2.1.2Glazing quality shall be low-iron, ultra-clear with 91% visible light transmission.
2.1.3Minimum nominal thickness shall be 6.0mm
2.1.4Mirror Edges: Flat and slightly rounded or buffed on corners. Seal edges with edge sealer
2.1.5Fabricate mirror sizes according to sizes indicated on approved shop drawings.
2.1.6Only install mirrors whose grade and quality does not decline upon exposure to areas with heavy moisture.

2.2 MISCELLANEOUS HARDWARE
2.2.1Unless otherwise approved by the architect, no extra accessories will be allowed on mirrors other than anchors and inserts that have no impact on the exposed side of the mirror.
2.2.2Use compatible mirror mastics as prescribed by manufacturers.

3. PART 3 EXECUTION
3.1 EXAMINATION
3.1.1Examine substrates or surface areas on which mirrors are to be mounted. Check for compliance with installer's requirements on tolerances, substrate preparations, and other conditions affecting work.
3.1.2Proceed with installations once substrate conditions are acceptable.
3.1.3Check installation requirements of approved manufacturer's prescribed mastic. Comply with written installation instructions.

3.2 INSTALLATION
3.2.1Provide 3mm air space between back of mirrors and mounting surface for air circulation to avoid undue damages on silver coating of mirror.
3.2.2Use pressure sensitive adhesive tapes and appropriate mirror hardware that do not affect the exposed side of the mirrors. Comply with manufacturer's written instructions on adhesives.
3.2.3Mirror installation shall appear seamless.

3.3 CLEANING AND PROTECTION
3.3.1Protect mirrors from breakage and contamination during construction. Cover surfaces with protective films.
3.3.2Do not exposed edges of mirrors to standing water.
3.3.3Keep installed mirrors clean. Wash exposed surfaces of mirrors clean and dry, free of visual damages prior to substantial completion.
3.3.4Do not use chemicals that damage the quality of the mirror film and the glass surface.

END OF SECTION

09 00 00	**FINISHES**	
09 30 0	Tile	

1. PART 1 GENERAL
1.1 RELATED DOCUMENTS
1.1.1Technical Architectural Drawings
1.1.2Specifications
1.1.3Requests for Interpretation
1.1.4Product Samples and Brochures
1.1.5Manufacturer's Data Sheets and Certificates
1.1.6Material Safety Data Sheets
1.1.7Work Program and Methodology Submittals

1.2 SUMMARY
This section includes provisions on tile installations as specified for the toilet, and other areas as indicated on the schedule of finishes.

1.3 RELATED SECTIONS
1.3.1Concrete Finishes

1.4 GENERAL PROVISION
1.4.1Comply with ASTM C207, Specifications for Hydrated Lime for Masonry.
1.4.2Maintain air temperature and structural base temperature at ceramic tile installation area above 12°C for 48 h before, during, and 48 h after, installation.
1.4.3Do not install tiles at temperatures less than 12°C or above 38°C.
1.4.4Do not apply epoxy mortar and grouts at temperatures below 15°C or above 25°C.
1.4.5Provide minimum 2% of each type and color of tile required for project for maintenance use. Store where directed.
1.4.6Maintenance material to be of same production run as installed material.
1.4.7Turn over product, item code, and other pertinent information to owner for product maintenance.
1.4.8Set mock-ups for the approval of the architect prior to complete installation. Do not proceed with installation until approved. Mock-up installations can be retained once accepted and taken down until acceptable.
1.4.9Consider extra tile quantities for mock-up installations.
1.4.10 Do not use tile trims.

1.5 DELIVERY, STORAGE, and HANDLING
1.5.1Deliver, store and handle products in a manner to avoid damage or contamination.
1.5.2Have materials delivered to job site prior to installation.
1.5.3Deliver all products to job site in manufacturer's unopened cartons with all labels intact and legible.
1.5.4Keep cartons dry and protect from vandalism and away from heavy traffic area.
1.5.5Store cartons in upright position.

1.6 SUBMITTALS

1.6.1PRODUCT APPROVAL ATTACHMENTS
1.6.1.1 Sample ceramic tile 150mm x 150mm cut from the actual material for approval. Mark each sample to show type, size, product code, and brand. Sample shall show actual texture and pattern of the material.
1.6.1.2 Technical data on dry-set Portland cement mortar and grout. Indicate brand, color, and product code.
1.6.1.3 Sample divider strips and tile spacers.

1.6.2EXECUTION APPROVAL ATTACHMENTS

1.6.2.1 Shop drawings, i.e. floor plans and wall elevations highlighting area of application and tile setting layout. Indicate start of tile, end of tile, grout distances, tolerances, dimensions of cuts for drains, and similar utility holes. Show dimensions of tiles cut from original tile dimensions.

1.7 QUALITY ASSURANCE

1.7.1Employ tile setters with minimum experience from projects of the same size and scale as the project.
1.7.2Only install approved tiles sourced from the same manufacturer.
1.7.3Observe standard tolerances for slopes and drains.
1.7.4Do not install tiles with visible defects such as chipped edges.
1.7.5Ensure maximum bonding of tiles to substrates. When tapped, no more than 20% of the tile surface area shall emanate a hollow sound.

1.8 WARRANTIES

Two (2) years.

