



Teifs Permadrain Wall System Specification

Expanded Language

CSI SECTION 07 24 00

CSI SECTION 07 24 00 - Exterior Insulation & Finish System (EIFS) - Class PB
SECTION 07 24 19: Water Drainable Exterior Insulation & Finish System (EIFS)- Class PB, Mechanical Attachment
(Teifs Permadrain Wall System, Class PB)

SYSTEM OVERVIEW

The Teifs Permadrain Wall System is a Class PB EIFS distinguished by installation with drainage. It features flat expanded polystyrene (EPS) insulation board mechanically fastened over Dupont™ StuccoWrap. The StuccoWrap provides a water-resistive barrier while its grooved pattern provides drainage.

Teifs Permadrain Wall System is qualified for combustible construction only. Its use is generally limited to walls with design-negative windload not over 29 pounds per square foot. Contact ParexLahabra Technical Department for higher loads.

Coordination and sequencing:

- Flashing membrane must be installed in rough openings before windows, doors, etc.
- Flashings that are counter-flashed by EIFS must be installed before the EIFS. Such flashings include “kick-outs,” deck flashings, etc.

All penetrations and terminations of the system must be made weather-tight, typically by sealants and/or flashings.

Weeps of vented track and flashings must not be blocked.

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes: Installation of the water-drainable Exterior Insulation and Finish System (EIFS) as an exterior wall cladding. The extent of EIFS assembly is as indicated on the drawings.
- B. The assembly components are: An Exterior Insulation and Finish System (EIFS) consisting of Expanded Polystyrene Insulation (EPS) Board, Mechanical Fasteners, Vented Track, Cementitious Base Coat with embedded Reinforcing Fabric Mesh, Primers (Optional), and Finish Coat installed with DuPont™ Stucco Wrap and flashing membrane to form a water-draining assembly.



1.02 EIFS DEFINITIONS

- A. Backwrapping: Continuation of base coat and fiberglass mesh around the edge of the polystyrene and onto the substrate in back of the polystyrene.
- B. Edgewrapping: Continuation of base coat and mesh onto the rough opening wall framing or masonry
- C. Expansion Joints: Sealant, backer-rod or bond breaker tape, and primer manufactured by others, forming a moveable junction between adjacent materials.

1.03 SYSTEM DESCRIPTION

- A. Field application: EIFS applied to substrate in final position on the structure.
- B. Teifs Permadrain Wall System: EPS insulation board mechanically attached over StuccoWrap water-resistive barrier, covered by fiberglass mesh reinforced base coat and colored, textured finish. The assembly is flashed at wall openings and vented for drainage at the base of the system and at the heads of openings.

1.04 TEIFS PERMADRAIN WALL SYSTEM FUNCTIONAL CRITERIA

- A. General:
 - 1. EIFS application shall be vertical. Inclined applications shall be sloped in a minimum of 6 in 12 (27°) for positive drainage.
 - 2. Sloped surfaces shall have a maximum run of 12 in. (305mm).
 - 3. Usage not meeting the above criteria shall be approved in writing by ParexLahabra Technical Department prior to installation.
- B. Impact Resistance Classification: Teifs Permadrain Wall System shall be classified in accordance with EIMA Test Method 101.86, Impact Resistance.
 - 1. Standard Impact Resistance 25-49 in-lbs, Intermediate Impact Resistance 50-89 in-lbs, High Impact Resistance 90-150 in-lbs, and Ultra-High Impact Range >150 impact range.
- C. Expansion joints: Continuous expansion joints shall be installed at the following locations:
 - 1. At building expansion joints
 - 2. At substrate expansion joints
 - 3. At floor lines in wood frame construction
 - 4. Where Teifs EIFS abuts other materials
 - 5. Where significant structural movement occurs, such as:
 - a. Changes in roof line
 - b. Changes in building shape and/or structural system
 - c. Where substrate changes (For exceptions to joints at substrate changes, contact the ParexLahabra Technical Department.)
- D. Substrate movement and expansion and contraction of Teifs EIFS and adjacent materials shall be taken into account in the design of expansion joints, with proper consideration given to sealant properties, installation conditions, temperature range, coefficients of expansion of materials, joint width-to-depth ratios, and other material factors. Minimum width of expansion joints shall be as follows:
 - 1. 1/2 in. (12.7mm) where EIFS abuts other materials
 - 2. 3/4 in. (19mm) when EIFS abuts the EIFS
 - 3. Larger width where indicated on drawings
- E. Manufacturer's details:
 - 1. Teifs EIFS latest published information shall be followed for standard detail treatments.
 - 2. Non-standard detail treatments shall be as recommended by the ParexLahabra Technical Department, shall be approved by the architect, and shall be part of the contract documents.

