air into the Finish and may inhibit proper curing. Small amounts of water may be added (maximum 10 oz.) to adjust workability.

Applications of STUC-O-FLEX Finishes shall commence only when adequate labor force and equipment is available to maintain a wet edge insuring a systematic installation free of cold joints.

A. STUC-O-FLEX Finishes

1. STUC-O-FLEX "T" or "Modified" Finish - Consistency of STUC-O-FLEX Finish will be similar to creamy stucco. Color is integral and will dry darker on the wall than the shade appears in the pail. Apply STUC-O-FLEX Finish using a stainless steel trowel to the thickness of the largest aggregate within the product and float smooth for a sand finish appearance. Various textures can be accomplished with troweling and floating of the STUC-O-FLEX Finish. Maintain a wet edge. Finish thickness must be a minimum 1/16" inch.
2. PUTZ-FLEX Finish - Coarse, wormy type texture. PUTZ-FLEX is applied with a stainless steel trowel and pulled tightly to the largest aggregate. Circular texturing is achieved with a stainless steel trowel or plastic float. Vertical texturing is achieved with up and down motions 12" to 24" using a wood float or plastic float.

- B. Normal temperatures (50 to 70 degrees F.) usually will promote a "dry to the touch" condition after 2-3 hours. Curing time, however, is approximately two weeks.

Observe instructions on the label including - Do not apply when temperature is below 40 degrees F. or will drop below freezing within 24 hours of application. Finish must be protected from direct moisture and freezing temperatures until dry (Normally 24 hours). No additives may be used.

NOTE: Flashing, Sealant, Proper Design and continued maintenance must prevent water intrusion behind any and all Stuc-O-Flex manufactured materials.