

SECTION 09 30 00

CERAMIC TILE

PART 1 - GENERAL

1.1 DESCRIPTION

- A. General: Perform tile work accordance with the requirements of the Contract Documents.
- B. Scope of Work includes but is not limited to:
 - 1. Ceramic tile.
 - 2. Setting materials and accessories.
 - 3. Grouting materials.
- C. Related Work specified in other Sections:
 - 1. Section 07 92 00 - Joint Sealants.
 - 2. Section 09 29 00 - Gypsum Board.
 - 3. Section 09 65 19 - Resilient Tile flooring and base.
 - 4. Section 10 28 00 - Toilet and bath accessories.
 - 5. Division 22 - Plumbing and floor drains.

1.2 QUALITY ASSURANCE

- A. Codes: Comply with the New York City Building Code and standards listed.
- B. Standards:
 - Tile Council of America (TCA): 2004 handbook for ceramic tile installation.
 - American National Standards Institute 1999 Specifications for the Installation of Ceramic Tile (as specified).
 - ANSI A108.5-1999 - Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar.
 - ANSI A108.10-1999 - Installation of Grout in Tilework.
 - ANSI A118.4-1999 - Specification for Latex Portland Cement Mortar.

- ANSI A118.6-1999 - Specification for Ceramic Tile Grouts.
- ANSI A137.1-1999 - American National Standard Specifications for Ceramic Tile.
- American Society of Testing and Materials (ASTM):
 - ASTM C-503-97 - Standard Specification for Marble Building Stone (Exterior) (for marble saddles).
 - ASTM C-836-95 - Specification for High Solids Content Cold Liquid Applied Elastomeric Waterproofing Membrane for use with separate wearing course.
 - ASTM C-1028-96 - Standard Specification for The Slip Resistance of Flooring Products (060 or better for floor tile).
 - ASTM D-2047-93 - Standard Test Method for Static Coefficient of Friction of Polished-Coated Floor Surfaces as Measured by the James Machine.

1.3 SUBMITTALS

- A. Manufacturer's Literature: Submit manufacturer's standard printed literature and tests indicating product information correlated to specific job requirements. Include slip-resistance test data for installed floor products.
- B. Samples: Submit samples of each kind and size of tile and grout, together with colors of each material and accessory for selection. Submit 12" square sample of selected tile color and grout assembly for final review.
- C. Certificate of Compliance (prior to approval of tile): Furnish a master grade certificate signed by both Tile Manufacturer and Tile Installer stating the quality grade of tile furnished.
- D. Master Grade Certificate (after delivery of tile): Furnish a master grade certificate after delivery of tile.
- E. Maintenance Guide: Submit tile manufacturer's maintenance guide for DSSM's use in maintaining ceramic tile work specified at completion of the work.

1.4 PRODUCT HANDLING

- A. Delivery: Deliver materials in manufacturer's unopened containers.
- B. Storage: Store tile and cementitious materials in clean, dry location.
- C. Temperature: Maintain 50° F minimum temperature during tile work and 7 days after completion. Provide adequate ventilation.
- D. Extra Stock: Provide 5 square feet of each type of tile used at completion of the job.

1.5 WARRANTY

Provide manufacturer five (5) year systems product warranty non-prorated to include replacement of defective materials including labor and materials. To the greatest extent practical materials shall be supplied by a single source.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

- A. See Finish Schedule. Other manufacturers/products that meet the performance requirements of the finishes specified will be considered, pending Architect's approval.

2.2 PRODUCTS, GENERAL:

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1, "Specifications for Ceramic Tile," for types, compositions, and other characteristics indicated.
 - 1. Provide tile complying with Standard Grade requirements, unless otherwise indicated.
 - 2. For facial dimensions of tile, comply with requirements relating to tile sizes specified in Part 1 "Definitions" Article.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI standards referenced in "Setting Materials" and "Grouting Materials" articles.
- C. Colors, Textures, and Patterns: Where manufacturer's standard products are indicated for tile, grout, and other products requiring selection of colors, surface textures, patterns, and other appearance characteristics, provide specific products or materials complying with the Finish plan and schedule:
- D. Factory Blending: For tile exhibiting color variations within the ranges selected during Sample submittals, blend tile in the factory and package so tile units taken from one package show the same range in colors as those taken from other packages and match approved Samples.

2.3 SETTING MATERIALS & ACCESSORIES

- A. Adhesives: (for bonding tiles, thin-set, to floors and walls, etc.)
 - 1. Manufacturer shall be equal to:
 - a. Laticrete International
 - 1) Latex Floors and Wall Tile Cement Mortar (at toilets):
#4237 plus #211 white filler powder
- OR -
#317 or Drybond with Laticrete 3701 latex admixture.

