hardwood: Yakal, Guijo or Paitan, good grade.

5.3.3 **Wood framing, planks and trims** exposed to view shall be Narra or Tanguile, kiln dried as indicated, good grade.

5.3.4 **Wood preservatives** shall be applied on all wood roofing members, ceiling joist, door and window jambs, base board, underneath of planks and trims and other surfaces where necessary as directed. Preservative shall be clear for exposed surfaces and/or tinted on hidden surfaces, conforming to the best commercial standard.

5.4 **Plywood** for wall sheeting or others shall be Tanguile thickness as indicated, conforming to the best commercial standards.

6.0 **Nails, common and finishing,** shall conform to the best commercial standard size and type best suited for the purpose intended.

7.0 **Interior finish carpentry.**

7.1 **General**. Finished woodwork shall be machined (flat) or hand (molded) sanded. Grades and species of wood shall be as specified. Interior finish shall be set plumb, level, square, and in true alignment. Joints shall be tight and formed to conceal shrinkage. Where practicable, jointing and nailing shall be concealed. Face nailing in trim and millwork and elsewhere as indicated, shall be set for putty stopping. Woodwork specified to receive a natural finish shall be selected for uniformity in color and graining.

8.0 **Hardware.** Items of finishing hardware specified under Section: Builders' Hardware shall be fitted carefully and attached securely. Care shall be exercised so as not to mar or injure the work.

9.0 **Submittal requirements.** Prior to procurement, the Contractor shall submit sample of wood preservatives, plastic laminates, cabinet finishes and other special boards as may be required for approval. Specified kiln-dried lumber shall be checked and approved prior to use.

~ END OF SECTION ~

SECTION 06.61.16 SOLID SURFACE FABRICATIONS (ACRYLIC)

1.0 **General.** Solid surface material – composite of 100% acrylic resin (Methylmethacrylate) and organic filler. Solid, nonporous surfacing material, homogeneously composed of a blend of natural minerals & polyester resins.

2.0 **Delivery, storage and handling.** Do not deliver components to project site until spaces are ready for installation.

3.0 **Project Site Conditions.** Environmental Requirements: Installation spaces must be maintained at normal occupancy temperature and humidity levels for minimum 72 hours prior to and continuously following installation.

4.0 **Materials.**

4.1 12mm thick with square edge profile design. Backsplashes profile – single or double-height coved seam.

4.2 Countertop Perimeter Frame. Reinforced concrete

4.3 Accessories.
Adhesive for Bonding: 100 percent silicone sealant complying with ASTM C 920.

4.4 Fabrication.
A. To be fabricated by recommended supplier.
B. Shop Assembly: Fabricate components in shop to the greatest extent practical.
1. Avoid seams within 1 in (25 mm) of inside or outside corners.
2. Counters with integrated sink, or indicated otherwise, as shown in drawings.

5.0 **Product Characteristics.**
Impact resistant – Minor cuts and scratches can be removed with fine sand paper.
Stain resistant – Severe stains can be removed easily with abrasive cleanser.
Heat resistant – Avoid exposing solid surface to continuous temperature over 80 deg C (176 deg F)
The same color and pattern through its entire thickness (not coated or laminated)

6.0 **Technical Data:**

Property		Typical result	Unit	Testing method
Density	1.73	g/cm3	DIN ISO 1183	1
Flexural strength	61.4	MPa	DIN EN ISO 178	1
Flexural modulus	9600	MPa	DIN EN ISO 178	1
Flexural elongation at break	0.69	%	DIN EN ISO 178	1
Dimensional stability at 20 °C – Change of length	< 0.16	%	DIN EN ISO 4586 T10	1
Impact resistance (large ball drop)	> 120	cm	DIN ISO 4586 T12	1
Impact resistance (spring load)	> 25	N	DIN ISO 4586 T11	1
Hardness of surface (Mohs index)	2-3		DIN EN 101: 1992-01	1
Compressive strength	168	MPa	EN ISO 604	1
Resistance to boiling water – Increase in weight	0.14	%	DIN EN 4586 T7	1
Resistance to boiling water – Surface change	Grade 5*		DIN EN 4586 T7	1
Resistance to dry heat (@ 180 °C)	Grade 5*		DIN ISO 4586 T8	1

Thermal shock	No visible change		UNI 9429 1
Resistance to abrasion	75	Loss in weight mm3 /100 rev.	DIN ISO 4586 T6 1
Lightfastness (Xenon Arc)	> 6	Blue wool scale	DIN ISO 4586 T16 1
Slip resistance with 120 µm grit	Passes R9 Requirement		DIN 51130 1
Slip resistance with 150 µm grit	Passes R9 Requirement		DIN 51130 1
Electrical discharge – Surface resistance	> 10	Ω	DIN EN 6134051 1
Fire classification	Euroclass B-s1,d0		DIN EN 13501-1:2002 2
Reaction to fire	Class M1		NF P 92-501 3
Smoke opacity and gas toxicity	Class F0		NF F 16-101 4
Fire tests	Class 0		BS 476 part 6 & 7 5
NSF Standard for Food Equipment Materials	Certified for Splash Zone		NSF/ANSI 051 6

7.0 **Application.** Countertops (kitchen, bank teller, table, serving counter, laboratory), vanity tops, Laboratories, walls (tubs/shower & wainscoting), shower & bath, toilet partitions, table tops and serving counters, indoor shop, shelves and service areas.

8.0 **Execution.**

1. Examination
   A. Examine cabinets upon which countertops will be installed.
   Coordinate with responsible entity to assure that counters are set to the following tolerance or better.
   1. Verify that cabinets are level to 1/8 in (3 mm) in 10 ft (3 m).
   2. Review manufacturer's Fabrication and Installation Check List.
   B. Coordinate with responsible entity to correct unsatisfactory conditions.
   C. Commencement of work by installer is acceptance of cabinet conditions.
2. Installation
   A. Install countertops and secure to cabinets in accordance with manufacturer's Fabrication and
   Installation Manual.
   B. Install Sinks and Bowls:
   1. Mounting Type: As shown on Drawings.
   2. Secure seam mount sinks and bowls to countertops with joint adhesive.
   3. Secure under mount sinks and bowls to countertops with clip system as recommended by manufacturer.
3. Repair
   A. Repair minor imperfections and cracked seams and replace sections of severely damaged

surfaces in accordance with manufacturer's Fabrication and Installation Manual.

