

# **Teifs Wall Systems**

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## **Complete Guide Specifications**

### **TeifsPERMADRAIN® Wall Systems (PB)** **Section 07240** **Exterior Insulation And Finish System (EIFS)**

This guide specification section has been prepared by Teifs Wall Systems, manufacturers of Exterior Insulation and Finish Systems. This section will assist design professionals in the preparation of a specification section on the TeifsPERMADRAIN® (Class PB) Exterior Insulation and Finish System (EIFS).

This section has been prepared according to principles established in the Manual of Practice published by The Construction Specifications Institute (CSI), including the use of section numbers and titles from 1995 Edition of Master Format.

Inch-pound units are contained within parenthesis after the SI (metric) measurements, e.g.: “6-mm (1/4 inch).” Metric measurements are rationalized units based on the SI system of measurement. Delete either the metric or (inch-pound) units of measure depending on project requirements; do not include both units in a project specification, as conflicting requirements or misinterpretation could result.

This guide specification is available in both hard copy and a variety of electronic softcopy formats to suit the more popular word processing programs and operating systems. Please contact Teifs at 800-358-4785 for copies of product data or for information on different available electronic soft copy formats.

## **PART 1: GENERAL**

### **1.01 SUMMARY**

#### A. Section Includes:

1. TeifsPERMADRAIN® Wall System: Exterior wall [and soffit] cladding of a weather resistant barrier, rigid insulation, mechanical fasteners, base coat with reinforcing mesh, and finish coat.
2. TeifsPERMADRAIN DM® Wall System: Exterior wall [and soffit] cladding of a weather resistant barrier, drainage mat, rigid insulation, mechanical fasteners, base coat with reinforcing mesh, and finish coat.
3. TeifsPERMADRAIN ML® or PL® Wall System: Exterior wall [and soffit] cladding of a weather resistant barrier, metal/plastic lath, 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 07270 - Air Barriers
6. Section 07620 - Sheet Metal Flashing and Trim: Perimeter flashings
7. Section 07900 - Joint Sealants
8. Section 09250 - Gypsum Board

### **1.02 SYSTEM DESCRIPTION**

- A. TeifsPERMADRAIN® Wall System is an Exterior Insulation and Finish System, Class PB with a weather resistant barrier (Tyvek Stuccowrap/Building Paper), rigid insulation (TeifsBOARD), mechanical fasteners, base coat (TeifsBASE) with reinforcing mesh (TeifsMESH), and finish coat (Teifs Finish).
- B. TeifsPERMADRAIN DM® Wall Systems is an Exterior Insulation and Finish System, Class PB with a weather resistant barrier (Tyvek Stuccowrap/Building Paper), rigid insulation (TeifsBOARD), drainage mat, mechanical fasteners, base coat (TeifsBASE) with reinforcing mesh (TeifsMESH), and finish coat (Teifs Finish).
- C. TeifsPERMADRAIN ML® or PL® Wall System is an Exterior Insulation and Finish System, Class PB with a weather resistant barrier (Tyvek Stuccowrap/Building Paper), lath (plastic lath/metal lath), adhesive bed (TeifsBASE), rigid insulation (TeifsBOARD), base coat (TeifsBase) with reinforcing mesh (TeifsMESH), and finish coat (Teifs Finish).

### **1.03 REFERENCES**

- A. ANSI/EIMA 99-A - American National Standard for Exterior Insulation and Finish System
- B. ASTM B 117 - Practice for Operating Salt Spray (Fog) Apparatus
- C. ASTM C 79/C 1396 - Gypsum Sheathing Board
- D. ASTM C 150 - Portland Cement
- E. ASTM C 297 - Test Method for Tensile Strength of Flat Sandwich Constructions in Flatwise Plane
- F. ASTM C 578 - Pre-formed Cellular Polystyrene Thermal Insulation
- G. ASTM C 1135 - Test Method for Determining Tensile Strength Adhesion Properties of Structural Sealants
- H. ASTM C 1177 - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing
- I. ASTM D 968 - Standard Method for Laboratory Compaction Characteristics of Soil using Standard Effort
- J. ASTM D 2247 - Practice for Testing Water Resistance of Coatings in 100% Relative Humidity
- K. Military Standard 810B - Environmental Test Methods
- L. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials
- M. ASTM E 96 – Standard Test Methods for Water Vapor Transmission of Materials
- N. ASTM E 119 - Method for Fire Tests of Building Construction and Materials

- O. ASTM E 330 - Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
- P. ASTM E 331 - Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
- Q. ASTM G 23 - Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type), with and without Water for Exposure of Non-metallic Materials
- R. EIMA 101.01 - Standard Test Method for Freeze-Thaw Resistance of Exterior Insulation and Finish Systems (EIFS), Class PB (Modified ASTM C 67)
- S. EIMA 101.02 - Standard Test Method for Resistance to Water Penetration of Exterior Insulation and Finish Systems (EIFS), Class PB (Modified ASTM E 331)
- T. EIMA 101.86 - Impact Resistance. EIMA 105.01 - Standard Test Method for Alkali Resistance of Glass Fiber Reinforcing Mesh for Use in Exterior Insulation and Finishing Systems (EIFS), Class PB
- U. EIMA 200.2 - Standard Test Method for Drainage Performance
- V. TeifsPERMADRAIN® Wall System Application Guide
- W. TeifsPERMADRAIN® Wall System Details

#### **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 code.
- 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.
  - 7. ICBO/EIMA Drainage Test: All systems pass greater than 90% efficiency.
- C. Fire Performance:
  - 1. Flame Spread - ASTM E 84: Flame spread index 5, smoke development 5.
  - 2. One Hour Fire Rating – ASTM E 119.
  - 3. BOCA Radiant Heat Exposure Test: Pass, no ignition.
- D. Structural Performance of the Assembly:
  - 1. Freeze Thaw Stability: 60 cycles, no cracking, checking or splitting.
  - 2. Wind Load Resistance - ASTM E 330: Ultimate Load
    - a. TeifsPERMADRAIN®/TeifsPERMADRAIN DM®: +5123 Pa (+107 psf), -2872 Pa (-60 psf), 20 gauge steel studs, 1/2" exterior gypsum sheathing.
    - b. TeifsPERMADRAIN ML®/PL®: +5594 Pa (+116.83 psf) -4490 Pa (-93.77 Pa), 20 gauge steel studs, 1/2" exterior gypsum sheathing.

