





#### FACILITY AUXILIARY BUILDING UNIVERSITY OF SOUTH CARLINA AIKEN STATE PROJECT NO.: H29-9552/50003331-2 JCS PROJECT NO: 18103

#### ADDENDUM #03 June 12, 2019

#### **GENERAL INFORMATION:**

- 1. Q: Is Builder's Risk Insurance by Owner?
  - A: Refer to A201, Section 11, in the project manual.
- Q: Has SC LLR review/approval time for fire protection been taken into consideration?
   A: Yes
- Q: Section 22 0500 Please confirm type 'L' hard copper piping is required for compressed air
   A: Yes, type 'L' hard copper piping is required. Also, piping shall be cleaned, purged, and ends sealed prior to completion
- Q: Please confirm that raceways, wire and devices for controls are to be installed by HVAC contractor?
   A: Yes, the controls are included in DIV 23

#### **SPECIFICATIONS:**

- 5. <u>SPECIFICATION SECTION 00 0101 Table of Contents</u>: **REPLACE** the section originally issued with the section included in this Addendum.
- 6. <u>SPECIFICATION SECTION 05 4000 Cold-Formed Metal Framing</u>: REPLACE the section originally issued with the section included in this Addendum.
- 7. <u>SPECIFICATION SECTION 03 3616 Dye Stained Colored Ground Polished Concrete</u> REPLACE the section originally issued with the section included in this Addendum.
- 8. <u>SPECIFICATION SECTION 09 3000 Tile:</u> REPLACE the section originally issued with the section included in this Addendum.

#### DRAWINGS:

- SHEET A501, Finish Schedule, Space 115 Women and Space 116 Men: Add note: The shower area walls are to be 6 x 6 ceramic tile on ½" cementitious backer board. Typical floor to ceiling. Provide waterproofing membrane at entire wall tile area sealing all corners and joints to create a water tight shower stall.
- **10.** <u>SHEET #C101 Stakeout and Water Plan</u>: **REPLACE** this sheet in the bid set with REVISED sheet C101 included in this addendum.
- 11. <u>SHEET #C102 Phase I Sediment & Erosion Control Plan</u>: REPLACE this sheet in the bid set with REVISED sheet C102 included in this addendum.
- 12. <u>SHEET #C102.1 Grading, Drainage and Utility Plan</u>: **REPLACE** this sheet in the bid set with REVISED sheet C102.1 included in this addendum.
- 13. <u>SHEET #C103 Sitework Details</u>: **REPLACE** this sheet in the bid set with REVISED sheet C103 included in this addendum.

#### END OF ADDENDUM #03

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## **VOLUME 1**

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00 0115	List of Drawings
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AIA A701-1997	Instructions to Bidders (Office of State Engineer Version)
AIA A310	Bid Bond
SE-330	Bid Form
AIA A101-2007	Standard Form of Agreement between Owner and Contractor
	(Office of State Engineer Version)
AIA A201-2007	General Conditions of the Contract for Construction
	(Office of State Engineer Version)
SE-355	Performance Bond
SE-357	Labor and Material Payment Bond
SE-380	Change Order to Construction Contract
	USC Supplemental Conditions
	USC Contractor's One Year Guarantee

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- 01 2500 Substitution Procedures
- 01 2500A Substitution Request Form
- 01 2600 Contract Modification Procedures
- 01 2900 Payment Procedures
- 01 3100 Project Management and Coordination
- 01 3300 Submittal Procedures
- 01 4001 Chapter 1 & Chapter 17 Special Inspections
- 01 4002 Contractors Statement of Responsibility
- 01 5000 Temporary Facilities and Controls
- 01 6000 Product Requirements
- 01 7300 Execution
- 01 7700 Closeout Procedures
- 01 7823 Operation and Maintenance Data
- 01 7839 Project Record Documents

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03 3616 Dye Stained Colored Ground & Polished Concrete

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#### DIVISION 05 METALS

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#### PART 1 – GENERAL

#### 1.1 SUMMARY

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to Work of this Section.
- B. Section Includes:
  - 1. Dye stained concrete slabs-on-grade and interior floor slabs.
  - 2. Grinding and polishing concrete surfaces.
- C. Related Sections:
  - 1. Division 3 Section "Cast-In-Place Concrete" for general applications of concrete and coordination of sample submittal and color selection.
  - 2. Division 7 Section "Joint Sealers" for colored sealant for joints.

#### 1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM):
  - 1. ASTM C309 "Liquid Membrane-Forming Compounds for Curing Concrete."
  - 2. ASTM C494 "Standard Specification for Chemical Admixtures for Concrete."

#### 1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's complete technical data sheets for the following:
  - 1. Concrete dye stain.
  - 2. Chemical lithium hardener
  - 3. Final finish
- B. Samples for Initial Selection: Manufacturer's color charts showing full range of colors available.
- C. Qualification Data: For firms indicated in "Quality Assurance" Article, including list of completed projects.
- D. Submit the following in accordance with Division 1 Section "Submittals"
- E. Product data for each grinding machine, including all types of grinding heads, dust extraction system, joint filler, concrete densifying impregnator, penetrating sealer, and any other chemicals used in the process.
- F. Applicators must submit a copy of their attendance to the manufacture's Polished Concrete Certified Training Program.
- G. Polished concrete samples: Size 6"x6", for each Polished Concrete finish required.

#### 1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer with experience in the production of specified products.
- B. Installer Qualifications: An installer with 5 years' experience with work of similar scope and quality.
- C. Obtain each specified material from same source and maintain high degree of consistency in workmanship throughout Project.
- D. Notification of manufacturer's authorized representative shall be given at least 1-week before start of Work.
- E. Certified Applicators:
  - 1. Consult Scofield for a list of Certified Applicators in your area.
- F. Pre-installation Conference: Conduct conference at project site to comply with requirements in Division 1, Section "Project Management and Coordination."
- G. Installer/Applicator shall be certified by chemical manufacturer and shall provide adequate number of skilled workmen who are thoroughly trained and experienced in the necessary craft.
- H. Manufacturer's Certification: Provide a letter of acknowledgement from both the equipment and chemical manufacturer stating that the installer is a trained applicator and is familiar with proper procedures and installation requirements recommended by the manufacturer.
- J. Dye Stained Ground and Polished Concrete Mockups:
  - 1. Provide under provisions of Division 1 Section "Quality Requirements".
  - 2. At location on Project selected by Architect, place and finish an 8 feet by 8 feet area of each color selected by the architect. Mockups are to be side by side for proper comparison evaluation in order to make final color selection(s).
  - 3. Construct mockup using processes and techniques intended for use on permanent work, including curing procedures. Include samples of control, construction, and expansion joints in sample panels. Mockup shall be produced by the individual workers who will perform the work for the Project.
  - 4. Select from Part 4 Schedules cut and shine level and finish coat.
  - 5. Edges should be included in mockup.
  - 6. Accepted mockup provides visual standard for work of Section.
  - 7. Mockup shall remain through completion of work for use as a quality standard for finished work.
  - 8. Remove mockup when directed.
- K. Environmental Limitations:
  - 1. Comply with manufacturer's written instructions for substrate temperature and moisture content, ambient temperature and humidity, ventilation and other conditions affecting chemical performance.
  - 2. Application of finish and dye system shall take place a minimum of 21 days prior to fixture and trim installation and/or substantial completion.
  - 3. Finish concrete area shall be closed to traffic during finish floor application and after application for the time as recommended by the manufacturer.

