PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included: Provide metal supports and fastenings, gypsum board, and related accessories specified.

1.02 RELATED DOCUMENTS

A. Applicable portions of the Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to the execution of the Contract, other documents listed in the Agreement and Modifications issued after the execution of the Contract shall apply to this Section. The general requirements for this work are located in Division 1 of the Specifications.

1.03 SUBMITTALS AND SUBSTITUTIONS

A. In accordance with Section 01 3000.

B. Substitutions will not be considered prior to the award of the General Contract.

1.04 QUALITY ASSURANCE

A. Qualifications of Installers: Use only skilled and experienced gypsum drywall installers. Fully supervise at all times helpers and apprentices used for drywall work with thoroughly skilled gypsum drywall installers.

B. Manufacturers' Recommendations: Manufacturers' recommended use of materials, fastenings, and methods of installation is basis for acceptance or rejection of drywall work where not specifically otherwise shown or detailed.

1.05 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
   1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
   2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

1.06 REFERENCE STANDARDS

A. ASTM E580, Suspension Systems in Areas Requiring Seismic Restraint.

B. ASTM C1396, "Gypsum Wallboard"

C. ASTM C840 Standard Specification for Application and Finishing of Gypsum Board

D. Gypsum Association publications:
   1. GA-214, "Recommended Levels of Gypsum Board Finish"
   2. GA-600, "Fire Resistance Design Manual".
   3. GA-800, "Materials Handling Manual".

1.07 FIRE RESISTANCE RATINGS AND IDENTIFICATION

A. Where gypsum drywall systems with fire resistance ratings are indicated or are required to comply with governing regulations, provide materials and installation methods identical to applicable assemblies which have been tested and listed by recognized authorities, including Underwriters Laboratories, Warnok-Hersey and Factory Mutual.

B. All joints in fire rated gypsum board construction are required to be taped and floated. This includes all joints in concealed and exposed partitions, ceilings and other applications where gypsum board is utilized as a fire barrier. All screws are to be floated over.
   1. Do not use self adhesive Tape at fire rated construction. Provide standard Tape and Drywall Mud.

C. All rated partitions are to extend to the underside of the roof or floor deck above and are to be sealed at the point of intersection with the deck in accordance with requirements of Section 07 8500, Firestopping.

1.08 PRODUCT HANDLING

A. Protection: Protect gypsum drywall materials before, during, and after installation. Protect installed work and materials of other trades.

B. Replacements: In event of damage, immediately make repairs and replacements necessary and at Contractor's expense.

PART 2 - PRODUCTS

2.01 GYPSUM MATERIALS

A. Manufacturers: Use products and materials by the following manufacturers:
   1. United States Gypsum
   2. National Gypsum Company
   3. Georgia-Pacific Company
   4. Temple-Inland, Inc.
   5. CertainTeed Gypsum

B. Gypsum Wallboard: Conform to ASTM C1396, have tapered edges and furnished in largest practical sheet size to minimize number of joints. Provide thickness indicated on Drawings.
   1. Fire Retardant Gypsum Board: Conform to U.L. Design Numbers listed on drawings for type and manufacturer.

C. Backerboard for Ceramic Tile:
   1. Provide 5/8 inch "Dens-Shield" by Georgia Pacific Company, Diamondback GlasRoc Tilebacker by CertainTeed., or approved equal. Furnish largest size sheets practical to minimize joints. Conform to manufacturer's instructions for installation given the conditions detailed on the drawings. Caulk all joints where backer board comes into contact with dissimilar material.

D. Mold Resistant Gypsum Board: Provide 5/8" USG - Mold Tough gypsum board, CertainTeed - M2Tech gypsum board, or approved equal complying with ASTM D3273, "Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
   1. To be used at Toilet Room walls (where there is no tile) and at the ceiling.
   2. Fire Retardant Type X where required.

2.02 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:
   1. Interior Gypsum Board: Paper.
   2. Exterior Gypsum Soffit Board: Paper.
   3. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
   4. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

2.03 WALL AND PARTITION FRAMING

A. Provide products by Steel Framing Industry Association Members in good standing (listing found at http://www.archtest.com/certification/SFIA_SteelFraming.aspx).

B. Provide type, size, gauge and physical properties as described by the manufacturers load and height tables and in accordance with the current local building code. All section properties shall be calculated in accordance with the AISI Specification for the Design of Cold-Formed Steel Structural Members (latest edition).

C. Structural calculations specifically related to this project and performed by the manufacturer's structural engineer will indicate depths, gages and spacings of studs required to meet deflection and load bearing requirements.

D. At all instances where radius steel stud and drywall construction is shown on drawings it is intended that the radius be smooth not faceted. Contractor is required to provide smooth face radius by whatever means necessary.

E. Runners: Match studs; type recommended by stud manufacturer for floor and ceiling support of studs, and for vertical abutment of drywall work at other work.

F. Install supplementary steel framing, blocking and bracing in the metal framing system wherever walls or partitions are indicated to support work requiring attachment to the wall or partition. Where type of supplementary support is not otherwise indicated, comply with the stud manufacturer's recommendations and industry standards in each case, considering the weight or loading resulting from the item supported.
   1. Screw attach blocking between studs for support of surface mounted items.
      a. Plumbing fixtures.
      b. Toilet partitions.
      c. Wall cabinets.
      d. Toilet accessories
      e. Hardware.
      f. Architectural woodwork.
      g. Grab bars.
      h. Handrails and railings.
      i. Signage.
      j. Other items requiring backing for attachment.

G. Deflection Track: Manufacturer’s single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal and lateral loads, as follows:
   1. Minimum Uncoated-Steel Thickness: Match stud thickness.
   2. Flange Width: Minimum 2”.

H. Structural slotted deflection track: Brady SLP-TRK® Sliptrack Structural System by Clark Dietrich, 800-543-7140, clarkdietrich.com, or approved equal.
   1. 1.5 mm (16 ga) thick, to ASTM A653/A653M, Grade 50 with a minimum yield point of 345 MPa 50,000 psi) thick,
   2. 18 ga or 20 ga thick per manufacturer’s recommendation, to ASTM A653/A653M, Grade 33 with a minimum yield point of 228 MPa (33,000 psi),
   3. 3 5/8” or 6” wide, depending on partition type. See Drawings.
   4. 3050 mm (10'-0") long
   5. 63 mm (2-1/2 inch) down-standing legs with 6 mm (1/4 inch) wide by 38 mm (1-1/2 inch) high slots spaced at 25 mm (1 inch) on center. Deeper leg tracks as required by metal building manufacturer.
   6. Galvanize to ASTM A924 / A924M, G60

I. Vertical Deflection Clips: Manufacturer’s standard clips, capable of isolating wall stud from upward and downward vertical displacement of primary structure.

J. Drift Clips: Manufacturer’s standard bypass or head clips, capable of accommodating upward and downward vertical displacement of primary structure.

K. Fasteners: Provide nut, bolts, washers, screws, and other fasteners with corrosion-resistant plated finish.

L. Electrodes for Welding: Comply with AWS Code and as recommended by stud manufacturer.

M. Galvanizing Repair: Where galvanized surfaces are damaged, prepare surfaces and repair in accordance with procedures specified in ASTM A 780.

2.04 ACOUSTICAL INSULATION

A. Provide unfaced Owens-Corning PINK Next Gen™ Fiberglas™ Sound Attenuation Batts (SAB), or approved equal complying with ASTM C 665, Type I.
   1. Combustion Characteristics: Passes ASTM E136.
   2. Flame Spread and Smoke Development: ASTM E84 <25/<50
   3. Fire Resistance Ratings: Part of ASTM E119 fire tested wall assemblies; or UL File #BKNV 3576 (Fire rated assemblies)
   4. Sound Transmission Class: ASTM C423

2.05 DIRECT CEILING SUSPENSION SYSTEMS

A. Grid Suspension System for Gypsum Board Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Armstrong World Industries, Inc.; Drywall Grid Systems.
      b. Chicago Metallic Corporation; Drywall Grid System.
      c. USG Corporation; Drywall Suspension System.

2.06 FASTENERS

A. Drywall Screws: Self-drilling type, 1" long for single layer application of gypsum board to metal studs and furring channels and of longer length for multiple layer installation.

B. Powder-Actuated Fasteners: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing per ASTM E 1190 conducted by a qualified testing agency.

2.07 ACCESSORIES

A. Corner Beads: 0.014 inch thick, hot dip galvanized steel with 1" flanges with 1/16" radius nose with large openings in flange similar to 5/8" diameter holes 7/8" on center.

B. Control and Expansion Joints: "Sheetrock" zinc control joint No.093 by USG, or approved equal. Provide safing and/or acoustical insulation behind control joints as required for adjacent partition construction. Use fire rated control joints in partitions requiring a fire rating.

C. RAR: Recessed Art Rail Reveal System
Manufacturer: Fry Reglet
Product: #DRMH-50
Notes: include hanger one clip insert per 24 linear inches of rail system

2.08 SOUND BARRIER MULLION TRIM CAP

A. Products: Subject to compliance with requirements, provide MULL-it-OVER Products; Sound barrier mullion trim cap systems. (616) 730-2162, www.mullitoverproducts.com

B. Sound Barrier Mullion Trim Cap: MULL-it-OVER Products; Mullion Trim Cap.
1. Profile: 55 Classic Mullion Trim Cap

C. Sound Transmission:
1. Single Sided Installations: STC 50 or higher.
2. Double-Sided Installations: STC 55 or higher.

D. Compressible Foam: Between edge of extrusion and interior face of curtain wall glass.
1. Thickness: Standard 1/2 inch, or 1 inch to accommodate a larger mullion deflection.

E. Finish for exposed surfaces of exposed aluminum extrusion:
1. Custom Finish: Custom anodized finishes and painted finishes available upon request.

2.09 ACCESS DOORS

A. Ceiling Access: Provide 24" x 24" Model FG glass fiber reinforced gypsum drywall access door as manufactured by Karp Associates, Inc., 1-800-888-4212 or approved equal. Door are to be flush mounted gypsum panels in a 5/8" thick frame.

PART 3 - EXECUTION

3.01 GENERAL PROVISIONS

A. Comply with specified requirements, manufacturer's instructions and recommendations, and referenced standards.

B. In cold weather, heat building to provide uniform temperature of 50 to 70 and provide ventilation to eliminate excess moisture.

C. Deliver materials to job in original unopened containers or bundles and store protected from damage and exposure to the elements.

D. Provide casing beads where edges of gypsum board meet dissimilar materials.

E. Cooperate with carpenters in placing of backing and blocking required for millwork, fixtures, fittings, and accessories.

F. Make cut-outs in panels for pipes, fixtures and small openings. Make holes and cut-outs by method that will not fracture wallboard core or tear covering. Cut holes with accuracy so plates, escutcheons and trim cover edges.

G. Seal cut edges, holes, and areas where wallboard covering is broken, with resistant sealer.

H. Install trim in strict accordance with manufacturers' recommendations. Install trim plumb, level, and true to line with firm attachment to supporting members.

I. At any change in direction of gypsum board, provide sufficient auxiliary framing, blocking or nailers to allow secure attachment along every edge of every individual piece of gypsum board. Do not leave any loose edges.

3.02 INSTALLATION OF METAL SUPPORT SYSTEMS

A. Do not bridge building expansion joints with support system, frame both sides of joints with furring and other support as indicated.

B. Ceiling Support Suspension System: Install in accordance with manufacturers recommendations.

C. Wall/Partition Support System
   1. Install supplementary framing, blocking and bracing to support fixtures, equipment, services, heavy trim, furnishings and similar work which cannot be adequately supported on gypsum board alone.
   2. Isolate stud system from transfer of structural loading to system, both horizontally and vertically. Provide slip or cushioned type joints to attain lateral support and avoid axial loading.
   3. Do not attach stud system to ductwork, piping, conduit, etc.
   4. Install runners (tracks) at floors, ceiling and structural walls and columns where gypsum drywall stud system abuts other work, except as otherwise indicated.
   5. Extend partition stud system through acoustical ceilings and elsewhere as indicated to the structural support and substrate above the ceiling as indicated. Install angle bracing at 4'0" on center from ceiling runner to structure above.
   6. Frame door openings with vertical studs securely attached by screws at each jamb either directly to frames or to jamb anchor slips on door frame; install runner track sections (for jack studs) at head and secure to jamb studs. Install angle bracing above ceiling to structural in each direction at strike side of door. Double studs at all door openings.
   7. Provide runner tracks of same gage as jamb studs. Space jack studs same as partition studs.
   8. Frame openings other than door openings in same manner as required for door openings; and install framing below sills of openings to match framing required above door heads. Opening for ductwork, piping must allow clearance for insulation, dampers, etc.
   9. Install wall/partition support system to maximum tolerances of 1/8" in 12'-0" measured horizontally and vertically.

10. At rated partitions, provide "5 sided" gypsum board enclosures where items (i.e. toilet accessories, electrical items, fire extinguisher cabinets, etc.) penetrate the surface of the wall, in order to maintain fire resistive integrity of the wall. Provide necessary related blocking.
    a. "5 sided" enclosures may be omitted where metal electrical backboxes not exceeding 16 square inches occur at one side only of a wall within a single stud cavity.
    b. In this case, provide fire stopping material described in Section 07 8500 to completely encompass the back box and its annular space.
    c. If 5 sided gypsum board enclosures are not to be provided at any fire rated partitions, all provisions for installation of electrical boxes in rated partitions as described by Underwriters Laboratories shall be adhered to AND prior approval shall be given in written form by the Architect.
11. Provide "5 sided" enclosures similar to those described above at all penetrations into "sound" partitions and insulated exterior walls regardless of size. The provisions for the omission of the 5 sided enclosures at certain fire rated partitions do not apply to these sound and exterior partitions.

3.03 GENERAL GYPSUM BOARD INSTALLATION REQUIREMENTS

A. Pre-Installation Conference: Meet at the project site with the installers of related work and review the coordination and sequencing of work to ensure that everything to be concealed by gypsum drywall has been accomplished, and that chases, access panels, openings, supplementary framing and blocking and similar provisions have been completed.

B. Install sound attenuation blankets where indicated, prior to gypsum board unless readily installed after board has been installed.

C. Locate exposed end-butt joints as far from center of walls and ceilings as possible, and stagger not less than 1'-0" in alternate course of board.

D. Install ceiling boards in the direction and manner which will minimize the number of end-butt joints, and which will avoid end joints in the central area of each ceiling. Stagger end joints at least 1'-0".

E. Install wall/partition boards vertically to avoid end-butt joints wherever possible. At stairwells and similar high walls, install boards horizontally with end joints staggered over studs. Do not butt boards to concrete floor. Maintain a minimum 1/4" to a maximum 3/8" space between bottom of board and concrete.

F. Install exposed gypsum board with face side out. Do not install imperfect, damaged or damp boards. Butt boards together for a light contact at edges and ends with not more than 1/16 inch open space between boards. Do not force into place.

G. Locate either edge or end joints over supports, except in horizontal applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Position boards so that like edges abut, tapered edges against tapered edges and mill-cut or field-cut ends against mill-cut or field cut ends. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions.

H. Attach gypsum board to framing and blocking as required for additional support at openings and cutouts. Space between recessed boxes and cut edges shall not exceed 1/8 inches.

I. Form control joints and expansion joints with space between edges of boards, prepared to receive trim accessories described below in article entitled "INSTALLATION OF DRYWALL TRIM ACCESSORIES".

J. Cover both faces of partition framing with gypsum board in concealed spaces (above ceilings, etc.) except in chase wall which are braced internally.

K. Space fasteners in gypsum boards in accordance with referenced standards and manufacturer's recommendations, except as otherwise indicated.

3.04 INSTALLATION OF CEILING ACCESS PANELS

A. General Contractor is required to coordinate locations and number of access panels with affected trades in order to minimize the number of access panels required.

B. Provide ceiling access panels in gypsum board ceilings as specified. Provide quantity required for access to the following items commonly found above the ceiling plain:
   1. Operable portion of fire, smoke and other dampers
   2. Valves and other operable portions of sprinkler system
   3. Valves to mechanical, domestic and other piping systems
   4. Mechanical devices
   5. Fire alarm devices
   6. Communication system devices and connection points
   7. Sanitary and storm sewer clean outs
   8. Also included are any other items located above an otherwise inaccessible ceiling that will require adjustment, maintenance, inspection, connection or replacement in whole or in part at any time after the initial installation of the item or the ceiling.

3.05 METHODS OF GYPSUM BOARD APPLICATION

A. On ceilings:
   1. Apply gypsum board prior to wall/partition board application to the greatest extend possible. For single-ply construction, use perpendicular application. For two-ply assembles use perpendicular application and apply face ply of gypsum board so that joints of face ply do not occur at joints of base ply with joints over framing members.
   2. Where screws are used, they shall be spaced not more than 12 in. o.c. for ceilings where the framing members are 16 in. o.c.

3. Screws shall be spaced not more than 12 in. o.c. for ceilings where framing members are 24 in. o.c.
4. For applications on wood or other applications, refer to Gypsum Association GA-216 for fastener type and spacing.

B. On partitions except shaft wall:
1. Use maximum length sheets practical to minimize end joints.
2. When gypsum board is installed parallel to framing members, space fasteners 12 inches on center in field of the board, and 8 inches on center along edges.
3. For applications on wood or other applications, refer to Gypsum Association GA-216 for fastener type and spacing.
4. When gypsum board is installed perpendicular to framing members, space fasteners 12 inches (304.8mm) on center in field and along edges.
5. Stagger screws on abutting edges or ends.
6. For single-ply construction, apply gypsum board with long dimension either parallel or perpendicular to framing members as required to minimize number of joints.
7. For two-ply gypsum board assemblies, apply base ply of gypsum board to assure minimum number of joints in face layer. Apply face ply of wallboard to base ply so that joints of face ply do not occur at joints of base ply with joints over framing members.

C. Wall Tile Base: Where drywall is base for thin set ceramic tile and similar rigid applied wall finishes, install gypsum backing board. At "wet" areas, install with un-cut long edge at bottom of work, and space 1/4" above fixture lips. Seal ends, cut-edges and penetrations of each piece with water resistant compound before installation.

3.06 INSTALLATION OF DRYWALL TRIM ACCESSORIES

A. General: Where feasible, use the same fasteners to anchor trim accessory flanges as required to fasten gypsum board to the supports. Otherwise, fasten flanges to comply with manufacturer's recommendations.

B. Install metal corner beads at external corners of drywall work. Corner beads are to be completely bedded and taped.

C. Install metal edge trim whenever edge of gypsum board would otherwise be exposed or semi-exposed, and except where plastic trim is indicated. Provide type with face flange to receive joint compound except where semi-finishing type is indicated. Install L-type trim where work is tightly abutted to other work, and install special kerf-type where other work is kerfed to receive long leg of L-type trim. Install U-type trim where edge is exposed, revealed, gasketed, or sealant-filled (including expansion joints).