- 2) Organic Adhesive: Laticrete #15 Multipurpose mastic.
 - a) Bostik, Inc. - Hydroment with latex admixtures, equal to above.
 - b) Maiepi - Kerabond/Keralastic.
 - c) The Upco Co.
 - d) Boiardi - #753 Elastiment.
 - e) U.S. Gypsum - Durock brand Ceramic Tile Adhesive.
 - f) North American - 2040.
 - g) Henry - 314 Type 1 multi-purpose floor and wall tile adhesive and 414 Type 1 (acrylic).
 - h) American Olean - AO 1900, with latex admixtures, equal to above.
 - i) Custom - Acryl 3000 Type II.
 - j) Miracle Adhesives Corp. - MA 5005 (epoxidized acrylic) for floors and walls and MA 200 at dry area walls only.

2. Materials:

- a. Bonding of thin set floor tile in toilet areas shall be thinset using white latex Portland cement mortar bonded as per ANSI A.118.4 1999 (TCA Handbook F 102-04 over slab on grade and TCA F 113-04 over supported slabs) and ANSI A-108.5.
 - b. Wall tile at shower and wet rooms: White latex Portland cement mortar as per ANSI A.118.4 1999 (TCA Handbook W 244-04).
 - c. Wall tile at toilet areas (not subject to frequent wetting). Organic Adhesive ANSI A.136.1 1999 Type I (TCA Handbook W 242-04).
3. Assembly: Do not use butadiene styrene latex mortar adhesive over polyurethane based waterproof membrane. Use only latex based adhesives over polyurethane membranes.

B. Liquid Thinset Waterproofing System: (installed under tile in showers and other wet areas where a recessed membrane is not used as per above grade in lieu of item C).

1. Manufacturer: Manufacturer shall be equal to:
 - a. Laticrete Waterproof Membranes - #9235 (liquid) or 301/335 (troweled). Set tile in Laticrete thinset mortar with 4237 additive over waterproof membrane.
 - b. Boiardi - Elastiment 645.
 - c. Maiepi - PRP315 polymer modified cementitious waterproof membrane.
 - d. Bostik Construction Products (Div. Emhart) - Hydroment Ultra Set. Integral waterproofing membrane, Hydroment 760 Standard thinset adhesive.
 - e. Noble Seal (American Olean)
2. Materials: It is intended that one manufacturer's products or compatible manufacturer's products be used for the tile installation including waterproofing, tile setting and grouting as per warranty requirements (Item 1.5).
 - a. Laticrete System 9235 Waterproof System or Boiardi Mer Crete BFP (300):

- 1) Reinforcing - 6 oz. nylon fabric or glass mat.
- 2) Waterproofing - High solids self-curing rubber paste flexible waterproof coating minimum 1/8" thick.
- b. L&M, & Boiardi 645 & Hydroment: One part polyurethane resin meeting ASTM C-836, 30 mils thick or as recommended to receive tile.
3. Assembly: Comply with TCA F-122-04.
- C. Cement Mortar Setting Bed: Thick bed mortar systems for use at shower slab depressions to create a slope to drain.
 1. Materials:
 - a. Provide a site or factory blended mortar powder equal to Laticrete #226 Factory Blended Mortar.
 - b. Dry or damp pack mortar shall be used primarily to level floor or provide a slope drain at 1/4" per foot. Mortar shall develop a compressive strength of 3,000 psi, have a maximum water absorption of 4% and maintain a minimum bond strength of 500 psi. Site mixed mortar mix shall consist of:
 - 1) One part (1) Portland Cement - ASTM C-150 Type I.
 - 2) Three parts clean sharp mason's silica sand - (washed of salts) (30-60 mesh) meeting ASTM C-144 (Measured in a loose damp condition). Allowable moisture content shall be 4 percent.
 - 3) Latex additive manufacturer shall be equal to:
 - a) Laticrete Liquid #3701 to bring the mortar to proper consistency for a dry or damp pack mortar placement and a #4237 Slurry Bond Coat as per manufacturer's directions.
 - b) Bostik, Inc. - Hydroment #425 multi-purpose admixture equal to above.
 - c) Fosroc - Titebond A and Bond Coat, equal to above.
 - d) Boiardi latex additive #150 and Bond Coat, equal to above.
 - 4) Wire mesh reinforcement as per TCA standards.
 2. Assembly: Comply with TCA F-121-04. Provide a thinset waterproofing membrane over a moisture cured mortar bed 1-1/4" to 2" thick. Provide a cleavage membrane of 15 lb. roofing felt over supported slabs.
 - D. Filling Compound: (for filling slight irregularities and depressions in structural slab for thin-set tile and create a slope to drain in limited areas)
 1. Manufacturer shall be equal to:
 - a. Sonneborn-Contech - "Sonocrete" or Epolith.
 - b. Euclid Chemical Co. - Epoly 456, 459, 464, 467 as recommended.
 - c. W. R. Grace Co. - Thiopoxy.
 - d. Boiardi - 102LC (liquid)/940-6 (filler) Underlayment.