2. PART 2 PRODUCTS

2.1 FLOOR TILES

2.1.1.1 Refer to Technical Working drawings for coverage of area of application

2.2 WALL TILES

2.2.1.1 Refer to Technical Working drawings for coverage of area of application.

2.3 MORTARS AND ADHESIVES

2.3.1Portland cement: to CSA-A5, type 10.
2.3.2Sand: to ASTM C144, passing 16 mesh.
2.3.3Hydrated lime: to ASTM C207, Type N. Latex additive: formulated for use in Portland cement mortar and thin set bond coat.
2.3.4Mortar bed for floors: 1 part Portland cement, 4 parts sand, 1 part water. Adjust water volume depending on water content of sand. Latex additive may be included. Mortar bed for walls 1 part Portland cement, 1/5 Dry set mortar: mix to manufacturer's instructions.
2.3.5Organic adhesive: pre-mixed.
2.3.6Mix bond and levelling coats, and grout to manufacturer's instructions.
2.3.7Adjust water volumes to suit water content of sand.
2.3.8Water: potable and free of minerals and chemicals which are detrimental to mortar and grout mixes.
2.3.9Dry set mortar: to ANSI A118.1.

2.4 GROUT

2.4.1COLOR: dark grey, brand and type compliant to manufacturer's prescriptions of the approved tile.
2.4.2Portland cement grout: as recommended by tile manufacturer.
2.4.3Dry curing wall grout: as recommended by tile manufacturer.
2.4.4Grout preparation: to manufacturer's instructions.

2.5 CLEANING COMPOUNDS

2.5.1Use materials compatible to the approved material. Cleaning materials shall not impede bonding of tile setting materials.
2.5.2Do not use caustic and acidic cleaning materials.

3. PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

3.1.1Check conditions and quality of substrates to be ready to accept finish. Apply tile to clean and sound surfaces.

3.2 INSTALLATION

3.2.1Fit tile around corners of fixtures, drains and other built-in objects. Maintain uniform joint appearance. Cut edges smooth and even. Do not split tiles unevenly. Refer to approved shop drawings for approved tile layout.
3.2.2Ensure joints between tiles are uniform, 0.00mm wide, plumb, straight, true, and even and flush with adjacent tile.
3.2.3Sound tiles after setting by tapping. Replace hollow sounding tiles.
3.2.4Allow minimum 24 hours setting time after installation before grouting.
3.2.5Clean installed tile surfaces immediately after installation before grout is cured. Remove excess grouts immediately.

3.3 MAXIMUM ALLOWABLE TOLERANCES

3.3.1SURFACE TOLERANCE
1:800
3.3.2LIPPAGE, MAXIMUM ALLOWABLE DEVIATION:
± 1,0 % of the total thickness of the approved tile
3.3.3STRAIGHTNESS OF SIDES, MAXIMUM ALLOWABLE DEVIATION:
± 0,1 % of true plumb and horizontal level
3.3.4RECTANGULARITY, MAXIMUM ALLOWABLE DEVIATION:
± 0,1 % of true plumb and horizontal level

3.4 CLEANING AND PROTECTION

3.4.1Clean installed tile surfaces regularly. Ensure surfaces are free from dust, stains, and other materials affecting its visible appearance upon substantial completion.
3.4.2Replace tiles damaged tiles.

END OF SECTION

09 00 00	FINISHES	
09 67 0	Fluid-Applied Flooring	

1. **PART 1 GENERAL**

1.1 RELATED DOCUMENTS

1.1.1Technical Architectural Drawings
1.1.2Specifications
1.1.3Requests for Interpretation
1.1.4Product Samples and Brochures
1.1.5Manufacturer's Data Sheets and Certificates
1.1.6Material Safety Data Sheets
1.1.7Work Program and Methodology Submittals

1.2 SUMMARY

This section includes standard performance and high performance fluid-applied flooring systems. Comply with areas of application as indicated in the drawings.

1.3 RELATED SECTIONS

1.3.1Concrete Finishes

1.4 GENERAL PROVISION

1.4.1Secure approval from architect for final finish style and application. Submit finish samples. Refer to the Submittal portion of this section for details.
1.4.2Coordinate work of this Section with work of other trades for proper time and sequence to avoid construction delays.
1.4.3Conduct pre-installation meeting months prior to commencing work of this Section to verify project on-site installations and project requirements, substrate conditions and coordination with other building sub-trades, and to review manufacturer's installation instructions and manufacturer's warranty requirements.

1.4.3.1 MOCK-UPS: Mock-Up: Construct mock-up where in obscure areas. Mock-up areas shall be 2m x 2m in dimensions, using proposed procedures, colors, textures, finishes and quality of work to judge quality of work, substrate preparation, operation of equipment and material application.

1.4.3.2 Do not proceed with work completion prior to written acceptance of mock-up. When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain part of finished work.

1.4.3.3 Assemble and install components only when temperatures are suitable to the requirements of the manufacturer. Maintain materials, substrates, and surrounding temperature suitable to manufacturer's required conditions.

1.5 MAINTENANCE, DELIVERY, STORAGE & HANDLING

1.5.1Deliver materials in manufacturer's original packaging with identification labels intact and in sizes suitable to the project.
1.5.2Store materials protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.
1.5.3Comply with local codes in the proper disposal of waste materials.

1.6 SUBMITTALS

1.6.1PRODUCT APPROVAL ATTACHMENTS

1.6.1.1 Manufacturer's product data, including manufacturer's SPEC-DATA product sheet.
1.6.1.2 Manufacturer's installation instructions.
1.6.1.3 Catalog pages illustrating products to be incorporated into project.
1.6.1.4 Material Safety Data Sheets (MSDS) of manufacturer- required products.

1.6.2EXECUTION APPROVAL ATTACHMENTS

1.6.2.1 Submit 300 × 300 mm samples of each fluid-applied flooring system specified to show color and texture with specified coats cascaded.

1.6.2.2 Submit shop drawings/ plans indicating extents of area to receive application
1.6.2.3 Submit detailed work methodology complying with manufacturer's requirements.