#### 1.5 DELIVERY, STORAGE AND HANDLING

A. All chemicals: Comply with manufacturer's instructions. Deliver in original, unopened packaging. Store in dry conditions.

#### 1.6 PROJECT CONDITIONS

- A. Dye Stained Concrete Environmental Requirements:
  - 1. Schedule placement to minimize exposure to wind and hot sun before material has cured.

#### 1.7 PRE-JOB CONFERENCE

- A. One week prior to placement of concrete a meeting will be held to discuss the Project and application materials. The mock-ups and final color(s) selections must be made prior to this meeting.
- B. It is suggested that the Architect, Construction Manager, General Contractor, Subcontractor, Ready-Mix Concrete Representative, and a Manufacturer's Representative be present.

#### PART 2 – PRODUCTS

#### 2.1 ACCEPTABLE MANUFACTURER

- A. L. M. SCOFIELD COMPANY, Douglasville, Georgia 1-800-800-9900.
- B. EQUAL PRODUCTS BY:
  - 1. H&C Decorative Stains & Dyes
  - 2. Prosoco/Consolideck® Decorative Stains & Dyes

#### 2.2 MATERIALS

- A. Solvent based color liquid dye concentrate: by L. M. SCOFIELD COMPANY.
- C. Provide manufacturer's companion Lithium Densifier and final finish product to help ensure color and protection.
- D. Acceptable product:
  - 1. SCOFIELD<sup>®</sup> Formula One<sup>™</sup> Liquid Dye Concentrate by L. M. SCOFIELD COMPANY.
  - 2. SCOFIELD<sup>®</sup> Formula One<sup>™</sup> Lithium Densifier MP by L. M. SCOFIELD COMPANY.
  - 3. SCOFIELD<sup>®</sup> Formula One<sup>™</sup> Guard-W by L. M. SCOFIELD COMPANY.
- E. Chemical Hardener/Densifiers Manufactured by L. M. SCOFIELD COMPANY:
  - 1. Materials:
    - a. SCOFIELD<sup>®</sup> Formula One<sup>™</sup>-LD MP is a high performing hardening and dust proofing compound that is chemically reactive and permanently bonds to concrete formulated to be used in conjunction with integrally colored concrete as well as uncolored concrete.
    - b. SCOFIELD<sup>®</sup> Formula One<sup>™</sup> Guard-W is water-borne acrylic penetrating material formulated to protect polished concrete from normal staining and to enhance gloss.
  - 2. Planetary grinding equipment must be capable of providing a multiple step process starting with course metal bond diamonds and ending with fine resin bond diamonds.

- F. SUBSTITUTIONS: The use of products other than those specified will be considered providing that the Contractor requests its use in writing within 14-days prior to bid date. This request shall be accompanied by the following:
  - 1. A certificate of compliance from material manufacturer stating that proposed products meet or exceed requirements of this Section.
  - 2. A side by side itemized comparison of the proposed product versus the specified product along with clear completed project photographs.
  - 3. Documented proof that proposed materials have a 5-year proven record of performance, confirmed by at least 5 local projects that Architect can examine along with clear completed project photographs.
- 2.3 COLORS
  - A. Concrete Dye Stain:
    - 1. Liquid Dye Concentrate by L. M. SCOFIELD COMPANY. Provide color selection chart for Architect to select desired colors for mock-ups.

#### PART 3 – EXECUTION

- 3.1 POLISHED CONCRETE APPLICATION
  - A. Applicator shall examine the areas and conditions under which work of this section will be provided and the General Contractor shall correct conditions detrimental to the timely and proper completion of the work and the Applicator shall not proceed until unsatisfactory conditions are resolved. Unless determined prior to bid, the condition of the floor before the polishing process is the responsibility of the General Contractor. The floor must be protected from damage during general construction.
  - B. Grind the concrete floor with metal bond diamonds removing construction debris until the specified Grade is obtained. The first cut must be performed with a metal bond diamond.
  - C. After the 400 grit resin bond diamond has been used apply liquid dye and liquid hardener according to the manufacturer's current literature. Allow 12 hours to cure before continuing.
  - D. Finish honing and polishing the floor to desired Class.
  - E. After the polishing process has been completed apply protection guard material according to the products current technical bulletin. Allow to cure for 2-4 hours.
  - F. Using a high-speed burnishing machine and diamond impregnated pads, burnish the surface to the desires gloss level.
  - G. Upon completion, the work shall be ready for final inspection and acceptance by the customer.

#### 3.2 PROTECTION

A. The General Contractor is responsible for using Temporary Floor Protection throughout the project to safeguard the surface quality of concrete slabs before and after application of decorative finishes or installations of other materials.

- B. All concrete floors that will be not be covered by other materials will be protected throughout the project. The concrete slab must be treated as a finished floor at all times during construction.
- C. Temporary Floor Protection will be removed only while finish work to the concrete is being performed and will be replaced after the final finish has cured sufficiently.
- D. Temporary Floor Protection will be Proguard Duracover as manufactured by L. M. Scofield Company, Douglasville, GA (800-800-9900). Seaming of the temporary floor protection will be performed with Scofield Proguard Heavy Duty Seaming Tape. Both products will be installed following the manufacturer's published installation procedures.
- E. DO NOT APPLY THE HEAVY DUTY SEAMING TAPE TO BARE OR FINISHED FLOORS OR WALL SURFACES AT ANY TIME. IT WILL PERMANENTLY DAMAGE THE FLOOR
- F. No substitutions will be allowed.

#### 3.3 CLEANING

- A. The work area shall be kept clean and free of debris at all times.
- B. Remove slurry and dust from adjoining surfaces as necessary.
- C. Dispose of material containers in accordance with local regulations.
- D. Protect finished work until fully cured per manufacturer's recommendations.

#### 3.4 APPLICATORS

A. For a list of Certified Applicators, contact Scofield at 1-800-800-9900.

#### PART 4 – SCHEDULES

- 4.1 CUT AND SHINE LEVELS
  - A. Cut Level (Depth of cut)
    - 1. Grade 2-3
  - B. Shine Level (Gloss level)
    - 1. Class 1

#### END OF SECTION

#### SECTION 05 4000- COLD-FORMED METAL FRAMING

#### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Exterior load-bearing wall framing.
  - 2. Interior load-bearing wall framing.
  - 3. Exterior non-load-bearing wall framing.
  - 4. Exterior soffit and fascia framing.
  - 5. Bracing for top of exterior storefront at entries.
  - 6. Exterior ceiling joist framing.
  - 7. Exterior hat channel framing.
  - 8. Other items indicated on the structural drawings to be by the light gage framing supplier (or the synonymous term cold-formed framing supplier).
- B. Related Sections include the following:
  - 1. Division 5 Section "Structural Steel Framing" for masonry shelf angles.
  - 2. Division 9 Section "Gypsum Board Assemblies" for interior non-load-bearing, metal-stud framing and ceiling-suspension assemblies.
  - 3. Division 9 Section "Gypsum Board Shaft-Wall Assemblies" for interior non-load-bearing, metal-stud-framed, shaft-wall assemblies.

