3.1.3Obtain and comply with Woodwork Manufacturer's and Installer's coordinated advice for optimum temperature and humidity conditions for woodwork during its storage and installation. Do not install woodwork until these conditions have been attained and stabilized so that woodwork is within plus or minus 1.0 percent of optimum moisture content from date of installation through remainder of construction period.

3.1.4Where woodwork is indicated to be fitted to other construction, check actual dimensions of other construction by accurate field measurements before manufacturing woodwork; show recorded measurements on final shop drawings. Coordinate manufacturing schedule with construction progress to avoid delay of work.

3.1.5All woodwork installations shall be plumb, level, true, and straight with no distortions. Install to a tolerance of 3mm in 2.40m for plumb and level and with no variations in flushness of adjoining surfaces.

3.1.6Anchor woodwork to anchors or blocking integrally attached to substrates. Secure woodwork to substrate, grounds, or horizontal and vertical levels by means of concealed fasteners, blind nailing, concealed stripping and blocking as required to complete installation. Ensure that anchoring work is done as neatly as possible. Always install for uniform appearance unless otherwise required by drawings approved by the architect.

3.1.7Adjust all damaged and defective woodwork where possible to eliminate functional and visual effects.

3.1.8Fabricate woodwork to dimensions, profiles, & details as indicated in approved shop drawings. Ease edges to radius indicated for the following:

3.1.8.1 Corners of cabinets & edges of solid wood (lumber) members less than 25mm in nominal thickness: 1.59mm (1/16 inch).

3.1.8.2 Edges of rails and similar members more than 25mm in nominal thickness: 3.175mm (1/8 inch). All arises on joinery are to be rounded to a radius of 1.5mm whether shown on the drawing or not.

3.2 CLEANING AND PROTECTION

3.2.1Clean, lubricate, and adjust all hardware to ensure smooth and true operation, latching and movement of cabinetry.

3.2.2Clean woodwork on all exposed and semi exposed surfaces.

3.2.3Touch up applied finishes to restore defective areas.

3.2.4Provide protective films for on all ornamental woodwork so that all completed work remains in good visual and functional conditions at the time of Substantial Completion.

END OF SECTION

DIVISION 07
THERMAL AND MOISTURE PROTECTION

07 00 00	DIVISION 7 THERMAL AND MOISTURE PROTECTION	
07 16 0	Integral Waterproofing	

1. PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

This section includes provisions on integral cementitious waterproofing found in the following areas:
1.2.1 Weather-Exposed corridors and patios
1.2.2 Water tanks, concrete sewage holding tank,
1.2.3 Walls and floors of fuel storage tanks
1.2.4 Roof Decks
1.2.5 Kitchen and Pantry
1.2.6 Toilet
1.2.7 Other indicated below ground areas and spaces where required or directed by the architect

1.3 GENERAL PROVISION

1.3.1 No leakage allowed from the concrete placed with integral waterproofing. Comply with recommendations for testing as per COE CRD-C 48 at 140m exposed to vertical water head.
1.3.2 Test chemical resistance of concrete samples with integral waterproofing. Immerse samples in sulfuric acid and weigh daily.
1.3.3 The compressive strength of concrete mixes cast with integral water proofing should be 10% stronger than the regular concrete mix without admixtures. Comply with ASTM C 39/C 39M after 28 days for testing procedures.
1.3.4 Use permanently watertight Hydrophilic integral waterproofing system compliant to the following performance requirements:
1.3.4.1 *Compressive Strength, 28 day (ASTM C39/C 39M); equal to and up to 8% increase.*
1.3.4.2 Water permeability, CRD C48-92; > 70% reduction.
1.3.4.3 Capillary absorption, ASTM C-1585; > 40% reduction
1.3.4.4 Drying Shrinkage performance shall be compliant to testing results of ASTM C157 or equivalent.
1.3.4.5 Resistance to Chloride penetration, ASTM C1202; 10% improvement
1.3.4.6 Materia shall be self-sealing as certified by independent testing; capable of treating concrete for cracks with width of 0.5mm or greater.
1.3.4.7 Sulphate resistance, ASTM C1012; .33% improvement in 6 months
1.3.4.8 Length change, ASTM C-157, up to 20% reduction
1.3.4.9 Capillary absorption, ASTM C-1585; > 40% reduction
1.3.4.10 NSF International — NSF61 Potable water approval
1.3.4.11 Corrected 30 Minute Water Absorption, Age at Test 7 Days (BS 1881-122): Not greater than 1.0%.

1.4 SUBMITTALS

1.4.1 PRODUCT APPROVAL ATTACHMENTS
1.4.1.1 Product data including manufacturer's written instructions for evaluating, preparing and treating substrate, technical data, *and tested physical and performance properties of waterproofing.*
1.4.1.2 Submit all material safety data sheets of products intended for the project.

3.4.2Place, consolidate and cure concrete in compliance with ACI 301, ACI 305, ACI 306, ACI 308 and ACI 309. Install waterstop system components in compliance with the drawings

3.5 FIELD QUALITY CONTROL

Comply with manufacturer's requirements.

3.6 CURING AND PROTECTION

Protect installed work from damage due to subsequent construction activity on the site. Follow ACI 308 curing guidelines. Apply evaporation retardant on flatwork. Where wet curing is not possible, apply curing compound following ASTM C309. Apply curing compound immediately to finished or stripped surfaces.

END OF SECTION

07 00 00	DIVISION 7 THERMAL AND MOISTURE PROTECTION
07 19 3	Polyethylene Sheet Damp-proofing/ Vapor Barrier

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 provision on polyethylene sheets used to serve as damp-proofing/ vapor-barrier work under all floor and stair slabs in contact with the ground.

1.3 RELATED SECTIONS

1.3.1Architectural Concrete
1.3.2Concrete Finishes

1.4 GENERAL PROVISION

1.4.1Verify with structural specifications. Ensure that polyethylene barriers do not compromise the structural strength of concrete.

1.5 SUBMITTALS

1.5.1PRODUCT APPROVAL ATTACHMENTS
1.5.2Submit product samples of damproofing polyethylene sheets not less than 1000 mm X 600 mm long, showng the 600mm overlap on one side as required. Properly label samples. Indicate grade and brand of damproofing material.
1.5.3Submit product data on adhesives used for overlap. Submit brand, label, and manufacturer's instructions for storage and application.

1.5.4EXECUTION APPROVAL ATTACHMENTS
1.5.5Submit detailed work methodology. Clearly state the required overlap

1.6 QUALITY ASSURANCE

1.6.1Obtain all *materials for damp-roofing and waterproofing from a single source at all times, unless otherwise* recommended by manufacturer.
1.6.2Only engage installers with relevant experience in installing damproofing materials, to a size and scope similar to that of the project.

2. PART 2 PRODUCTS

2.1 ADHESIVE AND MISCELLANEOUS MATERIALS

Use adhesive compounds as recommended by the manufacturer for bonding to substrate and overlaps, for sealing of seams in membrane, and for sealing of joints between membrane and flashings, adjoining surfaces and projections through membrane.

When using Plastic Cement, comply with ASTM D4586, Type 1. Sand shall comply with ASTM C 144 or ASTM C897.

2.2 POLYETHYLENE SHEET DAMPROOFING

Use chlorinated polyethylene formed into uniform flexible sheets, plain, 0.008-inch thick, compliant to ASTM C171.

3. PART 3 EXECUTION

3.1 PREPARATION AND EXAMINATION

3.1.1Check and comply with manufacturer's instructions on surface preparation requirements.
3.1.2Conduct an on-site pre-conference with installer and manufacturer representatives to check for work details, material selections, and site conditions, whether or not conditions are appropriate for performing work.

3.2 INSTALLATION

3.2.1Check and comply with manufacturer's instructions on installation.
3.2.2Schedule all installation work in the best possible time to optimize a timely construction schedule.
3.2.3When maximum length of the sheet is not enough for the work surface area, overlay a second sheet length. Provide minimum 300mm overlap at edges of polyethylene sheets. Fill overlap with adhesives at the full length.
3.2.4Extend sheets beyond flashings or at perpendicular surfaces, such as walls to provide complete coverage. Seal overlapping edges with adhesive. Bond to both vertical and horizontal surfaces, or as manufacturer shall recommend.
3.2.5Where pipes, and other permanent penetrations and punctures are necessary, seal damp proofing sheets around punctures with adhesives and tapes.

3.3 CLEANING AND PROTECTION

Neatly remove all excess laps, remove masking materials, and clean all stains on exposed surfaces as caused by installation work.

Do not allow any traffic on unprotected installed membranes and stored membrane materials.

END OF SECTION

07 00 00	DIVISION 7 THERMAL AND MOISTURE PROTECTION	
07 55 3	Building Insulation	

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 for both thermal and acoustic insulation materials installed in the following areas:
1.2.1Mechanical Equipment areas to disperse excess noise
1.2.2Thermal Insulation under Sheet Metal Roofing

1.3 RELATED SECTIONS

1.3.1*Sheet Metal Roofing*

1.4 GENERAL PROVISION

1.4.1Refer to Technical Working Drawings to identify areas of application.
1.4.2For Thermal Insulation Material under Metal Sheet Roofing, install insulation on all surface areas beneath the Sheet Metal Roofing, where specified by the architect. See products in this section for descriptions on insulating material. All insulating materials installed under sheet metal roofing shall be supported with a 10mm square welded wire mesh, primed and painted according to provisions in Division 9 Interior and Exterior Painting Sections. Comply with color and paint finish as specified by the architect.
1.4.3For Mechanical Equipment areas, use ASTM E-84, Class A, non-combustible, fire retardant wool with aluminum foil on one side, mounted and supported by Metal Furring Assemblies and/or built up steel assemblies using, with facing material 10mm square welded wire mesh, primed and painted. Comply with Division 9 Interior and Exterior Painting Sections. Comply with color and paint finish as specified by the architect.
1.4.4Test acoustical installations for machine and equipment areas. Ensure that when all acoustical installations in place, no point outside the mechanical equipment room that is subject to work conditions requiring focus shall receive noise levels higher than 80db at a time when all mechanical equipment installed are running.
1.4.5Do not use Spray-Applied Insulation unless otherwise approved. If approved, do not apply spray insulation until all installation of pipes, ducts, conduits, and other similar openings are completed. Do not seal or obstruct such similar openings with spray-applied insulation.
1.4.6Do not block necessary openings such as pipes, ducts, conduits, wirings, windows, and similar items.

