

DOC. NO. 4
SPECIFICATIONS

PHILIPPINE BIDDING DOCUMENTS

(As Harmonized with Development Partners)

Procurement for the

RENOVATION OF EXECUTIVE DIRECTOR'S OFFICE (OED)

Location: 2/F HEDC Bldg., C.P. Garcia Ave., UP Campus, Diliman, Quezon City

Government of the Republic of the Philippines

Fifth Edition

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SPECIFICATIONS

DIVISION 1.0 GENERAL REQUIREMENTS

SECTION 01000: GENERAL CONDITIONS

The General Requirements, General Conditions and General Scope of Work for this Project shall be prepared and furnished by the Owner.

DIVISION 3.0 CONCRETE

SECTION 03100: CONCRETE FORMWORK

PART 1.1 GENERAL

1.1 GENERAL REQUIREMENT:

The Work specified in this Section shall be subject to Division 1 - General Requirements of these Specifications.

1.2 WORK DESCRIPTION:

The Work specified in this Section shall include furnishing of materials, equipment, labor, plant, tools and all accessories necessary to perform the completion of formworks for reinforced concrete work and to permit deposition of reinforcement and concrete properly as shown on the drawings and specified herein

1.3 CODES AND STANDARDS.

American Concrete Institute (ACI) Codes and Standards ACI 347-378, Recommended Practice for Concrete Reinforcement, shall form part of these Specifications to the extent referenced.

1.4 RELATED PROVISIONS DESCRIBED ELSEWHERE:

Section 00100 - General Provisions
Section 05200 - Concrete Reinforcement
Section 03300 - Cast-in-place Concrete

1.5 SUBMITTALS:

The Contractor shall submit sample of formworks:

- A. 50mm x 60mm x 305mm good lumber
- B. 305mm x 305mm x 12mm plywood

1.6 STORAGE

Store all lumber in cool dry place, free from dirt and vermin.

1.7 GUARANTEE:

The Contractor shall furnish guarantee to the Owner per requirement of the contract for a period of one (1) year after date of Final Acceptance of the Work.

DIVISION 3.0 CONCRETE

SECTION 03100: CONCRETE FORMWORK

PART 2.0 PRODUCTS

2.1 MATERIALS:

- A. Lumber shall be "good lumber, TANGUILE or APITONG, 67% Stress Grade.
- B. Form plywood shall be 12mm thick.

PART 3.0 EXECUTION

3.1 PLACING

A. The Contractor shall, under his responsibility, design and provide forms that will produce correctly aligned concrete. No plastering, in general, shall be allowed so that extra care shall be exercised by the Contractor in choice of fitting, and rigidly supporting the forms. Plywood, metal, or surfaced lumber form shall be used for all exposed concrete work.

B. Column forms shall be checked for plumbness before concrete is deposited. Hand holes shall be provided in column forms at lowest points of pour to render this space accessible for cleaning. Positive means of adjustment of shores and struts shall be provided and all settlement shall be taken up during concrete placing operation.

C. All girders, beams, and slabs centering shall be crowned at least 6mm in all directions for 4500mm span. However, cambers for all cantilevers shall be as indicated in drawings or obtained from the Consultant by the Contractor.

D. Forms and shoring shall not be removed until the concrete is adequately set and shows by test a strength sufficient to support or resist anticipated loadings, and in no case less than two (2) days after concreting. Forms and shoring may be removed earlier than specified by standard government specifications provided that test samples of concrete are taken and are shown to be adequately strong to carry safely dead and construction live loads.

3.2 TOLERANCE LIMITS:

A. The Contractor is expected to set and maintain concrete forms so as to insure completed work within the following tolerance limits:

1. Variation from the plumb:

a. In the lines and surfaces of columns and walls:

In 3000mm	:	6mm
In any storey or 6000mm	:	10mm maximum
In 12,000mm	:	15mm maximum

b. For exposed corner columns, control joints, grooves, and other conspicuous lines:

In any bay or 6000mm	:	6mm maximum
In 12000mm	:	12mm maximum

2. Variation from the level or from the grades indicated on the drawings:

a. In floors (before removal of forms), beams and soffits:

In 3000mm	:	6mm
In any bay or 6000mm	:	10mm maximum
In 12000mm	:	15mm maximum



DIVISION 30 CONCRETE

SECTION 03100: CONCRETE FORMWORK

- b. For exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines:
- | | | |
|----------------------|---|--------------|
| In any bay or 8000mm | : | 6mm maximum |
| In 12000mm | : | 12mm maximum |
3. Variation of the linear building lines from the established position in drawings and related position of columns, walls and partitions:
- | | | |
|----------------------|---|--------------|
| In any bay or 8000mm | : | 6mm maximum |
| In 12000mm | : | 12mm maximum |
4. Variation in the sizes and location of sleeves, floor openings and wall openings: 6mm
5. Variation in cross-sectional dimensions of columns and beams and in thickness of slab walls: -6 to +12mm
6. Footings:
- Variation in dimensions in drawings: -6 to +50mm
(This applies to concrete only not to any reinforcing bars or dowels.)
 - Misplacement of eccentricity 2% at the footing width in the direction of misplacement but not to exceed 50mm.
(This applies to concrete only not to reinforcing bars and dowels.)
 - Reduction of thickness:
-5% of specified thickness
7. Variation in steps:
- In flight of steps:

Riser	:	3mm
Tread	:	6mm
 - In consecutive steps:

Riser	:	1.5mm
Tread	:	3mm

- END OF SECTION -



DIVISION 3.0 CONCRETE

SECTION 03200: CONCRETE REINFORCEMENT

PART 1.0 GENERAL

1.1 GENERAL REQUIREMENTS:

The Work specified in this Section shall be subject to Division 1 - General Requirements of these Specifications.

1.2 WORK DESCRIPTION:

The Work specified in this Section shall include furnishing of materials, equipment, labor, plant, tools and all accessories necessary to perform the completion of concrete reinforcement works as shown on the drawings and specified herein.

1.3 RELATED PROVISIONS DESCRIBED ELSEWHERE:

Section 00100 - General Provisions
Section 03100 - Concrete Formwork
Section 03300 - Cast-in-Place Concrete

1.4 CODES AND STANDARDS:

The following Codes and Standards referred to hereinafter by basic designation only form part of these Specifications to the extent referenced.

American Concrete Institute (ACI)315-80	Details and Detailing of Concrete Reinforcement
American Society for Testing and Materials (ASTM) 615-85	Deformed and Plain Billet Steel Bars for Concrete
American Welding Society (AWS)	Structural Welding Code - Reinforcing DL 479 Steel

1.5 SUBMITTALS:

Within 15 calendar days after the award of the contract, and before the concrete reinforcement materials are delivered to the jobsite, the Contractor shall submit to the Consultant, for review and approval prior to installation, two (2) copies of the manufacturer's recommendations for the products specified herein. Clearly mark data to indicate which type, size, or item is proposed. Data shall be sufficient to show conformance to specified requirements.

1.5 DELIVERY, HANDLING AND STORAGE:

Store all concrete reinforcement of different sizes and shapes in separate piles and racks raised above the ground to avoid excessive rusting. Protect from contaminants such as grease, oil and dirt. Provide for accurate identifications after bundles broken and tags removed.

1.7 GUARANTEE:

The Contractor shall furnish guarantee to the Owner per requirement of the contract for a period of one (1) year after date of Final Acceptance of the Work.

DIVISION 3.0 CONCRETE

SECTION 03200: CONCRETE REINFORCEMENT

PART 2.0 PRODUCTS

2.1 MATERIALS:

- A. Reinforcing steel bars shall conform to ASTM A615, with Yield Strength as indicated in the Structural Plans. Acceptability of foreign steel is predicated on obtaining test certification and proper identification for each lot.
- B. All devices necessary for proper placing, spacing, supporting and fastening of reinforcement shall conform to ACI 315. Steel accessories shall be galvanized after fabrication or fitted with plastic tips, if underside of concrete will be exposed. Steel shall be supported only on devices designed for this purpose.

PART 3.0 EXECUTION

3.1 PREPARATION:

- A. Bars are to be bent cold in accordance with the drawings and ACI 315. Reinforcing shall not be bent or straightened in a manner injurious to the steel. Bends for stirrups and ties and bars 16mm diameter and smaller shall be made around a pin having a diameter of not less than four (4) times the diameter of the bar. Bends for other bars shall be made around a pin with a diameter of at least six (6) times the diameter of the bar for bars over 16mm diameter. Hooks shall conform with Section 801, ACI 318. Reinforcing, which is reduced in section or excessively corroded, shall not be used.
- B. At time of concrete pouring, all reinforcement shall be free of oil, grease, dirt, concrete, loose rust or scale, ice or any other bond-reducing material.
- C. Reinforcement shall be accurately and uniformly placed in accordance with the drawings, and properly secured in position and supported by pre-cast concrete squares or metal or plastic accessories.

3.2 ALLOWABLE TOLERANCES:

A. Fabrication:

- | | | |
|--------------------|---|--------------------|
| 1. Sheared length | : | ± 25mm |
| 2. Stirrups, ties | : | ± 13mm and spirals |
| 3. All other bends | : | ± 25mm |

B. Placement:

- | | | |
|---------------------------|---|---------------------|
| 1. Concrete cover to form | : | ± 20mm surfaces |
| 2. Minimum spacing | : | ± 20mm between bars |

C. Top bars in slabs and beams:

- | | | |
|--|---|--------|
| 1. Members 200mm deep or less | : | ± 6mm |
| 2. Members more than 200mm
but not over 600mm | : | ± 13mm |

D. Crosswise of members:

Spaced evenly within 50mm of stated operation



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SECTION 03200. CONCRETE REINFORCEMENT

- E. Lengthwise of members:
 - ±50mm maximum bar movement to avoid interference with other reinforcing steel, conduits, or embedded items; One (1) bar diameter
- F. With the exception of temperature reinforcement, which shall be tied to main steel, reinforcement shall be securely tied at all intersections and splices with GA16 GI wire. Ends of wire ties shall point away from the form. Unless otherwise indicated, the number, type, and spacing of supports shall conform to ACI 315.
- G. All bars shall overlap a minimum 24 bar diameter at splices, but in no case less than 300mm. The clear distance between bars shall also apply to the clear distance between a contact splice and adjacent splices or bars. Splices are to be staggered. Splices in slabs at points of maximum stress are to be avoided wherever possible. Where they are necessary, such splices shall be welded or otherwise fully developed so as to transfer the entire stress from bar to bar without exceeding the allowable stress of Table 1002 (a) of ACI 318.
- H. Edges of wire mesh shall be lapped not less than 200mm. End laps shall not be made midway between supporting beams, or directly over beams of continuous structures. End laps are to be offset in adjacent width to prevent continuous laps. Panels shall be formed up to construction joints but with no wire passing these joints. At control joint locations, cut alternate mesh wires crossing joint.
- I. Wherever conduits, piping, inserts, sleeves, etc., interfere with the placing of reinforcing steel, the Contractor shall coordinate with the Consultant and follow an approved procedure. Bending of bars around openings or sleeves shall not be permitted.

- END OF SECTION -

DIVISION 3.0 CONCRETE

SECTION 03300: CAST-IN-PLACE CONCRETE

PART 1.0 GENERAL

1.1 WORK INCLUDED: This Section shall include furnishing of materials, equipment, labor, plant, tools and all accessories necessary to perform the completion of cast-in-place concrete works as shown on the drawings and specified herein.

