



## SECTION 09306

### TILE ADHESIVES, MORTARS AND GROUTS

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#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Cement self-leveling underlayment.
- B. Waterproofing and crack isolation membrane.
- C. Trowel applied thin-set mortar for setting tile.
- D. Acrylic latex admixture for thin-set mortar.
- E. Acrylic latex admixture for grout.
- F. Acrylic latex admixture for bond coats and mortar beds.
- G. Two-component, epoxy emulsion admixture.
- H. Polymer-modified Portland cement, unsanded grout.
- I. Polymer-modified Portland cement, sanded grout.

##### 1.2 RELATED SECTIONS

- A. Section 03300 - Concrete: Surface forms and surface preparation.
- B. Section 09260 - Gypsum Board Assemblies: Cement board, tile backer and other substrates for tile.

##### 1.3 REFERENCES

- A. ANSI A108.13 - Installation of Load Bearing Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone.
- B. ANSI A118.10 - Load-Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone Installations.
- C. ASTM C627 - Method for Evaluating Ceramic Floor Tile Installation Systems Using the Robinson Type Floor Tester.
- D. ASTM C836 - High Solids Content, Cold Liquid-Applied, Elastomeric Waterproofing Membrane for Use with Separate Wearing Course.
- E. ANSI A108.5 - Ceramic Tile Installed with Dry-Set Portland Cement Mortar or Latex-

Portland Cement Mortar.

- F. ANSI A118.4 - Latex-Portland Cement Mortar.
- G. ANSI A118.11 - Exterior Grade Plywood, Latex Portland Cement Mortar.
- H. ANSI A108.12 - Installation of Ceramic Tile with EGP (Exterior Glue Plywood) Mortar.
- I. ANSI A108.6 - Ceramic Tile Installed with Chemical-Resistant, Water-Cleanable, Tile-Setting and -Grouting Epoxy.
- J. ANSI A108.10 - Installation of Grout in Tilework.
- K. ANSI A118.3 - Chemical-Resistant, Water-Cleanable, Tile-Setting and -Grouting Epoxy and Water-Cleanable Tile-Setting Epoxy Adhesive.
- L. ANSI A108.1A- Ceramic Tile installed in a wet set method with Portland Cement Mortar.
- M. ANSI A118.6 - Standard Cement Grouts for Tile Installation.
- N. ANSI A118.7 - Polymer Modified Cement Grouts for Tile Installation.
- O. ANSI A108.9 - Ceramic Tile Installed with Modified Epoxy Emulsion Mortar/Grout.
- P. ANSI A118.8 - Modified Epoxy Emulsion Mortar/Grout.
- Q. ANSI A108.4 - Ceramic Tile Installed with Organic Adhesives or Water-Cleanable Tile-Setting Epoxy Adhesive.
- R. ANSI A136.1 - Organic Adhesives for Installation of Ceramic Tile.
- S. ADA - Americans with Disability Act.
- T. ANSI A137.1 - Ceramic Tile.
- U. ASTM C 144 - Aggregate for Masonry Mortar.
- V. ASTM C 150 - Portland Cement.
- W. ASTM C 207 - Hydrated Lime for Masonry Purposes.
- X. ASTM C 1028 - Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method.
- Y. ASTM E-989 for IIC (Impact Insulation Class) - Sound Deadening Underlayments.
- Z. Tile Council of America (TCA) - Handbook for Ceramic Tile Installation by Tile Council of America.

#### 1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. [ [ [Product Data](#) ] ]: Manufacturer's data sheets on each product to be used,

including:

1. Preparation instructions and recommendations.
  2. Storage and handling requirements and recommendations.
  3. Installation methods.
- C. Certifications:
1. Submit "Master Grade Certificate" for each type of ceramic, quarry, and paver tile in accordance with requirements of ANSI A137.1.
  2. Submit manufacturer's certifications that mortars, adhesives, and grouts are suitable for intended use.
- D. Shop Drawings:
1. Indicate tile layout, patterns, color arrangement, perimeter conditions, and junctions with dissimilar materials, thresholds, and setting details.
  2. Locate and detail expansion and control joints.
- E. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
1. Grout: Submit samples mounted in 6 inch (150 mm) long metal channels for each type and color specified.
- F. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
1. Grout: Submit samples mounted in 6 inch (150 mm) long metal channels for each type and color specified.
- G. Submit following Qualification Submittals: Manufacturer's and installer's qualification data.
- H. Closeout Submittals:
1. Submit under provisions of Section 01700.
  2. Maintenance Data: Include stain removal methods.

