SECTION 090571 – ACOUSTIC UNDERLAYMENT

1.1 QUALITY ASSURANCE

A. Product Requirements:

1. Anti-Microbial Properties:
   a. Synthetic fibers that do not support the growth of bacteria and fungus.
   b. High temperature manufacturing process to eliminate live organisms.
   c. EPA registered anti-microbial agent incorporated to control mold and bacteria.
2. Flammability: products shall comply with the Federal Flammability Standard: CPSC FF 1-70 (Pill Test).

B. Impact Insulation class required to be as follows:

1. An impact sound insulation performance of NIC, as indicated under Acoustical Requirements in the Concept Design Report.
2. Laboratory Acoustic Performance: as per ISO 10140-1/3 and ISO 717-2 or as per ASTM E 2179 and ASTM E 989 with a 150 mm concrete slab as a base.
3. Engage the Contractor to provide compliancy by field rating with ISO 16283-2 for the specified floor and screed types in areas representative of the rooms to be treated.
4. Manufacturer shall have a substantial track record of not less than 5 years for the design and installation of impact sound insulation floor underlayment in similar applications subject to the local climatic conditions and tested to the standards listed.

C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.

1. Finish areas designated by Engineer.
2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Engineer.
3. Refinish mock-up area as required to produce acceptable work.

1.2 WARRANTY

A. Manufacturer's warranty against all defects of material and workmanship:
   1. Warranty Period: 5 years from date of Taking Over.

1.3 FLOORING UNDERLAYMENT

A. Acoustical control for interior sound transmission shall be constructed to ensure sound isolation compliant with the minimum STC values specified in ASHRAE 189.1, Table 8.3.3.3, noting that all construction of acoustical items shall be visually inspected by an approved agency.

B. The isolation system shall be tested by a nationally recognized independent Acoustical Laboratory. System shall meet Fire Requirements for flame spread and smoke developed as indicated under Fire Requirements in the Concept Design Report, to be tested as per ASTM E-84 testing for the following:
   a. Flame spread.
   b. Smoke Developed.

C. Acoustic Underlay

1. Provide heavy-duty acoustic underlayer for screed, toping, floor finishes and where otherwise indicated; made of polyurethane-bound rubber-fiber, a mixture of cork and rubber crumb or other approved-type proprietary material; complete with manufacturer’s

standard perimeter wall strip, bond coat, and hi-tack adhesive tape; system-designed to meet or exceed the required impact sound pressure level reduction on slab structures, where indicated or required in the Project.

2. Thickness: As needed to meet requirements in the Concept Design Report.
3. Load Bearing Capacity: Not less than 3,000 kg/sq. m.
4. Impact sound reduction to comply with values indicated in the Concept Design Report.
5. Impact Sound Reduction shall be provided where indicated under the Acoustic Requirements in the Concept Design Report.
6. Water Vapor Transmission Rate (ASTM D 1653): 0.40 g/sqm/24 hrs.
7. Bond Coat: Provide as follows:
    a. For Dry Areas: High-tack, semi-pressure sensitive, acrylic-based adhesive; one-part; specifically formulated for acoustic underlayer bonding in dry area substrates.
8. For Wet Areas: Elastomeric, moisture-cured polyurethane adhesive; one-part; solvent-free.

D. Where an acoustical waterproofing and crack isolation membrane is indicated, utilize composite sheet membrane manufactured from an acoustically formulated alloy of Chlorinated Polyethylene (CPE), with polyester fabric laminated to both sides.

1. Performance Test Data:

    a. Sound Reduction: to be tested by an independent acoustical laboratory in accordance with ASTM E492-90 and ASTM E90-90.
    b. Test construction shall include a sound rated ceiling, concrete substrate, tile, and thin-set polymer modified thin-set yielding the values indicated under the Acoustic Requirements, as indicated in the Concept Design Report.
    c. Field tests shall be conducted in compliance with ASTM E1007.
    d. When tested to ASTM E2179, underlay shall yield to the values indicated under the Acoustic Requirements, as indicated in the Concept Design Report.
    e. Applicable Standards: Underlay shall meet ANSI A118.13, Standard for Sound Reduction Membranes.
    f. Underlay shall be classified for “Extra Heavy Service.” And shall exceed “High Performance” criteria for ANSI A118.12 (System Crack Resistance).
    g. Underlay shall be adhered with thin-set polymer modified cementitious adhesive grade C2TES1 to EN 120004, or equivalent.

1.4 INSTALLATION

A. Install in accordance with manufacturer's instructions.

1.5 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Taking Over.