1.2 APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced.

A. American Concrete Institute (ACI) Publications

- ACI301-84 Specifications for Structural Concrete for Buildings
- ACI 304-73 (R83) Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete
- ACI318-83 Building Code Requirements for Reinforced Concrete

B. American Society Testing Material (ASTM) Publications

- ASTM C91-83 Making & Curing Concrete Test Specimens in the Field
- ASTM C33-86 Concrete Aggregates
- ASTM C39-83b Compressive Strength of Cylindrical Concrete Specimens
- ASTM C64-83 Ready-Mixed Concrete
- ASTM C143-78 Slump of Portland Cement Concrete
- ASTM C 150-85 Portland Cement
- ASTM C171-88(R80) Sheet Materials for curing Concrete
- ASTM C172-82 Sampling Freshly Mixed Concrete
- ASTM C260-77 Air-Entraining Admixtures for Concrete
- ASTM C509-81 Liquid Membrane-forming Compounds for Curing Concrete
- ASTM D1751-83 Preformed Expansion Joint Filler for concrete Paving and Structural Construction (Non-Extruding and Resilient Bituminous Types)
- ASTM D1752-84 Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction
- ASTM D1850-74(R79) Concrete Joint Sealer, Cold-Application Type

1.3 SUBMITTALS: Within fifteen (15) calendar days after the award of the contract, and before the materials are delivered to the jobsite, the Contractor shall submit, to the Consultant, for review and approval prior to installation, the following:

- A Contractor Mix Design:** Submit a mix design for each type of concrete, including a complete list of materials including admixtures and the applicable



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SECTION 03300: CAST-IN-PLACE CONCRETE

reference specifications, and copies of test reports showing that the mix has been successfully used to produce concrete with the properties specified.

B. CATALOGUES. Submit manufacturer's recommendations for the items listed below. Clearly mark data to indicate which type, size, or item is proposed. Data shall be sufficient to show conformance to specified requirements.

1. Joint Filler;
2. Joint Sealer; and,
3. Wedge Anchors.

C. Manufacturer's Certificates of Compliance: Contractor shall submit sample of cement to be used. Properly indicate data as to type and use.

1.4 STORAGE: Store cement and concrete aggregates to prevent contamination or segregation.

PART 2.0 PRODUCT

2.1 CONCRETE MIX DESIGN:

A. Comply with ACI 301, except as modified herein. Concrete shall have a 28-day compressive strength as indicated below (or as indicated in the Structural Plans). Slump shall be between 75mm and 100mm in accordance with ASTM C143. Provide ASTM C33 aggregate size no. 67 (19mm) to NO.4 sieve.

B. Ready mixed concrete: Comply with C94, except as modified herein. Ready-mixed concrete is defined in this specification as concrete produced regularly by a commercial establishment and delivered to the purchaser in the plastic state.

2.2 MISCELLANEOUS CONNECTIONS Anchors, dowels, bolts, steel welding inserts, and connecting plates indicated and/or necessary in connection with the fabrication and erection of precast concrete members shall be positioned rigidly to prevent displacement while concrete is being placed.

2.3 MATERIALS:

A. Cement: comply with ASTM C150, Type I

B. Water: water shall be potable

C. Aggregates. Comply with ASTM C33, size no. 67 (19mm) to NO.4 sieve. Aggregates shall not contain any substance which may deleteriously react with the alkalis in the cement.

D. Expansion-Joint Filler: Comply with ASTM D1751, 12mm thick, unless otherwise indicated.

E. Joint Sealing Materials: Comply with ASTM D1190 or ASTM D1850 inside buildings; ASTM D1190 outside of buildings.

PART 3.0 EXECUTION

3.1 MEASURING, MIXING, TRANSPORTING AND PLACING CONCRETE:

A. General: Comply with ACI 301 and ACI 304.



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- B. Measuring: allowable tolerances for measuring cement and water shall be 1 %; for aggregates, 2%; and for admixtures, 3%
- C. Mixing: Machine mix all concrete. Begin mixing (30 minutes after the cement has been added to the aggregates. Introduce all mixing water in the drum before one-fourth of the mixing time has elapsed. The time elapsing between the introduction of the mixing water to the cement and aggregates or the cement to the aggregates and the start of placing of the concrete in final position in the forms shall not exceed 60 minutes if the air temperature is less than 85°F, and 45 min. if the air temperature is equal or greater than 85°F. On arrival at the job site, no addition of water will be allowed other than that required initially to adjust to the specified slump. Such an addition must not exceed the limits of the specified maximum water-cement ratio.
- D. Conveying: Convey concrete from the mixer to the forms as rapidly as practicable and so as not to cause segregation or loss of ingredients. Deposit concrete as close as practicable to its final position in the forms. At any point in the conveying, the free vertical drop of the concrete shall not exceed 900mm. Clean conveying equipment thoroughly before each run. Do not use aluminum pipes or chutes. Place concrete as soon as practicable after the forms and the reinforcement have been inspected and approved. Remove any concrete which has segregated in conveying and dispose of as directed.
- E. Placing: Do not place concrete when weather conditions prevent proper placement and consolidation. Do not place concrete in uncovered areas during periods of precipitation. Do not place concrete in water. Prepare subgrades of earth or other material properly and, if necessary, cover with heavy building paper or other suitable material to prevent the concrete from becoming contaminated. Dampen porous subgrades as required to prevent water hydration from being absorbed into the subgrade. Clean forms of dirt, construction debris. Place concrete in one continuous operation except where construction joints are provided. Place concrete in areas bounded by construction joints in one continuous operation. Remove water which accumulates on the surface of the concrete during placing by absorption with porous materials in a manner that prevents removal of cement.
- F. Vibration: Compact all concrete, with the exception of concrete slabs or less in depth, with high frequency, internal, mechanical vibrating equipment supplemented by hand spading and tamping. Consolidate concrete slabs 100mm or less in depth by wood tampers, spading, and setting with a heavy leveling straight edge. Vibrators shall be designed to operate with vibratory element submerged in the concrete, and shall have a frequency of not less than 8,000 impulses per minute when submerged.
- G. Ready-mixed concrete: All ready-mixed concrete shall be placed in forms within one (1) hour after adding water or not more than one and one half (1-1/2) hours if a retarder is used. It shall be kept constantly agitated during the transient period.

3.2 SURFACE FINISHES (EXCEPT FLOOR, SLAB, AND PAVEMENT FINISHES):

- A. Defects: Repair all formed surfaces by patching minor honeycombed or otherwise defective areas with cement mortar of the same composition as that used in the concrete. Patch concrete as soon as the forms are removed. Concrete with honeycombing or other defects which affect the structural strength of the member, will be rejected, or the defects corrected as directed by the Contracting Officer.

DIVISION 3.0 CONCRETE

SECTION 03300: CAST-IN-PLACE CONCRETE

- B. **Standard finish:** Provide standard finish for exposed concrete not indicated or specified otherwise. The surface of the concrete shall not vary more than 6mm when measured from a 2500 template. Exposed surfaces shall be uniform in appearance.
- C. **Against Forms:** Remove fins and other projections and level abrupt irregularities. Fill surface pits having a dimension greater than 3mm with cement mortar as specified.
- D. **Not against Forms:** Finish surfaces not otherwise specified with wood floats to even surfaces.

3.3 FLOOR AND SLAB FINISHES

- A. **General:** For floors with drains, slope the floors uniformly to the drains. In areas where homogenous tile is to be laid, depress the concrete base slab as indicated. Depressed slabs shall receive a floated finish. Interior floor slabs shall receive a steel troweled finish.
- B. **Finishing:** Place, consolidate and immediately strike off concrete to bring the top surface of the slab to proper contour, grade, and elevation. Immediately darby or bull float the surface with wooden tools so as to correct any unevenness. Complete striking-off and darbying before bleed water appears on the surface of the freshly placed concrete. Permit the concrete to attain a set sufficient for floating and sufficient to support the weight of the finisher and equipment. If the bleed water has not disappeared by the time floating of the surface is to start, drag excess water off using a rubber hose. Do not use dry cement to absorb bleed water.

3.4 CURING AND PROTECTION

- A. **General:** Protect concrete adequately from injurious action by sun, rain, mechanical injury, tire marks and oil stains, and do not allow it to dry out from the time it is placed until the expiration of the minimum curing period specified herein. Use impervious sheeting curing, liquid chemical or liquid membrane-forming compound, except as specified otherwise herein. Do not use membrane-forming compound on surfaces where its appearance would be objectionable, on any surface to be painted, where coverings are to be bonded to the concrete, or on concrete to which other concrete is to be bonded. Begin curing immediately following the removal of forms. Maintain the temperature of the air next to the concrete at not less than 40°F for the full curing periods.
- B. **Curing Periods:** Cure not less than ten (10) days for concrete exposed to the weather and not less than seven (7) days for all other concrete.
- C. **Removal of Forms:** Remove forms in a manner which will prevent damage to the concrete. Do not remove forms sooner than 24 hours after placement of concrete.

3.5 SAMPLING AND TESTING

- A. **Sampling:** Collect samples of fresh concrete in accordance with ASTM C172 during each working day as required to perform all tests specified herein. Make test specimens in accordance with ASTM C31.

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B. Testing:

1. **Consistency Tests:** determine slump in accordance with ASTM C143. Take samples for slump determination from the concrete while it is being placed. Perform tests at the beginning of a concrete placement operation and at subsequent intervals to ensure that the specification requirements are met. In addition, perform tests each time test cylinders are made.
2. **Compressive Tests:** Determine compressive strength in accordance with ASTM C39. Make four (4) test specimens for each set of tests. Test two (2) specimens at seven (7) days, and the other two (2) at twenty-eight (28) days. The strength of the concrete will be considered satisfactory if the average of the 28-day test results equals or exceeds the specified 28-day compressive strength, and no individual strength test is less than the required 28-day compressive strength by more than 2Mpa. Frequency of compressive tests on concrete cylinders shall not be less than four (4) test cylinders for each day for each class of concrete placed that day.

If the foregoing criteria is not met, core samples shall be taken and tested at the Contractor's expense. In such event, three (3) core samples for each cylinder test indicating defective concrete shall be taken for further testing. Sampling, testing, and evaluation of drilled cores shall be in accordance with ACI-318, Part 3, Chapter 4. Concrete which is determined to be defective based on the strength acceptance criteria therein shall be removed and replaced with acceptable concrete.

- END OF SECTION -

DIVISION 4.0 MASONRY

SECTION 04220: CONCRETE UNIT MASONRY

PART 1.0 GENERAL

- 1.1 **DESCRIPTION:** The contents of this section shall include furnishing of materials, equipment, labor, plant, tools and all accessories necessary to perform the completion of concrete unit masonry works as shown on the drawings and specified herein.
- 1.2 **REFERENCE STANDARD:** Comply with the latest edition of the following of the following as applicable unless otherwise specified or modified:
- 1.3 **SUBMITTALS:** Within fifteen (15) calendar days after the award of the contract, and before the materials are delivered to the jobsite, the Contractor shall submit to the Owner, for review and approval prior to installation, a certificate of compliance attesting that the concrete unit masonry meet the requirements specified herein.
- 1.4 **DELIVERY, HANDLING AND STORAGE:** Deliver cementitious materials to the site plainly marked and labeled with manufacturers' names and brands. Store cementitious materials in dry, weathertight sheds or enclosures and handle so as to prevent entry of foreign materials and damage by water or dampness. Store unit masonry off the ground and handle with care to avoid chipping and breakage. Protect materials from damage and, except for sand, keep dry until used. Cover sand to prevent intrusion of water and foreign materials and to prevent drying.

