SECTION 07240

EIFS

PART 1: GENERAL

1.01 SUMMARY

A. Section Includes:

1. TeifsFLEX Wall System: Exterior wall cladding of an adhesive bed, rigid insulation, base coat with reinforcing mesh, and finish coat.

B. Related Sections:

1. Section 04200 - Unit Masonry

2. Section 03300 - Concrete

3. Section 05400 - Cold Formed Steel Framing

4. Section 06100 - Wood Framing

5. Section 07620 - Sheet Metal Flashing and Trim: Perimeter flashings

6. Section 07900 - Joint Sealants

7. Section 09250 - Gypsum Board

1.02 SYSTEM DESCRIPTION

TeifsFLEX WALL SYSTEM is an Exterior Insulation and Finish System, Class PB with an adhesive bed (TeifsBASE), rigid insulation (TeifsBOARD), base coat (TeifsBase) with reinforcing mesh (TeifsMESH), and finish coat (TeifsFLEX).

1.03 REFERENCES

A. ASTM B 117 - Practice for Operating Salt Spray (Fog) Apparatus.

B. ASTM C 79 - Gypsum Sheathing Board.

C. ASTM C 150 - Portland Cement.

D. ASTM C 297 - Test Method for Tensile Strength of Flat Sandwich Constructions in Flatwise Plane.

E. ASTM C 578 - Pre-formed Cellular Polystyrene Thermal Insulation.

F. ASTM C 1135 - Test Method for Determining Tensile Strength Adhesion Properties of Structural Sealants.

G. ASTM C 1177 - Standard Specification for Glass Mat Gypsum Substrate for use as Sheathing.

H. ASTM D 968 - Standard Method for Laboratory Compaction Characteristics of Soil using Standard Effort.

I. ASTM D 2247 - Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.

J. Military Standard 810B - Environmental Test Methods.

K. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials.

L. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials

M. ASTM E 119 - Method for Fire Tests of Building Construction and Materials.

N. ASTM E 330 - Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

O. ASTM E 331 - Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

P. EIMA 101.86 - Impact Resistance.

Q. ASTM G 23 - Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type), with and without Water for Exposure of Non-metallic Materials.

R. TeifsFLEX WALL SYSTEM APPLICATION GUIDE.

S. TeifsFLEX WALL SYSTEM DETAILS.

T. UBC Std. 26-4 - Multi-Story Fire Evaluation of Exterior Non-loadbearing Foam Plastic Insulated Wall System.

1.04 PERFORMANCE REQUIREMENTS

A. Individual materials and the assembly of materials to provide:

1. Secure bond to structure and substrate.

2. Allowance for thermal movement caused by changing environment conditions.

3. Continuity of thermal barrier at building enclosure elements.

4. Weather tightness, resistance to wind, suction, and seismic loads identified by c ode.

B. Physical Properties:

1. Accelerated Weathering (5500 hours) - ASTM G 23: No deterioration or color change.

2. Moisture Resistance - ASTM D 2247: No deleterious effects after 14-day exposure.

3. Abrasion Resistance - ASTM D 968: 500 liters of sand, no deleterious effects.

4. Water Vapor Transmission - ASTM E 96: Permeable to water vapor.

5. Salt Spray Resistance - ASTM B 117: 300 hours, no deleterious effects.

6. Water Penetration - ASTM E 331: No water occurred on the inner face of the specimen when tested to 12.0 psf.

C. Fire Performance:

1. Flame Spread - ASTM E 84: Flame spread index 5, smoke development 5.

2. One Hour Fire Rrating - ASTM E 119.

3. BOCA Radiant Heat Exposure Test: Pass, no ignition .

4. UBC 26-9 Multi-Story Fire Test: Pass.

D. Structural Performance of the Assembly:

1. Freeze Thaw Stability: 60 cycles, no cracking, checking or splitting.

2. Wind Load Resistance - ASTM E 330: No delamination at 1.4-kPa (29-psf) for negative and 3.4-kPa (71-psf) for positive loads.