1.7 QUALITY ASSURANCE

1.7.1Source manufacturers with experience in manufacturing components similar to or exceeding requirements of the project. Manufacturers shall have sufficient capacity to produce and deliver required materials without causing delay in work. Manufacturers shall be capable of providing field service inspection.
1.7.2

1.8 WARRANTIES

1.8.1Warrant applications and installations from manufacturers able to provide five (5) year warranty.
1.8.2Comply with manufacturer's requirements for warranty.

2. **PART 2 PRODUCTS**

2.1 GENERAL MATERIALS

2.1.1Unless otherwise indicated, provide factory-mixed coatings.
2.1.2When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application.
2.1.3Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.
2.1.4VOCs need to be confirmed by using the products EDS sheets.
2.1.5Submit all pertinent product data as needed to complete project. Facilitate submittals in one set.

2.2 GENERAL PROPERTIES OF FLOORING ONE CURED:

2.2.1COMPRESSIVE STRENGTH: 8,590psi, comply with ASTM C579
2.2.2TENSILE STRENGTH: 2,500psi, comply with ASTM D 638
2.2.3FLEXURAL STRENGTH: 5,100psi, comply with ASTM D 790
2.2.4HARDNESS, SHORE: 85, comply with ASTM D 2240
2.2.5BOND STRENGTH: >400 comply with ASTM D 4541
2.2.6ABRASION RESISTANCE: 5mg loss, comply with ASTM D 4060
2.2.7WATER ABSORPTION: <0.1%, comply with ASTM C 413
2.2.8RESISTANCE TO FUNGI GROWTH: comply with ASTM G21

2.3 PRIMERS

2.3.1Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the approved manufacturer.

2.4 POLYURETHANE CONCRETE SEALER

2.4.1Use clear, water based matte finish, with two-component urethane resin. Part A component shall be thoroughly mixed with part B component, or as instructed and warranted by manufacturer. Initial appearance of product shall be milky white when wet and clear when dry.
2.4.2Comply with substrate preparation requirements by manufacturer.
2.4.3Material shall be resistant to oil, gasoline, water, salt, and chlorine. Compllant to ASTM D-1308
2.4.4Material shall be resistant to tire-marks.
2.4.5GLOSS: 25 for 1 coat
2.4.6PRACTICAL COVERAGE: 14 to 28 sqm per 4 liters/coat, depending on substrate porosity
2.4.7SURFACE DRY: 1 hour, allow for 2 hours in between recoats.
2.4.8DRY THROUGH: 24 hours for foot traffic, 72 hours for vehicular traffic
2.4.9THINNING: as required by manufacturer and as certified compatible
2.4.10 Application by roller or spray gun

2.5 ACCESSORIES:

2.5.1COATING APPLICATION ACCESSORIES: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and cleanup materials required, per manufacturer's specifications.

3. PART 3 EXECUTION

3.1 GENERAL EXAMINATION AND PREPARATION

3.1.1Verify that conditions of substrates previously installed under other sections or contracts are acceptable for product installation in accordance with manufacturer's instructions prior to fluid-applied flooring installation.
3.1.2Remedy all unacceptable conditions. Remove all items not necessary that affects quality of work. Coordinate schedules with construction manager.
3.1.3Do not proceed with work completion until all substrates and preparations are acceptable.
3.1.4If substrate is concrete, ensure that the surfaces have been properly cured in accordance to requirements by the manufacturer. Follow manufacturer procedures.
3.1.5Test moisture content of concrete. Match manufacturer's requirements.

3.2 GENERAL APPLICATION

3.2.1Comply with COSH and other safety requirements as specified by manufacturer.
3.2.2Comply with Exterior painting section of this specification for detailed application requirements.
3.2.3Apply components in accordance with manufacturer's written instructions.
3.2.4Remove oil and grease by detergent cleaning. Dry surface areas prior to application.
3.2.5Unless otherwise advised by manufacturer, acid etch smooth surfaces for improved adhesjon. Use acids compliant to manufacturer's product.
3.2.6Finished texture of acid wash smooth concrete shall be similar to 40~60 grit sandpaper.

3.3 CLEANING AND PROTECTION

3.3.1Remove surplus materials, rubbish, tools and equipment from project site. Dispose properly in accordance to local codes.
3.3.2Protect installed product from any damages during construction. In case of damages, repair any damaged surface prior to substantial turnover.
3.3.3Repair any damages incurred to adjacent materials during installation of material. Verify that conditions of substrates previously installed under other sections or contracts are acceptable for product installation in accordance with manufacturer's instructions prior to fluid-applied flooring installation.

END OF SECTION

09 00 00	FINISHES	
09 96 5	A. CEILING SUSPENSION ASSEMBLIES	

PART 1 GENERAL

1.1 RELATED DOCUMENTS

1.1.1Technical Architectural Drawings
1.1.2Specifications
1.1.3Requests for Interpretation
1.1.4Product Samples and Brochures
1.1.5Manufacturer's Data Sheets and Certificates
1.1.6Material Safety Data Sheets
1.1.7Work Program and Methodology Submittals

1.2 SUMMARY

This section includes provisions on mirrors as installed in toilet areas and other areas as indicated on the drawings.

1.3 RELATED SECTIONS

1.3.1 Ceiling Finishes

1.4 GENERAL PROVISION

1.4.1 Furnish all materials, labor, equipment, plant, and tools required to complete: Ceilings of fiber cement board (FCB or "ficem") panels; and Exposed suspension systems. All pertinent provisions of the General Conditions form part of this Section.