PART 2.0 PRODUCT

- 2.1 **MANUFACTURER:** All concrete unit masonry (Concrete Hollow Blocks) shall be load-bearing and manufactured by Jackbuilt or approved equal.
- 2.2 **UNIT MASONRY:**
 - A. Concrete Hollow Blocks (CHB) 100mm & 150mm thick, Comply with ASTM C90 as modified herein. The 28-day minimum compressive strength shall be $f_c = 400$ psi (or as indicated in the Structural Plans). Units shall be of modular dimensions and air, water, or steam cured. Store units at the site before use, a minimum of 28 days air cured units and ten (10) days for atmospheric steam or water cured units. Surfaces of units which are to be plastered or stuccoed shall be sufficiently rough to provide a suitable bond. Tool Joint finish shall be applied to all wall surfaces located above the ceiling.
 - B. Pre-cast Concrete Lintels (if preferred by Contractor): Same materials and surface texture as adjacent unit masonry with a 28-day compressive strength of not less than 17 Mpa (2,500 psi). Provide reinforcing as indicated. Provide lintels of sizes indicated, straight and true, with at least 200mm of bearing at each end.
- 2.3 **MORTAR:**
 - A. Portland Cement: Comply with ASTM C150, Type I.
 - B. Sand: Comply with ASTM C144.
 - C. Water: Clean, potable, and free from substances which could adversely affect the mortar.
 - D. Mortar Type: Comply with ASTM C270, Type M.



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SECTION 04220: CONCRETE UNIT MASONRY

- 2.4 REINFORCEMENT AND INSTALLATION NOTES:** Reinforcing bars (Rebars) shall comply with ASTM A615, with strength and bar spacings as shown in Structural Plans, as follows:
1. Provide 10mm diameter Rebars @ 610mm On Center (O.C.) Bothways.
 2. Provide similar dowels of the same spacing at columns, beams and slabs where CHB meet with these members, whether these are existing or new.
 3. Provide seismic stiffener columns for free-standing CHB. These columns shall be spaced no more than 3.0 meters. The size shall be 150x300 mm. and reinforced with 4 pos. 12mm diameter vertical bars hooked into supporting slab or beam. Ties shall be 10mm diameter @ 200mm O.C. Maximum height of such free-standing CHB shall be 3.0 meters
 4. Provide reinforced concrete lintel beams on all window and door openings and others as required. The lintel beam depth shall be 150mm with the same width as the CHB. Reinforcement shall be two (2) 10mm longitudinal bars. 10mm stirrup-hooks shall be spliced with the overhead beam or slab dowels for the Concrete Hollow Blocks (CHB).
 5. Provide seismic isolation gap (12mm styrophor slab) finished with mastic sealant at all toilet CHB walls meeting with columns and the beam above. Toilet wainscoting tiles shall be bonded only to the CHB or the reinforced concrete column but not to both.
 6. Provide Tool-joint finish for all CHB located above the ceiling.
 7. All walls are intended to extend beyond ceiling height and should be anchored securely to the underside of slab, beam or framing above as well as to the existing slab below. Provide dowels/ steel bracing, as needed to ensure structural stability

PART 3.0 EXECUTION

3.1 WORKMANSHIP:

- A. Surfaces on which concrete unit masonry is to be placed shall be smooth, clean, and free of foreign substances when mortar is applied. Carry unit masonry up to level and plumb all around. Furnish and use story poles or gage rods throughout the work. Changes in coursing or bonding after the work is started will not be permitted. Do not carry one section of the walls up in advance of the others. Step back unfinished work for joining with new work. Toothing will not be permitted.
- B. Check heights of concrete unit masonry with an instrument at concrete pad level to maintain the level of the walls.
- C. Handle unit masonry with care to avoid chipping, cracking, and scaling of faces and edges.
- D. Drilling, cutting, filling, and patching to accommodate the work of others shall be performed by masonry mechanics.
- E. Cut unit masonry with masonry saws for exposed work.
- F. Structural steelworks and miscellaneous metalwork specified elsewhere shall be placed in position as the work progresses.



DIVISION 4.0 MASONRY

SECTION 04220: CONCRETE UNIT MASONRY

3.2 **TOLERANCES:** Concrete unit masonry shall be within the following limits

- A. Face of Concrete Unit masonry: 1.5mm from face of adjoining unit.
- B. Variation from Plumb: 6mm.
- C. Variation from Level: 3mm in 900mm; 6mm in 2500mm; and 12mm maximum
- D. Variation in Wall Thickness: ± 6mm.

3.3 **FORMS AND SHORING:** Construct to shape, lines, and dimensions of members indicated and make sufficiently rigid to prevent deflections which may result in cracking or other damage to supported masonry. Do not remove until members have cured.

3.4 **MORTAR MIXING:**

- A. Measure mortar materials in proper containers to maintain control and accuracy of proportions. Do not measure materials with shovels.
- B. Mix mortar for not less than three (3) nor more than five (5) minutes after all the ingredients are in so as to produce a uniform mixture. Add water gradually as required to produce a workable consistency. Do not load mixer beyond its rated capacity. Keep mortar boxes, pans, and mixer drums clean and free of debris and dried mortar.
- C. Retemper mortar which has stiffened because of evaporation by adding water and mixing to obtain a workable consistency.

Do not use retemper mortar which has not been placed in final position within two and a half hours (2-1/2) after the initial mixing. Do not use anti-freeze compounds, salts, or any other substance to lower the freezing point of mortar.

- 1. Mortar: Mix mortar in accordance with ASTM C270 to obtain type mortar required.
- 2. Grout comply with ASTM C476. 28-day minimum compressive strength shall be 17 Mpa (2,500psi).

3.5 **CONCRETE MASONRY UNITLAYING:**

- A. Lay the first course in a full bed of mortar for the full width of the unit. Lay succeeding courses in running bond unless otherwise indicated. Form bed joints by applying the mortar to the entire top surfaces of the inner and outer face shells. Form head joints by applying the mortar for a width of about 25mm to the ends of the adjoining units. The mortar shall be such thickness that it will be forced out of the joints as the units are placed in position. Where anchors, bolts, and ties occur within the cells of the units, place metal lath in the joint at the bottom of such cells and fill the cells with mortar or grout as the work progresses. Do not dampen concrete unit masonry before or during laying.
- B. Where vertical reinforcement occurs, fill cores solid with grout. Lay units in such a manner as to preserve the unobstructed vertical continuity of cores to be filled. Embed the adjacent webs in mortar to prevent leakage of grout. Remove mortar fins protruding from joints before grout is placed.

DIVISION 4.0 MASONRY

SECTION 04220: CONCRETE UNIT MASONRY

- C. Minimum clear dimensions of vertical cores shall be 50mm by 75mm. Position reinforcing accurately as indicated. Use padding rod or vibrator to consolidate the grout. Minimum clear distance between masonry and vertical reinforcement shall be not less than 12mm. Unless indicated or specified otherwise, form splices by lapping bars not less than 40 bar diameters and wire tying them together.
- 3.6 **GROUTING PLACEMENT:** Place grout from the interior side of walls, except as approved otherwise. Protect sills, ledges, offsets, and other surfaces from grout droppings. Remove grout from such surfaces immediately. Grout shall be well mixed to prevent segregation and shall be sufficiently fluid to flow into joints and around reinforcing without leaving voids. Puddle or agitate grout thoroughly to eliminate voids. Remove masonry displaced by grouting operation and re-lay in alignment with fresh mortar.
- 3.7 **BONDING AND ANCHORING:** Unless indicated otherwise, extend partitions from the floor to the bottom of the floor or roof construction above. Structurally bond or anchor walls and partitions to each other and to concrete walls, beams, and columns. Securely anchor non-load-bearing partitions and interior walls to the construction above in a manner that provides lateral stability while permitting unrestricted deflection of construction above. Completely embed anchors in mortar joints.
- 3.8 **CLEANING:**
- A. Protect work which may be damaged during cleaning operations.
 - B. Upon completion of masonry work, cut out defective mortar joints and tuck point joints and all holes solidly with prehydrated mortar.
 - C. Clean exposed masonry surfaces with clear water and stiff fiber brushes and rinse with clear water. Where stains, mortar, or other soil remain, continue cleaning with warm water and detergent.
- 3.9 **PROTECTION:** Do not apply uniform loads for at least twelve (12) hours, concentrated loads for at least seventy-two (72) hours after masonry is constructed. Provide temporary bracing as required to prevent damage during construction.

- END OF SECTION -



**DIVISION 5.0 METALS
METHODS**

SECTION 05000: METAL MATERIALS AND

PART 1.0 GENERAL

- 1.1 **DESCRIPTION:** The contents of this section apply to all sections of this division unless otherwise specified or modified.
- 1.2 **REFERENCE STANDARD:** Comply with the latest edition of the following of the following as applicable unless otherwise specified or modified:
- A. **AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), 1978:** Specification for the Design, Fabrication and Erection of Structural Steel for Building; Code of Standard Practice for Steel Buildings and Bridges; Specification for Architecturally Exposed Structural Steel
 - B. **AMERICAN WELDING SOCIETY (AWS):** Standard Welding Symbols A2 0-88; Standard Welding Code 01.1-1973 (Rev 1-73 & 2-74). (To govern if in conflict with AISC).
 - C. **RESEARCH COUNCIL ON RIVETED AND BOLTED JOINTS OF THE ENGINEERING FOUNDATION (RCRBJ):** Specification for Structural Joists using ASTM A-325-76a Bolts.
 - D. **STRUCTURAL STEEL PAINTING COUNCIL (SSPC):** Painting Manual, Volume 1; Good Painting Practice, Painting Manual, Volume 2; Systems and Specifications.
 - E. **STEEL JOIST INSTITUTE-AMERICAN INSTITUTE OF STEEL CONSTRUCTION (SJI-AISC):** "Standard Specifications for Open Web Steel Joists," and "Standard Specifications for longspan Steel Joists," 1976 Editions.
 - F. **AMERICAN IRON AND STEEL INSTITUTE (AISI):** "Specifications for the Design of Cold-Formed Steel Structural Members, 1974."
- 1.3 **SOURCE QUALITY CONTROL:** Errors of Shop Drawings, Fabrication, Correct Fitting and Alignment of the various metal items or component members shall be the responsibility of the Contractor. However, the Fabricator shall permit the Owner or an independent inspection agency, if engaged by the Owner, to inspect work in progress in his shop. Such inspection shall not relieve the Contractor of his responsibility to furnish materials and workmanship in accordance with the Contract Documents.
- 1.4 **FIELD MEASUREMENTS:** Fabricator shall make measurements in field to verify or supplement dimensions indicated and be responsible for accurate fit of specified work.
- 1.5 **CORROSION PROTECTION:** Separate dissimilar metals, and metals from soil and other corrosive surfaces, with a 30-mil coating of Bituminous compound, SSPC Paint 12, unless permanent separation is provided.

- END OF SECTION -

**SECTION 5.0 METALS
METHODS**

SECTION 05010: METAL MATERIALS AND

PART 1.0 GENERAL

1.1 WORK INCLUDED: The contents of this section are inclusive of all metals used for this project with this corresponding methods of fabrication and installation.