#### 1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide cold-formed metal framing capable of withstanding design loads within limits and under conditions indicated.
  - 1. Design Loads and Criteria: As indicated on the structural drawings.
  - 2. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
    - a. Exterior Wall Framing: Horizontal deflection of 1/600 of the wall height for walls with brick or other masonry veneer. 1/360 for walls with other types of cladding. For purposes of deflection calculations, the wind load may be taken as 0.7 times the components and cladding 50-year wind loads in the applicable code. Strength calculations must be based on the full components and cladding 50-year wind loads.
    - b. Interior Load-Bearing Wall Framing: Horizontal deflection of 1/360 of the wall height under a horizontal load of 5 psf, or seismic load, whichever is greater.
    - c. Floor Joist Framing: Vertical deflection of 1/480 of the span for live loads and 1/360 for total load.
    - d. Roof Rafter Framing: Vertical deflection of 1/360 of the horizontally projected span

for total load.

- e. Ceiling Joist Framing: Vertical deflection of 1/360 of the span for total load.
- 3. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:
  - a. Upward and downward movement of 3/4 inch.
- B. Cold-Formed Steel Framing, General: Design according to AISI S200 "Standard for Cold-Formed Steel Framing - General Provisions."
  - 1. Headers: Design according to AISI's "Standard for Cold-Formed Steel Framing Header Design."
  - 2. Design exterior wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of cold-formed metal framing product and accessory indicated.
- B. Shop Drawings: Provide Shop Drawings prepared by cold-formed metal framing manufacturer. Show layout, spacings, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners. Show reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
  - 1. Include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Welding certificates.
- D. Qualification Data: For professional engineer.
- E. Product Test Reports: From a qualified testing agency, unless otherwise stated, indicating that each of the following complies with requirements, based on evaluation of comprehensive tests for current products:
  - 1. Expansion anchors.
  - 2. Power-actuated anchors.
  - 3. Mechanical fasteners.
  - 4. Vertical deflection clips.
- F. Evaluation Reports: For cold-formed steel framing.
  - 1. Steel framing manufacturer to have a third-party evaluation report for its products that are reviewed to the local building code or its model code (IBC 2015 and AISI S100).

#### 1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Member in good standing of the Steel Framing Industry Association (SFIA) or be a part of a similar organization that provides verifiable code compliance program.
  - 1. Products to be certified under an independent third-party inspection program administered by an agency accredited by IAS to ICC-ES AC98 IAS Accreditation Criteria for Inspection Agencies.

- B. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional engineer.
- C. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated for this Project.
- D. Product Tests: Mill certificates or data from a qualified independent testing agency[, or inhouse testing with calibrated test equipment,] indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.
- E. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified in accordance with the product-certification program of the Steel Framing Industry Association (SFIA) or be a part of a similar organization that provides verifiable code compliance program.
- F. Comply with the following AISI Specifications and Standards:
  - 1. AISI S100 "North American Specification for the Design of Cold-Formed Steel Structural Members"
  - 2. AISI S200 "Standard for Cold-Formed Steel Framing General Provisions."
  - 3. AISI S202 "Code of Standard Practice for Cold-Formed Steel Structural Framing."
  - 4. AISI S212 "Standard for Cold-Formed Steel Framing Header Design."

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling as required in AISI's "Code of Standard Practice."
- B. Store cold-formed metal framing, protect with a waterproof covering, and ventilate to avoid condensation.

#### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering coldformed metal framing that may be incorporated into the Work include, but are not limited to, the following:
  - 1. AllSteel Products, Inc.
  - 2. California Expanded Metal Products Company.
  - 3. ClarkDietrich.
  - 4. Consolidated Fabricators Corp.; Building Products Division.
  - 5. Craco Metals Manufacturing, LLC.
  - 6. Custom Stud, Inc.
  - 7. Formetal Co. Inc. (The).
  - 8. MarinoWare; a division of Ware Industries.
  - 9. Quail Run Building Materials, Inc.
  - 10. SCAFCO Corporation.
  - 11. Steel Construction Systems.
  - 12. Steeler, Inc.
  - 13. Super Stud Building Products, Inc.
  - 14. United Metal Products, Inc.

#### 2.2 MATERIALS

- A. Framing Members, General: Comply with AISI S200 and ASTM C955, Section 8 for conditions indicated.
- B. Steel Sheet at Shear Panels: ASTM A 1003/A1003 M, ASTM A 653/A 653 M, ASTM A 792/A 792 M, or ASTM A 875/A 875 M, metallic coated, of grade and coating weight as follows:
  - 1. Grade: Structural Steel (SS) Grade 33.
  - 2. Coating: G60.
  - 3. Thickness: As indicated on the structural drawings.
- C. Other Steel Sheet: ASTM A 1003/A1003 M, ASTM A 653/A 653 M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:
  - 1. Grade: As required by structural performance.
  - 2. Coating: [CP 60: G60 (Z180), A60 (ZF180), AZ50 (AZM150), or GF30 (ZGF90)].
- D. Steel Sheet for [Vertical Deflection] [Drift] [Rigid] [Foundation] Clips: ASTM A1003/A1003M, ASTM A653/A653M, structural steel, zinc coated, of grade and coating as follows:
  - 1. Grade: As required by structural performance.
  - 2. Coating: CP 90: G90 (Z275), AZ50 (AZM150), or GF45 (ZGF135)

#### 2.3 LOAD-BEARING WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
  - 1. Minimum Base-Steel Thickness: 0.0428 inch (18 gage) [0.0 538 inch (1.37 mm]], except studs to which exterior storefront, curtain wall, or windows are attached shall be 16 gage minimum.
  - 2. Flange Width: 1-5/8 inches.
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with straight flanges, and as follows:
  - 1. Minimum Base-Steel Thickness: Matching steel studs. except tracks to which exterior storefront, curtain wall, or windows are attached shall be 16 gage minimum.
  - 2. Flange Width: 1-1/4 inches.
- C. Steel Box or Back-to-Back Headers: Manufacturer's standard C-shapes used to form header beams, of web depths indicated, unpunched, with stiffened flanges, and as follows:
  - 1. Minimum Base-Steel Thickness: 0.0428 inch (18 gage) [0.0 538 inch (1.37 mm]].
  - 2. Flange Width: 1-5/8 inches.
- D. Steel Double-L Headers: Manufacturer's standard L-shapes used to form header beams, of web depths indicated, and as follows:
  - 1. Minimum Base-Steel Thickness: [0.0 428 inch (1.09 mm]]
  - 2. First option in subparagraph below is minimum top flange width recognized by AISI's "Standard for Cold-Formed Steel Framing Header Design." Coordinate with wall width.
  - 3. Top Flange Width: [1 -1/2 inches (38 mm}] [1 -5/8 inches (41 mm}] [2 inches (51 mm}] [2-1/2 inches (63 mm}].