1.5 MAINTENANCE

1.5.1Upon delivery on site, protect insulation materials from physical damage. Store away from wet areas or areas with high moisture content. Comply with manufacturer's instructions on handling and storing.

1.6 SUBMITTALS

1.6.1PRODUCT APPROVAL ATTACHMENTS
1.6.2Material and Safety Data Sheets for all Insulating Materials
1.6.3Technical Data Sheets for all Insulating Materials
1.6.4Product Sample 300mm x 300mm for each insulating material.
1.6.5Manufacturer's written installation, maintenance, storage, and protection instructions.

1.6.6EXECUTION APPROVAL ATTACHMENTS

1.6.6.1 Submit detailed work installation methodology.
1.6.6.2 Submit scaled and detailed shop drawings for all installation strategies, especially fastening, welding points, spacing of furring, etc.

1.7 QUALITY ASSURANCE

1.7.1Provide insulation materials compliant to UL Testing, or other testing and inspecting agency acceptable to authorities.
1.7.2Surface Burning characteristics of the insulating material shall be compliant with ASTM E 84, such that:
1.7.2.1 Class A Flame Spread shall be at 0-25; smoke-developed 0-450
1.7.2.2 *Class B Flame Spread shall be at 26-75; smoke-developed 0-450*
1.7.2.3 Class C Flame Spread shall be 76-200; smoke-developed 0-450

1.7.3Fire resistance rating of the material shall comply with ASTM E 119.
1.7.4Combustion characteristics of the material shall comply with ASTM E 136.

1.8 WARRANTIES

Insulation items shall be entitled to at least one (1) year warranty.

2. PART 2 PRODUCTS

2.1 INSULATION MATERIALS

2.1.1INSULATION FASTENERS
2.1.1.1 Use Self Adhesive Aluminum Foil Tapes complying with recommendations by the manufacturer of the approved insulating material. Minimum width of tape shall be 75mm to ensure proper fastening. Holding power shall be 1,50+Min in compliance to test method PSTC-7. Peel adhesion shall be at 20N/25mm in compliance to PSTC-1 test methods.
2.1.1.2 For metal assemblies, comply with metal fasteners as specified in the metal fabrication section.

2.1.2MINERAL WOOL
2.1.2.1 Use ASTM E-84, Class A, non-combustible, fire retardant wool with aluminum foil on one side.
2.1.2.2 Encase mineral wool in Metal Furring Assemblies and/or built up steel assemblies with one or two faces using 10mm square welded wire mesh, primed and painted. Comply with metal fabrications division of this specifications.
2.1.2.3 Aluminum on foil side shall be foil-scrim-kraft or foil-scrim-polyethylene vapor retarder with maximum flame spread of 25 and smoke development index of 5.

2.1.3THERMAL INSULATION FOR SHEET METAL ROOFING UNDERSLAB
2.1.3.1 Use fire-resistant Aluminum Foil Scrim Kraft Paper with three-way fiberglass scrim; actual thickness 150 microns or 85 gsm, 1200mm X 120,000mm in standard length (one roll); silver color.
2.1.3.2 Minimum reflectivity of the surface material shall be 95%.
2.1.3.3 Burst strength of insulation material shall at least be 30N/cm2, compliant with ASTM D774.
2.1.3.4 Temperature resistance shall be compliant with ASTM C1263.
2.1.3.5 Water Vapor Permeability shall be at 5.75/N.s
2.1.3.6 Tensile strength of material shall be MD-130N/25mm or XD-50N/25mm compliant with ASTM D828.
2.1.3.7 Install using a metal-assembly of angle bars, flat bars, and 10mm square welded wire mesh, primed and painted in dimensions as recommended by the manufacturer and approved by the architect.

3. PART 3 EXECUTION

3.1 PREPARATION AND EXAMINATION

3.1.1Obtain installer's requirements and conditions for installations. Check that area to receive installation is ready to receive insulation work. Together with installer, inspect that all bolts, anchors, and fasteners for sheet metal roofing are stable and ready to receive work.
3.1.2For wool and metal assemblies for thermal and acoustic insulation in mechanical equipment areas, check that the installation schedule shall not disrupt critical schedules of testing and other construction work.

3.2 INSTALLATION

3.2.1Comply with the installation requirements and instructions by the manufacturer of approved material insulation.
3.2.2Do not pierce or cut through insulation material aluminum facing. When faces are accidentally cut, replace damaged sheets.
3.2.3*Single-layer installation of insulation sheets is acceptable provided installed work is free of tears and damages.*
3.2.4Do not install torn insulation sheets.
3.2.5For mineral wool, ensure that the wool density is sufficient to absorb above level acoustic noise. Comply with ASTM C 1015 and manufacturer's written instructions.
3.2.6Separately prime and paint metal assemblies prior to installation of insulation whether under sheet metal roofing or on horizontal and vertical surfaces of rooms with mechanical equipment. Comply with Division 9 Interior Paints Section of this specifications for painting requirements. Only paint touch ups are allowable upon installation.
3.2.7Do not smear finishing paint on insulation material. Completed insulation installation shall be clean, and free of smears and other unwanted smudges. Restore all affected insulation sheets as needed.
3.2.8All metal assemblies supporting insulation shall be primed with red oxide, and non-gloss painted elastomeric paint, black color unless otherwise indicated on drawings and approved by architect. Comply with paint division of this specifications.
3.2.9All metal assemblies supporting insulation work shall be fabricated according to approved shop drawings.
3.2.10 When using mineral wool, do not place insulation assemblies near lighting fixtures and other electrical equipment not fire rated or protected from contact with insulation material.
3.2.11 All aluminum facing shall be set placed towards areas of high humidity.
3.2.12 Where there are openings such as windows, access panels, duct ends, electrical devices and boxes, ducts, air registers, and any such similar openings, neatly cut the insulation sheets such that these openings are not obstructed and are able to *function, Show all opening locations on shop drawings. Neatly seal by manufacturer-approved adhesive tape the cut* insulation sheets to ensure adhesion to nearby surfaces. Maintain visual neatness of installation.

3.3 PROTECTION

Protect installed insulation from weather exposure and other construction work that exposes it to damages. Schedule insulation installation work such that no critical construction work conflicts with its installation.

END OF SECTION

07 00 00	DIVISION 7 THERMAL AND MOISTURE PROTECTION
07 60 00	Sheet Metal Roofing

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 Sheet Metal Roofing, where indicated by the architect as referenced in the technical working drawings.

1.3 RELATED SECTIONS

1.3.1Metal Fabrications
1.3.2Exterior Painting

1.4 GENERAL PROVISION

1.4.1Only use pre-painted metal sheet and roofing accessories fabricated from cold rolled galvanized iron sheets tempered for extra strength and durability; compliant with PNS 67:2014 Hot-dip Metallic-Coated Steel Sheets for Roofing.
1.4.2Coordinate with structural designer to comply with purlin spacing requirements by manufacturer.
1.4.3Comply with ASTM A653/A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
1.4.4Length of sheets shall be long span, cut to lengths approved by the architect. Comply with special lengths for roof span exceeding 18000mm. Sheet metal roofing shall be homogenous when possible.
1.4.5Comply with profiles, thickness, and desired colors as approved by the architect.
Utilize Gauge Designation as follows:

1.4.5.1 BASE METAL THICKNESS, DESIGNATED GAUGE
1.4.5.1.1 0.400 mm thick, Gauge 28
1.4.5.1.2 0.500 mm thick, Gauge 26
1.4.5.1.3 0.600 mm thick, Gauge 24
1.4.5.1.4 0.800 mm thick, Gauge 22

1.4.5.2 PROTECTIVE COATINGS, THICKNESS
1.4.5.2.1 Zinc shall be minimum14 microns, (100 gm/ni)
1.4.5.2.2 Paint coatings Top coat shall be 15.20 microns thick
1.4.5.2.3 Paint coatings Bottom coat shall be 6.8 microns thick

1.4.5.3 BASE METAL THICKNESS, OVERALL THICKNESS WITH PROTECTIVE COATS
1.4.5.4 0.400 mm, with thickness 0.427-451 mm
1.4.5.5 0.500 mm, with thickness 0.532-551 mm
1.4.5.6 0.600 mm, with thickness 0.638-651 mm

1.5 MAINTENANCE

Protect paint and galvanized coating of sheets via proper handling.

1.6 SUBMITTALS

1.6.1PRODUCT APPROVAL ATTACHMENTS

1.6.1.1 Submit all product data sheets, material safety data sheets, and technical specifications.

1.6.1.2 Submit all product and manufacturer certificates.

1.6.1.3 Submit Product samples at 300mm x 300 mm of each sheet metal material

1.6.1.4 Submit Manufacturer's written instructions for handling, installation, and cleaning.

1.6.2EXECUTION APPROVAL ATTACHMENTS

1.6.3Detailed work methodology

1.6.4Shop drawings, namely roof plan indicating boundaries and location of finish area and detailed drawings of connections for rolls, ridges, hips and valleys, gutters, and other special connections as required to complete roofing installation and as indicated in technical working drawings. Show purlin distances, riveting details and/or any applicable fastening method. Submit these drawings to both architectural and structural consultants.

1.7 QUALITY ASSURANCE

1.7.1Only engage installers with specific training experience in installing sheet metal roofing works.

1.7.2Installers shall be supervised by the manufacturer's technical representative.

1.7.3Only source material from one manufacturer to ensure uniform application. Coordinate construction schedules properly to ensure timely completion.