For other assemblies, contact Teifs Technical Department.

3. Resistance to Impact - EIMA 101.86:

<u>Reinforcing Mesh</u>	<u>Test Result (in.-lb.)</u>	<u>Classification</u>	<u>Impact Range (in.-lb.)</u>
TeifsMESH	40	Standard	25-49
TeifsMESH 6	52	Standard	25-49
TeifsMESH 12	104	High	90-150
TeifsMESH 12/TeifsMESH	148	High	90-150
TeifsMESH 12/TeifsMESH 12	200	Ultra High	>150
TeifsMAT 15	240	Ultra High	>150
TeifsMAT 20	288	Ultra High	>150

4. Adhesive Strength - ASTM C 297: Minimum of 15 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, 204-mm x 300-mm (8-inch x 12-inch) in size illustrating coating color and texture range for selection.
- C. Manufacturer's Application Guide for TeifsPERMADRAIN® 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: Teifs Wall Systems.
  - 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 4 °C (40 °F) 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 4 °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.

## PART 2: PRODUCTS

### 2.01 MANUFACTURERS

Acceptable Manufacturer: Teifs Wall Systems, 220 Burseson, San Antonio, Texas, 78202, 1-800-358-4785, [www.teifs.com](http://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(Permadrain ML® and PL® only): Used to adhere the insulation board to the Lath.
  - 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:
    - a. Permadrain® / Permadrain DM®: 25-mm (1 inch)
    - b. Permadrain ML®/PL®: 19-mm (3/4 inch)
  - 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 (see Section 1.04 C. 3. for impact resistance):
  - 1. TeifsMESH: Standard Weight Reinforcing Fabric, not less than 4.8 oz./yd<sup>2</sup>.
  - 2. TeifsMESH 6: Standard Extra Reinforcing Fabric, not less than 6.0 oz./yd<sup>2</sup>.
  - 3. TeifsMESH 12: Intermediate Weight Reinforcing Fabric, not less than 12.0 oz./yd<sup>2</sup>.
  - 4. TeifsMAT 15: Heavy Weight Reinforcing Fabric, not less than 15 oz./yd<sup>2</sup>.

5. TeifsMAT 20: Heavy Weight Reinforcing Fabric, not less than 20 oz./yd<sup>2</sup>.
  6. TeifsBAKRAP: Strip Reinforcing Fabric, not less than 4.8 oz./yd<sup>2</sup> for special shapes, backwrapping and detail work.
  7. TeifsKORNERRAP: Reinforcing Fabric, not less than 8.0 oz/yd<sup>2</sup> 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 CUARZO: variable textured pattern
    - b. TeifsFLEX PIEDRA GRANDE: stucco like sand texture detail work
    - c. TeifsFLEX TEJAS: creamy sand texture using marble aggregate
    - d. TeifsFLEX TEJAS FINE: light sand texture using marble aggregate
    - e. TeifsFLEX FREEDOM: allows for almost any ornamental trowel texture
  2. Specialty Finish:
    - a. TeifsTUFFSTONE: colored ceramic beads in clear 100% acrylic binder with increased durability
    - b. TeifsEARTHSTONE: natural stone and ceramic beads in a 100% acrylic binder with increased durability

## 2.03 ACCESSORIES

- A. Weather Resistant Barrier:
  1. Tyvek Stuccowrap
  2. Code Approved weather barrier
- B. Drainage Mat:
  1. Drainage Mat: three dimensional 1/4" thick polypropylene, woven fabric
  2. Metal Lath: 2.5 galvanized metal lath
  3. Plastic Lath: 1/4" thick PVC (polyvinyl chloride) lath
- C. Fasteners: Wind Devil 2 or equivalent. Fastener length to be determined by substrate and EPS board thickness
- D. Starter Track: PVC trims complying with ASTM D1784 and ASTM C1063
- E. Flashing Tape: A 40 mil SBS modified rubberized asphalt membrane with a polyester top surface
- F. Flashing Tape Primer: Water-based, flashing tape primer
- G. Sealant Backer Rod: Closed cell extruded polyethylene foam rod sized to joint configuration
- H. Bond Breaker Tape: pressure-sensitive adhesive polyethylene tape, recommended by sealant manufacturer
- I. Sealant: Dow Corning 790, 795, GE Silprof LM, Pecora 890 and Pecora Dynatrol II and bond breaker

## 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 ensure 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 TeifsPERMADRAIN® 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.
- 2. Verify that substrate and adjacent materials are dry and sound, free of foreign substances that will impair bond or successful installation. Ensure 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 TeifsPERMADRAIN® Wall System products according to TeifsPERMADRAIN® Application Guide and TeifsPERMADRAIN® 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, manufacturers' written instructions and according to Teifs Sealant Application Guide.

### **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**

[October, 2002] • EXTERIOR INSULATION AND FINISH SYSTEM (EIFS) [Replaces June, 2000]