1.5 SUBMITTALS

1.5.1PRODUCT APPROVAL ATTACHMENTS
1.5.1.1 Product data for each type of product specified.

1.5.2EXECUTION APPROVAL ATTACHMENTS
1.5.2.1 Coordination drawings for reflected ceiling plans drawn accurately to scale and coordinating penetrations and ceiling mounted items. Show the following:
- 1.5.2.1.1 Ceiling suspension system members. Method of attaching suspension system hangers to building structure.
- 1.5.2.1.2 Ceiling-mounted items including light fixtures; air outlets and inlets; speakers; sprinklers; and special moldings at walls, column penetrations, and other junctures of ficem board ceilings with adjoining construction.
- 1.5.2.1.3 Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- 1.5.2.1.4 Product test reports from a qualified independent testing agency that based on its testing of current products for compliance of ficem board panel ceilings and components with requirements.

1.6 QUALITY ASSURANCE

1.6.1 INSTALLER QUALIFICATIONS: Engage an experienced Installer who has completed ficem board panel ceilings similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
1.6.2 SINGLE-SOURCE RESPONSIBILITY FOR CEILING PANEL UNITS: Obtain each type of ficem board ceiling panel from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.
1.6.3 SINGLE-SOURCE RESPONSIBILITY FOR SUSPENSION SYSTEM: Obtain each type of suspension system from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.

1.7 WARRANTIES

1.7.1Warranties shall include replacement of item in case of cracks or defects in ficem board and other damages occurring due to undue cause.

2. PART 2 PRODUCTS

2.1 Ceiling Board

2.1.1 Fiber cement board 4.5mm: paint finish Odorless Anti-Bacterial Latex paint flat White.

2.1.2 Ceiling joist :triple furring .5mm thick

2.1.3 1/4" thk marine plywood in wooden frame(see Reflected Ceiling Plans and Details)

Refer to Technical Working drawings for coverage of area of application.

3. PART 3 EXECUTION

3.1 EXAMINATION

3.1.1 COORDINATION: Furnish layouts for cast-in-place anchors, clips, and other ceiling anchors whose installation is specified in other Sections.

3.1.2 Furnish cast-in-place anchors and similar devices to other trades for installation well in advance of time needed for coordinating other work.

3.1.3 Measure each ceiling area and establish the layout of ficem board panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and conform to the layout shown on reflected ceiling plans.

3.2 INSTALLATION

3.2.1 GENERAL: Install ficem board panel ceilings to comply with publications referenced below per manufacturer's instructions and CISCA "Ceiling Systems Handbook."

3.2.2 Suspend ceiling hangers from building's structural members and as follows:

3.2.2.1 Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of the supporting structure or of the ceiling suspension system. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, counter splaying, or other equally effective means.

3.2.2.2 Splay hangers only where required and if permitted with fire-resistance-rated ceilings, to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

3.2.2.3 Where width of ducts and other construction within ceiling plenum produces hanger spacing that interfere with the location of hangers at spacing required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

3.2.2.4 Secure wire hangers to ceiling suspension members and to supports above with a minimum of 3 tight turns. Connect hangers either directly to structures or to inserts, eye screws, or other devices that are secure, that are appropriate for substrate, and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.

3.2.2.5 Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.

3.2.2.6 Secure bracing wires to ceiling suspension members and to supports with a minimum of 4 tight turns. Fasten bracing wires to concrete with cast-in-place or post-installed anchors. Install edge moldings and

trim of type indicated at perimeter of ficem board ceiling area and where necessary to conceal edges of ficem board panels. Apply ficem board sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.

3.2.2.7 Screw attach moldings to substrate at intervals not over 16 inches (400 mm) O.C. and not more than 3 inches (75 mm) from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet (3.18 mm in 3.66 m). Miter corners accurately and connect securely. Do not use exposed fasteners, including pop rivets, on moldings and trim. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

3.2.2.8 Install ficem board panels with undamaged edges and fitted accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide neat, precise fit. Arrange ficem board panels in the manner indicated on reflected ceiling plans.

3.2.2.9 For square-edged panels, install panels with edges fully hidden from view by flanges of suspension system runners and moldings.

3.2.2.10 Install hold-down clips in areas indicated and in areas required by governing regulations, or for fire-resistance ratings; space as recommended by panel manufacturer, unless otherwise indicated or required. Protect lighting fixtures and air ducts to comply with requirements indicated for fire-resistance-rated assembly.

3.3 CLEANING AND PROTECTION

3.3.1 Clean exposed surfaces of ficem board panel ceilings, including trim, edge moldings, and suspension system members.

3.3.2 Comply with manufacturer's instructions for cleaning and touchup of minor finish damage.

3.3.3 Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

09 00 00	FINISHES
09 96 5	Painting

1. PART 1 GENERAL

1.1 RELATED DOCUMENTS

1.1.1Technical Architectural Drawings

1.1.2Specifications

1.1.3Requests for Interpretation

1.1.4Product Samples and Brochures

1.1.5Manufacturer's Data Sheets and Certificates

1.1.6Material Safety Data Sheets
1.1.7Work Program and Methodology Submittals

1.2 SUMMARY

This section includes provisions on painting works as indicated in the technical working drawings, particularly painting and varnishing works, and other painting applications as needed to complete the project.

1.3 RELATED SECTIONS

1.3.1 Metal Fabrications
1.3.2 Exterior Walls
1.3.3 Interior Walls
1.3.4 Floor Surface
1.3.5 See drawings for location, quantity and extent of surfaces to receive paint and varnish.
1.3.6 All pertinent provisions of the General Conditions form part of this Section.