## 1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
1. Setting Materials: Minimum 10 years experience in manufacture of setting and grout materials specified.
  2. Obtain setting and grouting materials from one manufacturer to ensure compatibility.
  3. Obtain elastomeric membrane from same manufacturer as setting material or from manufacturer approved by setting material manufacturer to ensure compatibility.
- B. Installer Qualifications: Specializing in tile work having minimum of 5 years successful documented experience with work comparable to that required for this Project.
- C. Product Requirements:
1. Conform to ANSI- Recommended Standard Specifications for Ceramic Tile - A137.1.
  2. Conform to TCA The Installation Handbook recommendations.
- D. Regulatory Requirements: Conform to ADA friction coefficients for floor, and height and profile of thresholds; testing per ASTM C 1028.

- E. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
  - 1. Finish areas designated by Architect.
  - 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
  - 3. Refinish mock-up area as required to produce acceptable work.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's unopened containers, identified with name, brand, type, and grade.
- B. Protect materials from contamination, dampness, freezing, or overheating in accordance with manufacturer's instructions.
- C. Protect mortar and grout materials against moisture, soiling, or staining.
- D. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

#### 1.7 PROJECT CONDITIONS

- A. Comply with requirements of referenced standards and recommendations of material manufacturers for environmental conditions before, during, and after installation.
- B. Do not begin installation until building is completely enclosed and HVAC system is operating and maintaining temperature and humidity conditions consistent with "after occupancy" conditions for a minimum of 2 weeks.
- C. Maintain continuous and uniform building temperatures of not less than 50 degrees F (10 degrees C) during installation.
- D. Ventilate spaces receiving tile in accordance with material manufacturers' instructions.

#### 1.8 EXTRA MATERIALS

- A. At completion of project, deliver to Owner extra stock of materials used on project as follows:
  - 1. One unopened carton of each color of floor tile.
  - 2. One unopened carton of each color of wall tile.
  - 3. Six lineal feet of each color and type of base.
- B. Store in location as directed by Owner.
- C. Ensure materials are boxed and identified by manufacturer, type, and color.

### PART 2 PRODUCTS

#### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Bostik Inc.; 211 Boston St., Middleton, MA 01949-2128. ASD. Toll Free: (888) 592-8558. Tel: (978)777-0100 . Fax: (978) 750-7212. Email: christine.krisko@bostik-us.com. Web: <http://www.bostik-us.com>.

- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

## 2.2 TILE

- A. Comply with ANSI A137.1 for types, compositions, and grades of tile indicated. Furnish tile complying with "Standard Grade" requirements unless otherwise indicated.
- B. Colors, Textures, and Patterns: Where manufacturer's standard products are indicated for tile requiring selection of colors, surface textures, patterns, and other appearance characteristics, provide specific products or materials complying with the following requirements:
  - 1. Match Architect's samples.
  - 2. Provide tile trim and accessories that match color and finish of adjoining flat tile unless noted otherwise.

## 2.3 UNDERLAYMENT

- A. Self-Leveling Cement Underlayment, Durabond 83P.
  - 1. Thickness: Feather edge to 1 inch (25 mm).
  - 2. Thickness: 3/4 inch (19 mm) to 5 inches (127 mm) when mixed with 1/8 inch (3 mm) to 1/2 inch (12 mm) pea gravel.
  - 3. Bag Size: 50 pounds (22.7 kg), approximately 0.5 cu.ft.
  - 4. Compressive Strength: 5500 psi at 28 days.
  - 5. Heal/Wet Edge Time: 20 minutes.
  - 6. Final Set: 2 hours.
- B. Primer: Bostik Universal Primer.

## 2.4 WATERPROOFING AND CRACK ISOLATION MEMBRANE

- A. Liquid latex waterproof and CIM complying with Durabond D-222 DuraGuard and ANSI A118.10 and A118.12.