- e. Crossfield Products Corp. - Dex-O-Tex G-26 or A-81 Underlayment.
 - f. Fosroc - Titebond A and underlayment.
 - g. Laticrete - Sand/cement and 3701 mixture.
 - h. Maipei - Ceramic patch.
2. Material: Filling compound, for use under thin-set tile, shall be as recommended by tile and adhesive manufacturer to fill depressions and imperfections in the concrete slab or walls as recommended by the manufacturer.

E. Sound Deadening Underlayment: (for use at toilets)

- 1. Manufacturer shall be equal to:
 - a. Enkasonic - Sound Control Matting.
 - b. Kinetics - Noise Control 11C-65 or 11C-59 as applicable.
- 2. Assembly:
 - a. 7/16" glass mesh cement board over sound mat.
 - b. Sound control mesh.
 - c. Finish floor assembly.

2.4 GROUTING MATERIALS

(for tile areas)

A. Unglazed Floor Tile Grout:

- 1. Manufacturer: Provide grout mixture equal to:
 - a. Laticrete International - 500 Series Drybond floor sanded, Drybond floor #1776 grout.
 - b. American Olean - AO sanded latex grout.
 - c. Maipei - Karacolor.
 - d. Bostik Construction Products (Upco Company) - Hydroment Grout.
 - e. Boiardi Products Inc. - A.R. (sanded) Grout.
 - f. U.S. Gypsum - Durabond AR-20 (sanded grout for floors).
- 2. Materials: Floor Grout: Commercially prepared sanded Portland cement type grout with latex admixture and color selected by Architect from standard color range. Meet the requirements of ANSI A-118.6 H-2.1.

B. Grouting Material for Wall Tile:

- 1. Manufacturer shall be equal to:
 - a. Laticrete - 600 Series grout sanded with #1776 grout (latex) admixture.
 - b. Boiardi Products Corp. - Supreme (unsanded).
 - c. American Olean - AO Dry Wall Grouts (unsanded).

- d. Bostik, Inc. - Hydroment Dry Tile Grout.
 - e. Maipai - Keracolor/Plasticpoints.
 - f. TEC - Unsanded wall group TA-610.
2. Materials:
- a. Unsanded grout shall be mixed with a latex grout admixture to meet ANSI A-118.6 H-3 strength specification for Dry Set Grouts.
 - b. Color shall be as selected.
- C. Grout Sealer: Seal cementitious grout with a clear siloxane sealer by flood coating 2 coats as per manufacturer's instructions.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Acceptability of Surfaces: No curing compounds or concrete sealers to be used in construction. Scarify surfaces coated with sealers or curing compounds.
- 1. Patch: Patch missing tiles to receive new tile over with a leveling coat.
 - 2. Paint Removal: Remove paint from surfaces to be tiled.
 - 3. Maximum Variations:
 - a. Before tiling, be sure variations of surfaces to be tiled fall within 1/4" in 10' maximum variations.
 - b. Leveling coat is included in this Section. Concrete work to receive tile or a tile leveling course should have a float finish or be suitably roughened by acid etching to receive tilework.
 - 4. Cleaning: Before tiling, be sure surfaces to be tiled are free from coatings, curing membranes, oil, grease, wax, acid etching materials or dust.
- B. Layout:
- 1. Movement Joints:
 - a. Determine locations of movement joints before starting tilework.
 - b. Expansion/Control Joint Requirements:
 - 1) Interior - 24' to 36' in each direction.
 - 2) Interior tilework exposed to direct sunlight or moisture 12' to 16' in each direction.
 - 3) Where tilework abuts restraining surfaces such as perimeter walls, dissimilar floors, curbs, columns, pipes, ceilings, and where changes occur in backing materials.

- 4) Expansion, control, construction, cold and seismic joints in the structure should continue through the tilework.
 - 5) Joints through tilework directly over structural joints must never be narrower than the structural joint.
- c. Expansion Joint Width (Vertical & Horizontal):
- 1) Interior for quarry tile and paver tile - same as grout joint, but not less than 1/4".
 - 2) Interior for ceramic mosaic tile and glazed wall tile preferred not less than 1/4", but never less than 1/8".