4. Cleaning
   A. Reference Section 01 74 00-Cleaning and Waste Management.
   B. Clean surfaces in accordance with manufacturer's Care and Maintenance Instructions.
5. Protection
   A. Cover surfaces with heavy paper or cardboard to protect from damage until [date of Substantial Completion] [acceptance by Owner].

9.0 **Warranty.** Limited to 10 year warranty, and one-year installation warranty

~ END OF SECTION ~

~ END OF DIVISION ~

DIVISION 7 THERMAL AND MOISTURE PROTECTION

SECTION 7.44.56 FIBER REINFORCED CEMENTITIOUS PANELS

PART 1 GENERAL

1.1 SECTION INCLUDES
- A. Fiber reinforced cement panel siding system.
- B. Accessories required for complete installation.

1.2 RELATED SECTIONS
- A. Section 05 40 00 - Cold-Formed Metal Framing.
- B. Section 09 20 00 - Plaster and Gypsum Board.

1.3 REFERENCES
- A. ASTM C 1186 - Standard Specification for Flat Non-Asbestos Fiber-Cement Sheets.
- B. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Materials.

1.4 SYSTEM DESCRIPTION
- A. Performance Requirements:
  - a. Design and size components to withstand live loads caused by pressure of wind acting normal to plane of wall as calculated in accordance with ANSI/ASCE 7, and as measured in accordance with ANSI/ASTM E 330.
  - b. Deflection: Provide system capable of withstanding wind loading within the following limitations:
    - i. No permanent deformation is acceptable.
  - c. Design system to accommodate, without damage to system, components or deterioration of seals; movement within system; movement between system and perimeter framing components; dynamic loading and release of loads; and deflection of structural support framing.
  - d. Design to accommodate vertical inter-story movement and provide an allowance for the following tolerances:
    - i. Building floor slab live load differential deflection.
    - ii. Structural creep.
    - iii. Thermally induced expansion and contraction of framing members.
    - iv. Fabrication and erection tolerances.
    - v. Design ultimate load capacity of anchor components to withstand 2.0 times "Design Wind Load" without failure.
  - e. Maintain continuous air and vapor barrier throughout assembly.

1.5 SUBMITTALS
- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - a. Preparation instructions and recommendations.
  - b. Storage and handling requirements and recommendations.
  - c. Installation methods, including fastening patterns.
- C. Shop Drawings: Provide shop drawings and erection plans for review including the following:
  - a. Layout of furring, weather barrier, finished sheets and fastener pattern.
  - b. Details at base and top of walls, corners, at window and door trim and at other openings and connections.

D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
E. Verification Samples: For each finish product specified, two samples, minimum size 3 inches by 6 inches (76 mm by 150 mm) square, representing actual product, color, and patterns.
F. Manufacturer's Certificates: Certify materials and accessory component products meet or exceed specified requirements.
G. Manufacturer's warranties. Executed by manufacturer and installer.

1.6 QUALITY ASSURANCE

A. Mock-Up: Provide a mock-up of complete panel system including furring, insulation, weather barrier and panels for approval by Architect.
   a. Finish areas designated by Architect.
   b. Mock-up shall be a minimum of 4 panels showing one vertical and one horizontal joint and complete installation system and fastener layout.
   c. Do not proceed with remaining work until workmanship and color are approved by Architect.
   d. Refinish mock-up area as required to produce acceptable work.

A. Pre-Installation Conference:
   a. Prior to any panel application, the Contractor shall convene a pre-installation conference.
   b. Coordinate conference scheduling with the Architect. Conference shall be attended by the Contractor, Architect, personnel directly responsible for the installation of panels, flashing and sheet metal work and other trades interfacing with the panel work.
   c. Provide a copy of meeting notes and action items to all attending parties. Note action items requiring resolution prior to start of roof work.
   d. Discuss specific expectations and responsibilities, construction procedures, specification requirements, application, environmental conditions, job and surface readiness, material storage, and protection.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver cement panels to site until job is ready for their installation.
B. Store products in manufacturer's unopened packaging until ready for installation.
C. Store materials off the ground, flat and under cover in a dry place until erection.
D. Keep materials dry and protect from freezing.
E. Store materials in such a way to accommodate easy inspection of the materials prior to installation.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.9 WARRANTY

A. Installed material shall have a manufacturer's 5 year warranty.
B. Warranty includes the repair or replacement of siding that does not comply with requirements or that fails within specified warranty period. Failures include, but are not limited to, cracking, deforming or otherwise deteriorating beyond normal weathering.

PART 2 PRODUCTS

2.1 MATERIALS

A. Prefinished Cement Board Siding Panels: siding sheets, fiber reinforced, cement based product conforming to ASTM C 1186 and manufactured of cement sand, cellulose fibers and fillers.
   a. Panel Size:
      i. 5/16 inch 4 feet by 8 feet. (8 mm by 1220 mm by 2440 mm).
      ii. 5/16 inch 4 feet by 10 feet. (8 mm by 1220 mm by 3050 mm).

   b. Mechanical fasteners: External tamper proof screws, stainless steel, torx head fasteners.
      i. Screws shall be length as required by the panel manufacturer for the furring material used.
      ii. Wood screws: Size: #10 by 1-1/2 inch (38 mm).
      iii. Steel Screws: Size: #12 by 1-1/8 inch (29 mm).
   c. Continuous cushions of black EPDM rubber, 1-1/4 inch (32 mm) and 3-1/2 inch (95 mm) as required.

2.2 ACCESSORIES

A. Trim: PVC, composite and stainless steel trim shapes suitable for trim conditions.
B. Sheet Metal Flashing: Minimum 26 gauge hot-dipped galvanized steel sheet, or stainless steel.
C. Metal furring shall conform to the requirements of Section 09 20 00 - Plaster and Gypsum Board.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.
B. Ensure that framing is completed and that electrical rough-in, windows, doors, and flashing are in place before proceeding with work of this section.
C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation. Repair as necessary any substrate conditions that would be detrimental to proper installation.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
C. Ensure that all dust, dirt, fingerprints and all other foreign marks on the material are removed prior to installation of the panels.

3.3 INSTALLATION - GENERAL

A. Install in accordance with manufacturer's instructions and the approved shop drawings.
B. Panel Cutting:
   a. Cut panels using a high speed circular saw with a segmented diamond blade.
   b. Cut panels from the front side and protect the face from being damaged during cutting.
   c. For incidental cuts, cut panels from the front side using a jigsaw with a carbide tip blade.
   d. Provide adequate ventilation during cutting. Use of a dust extractor is recommended.
C. Drilling:
   a. Drilling of holes must be done from the front of the panel using a carbide tip drill bit.
   b. Holes are recommended to be done using a universal drill.

c. Larger holes, or cut-outs on the panel, can be made by a jig saw with a carbide blade or a hole saw with a diamond blade.