## 2.5 MORTARS

- A. Latex-Modified, Thin-Set Mortar:
  - 1. High performance, trowel applied, latex-modified, thin-set mortar exceeding requirements of ANSI A118.4 and ANSI A118.11; Durabond D70 ProFlex as manufactured by Bostik Inc.
  - 2. Characteristics:
    - a. Substrate deflection capabilities:
      - 1) Natural stone tile: L/720 maximum.
      - 2) Other tile: L/240 maximum.
  - 3. Physical properties:
    - a. Open time at 70 degrees F (21 degrees C): 70 minutes minimum.
    - b. Adjustability time: 40 minutes.
    - c. Pot life at 70 degrees F (21 degrees C): 1 to 2 hours.
    - d. Initial set at 70 degrees F (21 degrees C): 2 to 4 hours.
    - e. Final set at 70 degrees F (21 degrees C): 10 to 15 hours.
- B. Non-Sag, Latex-Modified, Thin-Set Mortar:

1. High performance, trowel applied, latex-modified, thin-set mortar exceeding requirements of ANSI A118.4 and ANSI A118.11; Durabond D65 High Performance and Non-Sag Mortar as manufactured by Bostik Inc.
  2. Characteristics:
    - a. Substrate deflection capabilities:
      - 1) Natural stone tile: L/720 maximum.
      - 2) Other tile: L/240 maximum.
  3. Physical properties:
    - a. Open time at 70 degrees F (21 degrees C): 70 minutes minimum.
    - b. Adjustability time: 40 minutes.
    - c. Pot life at 70 degrees F (21 degrees C): 1 to 2 hours.
    - d. Initial set at 70 degrees F (21 degrees C): 2 to 4 hours.
    - e. Final set at 70 degrees F (21 degrees C): 10 to 15 hours.
- C. Fast Setting, Latex-Modified, Thin-Set Mortar:
1. Trowel applied, fast setting latex-modified, thin-set mortar formulated with flexible non-re-emulsifying polymers and exceeding requirements of ANSI A118.4 and ANSI A118.11; Durabond D-55 Fast Set as manufactured by Bostik Inc.
  2. Characteristics:
    - a. Fast setting and obtains high early strength allowing grouting within 2 to 4 hours of tile setting.
  3. Substrate deflection capabilities:
    - a. Mixed with water: L/360 deflection.
    - b. Mixed with acrylic latex admixture: L/240 deflection.
  4. Physical properties:
    - a. Open time at 70 degrees F (21 degrees C): 20 minutes.
    - b. Adjustability time at 70 degrees F (21 degrees C): 20 minutes.
    - c. Pot life at 70 degrees F (21 degrees C): 30 minutes.
    - d. Initial set at 70 degrees F (21 degrees C): 60 minutes.
    - e. Final set at 70 degrees F (21 degrees C): 90 minutes.
- D. Premium Performance, Latex-Modified, Thin-Set Mortar:
1. Premium performance, multi-purpose, trowel applied, latex-modified, thin-set mortar exceeding requirements of ANSI A118.4 and ANSI A118.11; Durabond D-50 Flexible ThinSet as manufactured by Bostik Inc.
  2. Characteristics:
    - a. Suitable for a variety of tiles with different absorption rates.
    - b. Substrate deflection capabilities:
      - 1) Natural stone tile: L/720 maximum.
      - 2) Other tile: L/360 maximum.
  3. Physical properties:
    - a. Open time at 70 degrees F (21 degrees C): 70 minutes minimum.
    - b. Adjustability time at 70 degrees (21 degrees C): 30 minutes.
    - c. Initial set at 70 degrees F (21 degrees C): 9 hours.
    - d. Final set at 70 degrees F (21 degrees C): 12 hours.
- E. Latex-Modified Medium Bed Mortar:
1. Single component, trowel applied, latex-modified, medium bed mortar for setting large sized tile which exceeds requirements of ANSI A118.4 and ANSI A118.11; Durabond D-60 Medium Set as manufactured by Bostik Inc.
  2. Characteristics:
    - a. Suitable as 1/8 to 3/4 inch (3 to 19 mm) leveling bed to compensate for uneven tile and stone thickness, to fill irregular and uneven substrates, and to minimize tile lippage.
    - b. Freeze/thaw stable.