1.4 GENERAL PROVISION

1.4.1Only use appropriate painting products on surface areas.
1.4.2Comply with gloss levels as specified herein or on technical working drawings.
1.4.3Furnish rags, paint brushes, rollers, air brush equipment, masking tapes, and other similar accessories as needed to complete work indicated.

1.5 MAINTENANCE, DELIVERY AND STORAGE

1.5.1Furnish extra materials from the same products applied for maintenance purposes to owner upon substantial completion.
1.5.2Store materials in tightly covered containers that are accurately labeled. Keep containers in well ventilated areas with comfortable ambient temperatures as prescribed by manufacturers.
1.5.3Paint containers shall be free of foreign materials and residue.
1.5.4Store unused rags, brushes, and other accessories in clean and dry storage areas.
1.5.5Store used rags, brushes, and other accessories such that it does not impeded the working environment of other construction trades. Ensure that used materials are not stored such that it becomes a safety hazard.

1.6 SUBMITTALS

1.6.1PRODUCT APPROVAL ATTACHMENTS
1.6.1.1 Submit color swatches for each type of product for approval. Color swatches should indicate type of finish. Include surface preparation requirements and application instructions. Indicate coat requirements. Attach shop drawings cross referencing the location of application areas and full extent of painting coverage.

1.6.2EXECUTION APPROVAL ATTACHMENTS
1.6.3Submit detailed work methodology. Indicate number of coats per paint product to be applied. Manufacturer's instructions are acceptable

1.7 QUALITY ASSURANCE

1.7.1Establish a mock-up for each surface type with a different painting material. Do not proceed with painting the complete assembly without the approval of the architect.
1.7.2Only source from manufacturers with minimum of 15 year experience in the market, manufacturing products as specified.

1.7.3Only contract/employ paint applicators with significant experience from a project of the same size, scale, and type as this project. Contract paint applicators with experience in applying paint products on metal surfaces.
1.7.4Source primers, undercoat paints, and the finish coats from one and the same manufacturer to ensure compatibility. Comply with manufacturer's prescriptions on coating requirements and methods of application.

1.8 WARRANTIES

1.8.1Warrant for repainting and repair if the following failures occur within one year of substantial completion: water penetration through paint coating, deterioration of coating beyond normal weathering, alligatoring, blistering, chalking, cracking/flaking, efflorescence, nail head rusting, peeling, poor alkali resistance.

2. PART 2 PRODUCTS

2.1 Surface Preparation:

2.1.1 All new concrete surfaces with form oils or any separating agents adhering to the surface shall be eliminated by thorough application of masonry neutralizer accordingly.

2.1.2 Repair all surface imperfections with suitable putty using a knife. Allow to dry for at least 24 hours.

2.2.1 Exterior paint: Apply Permaplast K201 mix with Portland cement to correct surface imperfection.
2.2.1.2 Primer: (1 coat) Permacoat B701
2.2.1.3 Top Coat: (2 coats) Permacoat Semi-Gloss B715
2.2.1.4 Color: Verify Architect(company premix)
2.2.1.5 Texture Finish: Eggshell/Mongo finish finely Flattened

2.2.2 Interior finishes: Apply Permaplast K201 mix with Portland cement to correct surface imperfection.
2.2.2.2 Primer: (1 coat) Permacoat B701
2.2.2.3 Top Coat: (2 coats) Permacoat Semi-Gloss B715
2.2.2.4 Color: Verify Architect(company premix)
2.2.2.5 Texture Finish: Eggshell finish finely Flattened

2.2.3 Steel doors, jambs, grill works, and metal raceway
2.2.3.1 Primered with 2 coats zinc chromate epoxy grey (yellow for jambs).
2.2.3.2 Apply 2 coats - Top coats acrylic automotive finish. Primer: Mc Gills
2.2.3.3 Acrylic primer. Top coat: Mc Gills acrylic top coat.
2.2.3.4 Color- verify architect.

2.2.4 Architectural and structural pipes

2.2.4.1 Metal etching for all metals except G.I
2.2.4.2 Primered with 2 coats prime guard.(option epoxy primer grey)
2.2.4.3 Apply 2 coats —aqua epoxy. Airless Spray application
2.2.4.4 Color (verify architect).
2.2.5 Floor Surface: Non- Toxic Epoxy Paint
2.2.5.1 Primer: (1 coat) Epoxy Primer White B2200
2.2.5.2 Top Coat: (3 coats) Epoxy Enamel White B2100

3 PART 3 EXECUTION

3.2 EXAMINATION AND PREPARATION

3.2.5.2 Wipe metal surface with rag soaked in paint thinner to remove dust, dirt, grease, oil, wax, and other foreign matter. Clean field welds and bolted connections. Remove grease and oil residue.

3.2.5.3 Use metal etchers as prescribed by the manufacturer.
3.2.5.4 Use wire brush to scrape rusted materials.
3.2.5.5 After scraping rust, use water to wash surfaces clean and dry for at least 15 minutes before application of primer.
3.2.5.6 Comply with manufacturer's written instructions as warranted.
3.2.5.7 Ensure adhesion of approved material to substrates.

3.3 APPLICATION

3.3.5 Prime and finish all metal assemblies prior to any installation on project.
3.3.6 Use applicators and techniques suited for the quality coating of the substrates.
3.3.7 Do not apply to wet or damp surfaces.
3.3.8 Uniformly apply coatings using methods prescribed by manufacturer. Do not allow runs, sags, brush marks and inconsistent sheens.
3.3.9 Apply as many coats as necessary for uniform appearance.
3.3.10 Paint surfaces behind movable equipment and furniture.
3.3.11 Paint backsides to match exposed surfaces.
3.3.12 Paint access panels, including back sides, removable hinges and covers, and other items to match exposed surfaces.
3.3.13 Primers may be omitted if fabrications are factory-primed.
3.3.14 Comply with manufacturer's written instructions for application conditions.
3.3.15 Do not apply finish coats in imminent weather.
3.3.16 Ensure that application is uniform.