D. Prepare structural backing with studs, backer board, weather barrier and furring as required to meet the performance requirements specified. Install fiber reinforced panels over a properly prepared support system in accordance with the manufacturer's installation instructions and approved shop drawings.
E. Install weather barrier over prepared substrate.
F. Fiber reinforced cement panel siding shall be installed over an impervious weather barrier, on furring strips with black EPDM rubber strips, and with an air cavity behind the face panel to allow ventilation of the substrate.
G. Panels shall be attached to furring using the attachment pattern and fasteners indicated in the manufacturer's installation instructions and approved shop drawings.
H. Install black EPDM rubber strips to each furring member.
I. Pre-drill holes in cement boards in pattern indicated in the manufacturers installation instructions and approved shop drawings. Holes shall be of size as specified by the panel manufacturer for the fasteners being used.
J. Fasten fiber cement board to furring as per vendor's details with approved stainless steel fasteners.

3.4 PROTECTION

A. Protect installed products until completion of project.
B. Inspect walls for any damage. Replace panels that are damaged. Do not attempt to repair.
C. Ensure all dirt, dust, fingerprints and all foreign marks are immediately removed from the face of the material to avoid from permanent damage.
D. Replace damaged products before Substantial Completion.

~ END OF SECTION ~

~ END OF DIVISION ~

DIVISION 8 DOORS, WINDOWS AND GLAZING

SECTION 08.14.00 WOOD DOORS

1.0 **Scope.** This section includes wood flush, sliding doors, and frames, complete.

2.0 **General.** Interior wood flush, panel and sliding doors shall conform to the best commercial standard. Doors shall have wood preservative treatment, insect-treated and kiln-dried.

3.0 **Storage and protection.** Wood flush, panel and sliding doors and frames shall be protected against damage and dampness. Doors shall be stored under cover in a well-ventilated building where they will not be exposed to extreme changes of humidity. They shall not be brought into the building until plastering has been completed and is thoroughly dry.

4.0 **Materials.**

4.1 **Flush doors** shall be hollow cores from Tanguile kiln-dried frames with 6mm thick Tanguile plywood veneer or marine plywood as indicated.

4.2 **Panel doors** shall be decorative or carving types, from Tanguile or narra configuration and sizes as shown.

4.3 **Sliding doors** shall be from Tanguile K.D. frames with 6 mm thick ordinary Tanguile plywood veneer or 5.55 mm clear tempered glass as indicated.

4.4 **Wood door frames.** Frames shall be of the design, size and thickness indicated. This shall be set plumb and true, and well-braced to prevent distortion. Frames in masonry or concrete walls shall be secured as indicated, and shall be Guijo, Paitan or Yakal, good grade.

5.0 **Installation.** Flush, panel and sliding doors shall be leveled, hung plumbed, and fitted accurately allowing 2-mm clearance at the jambs and heads. Lock stiles of doors, 45 mm thick or thicker, shall be beveled 3 mm in 50 mm. Knob locks and latches shall be installed 1 m from finished floors to the center knobs. Apply hardware with fastenings of the size, quality, quantity and finish to provide workable door system and as specified in Section: Builder's Hardware.

6.0 **Submittal requirements.** Prior to fabrication of flush, panel and sliding doors, and frames, shop drawings shall be submitted indicating materials used, sizes, fastening devices, and finish for approval.

~ END OF SECTION ~

SECTION 08.81 GLASS AND GLAZING

1.0 **Scope.** This section includes provision of glass and glazing, complete.

2.0 **General.**

2.1 **Glass** shall be provided in locations as indicated and the corresponding type specified on architectural drawings. All standard procedure on glass and glazing work must be implemented to

ensure correct fitting and glazing so as to preserve the physical strength of the glass when used as intended on any building exterior and interior application.

2.2 **Glazing rabbets** shall be rigid, true, plumb, square, properly primed, clean, dry, and dust-free before glazing work is started. Protective coating shall be removed from metal rabbets with an approved solvent. Glazing work shall not be performed during damp or rainy weather. Sashes shall be glazed in a closed position and shall not be operated until the glazing compound has set. Glazing materials shall be mixed uniformly without the addition of thinners or other materials, and shall be used while still fresh.

3.0 **Delivery and storage**. Materials shall be delivered to the site in an undamaged condition and stored out of contact with the ground. Upon arrival at the jobsite the Contractor for damage shall check the glass. Glass found damaged, which, in the opinion of the Construction Architect/Engineer, may affect appearance or aesthetic of the glass curtain-wall system, shall not be used in the work. Glazing sealants shall be delivered to the site in unopened containers, labeled plainly with the manufacturer's name and brand.

4.0 **Materials.**

4.1 **Each glass** shall have the manufacturer's label showing the type, thickness, and quality of glass. Labels shall not be removed until the glazing work has been approved.

4.2.1 **Clear glass** shall be clear tempered 6 mm thick for powder-coated aluminum framed windows with clear rubber sealant neatly and properly installed.

4.2.2 **Wired glass or fire rated glass** shall have 60 minutes fire rating and be a type investigated and approved by a nationally recognized testing agency. Proof of such conformance and approval shall be in the form of a label attached to the glass attesting that identical glass has successfully passed fire tests for door assemblies as specified in ASTM Methods E 15.

4.3 **Glazing**

4.3.1 **Glazing materials** shall comply with all pertinent codes and regulations including recommendations specified on approved standards. For reference, glazing codes and recommendations are based on Japanese Industrial Standard (JIS). The use of non-skinning compounds, non-resilient type preformed sealers, and preformed impregnated type gaskets will not be permitted. When flexible vinyl gasket channels are used, the material shall conform to Commercial Standard CS230. Materials used with aluminum frames shall be aluminum colored, non-staining, and do not require painting. Other materials, which will be exposed to view and unpainted, shall be gray or neutral color. Glazing materials shall be as specified herein and as recommended by the glass manufacturer as approved.

4.3.1.1 **Glazing sealant** shall be single- or two-component silicone rubbers or two-component polysulfide type.