3. Resistance to Impact - EIMA 101.86:

Reinforcing Mesh	Test Result (in.-lb.)	Impact Range Classification	(in.-lb.)
TeifsMESH	40	Standard	25-49
TeifsMESH 6	48	Standard	25-49
TeifsMESH 12	104	High	90-150
TeifsMAT 15	240	Ultra-High	>150
TeifsMAT 20	248	Ultra-High	>150

4. Adhesive Strength - ASTM C 297: Minimum of 13 psi (failed within the insulation thickness, not the adhesive).

1.05 SUBMITTALS

A. Product Data: Provide data on system materials, product characteristics, performance criteria and limitations.

B. Samples: Submit two samples, 300-mm x 300-mm (12-inch x 12-inch) in size illustrating coating color and texture range for selection.

C. Manufacturer's Application Guide for TeifsFLEX Wall System: Indicate special procedures, perimeter conditions requiring special attention, jointing requirements, and other details.

D. Test Reports: Submit copies of test reports verifying performance requirements as requested by owner/architect.

1.06 QUALITY ASSURANCE

A. Qualifications:

1. System Manufacturer: Texas EIFS.

2. Materials shall be third-party certified by the Teifs' Manufacturers Verification Program to ensure that the manufactured materials are the same composition as tested materials.

3. Applicator: Company specializing in performing the Work of this Section approved by EIFS system manufacturer.

4. Insulation Board Manufacturer: Shall subscribe to the Teifs Third party Certification and Quality Assurance Program.

B. Regulatory Requirements:

1. Insulation board shall be separated from the interior of the building by a minimum 15 minute thermal barrier.

2. Insulation board thickness and use shall be in accordance with the applicable building codes.

C. Mock-Up:

1. Construct mock-up, 1.22-m x 1.22-m (4-ft. x 4-ft.), to represent:

a. Substrate, insulation board, finish, color, and surface texture.

b. Method of attachment and joints.

2. Mock-up shall be maintained at the job site.

1.07 PROJECT CONDITIONS

A. Materials shall be applied when ambient temperature is 5 0C (40 0F) and rising.

B. Do not install materials in inclement weather without adequate protection.

1.08 DELIVERY STORAGE AND HANDLING

A. Delivery: Teifs materials shall be delivered to the job site in original, unopened containers with labels intact. Unsatisfactory materials shall not be used.

B. Storage: Store Teifs materials in a cool, dry location, out of sunlight and protected from weather and other damage, at a minimum temperature of 5 ∞C (40 ∞F).

C. Protect adhesives and finish materials from freezing.

1.09 MAINTENANCE

A. Follow Teifs Maintenance Guide and TeifsFLEX APPLICATION GUIDE for repair and maintenance instructions.

1.10 WARRANTY

A. Limited Materials Warranty: Furnish written Limited Warranty on materials from Teifs for
a period of 5 years, commencing on date of Substantial Completion.

B. Limited Labor Warranty: Furnish written Limited Warranty against defects in workmanship from the Licensed Teifs Applicator, for a period of 5 years, commencing on date of Substantial Completion.

PART 2: PRODUCTS

2.01 MANUFACTURERS

Acceptable Manufacturer: Teifs WALL SYSTEMS, 220 Burleson, San Antonio, Texas, 78202, 1-800-358-4785, www.teifs.com

2.02 MATERIALS

A. Cement: Portland Cement Type I or II, ASTM C 150, white or gray, fresh, no lumps.

B. Insulation Board Adhesive: Used to adhere the insulation board to the substrate.

1. Cementitious Adhesive - 100% acrylic-based compound formulated for field mixing with Portland cement 1:1 by weight:

a. TeifsBASE.

b. TeifsBASE FR (fiber reinforced).