PART 2.0 PRODUCTS

2.1 MATERIALS

- A. **CAST IRON:** Lowest grade acceptable for cast iron shall be that of BS 321, Grade C. The casting shall be sharp and of exact form and required shape to fit the parts truly and to hold full dimensions. The product must be free from air holes, scratch, core nails, flaws and defects of any kind.
- B. **WROUGHT IRON:** Shall be kept free from any cracks, blisters, flaws and other defects and shall comply with BS 51, Grade A.
- C. **COPPER:** Shall conform to BS 743 and shall not be used in contact with aluminum.
- D. **BRONZE:** Shall consist of 56.5% copper, 41.25% zinc, 2.25% lead and shall have a natural polished finish.
- E. **BRASS:** Shall conform to any of the three main groups: - Alpha brass 0-39% zinc
 - Alpha brass 0-39% zinc
 - Alpha plus beta brass 39-46%
 - Beta brass 46-50%
 - 1) **Stair Nosing for Concrete Stairs:** 36mm x 6mm L 106 manufactured by Luzon Foundry. Submit sample for approval.
 - 2) **Metal Trim:** 6mm x 12mm x 3mm. Submit sample for approval.
- F. **STAINLESS STEEL:** Shall be of high chromium, high nickel steel. It shall comply generally with the requirements of BS 970 EN and be the type established for welding (58B). All Stainless Steel Components shall be Type 304 or better
 - 1) **Handrails:** 32mm diameter stainless steel pipe, Ga. 16 or 1.5 mm thick. Refer to plans for details.
 - 2) **Sinks:** Pantry or Kitchen Sinks shall be Type 316 (Food Grade), including drains and other accessories.
- G. **ALUMINUM SECTIONS OF FITTINGS**
 - 1) **Aluminum Doors and Windows:** Aluminum section for windows shall be 50mm x 100mm and 50mm x 150mm for doors. All aluminum sections shall be a minimum of 2mm or GA. 14 thick, except for extruded aluminum sections for window components which shall be a minimum of 3mm thick. All aluminum Doors and Door Assemblies should comply with Section 08120. All aluminum Windows and Window Assemblies should comply with Section 08520. Glazed Curtain Wall systems should comply with Section 08900. All aluminum components shall be powder coated in the color specified by the Architect. All screws shall be stainless steel, countersunk flush whenever possible. Submit mock-ups for approval.

DIVISION 5.0 METALS

SECTION 05010: METAL MATERIALS AND METHODS

- 2) **Aluminum Sunshade:** 50 x 25mm thick aluminum tubulars on 50 x 50 x 6mm thick extruded aluminum angular bars. Refer to plans for details . All aluminum shall be powder coated in the color specified by the Architect All screws shall be stainless steel or approved alloy, countersunk flush whenever possible. Submit mock-up for approval. See also section 08120 and 08520
- 3) **Aluminum** for glazed curtain wall systems shall be per manufacturer's specs. Obtain warranties from manufacturer and installer that ensures structural stability of the glazed curtain wall assembly.
- H. **METAL DOOR JAMBS:** Shall be of pressed bend prefabricated type, gauge 14 primed before delivery to site. Refer to schedule for location.
- I. **GALVANIZED STEEL:** Shall be entirely and evenly coated with zinc and free from stains, bare spots and other defects, such as blisters, pits, unplated areas, cloudy patches, cracks and stains.
- J. **STRUCTURAL STEEL:** Used for Railing and Grille Doors
 - 1) **Railing:** Use vertical bars: 18mm round bars @ 100mm on center (max) and horizontal bars: 10mm x 32mm thick flat bar attached to Stainless Steel Handrail. Primed before delivery to site. All steel railings to be epoxy spray painted. Refer to plans for design and details.
 - 2) **Grille Doors:** Use 16mm thick round bar @ 100mm on center (max) and horizontal 10mm thick x 32mm flat bar on 50mm x 150mm Rectangular Tube Framing (gauge 14). Primed before delivery to site. All Grille Doors to be epoxy spray painted. Refer to plans for design and details
- K. **GRATINGS AND TRENCHES:** Shall be entirely and evenly coated with zinc and free from stains, bare spots and other defects, such as blisters, pits, unplated areas, cloudy patches, cracks and stains.
 - 1) **400mm wide steel grating:** Use 20mm x 20mm x 4.5mm thick steel angle bar standing on edge equally-spaced from each other, 6mm diameter cross rod is welded to the flat bar to prevent it from buckling. Use Ecograte or approved equal. Refer to plans for design and details.

PART 9.0 EXECUTION

3.1 INSTALLATION OF FITTINGS AND FIXTURES

- A. Floor gratings shall be provided for trench drains where needed or as indicated in the Plans. Use steel floor gratings for ramps where indicated in the plans. Provide a 25mm recessed space at each side of trench drain. Refer to Plans for detail and length of trench drains.
 - B. Unless otherwise specified, provide material dividers at juncture of differences in flooring material. Use brass dividers, stainless steel strips, aluminum reducers or as indicated in Plans
 - C. Cast iron sleeves for all pipes, cables passing through concrete or masonry shall be at least 25mm larger than the external diameter of pipe or cable. For sleeves passing through roofs shall be taken 450mm above structural roof slab.
- END OF SECTION -

DIVISION 6.0 WOOD AND PLASTICS

SECTION 08200: CARPENTRY

PART 1 0 GENERAL

1.1 **WORK INCLUDED:** This section covers the furnishing of all materials, labor, equipment, and everything listed, mentioned on the drawings and in performing all operations necessary for the completion of all finish carpentry works in accordance with all applicable drawings, subject to the terms and conditions of the contract

1.2 **QUALITY ASSURANCE**

- A. **QUALIFICATION OF WORKMEN:** Specified work shall be fabricated by an Architectural Woodwork Manufacturing Company established in Millwork Business for at least ten (10) consecutive years. If required by the Architect, the Manufacturer of specified work shall show evidence of his experience, including a list of projects for which he manufactured work similar in scope and quality to the specified work.

For actual cutting and fitting of trim and finish materials, use only finish carpenters who are thoroughly trained and experienced in the skills required, who are completely familiar with the materials involved and the manufacturer's recommended methods of installation and who are thoroughly familiar with the requirements of this work.

- B. **REJECTION:** In the acceptance or rejection of finish carpentry, no allowance will be made for lack of skill on the part of the workmen.

1.3 **PRODUCT HANDLING**

- A. **PROTECTION:** Use all means necessary to protect the material of this section before, during, and after installation and to protect the installed work and materials of all other trades. Store all finish materials 12-inch minimum above the floor.
- B. **REPLACEMENT:** In the event of damage, immediately make all necessary repairs and replacements to the approval of the Architect/Interior Designer and at no additional cost to the Owner

1.4 **SUBMITTALS**

- A. **SHOP DRAWINGS:** Show materials, layouts, details of construction, dimensions and, where necessary, installation details.
- B. **SAMPLES and Mock-Ups, Panels, T&G Planks, Door Jambs and Trims.** Indicate Type of Wood used on all samples submitted. See Details and Door/Window Schedules

PART 2 0 PRODUCTS

2.1 **MATERIALS**A. **FINISH WOOD AND WOOD FRAMES**

- All finish wood shall be of quality suitable for painting finish specified and shall be fire retardant treated.

DIVISION 6.0 WOOD AND PLASTICS

SECTION 06200: CARPENTRY

2. Lumber shall be of the best grade available of the respective kinds required for the various parts of the work, well-seasoned, thoroughly dry, and free from loose or unsound knots, cup shakes or other imperfections impairing its strength, durability or appearance. All exposed surfaces shall be smooth unless otherwise specified.
 3. Yakal or Guijo shall be used for wood plates, door jambs, head and for all wood works in contact with masonry and all exposed woodworks where indicated on schedule. Note: Apply Coal Tar on masonry before wood is installed to prevent moisture absorption of wood.
 4. Pressure treated Apitong shall be used for ceiling joists, studs, cleats, roof framing and all other woodworks for structural purposes.
 5. Tanguile kiln dried shall be used for 25mm thick X 150mm T&G flooring in wax finish, 20mm x 150mm baseboards, door casings, panels, cabinetry and all other woodworks specified in the drawings.
 6. Plywood shall be A-B grade 6-19 mm thick, and fire resistant treated with Fire Hazard Classification Rating of not more than 25 for flame spread, fuel contributed and smoke generated. Use marine plywood for external & moisture exposed use, ordinary for painted paneling and ceiling requirements and ribbon grain Tanguile for varnished panels and doors.
- B. TREATMENT: All wood used for finishing shall be kiln-dried with fire retardant and pre-treated against termites. All exposed wood shall be kiln-dried to be applied with wood preservative, Sodalín, Xyladecor, Cuprinol or equal. Apply antitermite treatment (Solignum or approved equal) on all existing and new wood components, as needed.
- C. MISCELLANEOUS
1. ROUGH HARDWARE: Provide all items of rough hardware such as spikes, nails, bolts, toggle bolts, anchor bolts, wood screws, straps, clips necessary for the installation of specified work. Rough hardware items shall be of suitable type and of sufficient size and length to draw the work firmly together. Anchor bolts for wood nailers shall be steel 1/2-inch diameter. All rough hardware shall be hot-dip galvanized or stainless finish.
 2. CABINET HARDWARE: Provide all necessary cabinet hardware. Submit samples for selection / approval by Owner. All cabinet hardware should not be painted.

PART 3.0 EXECUTION

3.1 CONDITIONS OF WORK-IN-PLACE

- A. Examine work-in-place on which specified work is in any way dependent. Report in writing to the Owner / Architect any defect which may influence satisfactory completion and performance of specified work.
- B. The absence of such notification shall be construed as acceptance of work-in-place.
- C. Architectural and other finished woodwork shall be installed only when normal temperature and humidity conditions approximate the interior conditions that will exist when the building is occupied. The building should not be cold and damp, or hot and dry.

DIVISION 6.0 WOOD AND PLASTICS

SECTION 06200: CARPENTRY

3.2 FABRICATION

- A. Construction millwork to meet or exceed "Quality Standards" for custom grade for exposed surfaces.
- B. Finished work shall be square, plumb, true, and free from defects and blemishes.
- C. When it is necessary to cut and fit work at job site, units and materials shall be made with ample allowance for cutting.
- D. All joints shall be formed and made, both in shop and at job site, in such manner as to securely join members together and to prevent warping, splitting and opening up of joined parts due to swelling and shrinkage.
- E. Whenever possible, fastening shall be concealed on surfaces exposed to view; where not possible, secure with finishing nails or screws and glue; set all nail heads, and countersink all screw heads and cover with neatly fitted wood plugs to match grain. Fasten exterior work with non-corrosive fasteners.

3.3 INSTALLATION

- A. Install trim in as long lengths as possible with tight joints, coped where possible.
- B. Secure work with finishing nails or screw and waterproofing glue. On surfaces exposed to view, set all nail heads and countersink all screw heads and cover with neatly fitted wood plugs to match grain.
- C. Apply exterior materials with non-corrosive devices as detailed and as required to complete the project.

3.4 FINISHING HARDWARE

- A. Install all hardware listed in "Finish Hardware Section" or required to complete the project.
- B. Adjust moving parts to operate properly.