4.3.1.2 **Glazing or zipper gasket** shall be flexible chloroprene rubber, extruded in a profile to fit the frame, profile and glass thickness to provide full water and air tightness. Type of gasket, sizes, and shapes shall be suitable for the uses for which they are intended and are as follows:

a. **U-profile glazing channel** shall be fitted onto circumference of a glass

like a picture frame then frames are assembled onto the channel plate. Glazing channel is not recommended for the bottom side of double glazing glass or wired glass, which has to be provided with drain holes.

b. **Retrofit type glazing beads** shall be strung and installed on both sides of glass, which has been fitted into a frame to firmly fix the glass in position.

c. **Retro-fit glazing beads** shall be strung and fitted into one side of a glass beforehand, and the other strung beads are inserted into the other side on the site after glass has been installed into the frame.

4.3.2 **Glazing accessories** as required to supplement the installation shall be provided on the items to be glazed and provide a complete work. These include glazing points, clips, shims, angles, and beads, setting blocks, edge spacer, back up material, primer and masking tapes. Ferrous metal accessories, which will be exposed in the finished work, shall have a finish that will not corrode or stain while in service.

4.3.2.1 **Glazing clips** shall be of zinc coated steel of nonferrous metal, and shall be of types, sizes, and shapes suitable for the use for which they are intended.

4.3.2.2 **Setting block** shall be chloroprene rubber, trade name-Neoprene, and others with 90 hardness. Blocks shall be used to correctly position a glass in vertical direction, to prevent direct contact between glass edge and sash.

4.3.2.3 **Edge spacer** shall be chloroprene rubber with lesser hardness, used to prevent dislocation or breakage of a glass by the impact of opening and closing of movable windows.

4.3.2.4 **Back up material** shall be foamed polyethylene, or chloroprene rubber. This shall keep the glass in a correct position in horizontal (front and rear) direction, prevent direct contact between glass surface and sash, and adjust sealing depth.

4.3.2.5 **Primer** shall be clear and based from chlorinated rubber or as recommended by the glass manufacturer.

4.3.2.6 **Masking tape** shall be adhesive paper type or tape and used to prevent contamination of glass or sash during application of primer or filling of sealant. This shall maintain neat edge line of sealant. The following care must be taken in choosing masking tape to be used.

a. Masking tape should not affect adhesiveness of primer or sealant.

b. Adhesive used on masking tape should not contaminate glass or sash, or should not exfoliate such paint coats when masking tape is removed.

c. Masking tape must have appropriate thickness and hardness to allow folding back when used on the portions having complex configurations.

5.0 **Installation.**

5.1 **General**. Work instruction on glass fitting and installation should strictly follow a standard precautionary measure to avoid damage or breakage on glass and to secure total work safety. Glazing and fitting methods shall depend on the type of frame and the glass to be used. Glazing on conventional frame section such as aluminum shall be glazing bead, glazing channel or sealant as caulking materials. Glazing on concrete or metal channel support shall be sealant or glazing gaskets.

5.1.2 The sizes to provide for the required edge clearances to be glazed may be shop or field glazed, using glass of the quality and thickness specified or indicated. Preparation of surrounds and glazing, unless otherwise specified, shall be in conformance with the details and general conditions governing glazing in the FGMA Glazing Manual. Aluminum windows, wood doors, and wood windows may be glazed in conformance with one of the glazing methods described in the standards under which they are produced, except face puttying method illustrated and described in Commercial Standard CS163 will not be permitted. Beads or stops which are furnished with the items to be glazed shall be used to secure the glass in place. Insulating units shall not have edges or corners' ground, nipped, cut, or fitted after leaving the factory, shall not be subjected to springing, forcing, or twisting during setting, and shall be handled so as not to strike setting frames or other objects. Wire glass for fire doors shall be installed in accordance with the installation requirements of NFPA No. 80.

5.2 **Glass setting**. Items to be glazed may be shop or filed-glazed, using glass of the quality and thickness specified or indicated. Preparation of surrounds and glazing, unless otherwise specified, shall be in conformance with the details and general conditions governing glazing in the FGMA Glazing Manual. Aluminum windows, wood doors, and wood windows may be glazed in conformance with one of the glazing methods described in the standards under which they are produced, except face puttying method illustrated and described in Commercial Standard CS 163 which will not be permitted. Beads or stops which are furnished with the items to be glazed shall be used to secure the glass in place. Insulating units shall not have edges or corners ground, nipped, cut, or fitted after leaving the factory. They shall not be subjected to springing, forcing, or twisting during setting, and shall be handled so as not to strike setting frames or other objects. Wired glass for fire doors shall be installed in accordance with the installation requirements of NFPA No. 80.

6.0 **Protection.** Glass shall be provided with caution stickers to call attention. Wherever needed, glazed glasses shall be protected using protective materials.

7.0 **Cleaning.** Upon completion of the building, cracked, broken or imperfect glass, or glass which has been set improperly shall be replaced. Glass surfaces shall be thoroughly cleaned, with labels, paint spots, putty, and other defacements removed, and shall be clean at the time the work is accepted.

8.0 **Submittal requirements** Prior to procurement of materials, brochures, catalogs cuts and sample of glasses, glazing sealant and accessories shall be submit for approval.

– END OF SECTION –

SECTION 8.87 SAFETY AND SECURITY WINDOW FILM

PART 1 **GENERAL**

1.1 **SECTION INCLUDES**

A. Safety and Security Window Film:

B. Clear microlayered film. (Ultra S600) (Ultra S800)
C. Anti graffiti film. (AG4) (AG6)

1.2 RELATED SECTIONS

A. Section 08500 - Windows; windows to receive architectural window film.

B. Section 08600 - Skylights; glass skylights to receive architectural window film.

C. Section 08800 - Glazing; general glazing applications to receive architectural window film.

D. Section 08900 - Glazed Curtain Walls; curtain walls to receive architectural window film.

1.3 REFERENCES

A. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.

B. ASHRAE - American Society for Heating, Refrigeration, and Air Conditioning Engineers; Handbook of Fundamentals.

C. ASTM International (ASTM):
a. ASTM D 1004 - Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting.
b. ASTM D 1044 - Standard Method of Test for Resistance of Transparent Plastics to Surface Abrasion (Taber Abrader Test).
c. ASTM D 2582 - Standard Test Method for Puncture-Propagation Tear Resistance of Plastic Film and Thin Sheeting.
d. ASTM E 84 - Standard Method of Test for Surface Burning Characteristics of Building Materials.
e. ASTM E 903 - Standard Methods of Test for Solar Absorbance, Reflectance and Transmittance of Materials Using Integrating Spheres.
f. ASTM E 1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
g. ASTM E 1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.
h. ASTM F1642 - Standard Method of Test for Glazing and Glazing Systems Subject to Airblast Loadings
i. ASTM F2912 - Standard Specification for Glazing and Glazing Systems Subject to Airblast Loadings.