- c. Substrate deflection capabilities:
        - 1) Natural stone tile: L/720 maximum.
        - 2) Other tile: L/360 maximum.
    - 3. Physical properties:
      - a. Open time at 70 degrees F (21 degrees C): 70 minutes minimum.
      - b. Adjustability time at 70 degrees F (21 degrees C): 40 minutes.
      - c. Pot life at 70 degrees F (21 degrees C): 1 to 2 hours.
      - d. Initial set at 70 degrees F (21 degrees C): 8 to 10 hours.
      - e. Final set at 70 degrees F (21 degrees C): 10 to 15 hours.
- F. Polymer-Modified, Thin-Set Mortar:
- 1. Polymer-applied, trowel applied, thin-set mortar exceeding requirements of ANSI A118.4 and ANSI A118.11; Durabond D-40 DuraFlex as manufactured by Bostik Inc.
  - 2. Characteristics:
    - a. Suitable for interior and exterior installation of all types of wall and floor tile.
    - b. Substrate deflection capabilities:
      - 1) Natural stone tile: L/720 maximum.
      - 2) Other tile: L/360 maximum.
  - 3. Physical properties:
    - a. Pot life at 70 degrees F (21 degrees C): 1 to 2 hours.
    - b. Final set at 70 degrees F (21 degrees C): 12 hours.
    - c. Compressive strength at 28 days: 3,000 PSI.
- G. Premium Performance, Portland Cement, Thin-Set Mortar:
- 1. Premium performance, pre-blended, trowel applied, Portland cement thin-set mortar exceeding requirements of ANSI A118.1; Durabond D-5 Premium ThinSet Mortar as manufactured by Bostik Inc.
  - 2. Characteristics: Provides superior workability and troweling characteristics.
  - 3. Substrate deflection capabilities:
    - a. Natural stone tile: L/720.
    - b. Other tile: L/360.
  - 4. Acrylic latex admixture: High solids, acrylic latex emulsion; Durabond D-L16 Acrylic Latex Admixture as manufactured by Bostik, Inc.
  - 5. Flexible acrylic mortar admixture: Flexible, high solids, acrylic mortar admixture; Durabond D-L36 Admixture as manufactured by Bostik Inc.
- H. Portland Cement, Thin-Set Mortar:
- 1. Pre-blended, trowel applied, Portland cement thin-set mortar exceeding requirements of ANSI A118.1; Durabond D-2 as manufactured by Bostik Inc.
  - 2. Substrate deflection capabilities:
    - a. Natural stone tile: L/720.
    - b. Other tile: L/360.
  - 3. Acrylic latex admixture: High solids, acrylic latex emulsion; Durabond D-L16 Acrylic Latex Admixture as manufactured by Bostik Inc.
  - 4. Flexible acrylic mortar admixture: Flexible, high solids, acrylic mortar admixture; Durabond D-L36 Admixture as manufactured by Bostik Inc.

## 2.6 GROUT

- A. Unsanded Portland Cement Ceramic Tile Grout:
- 1. Unsanded grout formulated from ground quartz, Portland cement, color pigments, and other ingredients and exceeding requirements of ANSI A118.7; Durabond Fortified Tile Grout as manufactured by Bostik Inc.
  - 2. Physical properties:

- a. Pot life at 70 degrees F (21 degrees C): 60 minutes.
  - b. Initial set at 70 degrees F (21 degrees C): 100 minutes.
  - c. Final set at 70 degrees F (21 degrees C): 180 minutes.
  - d. 28 days compressive strength: 3,000 PSI minimum.
  - e. Dry shear strength: 550 PSI minimum.
  - f. Color:
    - 1) No. [\_\_\_\_\_] - [\_\_\_\_\_] color as manufactured by Bostik Inc.
    - 2) Selected by Architect from Manufacturer's full range as provided by.
3. Acrylic latex admixture: High solids, acrylic latex emulsion; Durabond D-L16 Acrylic Latex Admixture as manufactured by Bostik Inc.
- B. Sanded Portland Cement Ceramic Tile Grout:
- 1. Sanded grout formulated from graded quartz aggregates, Portland cement, color pigments, and other ingredients and exceeding requirements of ANSI A118.7-1999, H-4; Durabond Fortified Tile Grout(sanded) as manufactured by Bostik Inc.
  - 2. Physical properties:
    - a. Pot life at 70 degrees F (21 degrees C): 60 minutes.
    - b. Initial set at 70 degrees F (21 degrees C): 1 to 3 hours.
    - c. Final set at 70 degrees F (21 degrees C): 3 to 8 hours.
    - d. 28 days compressive strength: 5,000 PSI minimum.
    - e. Color:
      - 1) No. [\_\_\_\_H\_] [\_\_\_\_\_] color as manufactured by Bostik Inc.
      - 2) Selected by Architect from Manufacturer's full range as provided by Bostik Inc.
  - 3. Acrylic latex admixture: High solids, acrylic latex emulsion; Durabond D-L16 Acrylic Latex Admixture as manufactured by Bostik Inc.
  - 4. Epoxy admixture: Two-component, epoxy modified admixture to form setting and grouting system exceeding requirements of ANSI A118.8; Durabond D-190 as manufactured by Bostik Inc.