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3. Building code conformance: Teifs EIFS shall be acceptable for use on this project under applicable building codes and all local agencies having jurisdiction.

F. Related work:

1. Flashing shall be continuous and water-tight. Flashing shall be designed and installed to prevent infiltration of water behind EIFS. Refer to Division 7, Flashing section for specified flashing materials.
2. Substrate systems:
 - a. Systems shall be engineered to withstand applicable design loads including required safety factor.
 - b. Maximum deflection of the substrate system under positive or negative design loads shall not exceed 1/240 of span except as otherwise approved in writing by ParexLahabra Technical Department prior to installation.
 - c. Substrate dimensional tolerances: Flat within 1/4 in. (6.4mm) within any 4-ft. (1,219mm) radius.
 - d. Surface irregularities: Sheathing not over 1/8 in. (3mm); masonry not over 3/16 in. (4.8mm).
 - e. Design-negative windload shall not exceed 30 psf (1,436 Pa). Contact ParexLahabra Technical Department for higher design-negative windload.
3. EPS board shall be separated from the interior of the building by 1/2 in. (12.7mm) gypsum board or equivalent approved 15-minute thermal barrier.
4. Sealants for joints shall be installed to prevent infiltration of water behind EIFS. Refer to Division 7, Joint Sealants section for specified sealant materials.

1.05 SUBMITTALS

A. Verification samples:

1. Submit verification samples of EIFS finish to adequate size to represent each color and texture to be utilized on the project.
2. Each sample shall be made using the same tools and techniques as required for actual application. Samples shall be available and maintained at the job site.

B. Reports and certificates:

1. Test reports: Submit, when requested, selected test reports by independent laboratories verifying performance of the EIFS.
2. Valid ICC-ES report.
3. Applicator Certificate of Education: Submit, when requested, a copy of the applicator current certificate of education.

C. Material Product Data Sheets and Material Safety Data Sheets (MSDS) for all materials related to the EIFS.

D. Manufacturer's warranty in accordance with Division 1 General Requirements submittal section.

1.06 QUALITY ASSURANCE

A. Qualifications:

1. EIFS manufacturer:
 - a. Shall have marketed Exterior Insulation and Finish Systems in the United States for at least ten years.
 - b. Shall have supplied at least 1,000 projects of EIFS.
 - c. Shall have completed projects of same building size and type as this project.
2. EIFS applicator:
 - a. Shall possess a current certificate of education.
 - b. Shall be experienced and competent in installation of plaster-like materials.



B. Regulatory Requirements:

1. Insulation board shall be produced and labeled under a third-party quality program as required by applicable building code.
2. EIFS shall be installed in accordance with all codes and local agencies having jurisdiction.

C. Single-source responsibility:

1. All system materials shall be from a single manufacturing source or as specified by the EIFS manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver EIFS materials supplied by Teifs to site location in original unopened containers with labels intact. Upon arrival, materials shall be inspected for damage, and manufacturer shall be notified of any discrepancies. Unsatisfactory materials should not be used.
- B. Storage: Store EIFS materials supplied by Teifs in a cool, dry location, out of sunlight, protected from weather and other harmful environments, and at a temperature above 40°F (4°C) and below 110°F (43°C) in accordance with manufacturer's instructions.

1.08 PROJECT/SITE CONDITIONS

- A. General: Provide access to electric power and clean, potable water at area where Teifs EIFS materials are installed.
- B. Environmental conditions: In accordance with manufacturer's requirements, comply with:
1. Ambient air temperature: Minimum 40°F (4°C) and rising, and remaining so for 24 hours thereafter.
 2. Do not apply Teifs EIFS materials to substrate whose temperature is below 40°F (4°C).
 3. Do not apply Teifs EIFS during inclement weather unless appropriate protection is employed.
 4. Protect Teifs EIFS materials from excessive weather and damage from other trades.