#### 2.4 EXTERIOR NON-LOAD-BEARING WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
  - 1. Minimum Base-Steel Thickness: 0.0428 inch (18 gage), except studs to which exterior storefront, curtain wall, or windows are attached shall be 16 gage minimum.
  - 2. Flange Width: 1-5/8 inches.
  - 3. Section Properties: As required to meet the structural design criteria.
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:
  - 1. Minimum Base-Steel Thickness: Matching steel studs, except tracks to which exterior storefront, curtain wall, or windows are attached shall be 16 gage minimum.
  - 2. Flange Width: 1-1/4 inches.
- 2.5 SOFFIT, FASCIA, CEILING JOIST FRAMING, AND BACKUP FOR COMPOSITE METAL PANELS
  - A. Steel Framing: Manufacturer's standard C-shaped steel sections, of web depths indicated, with stiffened flanges, and as follows:
    - 1. Minimum Base-Steel Thickness: 0.0428 inch (18 gage), except studs and tracks to which exterior storefront, curtain wall, or windows are attached shall be 16 gage minimum.
    - 2. Flange Width: 1-5/8 inches.
    - 3. Section Properties: As required to meet the structural design criteria.
  - B. Where framing is for backup of composite metal panels, provide continuous 2" x 2" x 18 gage angles at all corners.
- 2.6 Hat Channels:
  - A. Manufacturer's standard structural hat channels, of depths indicated, and as follows:
    - 1. Minimum Base-Steel Thickness: 0.0428 inch (18 gage).
    - 2. Section Properties: As required to meet structural design criteria.

#### 2.7 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.
- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
  - 1. Supplementary framing.
  - 2. Bracing, bridging, and solid blocking.
  - 3. Web stiffeners.
  - 4. Anchor clips.
  - 5. End clips.
  - 6. Gusset plates.
  - 7. Stud kickers, knee braces, and girts.
  - 8. Joist hangers and end closures.
  - 9. Hole reinforcing plates.

- 10. Backer plates.
- 2.8 ANCHORS, CLIPS, AND FASTENERS
  - A. Steel Shapes and Clips: ASTM A 36, zinc coated by hot-dip process according to ASTM A 123/A 123M.
  - B. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel hex-headed bolts, and carbonsteel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153, Class C.
  - C. Expansion Anchors: Fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
  - D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times design load, as determined by testing per ASTM E 1190 conducted by a qualified independent testing agency.
  - E. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.
    - 1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.
  - F. Holdowns at Shear Panels: Provide Simpson holdown indicated or equal.
  - G. Welding Electrodes: Comply with AWS standards.

#### 2.9 FABRICATION

- A. Fabricate cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI specifications and standards, manufacturer's written instructions, and requirements in this Section.
  - 1. Fabricate framing assemblies using jigs or templates.
  - 2. Cut framing members by sawing or shearing; do not torch cut.
  - 3. Fasten cold-formed metal framing members by welding or screw fastening, as standard with fabricator. Wire tying of framing members is not permitted.
    - a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
    - b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads. Unless larger dimensions are indicated on Shop Drawings, 3/4" minimum clearance shall be maintained between screws and edges of members, and 3/4" minimum on-center spacing shall be maintained between adjacent screws.
- B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.
- C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
  - 1. Spacing: Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

2. Squareness: Fabricate each cold-formed metal framing assembly to a maximum out-of-square tolerance of 1/8 inch.

#### PART 3 - EXECUTION

#### 3.1 **EXAMINATION**

- A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.
  - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION, GENERAL

- A. Cold-formed metal framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed metal framing according to ASTM C1007 and AISI S200 "Standard for Cold-Formed Steel Framing - General Provisions" and to manufacturer's written instructions unless more stringent requirements are indicated.
- C. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened.
  - 1. Cut framing members by sawing or shearing; do not torch cut.
  - 2. Fasten cold-formed metal framing members by welding or screw fastening. Wire tying of framing members is not permitted.
    - a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
    - b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads. Unless larger dimensions are indicated on Shop Drawings, 3/4" minimum clearance shall be maintained between screws and edges of members, and 3/4" minimum on-center spacing shall be maintained between adjacent screws.
- D. In multistory buildings, do not install wall studs until the concrete slabs above and below the studs have been poured.
- E. Install framing members in one-piece lengths unless splice connections are indicated.
- F. Install manufactured connectors in accordance with the manufacturer's recommendations. The size and number of fasteners shall be as specified by the manufacturer.
- G. Framing around openings where windows, curtain wall, storefront, and louvers in exterior walls (headers, jambs, sills) are attached shall be 16 gage minimum.
- H. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- I. At exterior walls where wall stud framing is interrupted by steel beams and wall sheathing or insulation boards run continuous past the beam, provide vertical stud infill framing in the exterior sides of webs of beams at the same spacing as the wall studs. Minimum base metal thickness shall be not less than minimum base metal thickness required for exterior wall studs in this

specification. Infill framing is required whether shown on the drawings or not.

- J. Fasten structural hat channels to supporting construction as shown on Shop Drawings.
- K. Do not bridge building expansion joints with cold-formed metal framing. Independently frame both sides of expansion joints.
- L. Install insulation, specified in Division 7, in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- M. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.
- N. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
  - 1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

#### 3.3 LOAD-BEARING WALL INSTALLATION

- A. Install continuous top and bottom tracks sized to match studs. Align tracks accurately and securely anchor at corners and ends, and at spacings as follows:
  - 1. Anchor Spacing: As shown on Shop Drawings.
- B. Squarely seat studs against top and bottom tracks with gap not exceeding 1/8 inch between the end of wall framing member and the web of track. Fasten both flanges of studs to top and bottom tracks. Space studs as follows:
  - 1. Stud Spacing: 16 inches, unless indicated otherwise.
- C. Set studs plumb.
- D. Align studs vertically where floor framing interrupts wall-framing continuity. Where studs cannot be aligned, continuously reinforce track to transfer loads.
- E. Align floor and roof framing over studs. Where framing cannot be aligned, continuously reinforce track to transfer loads or provide additional studs as required.
- F. Anchor studs abutting structural columns or walls, including masonry walls, to supporting structure as indicated.
- G. Install headers over wall openings wider than stud spacing. Locate headers above openings as indicated. Fabricate headers of shapes indicated or required to transfer load to supporting studs, complete with clip-angle connectors, web stiffeners, or gusset plates.
  - 1. Frame wall openings with not less than a double stud at each jamb of frame as indicated on Shop Drawings. Fasten jamb members together to uniformly distribute loads.
  - 2. Install runner tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with clip angles or by welding, and space jack studs same as full-height wall studs.
- H. Install supplementary framing, blocking, and bracing in stud framing indicated to support fixtures, equipment, services, casework, heavy trim, furnishings, and similar work requiring

attachment to framing.