D. Consumer Products Safety Commission 16 CFR, Part 1201 - Safety Standard for Architectural Glazing Materials.

E. GSA-TS01 - Standard Test for Glazing and Glazing Systems Subject to Airblast Loadings.

F. NFRC 100/200 (Formerly ASTM E903) - Standard Methods of Test for Solar Absorbance, Reflectance and Transmittance of Materials Using Integrating Spheres.

G. ISO 16933, International Standard for Glass in Building: Explosion-resistant security glazing - Test and classification for arena air-blast testing.

1.4 PERFORMANCE REQUIREMENTS

A. Safety Glazing Impact Performance:
400 ft-lbs impact resistance, meeting ANSI Z97.1 (Class A, Unlimited) and 16 CFR 1201 (Category 2) impact requirements with film applied on 1/4 inch annealed glass.
Impact Resistance after Aging: 400 ft-lbs, meeting ANSI Z97.1 (Class A, Unlimited) and 16 CFR 1201 (Category 2) impact requirements with film applied on 1/8 inch annealed glass.

B. Tear Resistance:
Minimum Graves Area Tear Strength of 1,000 lbs% as measured on coated film product, without liner, per ASTM D1004.

C. Adhesion to Glass:
Minimum 8 lbs/in peel strength per ASTM D3330 (Method A).
Nominal 1 lbs/in peel strength per ASTM D3330 (Method A).

D. Flammability: Surface burning characteristics when tested in accordance ASTM E 84, demonstrating film applied to glass rated Class A for Interior Use:
Flame Spread Index: no greater than 25.
Smoke Developed Index: no greater than 55.

E. Abrasion Resistance:
Film shall have a surface coating that is resistant to abrasion such that less than 3 percent increase of transmitted light haze will result when tested in accordance to ASTM D 1044 using 100 cycles, 500 grams weight, and the CS10F Calibrase Wheel.
Film shall have a surface coating that is resistant to abrasion such that less than 2 percent increase of transmitted light haze will result when tested in accordance to ASTM D 1044 using 100 cycles, 500 grams weight, and the CS10F Calibrase Wheel.

F. UV Light Rejection:
Minimum of 99.9% UV light rejection (300 - 380 nm), per ASTM E903, as determined with film applied on 1/4 inch clear glass.

1.5 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's current technical literature on each product to be used, including:
Manufacturer's Data Sheets.
Preparation instructions and recommendations.
Storage and handling requirements and recommendations.
Installation methods.

C. 3rd Party Test Report Submittal Requirements. Submit the following 3rd Party test reports indicating compliance with the test values listed in this section.
Flammability Testing, ASTM E84.
Film Properties Testing, ASTM D882.
Abrasion Resistance Testing, ASTM D1044.
Peel Strength Testing, ASTM D3330.
Tear Resistance Testing, ASTM D1004.
Puncture Strength Testing, ASTM D4830.
Safety Glazing Impact Testing, ANSI Z97.1 and/or 16 CFR 1201.

Flammability Testing, ASTM E84.
Film Properties Testing, ASTM D882.
Abrasion Resistance Testing, ASTM D1044.
Peel Strength Testing, ASTM D3330.
Puncture Strength Testing, ASTM D4830.

D. Verification Samples: For each film specified, two samples representing actual film color and pattern.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten years experience.
Provide documentation that the adhesive used on the specified films is a Pressure Sensitive Adhesive (PSA).

B. Installer Qualifications: All products listed in this section are to be installed by a single installer with a minimum of five years demonstrated experience in installing products of the same type and scope as specified.
Provide documentation that the installer is authorized by the Manufacturer to perform Work specified in this section.
Provide a commercial building reference list of 5 properties where the installer has applied window film. This list will include the following information:
Name of building.
The name and telephone number of a management contact.
Type of glass.
Type of film and/or film attachment system.
Amount of film and/or film attachment system installed.
Date of completion.

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

1.7 DELIVERY, STORAGE, AND HANDLING

A. Follow Manufacturer's instructions for storage and handling.

B. Store products in manufacturer's unopened packaging until ready for installation.

C. Store and dispose of hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local authorities having jurisdiction.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

WARRANTY

A. At project closeout, provide to Owner or Owners Representative an executed current copy of the manufacturer's standard limited warranty against manufacturing defect, outlining its terms, conditions, and exclusions from coverage.

B. In order to validate warranty, installation must be performed by an Authorized 3M dealer and according to Manufacturer's installation instructions. Verification of Authorized 3M dealer can be confirmed by submission of active 3M dealer code number.

C. Anti-graffiti films are warranted for a period of 1 year when installed outdoors and for a period of 10 years when installed indoors.

PART 2 PRODUCTS

2.1 CLEAR MICROLAYERED SAFETY AND SECURITY WINDOW FILM

Micro-layered films refer to two or more dissimilar materials that are co-extruded into one film, as opposed to monolithic or monolayered films (single layer), or multi-layered films (typically 2- 3 layers) that are laminated together with an adhesive.

Safety and Security Window Film. Optically clear microlayered polyester film, nominally 6 mils (0.006 inch) thick, with a durable acrylic abrasion resistant coating over one surface and a pressure sensitive adhesive on the other. The film is clear and does not contain dyed polyester. The adhesive is pressure-activated, not water-activated, and forms a physical bond, not chemical bond, to the glass. The film is microlayered with both plastic and ductile polyester layers for tear resistance.

- Physical / Mechanical Performance Properties (nominal):
  - Film Color: Clear.
  - Film Thickness (excluding coatings or adhesive liner): Nominal 6 mils
  - Tensile Strength (ASTM D882):
    - Base Film: 32,000 psi (MD) / 32,000 psi (TD).
    - Coated Film: 32,000 psi (MD) / 32,000 psi (TD).
  - Break Strength (ASTM D882):
    - Base Film: 190 lb/in (MD) / 190 lb/in (TD).
    - Coated Film: 210 lb/in (MD) / 210 lb/in (TD).
  - Percent Elongation at Break (ASTM D882):
    - Base Film: 110 % (MD) / 100 % (TD).
    - Coated Film: 136 % (MD) / 115 % (TD).
  - Yield Strength:
    - Base Film: 12,000 psi (MD).
    - Coated Film: 15,000 psi (MD).
  - Percent Elongation at Yield (ASTM D882):
    - Base Film: 7% (MD).
    - Coated Film: 9% (MD).
  - Graves Tear Resistance (ASTM D1004):
    - Maximum Force (lbs):
      - Base Film: 28 (MD) / 28 (TD).
      - Coated Film: 28 (MD) / 28 (TD).
    - Maximum Extension (in):
      - Base Film: 0.45 (MD) / 0.65 (TD).
      - Coated Film: 0.55 (MD) / 0.55 (TD).
    - Graves Area Tear Resistance (lbs%):

- Base Film: 900 (MD) / 1,200 (TD).
- Coated Film: 900 (MD) / 1,100 (TD).