1.09 WARRANTY

- A. Warranty: Upon request, at completion of installation provide Teifs Permadrain Wall System Limited Warranty.

1.10 MAINTENANCE

- A. Maintenance instructions: At completion of EIFS installation, provide manufacturer's maintenance instructions for EIFS installed.
1. Refer to Division 1 General Requirements for submitting maintenance documentation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturer: ParexLahabra Inc, 4125 E. La Palma Ave, Suite 250, Anaheim CA 92807
- B. Components: Obtain components of Teifs EIFS from Teifs or its authorized distributors. No substitutions or additions of other materials shall be permitted without prior written permission for the project from ParexLahabra.
- C. Substitutions: Refer to Division 1 General Requirements section for provision regarding product substitutions.

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D. Alternative manufacturers: Alternative manufacturers to be considered equal to those specified herein shall be approved by the architect in writing in accordance with bidding requirements and provisions of contract documents and Section 01 23 00.

2.02 MATERIALS

A. DuPont® StuccoWrap or DrainWrap®: Vapor-permeable air barrier and secondary water-resistive barrier that provides drainage plane.

B. Flashing Membrane: Self-sealing, non-woven, mat-backed, rubberized asphalt membrane, 30 mils (0.76mm) thick.

C. Insulation Board:

1. Shall be produced by a manufacturer approved by ParexLahabra labeled under third-party quality program as required by applicable building code.
2. Shall conform to ASTM C-578 Type I and the EIMA “Guideline Specification for Molded Expanded Polystyrene (EPS) Insulation Board.”
3. Maximum size shall be 2 ft. x 4 ft. (610mm x 1,219mm).
4. Nominal thickness shall be 1-1/2 in. (38mm) minimum.

D. Mechanical Fasteners: Wind-lock Wind Devil 2 fasteners, non-thermal bridging polypropylene plastic plates and corrosion-resistant screws.

E. Teifs Base Coat:

1. TeifsBase Coat & Adhesive: 100% acrylic polymer based, requiring the addition of portland cement.
2. TeifsBase DB Base Coat & Adhesive: Copolymer-based factory blend of cement and proprietary ingredients.
3. TeifsStructure Base Coat & Adhesive: 100% acrylic polymer base; ready-to-use, applied without the addition of cement.

F. Teifs reinforcing mesh:

1. TeifsMesh: Weight 4.8 oz. per sq. yd (163g/m²); coated for protection against alkali; standard reinforcement of Teifs EIFS, or for use with TeifsMAT 15 or TeifsMAT 20.

NOTE: RETAIN BELOW MESH REQUIREMENTS AFTER DETERMINATION OF IMPACT RESISTANCE CLASSIFICATION.

2. TeifsMESH XL: Weight 12 oz. per sq. yd. (408g/m²); reinforcing mesh used with Teifs Permadrain Wall System to achieve EIMA intermediate impact strength.
3. TeifsMAT 15: Weight 15 oz. per sq. yd. (510g/m²); reinforcing mesh used with TeifsMESH to achieve EIMA high impact strength.
4. TeifsMAT 20: Weight 20 oz. per sq. yd. (679g/m²); reinforcing mesh used with TeifsMESH to achieve EIMA ultra-high impact strength.
5. Teifs KORNERAP: Reinforcing mesh used as a corner reinforcement; required with TeifsMAT 20.

G. Teifs Primers:

1. Primer: 100% acrylic-based coating to prepare surfaces for Teifs finishes.
2. Sanded Primer: 100% acrylic-based coating to prepare surface for Teifs finishes; required for Teifs Earthstone finish.

H. Teifs Finish Coat: Factory-blended, 100% acrylic polymer-based finish, integrally colored. Finish type, texture, and color as selected by architect.



- I. Vented Track: Exterior-grade vinyl extrusion with vent holes for drainage and perforated front flange to key base coat. Provides straight termination at base of the system at grade.
- J. Water: Clean, potable water.
- K. Portland cement: Conforming to ASTM C 150 Type I or I-II, fresh and free of lumps for addition to Teifs Base.