- END OF SECTION -

**DIVISION 7.0 THERMAL &
MOISTURE PROTECTION**

**SECTION 07114: MEMBRANE
WATERPROOFING**

PART 1.0 GENERAL

1.1 **WORK INCLUDED:** This section deals with all waterproofing works for the Toilet / T&B floor slabs, canopies, ledges, roof decks, concrete gutters and where indicated in the plans.

1.2 **PRODUCT HANDLING:**

- A. **PROTECTION AND STORAGE:** Membrane should be protected to avoid damages from other trades, construction materials or backfill. All materials should be protected from rain and direct sunlight. While stored or on site, rolls should be stored in a vertical position.
- B. **INSPECTION AND REPAIR:** In the event of damages, immediately make all the replacements necessary to the Owner. Patch tears and inadequately lapped seams with waterproofing membrane. Inspect membrane thoroughly before covering and make corrections immediately. All horizontal applications should be flood tested with a minimum 2" head of water for 24 hours. Mark any leaks and repair where the membrane is dry. Before flood testing, be sure the structure will withstand the dead load of the water.

PART 2.0 MATERIALS

2.1 **MATERIAL:** Waterproofing membrane shall be Polybond FC or an approved equal brand. This is a high performance torch applied waterproofing membrane made out of distilled bitumen modified with polymers and reinforced with a non-woven polyester mat which adds excellent puncture and tearing resistance to the membrane, as well as multi-directional elongation.

- A. Mineral Polybond (4.5 kg) and cementitious waterproofing for roof decks, concrete gutters, canopies and ledges.
- B. Mineral Polybond (3.5 kg) for toilets, bathrooms (T&B), janitor rooms and other wet areas

2.2 **RECOMMENDED EQUIPMENT:**

- A. LP gas filled tank with regulator and gauge
- B. Roofing torch properly connected to pressure gauge of LPG tank
- C. Sharp cutter or knife
- D. Trowel or spatula with a rounded end to avoid unintentional puncturing of the membrane
- E. Broom to clean & brush-off dust and dirt
- F. Gloves
- G. Fire Extinguisher

PART 3.0 EXECUTION

3.1 **SURFACE PREPARATION:**

- A. All areas to be waterproofed shall be wood-trowelled smooth, firm, dry and clean of rubbish, loose or foreign materials and obstruction, buttps flattened and holes filled and leveled.

**DIVISION 7.0 THERMAL &
MOISTURE PROTECTION**

**SECTION 07114: MEMBRANE
WATERPROOFING**

- B. Installation of cants in the angle formed by the horizontal and vertical surfaces, as well as the installation of metal fittings and similar work shall be in place and/or completed.

3.2 APPLICATION

- A. Coat entire area with primer around the perimeter extending 0.20 cm on the vertical walls and the base of all raised elements, then let primer dry well.
- B. Align rolls with a 100 mm side overlaps, starting from the drain towards the roof center.
- C. Re-roll and torch apply with a 150 mm end overlap and make sure each sheet is carefully bonded for 1 m at both ends.
- C. Re-check all seams and smooth edges with a pre-heated trowel.
- D. Test waterproofed areas by twenty four (24) hours and check for any seepages.

- 3.3 **TOPPING:** After the flood testing and upon approval and acceptance, all waterproofed areas shall be protected by concrete topping reinforced with chicken wire mesh (slope towards the drain). These shall be done by the General Contractor/Owner. Apply cementitious waterproofing over the concrete topping on areas indicated in this section and as specified in Section 07100

- END OF SECTION -

**DIVISION 7.0 THERMAL &
MOISTURE PROTECTION**

**SECTION 07210: MINERAL FIBER
BLANKET INSULATION**

PART 1.0 GENERAL

1.1 SECTION INCLUDES

- A. Thermal and Acoustic Insulation for Buildings

1.2 REFERENCES

- A. ASTM C 1224 - Reflective Insulation for Building Application
- B. ASTM D 3310 - Determining Corrosivity of Adhesive Materials
- C. ASTM E 84 - Surface Burning Characteristics of Building Materials
- D. ASTM E 96 - Standard Test Method for Water Vapor Transmission of Materials.

1.3 SUBMITTALS

- A. General:
Submit manufacturer's certification that proposed materials, details and systems as indicated and specified fully comply with manufacturer's details and specifications. If any portion of Contract Documents do not conform to manufacturer's standard recommendations, submit notification of portions of design that are at variance with manufacturer's specifications.
- B. Product Data:
 - 1. Submit manufacturer's product data including installation instructions. Indicate compliance with material requirements.
 - 2. Submit manufacturer's sample, minimum 150mm square.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying material name and manufacturer.
- B. Storage: Store materials in a clean, dry area indoors in accordance with manufacturer's instructions. Take necessary precautions to keep products clean, dry and free of damage.
- C. Handling: Protect materials during handling and installation to prevent damage. Comply with manufacturer's recommendations for handling, storing, and protecting of materials before and during installation.

1.5 SAFETY PRECAUTIONS

- A. Provide installers with dust/mist respirators and protective clothings.
- B. Do not smoke during installation of blanket thermal insulation.

**DIVISION 7.0 THERMAL
& MOISTURE PROTECTION**

**SECTION 07210: MINERAL
FIBER BLANKET INSULATION**

PART 2.0 PRODUCTS

2.1 BLANKET INSULATION

- A. Use: **Foil-Lined Rockwool insulation with a weight of 60kg / cu.m ASTM C685, TYPE II, Class A: Blanket with membrane-faced surface with a flame spread rate of 25 or less. When used in partition / wall or ceiling applications, wall / ceiling assemblies should have the following minimum acoustic ratings:**

**Noise Reduction Coefficient (NRC) = 0.75, minimum
Sound Transmission Class (STC) = 50, minimum**

- B. **Recycled Materials:** The minimum required recycled materials content by weight are:

**Rock Wool: 75% slag
Fiberglass: 20 -25% glass cullet**

- B. **Prohibited Materials:**

Do not provide asbestos-containing materials

PART 3.0 EXECUTION

3.1 EXAMINATION

- A. **Before installing insulation, ensure that areas that will be in contact with the insulation are dry and free of projections which could cause voids, compressed insulation, or punctured. If moisture or other conditions are found that do not allow the workmanlike installation of the insulation, do not proceed but notify contracting manager of such condition.**

3.2 INSTALLATION

- A. **Install and handle insulation in accordance with manufacturer's instructions. Keep material dry and free of extraneous materials. Ensure personal protective clothing and respiratory equipment is used.**
- B. **Do not install insulation in a manner that would sandwich electrical wiring between two layers of insulation.**

Install blanket insulation to butt tightly against adjoining blankets and to studs, rafters, joists, sill plates, headers and any obstructions. Staple securely to framing members, as needed. Provide continuity and integrity of insulation at corners, wall to ceiling joints, roof, and floor. Avoid creating thermal bridges.

- C. **Replace damaged material at no extra cost to the owner.**

- END OF SECTION -



**DIVISION 7.0 THERMAL
& MOISTURE PROTECTION**

**SECTION 07820: CAULKING
AND SEALANT**

PART 1.0 GENERAL

1.1 QUALIFICATIONS

- A. Before specified material or system is installed, the manufacturer or his authorized agent shall inform the Owner / Architect in writing that he has familiarized himself with the Contract Document, environmental conditions, and intended occupancy for this specific project and that his material or system is appropriate to the conditions to be encountered therein.
- B. Before specified material or system is installed, the manufacturer shall inform the Contractor, in writing, that he is familiar with the quality of workmanship of the installer and approves him as the installer of his material or system for this specific project.

1.2 SUBMITTALS

- A. **BROCHURES:** Submit Caulking and Sealant Manufacturer's Instructions for Application and Priming.
- B. **SAMPLES:** Submit upon request from the Architect.
 - 1. Cured sealant after color selection has been made from the Manufacturer's Color Range Brochure.
 - 2. Filler back-up material for sealant.
 - 3. Caulking material after color selection has been made from the Manufacturer's Color Range Brochure.

1.3 PRODUCT DELIVERY, HANDLING AND STORAGE

- A. Deliver materials to the project site with manufacturer's label intact and legible
- B. Store materials as per the manufacturer's recommendations. Materials with expired shelf life shall not be used.

1.4 PROTECTION OF EXISTING WORK

- A. Work adjacent to joints shall be cleaned free of smears of caulking or sealant compound as work progresses. Surfaces difficult to clean shall be protected with masking tape.
- B. Damaged work, as determined by the Architect, shall be repaired or replaced to the Architect's satisfaction.

1.5 WARRANTY: All caulking and sealant work shall be warranted, in writing, against all defects of materials and application for a period of 5 years after date of acceptance. Any failure that may occur within this period due to defective materials and/or application shall be repaired or replaced with proper materials and/or labor, as approved by the Architect at no additional cost to the Owner.

**DIVISION 7.0 THERMAL &
MOISTURE PROTECTION**

**SECTION 07920: CAULKING
AND SEALANT**

PART 2.0 PRODUCTS

2.1 CAULKING MATERIALS

- A. **CAULKING**: Vegetable oil and/or resin base, gum grade, elastic compound, conforming to FS TT -C-598B, Type I, color as selected by Architect from the manufacturer's Standard Color Range. Dow Corning or Euxit 950.
- B. **PRIMER FOR POROUS SURFACES**: Non-staining product of Caulking Manufacturer for use when recommended and as specified for the application by the manufacturer.
- C. **JOINT BACKING**: Back-up material to have outside diameter at least thirty (30%) percent greater than joint width and shall be one of the following: Oakum, picked dry and free of oil and tar; closed-cell Neoprene, tubular or rod stock, or Polyethylene rod stock.

2.2 SEALANT MATERIALS

- A. **SEALANT** for building construction perimeter joints such as windows, doors, panels, expansion joints, control joints, coping, etc., shall be a two-component non-staining elastomeric sealing compound based on liquid Polysulfide Polymer. Dow Corning or Euxit 950.
- B. **COLOR**: To be selected by the Architect from the Manufacturer's Standard or Custom Color Range matching color of adjacent materials as closely as possible.
- C. **PRIMER**: Non-staining product of Sealant Manufacturer.
- D. **JOINT BACKING**: Closed-cell Neoprene or polyethylene Rod E-White foam with square cross section. Width of materials shall be thirty (30%) percent greater than joint width.
- E. **BOND-BREAKER TAPE**: Wrinkled or smooth faced masking tape or other adhesive faced tape product is adaptable to installation in the bottom of a solidbacked joint for the purpose of breaking bond between the sealant and back of joint.
- F. **PRE-FORMED COMPRESSIBLE JOINT FILLER** (For other than Cured-in-Place concrete): Non-Extruding and Non-Bituminous Type, ASTM D1752, Type I or II.

PART 3.0 EXECUTION

3.1 LOCATION

- A. Caulking compound shall be installed in interior joints, including joints around pipes, conduits and ducts which penetrate interior walls and partitions and all other locations so indicated in the drawings.
- B. Sealant compound shall be installed in the following locations:
 - 1. All exterior joints where air, water, or sound could penetrate.
 - 2. Control and expansion joints in interior or exterior masonry.
 - 3. All other locations indicated to be sealed.

**DIVISION 7.0 THERMAL &
MOISTURE PROTECTION**

**SECTION 07920: CAULKING
AND SEALANT**

3.2 APPLICATION: General

- A. Do not apply exterior sealant in damp or rainy weather or until surfaces have thoroughly dried from the effects of such weather.
- B. Install specified material only after preparatory work has been approved and when adjoining work is in proper condition to receive it. Apply to masonry joints before they have been treated with masonry sealer or preservative.