END OF SECTION 090571

SECTION 092216 - NON-STRUCTURAL METAL FRAMING

1.1 QUALITY ASSURANCE

A. Code-compliance certification of studs and tracks.

1.2 MATERIALS

A. Steel Framing:

1. Steel studs and tracks.
2. Slip-Type Head Joints:

    a. Single long-leg track.
    b. Double tracks.
    c. Deflection track.

3. Firestop track.
4. Flat strap and backing plate.
5. Cold-rolled channel bridging.
6. Hat-shaped, rigid furring channels.
7. Resilient furring channels.
8. Cold-rolled furring channels.
9. Z-shaped furring.

B. Suspension Systems:

1. Wire hangers.
2. Flat hangers.
3. Carrying channels (main runners).
4. Furring channels.
5. Grid suspension systems for ceilings.

END OF SECTION 092216

# SECTION 092400 – PORTLAND CEMENT PLASTERING

## 1.1 MOCKUPS

A. Mockups for each finish.

## 1.2 MATERIALS

A. Expanded-Metal Lath: ASTM C847.
B. Accessories:
   1. Cornerite.
   2. External- (Outside-) corner reinforcement.
   3. Metal Trim: anodized aluminum.
   4. Plastic trim.

C. Bonding compound.
D. Finish Coats: Ready mixed.
E. Plaster Mixes: ASTM C926.
F. Thickness: to be 20 mm thick for exterior applications and 15 mm thick for interior applications.

## 1.3 INSTALLATION

A. Plaster Finishes: Float, unless otherwise indicated by the Engineer.

END OF SECTION 092400

SECTION 092900 - GYPSUM BOARD

1.1 MOCKUPS

A. Mockups for the following:

1. Levels of exposed gypsum board finish.

1.2 MATERIALS

A. Interior Gypsum Board:

1. Gypsum wallboard.
2. Gypsum board, Type X.
3. Gypsum ceiling board.
4. Mold-resistant gypsum board.

B. Specialty Gypsum Board:
1. Acoustically enhanced gypsum board.

C. Tile-Backing Panels:
1. Cementitious backer units.

D. Trim Accessories:

1. Interior.
2. Exterior.
3. Aluminum: Extruded profiles.

E. Auxiliary Materials:

1. Laminating adhesive.
2. Acoustical sealant.

END OF SECTION 092900

SECTION 093000 - TILING

1.1 QUALITY ASSURANCE

A. Mockup for each type of floor tile installation.

B. Mockup for each type of wall tile installation.

1.2 TILE PRODUCTS

A. Porcelain Quarry Tile Type: Unglazed.
   1. Size: as indicated on drawings.
   2. Face Size Variation: Rectified.
   3. Description:
   4. Trim Shapes: Base cove.

B. Ceramic Tile .
   1. Size: As indicated on drawings.
   2. Face Size Variation: Rectified.
   3. Description:
   4. Trim Shapes: Base cove.
   5. Slip resistant for floor applications.

C. Glazed Wall Tile Type:
   1. Size: As indicated on drawings.
   2. Face Size Variation: Rectified.
   3. Trim Shapes: Coved base.

1.3 ACCESSORY MATERIALS

A. Thresholds: Marble.

B. Tile Backing Panels: Cementitious backer units.

C. Waterproof Membrane:
   1. Refer to Section 071613 “Polymer Modified Cement Waterproofing”, for waterproofing in Swimming Pools.
   2. As specified in Section 071416 “Cold Fluid Applied Waterproofing”, for interior floor and wall tiles.

D. Crack Isolation Membrane: Chlorinated polyethylene sheet.

E. Metal edge strips.

1.4 INTERIOR TILE INSTALLATION SCHEDULE

A. Mortar and Grout for Interior Floors on Concrete:
   1. Sand-Portland Cement Grout: ANSI A108.10, composed of white or gray cement and white or colored aggregate as required to produce color indicated.
   2. Standard Cement Gout: ANSI A118.6.
   3. Polymer-Modified Tile Grout: ANSI A118.7.

a. Polymer Type: Acrylic resin or styrene-butadiene rubber in liquid-latex form for addition to prepackaged dry-grout mix.

4. Portland Cement Mortar (Thickset) Installation Materials: ANSI A108.02.
5. Dry-Set Portland Cement Mortar (Thin Set): ANSI A118.1.
6. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4.
7. Water-Cleanable, Tile-Setting Epoxy: ANSI A118.3.