- 1. If type of supplementary support is not indicated, comply with stud manufacturer's written recommendations and industry standards in each case, considering weight or load resulting from item supported.
- I. Install horizontal bridging in stud system, spaced in rows not more than 48 inches apart. Fasten at each stud intersection. Use one of the following methods:
  - 1. Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs with a minimum of 2 screws into each flange of the clip angle for framing members up to 8 inches deep.
  - Bridging: Combination of flat, taut, steel sheet straps and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges. Straps shall be minimum 1-1/4 inch wide and minimum 0.0329 inch (20 gage) thick.
  - 3. Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.
- J. Install miscellaneous framing and connections, including supplementary framing, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

#### 3.4 EXTERIOR NON-LOAD-BEARING WALL INSTALLATION

- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.
- B. Fasten both flanges of studs to top and bottom tracks, except where deflection tracks are used. Space studs as follows:
  - 1. Stud Spacing: 16 inches, except where otherwise indicated or where closer spacing is required by the engineering analysis.
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.
- D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
- E. Install horizontal bridging in wall studs spaced in rows not more than 48 inches apart using one of the methods below. Fasten at each stud intersection.
  - 1. Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
  - 2. Combination of flat, taut, steel sheet straps of width and thickness indicated and studtrack solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
  - 3. Proprietary bridging bars installed according to manufacturer's written instructions.
- F. Install headers, sills, and jamb studs at openings as required to resist wind and seismic loads and to transfer these loads to the structure.
- G. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, fasteners, and stud girts, to provide a complete and stable wall-framing system.

#### 3.5 SOFFIT, FASCIA, AND CEILING JOIST INSTALLATION

- A. Provide light gage framing for soffits, fascia, and exterior ceilings as indicated on the architectural and structural drawings. All required items may not be shown on the structural drawings.
  - 1. Dimensions and details shall be as shown on the architectural drawings.

#### 3.6 FIELD QUALITY CONTROL

- A. Testing: Owner will engage a special inspector to perform tests and inspections and prepare test reports.
- B. Special inspector shall verify the manufacturer's procedure for material control meets the requirements of IBC section 1704.3.
- C. Special inspector shall verify in the field that the following is in accordance with the Drawings and approved shop drawings:
  - 1. Member sizes, configurations, and spacings.
  - 2. Connections.
  - 3. Bracing and bridging.
  - 4. Shear wall panel construction including holdowns.
- D. Special inspector will report test results promptly and in writing to Contractor and Architect.
- E. Remove and replace work where test results or inspections indicate that it does not comply with specified requirements.
- F. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

#### 3.7 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 054000

#### **SECTION 09 3000**

TILE

#### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Tile for floor applications.
- B. Tile for wall applications.
- C. Cementitious backer board as tile substrate.
- D. Coated glass mat backer board as tile substrate.
- E. Ceramic accessories.
- F. Waterproofing under tile
- G. Ceramic trim.
- H. Non-ceramic trim.

#### **1.02 RELATED REQUIREMENTS**

- A. Section 03 30 00 Cast-In-Place Concrete.
- B. Section 07 9005 Joint Sealers.
- C. Section 09 2116 Gypsum Board Assemblies: Installation of tile backer board.
- D. Section 22 4200 Plumbing Fixtures:

#### 1.03 REFERENCE STANDARDS

- A. ANSI A108 Series/A118 Series/A136.1 American National Standard Specifications for the Installation of Ceramic Tile (Compendium); 2005.
- B. ANSI A108.1a American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2005.
- C. ANSI A108.1b American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex Portland Cement Mortar; 1999 (R2005).
- D. ANSI A108.1c Specifications for Contractors Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Bed with Dry-Set or Latex Portland Cement Mortar; 1999 (R2005).
- E. ANSI A108.4 American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive; 1999 (R2005).
- F. ANSI A108.5 American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar; 1999 (R2005).
- G. ANSI A108.6 American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy; 1999 (R2005).
- H. ANSI A108.8 American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 1999 (R2005).
- I. ANSI A108.9 American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 1999 (R2005).

- J. ANSI A108.10 American National Standard Specifications for Installation of Grout in Tilework; 1999 (R2005).
- K. ANSI A108.11 American National Standard for Interior Installation of Cementitious Backer Units; 1999 (R2005).
- L. ANSI A108.13 American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone; 2005.
- M. ANSI A118.3 American National Standard Specifications for Chemical Resistant, Water Cleanable Tile Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive; 1999 (R2005).
- N. ANSI A118.4 American National Standard Specifications for Latex-Portland Cement Mortar; 1999 (R2005).
- O. ANSI A118.9 American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 1999 (R2005).
- P. ANSI A137.1 American National Standard Specifications for Ceramic Tile; 2008.
- Q. ASTM C 1178/C 1178M Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2008.
- R. TCNA (HB) Handbook for Ceramic Tile Installation; 2010.

#### 1.04 SUBMITTALS

- A. See Section 01 3300 Submittal Procedures, for submittal procedures.
- B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.
- C. Samples: Mount tile and apply grout on two plywood panels, minimum 18 x 18 inches in size illustrating pattern, color variations, and grout joint size variations.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Maintenance Data: Include recommended cleaning methods, cleaning materials, stain removal methods, and polishes and waxes.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  1. Extra Tile: 2 percent percent of each size, color, and surface finish combination.
- G. LEED Submittals:
  - 1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.
  - 2. Product Certificates for Credit MR 5: For product and materials required to comply with requirements for regional materials indicating location and distance from Project of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include statement indicating cost for each regional material and the fraction by weight that is considered regional.
  - 3. Laboratory Test Reports for Credit IEQ 4: For adhesives, grouts, sealants and tile systems documentation indicating that products comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers" or other LEED-approved standard for VOC content.

#### 1.05 QUALITY ASSURANCE

- A. Maintain one copy of The Tile Council of North America Handbook and ANSI A108 Series/A118 Series on site.
- B. Standards: Mortar and grout materials and installation standards of the American National Standards Institute (ANSI) and Standard Specification for Ceramic Tile TCNA 137.1 2008 apply to the work, except as otherwise indicated.
- C. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum 5 years of documented experience.
- D. Installer Qualifications: Company specializing in performing tile installation, with minimum of 5 years of documented experience.
  - 1. Installer shall employ skilled mechanics trained and experienced in tile work.
  - 2. Registered as members in good standing with the Tile Council of America or an affiliated provincial association.

#### 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.
- B. Deliver all products to job site in manufacturer's unopened containers with grade seals unbroken and labels intact.
- C. Keep tile cartons dry and clean.

#### 1.07 FIELD CONDITIONS

- A. Maintain ambient and substrate temperature of 50 degrees F during installation and curing of mortar materials.
- B. Protect Portland cement based materials from direct sunlight, radiant heat, forced hot and cold ventilation and drafts until cured, to prevent premature evaporation of moisture. When installed at low temperatures allow for longer curing time and protect from damage until cured.
- C. Do not install epoxy based materials when surface temperature is less than 60 degrees F (16 degrees C) or over 90 degrees F (32 degrees C).

#### 1.08 WARRANTY

- A. Provide manufacturer's standard written 10-year warranty, covering materials and labor for replacement of defective materials.
- B. Provide Contractor's warranty that work will be free of defects in materials and workmanship for 5 years.