## 2.7 ADMIXTURES

- A. Acrylic Latex Admixture:
- 1. Multi-purpose, acrylic latex that shall be used to prepare bond coats and mortar beds and can be added to thin-set mortars and cement grouts to improve performance characteristics; Durabond D-L16 Acrylic Latex Admixture as manufactured by Bostik Inc.
  - 2. When admixture is added to Durabond D-5 thin-set Portland cement mortar, enhanced properties shall be not less than:
    - a. Open time at 70 degrees F (21 degrees C): 90 minutes minimum.
    - b. Adjustability time: 30 minutes.
    - c. 7 days shear strength:
      - 1) Ceramic mosaic tile: 400 psi (281gmf/sqmm).
      - 2) Glazed wall tile: 400 psi (281gmf/sqmm).
      - 3) Quarry tile to wood: Exceeds 350 psi (246 gmf/sqmm) wood failure.
    - d. Portland cement thin-set mortars enhanced with admixture shall exceed requirements of ANSI A118.4 and ANSI A118.11.
    - e. Substrate deflection capabilities:
      - 1) Natural stone tile: L/720 maximum.
      - 2) Other tile: L/360 maximum.
  - 3. When admixture is added to Durabond Fortified Tile Grout Sanded enhanced properties shall be not less than:
    - a. 7 days compressive strength: 4,000 psi (2812 gmf/sqmm).

- b. Initial set at 70 degrees F (21 degrees C): 60 minutes.
  - c. Water absorption at 50 percent humidity: 3 percent.
  - d. Water absorption from immersion: 4 percent.
  - e. Portland cement ceramic tile grouts enhanced with admixture shall exceed requirements of ANSI A118.6-1992 and ANSI A118.7.
- B. Flexible Acrylic Mortar Admixture:
- 1. Flexible, high solids, acrylic mortar admixture that can be added to thin-set mortars to improve performance characteristic; Durabond D-L36 Admixture as manufactured by Bostik Inc.
  - 2. When admixture is added to Durabond D-5 thin-set Portland cement mortars, enhanced properties shall be not less than:
    - a. Thin-set Portland cement mortar with admixture shall exceed requirements of ANSI A118.4 and ANSI A118.11.
    - b. Open time at 70 degrees F (21 degrees C): 40 to 60 minutes minimum.
    - c. Adjustability time at 70 degrees F (21 degrees C): 50 to 90 minutes.
    - d. Final set at 70 degrees F (21 degrees C): 18 hours.
    - e. Tensile strength: 546 psi (384 gmf/sqmm).
    - f. Flexural strength: 1,175 psi (826 gmf/sqmm).
    - g. 7 days shear strength:
      - 1) Porcelain tile: 600 psi (422 gmf/sqmm).
      - 2) Glazed wall tile: 658 psi (463 gmf/sqmm).
      - 3) Quarry tile: 450 psi (316 gmf/sqmm).
    - h. Substrate deflection capabilities:
      - 1) Natural stone tile: L/720 maximum.
      - 2) Other tile: L/240 maximum.
- C. Epoxy Admixture For Setting And Grouting:
- 1. Two-component, epoxy modified admixture to be combined with sanded Portland cement grout to form setting and grouting system exceeding requirements of ANSI A118.8; Durabond D-190 as manufactured by Bostik Inc.
    - a. Components: Resin, hardener, and sanded Portland cement grout.
    - b. Open time at 70 degrees F (21 degrees C): 60 minutes.
  - 2. Sanded, Portland cement grout with epoxy admixture shall have the following properties:
    - a. Open time at 70 degrees F (21 degrees C): 60 minutes.
    - b. Adjustability at 70 degrees F (21 degrees C): 90 minutes.
    - c. Pot life at 70 degrees F (21 degrees C): 120 minutes.
    - d. Initial set at 70 degrees F (21 degrees C): 5 - 1/2 hours.
    - e. Final set at 70 degrees F (21 degrees C): 9 hours.
    - f. 7 days compressive strength: 3,950 psi (2777 gmf/sqmm).
    - g. 28 days compressive strength: 6,000 psi (4218 gmf/sqmm).
    - h. 7 days tensile strength: 492 psi (346 gmf/sqmm).
    - i. 7 days shear bond strength:
      - 1) Ceramic mosaic tile: 378 psi (266 gmf/sqmm).
      - 2) Glazed wall tile: 439 psi (309 gmf/sqmm).
      - 3) Quarry tile: 372 psi (262 gmf/sqmm).
      - 4) Glazed tile to wood: 251 psi (176 gmf/sqmm).
      - 5) Quarry tile to wood: 263 psi (185 gmf/sqmm).
    - j. 28 days shear bond strength:
      - 1) Ceramic mosaic tile: 387 psi (272 gmf/sqmm).
      - 2) Glazed wall tile: 600 psi (422 gmf/sqmm).
      - 3) Quarry tile: 475 psi (334 gmf/sqmm).
      - 4) Glazed tile to wood: Exceeds failure of wood substrate.