3.4 INSPECTION OF FINISHED SURFACES PRIOR TO ACCEPTANCE

3.4.5 Secure approval from architect as endorsed by construction supervisor.
3.4.6 Installed fabrications shall be repainted and re-finished in case of any damages incurred during installation. Final installed fabrication permanently fixed to the project shall be in good condition.
3.4.7 Rejected surfaces shall be made good by the Contractor.
3.4.8 MASONRY (NEW SURFACE):
3.4.8.2.1 All areas to be painted must be dry and free of dirt, grease, oil, dust, loose grit or mortar and other contaminants.
3.4.8.2.2 Treat with Concrete Neutralizer at least a week prior to painting. Apply sufficient coats, let dry, then brush off white crystals that form on the surface.
3.4.8.2.3 Apply one coat Concrete Primer & Sealer.
3.4.8.2.4 Fill up all hairline cracks and crevices with Concrete Putty. Allow to dry, sand smooth, dust off, then spot prime before applying finish coats.

3.4.9 MASONRY (OLD SURFACE):
3.4.9.2 Remove scaling, flaking, blistering and peeling off paint either with the use of paint remover, wire brushing, or scraping.
3.4.9.3 For chalking old paint, use Masonry Surface Conditioner as primer.
3.4.9.4 In case of mildew infestation, treat with Fungicidal Wash Solution by scrubbing or brushing. To ensure adequate treatment, allow to remain on the surface for twenty four (24) hours. Brush off and rinse with water. Let dry.
3.4.10 WOOD (NEW SURFACE):
3.4.10.2 All areas to be painted must be dry and free of dirt, dust, grease, oil and other foreign matter.
3.4.10.3 Sand surface until wood is smooth to touch and no slivers or rough edges remain.
3.4.10.4 Dust off completely, then wipe with clean rag.
3.4.10.5 Apply one coat of Interior Primer & Sealer or Exterior Wood Primer.
3.4.10.6 Fill nail holes, cracks, dents and damaged areas with Plastic Wood Dough or Glazing Putty.

3.4.11 METAL (NEW SURFACE):
3.4.11.2 Remove dust, dirt, grease, oil, wax, loose scales and other contaminants by wiping with rag soaked in lacquer thinner or naphtha.
3.4.11.3 Sand, wire brush or scrape all rusty metal exposed to the weather for some time.
3.4.11.4 Treat surface with Rust Converter. Let stand overnight, then wipe off white residue with clean rag soaked in lacquer thinner of naphtha.
3.4.11.5 Apply one coat yellow zinc chromate primer. Let dry overnight before finishing with one or two coats of recommended topcoat.

3.4.12 The following conditions are considered unacceptable:
3.4.12.2 Brush/roller marks, streaks, laps, runs, sags, drips, heavy stippling, hiding or shadowing by inefficient application methods, skipped or missed areas, and foreign materials in paint coatings.
3.4.12.3 Evidence of poor coverage at rivet heads, plate edges, lap joints, crevices, pockets, corners and re-entrant angles.
3.4.12.4 Damage due to touching before paint is sufficiently dry or other contributory cause.
3.4.12.5 Damage due to application on moist surfaces or caused by inadequate protection from the weather.
3.4.12.6 Damage and/or contamination of paint due to blown contaminants (dust, spray paint, etc.)
3.4.12.7 Visible defects are evident, i.e. lack of uniformity or color, sheen, and texture across full surface area.

3.5 CLEANING AND PROTECTION

3.5.5 At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
3.5.6 After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
3.5.7 Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
3.5.8 At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

END OF SECTION

10 00 00	SPECIALTIES	
10 80 1	Toilet and Bath Accessories	

1. **PART 1 GENERAL**
   - **1.1 RELATED DOCUMENTS**
     - 1.1.1Technical Architectural Drawings
     - 1.1.2Specifications
     - 1.1.3Requests for Interpretation
     - 1.1.4Product Samples and Brochures
     - 1.1.5Manufacturer's Data Sheets and Certificates
     - 1.1.6Material Safety Data Sheets
     - 1.1.7Work Program and Methodology Submittals

   - **1.2 SUMMARY**

     This section includes provisions on toilet and bath accessories as needed for project completion. Accessories include:
     - 1.2.1Tissue Dispensers
     - 1.2.2Soap Dispensers and Holders
     - 1.2.3Grab Bars
     - 1.2.4Towel Bars
     - 1.2.5Curtain Holder
     - 1.2.6Other accessories as needed and indicated

   - **1.3 RELATED SECTIONS**
     - 1.3.1Mirrors
     - 1.3.2Interior Architectural Woodwork
     - 1.3.3Rough Carpentry
     - 1.3.4Hardware

   - **1.4 GENERAL PROVISION**
     - 1.4.1Furnish all insets and anchorages required to set accessories in concrete as structurally stable as possible.
     - 1.4.2Verify accessory locations on technical working drawings.

   - **1.5 SUBMITTALS**

     1.5.1PRODUCT APPROVAL ATTACHMENTS

     1.5.1.1 Submit full-size samples of units to the Architect for design review and approval. Submitted samples shall show actual finish, type, and make of material for installation.