D. Install metal control joints where indicated on drawings. If not indicated on drawings, install in accordance with the following:
1. Interior Partitions: Maximum Single Dimension not to exceed 20 feet. Maximum Single Area not to exceed 400 Sq. Ft.

2. Interior Ceiling With Perimeter Relief: Maximum Single Dimension not to exceed 40 feet. Maximum Single Area not to exceed 1,600 Sq.Ft. Install control joint at any change of direction of ceiling framing or support system.
3. Interior Ceiling Without Perimeter Relief: Maximum Single Dimension not to exceed 20 feet. Maximum Single Area not to exceed 400 Sq.Ft. Install control joint at any change of direction of ceiling framing or support system.

3.07 INSTALLING CEILING SUSPENSION SYSTEMS

A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
1. Hangers: 48 inches o.c.
2. Carrying Channels (Main Runners): 48 inches o.c.

B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.

C. Suspend hangers from building structure as follows:
1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.
2. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
4. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
5. Flat Hangers: Secure to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices and fasteners that are secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.
6. Do not attach hangers to steel roof deck.
7. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
8. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
9. Do not connect or suspend steel framing from ducts, pipes, or conduit.

D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.

E. Seismic Bracing: Sway-brace suspension systems with hangers used for support.

F. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.

G. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

3.08 JOINT TREATMENT AND FINISHING

A. General: Joint treatment for gypsum board surfaces is also described in Section 09 9000.

B. All joints in gypsum board construction are to be taped and floated. This includes work above ceilings, at concealed places and anywhere else joints in gypsum board construction occur.

1. All screw and/or nail heads are to be floated smooth both above and below ceiling line.

C. Finish Levels:

1. Level 1: At Ceiling plenum areas and concealed areas.
2. Level 2: At surfaces that are substrate for tile.
3. Level 3: At surfaces receiving medium (Orange Peel) or heavy (Knock-Down) texture finishes before painting or heavy wall coverings where lighting conditions are not critical.

4. Level 4 (Typical Finish): At surfaces receiving light (Semi-Smooth) textured finishes before painting or standard wall coverings or satin/eggshell paint or flat paint.

5. Level 5: At surfaces receiving gloss or semigloss enamels and/or other surfaces subject to severe lighting.

3.09 CLEANING UP

A. Do not allow accumulation of scraps and debris arising from work of this Section. Maintain premises in neat and orderly condition at all times. Immediately remove spilled or splashed compound material and all trace of residue from adjoining surfaces.

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Definition: Drywall shaft systems include special-purpose assemblies of gypsum boards and metal components designed for erection entirely from one side of shaft.

1.02 RELATED DOCUMENTS

A. Applicable portions of the Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to the execution of the Contract, other documents listed in the Agreement and Modifications issued after the execution of the Contract shall apply to this Section. The general requirements for this work are located in Division 1 of the Specifications.

1.03 SUBMITTALS AND SUBSTITUTIONS

A. In accordance with Section 01 3000.

B. Substitutions will not be considered prior to the award of the General Contract.

1.04 QUALITY ASSURANCE

A. Industry Standard: Comply with applicable requirements of GA-216 "Application and Finishing of Gypsum Board" by the Gypsum Association, except where more detailed or more stringent requirements are indicated including the recommendations of the manufacturer.

B. Allowable Tolerances: On faces of work exposed in occupied spaces, including stairwells (if any), limit offsets between planes of board faces to 1/8", and limit variation from plumb and location (including warp and bow) to 1/4" in 8'-0".

C. Fire Resistance Ratings: Provide drywall shaft systems which have fire resistance ratings indicated or required to comply with governing regulations, and which are identical in construction in forms of materials and installations to assemblies which have been tested and listed by recognized authorities, including UL.
   1. Comply with FM "Approval Guide" when applicable.
   2. Fire Resistance Rating as indicated on drawings.

D. Corridor partitions, smokestop partitions, horizontal exit partitions, exit enclosures, and fire walls shall be effectively and permanently identified with signs or stenciling in a manner acceptable to the authority having jurisdiction. Such identification shall be above any decorative ceiling and in concealed spaces. Suggested wording shall be approved by the authority having jurisdiction.

E. System Design Loading: Provide drywall shaft systems designed and tested by manufacturer to withstand the following lateral loadings (air pressures), applied continuously and cyclically, for maximum heights of partitions required, within the following deflections limits.
   1. Lateral Loading: As indicated but not less than 10 psf.
   2. Deflection Limit: As indicated but not less than 1/240 of partition height.

F. Sound Transmission Class: Provide drywall shaft systems designed and tested by manufacturer to achieve the following (minimum) STC rating (ASTM E 90).
   1. Rating: As indicated but not less than 35 STC.

1.05 PRODUCT HANDLING

A. Deliver drywall shaft system components and materials in sealed containers and bundles, fully identified with manufacturer's name, brand, type and grade; store in a dry, well ventilated space, protected from the weather, under cover and off the ground.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Provide drywall shaft system components produced by a single manufacturer selected from the following list:
   1. United States Gypsum
   2. National Gypsum Company
   3. Georgia-Pacific Company
   4. Temple-Inland, Inc.

2.02 BASIC SYSTEM MATERIALS

A. General: Except as otherwise indicated or required by governing regulations, provide the manufacturer's standard materials specified in his published product literature for the system and application required.

B. Metal Framing and Furring:
   1. Provide products by Steel Framing Industry Association Members in good standing (listing found at http://www.archtest.com/certification/SFIA_SteelFraming.aspx).
   2. Hot-dip galvanized steel, ASTM A 446, G 90 coating; except comply with ASTM C 645 for 25-gage members, provide electro-galvanized or hot-dip galvanized coating.

C. Gypsum Shaftwall Board: Manufacturer's special gypsum backing board or coreboard, of thickness and type indicated and as required to comply with system performance requirements.

D. Exposed Gypsum Board: ASTM C 36, Type X where required for fire-resistance rating. Long Edge Profile: Standard taper.

E. Drywall Trim Accessories: Provide manufacturer's standard trim accessories of types indicated for drywall work, formed of galvanized steel, with either knurled and perforated or expanded flanges for nailing or stapling, and beaded for concealment of flanges in joint compound. Provide corner beads, L-type edge trim-beads, U-type edge trim-beads, special L-kerf-type edge trim-beads, and one-piece control joint beads.

F. Joint Treatment Materials: ASTM C 475; type recommended by the manufacturer for the application indicated, except as otherwise indicated.
1. Joint Tape: Perforated type.
2. Joint Compound: Ready-mixed vinyl-type for interior use.
3. Grade: 2 separate grades; one specifically for bedding tapes and filling depressions, and one for topping and sanding.
4. Joint Compound: On interior work provide chemical-hardening- type for bedding and filling, ready-mixed vinyl-type or vinyl-type powder for topping.

G. Miscellaneous Materials: Provide auxiliary materials for gypsum drywall work of the type and grade recommended by the manufacturer of the system.
1. Laminating Adhesive: Special adhesive or joint compound specifically recommended for laminating gypsum boards.
2. Gypsum Board Fasteners: Comply with GA-216.

2.03 BASIC SYSTEM DESCRIPTION

A. General Requirements: The following descriptions indicate type of manufacturer's standard systems required; the descriptions are not intended to be comprehensive but to identify a discrete type of system. Provide a complete system, complying with requirements indicated. Modify and supplement manufacturer's standard system to comply with performance requirements, including those of governing regulations. Provide the depth, profile, gage, and anchorage system of metal support members recommended by manufacturer for heights and system design loading criteria indicated; provide runners, stiffeners, braces, and similar framing members required to form a complete system.

B. Cavity Shaftwall Systems: Provide shaftwall assemblies consisting of gypsum shaftwall boards inserted between U-shaped metal floor and ceiling tracks; specially-shaped studs engaged in tracks and fitted between shaftwall boards; and gypsum boards on finished side or sides applied to studs in number of layers, thicknesses and arrangement indicated.
1. Shaftwall Board Thickness: Not less than 1".
2. Stud Shape: I, C-H or double E.
3. Stud Size: As indicated.
4. Room-Side Finish: As indicated on drawings.
5. Shaft-Side Finish: As indicated on drawings.

PART 3 - EXECUTION

3.01 INSTALLATION OF DRYWALL SHAFT SYSTEMS

A. Preparations and Coordination
1. Pre-Installation Conference: Prior to the start of shaft system installation, meet at

the project site with the installers of related work including work requiring openings, chases, frames, access panels, support and similar integrated requirements including interference and conflicts, and coordinate layout and sequencing requirements for proper integration of the work.

2. Weather Exposure: Do not proceed with the installation of gypsum board until building is sufficiently enclosed and ambient conditions are adequately controlled to prevent moisture and weather deterioration of the work.

B. Installation of Basic System Components

1. General: Comply with the manufacturer's installation instructions. Comply with recognized industry standards for the installation of both lightgage metal framing and gypsum board, to the extent not specified by manufacturer's instructions. Anchor and fasten materials and components to comply with ratings and performance requirements, and to comply with governing regulations.
2. Do not bridge building expansion joints with drywall shaft system, frame both sides of joints with furring and other support as indicated.
3. Install supplementary framing, blocking and bracing to support fixtures, equipment, services, heavy trim, furnishings and similar work which cannot be adequately supported directly on gypsum drywall shaft system.
4. Isolate shaft system from transfer of structural loading to system, both horizontally and vertically. Provide slip or cushioned type joints to attain lateral support and avoid axial loading. Comply with details shown and with manufacturer's instructions.
5. Seal perimeter of each section of drywall shaft work where it abuts other work. Install a second bead of acoustical sealant in a location and manner which will prevent dislocation by air pressure differential between shaft and external spaces. Seal joints and penetrations in the work; comply with manufacturer's instructions.

C. Installation of Drywall Trim Accessories

1. General: Install metal trim accessories where room-side of drywall shaft system is indicated to receive drywall finish (tape and joint compound treatment), including spaces indicated for paint or wall coverings. Nail or staple the flanges of accessories in accordance with manufacturers instructions, and fasten integrally with gypsum board where possible. Apply trim wherever edge of gypsum board would otherwise be exposed or semi-exposed, including terminations of the work, openings in the work, external corners, expansion and control joints and similar edges, both exposed and abutting other work. Miter-cut corners of exposed trim accessories, and spline-reinforce from behind to eliminate offsets and misalignments.
2. Install L-type trim where board edges abut other work without space or reveal.
3. Install U-type trim where board edges are indicated for sealant or gasket application, or would otherwise be exposed (special kerf-type where kerf is provided to receive trim).
4. Install J-type semi-finishing trim where shown.
5. Install control-joint trim (beaded type) where indicated.

3.02 INSTALLATION OF DRYWALL FINISHING

A. Where room-side of drywall shaft work is indicated to receive drywall finish, including spaces indicated for paint or wall coverings, provide exposed boards with tapered edges and recessed fastener heads, ready for drywall finishing. Otherwise, for unfinished work, edge profile of exposed boards is Installer's option, except comply with requirements for fire-resistance and STC ratings.

B. Apply treatment at gypsum board joints (both directions), flanges of trim accessories, penetrations, fasteners heads, surface defects and elsewhere as required to prepare work for decoration. Prefill open joints and rounded or beveled edges, using type of compound recommended by manufacturer.
   1. Apply joint tape at joints between gypsum boards, except where a trim accessory is indicated.
   2. Apply joint compound in 3 coats (not including prefill of opening in base), and sand between last 2 coats and after last coat.
   3. Refer to sections on painting, coatings and wall-coverings in Division 9 for decorative finishes to be applied to drywall work.

3.03 PROTECTION OF WORK

A. Installer shall advise Contractor of required procedures for protecting drywall work from damage and deterioration during remainder of construction period.

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included: Furnish and install tile specified on floors and walls shown.

1.02 RELATED DOCUMENTS

A. Applicable portions of the Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to the execution of the Contract, other documents listed in the Agreement and Modifications issued after the execution of the Contract shall apply to this Section. The general requirements for this work are located in Division 1 of the Specifications.

1.03 SUBMITTALS AND SUBSTITUTIONS

A. In accordance with Section 01 3000.

B. Substitutions will not be considered prior to the award of the General Contract.

1.04 QUALITY ASSURANCE

A. Obtain each color, grade, finish, type, composition, and variety of tile from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.

B. Obtain ingredients of a uniform quality from one manufacturer for each cementitious and admixture component and from one source or producer for each aggregate.

C. Engage an experienced Installer who has successfully completed tile installations similar in material, design, and extent to that indicated for Project.

D. Install ceramic tile in accordance with recommendations contained in "Handbook for Ceramic Tile Installation" of the Tile Council of America, Inc., latest edition.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirement of ANSI A137.1 for labeling sealed tile packages.

B. Prevent damage or contamination to materials by water, freezing, foreign matter, and other causes.

C. Handle tile with temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If despite these precautions coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

1.06 PROJECT CONDITIONS

A. Maintain environmental conditions and protect work during and after installation to comply with referenced standards and manufacturer's printed recommendations.

B. Vent temporary heaters to exterior to prevent damage to tile work from carbon dioxide buildup.

C. Maintain temperatures at 50 F (10 C) or more in tiled areas during installation and for 7 days after completion, unless higher temperatures are required by referenced installation standard or manufacturer's instructions.

1.07 EXTRA MATERIALS

A. Deliver extra materials to Owner. Furnish extra materials that match products installed as described below, packaged with protective covering for storage and identified with labels clearly describing contents.
   1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed but a minimum of 12 pieces, for each type, composition, color, pattern, and size.

PART 2 - PRODUCTS

2.01 PRODUCTS, GENERAL

A. ANSI Standard for Ceramic Tile: Comply with ANSI A137.1 "American National Standard Specifications for Ceramic Tile" for types, compositions, and grades of tile indicated. Furnish tile complying with "Standard Grade" requirements unless otherwise indicated.

B. ANSI Standard for Tile Installation Materials: Comply with ANSI standard referenced with products and materials indicated for setting and grouting.

C. Conform to ADA requirements for slip resistance by providing minimum coefficients of sliding friction of 0.6 COF for horizontal surfaces and 0.8 COF for ramps and other sloped surfaces.

D. Factory blending: For tile exhibiting color variations within the ranges selected during sample submittals, blend tile in factory and package accordingly so that tile units taken from one package show the same range in colors as those taken from other packages and match approved samples.

2.02 TILE PRODUCTS

A. PT1: Porcelain Tile
Manufacturer: Nasco Stone+Tile
Pattern/Color: Dorado/Beige/Matte Finish
Size: 24” x 48” x 3/8”
Installation: 1/3 offset
Grout Joint: minimum recommended by manufacturer
Grout: Laticrete Spectralock Pro Epoxy Grout, color: Natural Grey #24
Notes: Refer to Finish Plans for layout

B. PT1B: Porcelain Tile Base
Manufacturer: Nasco Stone+Tile
Pattern/Color: Dorado/Beige/Matte Finish
Size: 6” x 48” x 3/8” factory cut
Grout Joint: minimum recommended by manufacturer
Grout: Laticrete Spectralock Pro Epoxy Grout, color: Natural Grey #24
Notes: Refer to elevations for joint alignment method

C. DT1: Decorative Tile
Manufacturer: Trinity Tile
Pattern/Color: Pattrice/Mossy Sage Matte
Size: 3” x 14”
Grout Joint: minimum recommended by manufacturer
Grout: Laticrete Spectralock Pro Epoxy Grout, color: Natural Grey #24
Notes: Refer to elevations for joint alignment method

D. DT2: Decorative Tile
Manufacturer: Nasco Stone + Tile
Pattern/Color: Flatiron/Bianco Glossy
Size: 2” x 9”
Grout Joint: minimum recommended by manufacturer
Grout: Laticrete Spectralock Pro Epoxy Grout, color: Natural Grey #24
Notes: Refer to elevations for joint alignment method

E. CT1: Ceramic Tile
Manufacturer: Contractor’s Selection
Pattern/Color: Dark Grey
Size: 4”x4”
Grout Joint: minimum recommended by manufacturer
Grout: Laticrete Spectralock Pro Epoxy Grout, color: TBD

2.03 SETTING MATERIALS

A. Thin-Set Applications at All Non-Wet Area Floors (TCA F115): Latex-Portland Cement Mortar: ANSI A118.4, composition as follows: Prepackaged dry mortar mix composed of portland cement, graded aggregate, and the manufacturer's standard dry polymer additive in the form of a re-emulsifiable powder to which only water is added at job site.

B. Thin-Set Applications at All Wet Area Floors and Upper Level Toilet Room Floors (TCA F122): Latex-Portland Cement Mortar: ANSI A118.4, composition as follows: Prepackaged dry mortar mix composed of portland cement, graded aggregate, and the manufacturer's standard dry polymer additive in the form of a re-emulsifiable powder to which only water is added at job site.
   1. Laticrete 9235, Ardex 8+9, or approved equal.

C. Thin-Set Applications at All Wet Area Walls (TCA W244): Latex-Portland Cement Mortar: ANSI A118.4, composition as follows: Prepackaged dry mortar mix composed of portland cement, graded aggregate, and the manufacturer's standard dry polymer additive in the form of a re-emulsifiable powder to which only water is added at job site.
   1. Laticrete 9235, Ardex 8+9, or approved equal.

D. Thin-Set Applications at All Non-Wet Area Walls (TCA W243): Latex-Portland Cement Mortar: ANSI A118.4, composition as follows: Prepackaged dry mortar mix composed of portland cement, graded aggregate, and the manufacturer's standard dry polymer additive in the form of a re-emulsifiable powder to which only water is added at job site.

2.04 SETTING MATERIALS FOR LARGE TILE

A. Any tile with at least one dimension over 15" is considered to be Large. Setting method is the same as for normal size tile except as follows:
   1. A LFT (Large Format Tile) mortar is required.
   2. All cracks in the concrete substrate will receive a crack isolation membrane.
   3. If extensive cracking is evident, a full coverage isolation sheet will be required.
   4. At Wet Areas and Upper Level Toilet Rooms, provide waterproof membrane.
      a. Waterproofing: Laticrete 9235, Ardex 8+9, or approved equal.

B. Materials:
   1. Self-leveler: TEC 318 or Ardex V1200 , Self Leveling Underlayment
   2. Crack Isolation Membrane: ANSI A118.12; TEC 317 Roll-On
   3. Medium Bed Mortar: Provide TEC 384/385 3N1 or Ardex A38

C. Installation:
   1. Tile: TCA F125 Partial or F125 Full as required by condition of substrate.
   2. Crack Isolation Membrane: ANSI A108.17

D. Substrate Preparation:
   1. Max. allowable variation is 1/8" in 10' with no more than 1/16" variation in 24" measured from the high points.
   2. Slab is to have a steel trowel and fine broom finish free of curing compounds.

2.05 GROUTING MATERIALS

A. Provide products to suit specific project requirements in accordance with TCA Handbook and as follows.
   1. Epoxy Grout: ANSI A118.3. Laticrete SpectraLOCK PRO, Ardex WA, or approved equal. Grout color to be selected from manufacturer's complete color line.