2. Non-cementitious Adhesive - flexible, acrylic copolymer adhesive: TeifsADHEEZ.

C. Insulation Board: TeifsBOARD. TeifsBOARD should meet Teifs specifications and shall be molded expanded polystyrene (EPS), conforming to ASTM C 578, Type I aged, in minimum sheet sizes of 24-inches x 48-inches, with thickness as indicated on the Drawings.

1. Minimum Thickness: 19-mm (3/4inch), balance as depicted on drawings.

2. Thickness Tolerance: 0.8-mm (1/32-inch) maximum.

3. Board Size: Maximum 1200 x 2400 mm (24 x 48 inches).

4. Board Size Tolerance: 1.5-mm (1/16-inch) from square and dimension.

5. Minimum Density: 0.95 pcf.;

D. Teifs Base Coats:

1. Cementitious Base Coat - 100% acrylic-based compound formulated for field mixing with Portland cement 1:1 by weight:

a. TeifsBASE.

b. TeifsBASE FR (fiber reinforced).

2. Cementitious, dry powder to be field mixed with water: TeifsBASE DB.

3. Non-cementitious acrylic-based Base Coat: TeifsSTRUCTURE.

E. Waterproof Base Coat/Adhesive - Polymer-Based compound mixed with Portland cement for sills and parapets: TeifsBASE STAYDRY.

F. Teifs Reinforcing Mesh - Balanced alkali-resistant treated, open-weave glass fiber fabric, compatible with system materials, conforming to ASTM D 578 and the following weight requirements or as noted on Drawings (see Section 1.04 C. 3. for impact resistance):

1. TeifsMESH 6: Standard Extra Reinforcing Fabric, not less than 6.0 oz./yd2.

2. TeifsBAKRAP: Strip Reinforcing Fabric, not less than 4.8 oz./yd2 for special shapes, backwrapping and detail work.

3. TeifsKORNERRAP: Reinforcing Fabric, not less than 8.0 oz./yd2 for corners.

G. Finish Coat: 100% acrylic-based, factory mixed, integral color and texture. Coating Color, Finish and Texture: as selected by architect.

1. Standard Finish: 100% water-based acrylic, resin-based, factory mixed, integral homogenous coloring and texture, by Teifs WALL SYSTEMS.
   a. TEIFSFLEX PIEDRA GRANDE: Produces a stucco - like sand texture.
2. For cementitious substrates or where finish is applied directly to cementitions substrate.

a. Primer: Water-based, pigmented, 100% acrylic, TeifsPRIMER.

b. Surface Sealer: Water-based 100% acrylic, TeifsSEALER.

H. Sheathing: Dens Glass Gold at Non Rated applications. Dens Glass Fire Guard Type X at rated conditions. (perimeter of Mechanical Mezzanine).

2.03 ACCESSORIES

A. Mechanical Fasteners: To be used as a secondary means of adhering the insulation to the substrate as necessary. Consult with Teifs for suggestions and determinations.

1. Steel Framing: Self-tapping steel drill screws, ASTM C954.

2. Light gauge Steel Framing: Self-tapping drill screws, ASTM C1002.

3. Wood Framing: Self-tapping drill screws, ASTM C1002.

4. Masonry/Concrete: Nylon fasteners, sized to fit insulation thickness indicated and penetrate substrate to depth required to secure anchorage, 1-7/8 inch in diameter.

B. Sealant Backer Rod: Closed cell extruded polyethylene foam rod sized to joint configuration.

C. Bond Breaker Tape: Pressure-sensitive adhesive polyethylene tape, recommended by sealant manufacturer.

D. Sealant: Dow Corning 790, 795 or Sonneborn Sonolastic N.P. II with compatible primer and bond breaker.

E. Galvanized minimum 2.5 lb./yd2 metal lath. Can be used as an alternative insulation board attachment method. Contact Teifs for specific installation instructions.