2.03 RELATED MATERIALS

A. Sheathing:

1. Plywood shall be not less than 7/16 in. (11.1mm) thick, minimum 4-ply APA-Engineered Wood Association Exposure 1 or Exterior Grade C-D or better.
2. Oriented structural Strand Board (OSB) shall be Exposure 1; thickness shall be not less than 7/16 in. (11.1mm).
3. For wood-based sheathing (plywood and OSB) comply with APA-Engineered Wood Association spacing recommendations fo 1/8 in. (3.2mm) for edge and end joints.
4. Exterior grade gypsum sheathing complying with ASTM C 1396 (formerly ASTM C 79) or glass mat sheathing complying with ASTM C 1177. When these non-screwable sheathings are used, unsulation board mechanical fasteners must penetrate the framing members.
5. Sheathing shall be protected from weather before, during, and after application of Teifs EIFS.

B. Flashing: Refer to Division 7 Flashing section for flashing materials.

C. Sealants:

1. Sealants for expansion joints in the Teifs EIFS shall be ultra-low-modulus designed for a minimum 100% elongation and mimimum 50% compression as selected by the architect.
2. Sealant for perimeter seals around window and door frames and other wall penetrations shall be low-modulus designed for minimum 50% elongation and minimum 25% compression as selected by the architect.
3. Sealant shall conform to ASTM C 920, Grade NS, and shall have been tested in accordance with ASTM C 1382.
4. Sealant backer rod shall be closed-cell polyethylene foam.
5. Sealant is to be applied to base coat of the Teifs EIFS.
6. Color of sealant to be selected by the architect and/or owner.
7. Joint design, surface preparation, and sealant primer shall be based on sealant manufacturer's recommendations and project conditions.

PART 3 - EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's instructions for installation of EIFS.

3.02 EXAMINATION

A. Examination of substrate:

1. Prior to installation of Teifs EIFS, examine substrate as follows:
 - a. Substrate shall be of a type approved by ParexLahabra
 - b. Substrate shall be examined for soundness, such as tightness of connections, crumbling or looseness of surface, voids and projections, spacing of panels, and other conditions.
 - c. Substrate shall be examined for dimensional tolerances per this specification.

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2. Substrate shall be free of foreign materials such as oil, dust, dirt, form release agents, paint, wax, water, frost, and other harmful materials.
3. Advise a contractor of discrepancies preventing installation of a manufacturer's warranty EIFS. Do not proceed with EIFS work until unsatisfactory conditions are corrected.
4. Correction of unsatisfactory conditions for substrates installed by other trades shall be the responsibility of the contractor.

3.03 PROTECTION AND COORDINATION

- A. Protection: Protect surrounding material surfaces and areas during installation of Teifs EIFS. Protect Teifs EIFS from weather and other damage immediately after installation and until installation of sealants and flashing.
- B. Coordination:
 1. Coordinate installation of Teifs EIFS with other construction trades.
 2. Ensure a continuous EIFS operation free of cold joints, scaffolding lines, texture variations, and other non-complying installation procedures.
 3. Promptly flash and/or seal system terminations to prevent water infiltrations. Use temporary cover when permanent flashing or sealant installation is delayed.
 4. Immediately cover tops of walls to prevent water infiltration.
 5. Upon full cure of Teifs EIFS, promptly install sealant to surfaces to be sealed.

NOTE: TEIFS PERMADRAIN WALL SYSTEM IS A DRAINABLE WATER-RESISTIVE BARRIER ASSEMBLY. SYSTEM PERFORMANCE IS DEPENDENT UPON, AMONG OTHER FACTORS, THE IMPORTANCE OF PROPER FLASHING AND JOINT SEALING AND ATTENTION TO PROPER FLASHING AND JOINT SEALANT DETAILS INDICATED ON DRAWINGS.