- Puncture Propagation Tear Resistance (ASTM D2582):
  - Coated Film: 6 lbf (MD) / 7 lbf (TD).
- Puncture Strength (ASTM D4830):
  - Coated Film: 140 lbf.

- Uniformity: No noticeable pin holes, streaks, thin spots, scratches, banding or other optical defects.
- Variation in Total Transmission across the width: Less than 2 percent over the average at any portion along the length.
- Identification: Labeled as to Manufacturer as listed in this Section.
- Solar Performance Properties: Film applied to 1/4 inch (6 mm) thick clear glass.
  - Visible Light Transmission (ASTM E 903): 87 percent.
  - Ultraviolet Transmission (ASTM E 903): Less than 0.5 percent.
- Impact Resistance for Safety Glazing: Tested on 1/4 inch (6 mm) annealed glass.
  - Safety Rating (CPSC 16 CFR, Part 1201): Category II (400 ft.-lbs).
  - Safety Rating (ANSI Z97.1): Class A, Unlimited Size.

2.2 ANTI-GRAFFITI WINDOW FILM

Anti-Graffiti (AG): Optically clear polyester film with a durable acrylic abrasion resistant coating over one surface and a pressure sensitive adhesive over the other. The film may be laminated to other clear polyester film layers to achieve the desired thickness of the film.

- Physical / Mechanical Performance Properties:
- Film Color: Clear.
- Thickness: Nominal 4.0 mils
- Tensile Strength (ASTM D 882): 25,000 psi.
- Break Strength (ASTM D 882) (Per Inch Width): 136 lbs.
- Elongation at Break (ASTM D 882): > 100 percent.
- Peel Strength: 1 lb/inch.
- Puncture Strength (ASTM D 4830): 90 lbs.
- Abrasion Resistance (ASTM D1044): < 2 percent increase in haze.
- Uniformity: No noticeable pin holes, streaks, thin spots, scratches, banding or other optical defects.
- Variation in Total Transmission across the Width: Less than 2 percent over the average at any portion along the length.
- Identification: Labeled as to Manufacturer as listed in this Section.

PART 3 EXECUTION

3.1 EXAMINATION

3.1.1 Film Examination:

If preparation of glass surfaces is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.

Glass surfaces receiving new film should first be examined to verify that they are free from defects and imperfections, which will affect the final appearance.

Do not proceed with installation until glass surfaces have been properly prepared and deviations from manufacturer's recommended tolerances are corrected. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result under the project conditions.

Commencement of installation constitutes acceptance of conditions.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Refer to Manufacturer's installation instructions for methods of preparation for Impact Protection Adhesive or Impact Protection Profile film attachment systems.

3.3 INSTALLATION

3.3.1 Film Installation, General:

- Install in accordance with manufacturer's instructions.
- Cut film edges neatly and square at a uniform distance of 3 mm (1/8 inch) to 1.5 mm (1/16 inch) of window sealant. Use new blade tips after 3 to 4 cuts.
- Spray the slip solution, composed of one capful of baby shampoo or dishwashing liquid to 1 gallon of water, on window glass and adhesive to facilitate proper positioning of film.
- Apply film to glass and lightly spray film with slip solution.
- Squeegee from top to bottom of window. Spray slip solution to film and squeegee a second time.
- Bump film edge with lint-free towel wrapped around edge of a 5-way tool.
- Upon completion of film application, allow 30 days for moisture from film installation to dry thoroughly, and to allow film to dry flat with no moisture dimples when viewed under normal viewing conditions.
- If completing an exterior application, check with the manufacturer as to whether edge sealing is required.

3.4 CLEANING AND PROTECTION

A. Remove left over material and debris from Work area. Use necessary means to protect film before, during, and after installation.

B. Touch-up, repair or replace damaged products before Substantial Completion.

C. After application of film, wash film using common window cleaning solutions, including ammonia solutions, 30 days after application. Do not use abrasive type cleaning agents and bristle brushes to avoid scratching film. Use synthetic sponges or soft cloths.

~ END OF SECTION ~

~ END OF DIVISION ~

DIVISION 9 FINISHES

SECTION 09.22.16 NON-STRUCTURAL METAL FRAMING (LIGHT STEEL FRAMING SYSTEM)

1.0 **Scope.** This section includes light steel framing system for dry wall partitions or fiber cement boards, metal lath partitions and ceiling assemblies.

2.0 **Storage of Materials.** Materials shall be stored out of contact with the ground to minimize contamination, corrosion and deterioration.

3.0 **Light steel framing system.** Sizes are manufacturer's standard.

3.1 **Hangers** shall be pre-punched, hot-dipped galvanized steel 1.0 mm thick.

3.2 **Suspension rod** shall be hot-dipped galvanized steel 6.0 mm diameter.

3.3 **Carrying channel clip** shall be spring steel clip 0.6 mm thick.

3.4 **Furring channel joiner and furring clip** shall be galvanized steel, gauge 24 thick.

3.5 **Furring member** shall have double crading, galvanized steel 5.0 m long; 0.40 m thick, configuration and size as shown hereinafter.

3.6 **Carrying channel and wall angle** shall be 5 meters long, gauge 19 and 2.4 or 3.0 meters long, gauge 24 thickness respectively, configuration and sizes as shown hereinafter.

4.0 **Materials for wall and partition,** profile and sizes shall be as follows:

4.1 **Track, top and bottom** shall be galvanized steel gauge 24 and 3.0 m long.

4.2 **Stud** shall be galvanized steel, gauge 24 and 3.0 m long.

5.0 **Application.** Light steel framing system shall be used in lieu of wood framing system and applied where indicated. Sizes, configurations and typical installation procedures are as shown in the accompanying drawings:

6.0 **Shop drawings.** Submit shop drawing of the required steel framing assemblies for walling, ceiling or other applications for approval prior to procurement.

~ END OF SECTION ~

SECTION 09.24 CEMENT PLASTERING

1.0 **Scope.** This section includes plastering, complete.