B. Mortar, adhesive and Grout for Swimming Pools:
1. Polymer modified water resistant adhesive for fixing swimming pool tiles on smooth concrete surface. Factory blended pre-packaged Cementous mortar adhesive composed of hydraulic binders to comply with ASTM C 348 and ASTM C 349, to be applied in thickness of 3mm to 10mm depending on tile and substrate suitability.
2. Water cleanable, chemical resistant waterproof epoxy tile grout. Three component epoxy based water cleanable, consisting of resin base, hardener and selected fillers, high chemical resistant and waterproof tile grout, to comply with ANSI 118.3 and ANSI 108.6 PART 1,3 and 4.

C. Mortar and Grout for Interior Walls, Masonry or Concrete:
1. Sand-Portland Cement Grout: ANSI A108.10, composed of white or gray cement and white or colored aggregate as required to produce color indicated.
2. Standard Cement Grout: ANSI A118.6.
3. Polymer-Modified Tile Grout: ANSI A118.7.
a. Polymer Type: Acrylic resin or] styrene-butadiene rubber in liquid-latex form for addition to prepackaged dry-grout mix.
4. Portland Cement Mortar (Thickset) Installation Materials: ANSI A108.02.
5. Dry-Set Portland Cement Mortar (Thin Set): ANSI A118.1.
6. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4.
7. Water-Cleanable, Tile-Setting Epoxy: ANSI A118.3.

END OF SECTION 093000

SECTION 095123 - ACOUSTICAL TILE CEILINGS

1.1 QUALITY ASSURANCE

A. Mockups for each form of construction.

1.2 PERFORMANCE REQUIREMENTS

A. Engineering design of seismic restraints by Contractor.

B. Flame-Spread Index: Refer to the Fire Requirements indicated in the Concept Design Report.

C. Smoke-Developed Index: Refer to the Fire Requirements indicated in the Concept Design Report.

1.3 PRODUCTS

A. Acoustical Tiles:

1. Type III: Mineral base with painted finish.
2. Pattern: C (perforated, small holes), unless, otherwise indicated by the Engineer.
3. Acoustic rating: Refer to the Acoustic Requirements, indicated in the Concept Design Report.
4. Thickness: As per Manufacturer's Standards.
5. Modular Size: As indicated on drawings.

B. Metal Suspension System:

1. High-humidity finish.
2. Direct Hung, Double Web Heavy duty.
3. Access: Manufacturer's Standard.
4. Attachment Devices: Post-installed expansion or power actuated.
5. Seismic perimeter stabilizer bars, struts, and clips.

C. Metal Edge Moldings and Trim: Extruded aluminum.

1.4 ERECTION TOLERANCES

A. Main and Cross Runners: Level to within 3 mm in 3.6 m.

B. Moldings and Trim: Level to within 3 mm in 3.6 m.

1.5 FIELD QUALITY CONTROL

A. Special Inspection: Contractor-engaged special inspector for seismic design.

B. Testing Agency: Contractor engaged.

END OF SECTION 095123

SECTION 095133 - ACOUSTICAL METAL PAN CEILINGS

1.1 QUALITY ASSURANCE

A. Mockups for each form of ceiling system and finish.

1.2 ACOUSTICAL METAL PAN CEILINGS, GENERAL

A. Acoustical Metal Pan Standard: ASTM E1264.

B. For Fire Rating, comply with the fire requirements indicated in the Concept Design Report.

C. Metal Suspension-System Standard: ASTM C635/C635M and ASTM C636/C636M.

1.3 PRODUCTS

A. As required, Sound Absorption: Fabric layer bonded to panel.

B. As required, Sound Attenuation Panels: Aluminum] with secondary sound-absorbent pads.

C. Aluminum Metal Pans:

1. Classification: Type VII, perforated, with mineral- or glass-fiber-base backing.
2. Pan Type: Lay in.
3. Pan Size: 1200 mm by 600 mm.
4. Pan Face Finish: As selected by the Engineer from Manufacturer’s full range.
5. NRC: Comply with the Acoustic Requirements indicated in the Concept Design Report
6. Ceiling Attenuation Class: Comply with the Acoustic Requirements indicated in the Concept Design Report.