3.04 INSTALLATION

- A. General: Installation shall conform to this specifications and Teifs EIFS written instructions and drawing details.
 1. Install DuPont StuccoWrap or DuPont DrainWrap and Flashing Membrane or DuPont Tyvek FlexWrap flashign membrane, making all laps weatherboard fashion to provide continuity of water shedding.
 2. Install tracks, backwrap mesh, or edgewrap mesh at system terminations.
 3. Install Wind-lock fasteners to secure insulation board to the wall in accordance with Wind-lock Corporation instructions. For exterior grade gypsum sheathing and glass mat sheathing mininum screw penetration of framing members shall be 3/4 in. (19mm) into wood and three full threads through steel. Minimum eight (8) fasteners per 2 ft. x 4 ft. (610mm x 1,219mm) piece of insulation board.
 4. Install insulation board without gaps in a running bond pattern and interlocked at corners.
 5. Rasp irregularities off insulation board.
 6. Apply base coat and fully embed mesh in base coat; include diagonal mesh patches at corners of openings and reinforcing mesh patches at joints of track sections. Apply multiple layers of base coat and mesh where required for specified impact resistance classification. Where multiple layers of mesh are used for increased impact resistance, base coat embedding the first layer of mesh need not dry before adding second layer of base coat and mesh.
 7. Apply primer to base coat after drying. Primer may be omitted if it is not required by the manufacturer's primer and base coat product data sheets for the specified finish coat.



8. Finish coat: Apply finish coat to match specified finish type, texture, and color. Apply finish except at base coat areas to receive sealant.
9. Install sealant in accordance with Teifs details and instructions. Apply sealant to base coat.

3.05 CLEAN UP

A. General: Remove excess and waste EIFS materials from job site.

1. Clean EIFS surfaces and work area of foreign materials resulting from EIFS operations.

END OF SECTION

Disclaimer

This guide specification is intended for use by a qualified designer. The guide specification is not intended to be used verbatim as an actual specification without appropriate modifications for the specific use intended. The guide specification must be integrated into and coordinated with the procedures of each design firm, and the requirements for a specific project.

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PRODUCT PERFORMANCE SHEET

REINFORCING MESH	TEST RESULTS (IN-LB)	CLASSIFICATION	IMPACT RANGE (IN-LB)
TeifsMesh	40	Standard	25-49
TeifsMesh 6	52	Medium	50-89
TeifsMesh 12	104	High	90-150
TeifsMesh 12 w/TeifsMesh	148	High	90-150
TeifsMesh 12 w/TeifsMesh 12	200	Ultra-High	>150
TeifsMesh 15	240	Ultra-High	>150
Teifs Mesh 20	288	Ultra-High	>150

FIRE PERFORMANCE

TEST	METHOD	TEIFS PERMADRAIN WALL SYSTEM
Intermediate Multi-Story Fire Evaluation	ASTM E 84	Pass
Fire Resistance	ASTM E 119 1 hour assembly	Standard fire-resistive assembly rating maintained
Radiant Heat Exposure	NFAP 268	Pass: 1 in. - 4 in. EPS
Surface Burning Characteristics of Coatings	ASTM E 84	Flame Spread: 0 - 15 Smoke Developed: 0 - 15

DRAINAGE PERFORMANCE

TEST	METHOD	TEIFS PERMADRAIN WALL SYSTEM
Drainage Efficiency	ICBO ES AC 24	Pass: Efficiency > 90%

STRENGTH

TEST	METHOD	TEIFS PERMADRAIN WALL SYSTEM
Transverse Wind-Load Resistance	ASTM E 330	Contact ParexLahabra Technical Services department for specific windload results
Tensile Bond Strength	ASTM E 2134	Greater than 15 psi for all substrates

ENVIRONMENTAL DURABILITY TEST

TEST	METHOD	TEIFS PERMADRAIN WALL SYSTEM
Accelerated Weathering	ASTM G23	5,500 hours; no deleterious effect
Water Penetration	331 Section 1403.2, Exception 2, of the IBC	Pass. No water occurred on the inner face of the specimen when tested to 12.0 psf
Moisture Resistance	ASTM D 2247	28 days: no deleterious effect
Abrasion Resistance	ASTM D968	600 liters: no deleterious effect
Freeze-Thaw	EIMA Method (60 cycles)	Pass, No visible effect
Mildew Resistance	ASTM D 3273	35 days: no growth
Water Vapor Transmission	ASTM E2121 (E96)	Permeable to water vapor
Salt Fog Resistance	ASTM B 117	600 hours: no deterioration

Where several tests on different materials are summarized, a range of values is shown. This summary has been prepared to provide quick but partial information on how certain combinations of Teifs products perform during certain tests. It is not a complete description of the test procedures or of the results thereof. ParexLahabra will mail copies of original test reports at no charge on request. Please contact ParexLahabra if further information is required.



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