2.0 **General.** All masonry unit work or concrete work not specifically specified with a

finish, exposed to view shall be cement-plastered. Plastering work shall be coordinated properly with the work of other trades. The work of other trades shall be protected properly from damage during plastering operations. Floors and finished work shall be properly protected with a covering of polyethylene sheets or heavy kraft waterproof paper, with lapped and sealed joints. Scaffolding shall be amply strong, well braced, tied securely and inspected regularly. Overloading of scaffolding will not be permitted.

3.0 **Delivery and storage of materials.** Manufactured materials shall be delivered in the original packages and containers bearing the name and brand of the manufacturer. Cement and lime shall be stored off the ground under watertight cover, and away from sweating walls and damp surfaces, until ready for use. Damaged or deteriorated materials shall be removed from the premises.

4.0 **Materials.**

4.1 **Cement** shall conform to PNS 07-1992, type 1.

4.2 **Sand** shall be clean natural sand or manufactured sand passing a 3 mm screen and retained in a No. 100 mesh sieve.

4.3 **Water** for mixing shall be potable.

4.4 **Lime** shall be hydrated lime with the requirement that the free (unhydrated) calcium oxide (CaO) and magnesium oxide (MgO) in the hydrated product shall not exceed 8 percent by weight calculated on the "as received" basis.

4.5 Skimcoat is a cement based modified polymer for thin plastering applications with thickness varying from feather edge up to a maximum thickness of 2mm. Based on white cement for use with white and light colored surfaces. It is used to cover pinholes, correct unevenness and minor imperfections in concretes. When applied properly will produce a high bonding, non-cracking, smooth thin plaster.

5.0 **Mixing of plaster.** Except where hand mixing of small patches is approved, mechanical mixers of an approved type shall be used for the mixing of plaster. Materials shall be accurately measured in a device that will maintain the specified proportions within a plus or minus tolerance not in excess of 5 percent by volume. Caked or lumped materials shall not be used. Mechanical mixers, mixing boxes, and tools shall be cleaned after mixing each batch and kept freely of plaster from previous mixes. Plaster shall be thoroughly mixed with the proper amount of water, until uniform in color and consistency. Re-tempering will not be permitted, and all plaster that has begun to stiffen shall be discarded.

6.0 **Proportioning of plaster.** Portland cement plaster shall be a two-coat application. Each coat shall be proportioned as follows: one part Portland cement, three parts sand, and 1/5 part lime putty.

7.0 **Application of plaster.**

7.1 **Workmanship.** Base coats shall be applied with sufficient pressure and the plaster shall be sufficiently plastic to provide good bond on masonry or concrete base. Plaster

work shall be finished level, plumb, square, and true, within a tolerance of 3 mm in 3 m, without eaves, cracks, blisters, pits, grazing, discoloration, projections, or other imperfections. Plasterwork shall have no visible junction marks where one day's work adjoins another. Finished work shall be covered and protected in an approved manner to prevent damage.

7.2 **Cement plaster** shall be applied in two coats double-up method on masonry or concrete to a thickness of not less than 12 mm. Base coats shall be applied with sufficient pressure and excessive evaporation during hot or drying weather conditions. Care shall be taken to prevent staining the finished plaster.

8.0. **Patching and pointing.** Upon completion of the building and when directed, all loose, cracked, damaged, or defective plastering shall be cut out and re-patched in a satisfactory and approved manner. All point-patching of plastered surfaces, and plaster work abutting or adjoining any other finish work, shall be done in a neat and workmanlike manner. Plaster droppings or splattering shall be removed from all surfaces. Exposed plastered surfaces shall be left in a clean unblemished condition ready to receive paint or other finish. Protective coverings shall be removed from floors, other surfaces, and all rubbish and debris shall be removed from the building.

9.0 **Sample requirement**. Prior to application of plasterwork, the Contractor shall apply a one-small-wall sample of plastering of the expected completed work on a designated area at the job site for workmanship approval by the architect.

~ END OF SECTION ~

SECTION 09.30.13 CERAMIC TILE WORK

1.0 **Scope.** This section includes provision of ceramic or mosaic tile work, complete.

1.1 **General.** The work shall be started until rough-in for plumbing and electrical work has been completed and tested. The work of all other trades in the area where tile work is to be done shall be protected from damage in a skillful manner and as directed.

2.0 **Delivery and Storage.** Manufactured materials shall be delivered in the manufacturer's original unbroken packages or containers that are labeled plainly with the manufacturer's name and brands. Containers for tiles shall be grade sealed. Materials shall be stored in watertight enclosures and shall be handled in a manner that will prevent damage by wear and dampness.

3.0 **Materials.**

3.1 **Ceramic tiles** shall be of good quality grade; *heavy duty or medium duty, gloss smooth finish,* same color and size code should be strictly followed. Color, design and texture shall be as approved.

3.2 **Listed or trim units** shall be provided as required by the architect for a completely and neatly finished installation. Trim units shall be of material identical to the tiles or of different material such as plastic or other synthetic materials.

3.3 **Tile adhesive and grout** shall be ABC as manufactured by Allgemeine-Bau-Chemie Phil., Inc. or An approved equal.

3.3.1 Tile adhesive (tile bonding agent) shall be used as the dry-set mortar to install tiles on walls and floors employing the thin-set method conforming to ANSI A108.1b. Use ABC-Redifix with Tile Adhesive for combination of latex-dry set installation to conform to NASI A108.5 or an approved equal.

3.3.2 Tile grout shall be used as ceramic tile joint filler conforming to ANSI A118.6. Color shall match the design of tiles.

3.4 **Polyurethane construction joint sealant and sanitary grade silicone sealant** as recommended by adhesive manufacturer shall be provided as movement joint sealant for intersecting walls and floors and for areas where wide area installations are required to minimize cracks.

3.5 **Grout Sealers** shall be clear, as recommended by adhesive manufacturer, and used on all tile grout installations for lasting color retention.

3.6 **Portland Cement** shall be gray color for use on screeding and plastering. This shall conform to the requirements of PNS 07- type 1.

3.7 **Hydrated lime** shall be the same quality as that used for masonry work.

3.8 **Sand for screeding and plastering work** shall conform to the requirements of ASTM specifications C35.

3.9 **Water** shall be potable.