     1.5.2EXECUTION APPROVAL ATTACHMENTS

     1.5.2.1 Shop drawings showing setting locations of accessories based on actual site measurements. Indicate distances from nearest finish lines both measure horizontally and vertically. Indicate actual tile joints on shop drawings if any.

   - **1.6 QUALITY ASSURANCE**

     1.6.1Ensure that all finishes installed are approved. Use appropriate anchorages, of stainless steel make to ensure structural stability of installation.

     1.6.2Ensure that installed accessories do not fall off due to rustication of anchors and inserts.

2. **PART 2 PRODUCTS**
   - **2.1 GENERAL MATERIALS**
     - 2.1.1Verify finish of material approved by architect.
     - 2.1.2Stainless Steel: AISI Type 302, with polished No. 4 finish, 22 gauge (0.34") minimum, unless otherwise indicated.
     - 2.1.3Chromium Plating: Nickel and chromium electro-deposited on base metal, ASTMB 456, Type SC 2.

     - 2.1.4Fasteners: Screws, bolts, and other devices of same material as accessory unit or of galvanized steel where concealed.

3. **PART 3 EXECUTION**
   - **3.1 INSTALLATION**

     3.1.1Comply with manufacturer's written instructions and methods. Use fasteners as prescribed by manufacturer to be appropriate to the substrate.

     3.1.2Ensure that all installation is plumb, level, and firmly attached to heights indicated as approved.

   - **3.2 CLEANING AND ADJUSTING**

     3.2.1Adjust toilet accessories for proper and smooth operation.

     3.2.2Clean and polish all exposed surfaces after removal of temporary labels and protective coatings.

END OF SECTION

DIVISION 12
FURNISHINGS

12 00 00	**FURNISHINGS**	
12 36 61.16	Solid Surface Countertops	

1. **PART 1 GENERAL**
   - **1.1 RELATED DOCUMENTS**
   - 1.1.1Technical Architectural Drawings
   - 1.1.2Specifications
   - 1.1.3Requests for Interpretation
   - 1.1.4Product Samples and Brochures
   - 1.1.5Manufacturer's Data Sheets and Certificates
   - 1.1.6Material Safety Data Sheets
   - 1.1.7Work Program and Methodology Submittals

   - **1.2 SUMMARY**
   - This section includes provisions on solid surface countertops as indicated in the following areas:
   - 1.2.1Pantry/Kitchen/ Toilet
   - 1.2.2Information and Display Counters
   - 1.2.3Other parts of the project as indicated on technical working drawings

   - **1.3 RELATED SECTIONS**
   - 1.3.1Plumbing Fixtures Section
   - 1.3.2Interior Architectural Woodwork
   - 1.3.3Rough Carpentry

   - **1.4 GENERAL PROVISIONS**
   - 1.4.1.1 Comply with dimensions as indicated in technical working drawings.
   - 1.4.1.2 Verify actual dimensions of countertops prior to fabrication. Check and coordinate location of utilities. Fabricate countertops such that utilities are not affected in functionality.

   - **1.5 SUBMITTALS**

   - 1.5.1PRODUCT APPROVAL ATTACHMENTS
   - Submit product data, including:
   - 1.5.1.1 Material description and product code
   - 1.5.1.2 Samples for selection at least 100mm x 100mm in size. Show final edging of material.
   - 1.5.1.3 Submit data on adhesives to be used for countertop installation. Include brand of adhesive and instructions on installation detailing surface preparations.

   - 1.5.2EXECUTION APPROVAL ATTACHMENTS
   - 1.5.2.1 Submit detailed requirements for subsurface preparation.
   - 1.5.2.2 Submit manufacturer's required detailed installation methodology, indicating corner blocks needed. Methodology shall clearly indicate surface preparations and tolerances.

   - **1.6 QUALITY ASSURANCE**
   - 1.6.1Source from a bonafide fabricator of countertops with skilled installers.
   - 1.6.2Source from fabricators with timely and good in-service records.

   - **1.7 WARRANTIES**
   - 1.7.1Comply with warranty requirements by manufacturer

2. **PART 2 PRODUCTS**
   - **2.1** Solid Surface Material: Homogeneous-filled plastic resin complying with ICPA SS-1. Color and pattern for the approval of the architect.
   - **2.2** Composite Wood Products: Ensure to be free from urea formaldehyde
   - **2.3** ADHESIVES: Use product as recommended and compliant to manufacturer's warranties and conditions. Use adhesives compliant to Food and Drug Administration.
   - **2.4** Use sealants to seal in countertops. Use appropriate joint sealants as needed by the manufacturer.

3. **PART 3 EXECUTION**
   - **3.1** EXAMINATION AND PREPARATION
   - Examine substrates and surface area to receive countertops. Check substrates to be compliant with manufacturer's requirements. Check for installation tolerances, cleanliness, surface damages, and similar surface preparation requirements.

   - **3.2** FABRICATION
   - Fabricate countertops according to solid surface material manufacturer's written instructions. Prepare countertops for field cutting openings for counter-mounted fixtures, if any. Drill countertops in shop for plumbing fittings and similar items. Verify actual dimensions prior to drilling.

   - **3.3** JOINTS:
   - No joints allowed within 450mm of sink, countertop, or any countertop section. Bond joints with adhesive and draw tight during setting. Mask surface areas with joints.

   - **3.4** EDGE:
   - Front and Side Edge of countertops: Front: standard straight and flat, slightly eased at top and bottom.
   - Seek approval from the architect for final edging.

   - **3.5** BACKSPLASH AND END SPLASH:
   - Top Edge: Standard straight and flat, slightly eased at corner.