- 5) Quarry tile to wood: Exceeds failure of wood substrate
- k. Compressive strength: 5,000 psi (3525 gmf/sqmm) minimum.
- l. Vertical joint sag: None up to 3/8 inch (10 mm) wide joints.
- m. Water absorption: 0 percent.
- n. Installation temperature range: 50 to 90 degrees F (10 degrees C to 32 degrees C).
- o. 7 days compressive strength: 4,000 psi (2812 gmf/sqmm).
- p. Initial set at 70 degrees F (21 degrees C): 60 minutes.
- q. Water absorption at 50 percent humidity: 3 percent.
- r. Water absorption from immersion: 4 percent.
- s. Latex modified and polymer grouts enhanced with admixture shall exceed requirements of ANSI A118.6, H4.

## 2.8 MASTICS

- A. D-2001 Ceramic Tile Mastic.
  - 1. Trowel applied, organic adhesive exceeding requirements of ANSI A136.1, Types I and II; Durabond D-2001 Ceramic Tile Mastic as manufactured by Bostik Inc.
  - 2. Physical properties:
    - a. Base: Acrylic co-polymer latex.
    - b. Color: White.
    - c. Open time at 70 degrees F (21 degrees C): 30 to 70 minutes.
    - d. Adjustability time: 50 to 90 minutes.
    - e. Dry shear strength: 550 psi (387 gmf/sqmm) minimum.
    - f. Substrate deflection capabilities:
      - 1) Natural stone tile: L/720 maximum.
      - 2) Other tile: L/360 maximum.
- B. D-1001 Ceramic Tile Mastic.
  - 1. Trowel applied, organic adhesive exceeding requirements of ANSI A136.1, Types I and II; Durabond D-1001 Ceramic Tile Mastic as manufactured by Bostik Inc.
  - 2. Physical properties:
    - a. Base: Acrylic co-polymer latex.
    - b. Color: Light cream.
    - c. Open time at 70 degrees F (21 degrees C): 40 to 70 minutes.
    - d. Adjustability time: 50 to 90 minutes.
    - e. Dry shear strength: 550 psi (387 gmf/sqmm) minimum.
    - f. Substrate deflection capabilities: L/360 maximum for tile.
- C. D-501 Tile Mastic.
  - 1. Trowel applied, organic adhesive exceeding requirements of ANSI A136.1, Types I and II; Durabond D-501 Grade Ceramic Tile Mastic as manufactured by Bostik Inc.
  - 2. Physical properties:
    - a. Base: Acrylic co-polymer latex.
    - b. Color: White.
    - c. Open time at 70 degrees F (21 degrees C): 30 to 40 minutes.
    - d. Adjustability time: 50 to 90 minutes.
    - e. Dry shear strength: 250 psi (175 gmf/sqmm) minimum..
    - f. Substrate deflection capabilities: L/360 maximum for tile.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Verify that areas to receive tile installed by thin bed method have wood float finish, are true within 1/4 inch in 10 feet (6 mm in 3048 mm) and are pitched to drains where required.
- D. Condition of Surfaces: Firm, dry, clean and free of oily or waxy films, mortar and soil. Grounds, anchors, plugs, hangers, electrical and mechanical work in or behind tile installed.
- E. Air Temperature and Surfaces in Rooms to Receive Flooring: Between 60 degrees to 90 degrees F (16 degrees C to 32 degrees C) unless otherwise recommended by manufacturers of materials being installed.