D. Metal Suspension Systems for Lay-in Acoustical Standard-Grid Pan Ceiling:
1. Narrow-Face, Capped, Steel: Heavy duty.

E. Seismic struts, Seismic clips and Hold-down clips.

F. Acoustical sealants.

1.4 FIELD QUALITY CONTROL

A. Testing: By Contractor.

END OF SECTION 095133

SECTION 096516 - RESILIENT SHEET FLOORING

1.1 PRODUCTS

A. Vinyl Sheet Flooring:

1. Backing: None, unbacked.
2. Wearing Surface: Textured.
3. Seamless-Installation Method: Heat welded .

B. Installation Materials:

1. Trowelable leveling and patching compounds.
2. Adhesives.
3. Integral-Flash-Cove-Base Accessories:

a. Cove strip.
b. Cap strip.
c. Corners.

4. Floor polish.

END OF SECTION 096516

SECTION 096536 - STATIC-CONTROL RESILIENT FLOORING

1.1 QUALITY ASSURANCE

A. Mockups for each form of construction and finish.

1.2 PRODUCTS

A. Conductive, Solid Vinyl Floor Tile: ASTM F 1700, Class I (monolithic), Type A (smooth surface).
   1. Conductive Properties: Provide floor coverings with static-control properties indicated as determined by testing identical products per test method indicated by an independent testing and inspecting agency.
      a. Electrical Resistance: Test per ASTM F 150 with 500-V applied voltage.
         1) Average greater than 25,000 ohms and less than 1 megohm when test specimens and installed floor coverings are tested surface to surface (point to point).
         2) Average no less than 25,000 ohms with no single measurement less than 10,000 ohms when installed floor coverings are tested surface to ground.
      b. Static Generation: Less than 100 V when tested per AATCC-134 at 20 percent relative humidity with conductive footwear.
      c. Static Decay: 5000 to 0 V in less than 0.01 seconds when tested per FED-STD-101C/4046.1.

B. Installation Materials:

   1. Trowelable leveling and patching compounds.
   2. Static-control adhesive.
   3. Grounding strips.
   4. Heat-welding bead.
   5. Integral-flash-cove base accessories.

1.3 INSTALLATION

A. Installation with oversight by manufacturer's representative.

B. Installation Method: Adhesive.

C. Seaming Method: Heat welded .

D. Integral-Flash-Cove Base: 100 mm..

1.4 FIELD QUALITY CONTROL

A. Testing Agency: Contractor engaged.

END OF SECTION 096536

SECTION 096566 - RESILIENT ATHLETIC FLOORING

1.1 PRODUCTS

A. Sheet Vinyl Flooring:

1. Unbacked Sheet Vinyl Flooring: 0.08 inch (2 mm) thick.
2. Sheet Vinyl Flooring with Backing:

a. Binder Content: 90 percent.
b. Overall Thickness: As per Manufacturer’s Standards.
c. Interlayer Material: Foamed Plastic.
d. Backing: Foamed plastic.

3. Seaming Method: Heal welding.
4. Traffic-Surface Texture: Embossed. Applied Finish: Factory applied UV urethane.

END OF SECTION 096566

SECTION 096813 - TILE CARPETING

1.1 QUALITY ASSURANCE

A. Mockups for each type of carpet tile installation.

1.2 WARRANTY

A. Materials and Workmanship for Carpet Tile: 10 years.

1.3 PRODUCTS

A. Carpet Tile :
1. Type of Manufacture ISO 2424: tufted per 10cm
2. Aspect ISO 2424: Multi-Level Pattern Loop
3. Dye Method EN 994: 100% Solution Dyed
4. Dimensions EN 994: 25 cm x 100 cm
5. Primary Backing ISO 2424: Pet Non-Woven
6. Secondary Backing ISO 2424: Manufacturer’s standard, Contains 90% Recycled Content
7. Pile Fibre Composition ISO 2424.
8. Total Thickness ISO 1765: 12.3 mm
9. Effective Pile Thickness ISO 1766: 3.5 mm
10. Total Mass ISO 8543: 4404 g/m²
11. Nominal Total Pile Mass ISO 2424 949 g/m²
12. Effective Pile Mass ISO 8543: 394 g/m²
13. Pile Density ISO 8543: 0.113 g/cm³
14. Number of Tufts ISO 1763: 129,000/m² | 32.8 per 10cm
15. Electrostatic Propensity ISO 6356: ≤ 2.0 kV (stroll test)
16. Use Classification EN 1307: 33 commercial heavy
17. Luxury Class EN 1307: LC1
18. Dimensional Stability EN 986: ≤ 0.2%
19. Impact Sound Insulation ISO 10140: 36dB
20. Sound Absorption Classification ISO 354/11654: 0.35 αw | Class D
21. Thermal Resistance m² K/W ISO 8302: 0.166 m² K/W TOG 0.46
22. Dry Slip Resistance ISO 13893: pass
23. Colour Fastness To Light ISO 105-B02: >6
24. Flammability EN 13501-1: Bfl-S1 (adhered testing)
25. Castor Chair EN 985: ≥2.4 Continuous Use