1.7.4Only source materials from tried and tested manufacturers with minimum of five year satisfactory performance in the field of roofing systems.

1.7.5Metal roof panel systems shall have no water leakage tested compliant to ASTM E1646.

1.7.6All sheet panels shall be designed such that it is capable of supporting 140kgs temporary concentrated loads at mid-span *in installed conditions, unless otherwise specified by the structural designer.*

1.8 WARRANTIES

1.8.1Warranty period by manufacturer shall at least be two (2) years from Substantial Date of Completion.

2. PART 2 PRODUCTS

2.1 METAL ROOF PANELS

2.1.1Use Rib-Type, standard nominal dimensions, seam type, and thickness by manufacturer as specified and approved by architect.

2.1.2Base metal type shall be Galvalume steel sheet, G90, conforming to ASTM A653, Galvalume steel sheet AZ50, conforming to ASTM A792 for painted and unpainted panels, Galvalume steel sheet AZ55, conforming to ASTM A792 for unpainted panels.

2.1.3Texture of surfaces shall be smooth. Follow finish on sample approved by architect.

2.1.4Color Fading shall not be more than 5 Hunter, tested according to ASTM D 2244.

2.1.5Chalking shall not be in excess of a No.8 rating, tested according to ASTM D 4214.

2.1.6Solar Reflectance Index shall be calculated according to ASTM E 1980.

2.1.7Fire Classification shall be Class A-90.

2.2 ACCESSORIES AND FASTENERS

2.2.1Color and material of all accessories and fasteners shall be uniform to that of approved sample.

2.2.2Use Rubber-Asphalt sealing compound, compliant to CAN/CGSB-37.29.

2.2.3Cleats shall be of same material and temper sheet metal, minimum 50mm wide with thickness or gauge as approved/ indicated by the architect in the technical working drawings.

2.2.4Conceal all fasteners, unless otherwise indicated or approved by the architect.

2.3 LONG SPAN ROOFING (CRIMP LOK SYSTEM)

This item is specified particularly for continuous roofing with a span beyond 18M, unless otherwise specified by the architect.

2.3.1Base metal type shall be Cold Rolled Steel; 275 MPa or 40,000 psi.

2.3.2Substrates shall be Galvalume 55, Aluminum-Zing Alloy-coated steel complying with ISO 9364.

2.3.3Paint coating shall be oven-baked epoxy primer and regular polyester finish.

2.3.4Top coating shall be 25 microns thick.
2.3.5Finish coating shall be 20 microns thick.
2.3.6Primer coat shall be 5 microns thick
2.3.7Bottom coat shall be a total of 10 microns, composed of backing coat at 5 microns and primer coat at 5 microns.
2.3.8Total thickness of metal sheet shall be from 0.40mm to 0.60mm, using a seam lock process of 180 degrees.
2.3.9Metal sheet shall withstand Salt Spray Test with a Class 1000 rating as per PNS 201:1990.
2.3.10 Texture of surfaces shall be smooth. Follow finish on sample approved by architect.

3. PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

Engage a technical representative from the manufacturer of the approved product to check actual site conditions, whether compliant to manufacturer's prerequisites for installation. Conduct a pre-installation on-site conference and product inspection.

3.2 INSTALLATION

3.2.1Follow approved shop drawings for spacing of cleats, alignment of panels, flashing details, and other drawing indications.
3.2.2No cleat shall be spaced beyond 600mm apart measured on center.
3.2.3Form all seams in direction of the water-flow.
3.2.4Ensure water tightness of all seams.
3.2.5Begin installation of metal panels at the eaves, or at the lowest slope point of the roofing. Loose lock pans to valley flashing and edge strips at eaves and gable rakes.
3.2.6Observe lap requirements by manufacturer.
3.2.7Form valleys of sheets not exceeding 3 m in length. Lap joints 150 mm in direction of flow. Extend valley sheet minimum 150 mm under roofing sheets. At valley line, double fold valley and roofing sheets and secure with cleats spaced 450 mm oc.

END OF SECTION

07 00 00	DIVISION 7 THERMAL AND MOISTURE PROTECTION	
07 92 0	Joint Sealants	

1. PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

1.2.1 This section includes provisions on joint work in the following areas:
1.2.1.1 Exterior and interior joints between all fenestration frames, i.e. louvers, doors, windows, skylights, and similar fenestration components and wall masonry.
1.2.1.2 Exterior and interior joints for concrete pavement and flooring.
1.2.1.3 Exterior and interior joints for unit pavers and pre-cast concrete curbs.

1.3 RELATED SECTIONS

1.3.1 Architectural Concrete

1.4 GENERAL PROVISION

1.4.1 Use airtight and watertight elastomeric joint sealants.
1.4.2 Provide joint sealants where indicated on technical working drawings and in standard areas for joint sealing, unless otherwise specified by the architect.
1.4.3 Unless otherwise indicated on drawings, joint sealers shall match the color and type of the adjacent finish.
1.4.4 Do not install joint sealers in ambient and substrate temperatures not within the recommendations of the manufacturer. Do not install joint sealers when substrates are wet due to rain or other condensation.
1.4.5 Remove all contaminants on the substrate that affect the adhesion of joint sealers.
1.4.6 Comply with manufacturer's requirements on required width of joints for accepting joint sealers.
1.4.7 Install all joint sealers within 21 to 30 days from completion of waterproofing work.
1.4.8 Provide fire-resistant joint sealers in areas prone to combustive behavior, namely utility areas, electrical rooms, and service chutes.
1.4.9 Where applicable, bond breaker tapes shall be utilized to prevent adhesion to rigid surfaces that can cause sealant failure.
1.4.10 Use non-staining absorbent type masking tapes compatible with joint sealant surfaces.

1.5 MAINTENANCE, DELIVERY, STORAGE, AND HANDLING

1.5.1 Deliver all joint sealing products in sealed containers, complete with labels and instructions. Containers with tampered seals shall not be accepted.
1.5.2 Comply with manufacturer's instructions for proper storage of all joint sealing materials.
1.5.3 Ensure that cleaners use chemical cleaners of type and make compatible to the joint sealant used.

1.6 SUBMITTALS

1.6.1 PRODUCT APPROVAL ATTACHMENTS
1.6.1.1 Submit samples of all joint sealers in exposed areas. Ensure that the color of the joint sealer is approved by the Architect. Indicate area of application on the sample submittal. Include a list of alternative colors as provided by the manufacturer.
1.6.1.2 Submit product data for all joint sealer products required. Include technical data and material safety data sheets, indicating proper methods for storage and application.

1.6.1.3 Copies of product warranties.

1.6.2EXECUTION APPROVAL ATTACHMENTS
1.6.2.1 Detailed work methodology indicating date and time of application.

1.7 WARRANTIES
Warranties shall not cover damages due to structural movements, such as settlement. However, all joint sealers are expected to be of quality and shall not showing any marks of disintegration for at least 5 years from the date of the *Substantial Completion of the project.*

2. PART 2 PRODUCTS

2.1 GENERAL MATERIALS
2.1.1Ensure that all joint sealers, fillers, and related materials are compatible with joint substrates and waterproofing materials. Check manufacturer's recommendations and comply with instructions on proper handling of materials.
2.1.2For liquid-applied Elastomeric Sealants, comply with ASTM C 920.
2.1.3Elastomeric sealants in areas continually exposed to water shall comply with ASTM C 1247.
2.1.4Elastomeric sealants in areas continually exposed or in contact with food shall comply with 21 CFR 177.2600.
2.1.5All sealants shall be UV resistant, non-chalking, non-staining, non-yellowing, self-cleaning, dirt pick resistant, and chemical resistant.
2.1.6For seals required in toilets and kitchens, i.e. sanitary seals, control and expansion joints, joints between mirrored glass and plywood backing, joints between stone countertops, and other joints required in sanitary areas, use mildew-resistant silicon sealant, formulated with fungicide and algaecide, and shall be intended for sealing interior joints with non-porous substrates.
2.1.7For sealing vertical joints on exposed surfaces in interior applications, i.e. interior unit masonry, concrete walls and partitions, joints between glazed aluminum frames and masonry at interiors interior steel door frames, masonry termination, ensure that joint sealers are paintable, with fungicide and algaecide. Sealers shall be capable of withstanding movement at +/-50 and shall be compliant to ASTM C 719.
2.1.8Use acoustical sealants for concealed joints where needed. Acoustical sealants shall be non-drying, non-hardening, non-skinning, non-staining, and gunnable.
2.1.9Where compression seals are necessary, use pre-formed Hollow Neoprene Gaskets. Comply with ASTM D 2628.
2.1.10 Fire resistant joint sealers where needed shall be compliant to ASTM E 814 and considered acceptable by the inspecting agency of the locality where the project is located.

3. PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION
3.1.1Examine that indicated areas of application are compliant to the manufacturer's conditions.
3.1.2Comply with manufacturer's requirements on surface area preparations of areas to receive joint sealers.
3.1.3Remove all foreign material affecting adhesion of joint sealers to indicated area of application.
3.1.4Clean receiving areas by brushing, grinding, blast cleaning, and other methods necessary to remove loose particles.
3.1.5Remove all forms of laitance.
3.1.6Use appropriate chemical cleaners for surfaces such as metal, glass, porcelain enamel. Glazed ceramic, and other similar non-porous surfaces. Ensure that chemical cleaners are compatible with both the receiving area and the joint sealers.
3.1.7Prime joint substrates where recommended by manufacturer.
3.1.8Use masking tape where needed to prevent unwanted contact of sealant onto adjoining surfaces. Carefully remove making tapes after tooling. Take care to keep applied joint seals undisturbed.

3.2 INSTALLATION OF SEALERS
3.2.1Comply with manufacturer's instructions to applicable products and areas of application.
3.2.2Comply with recommendations of ASTM C 962 for use of joint sealants as applicable.
3.2.3For Acoustical Sealants, comply with recommendations of ASTM C 919 as applicable.