#### PART 2 PRODUCTS

#### 2.01 GENERAL

- A. FloorScore Compliance: Tile for floors shall comply with requirements of FloorScore Standard.
- B. Low-Emitting Materials: Flooring systems shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers" or other LEED-approved standard for VOC content.
- C. See drawings for Floor Tile and Wall Tile patterns. Pattern Layouts to be Determined by Architect during Shop Drawing Review.
- D. Equal products will only be considered if substitutions are submitted and accepted by the architect prior to the bid.

#### **2.02 TILE** - Reference floor finish drawings I301 –I315 for distribution.

- A. Approved Manufacturers: All products of each type by the same manufacturer.
  - 1. Tile selection shall be as indicated on shop drawing review by Architect.
  - 2. The Architect reserves the right to select tile from any series listed when preparing color schedule. The tile contractor shall supply the selected tile at no additional cost to the Owner.
  - 3. Substitutions: See Section 01 60 00 Product Requirements.
  - 4. Approved manufacturers to those specified include:
    - DalTile
    - Interceramic
    - Crossville, Inc.
- B. **Porcelain Floor Tile (CT)** Provide thin-line anodized aluminum transition strips and edge protection by Schluter Systems, L.P. appropriate for each condition. Transition strips shall be in one piece for width of opening installed at each opening where ceramic tile or porcelain tile transitions to another material. Edge protection shall be used where wall and base tiles transitions to another material as required and shall be used and installed in accordance to manufacturer's recommendations and industry standards. Finishes to be selected by architect from manufacturer's standard finishes.

#### <u>CT-1</u> Porcelain Floor Tiles Type CT-1 used in Women's & Men's Toilets

- 1. Global Collection 2nd, Manufactured by Royal Mosa, Or Approved Equivalent Product.
- 2. Moisture Absorption: 0 To 0.5 Percent, ASTM C373.
- 3. Size And Shape: 6 X 6 Inches.
- 4. Edges: Square.
- 5. Surface Finish: Floor Tile Unglazed.
- 6. Trim Units: Matching Cove And Surface Bullnose Shapes In Sizes Coordinated With Field Tile. Provide Bullnose Edge Where Required.
  - A. Provide Bullnose Edge Where Required.
  - B. Base Tile Shall Be SP-Cove 6 X 6 Inches Where Required.
- 7. Wet Dynamic Coefficient Of Friction: 0.50-0.60 Acutestsm.
- 8. Tile Colors:
  - A. Field Tile Color: T.B.D. (approx. 50%)
  - B. Accent Tile Color: T.B.D. (approx. 50%)

Floor Pattern Layout to be Determined by Architect during Shop Drawing Review.

Use "Spectra Lock Pro" Epoxy Grout by Laticrete, Color: T.B.D., For Floor Tile Only.

Use " Spectralock® 2000 Ig" Epoxy Grout, Color: T.B.D. Manufactured by Laticrete.

Reference Finish Schedule & Color Key For Distribution.

#### <u>CT-2</u> Two Part Porcelain Tile Floor Consisting Of:

- A. Porcelain Floor Tile Type Ct-2A Used In Shower Area (Open Area): Ansi A137.1, And As Follows:
- 1. "Globalgrip AS", Manufactured by Royal Mosa, Or Approved Equivalent Product.
- 2. Moisture Absorption: < 0.5 Percent, Astm C373.

- 3. Coefficient Of Friction: Dry 0.90, Wet 0.82
- 4. Size and Shape: 6 X 6 Inches.
- 5. Edges: Square.
- 6. Surface Finish: Slip Resistant, Global Grip AS.
- 7. Colors: T.B.D.
- 8. Trim Units: Matching Cove And Surface Bullnose Shapes In Sizes Coordinated With Field Tile.

<u>And</u>

**B.** Porcelain Floor Tile Type Ct-2B Used in Stall Areas Sloping to The Drain: Porcelain Tile - To be Crossvile Mosaics Collection, Cross-Sheen (Ups) Texture, Size: 3" X 3", Wet Dynamic Coefficient Of Friction: 0.50-0.60, Color: T.B.D., By Crossville, Inc.

Use "Spectra Lock Pro" Epoxy Grout by Laticrete, Color: T.B.D., For Floor Tile Only.

Reference Floor Pattern Layout Plans For Distribution.

**CTB-1** Ceramic Tile Base - "Glazed Wall Tile - Bright & Mattte", 6" X 6" Tiles, Color: T.B.D. (Grp.1), Manufactured by American Olean. Provide Cove Base with Molded Inner & Outer Corners and Bullnose Finish Trim. Tile Joints to Align.

Use "Spectra Lock Pro" Epoxy Grout, Color: T.B.D., Manufactured By Laticrete.

Reference Finish Schedule & Color Key for Distribution.

**CWT-1** Ceramic Wall Tile, Floor to Ceiling High, Used In Women's & Men's Toilets (Reference Cwt Pattern Layout Elevations) - "Glazed Wall Tile - Bright & Mattte", 6" X 6" Tiles, Manufactured by American Olean.

Tile Patterns Consisting of:

- **A.** Field Tile Color: T.B.D. (Grp.1). (approx. 50%)
- B. Accent Tile Color: T.B.D. (Grp.1). (approx. 25%)
- **C.** Accent Tile Color: T.B.D. (Grp.2). (approx. 25%)

Provide Ctb-1 Cove Base 6" X 6" At Floor Joint, Molded Inner & Outer Corners And Bullnose Finished Trim Tiles. Tile Joints To Align.

USE "SPECTRA LOCK PRO" EPOXY GROUT, COLOR: #44 BRIGHT WHITE, MANUFACTURED BY LATICRETE, FOR WALLS ONLY.

#### 2.03 TRIM AND ACCESSORIES

- A. Ceramic Accessories: Same color and finish as adjacent field tile; same manufacturer as tile.
- B. Porcelain Trim: Matching bullnose, cove base, cove, and corner trim ceramic shapes in sizes coordinated with field tile.
  - 1. Applications: Use in the following locations:
    - a. Open Edges: Bullnose.

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- b. Inside Corners: Jointed.
- c. Floor to Wall Joints: Cove base.
- 2. Manufacturer: Same as for tile.
- C. Non-Ceramic Trim: Brushed stainless steel, style and dimensions to suit application, for setting using tile mortar or adhesive.
  - 1. Applications: Use in the following locations:
    - a. Open edges of floor tile.
    - b. Transition between floor finishes of different heights.
      - 1) Tile/Terrazzo Transition: Schluter Systems Reno-U or approved equal.
      - 2) Tile/Carpet Transition: Schluter Systems Reno-TK or approved equal.
      - Expansion and control joints, floor and wall.
  - 2. Manufacturer:
    - a. Schluter-Systems: www.schluter.com.
    - b. Substitutions: See Section 01 60 00 Product Requirements.