3.3 JOINT PREPARATION

- A. **GENERAL:** All joint surfaces must be dry and thoroughly clean. At Contractor's option, sealant filler back-up material may be placed in exterior joint flush with exposed surfaces to avoid early contamination of joint prior to proper scheduling for sealing of joint and as a temporary weather seal. When sealing of joint takes place, the filler shall be recessed into the joint to the proper depth as herein specified. Any damaged back up material shall be replaced prior to sealing.
- B. **MASONRY, CONCRETE OR OTHER POROUS SURFACES:** Remove all loose particles, dirt, paint, foreign matter, or curing compound by sandblasting or other approved means and prime. Exposed fine aggregate of concrete surfaces to be sealed.
- C. **METAL OR OTHER SMOOTH SURFACES:** Remove corrosion by wire brush or chemical cleaners or other approved method. Wipe surface with clean cloth soaked in solvent, such as Toluol or Methyl-Ethyl-Ketone or other approved solvent, and then wipe surface dry with clean, dry cloth while surface still wet with solvent.
- D. **PRIMING:** Joint interfaces to which caulking and sealant compounds are applied shall be primed when recommended by the Compound Manufacturer. Primers shall be applied in strict accordance with the Caulking or Sealant Manufacturer's latest printed instructions and shall be allowed to cure before installation of caulking or sealant compound.

3.4 JOINT DIMENSION

- A. **GENERAL:** Install specified backing at proper depth in joint to provide specified joint dimension. Caulking or sealant compound shall not be applied without backing. Install bond-breaking tape where back-Up is a solid material. Tubular or rod stock backing shall be rolled into the joint to avoid lengthwise stretching and shall not be twisted or braided.
- B. **CAULKING JOINTS:** Depth of caulking compound shall be from 1 to 2 times joint width. Joint width shall be not less than 1/4-inch nor more than 3/4 inch.
- C. **SEALANT JOINTS:** No sealant contacting surfaces shall be less than 1/4-inch. Sealant shall be 1/4-inch deep for 1/4-inch wide joints, 3/8-inch deep for 3/8-inch to 1/2-inch wide joints, and 1/2-inch deep for 1/2-inch to 1-inch wide joints, unless indicated otherwise by the manufacturer.

**DIVISION 7.0 THERMAL &
MOISTURE PROTECTION**

**SECTION 07920. CAULKING
AND SEALANT**

3.5 INSTALLATION

- A. Installation shall be performed in strict accordance with the Manufacturer's latest printed instructions. Caulking or sealant compound shall be forced into opening with hand or air-powered caulking gun and tooled so as to fill void completely. Gun shall have nozzle of proper size to fit joint.
- B. Take care not to smear adjoining surfaces with caulking or sealant compound. Finish exposed butt joint surfaces slightly concave by tooling unless otherwise indicated or directed by the Architect.
- C. Sealant shall not be allowed to remain on exposed face of surfaces.

3.6 REPAIR OF DEFECTIVE WORK: Restore all defective or damaged work to initial condition. Defective or damaged items and/or components which cannot be repaired or restored to initial condition shall be removed and replaced at no additional cost to the Owner.

3.7 CLEANING: At the end of each day, installer shall remove from the project site all accumulated trash generated by his work. Installer shall, upon completion of specified work, thoroughly clean all surfaces of sealing materials, masking tape, etc.

- END OF SECTION -

DIVISION 5.0 DOORS & WINDOWS

SECTION 05120: ALUMINUM DOORS AND FRAMES

PART 1.0 GENERAL

1.1 APPLICABLE PUBLICATIONS:

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation.

A. FEDERAL SPECIFICATION (FED. SPEC):

TI-P-545A Primer, paint, zinc Chromate, Alkyd Type

B. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) PUBLICATIONS.

B 209-82 Aluminum and Aluminum Alloy and Plate
(Rev. B)

B 221-82 Aluminum-alloy Extruded Bar, Rod, Wire, Shape and Tube
(Rev. B)

C. ALUMINUM ASSOCIATION (AA) PUBLICATION:

1980 Designation System for Aluminum Finishes

D. ARCHITECTURAL ALUMINUM MANUFACTURING ASSOCIATION (AAMA) PUBLICATIONS:

603.8-1980 Performance Requirements and Test Procedures for Pigmented Organic Coatings on Extruded Aluminum

606.2-1980 Performance Requirements and Test Procedures for Pigmented Organic Coatings on Extruded Aluminum
High Performance Organic Coatings on Architectural Extrusions and Panels

1.2 SUBMITTALS:

A. SHOP DRAWINGS. Include the following:

1. Elevation of each door type
2. Size/Dimensions of doors and frames
3. Metal gauges
4. Details of door and frame construction
5. Methods of anchorage
6. Glazing details
7. Weatherstripping
8. Provisions for and location of hardware
9. Hardware specifications
10. Details of installation
11. Schedule showing location of each door, frame, and swing of door

B. SAMPLES: Submit in duplicate. Metal samples shall be complete with required color and finish.

1. Corner section of door and frame members showing method of joining, glazing methods, weather-stripping, and facing sheets, not less than 7" x 7" in overall size.
2. Each color and finish specified for aluminum, 4" x 4" in size. For each powder coat finish, show the extremes of the color range.

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- C. **CERTIFICATES OF COMPLIANCE:** Manufacturer's certificates attesting that doors, frames, and accessories meet the specified requirements.

1.3 DELIVERY, STORAGE, AND PROTECTION

- A. Inspect materials delivered to the site for damage.
- B. Unload and store with minimum handling. Provide storage space in dry location with adequate ventilation, free from dust or water, and easily accessible for inspection and handling. Store materials neatly on the floor, properly stacked on non-absorptive strips of platform.
- C. Do not cover doors & frames with tarps, polyethylene film or similar coverings.
- D. Protect finished surfaces during shipping and handling using manufacturer's standard method, except no coatings or lacquers shall be applied to surfaces to which caulking and glazing compounds must adhere.

PART 2.0 PRODUCTS

- 2.1 **DOORS AND FRAMES:** Powder-coated Sliding/Swing type aluminum doors and frames of size, design, and location indicated. Provide doors complete with frames, framing members, adjoining side-lights, hardware and accessories. Aluminum doors and frames shall be manufactured by Hoover Philippines Inc. or approved equal.

2.2 MATERIALS

- A. **ANCHORS:** Steel with hot-dipped galvanized finish.
- B. **WEATHER STRIPPING:** Neoprene or rubber gasket silicone treated, or type recommended by door manufacturer.
- C. **ALUMINUM ALLOY FOR DOORS & FRAMES:** ASTM B 221, Alloy 6063-T5 for extrusions. ASTM B 209, alloy and temper best suited for the purpose for aluminum sheets and strips.
- D. **FASTENERS:** Hard aluminum or stainless steel.
- E. **STRUCTURAL:** ASTM A 36.
- F. **ZINC-CHROME:** Fed. Spec. TT-P-645.
- G. **BITUMINOUS PAINT:** Mil. Spec. MIL-C-18480

2.3 FABRICATION

- A. **ALUMINUM FRAMES:** Extruded aluminum shape to contours approximately as indicated. Thicknesses of frames, glazing beads, molding and trim shall be submitted to the Architect for approval. Provide removable glass stops and glazing beads for frames accommodating fixed glass. Use countersunk mild steel Phillips head screws for the exposed fastenings, and space not more than 12 inches on center. Mill joint in frame members to a hairline watertight fit, reinforce, and either weld along concealed lines of contact or secure mechanically. Shapes shown are representations of design, function, and required profile, and function maybe used subject to Architect's approval.
- B. **ALUMINUM DOORS:** Of type, sizes, and design indicated and not less than 13/4 inches thick. Other thicknesses shall be submitted for approval. Door sizes shown are nominal and shall include standard clearances as follows: 1/16 inch at hinge sills, 1/16 or 1/8 at lock sills and top rails, and 2/16 inch at floors and thresholds.

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Double-acting doors shall have square edges at hinge stile, lock stile, and meeting stile edges. Full Glazed Stile and Rail Doors: Doors shall have stile and rails as indicated. Fasten top and bottom rail together by means of welding 3/8 or 1/2-inch diameter cadmium-plated tensioned steel tie rods. Provide an adjustable mechanism of jack screws or other methods in the top rail to allow for minor clearances adjustments after installation.

- C. **WELDING & FASTENING:** Locate welds on unexposed surfaces. Welds on exposed surfaces shall be smoothly dressed. Select welding rods, filler wire, and flux to produce a uniform texture and color in finished work. Remove flux and spatter from the surfaces immediately after welding. Exposed screws or bolts will be permitted only at inconspicuous locations, and shall have countersunk heads. Weld concealed reinforcements for hardware in place.
- D. **WEATHER-STRIPPING:** Provide on stiles and rails of exterior doors or as indicated on the drawings. Fit into slots which are integral with doors or frames. Weather-stripping shall be easy to replace without special tools and adjustable at meeting rails of pairs of doors. Installation shall allow doors to swing freely and close positively.
- E. **ANCHORS:** On the back of sub-frames, provide anchors of the sizes indicated for securing sub-frames to adjacent construction. Anchor transom bars at ends and mullions at head and sill. Reinforce and anchor free standing door frames to floor construction as indicated on approved shop drawings and in accordance with manufacturer's recommendation. Place anchors as near top and bottom of each jamb and at intermediate points not more than 25" apart.
- F. **PROVISIONS FOR HARDWARE:** Hardware shall be manufacturer-supplied, submit specifications and samples for approval. Hardware templates and hardware except field-applied hardware shall be delivered to the door manufacturer for use in fabrication of aluminum doors and frames. Cut, reinforce, drill, and tap doors and frames at the factory to receive template hardware. Provide doors to receive surface-applied hardware, drill and tap in the field. Provide hardware reinforcements of stainless steel or steel with hot-dipped galvanized finish, and secure welding or stainless steel screws.
- G. **PROVISIONS FOR GLAZING:** Provide extruded aluminum snap-in glazing beads on interior side of doors. Provide extruded aluminum, theft-proof, snap-in glazing beads or fixed glazing beads on exterior or security side of doors. Glazing beads shall have vinyl insert glazing gaskets, neoprene or rubber gaskets. Design glazing beads to receive glass of thickness indicated or specified. Glazing is specified in the Section 08110, GLASS AND GLAZING.
- H. **FINISHES:** Exposed aluminum surfaces shall be powder coated. Submit for approval to the Architect duplicate samples showing color ranges within which the produced sample will be processed.

PART 3.0 EXECUTION

3.1 INSTALLATION

- A. **METHOD OF INSTALLATION:** Plumb, square, level, and align frames and framing members to receive doors adjoining sidelights. Anchor frames to adjacent construction as indicated and in accordance with manufacturer's printed instructions. Anchor bottom of each frame to rough floor construction mild steel angle clips secured to back of floor construction; use mild steel bolts and expansion rivets for fastening clip anchors. Seal metal-to-metal joints.