3.2.4Do not leave gaps between joint fillers.
3.2.5When handling, do not stretch, puncture, twist, or tear pre-formed joint fillers.
3.2.6Use bond breaker tapes between sealants and joint fillers, compression seals, or back of joints.
3.2.7Begin tooling of non-sag sealant immediately before setting and curing begins, unless otherwise instructed by the manufacturer.
3.2.8When tooling, form smooth, uniform heads to eliminate air pockets. Remove excess sealant from adjacent surfaces. Do not use tooling agents that damage the sealant or adjacent surfaces. Provide concave and flushed joints, unless otherwise indicated in drawings.
3.2.9When installing pre-formed foam sealants, install immediately after removal of protective wrapping. Do not stretch, twist, or pull the material. Ensure continuity between ends, turns, and intersections of joints. When applying during low temperatures, apply heat to sealant as needed following prescriptions by manufacturer.
3.2.10 Install all gaskets within tolerances and conditions allowed by the manufacturer. Use the appropriate adhesives and when required, always provide watertight joints.
3.2.11 For fire-stopping sealants, comply with installation requirements established by the testing and inspecting agency.

3.3 CLEANING AND PROTECTION

3.3.1Remove excess sealant and smears adjacent to joints. Only use appropriate cleaning materials.
3.3.2Protect accomplished joint sealer work during and after curing period.
3.3.3In case of damages before the time of Substantial Completion, remove damaged and deteriorated portions but cutting and immediately replace and reseal with new materials such the original work and repair work is indistinguishable.

END OF SECTION

DIVISION 08
DOORS, WINDOWS, and OPENINGS

08 00 00	DIVISION 8 DOORS, WINDOWS, and OPENINGS
08 11 0	Steel Doors and Frames

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
1.1.8Finish Hardware Schedule and Door Schedule
1.1.9Schedule of Doors and Windows

1.2 SUMMARY

1.2.1This section includes provisions on both fire-rated and non-rated Wooden Doors, Steel Doors, Steel Door Frames, Louvers, and Vision panel assemblies.

1.3 RELATED SECTIONS

1.3.1Joint Sealants
1.3.2Door Hardware
1.3.3Glazing

1.4 GENERAL PROVISION

1.4.1Check all door assembly requirements on the technical working drawings. Check quantities according to types of door assemblies. In case of discrepancies, submit a request for interpretation to the Architect. Do not place final orders for door assemblies without approval and verification from the architect.
1.4.2Verify actual dimensions of all openings through field measurements and indicate on shop drawings based on actual conditions. Ensure the door fabrications shall be consistent with actual dimensions. Indicate actual dimensions of pre-installed anchorages and indicate on shop drawings.
1.4.3Manufacturers shall provide complete instructions on anchorage requirements for door assemblies. Contractor to *comply with manufacturer's requirements.*
1.4.4Provide proper labels on all doors. Indicate fire rating, location, and testing results according to ratings required. Do not paint over door labels. All labels shall be affixed by the manufacturer.

1.5 MAINTENANCE, DELIVERY, STORAGE AND HANDLING

1.5.1All Door Assembly deliveries shall be completely protected by crates, cardboard wrapping, or other means of protection as warranted by the manufacturer.
1.5.2Inspect doors and frames upon delivery. Do not accept damaged deliveries and do not accept deliveries inconsistent with drawing requirements.
1.5.3Storage of delivered door assemblies shall be completely weather protected. Use appropriate wood blockings and take care to store door assemblies according to the manufacturer's requirements. Do not store door assemblies in areas with high humidity and other areas that can affect the quality of the finish.

1.6 SUBMITTALS

1.6.1PRODUCT APPROVAL ATTACHMENTS
1.6.1.1 Detailed Shop drawings of each type of door indicated in the drawings as listed according to the Schedule of *Doors. Be sure to indicate door designation, type, location of door installation, model of door, material description,* core description, construction details, label compliances, sound and fire resistance ratings and finishes.

1.6.1.2 Shop Drawings shall include elevations of each door design, door details, frame details for each frame type, shall be drawn to scale, with proper dimensions, complete with indications for locations of reinforcement and preparations for hardware, anchorages, accessories, joints and connections, glazing frames, and other glazing requirements.

1.6.1.3 Submit painted steel swatches from manufacturer's color charts following the color indicated in the drawings. Submit samples for each type of exposed finish not less than 75mm X 125mm in size and must be of the same thickness as the actual material.

1.6.1.4 Submit glazing samples with complete description of glazing performance.

1.6.1.5 Use the same door designation as indicated in the drawings.

1.6.2EXECUTION APPROVAL ATTACHMENTS

1.6.3Detailed work methodology indicating manufacturer's instructions for installing anchorages, sleeves, concrete inserts, anchor bolts, and other similar items.

1.7 QUALITY ASSURANCE

1.7.1Engage manufacturers with significant experience in completing projects of the same size and scale as of the project.

1.7.2Ensure material and assembly consistency.

1.7.3Manufacturers shall have good records in on-time delivery, provides support services in installation demonstration, and with good after-sales service records.

1.7.4Only source required metal door assemblies from a single manufacturer unless manufacturer is proven to be a poor performer.

1.7.5No door assembly from two different manufacturers shall be allowed for installation on site unless the door *assemblies are proven consistent and similar in make to the approved shop drawings. Submit new shop drawings for every* manufacturer.

1.8 WARRANTIES

Material and installation of door assemblies shall be warranted for two (2) years.

2. PART 2 PRODUCTS

2.1 FINISHES

2.1.1Comply with finish color and texture as indicated and required in the technical working drawings.

2.1.2All steel doors and frames shall have a layer of factory-applied, rust-inhibiting primer. Comply with ANSI A250.3 for performance and acceptance criteria.

2.1.3Final paint finish of the door assembly shall be factory-applied. Comply with ANSI A250.3.

2.1.4In case of damages during handling on site, restore finishes to its original condition as delivered.

2.1.5For fire rated doors, manufacturer shall provide one-coat of baked-on prime coat paint.

2.1.6Primers shall be of rust-inhibitive enamel or paint, applied vie air-dry or baking.

2.2 STEEL DOORS

2.2.1*For both fire-rated and non-rated fire doors, use GA No.18 Steel for all door faces and use Ga. No. 16 Steel for hinge* and lock rails, and top and bottom channels.

2.2.2All doors both non-fire rated and fire-rated steel door and access door systems shall comply with ANSI/SDI 100.

2.2.3Hot-rolled steel sheets used as material for door facing shall comply with ASTM 569/A 569M, Commercial Steel (CS), Type B. All sheets shall be free of scale, pitting, and other surface defects.

2.2.4Cold-rolled steel sheets used as material for door facing shall comply with ASTM A 366/A 366M, Commercial Steel (CS), Type B, stretcher-leveled.

2.2.5Metallic-Coated Steel Sheets used as material for door facing shall comply with ASTM A 653/A653M, Commercial Steel (CS), Type B with A40 (ZF120) zinc-iron alloy galvanized coating, stretcher-leveled.

2.2.6Only use electrolytic Zinc-Coated Steel Sheet for unexposed applications. Comply with ASTM A 591/A 591M, Commercial Steel (CS), Class B coating.

2.3 FABRICATION

2.3.1Prepare doors to receive specified hardware, i.e. lock rails, door handles, door sills.

2.3.2Unless otherwise indicated, all doors shall be 44mm thick as measured from finish to finish of top and bottom channels and rails.

2.3.3Comply with ANSI A250.8.
2.3.4Fabricate steel door and frame assemblies to be rigid, neat, and free from warps, buckling, and other defects visually affecting its appearance. Close top and bottom edges of doors such that fabrication is integral.
2.3.5Square off all edges unless otherwise required.
2.3.6For allowable tolerances, comply with SDI 117
2.3.7Provide for countersunk flat or oval heads for exposed screws and bolts.
2.3.8Comply with ANSI A115 series specifications for door and frame hardware preparation. Prepare doors and frames to receive concealed finish hardware. Provide cutouts, reinforcements, spaces, and other similar provisions as applicable.
2.3.9*For frames, fabricated with mitered corners. Continuously weld until face is seamless. Mechanically interlock or* continuously weld stops and rabbets. Comply with ANSI/SDI 100.

2.3.10	Allowable clearances shall be as follows:	
2.3.10.1	Jambs and heads	3.2mm
2.3.10.2	Between pairs of doors	6.4mm
2.3.10.3	Bottom of door	19mm

2.4 GLAZING, HARDWARE AND ACCESSORIES
2.4.1Provide a minimum of four anchors for each door jamb. Wall to jamb anchors shall be located opposite each other and in same relative position on side jambs.
2.4.2Provide floor anchors drilled for at least 9mm at bottom of each jamb member.
2.4.3For zinc-coated inserts, bolts, and fasteners, refer to manufacturer's standard units and comply with ASTM A 153. Class C or D as applicable.
2.4.4Provide weather-stripping and sound-stripping for jambs, heads, and sills as shown on drawings.
2.4.5All glazing for vision panels shall be of wired, safety glass as indicated in schedules.
2.4.6Provide Astragals as required by NFPA 80 for fire rated spaces.
2.4.7Provide for door louvers where indicated.
2.4.8*Provide door silencers where required.*

3. PART 3 EXECUTION
3.1 GENERAL INSTALLATION
3.1.1Comply with manufacturer's requirements for general installation procedures
3.1.2Comply with SDI 105.
3.1.3Comply with NFPA 80.
3.1.4Set frames in accurate positions. Plumb, align and brace securely until permanent anchors are set.
3.1.5Remove temporary braces and spreaders upon completion of installation.
restore all damaged surfaces.
3.1.6Provide at least three wall anchors per jamb. Use acceptable masonry wire and T-anchors where needed.
3.1.7Always install additional anchors for door assemblies higher than the standard 2100mm height.
3.1.8For smoke-control doors, comply with NFPA 105.