### 3.2 PREPARATION

- A. Prepare substrate and apply waterproofing and crack isolation membrane in accordance with manufacturer's instructions and ANSI A108.13.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### 3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Underlayment:
  1. Apply where required to reduce subfloor variation to an acceptable tolerance of 1/4 inch (6 mm) in 10 feet (3.05 m). Reinforce single layer plywood subfloor if applicable in conjunction with stapled lath.
  2. Prime substrate with Bostik Universal Primer in accordance with manufacturer's instructions.
  3. Apply Durabond 83P Underlayment with 5.5 quarts water per 50 pounds and in accordance with manufacturer's instructions.
- C. Waterproofing and Crack Isolation Membrane: Trowel Applied.
  1. Prepare substrate and apply waterproofing and crack isolation membrane in accordance with manufacturer's instructions and ANSI A108.13.
    - a. Concrete: Verify surface has light broom or similar texture.
    - b. Plywood: Installed in accordance with tile industry standards.
  2. Apply when temperature of surfaces to receive waterproofing and crack isolation membrane is 50 degrees F (10 degrees C) minimum.
  3. Spread waterproofing and crack isolation underlayment compound with V notched trowel. Immediately smooth with flat surface of trowel.
    - a. Minimum thickness: 30 mils.
    - b. Maximum thickness: 60 mils.
  4. Coves, corners, drains, and pipe penetrations:
    - a. Embed 2 inches (51 mm) wide fiberglass mesh tape in fresh underlayment. Apply 6 inches (152 mm) minimum wide layer of underlayment to both sides of coves, corners, and penetrations.
  5. Allow to cure 6 to 12 hours.
  6. Cracks greater than 1/8 inch (3 mm) width:

- a. Install backer rod or bond breaker tape in opening.
  - b. Fill crack with waterproofing and crack isolation material or urethane sealant.
  - c. Apply layer of underlayment 12 inches (305 mm) wide or width of tile whichever is greater on both side of crack.
  - d. Embed 2 inches (51 mm) wide fiberglass mesh tape in fresh underlayment.
- D. Waterproofing and Crack Isolation Membrane: Liquid Applied.
- 1. Treatment of cracks, coves, corners, drains, and pipe penetrations:
    - a. Provide 4 inches (102 mm) wide coating to each side of area being treated with heavy-nap roller.
    - b. Fold in 6 inches (152 mm) wide reinforcing fabric and firmly embed in liquid.
    - c. Apply second coat to achieve 20 mils total thickness. Let dry approximately 2 hours.
  - 2. Membrane application:
    - a. After pre-treated areas are dry to touch, apply coat of liquid with heavy-nap roller.
    - b. Immediately embed reinforcing fabric. Apply second coat of liquid to achieve 20 mils total thickness.
    - c. Apply final top coat to entire area being treated.
  - 3. Curing: Keep all traffic off installation for 2 hours or until membrane is dry to touch.
- E. Mortar: Latex Modified Thin Set:
- 1. Mixing: Mix potable water to mortar in ratio required by manufacturer with slow speed mixer at 150 RPM maximum. Allow mixture to stand 15 minutes and re-mix. Do not re-temper by adding more liquid.
  - 2. Application:
    - a. Apply mortar to area no greater than can be tiled in within set-up time of product.
    - b. Apply thin coat of mortar with flat edge of trowel to achieve mechanical bond to substrate. Comb additional mortar with notched trowel of size recommended by manufacturer.
    - c. Apply tile with twisting motion to ensure maximum contact.
  - 3. Field quality control: Periodically check back of tile for proper transfer and thickness:
    - a. Interior applications: 80 percent minimum coverage.
    - b. Exterior, wet, and plywood applications: 95 percent minimum coverage.
    - c. Finished mortar bed thickness: 3/32 to 1/8 inch (2 to 3 mm).
    - d. Finished mortar bed thickness: 1/8 to 3/4 inch (3 to 19 mm).
  - 4. Curing: Keep all traffic off installation until tile is firmly set.
- F. Mastic Setting Application:
- 1. Apply mastic only when temperature is 40 degrees F (8 degrees C) minimum.
  - 2. Apply mastic to area no greater than can be tiled in 45 minutes.
  - 3. Apply thin coat of mastic with flat edge of trowel to achieve mechanical bond to substrate. Comb additional mastic with notched trowel of size recommended by manufacturer.
  - 4. Apply tile with twisting motion to ensure maximum contact.
  - 5. Beat tile into mastic with rubber face beating block to ensure maximum contact and bond.
  - 6. Field quality control:
    - a. Periodically check back of tile to ensure 95 percent minimum coverage.
    - b. Finished adhesive bed thickness: 1/32 inch (1 mm) after beat-in.