#### 2.04 MORTAR MATERIALS

С

- A. Manufacturers:
  - 1. Basis of Design: Laticrete International, Inc.: www.laticrete.com.
  - 2. Bonsal American, Inc: www.sakrete.com
  - 3. Bostik Inc: www.bostik-us.com.
  - 4. Custom Building Products: www.custombuildingproducts.com.
  - 5. Substitutions: See Section 01 60 00 Product Requirements.
- B. Mortar Bed Materials: Portland cement, sand, latex additive and water.
- C. Mortar Bond Coat Materials:
  - 1. Latex-Portland Cement type: ANSI A118.4 and A118.11.
    - a. Thin-Set: One-step polymer fortified, thin-set mortar. Use at small size tile on flat surfaces. Laticrete 254 Platinum or approved equal.
      - 1) Shear Bond, Porcelain Tile, 28 day cure ANSI A118.4-1999; F-5.2.4: 500 psi (3.5 MPa).
      - 2) Shear Bond, Porcelain Tile, Water Immersion ANSI A118.4-1999; F-5.2.3 340 psi (2.3 MPa).
      - 3) Water Absorption ANSI A118.6-1999; H 4.4 4% max.
      - 4) Compressive Strength ANSI A118.4-1999; F-6.1: 5000 psi (34.5 MPa)
      - 5) TCNA Service Rating ASTM C-627: Extra Heavy
      - 6) Tensile Bond S 5980:1980 Class AA; 14 days: 1575 N (355 lbs)
      - 7) Shear Adhesion BS 5980:1980 Class AA; 14 days: 22.8 kN (5126 lbs)
      - 8) Coefficient of Linear Thermal Expansion ASTM C-531: 65x10-7 / Degrees F (117x10-7 / Degrees C)
      - 9) Color: T.B.D..
    - b. Medium Set: Polymer fortified dry-set mortar formulated for large-format tile. Mortar may be built up to 3/4". Use at large size tile and where necessary to allow for proper fit to sloped floor drains. Laticrete 220 Marble and Granite Mortar with Laticrete 3701 Mortar Admix.
      - 1) Compressive Strength: 5,000 psi (34.5 MPa), min. in accordance with ANSI A118.4.
      - 2) Hardness: 70 to 80, in accordance with ASTM D 2240 D-scale for 72 hours.
      - 3) Wet Density: 135 pcf (2166 kg/cu m), nominal, in accordance with ASTM C 905.
      - 4) Water Absorption: 5 percent, max. in accordance with ANSI A118.6; 1999 H-4.4.
      - 5) Surface Burning Characteristics: Flame spread and smoke developed indices of 0, in accordance with ASTM E 84, modified.
      - 6) Color: T.B.D.
      - 7) Color: T.B.D.
    - c. Thick-Bed Mortar: Polymer fortified blend made of factory-blended cement and

aggregates and polymers requiring only the addition of water; weather, frost, and shock resistant. Laticrete 3701 Fortified Mortar Bed or approved equal.

- 1) Compressive Strength: 4,000 5,000 psi min., in accordance with ANSI A118.7.
- 2) Water Absorption: 5 percent, maximum, in accordance with ANSI A118.7.
- 3) Flexural Strength: 1100 1200 psi in accordance with ANSI A118.7.
- 4) Shrinkage: 0.05% in accordance with ASTM C157.
- 5) TCNA Service Rating: Extra Heavy.

#### 2.05 GROUT MATERIALS

- A. Manufacturers:
  - 1. Basis of Design: Laticrete International, Inc.: www.laticrete.com.
  - 2. Bonsal American, Inc: www.sakrete.com
  - 3. Bostik Inc: www.bostik-us.com.
  - 4. Custom Building Products: www.custombuildingproducts.com.
  - 5. Substitutions: See Section 01-6000 Product Requirements.
- B. Epoxy Grout: ANSI A118.3, modified epoxy emulsion grout, color as selected from manufacturer's standard colors; use for all applications, except at kitchens and areas subject to harsh chemicals. Laticrete SpectraLOCK PRO Grout or approved equal.
  - 1. Water cleanability: Up to 80 minutes.
  - 2. Initial set: 2 hours.
  - 3. Service strength: 24 hours.
  - 4. Shrinkage: 0.25 percent.
  - 5. Quarry/quarry bond strength: 1,000 psi (6.9 MPa) Failure at tile.
  - 6. Compressive strength 3,500 psi (24 MPa) 7 days.
  - 7. Tensile strength 1,100 psi (7.6 MPa) 7 days.
  - 8. Thermal shock 510 psi (3.5 MPa).
  - 9. Water absorption: Less than 0.50 percent.
  - 10. Color: As selected by Architect from manufacturer's full range.
- C. Industrial Epoxy Grout: ANSI A118.3, Highly chemical resistant, industrial grade epoxy grout at kitchens and areas subject to harsh chemicals. 100 percent solids stain resistant, acid- and chemical-resistant, water cleanable. Laticrete SpectraLOCK 2000 IG or approved equal.
  - 1. Compressive Strength: 10,000 psi (69 MPa), min., in accordance with ANSI A118.5.
  - 2. Bond Strength: 620 psi (4.3 MPa), min., in accordance with ANSI A118.5.
  - 3. Thermal Shock Resistance: Complies with ANSI A118.3.
  - 4. Shrinkage and Sag Resistance: Complies with ANSI A118.5.
  - 5. Initial Set and Service Set Time: Complies with ANSI A118.5.
  - 6. Service Rating: Passing ASTM C 627 cycles 1-14 (TCNA "Extra Heavy").
  - 7. Color: As selected by Architect from manufacturer's full range.

#### 2.06 ACCESSORY MATERIALS

- A. Cleavage Membrane: No. 15 asphalt saturated felt.
- B. Waterproofing Membrane at Floors and Showers: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.
  - 1. Material: Single component, self-curing, liquid rubber polymer that forms a flexible, seamless waterproofing membrane that does not require the use of fabric in the field, coves or corners. Membrane shall function as a load-bearing waterproofing membrane and a crack isolation membrane.
    - a. TCNA Performance Level: Extra Heavy
    - b. Membrane shall contain anti-microbial protection.
    - c. 7 day hydrostatic test: Pass in accordance with ANSI A118.10
    - d. 7 day tensile strength: 265-300 psi in accordance with ANSI A118.10
    - e. 7 day water immersion: 95-120 psi in accordance with ANSI A118.10
    - f. 7 day shear bond: 200-275 psi in accordance with ANSI A118.10

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- g. 28 day shear strength: 214-343 psi in accordance with ANSI A118.10
- h. System crack resistance: Pass (high) in accordance with ANSI A118.12
- C. Crack Suppression and Anti-Fracture Membrane: Thin, fabric reinforced fluid-applied rubber membrane with capability of bridging non-structural cracks. Laticrete Blue 92 Anti-Fracture Membrane or approved equal.
  - 1. Service Rating: Passing ASTM C 627 cycles 1-14 (TCNA "Extra Heavy").
  - 2. System Crack Resistance ANSI A118.12 5.4: Pass at 1/8 inch (3 mm).
  - 3. Elongation ASTM D751- 89 17.1: 20- 30%.
  - 4. Breaking Strength (Cut Strip Method) ASTM D751:1700- 1900 Psi (11.72- 13.10 MPa).
  - 5. Nominal Dry Thickness LIL 1013- 92 0.020 inch (0.51mm).
  - 6. 28 Day Shear Strength ANSI A118.12 5.1.5: 125- 175 Psi (0.86- 1.6 MPa).
  - 7. Point Load ANSI A118.12 5.2: 3200- 3700 lbf (14- 16 kN).
- D. Reinforcing Mesh: 2 x 2 inch size weave of 16/16 wire size; welded fabric, galvanized.
- E. Cementitious Backer Board: ANSI A118.9; High density, cementitious, glass fiber reinforced, 1/2 inch thick; 2 inch wide coated glass fiber tape for joints and corners.
- F. Coated Glass Mat Backer Board: ASTM C 1178/C 1178M, with coated inorganic fiberglass mat on both surfaces and integral acrylic coating vapor retarder.
- G. Mesh Tape: 2-inch wide self-adhesive fiberglass mesh tape.
- H. Sealant: Single component neutral cure silicone sealant designed for exterior and interior applications for ceramic tile & stone applications.