3.2 CLEANING AND ADJUSTEMENTS
3.2.1Restore all surfaces damaged during installation. Smooth any rusted or damaged areas.
3.2.2Remove protective wrappings upon substantial completion of project.

END OF SECTION

08 00 00	DIVISION 8 DOORS, WINDOWS, and OPENINGS	
08 21 1	Flush Wood Doors	

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 door specifications for the following areas:
1.2.1Solid –core and Hollow-core doors with laminated facing situated in Toilet, Service Areas, and other areas as specified in the technical working drawings.
1.2.2Other wooden doors as needed on the project.

1.3 RELATED SECTIONS

1.3.1Division 6 Wood and Plastics Rough Carpentry
1.3.2Division 6 Interior Architectural Woodwork
1.3.3Division 8 Door Hardware

1.4 GENERAL PROVISION

1.4.1Submit Shop Drawings for approval prior to purchase from manufacturer and production of door assemblies for delivery.
1.4.2For Fire rated doors, comply with NFPA 80.
1.4.3Comply with hardware requirements. Double check door hardware schedule

1.5 MAINTENANCE, DELIVERY, STORAGE

1.5.1All door assemblies delivered shall be properly protected and accurately labeled according to its location and type of handle. Door quantities shall be consistent with requirements on the technical working drawings.
1.5.2Store delivered doors according to standards specified by the manufacturers in their written instructions.
1.5.3Store doors in dry, weather-protected areas. Ensure that storage areas are weather tight.
1.5.4Do not deliver doors during bad weather.

1.6 SUBMITTALS

1.6.1PRODUCT APPROVAL ATTACHMENTS

1.6.1.1 Submit product data for each type of door. Declare core details, material and construction of edge, factory-finish and colors.

1.6.1.2 Samples at least 200mm X150mm, of actual thickness for each material finish and wood specie. The sample should be a complete assembly using actual glue and wood for use in the project site, reflecting actual laminate to be used for approval. Include brochures for laminate options and other samples for finish choice. Samples shall be cut from the corner portion of the door.

1.6.2EXECUTION APPROVAL ATTACHMENTS
1.6.3Detailed work methodology on installation and restoration instructions.
1.6.4Shop drawings indicating location, size, actual dimensions of openings on site, hand of each door, elevations, construction details, and required hardware blocking. Show location of mortises and holes for hardware, anticipate cut-outs for hardware.

1.7 QUALITY ASSURANCE

1.7.1Only engage the services of qualified manufacturers with punctual delivery records and quality products.
1.7.2Only obtain flush wood doors from a single manufacturer. In case of a change of manufacturers, ensure approval of new samples.
1.7.3Manufacturers shall properly label all doors in accordance to specifications in the technical working drawings.

1.8 WARRANTIES

1.8.1Manufacturer's warranty should include an agreement to repair or replace door assemblies with workmanship and *material issues. Material issues include all forms of warping of core and/or face veneers.*
1.8.2All doors shall be guaranteed of good quality for at least two (2) years from date of Substantial Completion.

2. PART 2 PRODUCTS

2.1.1INTERIOR SOLID-CORE DOORS

2.1.1.1 Exposed Vertical and top Edges shall be of closed-grain hardwood.
2.1.1.2 Core shall be glued wood stave or structural composite lumber.
2.1.1.3 Stiles and rails shall be bonded to the core, and the entire door face, planed abrasively prior to veneering.
2.1.1.4 Performance Grade shall be Heavy-Duty, WDMA I.S. 1-A.
2.1.1.5 Door thickness shall be 44mm.
2.1.1.6 Fire rating of Interior Solid-Core Doors shall not be less than 45minutes, unless otherwise required by the architect.

2.1.2INTERIOR HOLLOW-CORE DOORS

2.1.2.1 Use premium grade facing, with exposed vertical and top edges of any closed-grain hardwood, standard duty. Compliant to WDMA I.S.1-A.
2.1.2.2 Door thickness shall be 44mm.

2.1.3HEAVY DUTY FIRE-PROTECTION-RATED DOORS

2.1.3.1 Door material shall not contain urea formaldehyde, with mineral core specified according to required fire-protection. Stiles, edges, and astragals where needed shall also be of fire-retardant materials. Complete assemblies with intumescent seals.
2.1.3.2 Color and finish of edges and astragals shall be of the same color as the door facing unless otherwise specified.
2.1.3.3 Mineral-core doors shall be of non-combustible mineral product with 125mm blocking for top-rail, mid-rail, and bottom-rail.

3. PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

3.1.1Check delivered door assemblies and match with appropriate openings. Check swings and handle requirements. Double check plumb jambs. Reject assemblies not fit to project requirements.
3.1.2Ensure that openings are ready to accept door installation.
3.1.3Check finishes of doors to be free from imperfections. Do not install doors that are not finished according to the approved finish.

3.2 INSTALLATION

3.2.1Comply with manufacturer's written instructions and NFPA 80 for installation procedures.
3.2.2Seal edges of doors, cutouts, and mortises after fitting and machining.
3.2.3Ensure alignment and correct fit of doors. All clearances shall be uniform and beveled as indicated on drawings or as specified:

3.2.3.1 Provide 3.2mm clearances at heads, bottom of doors to top of finish, jambs, and between pairs of doors.
3.2.3.2 Where a threshold is required, provide 6.4mm clearances between bottom of door and top of threshold. Provide a door bottom seal.
3.2.3.3 Bevel all doors at 3 ½ degrees along the lock and hinge edges.

3.2.3.4 Test swinging of doors and ensure that operation is free and smooth. Re-hang or replace door assemblies otherwise.

3.2.3.5 Install hardware appropriate hardware. Refer to Division 8 "Door Hardware" for details.

3.2.3.6 Clean and restore all door surfaces and finishes damaged during installation back to original conditions.

END OF SECTION

08 00 00	DIVISION 8 DOORS, WINDOWS, and OPENINGS
08 42 00	Entrances

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

1.2.1This section includes provisions on aluminum framed doors for entrances as specified on technical working drawings. Verify door specifications on drawings.

1.3 RELATED SECTIONS

1.3.1Hardware
1.3.2Glazing

1.4 GENERAL PROVISION

1.4.1Comply with door specifications as indicated in the technical working drawings. Aluminum-framed doors powder coated aluminum metal. Submit brochures, samples/ shop drawings showing door assemblies drawn to scale for the approval of the architect.
1.4.2Do not install handles on aluminum.
1.4.3All aluminum frame members shall withstand minimum 25psf wind load and shall be provided with internal reinforcing if necessary.
1.4.4Use EPDM Rubber between glazing and framing.
1.4.5Include top and bottom mohair in assembly.
1.4.6Only use H-type handles, installed vertically.
1.4.7Only use lever-type door locks.
1.4.8Comply with manufacturer's standards for the structural attachment of framing members.
1.4.9Use standard pivot hinges.
1.4.10 Use heavy-duty soft-closing door closers. Install alongside the top rail.
1.4.11 Use heavy-duty deadbolt locksets with keying mechanisms to be installed at the bottom rail only.
1.4.12 All exposed areas shall be finished with a Class 1 electrolytically deposited color in clear anodized finish.

1.5 MAINTENANCE, DELIVERY, STORAGE, AND HANDLING

1.5.1Protect installed and finished doors with strippable membrane, with proper markings for safety. Keep membrane on glass until substantial completion of project.
1.5.2Upon substantial completion, restore glazing and thoroughly clean glass surface.
1.5.3Comply with manufacturer's lead-time requirements.
1.5.4All materials shall be delivered in protective packaging, sealed, undamaged, and properly labeled. All labels shall indicate precise location and orientation of doors. Handle all deliveries with care.
1.5.5Maintain temperature, humidity, and ventilation on site and storage area within recommended limits by the manufacturer.
1.5.6Adjust all moveable parts until operation is ensured smooth and safe prior to acceptance.
1.5.7Label all keys to match all doors prior to turn-over.

1.6 SUBMITTALS

1.6.1PRODUCT APPROVAL ATTACHMENTS
1.6.1.1 Submit data on manufacturing and installation details.

1.6.1.2 Submit product data on fasteners and sealants.

1.6.1.3 Submit sample section cuts showing final finish and profile of framing material. Do not manufacture and install on site without approval from the architects. Sample profiles shall be cut in 200mm lengths. The sample profile should be submitted as a complete assembly showing the corners of the door. Do not submit disintegrated samples.

1.6.1.4 Submit sample cuts of glazing material at least 200mm X 200mm. Show true color and make of glazing. Only approved glazing can proceed with fabrication and site installation.

1.6.1.5 Submit shop drawings of all profiles cut at the jamb, head, lock-stile. Indicate nominal thickness of all aluminum sections to be used in the assembly. No aluminum section shall be less than 1.2mm thick.

1.6.2EXECUTION APPROVAL ATTACHMENTS

1.6.2.1 Submit design calculations and shop drawings. Properly label dimensions and material specifications for each part. Indicate location and specification of hardware and fastener. Indicate door assembly labels and areas of installation.

1.6.2.2 Submit detailed work methodology indicating order of installation of the assembly.

1.6.2.3 Submit restoration procedures upon completion of work.

1.7 QUALITY ASSURANCE

1.7.1Only source door assemblies from experienced manufacturers with good records in the timely delivery and installation of door assemblies. Manufacturer shall be capable of providing field services during and after construction.

1.7.2Only source aluminum door assemblies from one manufacturer/ a single source.

1.7.3Only engage installers with specialized expertise in the installation of door assemblies in a project size and scope similar to the project.

1.7.4Conduct pre-installation walk thru meetings to inspect readiness of installation area.

1.7.5Provide a mock-up installation complete with surface preparation techniques. Have the mock-up approved prior to complete installation.

1.7.6Do not proceed with work when assemblies delivered have defects due to workmanship, color, finish, sheen, and other conditions degrading the quality and appearance of the material.

1.7.7Do not conduct installation works in environmental conditions not recommended by the manufacturer.

1.7.8Comply with manufacturer's prescribed tolerances.