3.2 INSTALLATION

A. Workmanship:

1. Manufacturer's Instructions: Use products in strict accordance with recommendations and directions of manufacturers and TCA standards. If products of more than one manufacturer are used insure compatibility of materials. The coefficient of friction for installed tile shall exceed .60 as per ASTM C-1028.
2. Mixes: Proportion mixes in accordance with latest ANSI standard specifications.
3. Edge Cuts: Smooth exposed cut edges. Be sure cut edges are clean before installing tiles.
4. Fitting: Fit tile carefully against trim, accessories, around pipes, electric boxes and other built-in fixtures so that escutcheons, plates and collars will completely overlap cut edges.
 - a. Minimizing Cuts: Lay out tilework so as to minimize cuts less than one-half tile in size.
 - b. Location of Cuts: Locate cuts in both walls and floors so that they will be least conspicuous.
 - c. Alignment: Align wall and floor joints to give straight uniform grout lines, plumb and level on axis indicated. Align floor joints to give straight uniform grout lines, parallel with walls.
 - d. Joint Width: Make joints same width, so extent of each sheet is not apparent in finished work.

B. Setting Methods: The following are standards likely to be used with the project. Other standards are available for wood framing, light duty use and pools, as applicable.

1. Floor Tile: Installation assemblies shall comply with the following Tile Council of America (TCA) Commercial Construction Standards as applicable for project conditions:
 - a. Interior Exposure Installation:
 - 1) F101-04 Cement mortar bonded (thick set) on grade.

- 2) F102-04 Dry-set mortar or latex portland cement mortar (thin set) on grade.
- 3) F111-04 Cement mortar (thick set) with cleavage membrane on a supported slab subject to deflection or vibration.
- 4) F112-04 Cement mortar (thick set) bonded to a slab on grade (no deflection).
- b. Interior Exposure Installation:
 - 1) F113-04 Dry-set mortar latex-portland-cement mortar on grade.
 - 2) F121-04 Waterproof membrane and cement mortar (thickset) bed for supported slabs subject to deflection or vibration.
 - 3) F122-04 Waterproof interior slab thinset - slab deflection less than 1/360 and moderate use.
2. Wall Tile:
 - a. Exterior/Interior Exposure Installation:
 - 1) W201-04 Masonry cement mortar on irregular surface with wire lath (thickset).
 - 2) W202-04 Dry-set mortar or latex-portland-cement mortar (thinset).
 - b. Wall Tile Interior Installation:
 - 1) W211-04 Cement mortar bonded thickset at sound wet areas over masonry or concrete.
 - 2) W221-04 Cement mortar (thickset) with metal lath thickset over racked masonry or concrete at wet areas.
 - 3) W241-04 Cement mortar (thickset) over metal studs.
3. Thin Set Ceramic Tile on Dimensionally Stable Concrete Floor: Comply with ANSI A.118.4 1999 Latex Portland Cement Mortar. Floor deflection not to exceed 1/360. Follow TCA Assembly F 102-04 on slabs or grade and F 113-04 on framed slabs without waterproofing.
4. Glazed Wall Tile:
 - a. Wet Areas: (i.e. showers) Comply with ANSI A.118.4 1999 Latex Portland Cement Mortar. Follow TCA Assembly W244-04.
5. Waterproof Floor: (Install assemblies as per manufacturer's instructions)
 - a. Level floor surfaces to tolerances listed and as required to complete installation with minimum tile cuts.
 - b. Waterproofing shall be carried over penetrations such as pipes and sleeves and up wall as shown. Avoid pinholes.

- c. Set and grout tile over tested waterproofing assemblies without cutting runs of tiles at top of wall.
- d. Flood test after cure is complete where possible.
- e. Comply with TCA F 122-04 thinset and F 121-04 at depressed slabs.

C. Cleaning:

- 1. Grouting Completion: Clean tile surfaces thoroughly on completion of grouting.
- 2. Grout Haze Removal: Remove grout haze, observing tile manufacturer's recommendations as to use of acid and chemical cleaners equal to Pro So Co. Sure Klean grout and tile cleaner.
- 3. Rinsing: Rinse tilework thoroughly with clean water before and after using chemical cleaners.
- 4. Neutral Cleaner Solution: Apply to clean, completed tile floors a protective coat of neutral cleaner solution, one part cleaner to one part water.

3.3 PROTECTION

- A. Construction Paper: Cover tile floors with heavy-duty non-staining construction paper, masked in place equal to St. Regis Paper Co. "Seekure" or Fortifiber Corp. Seekure finished floor protection paper or Pro So Co. Inc. Protec Tile with 859 stripper.
- B. Paper Removal & Rinsing: Just before final acceptance of tilework, remove paper and rinse protective coat with neutral cleaner on tile surfaces.
- C. Protection from Traffic:
 - 1. Time: Prohibit foot and wheel traffic from using newly installed tile floors for at least 7 days.
 - 2. Method: Place large, flat boards in walkways and wheelways for 7 days where use of newly installed floor is unavoidable.

END OF SECTION 09 30 00