2.06 MISCELLANEOUS MATERIALS

A. Transition Accessories:
PT to CPT/WOS: Schluter, profile: Schiene, finish: TBD
DT outside corner: Schluter, profile: Jolly, finish: TBD
PT to LVT: Schluter, profile: Reno-U, finish: TBD
PT1B base: Schluter, profile: Jolly, finish: TBD

B. Provide other materials, not specifically described but required for complete and proper tile installation, selected by Contractor subject to approval of Architect.

C. Expansion Joints: In accordance with TCA Method EJ171.

D. Sealant: ASTM C920; TEC 155, AccuColor 100, or Ardex SX 100% Silicone

2.07 MIXING MORTARS AND GROUT

A. Mix mortars and grouts to comply with requirements of referenced standards and manufacturers including those for accurate proportioning of materials, water, or additive content; type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other procedures needed to produce mortars and grouts of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and areas where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
1. Verify that substrates for setting tile are firm, dry, clean, and free from oil or waxy films and curing compounds.
2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.

B. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Blending: For tile exhibiting color variations within the ranges selected during sample submittals, verify that tile has been blended in factory and packaged accordingly so that tile units taken from one package show the same range in colors as those taken from other packages and match approved samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

3.03 INSTALLATION, GENERAL

A. ANSI Tile Installation Standard: Comply with parts of ANSI 108 series of tile installation standards included under "American National Standard Specifications for the Installation of Ceramic Tile" that apply to type of setting and grouting materials and methods indicated.

B. TCA Installation Guidelines: TCA "Handbook for Ceramic Tile Installation"; comply with TCA installation methods indicated.

C. Extend tile work into recesses and under or behind equipment and fixtures to form a complete covering without interruptions except as otherwise shown. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so that plates, collars, or covers overlap tile.

E. Jointing Pattern: Unless otherwise shown, lay tile in grid pattern. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths unless otherwise shown.

F. Lay out tile wainscots to next full tile beyond dimensions indicated.

G. Expansion Joints: Locate expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated during installation of setting materials, mortar beds, and tile. Do not saw cut joints after installation of tiles.
   1. Locate joints in tile surfaces directly above joints in concrete substrates.
   2. Provide expansion and control joints at not more than 15 feet o.c., at all expansion and control joints in the concrete subfloor and where otherwise recommended by the "Handbook for Ceramic Tile Installation" of the Tile Council of America.
   3. Movement joints shall be provided throughout the tile and work will conform to ANSI Specification A108.01-3.7; A108.02 B 4.4.and TCA Details EJ171.
   4. Seal all joints in accordance with requirements of Section 07 9000.

H. Grout tile to comply with the requirements of the following installation standards:
   1. ANSI A108.

3.04 WATERPROOFING FOR TILE INSTALLATIONS

A. Install waterproofing in compliance with waterproofing manufacturer's instructions to produce a waterproof membrane of uniform thickness bonded securely to substrate.

B. Do not install tile over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

C. Turn membrane up at perimeter of floor a minimum of 6".

3.05 INSTALLATION METHODS

A. Conform to TCA Handbook for installation on various substrates shown on drawings, using materials listed in Part 2 of this Specification Section.

B. Metal Edge Strips: Install at locations indicated or where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with top of tile.

3.06 CLEANING AND PROTECTION

A. Cleaning: Upon completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
   1. Remove grout residue from tile as soon as possible.
   2. Unglazed tile may be cleaned with acid solutions only when permitted by tile and grout manufacturer's printed instructions, but no sooner than 14 days after installation. Protect metal surfaces, cast iron, and vitreous plumbing fixtures from effects of acid cleaning. Flush surface with clean water before and after cleaning.

B. Finished Tile Work: Leave finished installation clean and free of cracked, chipped, broken, unbonded, and otherwise defective tile work.

C. Provide final protection and maintain conditions in a manner acceptable to manufacturer and installer that ensures that tile is without damage or deterioration at time of Substantial Completion.
   1. When recommended by tile manufacturer, apply a protective coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.
   2. Prohibit foot and wheel traffic from tiled floors for at least 7 days after grouting is completed.

D. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

A. Work includes: Furnish necessary materials, labor and equipment required to prepare designated areas and install Epoxy Terrazzo Flooring System.

1.02 RELATED DOCUMENTS

A. Applicable portions of the Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to the execution of the Contract, other documents listed in the Agreement and Modifications issued after the execution of the Contract shall apply to this Section. The general requirements for this work are located in Division 1 of the Specifications.

1.03 SUBMITTALS AND SUBSTITUTIONS

A. In accordance with Section 01 3000.

B. Substitutions will not be considered prior to the award of the General Contract.

C. Manufacturer's product data for each type of terrazzo and accessory, including the following. System will be evaluated on the basis of these standards. For tests not listed in published data, manufacturer shall supply missing data according to referenced standard.
   1. Physical properties.
   2. Performance properties.
   3. Specified tests.
   4. Material Safety Data Sheet.
   5. Manufacturer’s standard warranty.

D. Shop Drawings: Include terrazzo fabrication and installation requirements. Include plans, elevations, sections, component details, and attachments to other Work. Show layout of the following:
   1. Divider and control - and expansion-joint strips. Includes back-to-back control joints; strips at terrazzo base on masonry walls to align with masonry control joints.
   2. Base and border strips.
   3. Abrasive Strips.
   4. Stair treads, risers, and landings.
   5. Precast terrazzo jointing and edge configurations including anchorage details.
   6. Large scale details of terrazzo patterns and metal or other material inserts.
   7. Terrazzo base.

E. Samples of Verification: Match Architect's samples for each type, material, color, and pattern of terrazzo and accessory required showing the full range of color, texture, and pattern variations expected. Label each terrazzo sample to identify manufacturer’s matrix color and aggregate types, sizes, and proportions. Prepare samples of same thickness and

from same material to be used for the Work in size indicated below:

1. Epoxy Terrazzo: minimum 6" x 6" sample of each color and type of terrazzo.
2. Accessories: submit a 6" length of each kind of divider strip, stop strip or control joint required.
3. Full-profile: 12" wide samples of combination tread/riser, with cast-in nosing.

F. Manufacturer Experience: Furnish list of at least five (5) epoxy terrazzo projects using material being submitted for this project installed during the past five (5) years of the same scope, complexity and at least 50% of the square footage, including the same items as in (G.) Below.

G. Installer certificates: Submit proof of Contractor and Epoxy Supplier Membership in N.T.M.A.

H. Qualification Data: Terrazzo Contractor Experience: Furnish list of at least five (5) epoxy terrazzo projects using material specified for this project or similar that contractor has installed during the past five (5) years of the same scope, complexity and at least 50% of the square footage, including the following:

1. Project name.
2. Square footage of terrazzo base and cast in place base.
3. Address of facility with contact name and phone number.
4. Contact name, address and phone number of prime contractor or construction manager.
5. Contact name, address and phone number of prime contractor or construction manager.
6. Field experience resumes of key project personnel including lead supervisor and field technicians to be used on this project.

I. Material Test Reports: For epoxy terrazzo and moisture test.

J. Material Certificates: For epoxy terrazzo, in lieu of material test reports, when permitted by Architect, signed by manufacturers.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer (applicator) who is acceptable to epoxy terrazzo manufacturer to install manufacturer’s products.

1. Terrazzo Contractor Qualifications: Use resin manufacturer certified terrazzo contractor with at least five (5) years satisfactory experience in installation of resinous epoxy terrazzo with proof of N.T.M.A. membership. Terrazzo contractor shall demonstrate experience during last five (5) years of at least three (3) projects of comparable scope and complexity of at least 50% of total square footage of this project. (See experience criteria in Submittals section.)

B. Source Limitations:

1. Obtain primary Epoxy Terrazzo Flooring System materials including membranes, primers, resins, and hardening agents from a single manufacturer with documented experience providing resinous ground terrazzo flooring, and proof of N.T.M.A. membership.

2. Obtain aggregates, solvents and other secondary materials from source recommended by manufacturer of primary materials.

C. Pre Installation Conference: Conduct conference at Project site. Review methods and procedures related to terrazzo including, but not limited to, the following:
1. Inspect and discuss installation procedures, joint details, jobsite conditions, substrate specification, vapor barrier details and coordinate with other trades.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review special terrazzo designs and patterns.
4. Review dust-control procedures.
5. Review plans for concrete curing and site drying to enable timely achievement of suitable slab moisture conditions.
6. Review sequence of installation of all components including curing / setting times.

D. N.T.M.A. Standard: Comply with N.T.M.A. Guide Specification and written recommendations for terrazzo type indicated unless more stringent requirements are specified.

E. Mockups: Install mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution.
1. For epoxy terrazzo, install mockups of at least 100 sq. ft. of typical flooring and base condition for each color and pattern in locations directed by Architect.
2. Approved mockups may become part of the completed work if undisturbed at time of Substantial Completion.
3. Provide sample of adhesives used to attach accessories to floor slab.

1.05 WARRANTY

A. Terrazzo contractor jointly with manufacturer shall furnish standard guarantee of Epoxy Terrazzo Flooring System for one year after installation. This labor and material guarantee includes loss of bond and damage due to normal wear and tear.

B. Not included is damage due to bubbling or loss of adhesion due to moisture penetration through the substrate, Acts of God or other elements beyond scope of protection of this system. Also excluded are reflective cracks from substrate.

C. In case of warranty claim, owner will notify manufacturer and terrazzo contractor in writing within 30 days of first appearance of any problems which are covered under this warranty, and will provide free access to area during normal working hours. Property protection is also the owner's responsibility. Remedy is limited to direct repair of Epoxy Terrazzo Flooring System.

1.06 MATERIAL DELIVERY, HANDLING AND STORAGE

A. Primary system materials shall be delivered in manufacturer's undamaged, unopened containers. Each container shall be clearly marked with the following:
1. Product name

2. Manufacturer's name
3. Component designation (A or B, etc.)
4. Ratio of component mixture
5. CHEMTREC Emergency Response Information

B. Handle materials by methods which prevent damage.

C. Inspect direct jobsite deliveries to assure that quantities are correct and that materials comply with requirements and are not damaged.

D. Replace, at no cost to Owner, material found to be defective in manufacturing or that was damaged in transit, handling or storage.

E. Store materials per manufacturer's instructions and as follows:
1. Seals and labels shall be intact and legible.
2. Temperature of storage area shall be maintained between 55° F and 90° F.
3. Do not use materials which have been stored for a longer period of time than the manufacturer's maximum recommended shelf life.

1.07 PROJECT CONDITIONS

A. Terrazzo contractor shall, prior to surface preparation:
1. Evaluate slab condition, including slab moisture content and extent of repairs required, if any.
2. Test concrete substrates according to ASTM F2170 (Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes). Do not install terrazzo or terrazzo accessories until test results are 80% or less RH. If 80% RH is not met, consult terrazzo manufacturer for additional drying or negative side moisture mitigation methods.

B. Prior to and during each day of installation, the terrazzo contractor shall verify that the dew point is at least 5° F less than the slab and air temperature.

C. Protect surrounding substrates and surfaces, as well as in-place equipment and including aluminum doors and window frames from damage during surface preparation and system application.

D. Job area shall be free of other trades during surface preparation, crack detailing, divider strip installation, terrazzo pouring, and for a period of 36 hours upon completion. Provide adequate floor protection or keep all traffic off terrazzo floor after installation begins.. Once polished, job area shall be free of other trades until 36 hours minimum after completion of seal coat.

E. General contractor or construction manager shall insure that drains in installation area must be working and raised or lowered to actual finish elevation of terrazzo.

F. General contractor or construction manager shall provide ventilation by use of fans or other devices.

G. The general contractor or construction manager shall maintain lighting at minimum uniform level of 50-60 foot candles in areas where terrazzo system is being installed. If possible, schedule terrazzo installation so that permanent lights will be in place and working during installation.

H. General contractor or construction manager shall ensure that leaks from pipes and other sources are corrected prior to flooring installation.

I. General contractor or construction manager shall provide minimum substrate and atmospheric temperature of 55° F during stripping and pouring and until 48 hours after completion of pouring. General contractor or construction manager shall not allow substrate or air temperature to fall below 40° F after terrazzo has been poured.

J. General contractor or construction manager shall provide protection from other trades prior to final acceptance of owner to prevent scratches, gouges, chips, stains, etc.

PART 2 - PRODUCTS

2.01 EPOXY TERRAZZO

A. Thickness: The system shall be installed at a thickness of 3/8" unless otherwise indicated.

B. Materials:
1. Epoxy Resin: Manufacturer's standard recommended for use indicated and in color required for mix indicated.
   a. Physical Properties without Aggregates:
      1. Hardness: ASTM-D-2240 70-85 Shore D
      2. Minimum Tensile Strength: 4,800 psi per ASTM D 638 for a 2" specimen made using a "C" die per ASTM D 412.
      3. Minimum Compressive Strength: 12,000 psi per ASTM D 695, Specimen B cylinder.
      4. Chemical Resistance: No deleterious effects by contaminants listed below after 7-day immersion at room temperature per ASTM D 1308.
         a. Distilled water
         b. Mineral water
         c. Isopropanol
         d. Ethanol
         e. 0.025 percent detergent solution
         f. 1% percent soap solution
         g. 10 percent sodium hydroxide
         h. 10 percent hydrochloric acid
         i. 5 percent acetic acid
   b. Physical Properties with Aggregates: For resin blended with Georgia White marble, ground, grouted, and cured per requirements on N.T.M.A.'s Guide Specification for Epoxy Terrazzo, comply with the following:
      1. Flammability: Self-extinguishing, maximum extent of burning 0.25" per ASTM D 635.

2. Linear Coefficient of Thermal Expansion: 25.0×10^{-6} in/in per ^{o}F for temperature range of -12^{o} to 140^{o} per ASTM D 696.
3. Bond Strength: When tested in accordance with Field Test Method for surface soundness and adhesion as described in ACI Committee No. 403 Bulletin Title 59-43 (Pages 1139-1141) the Epoxy Terrazzo shall comply with the following value: 100% concrete failure minimum, with 300 PSI minimum tensile strength.

2. Marble Chips, Granite, Glass, Synthetic and Mother of Pearl:
   a. Sizes shall be #2's, #1's, and #0's, conforming to N.T.M.A. gradation standards.
   b. Abrasion and Impact resistance when testing in accordance with ASTM C 131-89 shall not exceed 40% loss.
   c. Weight gain upon 24-hour immersion in water not to exceed 0.75%.
   d. Chips shall contain no deleterious or foreign matter.
   e. Dust content less that 1% by weight.
   f. Label bags legibly with correct name and size of chip.

C. Terrazzo Schedule:

1. TZ1: Terrazzo, Color 1
   Manufacturer: T&M Supply
   Thickness: 3/8”
   Mix: TBD; custom aggregate mix of standard chip sizes (0 through 3) in a customized percentage by design team, assume 20% of total percentage to be premium chip type (such as Mother of Pearl Fresh Water or Glass); custom colored epoxy to be determined by design team
   Notes: 1/8” Brass divider strip; refer to Finish Plans for layout

2. TZ2: Terrazzo, Color 2
   Manufacturer: T&M Supply
   Thickness: 3/8”
   Mix: TBD; custom aggregate mix of standard chip sizes (0 through 3) in a customized percentage by design team, assume 20% of total percentage to be premium chip type (such as Mother of Pearl Fresh Water or Glass); custom colored epoxy to be determined by design team
   Notes: 1/8” Brass divider strip; refer to Finish Plans for layout

3. TZ3: Terrazzo, Color 3
   Manufacturer: T&M Supply
   Thickness: 3/8”
   Mix: TBD; custom aggregate mix of standard chip sizes (0 through 3) in a customized percentage by design team, assume 35% of total percentage to be premium chip type (such as Mother of Pearl Fresh Water or Glass); custom colored epoxy to be determined by design team
   Notes: 1/8” Brass divider strip; refer to Finish Plans for layout

4. TZB: Integral terrazzo base
   Manufacturer: T&M Supply
   Mix: match TZ1
   Notes: 6”H, with brass top cap

2.02 DIVIDER AND ACCESSORY STRIPS

A. Thin –Set Divider Strips: L-type and T-type.
   1. Material: Half hard brass
   2. Top Width: 1/16 inch.

B. Heavy-Top Divider Strips: Angle type in depth required for topping thickness indicated.
   1. Bottom-Section Material: Matching top-section material.
   2. Top-Section Material: White zinc alloy, unless otherwise indicated.
   3. Top-Section Width: 1/8 inch unless otherwise indicated.

C. Control joint Strips: Separate, double L-type divider strips, positioned back to back with 3/8 inch separation filled will sealant.

D. Accessory Strips: Match divider-strip width, material, and color unless otherwise indicated
   1. Base bead and base dividers.
   2. Edge beads for exposed edges of terrazzo.

E. Nosings for Stair Treads and Landings: Extruded aluminum, with abrasive filler consisting of aluminum oxide, silicon carbide, or a combination of both, in an epoxy-resin binder.
   1. Fabricate nosings in sizes and configurations indicated and in uninterrupted lengths necessary for an accurate fit.
      a. For Precast Treads and Landings: Apply clear lacquer to concealed bottoms, sides, and edges of extruded units set into precast terrazzo units.
   2. Available Manufacturers and Products:
      a. Wooster Products Inc. Type 128 with Time Saver Anchor.
      b. Balco Inc.
   3. Nosings: Square-back units, 1-7/8 inches wide with 1-1/8 inches lip, for casting into terrazzo steps.
   4. Provide anchors welded to underside of nosing for embedding units in terrazzo

2.03 MISELLANEOUS PRODUCTS

A. Concrete Patch and Topping: 100 percent solids fill mortar system including blended aggregate.
   1. Compressive Strength: ASTM C579, 8,000 psi minimum.
   2. Hardness: ASTM D2240, 75-80 Shore D

B. Moisture Remediation System: Two-component formulation designed to reduce moisture vapor transmission through concrete and provide bond with epoxy terrazzo flooring system.
   1. Adhesion: ASTM D4541, 500 psi (3.5 mPA).
   2. Moisture Vapor Transmission: ASTM E96, 0.131 perm.

C. Primer: 100 percent solids, epoxy primer moisture insensitive. No solvent containing primers are allowed
   1. Moisture Vapor Transmission: ASTM E96, 1 perm maximum.

D. Crack Isolation Membrane
   1. Flexible Epoxy Membrane: Flexible epoxy membrane with 100 percent solids with the following properties:
      a. Tensile Strength: ASTM D2370 at 68° F 1,500 psi
      b. Elongation: ASTM D2370 at 68° F 130 percent.
      c. Adhesion: ASTM D4541, 350 psi

E. Membrane Reinforcing: Fiberglass mesh reinforcement fabric compatible with crack isolation membrane.

F. Divider-Strip Adhesive: Epoxy-resin adhesive recommended by adhesive manufacturer for this use and acceptable to terrazzo manufacturer.
   1. Use adhesive that has a VOC content of 50g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

G. Anchoring Devices:
   1. Strips: Provide mechanical anchoring devices for strip materials as required for secure attachment to substrate.
   2. Precast Terrazzo: Provide mechanical anchoring devices as recommended by Terrazzo Contractor for proper anchorage and support of units for conditions of installation and support.