1.8 WARRANTIES

1.8.1Ensure two (2) year warranty beginning after the date of substantial completion. Warranty shall include replacement and repair of defective units or hardware installed.

1.8.2In case of breakage of glass due to improper safety management, the contractor shall replace all breakage.

2. PART 2 PRODUCTS

2.1 ENTRANCE DOORS

2.1.1Use aluminum frames compliant with ASTM B221; 6063-T5 and T6 alloy and temper. Major load-supporting aluminum *sections shall be of minimum 3mm nominal thickness. No aluminum section with a supporting function in the assembly* shall be lesser than 1.2mm thick, unless otherwise approved by the architect.

2.1.2All storefront doors shall comply as indicated on technical working drawings.

2.1.3All storefront doors situated along the faculty rooms shall be standard pre-assembled storefront system complete with narrow door stiles.

2.1.4All storefront door finish shall be clear anodized finish, finish and color approved by the architects.

2.2 GLAZING

2.2.1All glazing shall be minimum 6mm thick, shall be impact-resistant, and adhered with weatherproof silicone sealants, and weatherproofed extruded EPDM glazing gaskets.

2.2.2All glazing shall be free of warp and twist

2.2.3Refer to Section 08810 Glass and Glazing requirements.

2.3 ACCESSORIES

2.3.1DOOR STOPS: Install heavy duty flooring door stops to match all operable door leafs. Use heavy duty floor stops of steel chrome, hairline finish installed at flooring.

2.3.2DOOR SWEEPS AND DRIP CAPS: Equip all aluminum storefront doors with door sweeps and drip caps.
2.3.3WEATHERSTRIPPERS/ JAMB SEALS: Install weather strippers to seal doors at meeting stiles for pairs of doors, door tubing, and astragals.
2.3.4LATCH HANDLES: Only use lever-type door handles with finish matching the storefront finish. Submit samples and brochures of cylinder locks to be used to the architect for approval.
2.3.5CYLINDER LOCKS: Only use cylinder locks as locking mechanisms unless otherwise approved by the architect. Submit samples and brochures of cylinder locks to be used to the architect for approval.
2.3.6HINGES: Only use offset-pivot hinges installed according to manufacturer's prescriptions.

3. PART 3 EXECUTION

3.1 INSTALLATION AND PREPARATION

3.1.1Only uncrate/unpack delivered door assemblies upon commencement of installation. Check labels to match indicated location and orientation.
3.1.2Check plumb-ness of receiving door unit. Inspect gaps and allowable tolerances to match manufacturer's requirements.
3.1.3Examine and verify all actual field measurements prior to fabrication. Reflect recorded measurements on shop drawings.
3.1.4Clean and prepare all substrates prior to installation.
3.1.5Follow manufacturers' approved standard installation procedures for aluminum door installation.
3.1.6Align all assemblies and ensure smooth operation of all operable windows and adjust accordingly. Door assemblies shall be free of warp and twists of any kind.
3.1.7Test doors in locked conditions to withstand static air pressure at 1.57 psf. Test in accordance to ASTM E 283.

3.2 PROTECTION

3.2.1Protect all areas adjacent to area of work to avoid damages.
3.2.2Protect installed products until completion of project.
3.2.3Upon completion of project, remove temporary coverings and protection of adjacent areas.
3.2.4Remove all construction debris from the project site in a safe and proper manner. Dispose debris properly.
3.2.5Clean all installed products in accordance to manufacturer's prescriptions.
3.2.6Touch-up, repair, and replace damaged products prior to Substantial Completion.

END OF SECTION

08 00 00	DIVISION 8 DOORS, WINDOWS, and OPENINGS
08 51 00	Metal Windows

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

1.2.1This section includes provisions on all metal windows as specified on technical working drawings.

1.3 RELATED SECTIONS

1.3.1Hardware
1.3.2Glazing

1.4 GENERAL PROVISION

1.4.1All metal windows of jalousie type, fixed, casement, or awning types shall be aluminum anodized
1.4.2Submit brochures, samples/ shop drawings window door assemblies drawn to scale for the approval of the architect. No material can be installed on site without the approval of the architect. All materials shall be approved prior to mass fabrication.
1.4.3Refer to technical working drawings and Division 8 Hardware for details on metal window hardware specifications.
1.4.4All aluminum frame members shall withstand minimum 25psf wind load and shall be provided with internal reinforcing if necessary.
1.4.5Use EPDM Rubber between glazing and framing.
1.4.60nly use lever-type handles and latch type locking mechanisms for casement and awning windows.
1.4.7Comply with manufacturer's standards for the structural attachment of framing members.
1.4.8Use standard side hung hinges for casement windows opening from 0 to 30 degrees.
1.4.9Use standard top hung hinges for awning windows, opening from 0 to 80 degrees.
1.4.10 All exposed areas shall be finished with Class 1 electrolytically deposited color in clear anodized finish.
1.4.11 Comply with gravity, wind, and earthquake load requirements as per the National Structural Code of the Philippines (NSCP).
1.4.12 Consider thermal movements from ambient and surface temperature changes.

1.5 MAINTENANCE, DELIVERY, STORAGE, AND HANDLING

1.5.1Protect installed and finished window assemblies with strippable membrane, with proper markings for safety. Keep membrane on glass until substantial completion of project.
1.5.2All window assemblies shall be safely stacked horizontally with heavy duty spacers unless otherwise specified by the manufacturer.
1.5.3Upon substantial completion, restore glazing and thoroughly clean glass surface.
1.5.4Comply with manufacturer's lead-time requirements for fabrication and delivery so as not to disrupt construction schedule.
1.5.5All materials shall be delivered in protective packaging, sealed, undamaged, and properly labeled. All labels shall indicate precise location and orientation of window assemblies. Handle all deliveries with care.
1.5.6Maintain temperature, humidity, and ventilation on site and storage area within recommended limits by the manufacturer.
1.5.7Adjust all moveable parts until operation is ensured smooth and safe prior to acceptance.

1.6 SUBMITTALS

1.6.1PRODUCT APPROVAL ATTACHMENTS

1.6.1.1 Submit data on manufacturing and installation details, indicating step by step work methodology and substrate preparation requirements.

1.6.1.2 Submit product data on fasteners and sealants.

1.6.1.3 Submit sample section cuts showing final finish and profile of framing material. Do not manufacture and install on site without approval from the architects. Sample profiles shall be cut in 200mm lengths. The sample profile should be submitted as a complete assembly showing the corners of the window assembly. Do not submit disintegrated samples.

1.6.1.4 *Submit sample cuts of glazing material at least 200mm X 200mm. Show true color and make of glazing.* Only approved glazing can proceed with fabrication and site installation.

1.6.1.5 Submit shop drawings of all profiles cut at the jamb, head, lock-stile. Indicate nominal thickness of all aluminum sections to be used in the assembly. No aluminum section shall be less than 1.2mm thick.

1.6.2EXECUTION APPROVAL ATTACHMENTS

1.6.2.1 Submit design calculations and shop drawings. Properly label dimensions and material specifications for each part. Indicate location and specification of all hardware and fastener. Indicate window assembly labels and areas of installation. Shop drawings must show corrected dimensions of openings to receive the window assembly.

1.6.2.2 Submit detailed work methodology indicating order of installation of the assembly.

1.6.2.3 Submit restoration procedures upon completion of work.

1.7 QUALITY ASSURANCE

1.7.1Only source assemblies from experienced manufacturers with good records in timely delivery and quality installation. Manufacturer shall be capable of providing field services during and after construction.

1.7.2Only source aluminum window assemblies from one manufacturer/ a single source to ensure uniformity of material as specified on technical working drawings.

1.7.3Only engage installers with specialized expertise in the installation of window assemblies in a project size and scope similar to the project.

1.7.4Conduct pre-installation walk thru meetings to inspect readiness of installation area. Comply with manufacturer's requirements.

1.7.5Provide a mock-up installation complete with surface preparation techniques. Have the mock-up approved prior to complete installation.

1.7.6Do not proceed with work when assemblies delivered have defects due to workmanship, color, finish, sheen, and other conditions degrading the quality and appearance of the material.

1.7.7Do not conduct installation works in environmental conditions not recommended by the manufacturer.

1.7.8Comply with manufacturer's prescribed tolerances.

1.8 WARRANTIES

1.8.1Ensure two (2) year warranty beginning after the date of substantial completion. Warranty shall include replacement and repair of defective units or hardware installed.

1.8.2In case of breakage of glass due to improper safety management, the contractor shall replace all breakage.

2. PART 2 PRODUCTS

2.1 FIXED, TOP-HUNG, AND CASEMENT WINDOWS

2.1.1Use aluminum frames compliant with ASTM B221; 6063-T5 and T6 alloy and temper. Major load-supporting aluminum sections shall be of minimum 3mm nominal thickness. No aluminum section with a supporting function in the assembly shall be lesser than 1.2mm thick, unless otherwise approved by the architect.

2.1.2All window assemblies shall comply with make and design as specified in the technical working drawings. Validate and verify measurements as per actual conditions on site prior to fabrication and installation.

2.1.3All metal windows of jalousie type, fixed, casement, or awning types shall be of anodized aluminum finish, silver-colored, hairline finish aluminum metal in its metal parts, unless otherwise approved by the architects. No material can be installed on site without the approval of the architect.

2.2 GLAZING

2.2.1All glazing shall be minimum 6mm thick, shall be impact-resistant, and adhered with weatherproof silicone sealants, and weatherproofed extruded EPDM glazing gaskets.
2.2.2All glazing shall be free of warp and twist
2.2.3Refer to Section 08810 Glass and Glazing requirements.