B. Carpet Tile :
1. Construction: Multi-Level Pattern/Cut Loop
2. Fiber: Nylon
3. Dye Method: 100% Solution Dyed
4. Primary Backing: Synthetic
5. Secondary Backing: Ecoworx® Polyolefin Plastomer
6. Protective Treatments: Soil Protection
7. Adhesive: Manufacturer’s standard.
8. Product Size: 46 cm x 91 cm
9. Area per Carton: 4.18 m²
10. Pieces per Carton: 10 pcs
11. Gauge: 39.4 per 10 cm
12. Stitches: 34.5 per 10 cm
13. Finished Pile Thickness: 3.15 mm
14. Average Density: 0.301 g/cm³
15. Total Thickness: 8.31 mm

16. Tufted Weight: 949.4 g/m²
17. Tests:
    a. Antimicrobial Assessment: Passes (AATCC-174) (When installed using Shaw 5036 adhesive).
    b. Pill Test: Pass.
    c. Radiant Panel: Class I.
    d. ASTM E 662: Less Than 450.
    e. Electrostatic Propensity: Less Than 3.5 kv.
    f. CRI Green Label Plus (GLP): GLP9968.
    g. ADA Compliance: >0.6, Meets the recommended static coefficient of friction for ADA walking surfaces and accessible routes.

END OF SECTION 096813

SECTION 096816 - SHEET CARPETING

1.1 QUALITY ASSURANCE

A. Mockups for each type of carpet tile installation.

1.2 WARRANTY

A. Materials and Workmanship for Carpet Failure: 10 years.

B. Materials and Workmanship for Carpet Cushion Failure: 10 years.

1.3 PRODUCTS

A. High-end Tufted Carpet:

1. Structure: Tufted cut pile as per ISO 2424.
2. Gauge: 1/8 ISO 2424.
3. Backing: Woven textile.
4. Pile Material: 100% Polyamide as per DIR 96/73, 96/74.
5. Total thickness: 11.5 mm as per ISO 1765.
6. Surface Pile thickness: 9.0 mm as per ISO 1766.
7. Tufts: 140.900 pr. m2. As per ISO 1763.
8. Total Carpet Weight: Apr.2.925 g/m2 as per ISO 8543.
9. Pile yarn weight: 1.750 g/m2.
10. Surface Pile Density: 0.150 g/cm3 as per ISO 8543.
11. Performance Area: Class 31 Commercial-Moderate as per EN1307.
12. Fire Classification: Class 1 as per ASTM E-648.

1.4 EXECUTION

A. Installation: Manufacturer’s Standards. .

END OF SECTION 096816

SECTION 096900 - ACCESS FLOORING

1.1 SUMMARY

A. Section Includes:

1. Cementitious-core steel panel access flooring.

1.2 MOCKUPS

A. Mockups for each floor panel and floor finish. Size not less than 3 floor panels in length by 3 floor panels in width

1.3 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Withstand effects of motion due to earthquake according to SBC code .

B. Structural Performance:

1. Concentrated Loads: To withstand loads impose by equipment installed.
2. Ultimate Loads: To withstand loads impose by equipment installed.
3. Rolling Loads: To withstand loads impose by equipment installed.

1.4 PRODUCTS

A. Cementitious-Core Steel Panel Access Flooring:

1. Size: 600 by 600 mm.

a. Provide perforated panels or grates with or without dampers where indicated and as required.

2. Understructure: Pedestal, with panels attached with bolts.
3. Floor Panel Coverings with Edge Trim:
   a. Solid-Vinyl Tile: Static coductive.

B. Accessories:

1. Service Outlets: Each with a minimum of two power receptacle(s).
2. Adjustable plastic diffusers.
3. Cavity dividers.
4. Closures.
5. Ramps, steps, and railings.