H. Finishing Grout: Epoxy grout with 100 percent Solids.

I. Control Joint Filler: Flexible, grindable, epoxy joint filler, 100 percent solids, with the following properties:
   1. Tensile Strength: ASTM D2370 at 68° F 1,600 psi
   2. Elongation: ASTM D2370 at 68° F 100 percent
   3. Tensile Modulus: ASTM D2370 at 68° F 27,800 psi
   4. Color: As selected by the Architect.

J. Joint Sealant: Flexible sealant as recommended by flooring manufacturer.

K. Expansion Joints: As shown

L. Terrazzo Cleaner: As recommended by cleaner manufacturer for use on terrazzo type specified and as follows:
   1. Biodegradable
   2. Chemically neutral
   3. pH factor between 7 and 10
   4. Free from phosphate, crystallizing salts, and water soluble alkaline salts.

M. Terrazzo Sealer and Finishing: 3M™ Stone Floor Protection System
   1. 3M™ Easy Trap Duster
   2. 3M™ Neutral Cleaner Concentrate
   3. Scotch-Brite™ Purple Diamond Floor Pad Plus
   4. 3M™ Red Buffer Pad 5100
   5. 3M™ Trizact™ Diamond HX Discs

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions, including levelness tolerances, have been corrected. Examine areas to receive terrazzo for:
   1. Defects in existing work that affect proper execution of terrazzo work.
   2. Deviations beyond allowable tolerances for the concrete slab work.
   3. Age (minimum 30 days) and moisture content of concrete slab. If concrete substrate moisture exceeds 80% according to ASTM F2170 (Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes), consult terrazzo manufacturer for additional drying or negative side moisture mitigation methods.
   4. Start work only when all defects are corrected.

3.02 PREPARATION

A. Clean substrates of substances that might impair epoxy terrazzo bond, including oil, grease, and curing compounds.

B. Provide clean, dry, and neutral substrate for terrazzo application. Determine dryness characteristics by performing moisture tests recommended by terrazzo manufacturer.
   1. Concrete: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with epoxy terrazzo.
      a. Prepare concrete substrate to open surface pores by means of vacuum shotblasting or with a terrazzo grinder, dry with coarse diamond stones with a vacuum unit. Surface preparation results should achieve a CSP3-CSP5 profile according to International Concrete Repair Institute Guideline No. 03732. Remove all contaminating or bond breaking substances including, but not limited to dust, laitance, curing compounds, coatings, sealers, oil, grease and carpet or vinyl mastics or adhesives. Any oil or grease not removed by vacuum blasting must be chemically removed. All spalled or deteriorated concrete should be mechanically removed by chipping hammers. Acid etching is not acceptable.
      b. Repair or level damaged concrete with Epoxy Fill Mortar. Latex fills or self leveling underlayments are not acceptable.
      c. Cracks and non-expansion joints greater than 1/16" wide after surface preparation shall be prepared until sound.

C. Protect other work from dust generated by grinding operations. Control dust to prevent air pollution and comply with environmental protection regulations.
   1. Erect and maintain temporary enclosures and other suitable methods to limit dust migration and to ensure adequate ambient temperatures and ventilation conditions during installation.

D. Install moisture suppression system.

3.03 EPOXY TERRAZZO INSTALLATION WITH CRACK DETAILING

A. **TYPICAL INSTALLATION**
   1. Comply with N.T.M.A.'s written recommendations for terrazzo and accessory installation.
   2. Place, rough grind, grout, cure grout, fine grind, and finish terrazzo according to manufacturer's written instructions and N.T.M.A.'s Guide Specification for Epoxy Terrazzo.
   3. Ensure that matrix components and fluids from grinding operations do not stain terrazzo by reacting with divider and control-joint strips.
   4. Delay fine grinding until heavy trade work is complete and construction traffic through area is restricted.

B. Divider and Accessory Strips: Install in locations indicated, in adhesive setting bed, without voids below strips.

C. Control-Joint Strips: Install back to back, directly over concrete control and non-doweled construction joints, leaving a space appropriate for anticipated movement - typically 1/4" - 3/8". Fill gap between control joints with Flexible Epoxy Joint Sealant.

D. Cracks and Non-Expansion Joints.
   1. Type 1 - Hairline cracks shall be filled with epoxy primer and receive detail coat of epoxy primer with 6" fiberglass tape.
   2. Type 2 - Fill cracks greater than hairline but less that 1/16" wide after surface preparation with epoxy primer or Membrane. Place detail coat of Membrane over crack and embed 12" wide fabric. Lightly abrade or solvent wipe treated cracks prior to applying primer.
   3. Type 3 - Fill cracks greater that 1/16" with Membrane. Place 25-30 mil detail coat so that Membrane extends at least 9" to 12" on each side of crack or joint. After Membrane has leveled, lay precut Fabric into wet Membrane. Smooth cloth with flat steel trowel, allowing cloth to be encapsulated but remain exposed on the surface of Membrane. Lightly abrade or solvent wipe treated cracks prior to applying primer. Allow in base bid for above crack detailing as follows - 5% of lineal footage of total project square footage for combined Type 1 & 2, and 3% of lineal footage for Type 3. {i.e., a 10,000 sq. ft. project would allow for a combined 500 lineal feet of Type 1 & 2 repairs and 300 lineal feet of Type 3 repairs.}

E. Install moisture suppression system.

F. Primer: Apply epoxy evenly over prepared substrate, cracks and non-expansion joints at the rate of 200-300 square feet per gallon for normal concrete, to thoroughly wet surface, but avoiding ponding the material. (Highly porous concrete may require additional material.)

G. Placing Terrazzo:
1. Mix terrazzo binder with chips and fillers in ratios as approved by manufacturer.
2. Trowel apply terrazzo mixture over epoxy primer to provide smooth seamless surface as a minimum of 3/8" thick. Allow cure per manufacturer's recommendations prior to grinding operations.

H. Rough Grinding: Grind with 24 or finer grit stones or with comparable diamond plates.

I. Intermediate Grinding: Follow initial grind with 80 or finer grit stones.

J. Grouting:
1. Cleanse floor with clean water and rinse thoroughly.
2. Remove excess rinse water by wet vacuum and machine until completely dry.
3. Apply epoxy grout to fill voids.

K. Fine Grinding: Grind with 120 grit stones until all grout is removed from surface. Repeat rough grinding, grout coat, and fine grinding if large voids exist after initial fine grinding. Produce surface with a minimum of 70 percent aggregate exposure.

L. Remove and replace terrazzo areas that evidence lack of bond with substrate. Cut out terrazzo areas in panels defined by strips and replace to match adjacent terrazzo.

M. Construction Tolerances: Limit variation in terrazzo surface from level to 1/4" in 10 feet.

3.04 CLEANING AND PROTECTING

A. Upon completion, the work shall be ready for final inspection and acceptance by the Owner or his agent. The general contractor or construction manager shall protect the floor from the time the terrazzo contractor begins the work until he requests final inspection.

B. Sealing:
1. Seal surfaces according to NTMA's written recommendations.
2. Apply sealer according to sealer manufacturer's written instructions.
3. Apply finish coat according to manufacturer's written instructions.
4. Buff and polish to final sheen. Cover and protect floor for duration of construction until Substantial Completion.
5. Terrazzo contractor to include a final trip to clean and buff floor when directed by Contractor prior to final acceptance by Owner.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general conditions of Contract, including General and Supplementary Conditions and Divisions-1 Specification sections apply to work of this section

1.2 SUMMARY

A. Section Includes

1. Solid Wood and Wood veneer ceiling panels
2. Exposed grid suspension system
3. Wire hangers, fasteners, main runners, wall angle moldings and accessories.

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM):

1) ASTM A 1008 Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability

2) ASTM A 641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire

3) ASTM A 653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process

4) ASTM C 423 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method

5) ASTM C 635 Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings

6) ASTM C 636 Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels

7) ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials

8) ASTM E 580 Installation of Metal Suspension Systems in Areas Requiring Moderate Seismic Restraint

9) ASTM E 1264 Classification for Acoustical Ceiling Products

B. Hardwood Plywood & Veneer Association (HPVA)

C. International Building Code

D. ASHRAE Standard 62 1 2004 Ventilation for Acceptable Indoor Air Quality

E. NFPA 70 National Electrical Code

F. ASCE 7 American Society of Civil Engineers, Minimum Design Loads for Buildings and Other Structures

G. International Code Council-Evaluation Services - AC 156 Acceptance Criteria for Seismic Qualification Testing of Non-structural Components

H. International Code Council-Evaluation Services Report - Seismic Engineer Report

1. ESR 1308 - Armstrong T-Bar or Dimensional Suspension

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's technical data for each type of ceiling unit and suspension system required.

B. Installation Instructions: Submit manufacturer's installation instructions as referenced in Part 3, Installation.

C. Samples: Minimum 3-1/2 inch or 5-1/2 inch samples of specified panel; 8 inch long samples of exposed wall molding and suspension system, including main runner.

D. Shop Drawings: Illustrating the layout and details of the ceilings. Show locations of items that are to be coordinated with, or supported by the ceilings.
E. Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards.
F. All products not conforming to manufacturer's current published values must be removed and dispose. Replace with complying product at the expense of the Contractor performing the work.

1.5 QUALITY ASSURANCE

A. Single-Source Responsibility: Provide ceiling panel units and grid components by a single manufacturer.
B. Fire Performance Characteristics: Identify ceiling components with appropriate markings of applicable testing and inspecting organization.
1. Surface Burning Characteristics: As follows, tested by HPVA (Hardwood Plywood and Veneer Association) under the test standard ASTM E-84 tunnel test and complying with ASTM E 1264 for Class A products.
a. Flame Spread: 25 or less
b. Smoke Developed: 50 or less
C. Woodworking Standards: Manufacturer must comply with specified provisions of Architectural Woodworking Institute quality standards.
D. Coordination of Work: Coordinate ceiling work with installers of related work including, but not limited to building insulation, wet work i.e. gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.

1.6 DELIVERY, STORAGE AND HANDLING

A. Store the wood veneer ceiling panels in a dry interior location in their cartons prior to installation to avoid damage. Store the ceiling panel cartons in a flat, horizontal position. Do not remove the protectors between the panels until installation.
B. Do not store in unconditioned spaces with humidity greater than 55 percent or lower than 25 percent relative humidity and temperatures lower than 50 degrees F or greater than 86 degrees F. Do not expose the wood veneer ceiling panels to extreme temperatures, for example, close to a heating source or near a window with direct sunlight.
C. Handle ceiling units carefully to avoid chipped edges or damage to units in any way.

1.7 PROJECT CONDITIONS

A. Prior to installation, the wood veneer ceiling materials are required to reach room temperature and have stabilized moisture content for a minimum of 72 hours.
B. Do not install the wood veneer panels in spaces where the temperature or humidity conditions vary greatly from the temperatures and conditions that will be normal in the occupied space.
C. As interior finish products, the wood veneer panels are designed for installation in temperature conditions between 50 degrees F and 86 degrees F, in spaces where the building is enclosed and HVAC systems are functioning and will be in continuous operation. Relative humidity should not fall below 25 percent or exceed 55 percent.

1.8 WARRANTY

A. Wood Veneer Panel: Submit a written warranty executed by the manufacturer, agreeing to repair or replace panels that fail within the warranty period. Failures include, but are not limited to:
1. Ceiling Panels: Defects in materials or factory workmanship
2. Grid System: Rusting and manufacturing defects
B. Warranty Period:
1. Wood veneer panels: One (1) year from date of installation

2. Grid: One (1) year from date of installation

C. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

1.9 MAINTENANCE

A. Extra Materials: Deliver extra materials to Owner. Furnish extra materials described below that match products installed. Packaged with protective covering for storage and identified with appropriate labels.

1. Ceiling Units: Furnish quantity of full-size units equal to 5.0 percent of amount installed.

2. Exposed Suspension System Components: Furnish quantity of each exposed suspension component equal to 2.0 percent of amount installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Ceiling Panels:

1. Armstrong World Industries, Inc.

B. Suspension Systems:

1. Armstrong World Industries, Inc.

2.2 CEILING AND WALL PANELS

A. SWS1:
Manufacturer: Armstrong
System: Woodworks Grille System, Forte Ceiling Panel with BioAcoustics backing
Size: 12” x 96” and 12” x custom length, 3/4" slat width X 3 1/4" slat height, 4 slats per panel
Finish: custom species/stain to match SWV and/or PL1 (06 4000); submit samples for approval

B. SWS2:
Manufacturer: Armstrong
System: Woodworks Grille System, Forte Wall Panel with BioAcoustics backing
Size: 12” x 96” and 12” x custom length, 3/4" slat width X 2 1/4" slat height, 4 slats per panel
Finish: custom species/stain to match SWV and/or PL1 (06 4000); submit samples for approval
Note: Wall Application; refer to drawings for details

C. SWP:
Manufacturer: Armstrong
System: Woodworks Concealed System, 24” x 96”, W2 perforation, Black Fiberglass Infill Panel
Finish: Constants Walnut
Notes: At wall application, install on Z-clip system as detailed; refer to drawings for direction information

2.3 METAL SUSPENSION SYSTEMS

A. Components:

Main beams and cross tees, base metal and end detail, fabricated from commercial quality hot dipped galvanized steel complying with ASTM A 653. Main beams and cross tees are double-web steel construction with type exposed flange design. Exposed surfaces chemically cleansed, capping prefinished galvanized steel in baked polyester paint. Main beams and cross tees shall have rotary stitching.

a. Structural Classification: ASTM C 635 Heavy Duty duty

b. Color: Black and match the actual color of the selected ceiling tile, unless noted otherwise.

c. Acceptable Product: PRELUDE XL 15/16" Exposed Tee as manufactured by Armstrong World Industries

B. Attachment Devices:

Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.

C. Wire for Hangers and Ties:

ASTM A 641, Class 1 zinc coating, soft annealed, with a yield stress load of at least time three design load, but not less than 12 gauge.

D. Wood Works Edge Moldings and Trim:

E. WoodWorks Suspension Accessories:

PART 3 – EXECUTION

3.1 EXAMINATION

A. Do not proceed with installation until all wet work such as concrete, terrazzo, plastering and painting has been completed and thoroughly dried out.

B. Proper designs for both supply air and return air, maintenance of the HVAC filters and building interior space are essential to minimize soiling. Before starting the HVAC system, make sure supply air is properly filtered and the building interior is free of construction dust.

3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders, and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures.

3.3 INSTALLATION

A. Install suspension system and panels in compliance with ASTM C636; CISCA Seismic Guidelines; approved construction drawings; with the authorities having jurisdiction; and in accordance with the manufacturer's installation instructions.

B. Install wall moldings at intersection of suspended ceiling and vertical surfaces.

3.4 ADJUSTING AND CLEANING

A. Replace damaged and broken panels.

B. Clean exposed surfaces of ceilings panels, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch up of minor finish damage. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included: Furnish and install suspension systems, ceiling boards, panels and tiles, and accessories required for complete installation of acoustical ceilings specified.

1.02 RELATED DOCUMENTS

A. Applicable portions of the Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to the execution of the Contract, other documents listed in the Agreement and Modifications issued after the execution of the Contract shall apply to this Section. The general requirements for this work are located in Division 1 of the Specifications.

1.03 SUBMITTALS AND SUBSTITUTIONS

A. In accordance with Section 01 3000.

B. Substitutions will not be considered prior to the award of the General Contract.

1.04 APPLICABLE STANDARDS

A. American Society for Testing and Materials:
   1. ASTM C 635, "Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings".
   2. ASTM C 636, "Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels".
   3. ASTM E 84, "Surface Burning Characteristics of Building Materials".
   4. ASTM E 580, "Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint"
   5. International Building Code, Section 16, Suspended Ceilings (Seismic Restraint)

1.05 SEISMIC RESTRAINT REQUIREMENTS

A. Based upon seismic design analysis described in IBC. Refer to Code Data for Seismic Category.

B. Category A or B: Ceiling installation should conform to basic minimums established in ASTM C636.

1.06 PRODUCT HANDLING

A. Protection: Protect suspended acoustical ceiling materials before, during, and after installation. Protect installed work and materials of other trades.

B. Replacements: In event of damage, immediately make repairs and replacements necessary and at Contractor's expense.

1.07 EXTRA MATERIALS

A. Deliver extra materials to Owner. Furnish extra materials, totaling 3% of the total installed, matching products installed as described below, packaged with protective covering for storage and identified with labels clearly describing contents.

PART 2 - PRODUCTS

2.01 ACOUSTICAL CEILING BOARDS

A. Ceiling Schedule:

A1: Armstrong Optima Square Tegular, 9/16” grid, 12” x 96”
A2: Armstrong Optima Square Tegular, 9/16” grid, 24” x 24”
A3: Armstrong Dune Square Lay-in, 15/16” grid, 24” x 24”
A4: Armstrong Clean Room VL Square Lay-in, 15/16” grid, 24” x 24”
A5: Armstrong Tectum Direct-Attach, various sizes, refer to RCP’s, exposed edges beveled & finished
A7: Turf Datum Acoustic Blade, 11.25”H x 48”L, 72”L, 96”L, color: 48 Light Brown

B. Accessories:
Axiom Trim, 6”H
Axiom 9/16” Shadow Reveal Mold
Axiom 9/16” Flush Acoustic to Drywall Transition

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

A. Examine surfaces and conditions affecting proper installation of acoustical materials. Do not proceed until unsatisfactory conditions are corrected.

B. Do not start acoustical ceiling work until glazing is completed and exterior openings are enclosed.

C. All wet work, including concrete and masonry work must be completed and dried out before work is started.

D. Do not install acoustical materials unless uniform temperature in spaces where acoustical tile work is performed is at least 60E F. during and after installation.

E. Install acoustical ceilings, complete, including component parts necessary to suspend systems from structure.

F. Install suspension systems to permit border units of greatest possible size where not full size.

G. Following installation, clean soiled and discolored surfaces. Remove and replace units damaged or improperly installed.

H. For any units that do not have square edges and must be cut for any reason, install edge angle or "T" at same elevation as other supporting members and make a field cut in the same profile as the factory edge or splice in a factory edge. Paint cut edges or splice joints to match giving a visually flawless result.

END OF SECTION

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general conditions of Contract, including General and Supplementary Conditions and Divisions-1 Specification sections apply to work of this section.

1.02 SUMMARY

a) Section Includes

1) Acoustical ceiling panel

2) Wire hangers, fasteners, main runners, cross tees, and wall angle moldings

3) Perimeter Trim

1.03 REFERENCES

a) American Society for Testing and Materials (ASTM):

1) ASTM A 1008 Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability

2) ASTM A 641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire

3) ASTM A 653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process

4) ASTM C 645 Standard Specification for Metal Suspension Systems

5) ASTM C 636 Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels

6) ASTM C754 AND C1858 All installations should be in compliance with these tests.