#### PART 3 EXECUTION

#### 3.01 EXAMINATION

- A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.
- C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of setting materials to sub-floor surfaces.
- D. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.
- E. Verify that required floor-mounted utilities are in correct location.
- F. Do not proceed until the unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

#### 3.02 PREPARATION

- A. Protect surrounding work from damage.
- B. Vacuum clean surfaces and damp clean.
- C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.
- D. Install cementitious backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of dry-set mortar to a feather edge.
- E. Install tile backer board in strict accordance with manufacturer's instructions, using galvanized roofing nails or corrosion-resistant bugle head drywall screws. Bed fiberglass self-adhesive tape

at all joints and corners with material used to set tiles.

#### 3.03 INSTALLATION - GENERAL

- A. Install tile and grout in accordance with applicable requirements of ANSI A108.1 through A108.13, manufacturer's instructions, and The Tile Council of North America Handbook recommendations.
- B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.
  - 1. See drawings for tile patterns.
  - 2. Align joints when adjoining tiles on floor and base are the same size.
  - 3. Layout tile work and center tile fields both directions in each space or on each wall area. Adjust to minimize tile cutting.
  - 4. Provide uniform 1/8" joint widths for tiles up to 8" x 8" and 1/4" joints at larger tiles, unless otherwise shown.
- C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
- D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar, or excess grout.
- E. Form internal angles square and external angles bullnosed.
- F. Install ceramic accessories rigidly in prepared openings.
- G. Provide all transition pieces, trim, corners and ends as required to achieve a neat, finished project.
- H. Install non-ceramic trim in accordance with manufacturer's instructions.
- Ι. Sound tile after setting. Replace hollow sounding units.
- J. Keep expansion joints free of adhesive or grout. Apply sealant to joints.
- K. Allow tile to set for a minimum of 48 hours prior to grouting.
- L. Grout tile joints. Use standard grout unless otherwise indicated.
- M. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.

#### 3.04 INSTALLATION - FLOORS - THIN-SET AND MEDIUM-SET METHODS

- A. Over interior concrete substrates, install in accordance with TCNA Handbook Method F113, dryset or latex-portland cement bond coat, unless otherwise indicated.
  - 1. Where waterproofing membrane is indicated, install in accordance with The Tile Council of North America Handbook Method F122, with latex-Portland cement grout.
  - 2. Where epoxy or furan grout is indicated, but not epoxy or furan bond coat, install in accordance with The Tile Council of North America Handbook Method F115.

#### 3.05 INSTALLATION - FLOORS - MORTAR BED METHODS

- Α. Over interior concrete substrates, install in accordance with The Tile Council of North America Handbook Method F111, with cleavage membrane, unless otherwise indicated.
  - 1. Where waterproofing membrane is indicated, with standard grout or no mention of grout type, install in accordance with The Tile Council of North America Handbook Method F121.
  - 2. Where epoxy or furan grout is indicated, but not epoxy or furan bond coat, install in accordance with The Tile Council of North America Handbook Method F114, with waterproofing membrane.
- B. Cleavage Membrane: Lap edges and ends.
- C. Waterproofing Membrane: Install as specified in ANSI A108.13.

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D. Mortar Bed Thickness: 1-1/4 inch, unless otherwise indicated.

#### 3.06 INSTALLATION - WALL TILE & BASE

- A. Over coated glass mat backer board on studs, install in accordance with The Tile Council of North America Handbook Method W245.
- B. Over interior concrete and masonry install in accordance with The Tile Council of North America Handbook Method W202, thin-set with dry-set or latex-portland cement bond coat.

#### 3.07 TILE ACCESSORIES:

A. Apply control joint profiles at control joints in slab where indicated. Control joint locations shall be approved by Architect. Provide anti-fracture membrane at all control joints in new and existing slabs and where new slabs abut existing slabs. Anti-fracture membrane shall extend 6" to each side of control joint. Prime substrate and install in accordance with manufacturer's recommendations.

#### 3.08 EXPANSION JOINTS:

- A. Provide horizontal and vertical expansion joints per TCNA EJ171 as follows:
  - 1. At the perimeter of all spaces 8'-0" x 8'-0" and larger.
  - 2. At interior spaces not to exceed 20'-0" x 20'-0" in either direction.
  - 3. Verify expansion joint locations with the Architect prior to installation.

#### 3.09 CLEANING

A. Clean tile and grout surfaces. Remove all grout haze, observing tile manufacturer's recommendations as to use of acid and chemical cleaners. Rinse tile work thoroughly with clean water before and after using chemical cleaners.

#### 3.10 PROTECTION

- A. Protect tile in accordance with TCNA recommendations.
- B. Do not permit traffic over finished floor surface for 4 days after installation.
- C. Place large, flat boards in walkways and wheelways for 7 days, where use of newly tiled floor is unavoidable.
- D. Walls: Protect from impact, vibration and heavy hammering on adjacent and opposite walls for at least 14 days after installation, unless manufacturer's instructions allow a shorter period.
- E. Protect from food products and chemicals which can cause staining until acceptance by the Owner.
- F. Protect from freezing and total water immersion for at least 21 days after installation.
- G. Apply to all clean, completed tile walls and floors a protective coat of neutral cleaner solution, 1 part cleaner to 1 part water. In addition cover all tile floors with heavy-duty, non-staining construction paper, masked in place. Just before final acceptance of tile work, remove paper and rinse protective coat of neutral cleaner from all tile surfaces.

#### 3.11 SCHEDULE - See drawings I300's (to be provided with shop drawing review) and A500's.

#### END OF SECTION





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CIVIL PLANS PREPARED BY: HASS & HILDERBRAND, Inc. POST OFFICE BOX 3276 133 GREENVILLE STREET, SW AIKEN, S.C. 29802 (803) 649–1316

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24 26 27 ndicap access including Analysis States on historically historic preservation office there are no historically this site. I species on this site per the scdnr south Carolina rare, I species inventory map. species map of the usgs Jated January 17th, 2006. Vetlands on this site. I by the Valley Public Service Authority. I by the Valley Public Service Authority. The site there are no apparent archeological resources

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# FACILITY AND AUXILIARY SERVICES BUILDING

UNIVERSITY OF SOUTH CAROLINA AIKEN, SOUTH CAROLINA

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