1.5 INSTALLATION

A. Pedestals set with mechanical anchors.

END OF SECTION 096900

SECTION 099113 - EXTERIOR PAINTING

1.1 SUMMARY

A. Primers.

B. Finish coatings.

1.2 QUALITY ASSURANCE

A. Mockups for each color and finish.

1.3 FIELD QUALITY CONTROL

A. Testing Agency: Owner engaged.

1.4 EXTERIOR PAINTING SCHEDULE

A. Concrete Substrates, Nontraffic Surfaces:

B. Portland Cement Plaster Substrates:
1. High-build latex system. Dry film thickness of not less than 0.25 mm.

END OF SECTION 099113

SECTION 099123 - INTERIOR PAINTING

1.1 SUMMARY

A. Primers.

B. Finish coatings.

1.2 QUALITY ASSURANCE

A. Mockups for each color and finish.

1.3 FIELD QUALITY CONTROL

A. Testing Agency: Owner engaged.

1.4 INTERIOR PAINTING SCHEDULE

A. Concrete Substrates, Nontraffic Surfaces:

1. Latex system.

B. Gypsum Board and Plaster Substrates:

1. Latex over latex sealer system.
2. Latex over alkyd primer system (for plaster only).

END OF SECTION 099123

# SECTION 099611 - HIGH-PERFORMANCE COATINGS (PROPRIETARY SPECIFICATION)

## 1.1 QUALITY ASSURANCE

A. Mockups for each finish.

## 1.2 SOURCE QUALITY CONTROL

A. Testing: Contractor engaged.

## 1.3 EXTERIOR HIGH-PERFORMANCE COATING SCHEDULE

A. Galvanized-Metal Substrates, Steel and Iron Substrates, and structural steel.

1. Polyurethane Colored Coating: factory applied paint system, shall comply with ISO12944-5:2007 obtained from single supplier consisting of high build polyurethane colored coating over an anti-corrosive pigmented primer and a barrier coat. Color of polyurethane coating applied as selected by the Engineer from manufacturer's full range of colors and gloss.

2. Substrate Low Alloy Carbon Steel, and wrought iron

3. Primer Epoxy Zinc rich Primer 60-80 microns

4. Intermediate coat Two Component-Polyamide high solid water borne Epoxy coating 150 micron

5. Urethane topcoat Aliphiatic, polyurethane, 75 microns one coat for interior applications and two coats (150) microns for external applications.

6. Warranty: 20 years to first maintenance from date of Taking over Certificate.

## 1.4 INTERIOR HIGH-PERFORMANCE COATING SCHEDULE

A. Concrete Substrates, Vertical Surfaces:

1. Epoxy system.
   a. Initial Coat/Primer: One coat of a transparent, solvent free two component epoxy primer / sealer, vol. solids 98 ± 2%, Thickness 150 microns DFT.
   b. Finishing Coat: One finishing coat of a two component, high solids, solvent free coating, vol. solids 98 ± 2%, thickness 150 microns dft, Coating to be suitable for food preparation areas.
   c. Coating system to be independently tested for following properties: after 28 days curing:
      1) Compressive Strength: not less than 90 N/mm² (ASTM C579).
      2) Tensile Strength: not less than 8 N/mm² (ASTM C307).
      3) Crack bridging ability: 1.62(ASTM D 638-10/C1305).
      4) Water Absorption: 0.0 (ASTM C413).

2. Anti-Static Epoxy system on Base of wall
   a. High Build Solvent Free Conductive Epoxy Based Coating System For Telecom Rooms And The Like: system to be comprised of two component solvent free epoxy primer and two component static conductive coating having conductive element and grounding plates. Dry film thickness to be as recommended by manufacturer.

1) 100% Solid Solvent Free Epoxy Primer .DFT as recommended by manufacturer.
2) Apply copper tape around the perimeter and as recommended by manufacturer.
3) Wear Resistant conductive epoxy top coat. DFT as recommended by manufacturer.
4) System minimum required physical properties:
   a) Compressive Strength: 50 N/mm2(ASTM C579)
   b) Tensile Strength: 20 N/mm² (ASTM C307)
   c) Flexural Strength: 40 N/mm² (ATM C580)
   d) Adhesion Strength: minimum 3N/mm2 (ASTM D4541)
   e) Shore A Hardness : 98 (ASTM D2240)
   f) Shore "D" Hardness: 80 (ASTM D2240)
   g) Water Absorption: 0.04 (ASTM C413)
   h) Abrasion: Weight loss no more than 0.03% (ASTM D4060)
   i) Coefficient of Friction: ASTM D 2047, 0.60 to 0.90, (Varies by resin and use of non-skid aggregates)
   j) Thermal Shock Resistance: ASTM C 884, should Pass.
   k) Flame Ret ardency, as per BS 476, Part -7, 1971, Class 1
   l) Colours shall be to the engineer's selection from the manufacturer's standard range.