7) ASTM D 3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber

8) ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials

9) ASTM E 580 Installation of Metal Suspension Systems in Areas Requiring Moderate Seismic Restraint

10) ASTM C 423 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method

11) ASTM E 1414 Standard Test Method for Airborne Sound Attenuation between Rooms Sharing a Common Ceiling Plenum

12) ASTM E 1264 Classification for Acoustical Ceiling Products

13) ASTM E3090 All references to suspension component property testing per this test method.

b) B. International Building Code

c) C. ASHRAE Standard 62.1-2004, Ventilation for Acceptable Indoor Air Quality

d) D. NFPA 70 National Electrical Code

e) E. ASCE 7 American Society of Civil Engineers, Minimum Design Loads for Buildings and Other Structures

f) International Code Council-Evaluation Services - AC 156 Acceptance Criteria for Seismic Qualification Testing of Non-structural Components

g) International Code Council-Evaluation Services Report - Seismic Engineer Report

a. 1. ESR 1289 - Armstrong Suspension Systems

1.04 SYSTEM DESCRIPTION

Continuous/Wall-to-Wall or Cloud installation

1.05 SUBMITTALS

a) **Shop Drawings:** Layout and details of ceilings. Show locations of items that are to be coordinated with, or supported by the ceilings.

b) **Installation Instructions:** Submit manufacturer's installation instructions as referenced in Part three, Installation.

c) **Product Data:** Submit manufacturer's technical data for each type of ceiling unit and suspension system required.

d) **Samples:** Minimum 6 x 6 inch samples of specified panel; 8 inch long samples of exposed wall molding and suspension system, including main runner and 4 foot cross tees.

e) **Certifications:** Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards.

f) **Non-Conformance:** All products not conforming to the requirements of this specification and or the manufacturer's published values are to be disposed. The Contractor performing the work will replace with approved product at their expense.

1.06 QUALITY ASSURANCE

a) Single-Source Responsibility: Provide acoustical panel units and grid components by a single manufacturer.

b) Fire Performance Characteristics: Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.

c) Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with ASTM E 1264 Classification.

d) Acoustical Panels: As with other architectural features located at the ceiling that may obstruct or skew the planned fire sprinkler pattern through possibly delay or accelerate the activation of the sprinkler or fire detection systems by channeling heat from a fire either toward or away from the device. Designers and installers are advised to consult a fire protection engineer, NFPA 13, or their local codes for guidance where automatic fire detection and suppression systems are present.

e) Coordination of Work: Coordinate acoustical ceiling work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers. ACOUSTIBuilt Panels are 7/8" thick.

f) Installer Qualification: Subcontractor is an experienced Installer that has reviewed and understands the system installation instructions thoroughly. Subcontractor will follow written installation instructions and utilize approved equipment and procedures for finishing installation.

g) ACOUSTIBuilt is finished to a level 4 drywall finish equivalent. Installing ACOUSTIBuilt requires special attention to finishing details. Light coves and low angle lighting will exaggerate imperfections. Mock-ups and hands-on training are strongly recommended.

1.07 DELIVERY, STORAGE AND HANDLING

a) Deliver acoustical ceiling units to project site in original, unopened packages/crates and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.

b) Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content. Store all material within temperature limits required by manufacturer.

c) Handle acoustical ceiling units carefully to avoid chipping edges or damaged units in any way.

1.08 PROJECT CONDITIONS

a) Space Enclosure:

1) Building areas to receive ceilings shall be free of construction dust and debris. ACOUSTIBuilt panels should be installed in areas where the building is enclosed and the HVAC is continuously functioning. This product is not recommended for exterior applications, where standing water is present, or where moisture will come into direct contact with the ceiling.

i. HVAC should be designed, installed, and operated in accordance with ASHRAE Standard 62.1. It is also necessary for the area to be enclosed, for the HVAC systems to be functioning, and in continuous operations for the life of the product. Product is not intended for use where natural ventilation is part of the ventilation strategy and not recommended in areas where a differential plenum pressure exists.

1.09 WARRANTY

a) Acoustical Panel: Submit a written warranty executed by the manufacturer, agreeing to repair or replace panels that fail within the warranty period. Failures include, but are not limited to the following:

a. Acoustical Panels: Manufacturer's defects in material

b. Grid System: Rusting and manufacturer's defects

b) Warranty Period:

a. Acoustical panels: Ten (10) years from date of substantial completion

b. Suspension: Ten (10) years from date of substantial completion

c) The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

a) Basis of Design ACOUSTIBuilt:

a. Armstrong World Industries, Inc.

b) Finish

a. Joint Compound Finish by Others

b. Spray Applied Finish by Armstrong World Industries, Inc.

c) Suspension Systems

a. Armstrong World Industries, Inc.

d) Perimeter Trim Systems

a. Armstrong World Industries, Inc.

e) Soffit Construction

a. Armstrong World Industries, Inc. Drywall Grid SimpleSoffit™

2.02 ACOUSTICAL CEILING UNITS

A. A8: Seamless Acoustical Drywall
Manufacturer: Armstrong
Product: Acoustibuilt #2604
Trim Accessories: Axiom One-Piece Drywall Trim 6"H, ½" Wall Reveal at Ceiling to Wall Transitions
Finish: Paint TBD
Installation Note: use mesh tape at AcoustiBuilt to One-Piece flange to create seamless appearance

a) Finish

1. Joint Compound

a. Setting Compound: Lightweight setting-type drywall joint compound, Ultra lightweight drying-type drywall joint compound

b. Joint Tape: Self-Adhesive mesh drywall joint tape (Panel to Panel)

1. Use Setting Type Compound for initial coats and use Drying Type Compound for final coats per the installation instructions. DO NOT use any other type of drywall compound such as All-Purpose Compound.

2. Paper tape at the wall intersection

2. Spray Applied Finish – Required Product: #2605WH Fine Texture Finish for ACOUSTIBuilt panels – White as manufactured by Armstrong World Industries.

b) Suspension Systems

1. Armstrong Drywall Suspension Systems all main beams and cross tees shall be commercial quality hot-dipped galvanized steel
    i. Main beam: manufactured main beam- 1-1/2" knurled face with ScrewStop™ reverse hem by 1-11/16 inches high. Drywall Main Beams are factory punched with cross tee routs, hanger wire holes, and SuperLock™ main beam clip for a strong secure connection and fast accurate alignment. Drywall Main Beams are Heavy-duty performance per ASTM C635
    ii. HD8906 - 12ft HD Drywall Main Beam 1-1/2 in
2. Cross Tees: manufactured cross tee- 1-1/2" knurled face with ScrewStop™ reverse hem by 1-1/2 inches high with factory punched cross tee routs and hanger wire holes and XL stake on clip for a strong secure connection.
    i. XL8945P - 4ft Drywall Cross Tee
3. Wall Molding:
    i. KAM12 - 12ft Knurled Angle Molding 1-1/4" Face
4. Hanger wire: a Class 1 zinc coating, soft temper, pre-stretched, with a yield stress load of at least time three times the design load, but not less than 12-gauge.
5. Fasteners (for Panel attachment)
    i. #6 x 1-5/8” Fine thread drywall screws
    ii. Recommended Adhesives: Loctite PL Premium Polyurethane Construction Adhesive, OSI F38 Drywall Panel Adhesive.
6. Perimeter Systems
    i. Commercial quality extruded aluminum alloy 6063 trim channel, factory finished in baked polyester paint. Commercial quality galvanized steel unfinished T-bar connection clips; galvanized steel splice plates.
        1. Color: White
        2. Size: 120 in X 4 in (also available in 6”)
        3. Recycle Content: Post-Consumer - 50% Pre-Consumer - 0%
        4. Acceptable Product: AXIOM One Piece for Drywall, 4in Straight – AX1PC4STR or Curved AX1PC4CUR as manufactured by Armstrong World Industries
    ii. Axiom Trim Channel:
        1. AX4STR 4in Axiom Classic Straight
        2. AX1PC4STR 4IN One –Piece Drywall Trim

iii. Axiom Bottom Trim with taping flange

1. AXBTASTR – Bottom Trim for ACOUSTIBuilt (also available in curved)

iv. Axiom Accessories:

1. AXSPLICE - Splice Plate

c) Material Ingredient Transparency: Health Product Declaration (HPD); Declare Label

d) Life Cycle Assessment: Third Party Certified Environmental Product Declaration (EPD)

PART 3 – EXECUTION

3.01 GENERAL

a) Prior to installation, contact your Armstrong Installation Systems Specialist (ISS). Before installation, inspect previous work of all other trades. Verify that all work is complete and accurate to the point where this installation may properly proceed in strict accordance with framing shop drawings.

b) If framing preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

c) The system installation is similar to a conventional drywall installation. However, there are key differences in both material substrate and methods of finishing and installation that make this system unique. Installers should review and follow all written directions of the installation instructions and view the installation video.

d) Installation: In accordance with all approved plans, details, and manufacturer's installation guidelines located in the Armstrong ACOUSTIBuilt Assembly and Installation Instructions (BPLA-299099), and Drywall Grid Systems Hanging and Framing Flat Ceilings Installation Guides (BPCS3539) .

1. Install seismic components if required by the building code. Seismic components to be specified on the architectural plans by the project engineer or design team.
2. Suspend main beam from overhead construction with hanger wires spaced 4-0 ft. on center along the length of the main runner. Install hanger wires plumb and straight.
3. 48” Cross tees shall be installed 16” on center. Extra cross tees are required at 72” every 12’. All 4 panel edges must be supported by a grid main or tee.
4. Install wall moldings/perimeter trim at intersection of suspended ceiling and vertical surfaces
5. Main runners and cross tees shall be attached at perimeter conditions
6. When determining the grid layout, consider the long edges of the boards must run parallel with the mains.
7. This system relies on a square grid system to ensure panel edges align at centers of cross tees. If the installation does not meet these squareness requirements, the panel edges may run off the grid system.
    i. The system must be square to within 1/8" over a 48" x 48" module.
    ii. The suspension system must be leveled to within 1/4" in 10'.

8. Floating perimeters must be trimmed with either Axiom® One-Piece Drywall Trim or Axiom® Classic with Bottom Trim for ACOUSTIBuilt™. Refer to the installation instructions for integration with ACOUSTIBuilt installations.
9. Install access doors where plenum access is required. Refer to the RCP for the location)

3.02 PREPARATION

a) Do not proceed with installation until all wet work such as concrete, terrazzo, plastering and painting has been completed and thoroughly dried out, unless expressly permitted by manufacturer's printed recommendations.

b) Coordination: Furnish layouts for preset inserts, clips, and other ceiling anchors whose installation is specified in other sections.

c) Furnish concrete inserts and similar devices to other trades for installation well in advance of time needed for coordination of other work.

3.03 INSTALLATION

A) Control joints are required following the standards used for gypsum board listed in ASTM C840, Section 20

I. Ceilings with perimeter relief cannot exceed 50 LF and 2500 SF between control joints

II. Ceilings without perimeter relief cannot exceed 30 LF and 900 SF between control joints

B) Panel joints and fasteners are finished with tape and compound to create a flat surface. While the materials used to finish ACOUSTIBuilt panels are also used to finish drywall, the procedure has unique requirements.

C) Joint compound coverage shall be limited to preserve the acoustical performance of the panels. Compound at panel joints shall not exceed 8 inch widths. Compound applied to field fasteners shall not exceed 2 inch by 2-inch areas. All compound shall be smooth and free of tool marks and ridges. Panels are to be finished with taping knives. Production tools, including boxes, are detailed on the installation instructions.

D) Sanding and inspection: Throughout the sanding process, inspect the surface frequently for flatness. Direct a light across the ceiling to highlight unevenness that requires attention.

E) Fine Texture Finish shall be applied in 4-5 coat process (additional coat may be used to achieve the desired finish) as called out in the installation instructions. Fine Texture Finish for ACOUSTIBuilt is applied in multiple coats, layered to achieve a uniform appearance and acoustical performance. It is strongly encouraged to practice spraying to ensure proper calibration and technique are achieved. Refer to the installation video.

I. ACOUSTIBuilt fine texture finish MUST be sprayed with a Graco Mark V texture system. This equipment properly atomizes the finish for acoustics and aesthetics. Fine texture finish is not intended for use with any other airless paint systems not recommended by Armstrong or to be applied by brush or rolling.

II. See Manufactures installation instructions for correct spray tip, pressure settings for spray system, finish preparation, spray calibration and spray procedure and technique.

3.04 ADJUSTING AND CLEANING

a) To remove soot, dirt, and dust use a vacuum operating at low power with a soft brush or use a dry soot cleaning sponge.

b) Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch up of minor finish damage.

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included: Furnish and install resilient flooring and base specified. Clean and protect resilient floor areas after installation.

1.02 RELATED DOCUMENTS

A. Applicable portions of the Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to the execution of the Contract, other documents listed in the Agreement and Modifications issued after the execution of the Contract shall apply to this Section. The general requirements for this work are located in Division 1 of the Specifications.

1.03 SUBMITTALS AND SUBSTITUTIONS

A. In accordance with Section 01 3000.

B. Substitutions will not be considered prior to the award of the General Contract.

1.04 QUALITY ASSURANCE

A. Obtain each type, color, and pattern of flooring from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.

B. Qualifications of Installers: Use only skilled and experienced resilient flooring installers for preparation of substrate and installation of flooring. Supervise helpers and apprentices at all times with thoroughly skilled resilient flooring installers.

C. Manufacturers' Recommendations: Manufacturers' recommended methods of installation and the referenced applicable standards is basis for installation methods used on this work.

D. Applicable Standards:
   1. Resilient Tile Institute:
      (a) Recommended Installation Specifications for Vinyl Composition Tile Flooring and Asphalt Tile Flooring.
   2. Rubber Manufacturer's Association:
      (a) Manual for the Preparation of Subfloors for the Installation of Solid Vinyl and Rubber Flooring.
      (b) Specifications for Flexible Vinyl Cove Base.
      (c) Specifications for Rubber Cover Base.
      (d) Specifications for Solid Vinyl Flooring.
   3. Conform to ADA requirements for slip resistance by providing minimum coefficients of sliding friction of 0.6 COF for horizontal surfaces and 0.8 COF for ramps and other sloped surfaces.

1.05 MOISTURE SLAB TEST

A. One of the following three methods shall be used to determine moisture content of slab at time of application.

B. Using a Tramax concrete moisture detection device, firmly apply the test apparatus to concrete that has had sealers or other subsequent coatings removed. The readings shall be 4.2% or less. If readings are higher, use ASTM F- 2170 for non conditioned spaces and/or ASTM F1869 for conditioned spaces.

C. ASTM F-2170 in situ Relative Humidity Test. Follow test procedures of manufacturer of testing equipment. Reading should be below 75%. If above 75%, use the next test method below.

D. ASTM F-1869 Calcium Chloride Moisture Vapor Transmission Test. Follow test procedures of manufacturer of testing equipment. Results should be below 3 lbs/1,000 square feet/24 hours. (This test is valid only for conditioned spaces.)

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver flooring and installation accessories to Project site in original manufacturer's unopened cartons and containers each bearing names of product and manufacturer, Project identification, and shipping and handling instructions.

B. Store flooring materials in dry spaces protected from the weather with ambient temperatures maintained between 50 deg F (10 deg C) and 90 deg F (32 deg C).

C. Store flooring materials on flat surfaces. Move flooring and installation accessories into spaces where they will be installed at least 48 hours in advance of installation.

1.07 PROJECT CONDITIONS

A. Maintain a minimum temperature of 70 deg F (21 deg C) in spaces to receive flooring for at least 48 hours prior to installation, during installation, and for not less than 48 hours after installation. After this period, maintain a temperature of not less than 55 deg F (13 deg C).

B. Do not install flooring until they are at the same temperature as the space where they are to be installed.

C. Close spaces to traffic during installation.

1.08 SEQUENCING AND SCHEDULING

A. Install flooring and accessories after other finishing operations, including painting, have been completed.

B. Do not install flooring over concrete slabs until the slabs have cured and are sufficiently dry to bond with adhesive as determined by flooring manufacturer's recommended bond and moisture test.

1.09 EXTRA MATERIALS

A. Deliver extra materials to Owner. Furnish extra materials, totaling 3% of the total installed, matching products installed as described below, packaged with protective covering for storage and identified with labels clearly describing contents.

PART 2 - PRODUCTS

2.01 VINYL TILE

A. LVT1: Luxury Vinyl Tile
Manufacturer: Patcraft
Pattern/Color: Energize/Intention
Size: 9” x 36”
Install Method: Stagger
Notes: 20 mil wear layer
Contact: Kandid Scott, Patcraft, 501.951.5000

B. LVT2: Luxury Vinyl Tile
Manufacturer: Patcraft
Pattern/Color: Reach/Intention
Size: 9” x 36”
Install Method: Stagger
Notes: 20 mil wear layer
Contact: Kandid Scott, Patcraft, 501.951.5000

C. SCF: Static Control Flooring
Manufacturer: Armstrong
Pattern/Color: Excelon SDT/color TBD
Size: 12” x 12”

D. RBR: Integral Stair Tread & Riser & coordinating Rubber Landing Sheet
Manufacturer: Johnsonite
Product: Vinyl Stair Treads and Risers, Square Nose
Texture: Service Weight
Color: TBD
Notes: Black Grit Tape insert, Sheet at Landings

2.02 RUBBER BASE

A. DB1: Decorative Rubber Base, Color 1
Manufacturer: Johnsonite
Profile: Millwork/Mandalay MW-XX-H6
Color: Custom color to match Paint 1

B. DB2: Decorative Rubber Base, Color 2
Manufacturer: Johnsonite
Profile: Millwork/Mandalay MW-XX-H6
Color: Custom color to match Paint 2

C. DB3: Decorative Rubber Base, Color 3
Manufacturer: Johnsonite
Profile: Millwork/Mandalay MW-XX-H6
Color: Custom color to match Paint 3

D. RB1: Rubber Base, Color 1
Manufacturer: Johnsonite
Profile: Traditional Vinyl 1/8”/4”H toe/120’ coils
Color: TBD

E. RB4: Rubber Base, Color 4
Manufacturer: Johnsonite
Profile: Traditional Vinyl 1/8”/4”H toe/120’ coils
Color: TBD

2.03 INSTALLATION ACCESSORIES

A. Concrete Slab Primer: Nonstaining type as recommended by flooring manufacturer.

B. Trowelable Underlayments and Patching Compounds: Latex-modified, portland-cement-based formulation provided or approved by flooring manufacturer for applications indicated. Provide materials for filling cracks and leveling floor depressions by Flintcote Underlayment, Floorstone, Stonehard Resurfacer, or approved equal.

C. Adhesives (Cements): Water-resistant type recommended by flooring manufacturer to suit resilient flooring products and substrate conditions indicated.