2.3 ACCESSORIES

2.3.1WEATHERSTRIPPERS/ JAMB SEALS: Install weather strippers to seal doors at meeting stiles for pairs of doors, door tubing, and astragals.
2.3.2LATCH HANDLES: Only use lever-type door handles with finish matching the storefront finish. Submit samples and brochures of locks to be used to the architect for approval.
2.3.3HINGES: Use standard friction hinges for top-hung and casement windows. For top-hung windows, hinges shall be unhanded. Refer to technical working drawings to determine handedness for casement windows. Comply with technical working drawings. Comply with manufacturer's recommendations for maximum allowable weight capacity of hinges. Only use stainless steel grade 430 for all hinges.
2.3.4*FASTENERS AND ACCESSORIES: Use fasteners and accessories of the same fastened metal as the aluminum*

3. PART 3 EXECUTION

3.1 INSTALLATION AND PREPARATION

3.1.1Only uncrate/unpack delivered window assemblies upon commencement of installation. Check labels to match indicated location and orientation.
3.1.2Check plumb-ness of receiving window units. Inspect gaps and allowable tolerances to match manufacturer's requirements.
3.1.3Examine and verify all actual field measurements prior to fabrication. Reflect recorded measurements on shop drawings for approval.
3.1.4Clean and prepare all substrates prior to installation. Comply with manufacturer's cleanliness requirements.
3.1.5Follow manufacturers' approved standard installation procedures for installation.
3.1.6Align all assemblies and ensure smooth operation of all operable windows and adjust accordingly. All assemblies shall be free of warp and twists of any kind.
3.1.7Test windows in locked conditions to withstand static air pressure at 1.57 psf. Test in accordance to ASTM E 283.

3.2 PROTECTION

3.2.1Protect all areas adjacent to area of work to avoid damages.
3.2.2Protect installed products until completion of project.
3.2.3Upon completion of project, remove temporary coverings and protection of adjacent areas.
3.2.4Remove all construction debris from the project site in a safe and proper manner. Dispose debris properly.
3.2.5Clean all installed products in accordance to manufacturer's prescriptions.
3.2.6Touch-up, repair, and replace damaged products prior to Substantial Completion.

END OF SECTION

08 00 00	DIVISION 8 DOORS, WINDOWS, and OPENINGS
08 70 00	Hardware

1. PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

1.2.1 This section includes provisions for finish hardware for doors and windows where intended for this project.

1.3 RELATED SECTIONS

1.3.1 Section Steel Doors and Frames
1.3.2 Flush Wood Doors
1.3.3 Interior Architectural Woodwork
1.3.4 Rough Carpentry

1.4 GENERAL PROVISION

1.4.1 Comply with specifications as indicated in the door hardware schedule.
1.4.2 *The contractor shall provide a key-cabinet of a hinged-panel type that can be secured by a lockset. The Key cabinet* shall house all keys to all portions requiring a locking mechanism. Situate the key cabinet in an secure area, not exposed to the public, and accessible only to the owner's administrators.
1.4.3 Use appropriate hardware size in proportion to the door/window/panel/any surface requiring the hardware. Check load capacity of hardware, especially hinges to match the load requirements of the door/window/panel/any surface requiring the hardware mechanism.
1.4.4 The contractor shall provide and install all necessary hardware intended for the project. This includes the following but not limited to:

1.4.4.1 Hinges
1.4.4.2 Locks and Dummy Trims
1.4.4.3 Cylindrical locks with lever handle
1.4.4.4 Tubular locks with lever handle
1.4.4.5 Deadbolts
1.4.4.6 Fire Exit and Panic Exit Devices
1.4.4.7 Door Closers
1.4.4.8 Floor Closers
1.4.4.9 Door stops
1.4.4.10 Door trims
1.4.4.11 Silencers
1.4.4.12 Door pulls
1.4.4.13 Push plates
1.4.4.14 Armor Plates
1.4.4.15 Kick Plates
1.4.4.16 Flush bolts
1.4.4.17 Door Viewers
1.4.4.18 Door Coordinators
1.4.4.19 Flush pull
1.4.4.20 Door seals and weather-stripping

1.4.4.21 Other required hardware finish

1.5 MAINTENANCE

1.5.1Store all hardware in properly labeled containers, with complete sets to match appropriate installation procedures.
1.5.2Secure all hardware storage and secure all hardware keys.
1.5.3Only deliver the keys directly to the owner and/or bonafide representative of the owner upon substantial completion of the project.
1.5.4Tag each hardware item and its completed set properly for appropriate identification of pieces. Match tags/ identifications with related hardware. Include basic installation instructions in all labels.
1.5.5Store hardware in cool and dry areas.

1.6 SUBMITTALS

1.6.1PRODUCT APPROVAL ATTACHMENTS
1.6.1.1 Submit product brochures detailing the mechanisms and handedness of hardware to match the doors and windows it is specified for. Brochures should include complete hardware codes and a list/code of areas of installation.

1.6.2EXECUTION APPROVAL ATTACHMENTS
1.6.2.1 Submit detailed work methodology indicating installation requirements and procedures.
1.6.2.2 Indicate on shop drawings the proper labels and codes to match the hardware specifications as indicated on technical working drawings.
1.6.2.3 Deliver keys directly to Owner complete with proper labels.

1.7 *QUALITY ASSURANCE*

1.7.1Source all hardware type from a single manufacturer to ensure uniform quality.
1.7.2Suppliers shall be recognized architectural hardware suppliers with manufacturing capability suitable to the quantity and quality required by the project.
1.7.3Tag all hardware with proper identifying labels related to hardware schedule. Include installation requirements.

1.8 WARRANTIES

1.8.1Manufacturer/ contractor shall agree to replace all defective hardware within two (2) years from date of substantial completion.

2. PART 2 PRODUCTS

2.1 GENERAL PRODUCTS

2.1.1Provide Panic Exit Devices for Fire Rated applications/means of egress intended for fire.
2.1.2All hardware finishes shall be in satin stainless steel finish. Be sure that all hardware are of consistent finishes.
2.1.3Use hardware that is compliant with UL requirements and conforming to NFPA No. 80 requirements.
2.1.4Use hardware compliant to the following:
2.1.4.1 *Mortise Hinges: Mortise Hinges: ANSI / BHMA A156.1.*
2.1.4.2 Locks and Latches: ANSI / BHMA A156.2
2.1.4.3 Tubular locks: Grade 3 type tubular locks shall not have less than 5 pin tumblers.
2.1.4.4 Cylindrical locks: Grade 2 cylindrical locks shall not have less than 6 pin tumblers.
2.1.4.5 Deadbolts: ANSI / BHMA A156.5; Grade 2.
2.1.4.6 Door Closers: UL Listed.
2.1.4.7 Fire Exit Devices: BHMA / ANSI A156.3, Grade 1, UL Listed.
2.1.4.8 Door Coordinators: ANSI/BHMA A156.3, Type 21A; UL Listed for installation on labeled frame
2.1.4.9 Seals and Weather stripping: BHMA / ANSI A156.22
2.1.4.10 Aluminum Extrusions: B6060+5.
2.1.4.11 Neoprene with service temperature of 40˚C to 70˚C.
2.1.4.12 PVC extrusions with service temperature of -5˚C to 70˚C.
2.1.4.13 Silicone with service temperatures of -60˚C to 230˚C.
2.1.4.14 EPDM with service temperature of -40˚C to 100˚C.
2.1.4.15 Threshold: BHMA / ANSI A156.21.

2.2 DOOR HARDWARE FOR METAL/ALUMINUM FRAMED STOREFRONT DOORS

2.2.1Coordinate with requirements of manufacturers.
2.2.2Comply with required hardware as specified in the technical working drawings.
2.2.3Only install cylindrical deadbolts with keying mechanisms on the lower rails of doors.
2.2.4Use heavy-duty UL Listed cylindrical deadbolts to be installed on bottom rail of door.
2.2.5Install heavy-duty door closers on the top rail.

2.3 DOOR HARDWARE FOR WOOD PANEL DOORS

2.3.1*Coordinate with requirements of manufacturers.*
2.3.2Comply with required hardware as specified in the technical working drawings.
2.3.3Verify installation and hardware mechanisms and secure fit with door panels.
2.3.4Use heavy duty cylindrical locks with lever-type handles. Verify handedness of each lever-type installation.
2.3.5Use heavy-duty UL Listed cylindrical deadbolts to be installed on bottom rail of door.
2.3.6Install heavy-duty door closers on the top rail.
2.3.7Install heavy-duty door closers alongside top rail.

2.4 DOOR HARDWARE FOR TOILETS

2.4.1Use heavy-duty privacy locksets, lever-type handles. Verify handedness of each lever-type installation.

2.5 KEYING SYSTEM

2.5.1Provide at least three sets of keys for every lock, group, or set of locks. Test all key sets and verify matching locks. Label properly and store all key sets in key cabinet to be provided by contractor.
2.5.2Provide a master key for all utility spaces.
2.5.3Situate all keys in hinged key cabinet, wall mounted key cabinet. Situate key cabinet in a secure area accessible to administrative staff or security personnel only. Provide extra 50% capacity in the key cabinet on top of all required keysets. *Label key sets accordingly.*

3. PART 3 EXECUTION

3.1 GENERAL INSTRUCTIONS

3.1.1Comply with manufacturer's instructions for lockset installations.

3.2 GENERAL INSTALLATION

3.2.1NUMBER OF HINGES REQUIRED:

Comply with the following quantities of hinges, unless otherwise specified in the technical working drawings and/or as needed/recommended by the manufacturer to comply with warranties.

Provide two (2) pieces hinge for doors with heights up to 1500mm.
Provide three (3) pieces hinge for doors with heights over 1500mm but not over 2290mm.
Provide four (4) pieces hinge for doors with heights over 2290mm but not over 3000mm.
For doors over 3000mm in height, provide additional hinge for each additional 750mm of door height or fraction thereof.

3.2.1.1 LOCATION OF HINGES:
TOP HINGE: Not over 244mm from inside of frame rabbet at head to center line of hinge.
BOTTOM HINGE: Not over 264mm above bottom of door frame to center line of hinge
CENTER HINGE: Located at equal distances between top and bottom hinges.