PART 3: GENERAL

3.01 SUMMARY

A. General:

1. Verify that surfaces and wall openings are ready to receive work.

2. Correct unsatisfactory conditions prior to installation.

3. Architect or General Contractor shall insure that all needed flashings and other water proofing details have been installed correctly.

4. Follow Teifs Check List Prior to Installation located in Teifs APPLICATION GUIDE for TeifsFLEX WALL SYSTEM

B. Substrates

1. Acceptable Substrates:

a. Dens-glass Gold Sheathing.

b. Exterior Grade Gypsum Sheathing with Regular or Type X core.

c. Exterior Fiber Reinforced Cement Board.

d. Unglazed Brick

e. Unit Masonry

f. Concrete which has been cured for at least 28 days.

g. Portland Cement Plaster which contains no more than 10% lime.

h. Minimum 1/2 inch 4-ply, APA Exposure 1, Grade C-D or better plywood, with the C side or better, facing the exterior. The plywood shall be installed according to APA guidelines and shall be plane to within a 1/4 inch over a 4-ft. radius.

i. Minimum 7/16 inch thick APA rated Exposure 1 Sheathing with 24/16 span rating installed according to APA guidelines.

2. Verify that substrate and adjacent materials are dry and sound, free of foreign substances that will impair bond or successful installation. Insure that the substrate is not frozen.

3. Verify substrate surface is flat and free of surface irregularities: Maximum 6-mm (1/4 inch) measured within any 1.22-m (4-foot) radius.

3.02 PREPARATION

A. Report discrepancies materially different from Contract Documents to architect prior to commencement of installation.

B. Protect adjacent work areas from moisture, deterioration, and soiling resulting from system installation. Provide temporary coverings and other measures to protect other work.

3.03 INSTALLATION

A. General:

1. Install TeifsFLEX WALL SYSTEM products according to TeifsFLEX APPLICATION GUIDE and TeifsFLEX DETAILS.

2. Install Flashing according to Teifs WINDOW FLASHING TECHNICAL BULLETIN and TeifsFLEX DETAILS.

3. Install third-party system components to product manufacturers' written instructions.

4. Sealant: Apply at system perimeter and prepared joints to requirements of Section 07900 and manufacturer's written instructions.

B. Insulation:

1. Apply TeifsBAKRAP at all terminations (windows, doors, etc.).

2. Mixing:

a. TeifsBASE and TeifsBASE FR: Mix with Type I or II Portland Cement 1:1 ratio by weight. A small amount of potable water may be added. Set aside for 10 minutes and re-mix, adding a small amount of water to improve workability. This is critical in obtaining pot life.

b. TeifsBASE DB: Place 5 quarts of clean, cool water into a clean mixing container. Slowly add the 50-pound bag of TeifsBase DB to the water while mixing to a creamy consistency. Set aside for 10 minutes and remix.

c. TeifsADHEEZ: A small amount of potable water may be added

3. Apply Teifs Base Coat to the backside of the Insulation Board using a 3/8 inch notched trowel.

4. Immediately install TeifsBOARD on the Substrate:

a. Do not allow the Teifs Base Coat mixture to form a skin on the Insulation Board before installation.

b. Slide Insulation Board gently into position. Apply firm pressure over the entire board surface to ensure uniform contact.

c. Install in a running bond pattern beginning at the base of the wall and make sure the corners are straight and plumb and all inside and outside corners shall be interlocked.

d. "L" shaped pieces of Insulation Board shall be used at corners of openings.

5. Joints between Insulation Board shall be tight with no gaps. If gaps occur at intersections of Insulation Board, slivers of insulation shall be used to fill gaps.

6. Allow the adhesively applied Insulation Board to cure at least 24 hours before proceeding.

7. Once Insulation Board is in place and adhesive has cured, the surface shall be rasped smooth so that all irregularities are removed.