   - **3.6** INSTALLATION:
   - 3.6.1TOLERANCES:
   - Countertop level tolerances: 3mm in 2.4m, maximum 6mm. Maximum vertical difference between connected planes of two units: 0.4mm.
   - 3.6.2FASTEN:
   - Comply with manufacturer's requirements for installation. Always apply sealants to wall gaps.

   - **3.7** CLEANING AND PROTECTION
   - 3.7.1Protect completed installations with a protective film covering until such time that substantial completion is attained.

END OF SECTION

DIVISION 13
SPECIAL CONSTRUCTION

13 00 00	**SPECIAL CONSTRUCTION**	
13 85 0	Detection and Alarm	

1. **PART 1 GENERAL**
   - **1.1 RELATED DOCUMENTS**
     - 1.1.1Technical Architectural Drawings
     - 1.1.2Specifications
     - 1.1.3Requests for Interpretation
     - 1.1.4Product Samples and Brochures
     - 1.1.5Manufacturer's Data Sheets and Certificates
     - 1.1.6Material Safety Data Sheets
     - 1.1.7Work Program and Methodology Submittals

   - **1.2 SUMMARY**

     This section includes provisions on Smoke Detection systems as needed by the project. Includeed in provisions are the furnishing, installation, and connection of the fire alarm equipment to form a complete coordinated system ready for operation. It shall include, but not be limited to, alarm initiating devices, alarm notification appliances, control units, fire safety control devices, annunciators, power supplies, and wiring as shown on the drawings and specified. The fire alarm system shall not be combined with other systems such as building automation, energy management, security, etc.

   - **1.3 RELATED SECTIONS**
     - 1.3.1Electrical Fixtures

   - **1.4 GENERAL PROVISION**
     - 1.4.1Comply with requirements of local and national codes.
     - 1.4.2Ensure that equipment installed are compatible. Source from a single manufacturer to ensure fit.
     - 1.4.3Comply with designer's specifications as indicated on technical working drawings.
     - 1.4.4Turnover operation manuals to owner upon substantial completion.

   - **1.5 MAINTENANCE**
     - 1.5.1Test functionality of smoke detection systems prior to substantial turnover.

   - **1.6 SUBMITTALS**

     1.6.1PRODUCT APPROVAL ATTACHMENTS

     1.6.1.1 PRODUCT DATA, including operation manuals, installation procedures,

     1.6.2EXECUTION APPROVAL ATTACHMENTS

     1.6.2.1 SHOP DRAWINGS

     Show locations of Smoke Detectors on floor plans. Show measurements as per actual site conditions. Show wiring diagrams.

   - **1.7 QUALITY ASSURANCE**

     Source all equipment and pertinent accessories to complete the system from a single manufacturer to ensure compatibility.

   - **1.8 WARRANTIES**

     All work performed and all material and equipment furnished under this contract shall be free from defects and shall remain so for a period of one year from the date of acceptance of the entire installation.

2. **PART 2 PRODUCTS**
   - **2.1** BATTERY OPERATED SMOKE DETECTORS
     - 2.1.1Unless otherwise specified by designer, Smoke detectors shall be photoelectric type and UL listed for use with the fire alarm control unit being furnished.
     - 2.1.2Smoke detectors shall be addressable type complying with applicable UL Standards for system type detectors. Smoke detectors shall be installed in accordance with the manufacturer's recommendations and NFPA 72.
     - 2.1.3Detectors shall have an indication lamp to denote an alarm condition. Provide remote indicator lamps and identification plates where detectors are concealed from view. Locate the remote indicator lamps and identification plates flush mounted on walls so they can be observed from a normal standing position.
     - 2.1.4All spot type and duct type detectors installed shall be of the photoelectric type.
     - 2.1.5Photoelectric detectors shall be factory calibrated and readily field adjustable. The sensitivity of any photoelectric detector shall be factory set at 3.0 plus or minus 0.25 percent obscuration per foot.
     - 2.1.6Detectors shall provide a visual trouble indication if they drift out of sensitivity range or fail internal diagnostics. Detectors shall also provide visual indication of sensitivity level upon testing. Detectors, along with the fire alarm control units shall be UL listed for testing the sensitivity of the detectors.
     - 2.1.7Battery shall be of the sealed, maintenance free type, 24-volt nominal

   - **2.2** ALARM BELLS
     - 2.2.1Shall be electric, single stroke or vibrating, heavy duty, under dome, solenoid type.
     - 2.2.2Unless otherwise shown on the drawings, shall be 6 inches (150 mm) diameter and have a minimum nominal rating of 80 dBA at 10 feet (3,000 mm).
     - 2.2.3Mount on removable adapter plates on outlet boxes.
     - 2.2.4Bells located outdoors shall be weatherproof type with metal housing and protective grille.

   - **2.3** CONDUITS, WIRING, AND ACCESSORIES

     Comply with requirements by Electrical Engineer.

3. **PART 3 EXECUTION**
   - **3.1** GENERAL INSTALLATION
     - 3.1.1Installation shall be in accordance with local codes, as shown on the drawings, and as recommended by the major equipment manufacturer. Fire alarm wiring shall be installed in conduit. All conduit and wire shall be installed in accordance with all applicable codes.
     - 3.1.2All conduits, junction boxes, conduit supports and hangers shall be concealed in finished areas and may be exposed in unfinished areas.
     - 3.1.3All new and reused exposed conduits shall be painted in accordance with Section 09 91 00, PAINTING to match surrounding finished areas and red in unfinished areas.
     - 3.1.4All smoke detectors shall be installed on ceiling, surface mounted.
     - 3.1.5Check that the entire alarm system is fully functional upon substantial turnover. Repair and replace dysfunctional units so as to comply.

END OF SECTION