4.0 **Installation**

4.1 **Mortar materials**. For screeding and plastering shall be measured in approved containers, which will insure that the specified proportions of materials will be controlled and accurately maintained during the process of the work. Measuring materials with shovels, "shovel count," will not be permitted. Unless specified otherwise, mortar shall be mixed in proportions by volume, in approved mixing machines or containers. The quantity of water shall be controlled accurately and uniformly throughout the mass. A sufficient amount of water shall be added gradually and the mass further mixed until a mortar of the plasticity necessary for the purposes intended is obtained. Mortar containers, pans, floor slabs and mixer drums shall be kept clean and free from debris and dried mortar. Mortar shall be used before the initial setting of the cement has started to set. Re-tempering will not be permitted. All mortar materials shall be mixed by volume in the proportion of 1 part portland cement, 4 parts dry sand and ½ part lime.

4.2 **Application of wall plasters and floor screeds.** Surface preparation shall be of the utmost importance in every tile work. Special care must be taken into consideration on the application of wall plasters and floor screeds. Tiles shall be installed over a firm surface or substrate. The surfaces should be sound, clean and free from substances that may cause bonding to fail. In addition to being structurally sound, surfaces to be tiled shall also be flat and level. An uneven surface will result to tile installation with an uneven surface. Use a spirit level to check whether floors and countertops are level. All walls shall be plumbed as required.

4.3 **Floor and wall tiles installation.** Make sure that floor surface to be tiled shall be sound, smooth and clean. Use ABC-Tile adhesive as your dry-set mortar (thin-bed method). For tile installations on

other substrates like old tiles, granolithic floors, marble, fiber cement boards and gypsum boards, use ABC-Redifix with ABC-Tile adhesive for increased bonding strength and flexibility. Mix the tile adhesive in a non-absorbent material like plastic pail or tin can only. Wet substrate lightly before applying the tile adhesive especially during hot or windy conditions and on areas exposed directly to sunlight. Spread the adhesive mortar over one (1) square meter area at a time and comb with a special notched trowel. Fix the tiles immediately within the adhesive's open time of 15 minutes. Adjust and align the tiles accordingly and carry out random checks every 5 square meters to determine whether the back of tiles are fully covered with adhesive and check if the tile adhesive mortar still adheres to your fingers. If not, remove the adhesive layer and throw away. Follow the manufacturer's recommendation on mixing and application.

4.4 **Grouting**. Grouting can be applied on newly installed tiles after 24 hours curing. Use ABC-Tile Grout as your ceramic tile joint filler. Prior to application of grout, ensure that the grout lines are clean and if needed, remove excess tile adhesive on the tiles. Mix tile grout in a plastic pail only. Spread the paste diagonally across the tile joints using a rubber-faced float. Apply enough pressure to fill the joints uniformly and after about five (5) minutes or when the residue on the tiles begin to form a haze, apply a wet sponge using the same diagonal strokes until the grout is flush with the tiles. Wash the sponge and wring out as much water as possible, then tool the filled joints by lightly running the sponge along the tile grout lines. Wipe any remaining dry residue with a clean, soft and dry cloth to reveal the tile's true color and texture. Grouted areas may be opened to foot traffic at least 24 hours. Follow the manufacturer's recommendation on mixing and application.

4.5 **Expansion joints**. Provide expansion joints for wide area tile installations to accommodate structural movements. Use Polyurethane Construction Joint Sealant spaced approximately every six (6) meters on both ways. Also provide movement joints at intersecting tiled walls and floors as in the case of toilets and kitchens. Use Sanitary Grade Silicone Sealant with mildew resistance (fungicide) for this application.

4.6 **Grout sealers**. Apply grout sealers on the tile grouts 24 hours after grouting. Grout sealers shall be used primarily to protect the grout from damage-stains and discoloration.

4.7 **Cleaning and curing**. Floors shall be covered with waterproofed paper with all joints lapped at least 100 mm and the laps tape-sealed or held down with planks or other weights and allowed to damp-cure for at least 72 hours before foot traffic is permitted thereon. All completed tile work shall be thoroughly cleaned and polished. Acid cleaning, when necessary, shall not be done within 14 days after grout application and protect all metal or plastic trims from the solution. Use only a ten (10%) percent muriatic acid solution and after acid, the tiles shall be flushed with clean water.

4.8 **Protection.** Finished floor tiles shall be covered with clean building paper before foot traffic is permitted on them. Board walkways shall be placed on floors that are to be continuously used as passageway by workers.

5.0 **Submittal requirements**. Samples of actual tiles and grout colors to be provided shall be submitted for approval before tile work is started. The finished work shall match the approved samples in size, color pattern, finish and texture.

~ END OF SECTION ~

SECTION 09.91.23 INTERIOR PAINTING

1.0 **Scope**. This section includes interior painting, complete.

2.0 **General**. Surfaces to be painted shall be thoroughly cleaned and except for cement-emulsion filler, shall be dry when the paint is applied. Interior areas shall be broom-cleaned and dust-free before and during the application of any painting materials. Paint colors not specified shall be as approved. Paint finishes not specified shall be flat, semi-gloss, or gloss as directed. Surfaces, which will be inaccessible after erection, shall be treated and primed prior to erection, using two coats of the designated primer. Such inaccessible surfaces are defined as those surfaces that are concealed after erection or installation. Surfaces of steel to be embedded in concrete shall not be painted. Succeeding coats of the same type and/or color of paint shall vary sufficiently from the color of the preceding coat to permit ready identification. Damaged painting shall be retouched before the succeeding coat is applied. Finish surfaces shall be smooth, even, and free from defects. The number of paint coats specified shall be in addition to the shop priming coats.

3.0 **Delivery and storage**. Paints and paint materials shall be delivered in sealed containers that plainly show the brand name of the manufacturer. Storage of paints and paint materials and the mixing of paints shall be restricted to the locations directed.

4.0 **Materials**. All paints, thinners, linseed oils, and varnishes to be used shall high quality painting system. All paints shall contain an effective amount of fungicide and mildew-proofing agent that shall prevent the paint from showing a mold growth or shall be inherently fungistatic by the nature of their constituents and shall be non-toxic to person.

4.1 **Latex semi-gloss paints** shall be water-based type.

4.2 **Alkyd gloss enamel paints** shall be oil-based type.

4.3 **Alkyd flat enamel paints** shall be oil-based type

4.4 **Clear gloss varnish** shall be lacquer solvent type.

4.5 **Reducers** shall be turpentine for enamel oil-based type, lacquer solvent for Clear Gloss Varnish, and aromatic carbon solvents for polyurethane coating.

4.6 **Clear polyurethane** coating shall be approved two-component type.

4.7 **Wood putty** shall be oil-based type for alkyd enamel top coating and two-component type for polyurethane top coating.

4.8 **Patching compound powder** for sealing concrete and plaster shall be white Decalite type.

4.9 **Sandpaper** shall be waterproof type.