3. FDA approved anti-slip Epoxy.
   a. High Build, Solvent Free, Epoxy Based Topcoat For Walls and Ceilings:
      1) Initial Coat/Primer: One coat of a transparent, solvent free two component epoxy primer / sealer, vol. solids 98 ± 2%, Thickness 150 microns DFT.
      2) Finishing Coat: One finishing coat of a two component, high solids, solvent free coating, vol. solids 98 ± 2%, thickness 150 microns dft, Coating to be suitable for food preparation areas.
      3) Coating system to be independently tested for following properties: after 28 days curing
         a) Compressive Strength: not less than 90 N/mm² (ASTM C579)
         b) Tensile Strength: not less than 8 N/mm² (ASTM C307)
         c) Crack bridging ability: 1.62(ASTM D 638-10/C1305)
         d) Water Absorption: 0.0 (ASTM C413)

B. Concrete Substrates, Horizontal Surfaces.

1. Epoxy system.
   a. First Coat:
      1) One coat transparent, two component epoxy primer / sealer, vol. solids 98 ± 2% Thickness 150 microns DFT, VOC:70 gm/L.
   b. Top coat:
      1) One coat Solvent Free, high solids epoxy based self-leveling coating, vol. solids 98 ± 2%, thickness 4000 microns dft (4mm).

   c. System minimum required physical properties:
      1) Compressive Strength: 73 N/mm² (ASTM C579).
      2) Tensile Strength: 14 N/mm² (ASTM C307).
      3) Flexural Strength: 24 N/mm² (ATM C580).
      4) Shore "A" Hardness: 96 average (ASTM D2240 - 1996).
      5) Shore "D" Hardness: 75 (ASTM D2240 - 1996).
      6) Bond Strength to concrete: 2N/mm² (ASTM D 4541).
      7) Crack Bridgability: 1.4 mm (ASTM C836).
      8) Water Absorption: 0.04% (ASTM C 413-01-1996).
      9) Abrasion Resistance: 96mg (ASTM D4060/cs 17 1000 cycles).
      10) Impact Resistance: No sign of cracks ASTM D 2794.

2. Anti-static Epoxy floor coating system on screed.
    a. High Build Solvent Free Conductive Epoxy Based Coating System For Telecom Rooms And The Like: system to be comprised of two component solvent free epoxy primer and two component static conductive coating having conductive element and grounding plates. Dry film thickness to be as recommended by manufacturer.
        1) 100% Solid Solvent Free Epoxy Primer .DFT as recommended by manufacturer.
        2) Apply copper tape around the perimeter and as recommended by manufacturer.
        3) Wear Resistant conductive epoxy top coat. DFT as recommended by manufacturer.
        4) System minimum required physical properties:
            a) Compressive Strength: 50 N/mm2(ASTM C579)
            b) Tensile Strength: 20 N/mm² (ASTM C307)
            c) Flexural Strength: 40 N/mm² (ATM C580)
            d) Adhesion Strength: minimum 3N/mm2 (ASTM D4541)
            e) Shore A Hardness : 98 (ASTM D2240)
            f) Shore “D” Hardness: 80 (ASTM D2240)
            g) Water Absorption: 0.04 (ASTM C413)
            h) Abrasion: Weight loss no more than 0.03% (ASTM D4060)
            i) Coefficient of Friction: ASTM D 2047, 0.60 to 0.90, (Varies by resin and use of non-skid aggregates)
            j) Thermal Shock Resistance: ASTM C 884, should Pass.
            k) Flame Ret ardency, as per BS 476, Part -7, 1971, Class 1
            l) Colours shall be to the engineer's selection from the manufacturer's standard range.

3. FDA approved anti-slip Epoxy.
    a. High Build, Solvent Free, Epoxy Based Topcoat For Walls and Ceilings:
        1) Initial Coat/Primer: One coat of a transparent, solvent free two component epoxy primer / sealer, vol. solids 98 ± 2%, Thickness 150 microns DFT.
        2) Finishing Coat: One finishing coat of a two component, high solids, solvent free coating, vol. solids 98 ± 2%, thickness 150 microns dft, Coating to be suitable for food preparation areas.
        3) Coating system to be independently tested for following properties: after 28 days curing
            a) Compressive Strength: not less than 90 N/mm² (ASTM C579)
            b) Tensile Strength: not less than 8 N/mm² (ASTM C307)
            c) Crack bridging ability: 1.62(ASTM D 638-10/C1305)
            d) Water Absorption: 0.0 (ASTM C413)

C. Plaster Substrates:

1. Epoxy system.

2. Chemical resistant Epoxy paint.

3. Anti-static Epoxy system.

D. Anti-Carbonation Coating:
1. Elastomeric Anti-Carbonation Coating on smooth concrete vertical surfaces, for walls, columns, ceilings and the like: flexible two-coat system 100% acrylic coating required to provide protection against ingress of carbon dioxide and chloride inon ingress, with anti-fungal and anti-algae properties. Anti-Carbonation coating should be breathable, with excellent durability, fade resistance and resistance to cracking, peeling and chipping while bridging hair line cracks.
    a. Coating System shall compromise the following:
        1) Primer : 1x Acrylic copolymer semi-pigmented penetrating Primer. DFT: 20-30 µm.