8. Install aesthetic joints at this time, ensuring that 3/4 inch of Insulation Board is left at the base of the joint.

C. Teifs Base Coat/Reinforcing Mesh:

1. Mixing:

a. TeifsBASE and TeifsBASE FR: Mix with Type I or II Portland Cement 1:1 ratio by weight. A small amount of potable water may be added. Set aside for 10 minutes and re-mix.

b. TeifsBASE DB: Place 5 quarts of clean, cool water into a clean mixing container. Slowly add the 50-pound bag of TeifsBASE DB to the water while mixing to a creamy consistency. Set aside for 10 minutes and re-mix.

c. TeifsSTRUCTURE: Mix to a smooth, homogeneous consistency. A small amount of potable water may be added.

2. Increased impact resistance: Use TeifsMAT 15 or 20 which shall be applied prior to TeifsMESH

a. Apply Base Coat to areas specified to receive TeifsMat 15 or 20 and embed mesh using a "T" stroke.

b. The TeifsMAT shall be butted together and not overlapped, as this will result in a ridge in the lamina.

c. Allow the TeifsMAT/BASe coat lamina to cure a minimum of 24 hours.

3. Apply TeifsMESH to the entire wall surface overlapping any joints 2-1/2 inches and 4 inches at corners according to instructions below and in TeifsFLEX APPLICATION GUIDE. All outside corners shall have two layers of TeifsMESH or TeifsKORNERAP.

4. TeifsMESH

a. Apply Base Coat to the Insulation Board using a stainless steel trowel to a uniform thickness of approximately 1.6-mm (1/16-inch).

b. Embed TeifsMESH for standard impact resistance. The reinforcing mesh shall be embedded such that the color of the reinforcing mesh is not visible. Take care to avoid cutting or creating wrinkles in the mesh.

c. The edges of the Insulation Board shall be edge wrapped with Teifs Base Coat and TeifsBAKRAP.

d. Once the reinforcing mesh is installed, there should be no area where insulation board is visible.

e. Smooth any rough edges and apply more TeifsBASE to ensure that the mesh color is not visible.

f. Allow the reinforced base coat to cure for a minimum of 24 hours.

g. Smooth any rough edges and apply more TeifsBASE to ensure that the mesh color is not visible.

h. Allow the reinforced base coat to cure.

D. Finish Coating

Do not apply TeifsFlex Finish in any moving joint to receive sealant. Certain static joint applications utilizing fillet bead caulking may be applied to the Finish Coat. See the TeifsFLEX Details for examples.

1. Mix Teifs Finish Coat thoroughly until a workable consistency is achieved. Do not overmix as this may cause air entrapment. A small amount of water may be added to improve workability. Always add the same amount of water to each pail to ensure consistent color and texture.

2. Avoid applying Finish in direct sunlight.

3. Apply the Teifs Finish Coat over the Base Coat/Reinforcing Mesh lamina using a stainless steel trowel. CUARZO and PIEDRA GRANDE finish shall be installed and leveled to a uniform thickness no greater than the largest aggregate. TEJAS, TEJAS FINE, and PIEDRA GRANDE Finish shall be applied at a thickness of 1 to 1-1/2 times the aggregate size.

4. Texture is achieved by a uniform trowel motion to match the approved sample. All finishes should be installed continuously, maintaining a wet edge to prevent cold joints.

E. Sealant:

1. Apply sealant at system perimeter and prepared joints to requirements of Section 07900 and manufacturer's written instructions.

2. Allow Base Coat to cure at least 2 days before applying sealant.

3. Use bond breaker tape for joints too shallow to receive backer rod.

3.04 FIELD QUALITY CONTROL

A. Repair or replace defective materials to eliminate blisters, buckles, excessive crazing, cracking, and other areas where bond to the substrate has failed.

3.05 CLEANING AND PROTECTION OF FINISHED WORK

A. Remove temporary covers and barriers protecting adjacent construction after installation.

B. Do not permit finish surface to become soiled or damaged.

END OF SECTION