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between framing membranes as specified as in Section 07920, Sealant and Caulking. Hang doors accurately with proper clearances and hardware. After erection and glazing adjust hardware to operate properly

1. **Masonry and Concrete:** Provide aluminum surfaces in contact with mortar, concrete, or other masonry materials with one coat of heavy-bodied bituminous paint.
 2. **Wood or Other Absorptive Materials:** Provide aluminum surfaces in contact with absorptive materials subject to frequent moisture, and aluminum surfaces in contact with treated wood with two coats of aluminum paint or one coat of heavy-bodied bituminous paint. In lieu of painting the aluminum, the Contractor shall have the option of painting the wood or other absorptive surfaces with two coats of aluminum paint and sealing the joints with caulking compound.
- 3.2 **PROTECTION:** Protect doors and frames from damage. Prior to completion and acceptance of the work, restore damage doors and frames to original condition, or replace with new
- 3.3 **CLEANING:** Upon completion of installation, thoroughly clean door and frame surface in accordance with door manufacture's recommended procedure. Do not use abrasive, caustic, or acid cleaning agents.
- 3.4 **GUARANTEE:** General Contractor and Aluminum/Glazing Contractor shall jointly provide labor and material guarantee for Aluminum Doors and Frames against defects or leaks for a two (2) year period, following substantial completion of project and shall promptly repair leaks and replace defective material at no cost to the Owner for a period up to ten (10) years

- END OF SECTION -

DIVISION 5.0 DOORS & WINDOWS

SECTION 08200: WOOD DOORS

PART 1.0 GENERAL

1.1 SUBMITTALS

- A. **SHOP DRAWINGS:** Indicate dimensions and elevation of each door type, location in building of each door, and pertinent erection instructions.
 - 1. Elevation of each door type
 - 2. Size/Dimensions of doors and frames
 - 3. Metal gauges
 - 4. Details of door and frame construction
 - 5. Methods of anchorage
 - 6. Glazing details
 - 7. Weatherstripping
 - 8. Provisions for and location of hardware
 - 9. Hardware specifications
 - 10. Details of installation
 - 11. Schedule showing location of each door, frame, and swing of door
- B. **SAMPLES:** Submit samples of corner section of each type of door cut diagonally with twelve-inch sides, showing construction and finish. Submit samples of corresponding door jambs (see Section 0200: Carpentry) with each type of door sample. Indicate type of wood on all samples.

1.2 **PRODUCT HANDLING:** Protect specified work by means of suitable cartons or paper bag during transportation to project site. Damaged items shall be replaced without additional cost to the Owner. Specified work shall be delivered to the building in which it is to be installed and at such time when the normal temperature and humidity conditions approximate the interior conditions that will exist when the building is occupied.

1.3 **WARRANTY:** Specified work shall be guaranteed for two (2) years starting from date of Owner's acceptance against warping, twisting or manufacturing defects. During the "Warranty Period", the contractor shall ascertain that each wood door shall equal in quality to the original specifications; the contractor shall make the necessary adjustments without additional cost to the Owner, including all labor costs of handling and refinishing. The Contractor does further agree to make the replacement within ten (10) days after the receipt of notice from the Owner.

PART 2.0 PRODUCTS

2.1 FLUSH HOLLOW CORE DOOR

- A. **TANGUILE DOOR:** 45mm thick door using 8mm thick Tangiule plywood veneer, ribbon grained and/or marine-type where indicated. Door to be spray-painted or varnished.
- B. **FACE:** 3 plywood veneer, verify type of veneer from Plans.
- C. **CORE CONSTRUCTION:** Wood wool fillers (fine shavings from wood) or as approved by the Architect.
- D. **STILE EDGES:** Doors designed to have stile edges shall be provided as shown on the drawings.

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SECTION 08200: WOOD DOORS

- E. **TOP AND BOTTOM EDGES:** Hardwood or softwood, in accordance with Manufacturer's latest printed standards. Top and bottom edges of doors shall be sealed with spar varnish or other approved sealer prior to shipment.
- F. **FRAME:** Provide wood frames trimmed from 50 x 150 mm wood. Use thoroughly seasoned, kiln-dried, non-resinous soft wood cores for frames and trim, milled true to form from solid stock, and free from defects that would impair its strength or durability. Provide applied members at jambs and heads where indicated.

2.2 FLUSH SOLID CORE DOORS

- A. **TANGULE DOOR:** 45mm thick door using 6mm thick Tangule plywood veneer, ribbon grained and/or marine-type where indicated. Door to be sprayed/painted or varnished.
- B. **FACE:** 3 plywood veneer, verify type of veneer from Plans.
- C. **CORE CONSTRUCTION:** Form 50mm x 50mm wood glued together.
- D. **STILE EDGES:** Doors designed to have stile edges shall be provided as shown on the drawings.
- E. **TOP AND BOTTOM EDGES:** Hardwood or softwood, in accordance with Manufacturer's latest printed standards. Top and bottom edges of doors shall be sealed with spar varnish or other approved sealer prior to shipment.
- F. **FRAME:** Provide wood frames trimmed from 50 x 150 mm wood. Use thoroughly seasoned, kiln-dried, non-resinous soft wood cores for frames and trim, milled true to form from solid stock, and free from defects that would impair its strength or durability. Provide applied members at jambs and heads where indicated.

PART 3.0 EXECUTION

- A. **WOOD DOORS:** Wood doors shall be conditioned to the average prevailing temperature and humidity at building before hanging. Doors should fit accurately in their respective frames, with proper door clearances.
- B. **CLEARANCES:** Door clearances shall be 1/8-inch at head and lock stile, 1/8-inch at hinge stile, and 1/2-inch at bottom including thickness of resilient floor covering, unless otherwise indicated.
- C. **CONSTRUCTION:** Stiles and rails shall be mortised and tenoned and provided with the necessary rabbets to receive the specified type of panel. All joints shall be made with water resistant glue. The assembled door frames shall be held in retainers until the glue has dried and attained its strength. Panels shall be true to shape and profiles and shall be uniform throughout for doors of the same type.
- D. **FINISH:** Upon completion of each door unit, the door shall be sanded free of machine marks which will show through the finish. Verify from Plans for the finish of all doors.

- END OF SECTION -

DIVISION 5.0 DOORS & WINDOWS

**SECTION 08520: ALUMINUM
WINDOWS AND FRAMES**

PART 1.0 GENERAL

- 1.1 **DESCRIPTION:** All items and components forming any portion of the Aluminum Windows and Frames including hardware provisions, glass and glazing, etc., and all similar work to install in the place
- 1.2 **SUBMITTALS**
- A. **SHOP DRAWINGS:** Submit shop drawings, brochures and installation instructions. Clearly show detail of each frame type, elevations of each window frame type, conditions of openings with various wall thicknesses and materials, typical and special details of window frame construction, method of assembling sections, location reinforcement and installation requirements for hardware: size, shape, and thickness of materials.
 - B. **SCHEDULES:** Submit Window Schedule relating type of window and frame to be installed in each opening.
 - C. **SAMPLE:** Submit 12" corner sample showing construction and finish
- 1.3 **PROTECTION:** The installer shall protect any existing work subject to damage during installation of specified work. Finished work that is readily subject to damage by subsequent work or environmental conditions shall be protected by the installer immediately following the installation thereof.
- 1.4 **FIELD MEASUREMENT:** Fabricator of custom work shall make measurements in the field to verify or supplement dimensions indicated and be responsible for accurate fit of work.
- 1.5 **FIELD QUALITY CONTROL:** Facilities shall be provided by the Contractor as needed for the proper inspection of specified work. Improper workmanship, as determined by the Architect, shall be corrected and replaced at no additional cost to the Owner.
- 1.6 **CONDITION OF WORK-IN-PLACE:** Examine work-in-place on which specified work is in any way dependent. Report, in writing, to the Owner / Architect any defect which may influence satisfactory completion and performance of specified work. The absence of such notification shall be construed as acceptance of work-in-place.

PART 2.0 PRODUCTS

2.1 MATERIALS

- A. **ALLOYS:** Aluminum shall be 6063-T5; standard alloy for architectural applications. Aluminum shall be of commercial quality and proper alloy for window construction, free from defects impairing strength and/or durability. Detached hardware and hinges having component parts (screws, nuts, washers, bolts, rivets, clips, etc.) which are exposed shall be aluminum. All Aluminum windows and frames shall be manufactured by HovverPhile, Inc. or equal.
- B. **WEATHERSTRIPPING:** All weatherstrips shall be of continuous vinyl with suitable profiles.
- C. **HARDWARE:** Manufacturer-supplied. Submit specifications and samples for approval.



DIVISION 5.0 DOORS & WINDOWS

SECTION 08520: ALUMINUM WINDOWS AND FRAMES

- D. **FRAMING:** The framing members must be square and true and properly designed to resist any load they will have to support. Any framing member should not deflect more than 1/175 of its span, with a maximum of 30 mm at any point. The twisting of the horizontal bottom member should be limited to 1 inch from the horizontal plane. Glazing stop or any other fitting should be designed to resist any load transmitted to the glazing.
- E. **REBATE:** The rebate must be dimensional according to the glazing type, size, and tolerances and to accommodate the glazing materials. The rebate will be protected against corrosion. The sill member will have adequate weep. All types of rebates, channels, or structural gaskets must be provided with a weep system in order to (a) prevent the accumulation of moisture in the rebate for prolonged periods; (b) squeeze the moisture vapor pressure between the air outside and the air inside the rebate. Situated in the bottom of the rebate there should be at least 2 weep holes with additional ones every 50 cm. over 1 meter. They will be oblong shaped, their smallest dimension will be 5 mm, their surface at least 50 sq. mm.

2.2 DIMENSIONAL TOLERANCES

DIMENSION	TOLERANCES
Inside width of frame	3mm. max.
Inside depth of frame	3mm. max.
Depth of frame	2mm. max.
Diagonal distance	2 mm. max.

2.3 **SHOP COATING:** Prior to coating, remove all oil, grease, sand, dirt or other foreign substance. Finish surfaces shall be smooth and free from irregularities and rough spots. Powder coat finish shall be Corro-Flat in Architect approved color.

2.4 PERFORMANCE SPECIFICATION

- A. **NOISE REDUCTION LEVEL:** Windows shall be designed and constructed to reduce exterior peak ambient, air borne noise levels not exceeding 45 decibels.
- B. **AIR TIGHTNESS:** Air infiltration shall not exceed 0.184 cu.m/sq.m. (0.05 cfm/sq.ft.) of window area. The permeability (Q/L) shall be less than 0.2 m³/sq m.h.
- C. **THERMAL INSULATION:** Heat transmission shall be less than k=3.0 kilocalories/ sq.m. hour °C.
- D. **WATER TIGHTNESS:** Windows shall be watertight enough as to withstand 200 kg/sq.m. water pressure.
- E. **UNIT STRENGTH:** Aluminum finishings shall have electrolytic pigmentation of more than 18 microns.



DIVISION 8.0 DOORS & WINDOWS

**SECTION 08520: ALUMINUM
WINDOWS AND FRAMES**

- F. **FRAMING:** Framing members must be square true and properly designed to resist any load they will have to support. Any framing member should not deflect more than 1/176 of its span, with a maximum of 20mm at any point. The twisting of the horizontal bottom member should be limited to 1" from the horizontal plane. Glazing or any other fitting should be designed to resist any load transmitted by the glazing.