D. Accessories:
1. LVT to C: Patcraft Transition, color: TBD or Johnsonite Slimline, color: TBD (allow for metallic)
2. RBR to CPT: Patcraft Microtransition, color: TBD or Johnsonite Slimline, color: TBD (allow for metallic)

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas where installation of flooring will occur, with Installer present, to verify that substrates and conditions are satisfactory for installation and comply with manufacturer's requirements and those specified in this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:
1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials whose presence would interfere with bonding of adhesive. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by manufacturer.
2. Finishes of subfloors comply with tolerances and other requirements specified in Division 3 Section "Cast-In-Place Concrete" for slabs receiving resilient flooring.

3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits of any kind.

3.02 PREPARATION

A. Comply with manufacturer's installation specifications to prepare substrates indicated to receive flooring.

B. Use trowelable leveling and patching compounds per manufacturer's directions to fill cracks, holes, and depressions in substrates.

C. Remove coatings, including curing compounds, and other substances that are incompatible with flooring adhesives and that contain soap, wax, oil, or silicone, by using a terrazzo or concrete grinder, a drum sander, or a polishing machine equipped with a heavy-duty wire brush.

D. Broom or vacuum clean substrates to be covered by flooring immediately before installation. Following cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust.

E. Apply concrete slab primer, if recommended by flooring manufacturer, prior to applying adhesive. Apply according to manufacturer's directions.

3.03 TILE FLOORING INSTALLATION

A. Comply with tile manufacturer's installation directions and other requirements indicated that are applicable to each type of tile installation included in Project.

B. Lay out tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths at perimeter that equal less than one-half of a tile. Install tiles square with room axis, unless otherwise indicated.

C. Match tiles for color and pattern by selecting tiles from cartons in same sequence as manufactured and packaged, if so numbered. Cut tiles neatly around all fixtures. Discard broken, cracked, chipped, or deformed tiles.

D. Where demountable partitions and other items are indicated for installing on top of finished tile floor, install tile before these items are installed.

E. Scribe, cut, and fit tiles to butt tightly to vertical surfaces, permanent fixtures, built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings.

F. Extend tiles into toe spaces, door reveals, closets, and similar openings.

G. Maintain reference markers, holes, or openings that are in place or plainly marked for future cutting by repeating on finish flooring as marked on subfloor. Use chalk or other nonpermanent marking device.

H. Install 1-1/8" wide bullnose edging strips where edges of tile are exposed.

I. Install tiles on covers for telephone and electrical ducts, and similar items occurring within finished floor areas. Maintain overall continuity of color and pattern with pieces of flooring installed on these covers. Tightly adhere edges to perimeter of floor around covers and to covers.

J. Adhere tiles to flooring substrates without producing open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections in completed tile installation.

K. Use full spread of adhesive applied to substrate in compliance with tile manufacturer's directions including those for trowel notching, adhesive mixing, and adhesive open and working times.

L. Hand roll tiles where required by tile manufacturer.

3.04 RESILIENT BASE INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient base.

B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.

D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch resilient base during installation.

F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

G. Preformed Corners: Install preformed corners before installing straight pieces.

H. Job-Formed Corners:
   1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 4 inches in length.
      a. Form without producing discoloration (whitening) at bends.
   2. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 4 inches in length.
      a. Miter or cope corners to minimize open joints.

3.05 CLEANING AND PROTECTION

A. Perform the following operations immediately after completing installation:
   1. Remove visible adhesive and other surface blemishes using cleaner recommended by flooring manufacturers.
   2. Sweep or vacuum floor thoroughly.

3. Do not wash floor until after time period recommended by resilient flooring manufacturer.
4. Damp-mop flooring to remove black marks and soil.

B. Protect flooring against mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods indicated or recommended by flooring manufacturer.
1. Apply protective floor polish to flooring surfaces that are free from soil, visible adhesive, and surface blemishes.
2. Use commercially available, metal, cross-linked acrylic product acceptable to flooring manufacturer.
3. Coordinate selection of floor polish with Owner's maintenance service.
4. Cover flooring with undyed, untreated building paper until inspection for Substantial Completion.
5. Do not move heavy and sharp objects directly over flooring. Place plywood or hardboard panels over flooring and under objects while they are being moved. Slide or roll objects over panels without moving panels.

C. Clean flooring not more than 4 days prior to dates scheduled for inspections intended to establish date of Substantial Completion in each area of Project. Clean flooring using method recommended by manufacturer.
1. Strip protective floor polish that was applied after completing installation prior to cleaning.
2. Reapply floor polish after cleaning.

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included: Furnish and install resilient flooring and base specified. Clean and protect resilient floor areas after installation.

1.02 RELATED DOCUMENTS

A. Applicable portions of the Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to the execution of the Contract, other documents listed in the Agreement and Modifications issued after the execution of the Contract shall apply to this Section. The general requirements for this work are located in Division 1 of the Specifications.

1.03 SUBMITTALS AND SUBSTITUTIONS

A. In accordance with Section 01 3000.

B. Substitutions will not be considered prior to the award of the General Contract.

1.04 QUALITY ASSURANCE

A. Obtain each type, color, and pattern of flooring from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.

B. Qualifications of Installers: Use only skilled and experienced resilient flooring installers for preparation of substrate and installation of flooring. Supervise helpers and apprentices at all times with thoroughly skilled resilient flooring installers.

C. Manufacturers' Recommendations: Manufacturers' recommended methods of installation and the referenced applicable standards is basis for installation methods used on this work.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver flooring and installation accessories to Project site in original manufacturer's unopened cartons and containers each bearing names of product and manufacturer, Project identification, and shipping and handling instructions.

B. Store flooring materials in dry spaces protected from the weather with ambient temperatures maintained between 50 deg F (10 deg C) and 90 deg F (32 deg C).

C. Store flooring materials on flat surfaces. Move flooring and installation accessories into spaces where they will be installed at least 48 hours in advance of installation.

1.06 MOISTURE SLAB TEST

A. One of the following three methods shall be used to determine moisture content of slab at time of application.

B. Using a Tramax concrete moisture detection device, firmly apply the test apparatus to concrete that has had sealers or other subsequent coatings removed. The readings shall be 4.2% or less. If readings are higher, use ASTM F- 2170 for non conditioned spaces and/or ASTM F1869 for conditioned spaces.

C. ASTM F-2170 in situ Relative Humidity Test. Follow test procedures of manufacturer of testing equipment. Reading should be below 75%. If above 75%, use the next test method below.

D. ASTM F-1869 Calcium Chloride Moisture Vapor Transmission Test. Follow test procedures of manufacturer of testing equipment. Results should be below 3 lbs/1,000 square feet/24 hours. (This test is valid only for conditioned spaces.)

1.07 PROJECT CONDITIONS

A. Maintain a minimum temperature of 70 deg F (21 deg C) in spaces to receive flooring for at least 48 hours prior to installation, during installation, and for not less than 48 hours after installation. After this period, maintain a temperature of not less than 55 deg F (13 deg C).

B. Do not install flooring until they are at the same temperature as the space where they are to be installed.

C. Close spaces to traffic during installation.

1.08 SEQUENCING AND SCHEDULING

A. Install flooring and accessories after other finishing operations, including painting, have been completed.

B. Do not install flooring over concrete slabs until the slabs have cured and are sufficiently dry to bond with adhesive as determined by flooring manufacturer's recommended bond and moisture test.

1.09 EXTRA MATERIALS

A. Deliver extra materials to Owner. Furnish extra materials, totaling 3% of the total installed, matching products installed as described below, packaged with protective covering for storage and identified with labels clearly describing contents.

PART 2 - PRODUCTS

2.01 FLOORING

A. SF: Sports Floor
Manufacturer: Tarkett
Pattern/Color: Triumph/Lunar Explorer
Size: 24” x 24” x 3/8” Square Edge Tile

B. Transition Accessories:
1. SF to LVT: Johnsonite Slimline, color: TBD (allow for metallic)

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas where installation of flooring will occur, with Installer present, to verify that substrates and conditions are satisfactory for installation and comply with manufacturer's requirements and those specified in this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:
1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials whose presence would interfere with bonding of adhesive. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by manufacturer.
2. Finishes of subfloors comply with tolerances and other requirements specified in Division 3 Section "Cast-In-Place Concrete" for slabs receiving resilient flooring.
3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits of any kind.

3.02 TILE INSTALLATION PROCEDURE:

A. Square the area and establish reference points on substrate.

B. Lay out the tile so that a minimum of one-half of a tile forms the border along the perimeter.

C. Use established reference points and install the flooring.

D. Start with the first row of tiles in the upper left corner of the area with the recessed channel facing outward to receive the tab insert of the next tile to be installed.

E. Align the next tile to the installed tile by inserting the tab insert into the recessed-channel.

F. Once the tiles are properly aligned, roll the edge of the tiles with a small hand roller to lock the channel and tab together.

G. Make all final cuts around the perimeter of the area, alcoves, offsets, and other obstructions with a utility knife. Cut tiles net to walls and vertical objects. Cutting tiles tight or heavy to walls and vertical objects may cause tiles to lift or peak at the seams.

3.03 POST INSTALLATION FLOOR PROTECTION:

A. New flooring material may not be performed until all the other trades have completed their work. Proper precautions must be taken during and after the installation process to avoid damage to the newly installed flooring.

B. Immediately after installation:
   1. Flooring must be swept or vacuumed to remove loose dirt and grit prior to the application of proper floor protection. Do not trap dirt and grit under floor protection. (Lightly damp mop if necessary)
   2. Apply floor protection suitable for construction foot traffic such as: undyed heavy Kraft paper, Ram Board, 1/8” Masonite panels, or similar product designed for resilient floor protection.
   3. Areas that will receive heavy traffic, rolling loads, pallet jacks, and furniture or appliance placement must be protected with ¼” thick Masonite or similar wood panels

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

A. Provide all Resilient Seamless Sheet Vinyl Flooring, integral flash cove base and accessories.

1.02 RELATED DOCUMENTS

A. Applicable portions of the Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to the execution of the Contract, other documents listed in the Agreement and Modifications issued after the execution of the Contract shall apply to this Section. The general requirements for this work are located in Division 1 of the Specifications.

1.03 SUBMITTALS AND SUBSTITUTIONS

A. In accordance with Section 01 3000.

B. Substitutions will not be considered prior to the award of the General Contract.

1.04 QUALITY ASSURANCE

A. Qualifications of Installation: Use only skilled and experienced resilient flooring installers, certified by the resilient flooring manufacturer, for preparation of substrate and installation of flooring. Supervise helpers and apprentices at all times with thoroughly skilled resilient flooring installers.

B. Manufacturer's Recommendations: Manufacturer's recommended methods of installation and the referenced applicable standards are the basis for installation methods used on this work.

C. Applicable Standards:
   1. Federal Specification: L-F-475-A(3), Type 2, Grade A, Filled Sheet Vinyl Plastic Flooring.
   2. ASTM E648 (Flame Spread) and ASTM E662 (Smoke).

D. Fire Test Performance: Provide resilient flooring which complies with the following fire test performance criteria as determined but not limited to, the following:
   1. Critical Radiant Flux: Shall be rated not less than Class I per ASTM E648, NFPA253, NBSIR 75-950.
   2. Flame Spread: Not more than 75 per ASTM E84.
   3. Smoke Density: Not more than 450 per ASTM E662.

1.05 MOISTURE SLAB TEST

A. One of the following three methods shall be used to determine moisture content of slab at time of application.

B. Using a Tramax concrete moisture detection device, firmly apply the test apparatus to concrete that has had sealers or other subsequent coatings removed. The readings shall be 4.2% or less. If readings are higher, use ASTM F- 2170 for non conditioned spaces and/or ASTM F1869 for conditioned spaces.

C. ASTM F-2170 in situ Relative Humidity Test. Follow test procedures of manufacturer of testing equipment. Reading should be below 75%. If above 75%, use the next test method below.

D. ASTM F-1869 Calcium Chloride Moisture Vapor Transmission Test. Follow test procedures of manufacturer of testing equipment. Results should be below 3 lbs/1,000 square feet/24 hours. (This test is valid only for conditioned spaces.)

1.06 DELIVERY AND STORAGE

A. Delivery: Deliver materials to the project site in the manufacturer's original containers, clearly marked to indicate pattern, gage, lot number, and sequence of manufacture.

B. Storage: Store in original container in a clean dry location, protected from weather, at not less than 70NF for at least 48 hours before start of installation.

C. Schedule and Coordination: Coordinate delivery with Owner's Project Manager to allow for minimum storage time on job site prior to installation.

1.07 JOB CONDITIONS

A. Temperature and Humidity: Maintain temperature minimum of 70NF and maximum of 80NF with relative humidity below 75% for a minimum of 72 hours prior to installation. Maintain the above conditions continuously during and after installation as recommended by the flooring manufacturer, but in any case not less than 72 hours after installation.

B. The extended temperature range after the installation shall be from 50NF minimum to 85NF maximum, to maintain manufacturer's product warranty.

1.08 PRODUCT HANDLING

A. Protection: Protect resilient flooring materials before, during and after installation. Protect installed work and materials of other trades.

B. Replacements: In event of damage, immediately make repairs and replacements necessary at Contractor's expense.

1.09 EXTRA MATERIALS

A. Deliver extra materials to Owner. Furnish extra materials, totaling 3% of the total installed, matching products installed as described below, packaged with protective covering for storage and identified with labels clearly describing contents.

PART 2 - PRODUCTS

2.01 VINYL SHEET FLOORING

A. SV: Seamless Sheet Vinyl
Manufacturer: Patcraft
Pattern/Color: Holistic Shades/Radiant
Size: 78.74”W x 65.62’L
Notes: heat weld seams, rod color TBD; provide heavy-duty adhesive under patient beds as noted on the finish plan
Contact: Kandid Scott, Patcraft, 501.951.5000

B. SVB: Seamless Sheet Vinyl base
Manufacturer: Patcraft
Pattern/Color: Holistic Shades/Radiant
Notes: Integral, 6”H with Johnsonite Cove Cap (color TBD), supported cove accessory
Contact: Kandid Scott, Patcraft, 501.951.5000

2.02 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement based or blended hydraulic-cement-based formulation.

B. Adhesives: As recommended by Patcraft to meet site conditions.
1. General Use: Two-Part Urethane Adhesive
2. At Patient Rooms: Provide a 6' x 10' area of roll resistant adhesive at each bed

C. Transition Accessories:
1. SF to LVT: Patcraft Microtransition, color: TBD or Johnsonite Slimline, color: TBD (allow for metallic)

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the work.

B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of Resilient Sheet Flooring.
   1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
   2. Remove substrate paint, coatings and other substances that are incompatible with adhesives or contain soap, wax, oil, solvents, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
   3. Mechanically remove contamination on the substrate that may cause damage to the resilient flooring material. Permanent and non-permanent markers, pens, crayons, paint, etc., must not be used to write on the back of the flooring material or used to mark the substrate as they could bleed through and stain the flooring material.
   4. Prepare Substrates according to ASTM F 710 including the following:
      a. Moisture Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
         1) Perform relative humidity test using in situ probes, ASTM F 2170. Must not exceed 75%.
      b. A pH test for alkalinity must be conducted. Results should range between 7 and 9. If the test results are not within the acceptable range of 7 to 9, the installation must not proceed until the problem has been corrected.
      c. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer.

B. Fill cracks, holes, depressions and irregularities in the substrate with good quality Portland cement based underlayment leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.

C. Floor covering shall not be installed over expansion joints.

D. Do not install resilient products until they are same temperature as the space where they are to be installed.
   1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.03 RESILIENT SHEET FLOORING INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient sheet flooring.

B. Resilient Sheet Flooring:
   1. Install with adhesive specified for the site conditions and follow adhesive label for proper use.
   2. Install rolls in sequential order following roll numbers on the labels.
   3. Reverse sheets unless instructed otherwise in Installation Instructions.
   4. Roll the flooring in both directions using a 100 pound three-section roller.
   5. Vinyl sheet flooring must be welded. DO NOT TRIM WELD ROD FLUSH WITH FLOORING UNTIL IT HAS COMPLETELY COOLED.

6. Resilient Sheet Flooring may be flash coved.
    a. Use Cove Filler Strip.
    b. Net fit flooring material into the appropriate cove cap.

3.04 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.

B. Perform the following operations immediately after completing resilient product installation:
    1. Remove adhesive and other blemishes from exposed surfaces.
    2. Sweep and vacuum surfaces thoroughly.
    3. Damp-mop surfaces to remove marks and soil.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
    1. No traffic for 24 hours after installation.
    2. No heavy traffic, rolling loads, or furniture placement for 72 hours after installation.

D. Wait 72 hours after installation before performing initial cleaning.

E. A regular maintenance program must be started after the initial cleaning.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Furnish labor, materials, tools and equipment required and install decorative, seamless epoxy flooring and cove base specified.

1.02 RELATED DOCUMENTS

A. Applicable portions of the Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to the execution of the Contract, other documents listed in the Agreement and Modifications issued after the execution of the Contract shall apply to this Section. The general requirements for this work are located in Division 1 of the Specifications.

1.03 SUBMITTALS AND SUBSTITUTIONS

A. In accordance with Section 01 3000.

B. Substitutions will not be considered prior to the award of the General Contract.

1.04 QUALITY ASSURANCE

A. Subcontractor Qualifications: Use installer approved and licensed representative of manufacturer of materials used. Use mechanics experienced in commercial installation of materials used and factory trained and qualified by manufacturer.

B. Single Source Responsibility: Obtain each color, grade, finish, type, composition, and variety of flooring material from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.

C. Field Constructed Mock-up: Before installing flooring, erect mock-ups for each form of construction and finish required to verify selections made under sample submittals and to demonstrate aesthetic effects as well as qualities of materials and execution. Build mock-ups to comply with the following requirements, using materials indicated for final unit of Work.
   1. Locate mock-ups on site in location and size as directed by Architect.
   2. Demonstrate the proposed range of aesthetic effects and workmanship.
   3. Obtain Architect's acceptance of mock-ups before start of final unit of Work.
   4. Retain and maintain mock-ups during construction in undisturbed condition as a standard for judging completed unit of Work.
   5. When directed, demolish and remove mock-ups from Project site.

E. Pre-Installation Conference: Conduct conference at Project site as directed by Architect.

1.05 MOISTURE SLAB TEST

A. One of the following three methods shall be used to determine moisture content of slab at time of application.

B. Using a Tramax concrete moisture detection device, firmly apply the test apparatus to concrete that has had sealers or other subsequent coatings removed. The readings shall be 4.2% or less. If readings are higher, use ASTM F- 2170 for non conditioned spaces and/or ASTM F1869 for conditioned spaces.

C. ASTM F-2170 in situ Relative Humidity Test. Follow test procedures of manufacturer of testing equipment. Reading should be below 75%. If above 75%, use the next test method below.

D. ASTM F-1869 Calcium Chloride Moisture Vapor Transmission Test. Follow test procedures of manufacturer of testing equipment. Results should be below 3 lbs/1,000 square feet/24 hours. (This test is valid only for conditioned spaces.)

1.06 PROJECT CONDITIONS

A. Maintain environmental conditions and protect work during and after installation to comply with referenced standards and manufacturer's printed recommendations.

B. Maintain temperatures at 50NF (10NC) or more during installation and for 7 days after completion, unless higher temperatures are required by manufacturer's instructions.