2) Filler: Acrylic Copolymer Putty filler for concrete/render. Thickness: As needed.
3) Topcoat: Smooth finish: 2 x 100% pure acrylic anti-carbonation smooth finish shall be water borne VOC compliant cross-linked technology with superior UV resistance and minor crack resistant capability. DFT 30 µm/coat.

2. Colour and texture shall be as indicated on design drawings or to engineer's approval, as selected from Manufacturer's standard range of colors.
3. Surface preparation and methods of application shall be strictly in accordance with manufacturer's written instructions.
   a. Anti-Carbonation coating Properties
      1) Determination of carbon dioxide diffusion coefficient to BS EN 1062-6, Method A
         a) Carbon dioxide co-efficient: Dco2= 2.44 x 10-8m2/d
         b) Equivalent air layer thickness: R= 600 m
         c) Equivalent concrete layer thickness: Sc= 156 cm
      2) Determination of Chloride ion diffusion coefficient: 4.13 x 10-09 in accordance with Taywood method
      3) Determination of water vapor transmission in accordance with Taywood method
         a) Mass flow (flux): 32.89 (avg) g.m.m2/d
         b) Equivalent air layer thickness: Sd= 1.46 m
      4) Determination of liquid water transmission to BS EN 1062-3
         a) Liquid water transmission rate: 0.01 kg/m2.h0.5
         b) Liquid water diffusion value: 99.99 %
      5) Determination of crack bridging ability: A1 to BS EN 1062-7 Method A
         a) Elongation: 2.86 N.mm2 to ASTM C412
         b) Tensile strength at break: 50 % to ASTM C412

END OF SECTION 099611

SECTION 099646 - INTUMESCENT PAINTS

1.1 SUMMARY

A. Surface preparation and application of fire proofing and intumescent coating systems to structural steel in a cellulosic fire situation.

1.2 QUALITY ASSURANCE

A. Applicator Qualifications: Authorized by manufacturer and shall have valid authorization from authorities having jurisdiction in locality.

B. Source Limitations: Provide Proprietary intumescent paint system including all system coats.

C. Benchmark Samples (Mockups): Provide a full-coat benchmark finish sample for each type of coating and substrate required.

D. Fire Test Response Characteristics: Provide intumescent paints with the following surface burning characteristics as determined by testing identical products per ASTM E 84, by UL, or by another testing and inspecting agency acceptable to Engineer.

1. Flame-Spread Index: 50
2. Smoke-Developed Index: 450

E. Fire-Resistance Characteristics: Provide intumescent paint system with the following fire resistance duration as determined by testing identical products per ASTM E 119 or BS 476 part 20/21 by UL (USA), Warnock Hersey (USA) BRE Warrington Certifire (UK) or by another testing and inspecting agency acceptable to Authorities having Jurisdiction.

1. Fire Resistance Rating: As required in fire and life safety report

F. Field Quality Control: Testing Agency

1.3 WARRANTY

A. Warranty period for Fire Performance: 5 years from date of Taking Over.

B. Warranty for Corrosion Resistance: 5 years from date of Taking Over.

1.4 INTUMESCENT PAINT SYSTEM

A. Intumescent paint system shall consist of the following coats;

1. Corrosion protection primer
2. Intumescent coating in multiple-coat application according to required thickness
3. Finish topcoat with high performance paint in the indicated or selected colourcolor.

B. VOC Content: Products applied in the field (mechanical splices and touch up works) shall comply with VOC content limits of authorities having jurisdiction.

1. Flat Paints and Coatings: 50 g/L.
2. Non-flat Paints and Coatings: 150 g/L.
3. Primers, Sealers and Undercoats: 250 g/L.

C. Selection of Desired Quality Finish

1. High Decorative Finish: Definition: High standard of evenness, smoothness and gloss when viewed from a minimum distance of 2m.

END OF SECTION 09964