3.3 CLEANING AND PROTECTION

3.3.1Protect hardware from damages by covering.
3.3.2Ensure all hardware are working and operating smoothly at the time of substantial turnover.

END OF SECTION

08 00 00	DIVISION 8 DOORS, WINDOWS, and OPENINGS
08 80 00	Glazing

1. PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

This section includes provisions on glazing requirements as specified above the ring beam of the project, central to the atrium/entrance lobby. Also included in this section are glazing requirements in all other areas of the project as indicated, i.e. wall partitions, clerestory windows, specialized glazing as instruction boards, or as indicated on drawings.

1.3 RELATED SECTIONS

1.3.1 Metal Windows
1.3.2 Louvers and Screens
1.3.3 Metal Fabrications

1.4 GENERAL PROVISION

1.4.1 Only use tempered/heat-treated glass on all portions of the project site.
1.4.2 Comply with combined printed recommendations of glass manufacturers, of manufacturers of sealants, gaskets and other glazing materials, except where more stringent requirements are indicated, including those of referenced glazing standards.

1.5 MAINTENANCE, DELIVERY, STORAGE AND HANDLING

1.5.1 Protect glazing materials from damage. Wrap delivered glazing in protective film to protect it from scratches and breakage.
1.5.2 Use wood blocks to separate glass panes and avoid breakage.
1.5.3 Protect glass from edge damage during handling and installation. Remove from project and dispose of glass units with edge damage or other imperfections of kind that, when installed, weakens glass and impairs performance and appearance.
1.5.4 Apply primers to joint surfaces where required for adhesion of sealants, as determined by pre-construction sealant-*substrate testing.*

1.6 SUBMITTALS

1.6.1 PRODUCT APPROVAL ATTACHMENTS

1.6.1.1 SAMPLE: Submit 300mm X 300mm sample glazing with sealant samples showing actual thickness and color of glaze and sealant.

1.6.1.2 PRODUCT DATA OF SEALANT: Include manufacturer's standard curing procedures, installation requirements, Type, Grade, and Class.

1.6.2 EXECUTION APPROVAL ATTACHMENTS

1.6.2.1 Complete shop drawings, i.e. elevations, sections, and key plans showing exact area of installation.

1.7 QUALITY ASSURANCE

Source all glazing from a single manufacturer to ensure uniformity.

1.8 WARRANTIES

Comply with manufacturer's requirements for warranties. Warrant glazing for at least two (2) years from substantial completion of project.

2. PART 2 PRODUCTS

2.1 GENERAL PRODUCTS

2.1.1FLAT GLASS: Compliant to ASTM C 1036 "Standard Specification for Flat Glass".
2.1.2HEAT-TREATED GLASS STANDARD: Compliant to ASTM C 1048 requirements.
2.1.3*CLEAR FLOAT GLASS: Type*

2.2 SILICON SEALANT, AND OTHER GLAZING ACCESSORIES

2.2.1Only use clear sealants.
2.2.2Select glazing compatibility of sealant with other materials on the assembly, namely frames and glass and other parts of the system.
2.2.3GASKETS: Neoprene extrusions of size and shape as needed by the assembly. Use color intended for the project. Comply with ASTM C 542.
2.2.4SETTING BLOCKS: : Neoprene, EPDM or silicone blocks as required for compatibility with glazing sealants, 80 to 90 Shore A durometer hardness
2.2.5SPACERS: Neoprene, EPDM or silicone blocks, or continuous extrusions, as required for compatibility with glazing sealant, of size, shape and hardness recommended by glass and sealant manufacturers for application indicated.
2.2.6EDGE BLOCKS: Neoprene, EPDM or silicone blocks, as required for compatibility with glazing sealants, of size and hardness required to limit lateral movement (side-walking) of glass.
2.2.7COMPRESSIBLE FILLER RODS: Closed-cell or waterproof- jacketed rod stock of synthetic rubber or plastic foam, flexible and resilient, with 5-10 psi compression strength for 25 percent deflection.

3. PART 3 EXECUTION

3.1 GENERAL EXECUTION

3.1.1Do not proceed with glazing works when glazing is wet due to rain and/or subject to condensation due to ambient weather conditions.
3.1.2Install setting blocks of proper size in sill rabbet, located one quarter of glass width from each corner, but with edge nearest corner not closer than 150mm (6") from corner, unless otherwise required. Set blocks in thin course of sealant which is acceptable for heel bead use.
3.1.3Provide spacers inside and out, of correct size and spacing to preserve required face clearances, for glass sizes larger than 50 united inches (length plus height), except where gaskets or glazing tapes with continuous spacer rods are used for glazing. Provide 3.175mm (1/8") minimum bite of spacers on glass and use thickness equal to sealant width, except with sealant tape use thickness slightly less than final compressed thickness of tape.
3.1.4Provide edge blocking to comply with requirements of referenced glazing standard, except where otherwise required by glass unit manufacturer.
3.1.5Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.
3.1.6Tempered Glass: Glass shall have clean-cut, factory fabricated edges. Field cutting will not be permitted.
3.1.7Provide compressible filler rods of equivalent back-up material, as recommended by sealant and glass manufacturers.
3.1.8Force sealant into glazing channels to eliminate voids and to ensure complete "wetting" or bond of sealant to glass and channel surfaces.
3.1.9Tool exposed surfaces of sealant to provide a substantial "wash" away from glass. Install pressurized tapes and gaskets to protrude slightly out of channel, so as to eliminate dirt and moisture pockets.
3.1.10 Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage to ensure that gasket will not "walk" out when installation is subjected to movement.
3.1.11 Miter cut wedge-shaped gaskets at corners and install gaskets in manner recommended by gasket manufacturer to prevent pull away at corners; seal corner joints and butt joints with sealant recommended by gasket manufacturer.
3.1.12 Lock-Strip Glazing: Comply with ASTM C 716 and gasket manufacturer's printed recommendations. Provide supplementary wet seal and weep system unless otherwise indicated.

3.2 EXAMINATION

3.2.1 Conduct pre-fabrication on-site meetings to inspect actual site conditions prior to fabrication. Inspections shall be in the presence of manufacturing.

3.2.2 Check installation tolerances, including size, squareness, and offsets at corners. Check if functionality of weep systems will not be impeded.

3.2.3 Do not commence glazing works until unacceptable conditions are corrected.

3.3 FABRICATION

3.3.1 Verify actual dimensions of frames and receiving areas on site prior to fabrication of glazing.

3.3.2 Fabricate glass according to exact measurements needed on site. FIELD CUTTING IS NOT ALLOWED.

3.4 PROJECT CONDITIONS

3.4.1 Do not proceed with glazing works when glazing is wet due to rain and/or subject to condensation due to ambient weather conditions.

3.5 PROTECTION & CLEANING

3.5.1 Affix non-permanent labels on installed glass surfaces for safety purposes. Use DO NOT CROSS streamers. DO NOT *PAINT or use permanent markers on the glass. Ensure safety labels are non-permanent.*

3.5.2 Remove non-permanent labels and clean surfaces upon substantial turnover.

3.5.3 Examine installed glazing at every key point of construction. Remove and replace broken, chipped, cracked, abraded, or any form of damages on glass, including vandalism and damages caused by natural conditions.

3.5.4 Wash glass on both surfaces prior to date of inspection for turnover.

3.5.5 Comply with manufacturer's methods for glass cleaning.

END OF SECTION

08 00 00	DIVISION 8 DOORS, WINDOWS, and OPENINGS
08 81 4	Mirrors

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 mirrors as installed in toilet areas and other areas as indicated on the drawings.

1.3 RELATED SECTIONS

1.3.1Rough Carpentry
1.3.2Toilet and Bath Accessories

1.4 GENERAL PROVISION

1.4.1Mirrors installed in Toilets and Baths shall be adhered to the backing material using prescribed adhesives. No bolts and screws shall protrude or be reflected on the mirror.
1.4.2Unless otherwise indicated on the technical working drawings, all mirrors in toilet areas shall be mounted 150mm *above the top of the lavatory.*
1.4.3Align and flush all mirrors with the wall tile layout. Indicate in shop drawings and secure mounting height approvals from the architect.

1.5 SUBMITTALS

1.5.1PRODUCT APPROVAL ATTACHMENTS

1.5.1.1 Sample showing final finish edges of the material. Sample size shall be 300mm x 300mm, adhered to backing material. Samples shall be properly labeled indicating thickness and grade/quality of mirror.

1.5.2EXECUTION APPROVAL ATTACHMENTS

1.5.2.1 Submit shop drawings showing mounting height of mirrors. Reflect actual heights of lavatory, and neighboring finishes as seen on site. Reflect distances from existing finishing grooves such as tiles and similar items.

1.6 QUALITY ASSURANCE

Glazing Standards: Comply with recommendations of Flat Glass Marketing Association (FGMA) "Glazing Manual" and National Association of Mirror Manufacturers (NAMM) in its publication "MIRRORS, Handle with Extreme Care, Tips for the Professional on the Care and Handling of Mirrors", unless more stringent requirements are indicated.

1.7 WARRANTIES

1.7.1Warranties shall include replacement of item in case of cracks or defects in mirror silver coatings and other damages occurring due to undue cause, i.e. changes in ambient temperature, that damage the final quality of the mirror.
1.7.2Warranties shall be in effect after installation, during construction and one (1) year from substantial completion of project.

2. PART 2 PRODUCTS

2.1 GLASS

2.1.1Compliant to ASTM C 1503, must be low in lead content and shall be copper free.

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

DIVISION 09
FINISHES

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

1.7.1*Employ 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
2.1.1.2 600 x 600 non- slip porcelain tiles (laser cut) for Pwd Room, Dark Grey color for Architect's Approval.

2.2 WALL TILES

2.2.1.1 Refer to Technical Working drawings for coverage of area of application.
2.2.1.2 use 600 cm. x 600cm. white glazed porcelain wall tiles flushed against concrete, spaced at minimum tile grout distance in white for Restrooms.

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.
3.2.3*Sound 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