C. Prevent damage or contamination to materials by water, freezing, foreign matter, and other causes.

1.07 WARRANTY

A. System manufacturer and system installer required to jointly warrant against bond failure, cracking, and deteriorations of seamless covering installed on structurally sound substrate for period of one year after acceptance of project and to replace, repair, or make good defective work or materials at Contractor's expense during warranty period.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Provide Seamless Floor Covering by Desco Coatings, Inc., 1-800-426-4164, or approved equal.

2.02 MATERIALS

A. Seamless Epoxy Flooring: Provide Cremona or equal, minimum 3/16" thickness; No Broadcasting Allowed.
   1. Provide integral cove base, 1" radius.
   2. Provide water diverter and slope floor to drain.
   3. Finish: Satin

4. Texture:
   Orange Peel: Offers a smooth easily cleaned surface with a slight texture.

B. PEF: Poured Epoxy Floor
Manufacturer: Desco
Product/Color: Quartz Cremona TG/Kestrel
Grit: Medium

C. PEB: Poured Epoxy Base
Manufacturer: Desco
Pattern/Color: match PEF
Grit: Medium
Notes: integral, 6"H with Schluter Jolly top cap

D. Transition Accessories:
1. PEF to SF: Schluter, profile: Reno TK, finish: TBD
2. PEB base: Schluter, profile: Jolly, finish: TBD

E. Minimum Performance Characteristics:
1. Impact Resistance: Gardner Impact Test. 160 in/lb - no cracking, chipping or delamination.
2. Indentation Resistance: MIL D 3134F, Section 4.74. Withstands 2,000 lbs/sq. in. for 30 minutes without indentation.
3. Tabor Abrasion Resistance: CS17 Wheels with 2,000 gm load for 10,000 cycles. 27.6 mg average loss per 1,000 cycles.
4. Toxicity: U.S. Department of Agriculture Research Service Meat Inspection Division, Non-Toxic.
5. Flammability: ASTM E-84 Tunnel Test. Flame Spread Classification (FSC) not to exceed 35.
6. Compressive Strength: ASTM C-579 - 10,400 psi.
7. Chemical Resistance: Unaffected by the following:

20% Hydrochloric Acid	10% Lactic Acid
Urine	Tea
Coffee	Mustard
Ethyl Alcohol	Mercurochrome
Iodine	Betadyne

2.03 OTHER MATERIALS

A. Provide materials not specifically described but required for complete and proper installation of seamless flooring of new, first quality of their respective kinds, in strict accordance with recommendations of manufacturer of flooring used, and subject to approval of Architect.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and areas where flooring will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting

performance of installed flooring.

1. Verify that substrates are firm, dry, clean, and free from oil or waxy films and curing compounds.
2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind flooring has been completed before installing flooring.
3. Notify the Architect of any cracks or irregularities in the substrate that might telegraph through the flooring or cause it to crack.

B. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. General: Prepare substrate surfaces including etching of concrete floors, application of sealer or primer coats and preparation required to obtain optimum adhesion to surfaces, to seal surfaces against migration of foreign materials through coating, and to provide for smooth, uniform finished surface.

B. Patch all depressions, divots, honeycombed or scaled concrete with filler as recommended by manufacturer.

C. Fill all non-moving cracks or control joints with joint filler as recommended by manufacturer.

D. Fill all moving cracks or joints with a firm but flexible sealant material as recommended by manufacturer. Control joints should be re-cut in finished floor if required and filled with sealants.

E. Mask surfaces that require protection.

3.03 INSTALLATION

A. Apply flooring in accordance with manufacturer's printed instructions, employing lead mechanic qualified under the quality assurance portion of this specification, using equipment specifically designed for this purpose.

B. Surfacing shall be tightly compacted, trowel applied. Trowel apply vertical cove base and hand sand cove base. Apply three coats of resin to assure a smooth surface and cove. Do not allow resin to puddle in cove.

C. Install integral cove base to height of 6” with 1” radius cove.

1. Trowel apply vertical cove base.
2. Hand sand cove base.
3. Apply three coats of resin to assure a smooth surface and cove.
4. Do not allow resin to puddle in cove.

D. Finished work shall match approved samples; be uniform in thickness, sheen, color, pattern, and texture; and be free from defects detrimental to performance.

3.04 PROTECTION

A. During work under this Section protect surfaces of other trades against damage. After installation allow no traffic on seamless covering for at least 72 hours. Protect completed flooring from damage until final acceptance of project by Owner.

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included: Furnish and install specified carpet, including accessories required for complete and proper installation. Clean and protect installed carpet.

1.02 RELATED DOCUMENTS

A. Applicable portions of the Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to the execution of the Contract, other documents listed in the Agreement and Modifications issued after the execution of the Contract shall apply to this Section. The general requirements for this work are located in Division 1 of the Specifications.

1.03 SUBMITTALS AND SUBSTITUTIONS

A. In accordance with Section 01 3000.

B. Substitutions will not be considered prior to the award of the General Contract.

1.04 QUALITY ASSURANCE

A. Qualifications of Installers: Use only thoroughly trained and experienced carpet installers completely familiar with materials specified, manufacturer's recommended methods of installation, and requirements of this work.

B. Manufacturer's Recommendations: Manufacturer's recommended methods of installation is basis for methods of installation used in this work.

C. Applicable Standards:
1. ASTM E 648, "Standard Method of Test for Critical Radiant Flux of Floor Covering Systems using a Radiant Heat Source", (GSA-372). Minimum of .25 Watts/cm^2.
2. Carpet and Rug Institute (CRI) "Carpet Specifiers Handbook".

1.05 MOISTURE SLAB TEST

A. One of the following three methods shall be used to determine moisture content of slab at time of application.

B. Using a Tramax concrete moisture detection device, firmly apply the test apparatus to concrete that has had sealers or other subsequent coatings removed. The readings shall be 4.2% or less. If readings are higher, use ASTM F- 2170 for non conditioned spaces and/or ASTM F1869 for conditioned spaces.

C. ASTM F-2170 in situ Relative Humidity Test. Follow test procedures of manufacturer of testing equipment. Reading should be below 75%. If above 75%, use the next test method below.

D. ASTM F-1869 Calcium Chloride Moisture Vapor Transmission Test. Follow test procedures of manufacturer of testing equipment. Results should be below 3 lbs/1,000 square feet/24 hours. (This test is valid only for conditioned spaces.)

1.06 WARRANTY

A. Carpet manufacturer to guarantee in writing, his goods for period of 2 years against defective workmanship and materials. Carpeting subcontractor to guarantee remaining materials and equipment to comply with requirements of Contract documents for period of 2 years, and agrees to promptly and without charge, make changes, replacements and corrections required to correct defects in design, material, or workmanship developing in materials or equipment under its intended use.

B. Carpeting subcontractor also, at his expense, shall promptly and properly replace improper work within 2 years after final approval as evidenced by date of final payment. Carpeting contractor will receive no compensation for loss in replacement of goods or workmanship. Foregoing two-year absolute guaranty and warranty does not in any way limit, restrict, or affect liability of Contractor, or his subcontractors for indemnity provided for in this Contract, nor does it in any way shorten limitation period fixed by law for filing any action against Contractor for enforcement or for breach of Contract.

PART 2 - PRODUCTS

2.01 CARPET

A. CPT1: Modular Carpet Tile
Manufacturer: Patcraft
Pattern/Color: Patina/Industrial Craft
Backing: Ecologix
Size: 12” x 48”
Notes: Stagger Installation
Contact: Kandid Scott, Patcraft, 501.951.5000

B. CPT2: Modular Carpet Tile
Manufacturer: Patcraft
Pattern/Color: Patina Custom/Sample #E4929-0 (subject to change)
Backing: Ecologix
Size: 12” x 48”
Notes: Stagger Installation
Contact: Kandid Scott, Patcraft, 501.951.5000

C. WOS: Walk-off Carpet Tile
Manufacturer: Patcraft
Pattern/Color: On the Right Foot/Chocolate
Size: 24” x 24”
Notes: Monolithic installation
Contact: Kandid Scott, Patcraft, 501.951.5000

2.02 MATERIAL TOLERANCES

A. Final manufactured carpeting, all types, subject to following tolerances:
   1. Five percent (plus or minus) variation in basic raw materials, pile height and weight.
   2. Transverse and longitudinal rows perpendicular to each other with no tolerance allowed that causes uneven or bowed cross seams visible to the naked eye.

2.03 CARPET ACCESSORIES

A. Carpet Edge Guard and/or Transition Strip:
   1. CPT to LVT: Patcraft Microtransition, color: TBD or Johnsonite Slimline, color: TBD (allow for metallic)
   2. CPT to C: Patcraft Transition, color: TBD or Johnsonite Slimline, color: TBD (allow for metallic)

B. Installation Adhesive: Water-resistant type recommended by carpet or cushion manufacturer, and complying with flammability requirements for installed carpet.

C. Seaming Cement: Hot melt seaming adhesive or similar product recommended by carpet manufacturer, for taping seams and buttering cut edges at backing to form secure seams and prevent pile loss at seams.

D. Trowelable Underlayment: Where carpet transitions up to other floor covering, provide trowelable underlayment material in thickness required sloping down to feather edge at 1/8" +/- per foot slope.

PART 3 - EXECUTION

3.01 MEASUREMENTS

A. Dimensions for carpet areas are approximate. Carefully check dimensions and other conditions affecting this work in the field. Contractor responsible for proper installation of carpet in areas designated.

3.02 PRE-INSTALLATION REQUIREMENTS

A. Installer must examine substrates for moisture content and other conditions under which carpeting is installed, and notify Contractor in writing of conditions detrimental to proper completion of this work. Do not proceed until unsatisfactory conditions are corrected.
   1. Floor preparation shall be free of cracks and holes. Gaps of 1/16" or more are to be filled with latex base flashing compound.

2. Floor temperature should be at 65E at least 24 hours prior to installation and 48 hours after carpet is installed.

B. Clear debris and scrape up cementitious deposits from surfaces to receive carpeting. Vacuum clean immediately before installation. Check concrete surfaces to ensure no "dusting" results through installed carpet. Apply sealer when required to prevent dusting.

C. Sequence carpeting with other work to minimize possibility of damaging and soiling carpet during remainder of construction period.

3.03 INSTALLATION, GENERAL

A. Comply with CRI 104, Section 14 "Carpet Modules" for carpet tile, and with manufacturer's recommendations and final shop drawings for installation.

B. Extend carpet and carpet tile under open-bottomed obstructions and under removable flanges and furnishings, and into alcoves and closets of each space.

C. Provide cut-outs where required, and bind cut edges properly where not concealed by protective edge guards or overlapping flanges.

D. Coordinate installation with installation of edge/transition treatment.

E. Maintain dye lot integrity. Do not mix dye lots in same area.

3.04 CARPET TILE INSTALLATION

A. Comply with manufacturer's instructions and final shop drawings.

B. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edging, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.

C. Install in installation method scheduled using releasable adhesive.

D. Transition Strips: Place strips tightly butted and secured to flooring with adhesive

3.05 PROTECTION AND CLEANING OF CARPETING

A. Adequately cover and protect against damage during shipment and delivery to job site, and until acceptance by Owner.

B. Protect during installation using drop cloths, or heavy, reinforced, non-staining Kraft paper.

C. Damaged carpeting will be rejected and replaced by Contractor.

D. At completion of work and when directed by Owner, vacuum clean carpet and remove soiling.

E. Install protective covering over carpet.

3.06 MAINTENANCE

A. Submit 2 copies of complete manual of manufacturer's maintenance recommendations for each type carpet specified.

3.07 ATTIC STOCK

A. Modular Attic Stock: 3 percent of job required yardage of each carpet.

B. Package overrun and attic stock pieces in wrapping suitable for storage, clearly labeled and marked as to construction quality, color, and sizes. Place in orderly manner in areas designated by Owner.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Resilient cork/linoleum tackable wallcovering.
   2. Accessories.

1.02 SUBMITTALS

A. Comply with Section 01 3000.

B. Product data indicating compliance with specified requirements.

C. Installation Instructions.

D. Samples: 6 X 9 inch (150 x 225 mm) samples of each type of tackable wallcovering material required.

1.03 QUALITY ASSURANCE

A. Fire Performance Characteristics: Comply with fire performance characteristics indicated below. Identify components with markings from testing and inspection organization.
   1. ASTM E 84 (Fuel contribution) - Class B
   2. NFPA253 (Critical Radiant Flux) - Class II

B. Single Source Responsibility: Obtain tackable wallcovering system components from a single source.

C. Deliver materials in original factory wrappings and containers, clearly labeled with manufacturer, brand name, and fire hazard classification.

D. Store materials in original, undamaged packages and containers inside a well-ventilated area protected from weather, moisture, soiling, and extreme temperatures. Maintain room temperature within the storage area at not less than 68º F (20º C) during the period materials are stored.

1.04 PROJECT CONDITIONS

A. Maintain ambient temperature within the building at not less than 68º F (20º C) for a minimum of 72 hours prior to beginning of installation.
   1. Do not install tackable wallcovering until the space is enclosed and weatherproof.
   2. Do not install tackable wallcovering until temperature is stabilized and permanent lighting is in place.

1.05 MAINTENANCE

A. Maintenance Instructions: Include precautions against cleaning materials and methods that may be detrimental to finishes and performance.
B. Extra Materials: Deliver to Owner extra materials from same production run as installed products. Package with protective materials.

1.06 WARRANTY

A. Submit manufacturer's limited five-year written warranty against manufacturing defects.

PART 2 - PRODUCTS

2.01 PRODUCTS

A. Manufacturer: Walltalkers
TB: Tackboard
Product: Tac-Wall
Color: 82 Quarry
Size: Refer to drawings for size

B. J-Trim for **tac•wall:** JTRM-00: Clear satin, anodized aluminum, 1/4 inch profile trim

C. Q-Pins:
1. WTQP-00: 24 Push Pins Black and White.
2. WTQP-01: 24 Push Pins Translucent.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine areas and conditions in which tackable wallcoverings will be installed.
1. Complete finishing operations, including painting, before beginning installation of tackable wallcovering materials.
2. Wall surfaces to receive wallcovering materials shall be dry and free from dirt, grease, loose paint, and scale.
3. Do not proceed with installations until satisfactory conditions have been corrected.

3.02 PREPARATION

A. Surface Preparation: Remove hardware, accessories, plates, and similar items to allow tackable wallcovering to be installed.
1. Plaster surface: Remove surface chalk. In new work, use moisture meter to determine moisture content. Do not begin installation when moisture content is greater than five percent.
2. Gypsum board surface: Recess nails and screws. Repair irregular tape joints, sand and remove dust.
3. Painted surface: Remove loose paint or scale. Sand surface of enamel or gloss paint and wipe clean with damp cloth.
4. Ensure gypsum wallboard surfaces scheduled to receive wallcovering are properly primed with a quality acrylic wallcovering primer

B. Prime substrate as recommended by manufacturer.

3.03 APPLICATION

A. Comply with manufacturer's printed installation instructions.

B. Cut sheets to size including 2 to 3 inches of overage. Allow sheets to lay flat for at least 24 hours prior to the application. Mark roll direct on the backside of each sheet. Hang sheets in sequence as cut from the roll, do not reverse every other sheet.

C. Permanent HVAC system should be set to 68º F (20º C) for at least 72 hours prior to, during, and after the installation.

D. Back roll each sheet prior to the installation to release curl memory.

E. For seamed applications, using a seam and strip cutter remove the factory edge of one sheet. Using the same tool, overlap and trace cut the mating edge of the second sheet. Repeat this step for as many sheets as required for the job.

F. Scribe, cut, and fit material to butt tightly to adjacent surfaces, built-in casework, and permanent fixtures and pipes.

G. Apply adhesive (only enough to hang one sheet at a time) with a 1/16 inch trowel to the area to receiving the sheet.

H. Work from top to bottom then side to side. Roll sheet firmly into adhesive for positive contact and to remove air bubbles.

I. Remove adhesive residue immediately.

3.04 CLEANING

A. Clean wallcovering using a sponge with a neutral pH cleaning solution. Do not use abrasive cleaners. Rinse thoroughly with water and let dry before using.

B. Remove excess adhesive using methods and materials recommended by manufacturer.

3.05 PROTECTION

A. Protect installed product and finish surfaces from damage during construction.

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION

A. Provide acoustical wall panels specified.

1.02 RELATED DOCUMENTS

A. Applicable portions of the Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to the execution of the Contract, other documents listed in the Agreement and Modifications issued after the execution of the Contract shall apply to this Section. The general requirements for this work are located in Division 1 of the Specifications.

1.03 SUBMITTALS AND SUBSTITUTIONS

A. In accordance with Section 01 3000.

B. Substitutions will not be considered prior to the award of the General Contract.

1.04 QUALITY ASSURANCE

A. Furnish at least one person, present at all times, thoroughly familiar with installation requirements of each item, to personally supervise installation.

1.05 PRODUCT HANDLING

A. Protect wall panels before, during, and after installation. Protect installed work and materials of other trades.

B. In event of damage, immediately make repairs and replacements at Contractor's expense.

PART 2 - PRODUCTS

2.01 ACOUSTICAL WALL PANELS

A. AWP: Acoustic Wall Panel
Manufacturer: Armstrong Commercial
Product: Soundsoak 60 Mineral Fiber, Fabric Wrapped Acoustic Panel
Size: ¾” thick, refer to drawings for sizing
Mounting Method: A (direct)
AWP1: Carnegie/Xorel/Strie/color TBD
AWP3: Stinson/Intermix/Aster INX69

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

A. Prior to installation, verify items may be installed in accordance with manufacturers' recommendations.

B. Notify Architect of conditions that would adversely affect installation.

C. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install wall panels in strict accordance with manufacturers' current recommendations and instructions.

3.03 ADJUSTMENT AND CLEANING

A. Verify that trim is in place and adjust components.

B. Remove labels and packing materials from job site.

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included: Provide specified painting and finishing of interior and exterior items.
   1. **Do not paint** over any code required labels, such as Underwriters' Laboratories and Factory Mutual, or any equipment identification, performance rating, name, or nomenclature plates. Mask off the label before applying finish and remove masking after finish is dry.

1.02 RELATED DOCUMENTS

A. Applicable portions of the Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to the execution of the Contract, other documents listed in the Agreement and Modifications issued after the execution of the Contract shall apply to this Section. The general requirements for this work are located in Division 1 of the Specifications.

1.03 SUBMITTALS AND SUBSTITUTIONS

A. In accordance with Section 01 3000.

B. Product Data: For each type of product. Include preparation requirements and application instructions.

C. Color Samples: For each type of paint system and in each color and gloss of topcoat. This is required for final color verification. DO NOT proceed with paint application until all colors have received final approval.
   1. Submit Samples on rigid backing, 8 inches square minimum.
   2. Step coats on Samples to show each coat required for system.
   3. Label each coat of each Sample.
   4. Label each Sample for location and application area.