7. Curing: Keep all traffic off installation for 12 hours.
  8. Grouting: Perform grouting 24 hours minimum after setting tile.
- G. Latex Grouting:
1. Mix and apply grout in accordance with manufacturer's recommendations and installation instructions and ANSI A108.10.
  2. Do not apply grout when temperature is below 50 degrees F (10 degrees C) or above 100 degrees F (38 degrees C).
  3. Mixing: Mix with slow speed mixer at 150 RPM maximum. Allow mixture to stand 15 minutes and remix. Ensure uniform color. Do not re-temper by adding more liquid.
  4. Preparation: Remove tile spacers. Lightly dampen tile.
  5. Application: Spread grout over tile with rubber float. Work back and forth with 45 degrees angle to tile face. Completely fill joints. Remove excess grout with rubber float.
  6. Cleaning: In approximately 30 minutes when grout is firm, clean grout residue for tile face. Use damp cloth or sponge and rinse often. Use dry cloth for final buffing to remove and remaining grout film.
  7. Curing: For grout mixed with water, damp cure for 3 days by wiping joints with damp cloth or sponge several times a day or by covering joints with non-staining kraft paper.
  8. Curing: For grout mixed with acrylic latex admixture, allow grout to air cure. Protect tile installation and limit traffic until grout is completely cured.
- H. Epoxy Mortar and Grouting:
1. Mixing: Mix with slow speed mixer at 150 RPM maximum. Do not mix at high speed or entrain air into mixture.
    - a. Thoroughly mix resin component for 5 minutes minimum.
    - b. Add hardener component and mix for 5 minutes minimum removing all lumps.
  2. Adhesive application:
    - a. Apply epoxy adhesive to area no greater than can be tiled in 60 minutes.
    - b. Apply thin coat of epoxy adhesive with flat edge of trowel to achieve mechanical bond to substrate. Comb adhesive with notched trowel of size recommended by manufacturer.
    - c. Press or twist unit into combed epoxy adhesive.
    - d. Beat unit into epoxy adhesive with rubber faced beating block to ensure maximum contact and bond.
    - e. Field quality control: Periodically check back of unit for proper transfer and thickness:
      - 1) Interior applications: 95 percent minimum coverage.
      - 2) Finished mortar bed thickness: 3/32 to 1/8 inch (2 to 3 mm).
    - f. Curing: Keep all traffic off installation for 24 hours minimum. Limit heavy traffic for 7 days.
  3. Grout application:
    - a. Preparation:
      - 1) Ensure unit is firmly bonded, clean, and free of dust and other contaminants.
      - 2) Apply grout release agent or sealer to unit surfaces to facilitate removal of grout haze.
      - 3) Lightly dampen surfaces.
      - 4) Spread epoxy grout over unit with epoxy grout float. Work back and forth with 45 degrees angle to tile face. Completely fill joints. Remove excess grout with rubber float.
    - b. Cleaning:

- 1) Immediately perform initial cleaning. Lightly scour surface with a wet nylon scrub pad using circular motion. Clean grout residue from surface with damp cloth or sponge and rinse often.
- 2) After epoxy grout has hardened in 8 to 16 hours, remove epoxy haze with cleaner as recommended by grout manufacturer. Wash off remaining residue with clean water. Complete final cleaning within 24 hours of installation..

#### 3.4 PROTECTION

- A. Touch-up, repair or replace damaged products before Substantial Completion.
- B. Protect installed products until completion of project.

END OF SECTION