D. Substitutions will not be considered prior to the award of the General Contract.

1.04 DEFINITIONS

A. Term "paint", as used herein, includes enamels, paints, sealers, fillers, emulsions, varnishes, stains, and other coatings whether used as prime, intermediate, or finish coats.

1.05 QUALITY ASSURANCE

A. Qualifications of Painters: Use only qualified journeyman painters for mixing and application of paint. In acceptance or rejection of painting, no allowance made for lack of skill on part of painters.

1.06 PRODUCT HANDLING

A. Delivery: Deliver paint materials to job site in original unopened containers with labels intact and legible at time of use.

B. Protection:
   1. Store only approved materials at job site and store only in suitable and designated area restricted to storage of paint materials and related equipment.
   2. Ensure safe storage and use of paint materials and prompt and safe disposal of waste.
   3. Protect paint materials before, during, and after application and protect installed work and materials of other trades.

PART 2 - PRODUCTS

2.01 PAINT MATERIALS

A. Manufacturers: Provide paints, enamels, stains, varnishes, and admixtures of first line quality by Sherwin Williams. Sherwin Williams products specified herein establish minimum quality standards.

B. Compatibility:
   1. Paint materials and equipment to be compatible. Finish coats compatible with prime coats, prime coats compatible with surface to be coated, and tools and equipment compatible with coating applied.
   2. Thinners (when used): Use thinners recommended for that purpose by manufacturer of material thinned.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

A. Inspection: Carefully inspect installed work of other trades and verify work is complete to point where painting work may properly commence. Verify paint finishes may be applied in strict accordance with manufacturer's directions and requirements of these Specifications.

B. Discrepancies: Do not proceed with installation in areas of discrepancy until discrepancies are fully resolved.

3.02 PREPARATION OF SURFACES

A. Protection: Completely mask, remove, and adequately protect hardware, accessories, machined surfaces, plates, lighting fixtures, and similar items in contact with painted surfaces not scheduled to receive paint.

B. Priming: Use primer recommended by manufacturer of coating system. Spot prime exposed nails and metals to be painted with emulsion paints.

C. Cleaning: Thoroughly clean surfaces receiving paint. Schedule cleaning and painting so dust and contaminants from cleaning process will not fall on wet, newly painted surfaces.

D. Gypsum Board: Treat and conceal joints, screwheads, and depressions in gypsum board surface in accordance with manufacturer's recommendations and instructions. Painted surfaces must be completely clean and continuously smooth. Treat internal and exterior corners and angles formed by intersection of wallboard surfaces and wallboard edges with joint reinforcements system in accordance with manufacturer's standard installation specifications where intersections and edges do not have metal trim. **All joints in gypsum board construction are to be taped and floated. This includes work above ceilings, at concealed places and anywhere else joints in gypsum board construction occur.** A slight egg-shell texture may be acceptable if approved by Architect prior to application. Heavy "knockdown" texturing is not acceptable.

E. Primed Ferrous Metals: Clean ferrous metals free of dust, grease and grime. Sand smooth rust spots, mars and abrasions in surfaces. Touch-up shop-applied prime coats which have damage or bare areas. Wire-brush, solvent clean, and touch up with same primer as shop coat.

1. At decorative structural steel grind, smooth and fill all imperfections on surface to be completely smooth. Touch up shop primer as described in paint schedule.

F. Galvanized Metal Surfaces: Clean free of oil and surface contaminates with acceptable non-petroleum based solvent. Touch up bare metal with zinc chromate primer.

3.03 WORKMANSHIP

A. Do not perform outside painting in extremely cold, frosty, or damp weather. Do not paint in dusty rooms. If required, sprinkle floors, to lay dust. Do not apply coats of paint on either wet or damp surfaces and in no case unless preceding coat is dry and hard.

B. Clean surfaces before priming. Remove dirt, oil, grease, rust, scale, and foreign matter. Clean with sandpaper, steel scraper, or wire brushes where necessary.

C. Specified coats are to cover completed painting and finishing work. Where color, stain, or undercoats show through final coat, install additional coats until uniform coverage is obtained.

D. Vary tints of undercoats slightly for identification of succeeding coats. Ample time of drying required to secure best possible results.

E. At all accent paint locations, contractor to mock-up approximately 3’-0” x 3’-0” color swatch, with final approval of color pending client walk-through.

F. Coats specified are in addition to shop or mill priming required under other Sections of these specifications.

G. All cabinet devices that require finish painting are to be painted with doors in the open position and shall be allowed to dry for a minimum of 24 hours in the open position. DO NOT PAINT DOORS CLOSED AND TRIM AFTER DRYING.

1. Cabinets that require finish painting include, but are not limited to, wall and ceiling access doors, fire extinguisher/hose/valve cabinets, electrical panel boxes, etc.

H. Corridor partitions, smokestop partitions, horizontal exit partitions, exit enclosures, and fire walls shall be effectively and permanently identified with signs or stenciling in a manner acceptable to the authority having jurisdiction. Label each wall at 20'-0" maximum. Such identification shall be above any decorative ceiling and in concealed spaces. Approved wording is to be:
FIRE AND SMOKE BARRIER - PROTECT ALL OPENINGS

3.04 PAINT SCHEDULE

A. Finish surfaces as follows:

	SURFACE	TREATMENT
1.	**Exterior Ferrous Metals:**	1st Coat - SW Pro-Cryl Universal Water Based Primer, B66-310 Series (Touch up only on primed surfaces) 2nd & 3rd Coats - SW Pro Industrial DTM Acrylic Coating B66-1250 Series
2.	**Interior Ferrous Metals:**	1st Coat - SW Pro-Cryl Universal Water Based Primer, B66-310 Series (Touch up only on primed surfaces) 2nd & 3rd Coats - SW Pro Industrial Acrylic, B66-600 Series.
3.	**Interior Aluminum:**	1st Coat - SW Pro-Cryl Universal Water Based Primer, B66-310 Series (Touch up only on primed surfaces) 2nd & 3rd Coats - SW Pro Industrial Acrylic, B66-600 Series.
4.	**Galvanized Metal:** (Includes exposed galvanized steel lintels, railings, stairs, doors and frames at interior and exterior locations)	1st Coat - SW Pro-Cryl Universal Water Based Primer, B66-310 Series (Touch up only on primed surfaces) 2nd & 3rd Coats - SW Pro Industrial Acrylic, B66-600 Series
5.	**Int. Gyp. Board - Painted:**	1st Coat - SW ProMar 200 Zero VOC Latex Primer, B28W2600 2nd & 3rd Coats - SW ProMar 200 Zero VOC Latex .
6.	**Int. Gyp. Board - Glazecoat:**	1st Coat - SW ProMar 200 Zero VOC Latex Primer, B28W2600 2nd & 3rd Coats - K46W00151 - Pro Industrial PreCatalyzed Waterbased Semi-Gloss Epoxy
7.	**Architectural Woodwork:** **Paint Finished On-Site**	1st Coat - SW Multi-Purpose Latex Primer, B51-450 2nd & 3rd Coats - SW Pro Industrial Acrylic, B66-600.
8.	**Architectural Woodwork:** **Stain Finished On-Site**	1st Coat: SW Minwax Performance Series Interior Stain. 2nd & 3rd Coats: SW WoodClassics Waterborne Polyurethane Varnish, A68 Series (4 mils wet, 1 mil dry per coat)

Refer to Section 06 4000 for architectural woodwork to be shop finished off site

9. **Interior Exposed Structure and Exposed Overhead MEP:** Prime Coat - Provide manufacturer's recommended primer, undercoat if required.
1st & 2nd Coats - SW Pro Industrial Waterborne Acrylic Dry Fall, B42 Series

B. Color Schedule:
LP: Interior Latex on Level 4 Gyp Finish (typical throughout unless otherwise noted), Eggshell finish
LP*: Interior Latex on Level 5 Gyp Finish, Eggshell finish
EP: Interior Epoxy on Level 4 Gyp Finish (typical throughout unless otherwise noted), Eggshell Finish
Other paint types to include Interior Epoxy Flat Finish, Interior Latex Flat Finish

Colors:
1: Sherwin Williams, Oyster White SW7637
2: Sherwin Williams, Inverness SW6433
3: Sherwin Williams, Framboise SW6566
4: TBD (exposed structure)
5. Ceiling: Sherwin Williams, Greek Villa SW7551

3.05 PAINTING OF MECHANICAL AND ELECTRICAL WORK

A. Painting of pipe and duct insulation and uncoated ferrous metal in inaccessible pipe and duct chases, in plumbing chases, and in spaces above ceiling is not required.

B. Metal Work in Mechanical Room (finish as follows):
1. Clean prefinished equipment and touch up with enamel to match manufacturer's final coat.
2. Clean exposed pipe, exposed conduit and electric outlet boxes, hangers and brackets, valve handles, and miscellaneous pipe line devices and give two coats of medium gray enamel.
3. Clean prime painted or unfinished items of manufactured mechanical and electrical equipment, then prime and finish with two coats of enamel to match other finished items of equipment.
4. Finish remaining exposed metal items with two coats of light grey enamel.

C. Paint exposed interior metal work, including ferrous and non-ferrous piping, for heating ventilating, plumbing and electrical equipment, electric cabinets, ventilating grilles, metal access panels. Give exposed metal items one coat of enamel undercoater and one coat of enamel in addition to priming coat.

D. Give pipe and duct insulation exposed to view one coat glue size and two coats enamel.

E. Paint all mechanical, electrical and plumbing items that are visible through registers, grilles and diffusers with Flat Black-Out paint.

3.06 PROTECTION, CLEAN UP, AND TOUCH-UP

A. Protect all work from paint droppings and spattering by use of masking, drop cloths, removal of items or by other approved methods.

B. Upon completion, clean paint drops and smears from hardware, glass and other surfaces and items.

C. Before final inspection, touch-up or refinish painted surfaces which have become damaged or discolored.
   1. Perform touch-up work in a manner to produce solid even color and finish texture to match surrounding color and finish texture.
   2. Areas that receive touch-up work and do not match surrounding color or finish texture will be refinished at Contractors expense.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Contract Drawings and general provisions of the Contract, apply to this Section.

1.2 SUMMARY

A. This Section includes surface preparation and application of paint systems for the high build, two coat systems for the items of types, patterns, sizes, and colors described in this article.

B. Provide the following systems as shown on Drawings:

1. Parking Stall Stripes.
2. Traffic Arrows, crosswalks, accessible stall access aisles, walkways, symbols, stop bars, words and other markings.
3. International Symbol of Accessibility.

C. Provide painting of curbs and curb ramps as described in the following paragraphs:

1. Paint vertical surface and the first 6 in. of the abutting horizontal surface at the top of all curbs and islands (including PARCS equipment islands) within parking facility except those which do not exceed 3’0” in width and abut a wall, spandrel panel, bumper wall guardrail or other construction (not including landscaping or equipment) which prevents passage of pedestrians.
2. In parking areas and/or at streets and sidewalks within the project limits or constructed as part of this project, paint curb ramps (including flares), curb returns at curb ramps and any projecting elements at edges of accessible ramps without handrails. Paint curb returns at driveways and paint curb minimum of 3 ft either side of curb ramp or driveway, (or curb ramp flare length, whichever is greater) in accordance with Pavement Marking.
3. Paint color for curbs and curb ramps shall be yellow.

D. Proportion International Symbol of Accessibility in accordance with ICC A117.1-2009 Accessible and Usable Buildings or 2010 ADA Standards for Accessible Design.

E. Related Work:

1. Pavement Marking Contractor shall verify compatibility with sealers, joint sealants, caulking and all other surface treatments as specified in Division 07.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Provide product data as follows:

1. Manufacturer's certification that the material complies with standards referenced within this Section.
2. Intended paint use.
3. Pigment type and content.
4. Vehicle type and content.

C. Submit list of similar projects (minimum of 5) where pavement-marking paint has been in use for a period of not less than 2 yrs.

1.4 PROJECT CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 degrees F.

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 degrees F above the dew point; or to damp or wet surfaces.

1.5 QUALITY ASSURANCE

A. Provide written 1 year warranty to Owner that pavement markings will be free of defects due to workmanship, inadequate surface preparation, and materials including, but not limited to, fading and/or loss of markings due to abrasion, peeling, bubbling and/or delamination. Excessive delamination, peeling, bubbling or abrasion loss shall be defined as more than 15% loss of marking material within one year of substantial completion and/or occupancy of the parking area. With no additional cost to Owner, repair and/or recoat all pavement marking where defects develop or appear during warranty period and all damage to other Work due to such defects.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Pavement marking materials shall meet Federal, State and Local environmental standards.

B. Paint shall be manufactured and formulated from first grade raw materials and shall be free from defects or imperfections that might adversely affect product serviceability.

C. Paints shall comply with the National Organic Compound Emission Standards for Architectural Coatings, Environmental Protection Agency, 40 CFR Part 59.

D. The product shall not contain mercury, lead, hexavalent chromium, or halogenated solvents.

2.2 PAVEMENT MARKING PAINTS:

A. 100% acrylic waterborne - paint shall be used for white pavement markings and shall meet requirements of MPI #70.

1. All products shall have performance requirements of Type I and II of Federal Standard TT-P-1952E.

2. 100% acrylic waterborne paint for special color pavement markings (blue, green, red, black) shall meet requirements of Federal Specification TT-P-1952E. Special color marking materials shall be compatible with the white pavement markings where they are layered.

2.3 COLOR OF PAINT

A. Color of paint, unless noted otherwise on Contract Drawings, shall be white and shall match federal color chip No. 37925. Color shall have daylight directional reflectance (without glass beads) of not less than 84% (relative to magnesium oxide) when tested in accordance with Federal Test Method Standard 141, Method 6121.

B. Paint color for traffic white, where shown on Contract Drawings or specified herein, shall match federal color chip No. 37925 commonly referred to as federal highway white. Color shall have daylight directional reflectance (without glass beads) of not less than 84% (relative to magnesium oxide) when tested in accordance with Federal Test Method Standard 141, Method 6121.

C. Paint color for blue accessible parking space pavement markings, if shown on Contract Drawings, shall match federal color chip No. 35180. The Light Reflectance Value (without glass beads) shall not be less than 10%.

2.4 SILICA SAND

A. Silica Sand, where used, shall be foundry grade silica sand composed of at least 99.5 percent silicon dioxide when tested in accordance with ASTM C 146. The gradation of silica sand shall meet the paint manufacturer’s recommendation. Sand shall broadcast into markings at rate not less than 6 lbs per gallon of paint.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.

B. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

C. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

D. Striping shall not be placed until full cure of concrete slab and sealer. Concrete surfaces generally require 30 to 90 days @ 70□F or higher. Sealers (other than silane) generally require 14 days @ 70□F or higher. Silane sealers require 24 hrs @ 70□F or higher. Bituminous surfaces generally require 30 days @ 45□ F or higher.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.

B. Do not paint or finish any surface that is wet or damp.

C. Clean substrates of substances that could impair bond of paints, including dirt, dust, oil, grease, and incompatible paints and encapsulates.

D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

E. Lay out all striping on each tier, using dimensions and details shown on Contract Drawings, before painting that tier. Report any discrepancies, interferences or changes in striping due to field conditions to Engineer/Architect prior to painting. Pavement Marking Contractor shall be required to remove paint, repair surface treatment and repaint stripes not applied in strict accordance with Contract Drawings.

F. Where existing painted pavement markings and/or stripes conflict with new striping layout or must be removed due to installation which does not conform to contract requirements, remove existing paint markings, using care to avoid scarring substrate surface.

1. Concrete and asphalt surfaces: Material shall be removed by methods acceptable to Engineer/Architect and cause as little damage as possible to surface texture of pavement. Methods, that can provide acceptable results, are grinding and air or shot blasting. Use of chemicals to remove pavement markings prohibited. Collect residue generated by removal of pavement markings and dispose of as required by all applicable laws and regulations. If grinding is used, lightly grind floor surface using wheel mounted floor grinder or similar equipment with positive elevation control of grinder head. For all removal techniques: On test area, demonstrate to Owner acceptable removal of paint material and control of paint removal equipment to prevent substrate scarring.
2. Traffic Topping/Membrane surfaces: Remove existing pavement markings by solvent washing or high-pressure water washing. Submit letter from traffic topping/membrane manufacturer certifying that solvents and/or water pressures are acceptable for this use and will not damage material. On test area, demonstrate to Owner acceptable removal of paint material and control of paint removal equipment to prevent substrate scarring.
3. Contractor shall not use paint, bituminous bond coat or other methods of covering markings to obliterate existing pavement markings.
4. Material deposited on pavement as a result of removal shall be removed as work

progresses. Accumulation of material, that might interfere with drainage or might constitute a hazard to traffic, prohibited.

5. Curing compounds on new concrete surfaces (less than 1 yr old) shall be removed per existing pavement marking removal requirements prior to installation of new pavement markings.

G. Work Areas:

1. Store, mix and prepare paints only in areas designated by Contractor for that purpose.
2. Provide clean cans and buckets required for mixing paints and for receiving rags and other waste materials associated with painting. Clean buckets regularly. At close of each day's Work, remove used rags and other waste materials associated with painting.
3. Take precautions to prevent fire in or around painting materials. Provide and maintain appropriate hand fire extinguisher near paint storage and mixing area.

H. Mixing:

1. Do not intermix materials of different character or different manufacturer.
2. Do not thin material except as recommended by manufacturer.

I. Disposal:

1. Contractor shall properly dispose of unused materials and containers in compliance with Federal Resource Conservation Recovery Act (RCRA) of 1976 as amended and all other applicable laws and regulations.

3.3 APPLICATION

A. Apply paint in 2-coat system; first coat shall be 50% of total 15 wet mil minimum thickness, not to exceed 8 mils. First coat shall be cured prior to installation of second coat. At Contractor's option, one coat may be applied before substantial completion, with a second coat delayed for 3-6 months until weather conditions are appropriate and the concrete has cured sufficiently for proper adhesion.

1. Two coat system total wet mil thickness of 0.015 in (0.381 mm).
2. Two coat system total wet mil thickness of 0.018 to 0.025 in (0.457 – 0.635 mm) When Type IVA beads are used.
3. Two coat system total wet mil thickness of 0.015 to 0.018 in (0.381 – 0.457 mm) When Type IVB beads are used.

B. Apply painting and finishing materials in accordance with manufacturer's directions. Use applications and techniques best suited for material and surfaces to which applied. Minimum air shall be used to prevent overspray. Temperature during application shall be minimum of 40º F and rising, unless manufacturer requires higher minimum temperature. Maximum relative humidity shall be as required by manufacturer.

C. Application of silica sand shall coincide with application of paint, but shall be done as separate operation by a suitable dispenser. Sand may be premixed with paint for application to curbs only. Silica sand shall adhere to the cured paint or all marking operations shall cease until corrections are made.

D. All lines shall be straight, true, and sharp without fuzzy edges, overspray or non- uniform application. Corners shall be at right angles, unless shown otherwise, with no overlaps. Line width shall be uniform (-0%, +5% from specified width). No excessive humping (more material in middle than at edges or vice versa).

END OF SECTION