PART 3.0 EXECUTION

- 3.1 **CONDITIONS PRIOR TO INSTALLATION:** Make provisions for drainage of any water leakage and condensation taking place within the construction.
- 3.2 **INSTALLATION OF FRAMES**
 - A. **CONCRETE WALLS:** Install frames in forms plumb and true to planes, securely anchoring in place prior to placing concrete. Provide necessary anchors and horizontal stiffeners, if required, to prevent frames from bowing.
 - B. **MASONRY WALLS .** Erect in position, plumb and securely anchor to floor and brace horizontal spreaders and fill solid with grout and mortar.
- 3.3 **REPAIR OF DEFECTIVE WORK:** Restore all defective or damaged work to initial condition. Defective or damaged items and / or components which cannot be repaired or restored to initial condition shall be removed and replaced at no additional cost to the Owner.
- 3.4 **CLEANING:** Frame should be wiped with a soft cloth, sponge or brush and cleaned with a mild solution of detergent every 6 months. Harsh cleaning materials such as steel wool or abrasive scouring powders should be avoided and strong acid or alkali cleaners should not be used.

- END OF SECTION -

DIVISION 8.0 DOORS & WINDOWS

SECTION 08710: FINISH HARDWARE

PART 1.0 GENERAL

- 1.1 **SCOPE:** The work in this section shall include the furnishing of all items of finish hardware as herein after specified, or obviously necessary for completion of this project, excepting the items specifically excluded from this section. Work not included in this section are the Aluminum door and window hardware.
- 1.2 **SCHEDULE:** Upon award of the contract, the successful Contractor shall submit six (6) typewritten hardware schedules to the Architect for approval. Each schedule shall contain a door index listing each door or opening on the project and the hardware for said opening. In addition, each schedule shall have a complete keying lay-out, and explanation of the abbreviations and symbols used in the schedule. Each item of hardware listed is to be clearly identified by manufacturer, manufacturer's number, and finish. Schedules not complying with the above will be rejected. The hardware supplier shall be responsible for checking and interpreting the detailed drawings to insure the proper fit and operation of all items of finish hardware.
- 1.3 **APPROVAL:** The Architect retains the authority to approve or reject any schedule based upon the general quality of the product submitted and compliance with the specifications. The Contractor shall be prepared to furnish samples, at the Architect's request, of any items he proposes to substitute. Samples will be held until completion of the project and then will be returned to the Contractor.
- 1.4 **QUALITY:** All specified materials furnished under this section shall be free from defects and blemishes. The hardware supplier shall repair or replace any item of finish hardware which may prove to be defective before final acceptance of work. All finish hardware shall be made in the US, Europe, or Canada.
- 1.5 **ACCEPTABLE:** The following hardware list include the items and manufacturers specified and those which are accepted by the Architect. All hardware shall have Manufacturer's and Distributor's 5 year warranty from date of customer's acceptance.

PRODUCTMANUFACTURERS

•Hinges	Stanley, Hafele, Yale, Hafele
•Floor Hinges	McKinney, Ryobi
•Locksets (Heavy Duty)	Schlage, Hafele, Corbin
•Dead bolt Locks	Schlage, Hafele, Corbin
•Pushbar Devices	Corbin, Von Duprin, Yale
•Door Closer	LCN, Corbin
•Miscellaneous	Ives, Stanley, O Line, Alpha
•Access Control Lockset	Schlage

PART 2.0 PRODUCTS:

- 2.1 **HINGES:** Hinges are to be manufactured by Stanley, Hafele, Yale or approved equal. Use non-ferrous hinges with stainless steel non-removable pin for doors opening outside; two ball bearing butt hinges 89mm x 89mm x 3.3mm thick for high frequency doors and doors equipped with door closers.
- 2.2 **FLOOR HINGES:** Floor hinges are to be manufactured by McKinney or equal. Floor hinges shall have 90° hold-open, unless otherwise indicated in the Door / Hardware Schedule or shown on the drawings.

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SECTION 08710: FINISH HARDWARE

- 2.3 **GRAVITY PIVOT HINGES:** Pivot Hinges for hanging doors are to be manufactured by McKinney or equal. Finish shall be US28D unless otherwise specified.
- 2.4 **LOCKSETS:** All cylindrical knob locksets shall be Schlage A59PD Orbit 626 "Entrance Lock" ANSI Grade 2 orbit design in stainless steel satin finish or approved equal. All lever type handle locksets shall be D Line or approved equal, stainless steel satin finish. Other brands by acceptable manufacturers shall be submitted for the Architect's approval. All locksets should have a 5 year warranty. Refer to Schedule of Doors for the types of locksets, location and finishes.
- 2.5 **DEADBOLT T LOCKS:** Deadbolt locks shall be Schlage B series Schlage BC160EV "Single Cylinder Deadbolt" 626 Standard Duty Commercial Deadbolts or Schlage BC 162EV "Double Cylinder Deadbolt" 626 Standard Duty Commercial Deadbolts or approved equal by acceptable manufacturers. Mounting location and Finish shall match cylindrical lockset or as indicated in the Schedule of Doors.
- 2.6 **DOOR CLOSERS:** Overhead door closers shall be Yale 2000 series or approved equal. Use regular arm mounting, parallel arm or integrated concealed, with holdopen function as specified in the Door Schedule.
- 2.7 **PUSH-BAR EXIT DEVICES:** Exit devices shall be Von Duprin Series 22 Touchbar or approved equivalent by acceptable manufacturers. Design to be low profile with maximum 63mm (2-1/2") projection and with stainless steel satin finish. All rim devices to be non-handed. Push bar to be of heavy gauge steel channel construction with exit alarm kit to monitor the use of exit; see Schedule of Doors.
- 2.8 **SLIDING DOOR TRACKS:** Use heavy-duty sliding door tracks, glides, hangers and other fittings needed for appropriate door weight and function as per manufacturer's specification. Use Centor brand or approved equal by acceptable manufacturers.
- 2.9 **DOOR HANDLE:** Use 32mm diameter stainless steel satin finish door handle. See Door Schedule and submit sample.
- 2.10 **MISCELLANEOUS HARDWARE:** Bolts, holders, plates, door holders, door stops, peepholes, and other miscellaneous hardware shall be by Hafele, Stanley, or Yale and shall be verified from the Schedule of Doors. Other brands by acceptable manufacturers shall be submitted to the Architect for approval.
- 2.11 **METAL DOOR HARDWARE:** Shall be integrated in the manufacture of all metal sections, manufacturer-supplied. Submit samples and prepare mock-ups for the Architect's approval.
- 2.12 **ACCESS CONTROL:** Shall be Schlage - Von Dupon Stand Alone Exit Trim (battery-powered) featuring Schlage Keyway Cylinder and Lever Type Handle (Satin Chrome Finish), fully-integrated with the panic exit device. All device components shall be weather-proof for outdoor applications. Other brands by acceptable manufacturers shall be submitted for the Architect's approval. All access-control devices should have a 5 year warranty, minimum.

DIVISION 8.0 DOORS & WINDOWS

SECTION 08710: FINISH HARDWARE

PART 3.0 APPLICATION

- 3.1 **APPLICATION.** All hardware shall be installed in a neat manner and following the manufacturer's Instructions. Fasteners supplied with the hardware shall be used to secure hardware to wood surfaces. Appropriate and applicable fasteners used for hardware shall be protected from paint, stains, blemishes & damage. All hardware shall be properly adjusted and checked in the presence of the Owner and the Architect or their representative to show that all hinges, locks, latches, bolts and door closers operate properly. After the hardware is checked, the keys shall be tagged, identified and delivered to the Owner.
- 3.2 **KEYS AND KEYING.** All locks shall have at least two (2) keys with the lock number stamped upon them and with the corresponding number stamped upon the face of the lock. After all the locks have been installed and upon completion of the work, the keys shall, in the presence of the owner's representative be shown to operate their respective locks and shall be tagged correspondingly.
- 3.3 **KEEP ALL FINISH HARDWARE FREE FROM PAINT SPLATTERS. DO NOT PAINT OVER FINISH HARDWARE.**

- END OF SECTION -

DIVISION 8.0 DOORS & WINDOWS

SECTION 08810: GLASS AND GLAZING

PART 1.0 GENERAL

- 1.1 **WORK INCLUDED.** Glass and Glazing required for this work includes, but is not necessarily limited to, tempered float glass, float glass, plate glass, plate glass mirrors and polycarbonate sheets
- 1.2 **QUALITY ASSURANCE**
- A. **QUALIFICATIONS OF INSTALLERS:** Provide at least one person who shall be thoroughly trained and experienced in the skills required, who shall be completely familiar with the referenced standards and the requirements of this work, and who shall personally direct all installation performed under this section of the specifications.
- B. **CODES AND STANDARDS:** In addition to complying with all pertinent Codes and Regulations, comply with all pertinent recommendations contained in the "Glazing Manual" of the Float Glass Marketing Association.
- 1.3 **SUBMITTALS OF SAMPLES:** Submit samples of each type of glass and glazing materials.
- 1.4 **PRODUCT DELIVERY, HANDLING, AND STORAGE:** Deliver materials to the project site in their original unopened containers bearing label clearly identifying manufacturer's name, brand and grade. Store under cover and protect from damage, label shall be affixed to each pane of glass indicating thickness and shall remain on glass until final cleaning. Safety glazing material shall bear Safety Glazing Material labels.
- 1.5 **PROTECTION AND DAMAGED WORK:** Protect specified work, adjacent work and materials against damage during progress of the work. Glass damaged due to improper handling or setting shall be replaced at no extra cost to the Owner
- 1.6 **CONDITIONS OF WORK-IN-PLACE:** Examine work-in-place of which glazing is in any way dependent. Verify actual dimensions before fabrication and installation. Coordinate with the work of other trades. Report in writing to the Architect any defects which may influence satisfactory completion and performance of the work. Absence of such notification shall be construed as acceptance of work-in-place. Exterior glazing materials shall not be installed in damp weather nor when ambient temperature is below 40° F.
- 1.7 **GUARANTEE.** The Glass Manufacturer shall provide written material guarantee for a period of ten (10) years, beginning at substantial completion of project, guaranteeing glass against all defects and loss of hermetic seal. The General Contractor shall provide written guarantee for labor to replace defective glass during Glass Manufacturer's 10-Year Material Guarantee Period.

PART 2.0 PRODUCTS

2.1 GLASS

- A. **INTERIOR GLASS:** Use 6mm or 10mm thick clear or tinted tempered glass. Refer to Plans for locations.
- B. **EXTERIOR GLASS:** Use 6mm or 10mm thick clear or tinted tempered glass. Refer to Plans for location

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SECTION 08610: GLASS AND GLAZING

- C. **VISION GLASS:** Use 6mm thick clear wired glass. Refer to Door Schedule for location and design.
- D. **MIRROR:** Provide 6 mm thick plate or float glass quality Q2 facial mirrors with 5 year warranty on 20mm thick marine plywood backing.

2.2 **GLAZING MATERIALS:** Elastomeric Sealing Compound, Dow Corning or equal. Refer to Section 07920.

2.3 **GLAZING FILM:** Use 3M Scotchcal Film Series 7725 for decal strips. Verify design.

PART 3.0 INSTALLATION

- A. Installation, including preparation by glaziers, glass positioning, edge clearances and tolerances, setting and application of glazing materials shall comply with recommendations of the Glass/Polycarbonate Manufacturer.
- B. Before glazing, clean all rabbets to receive panels with cleaning solvent equal to Benzene or Naptha, or as recommended by Glazing Compound Manufacturer. Under no circumstances shall panels be installed in wet, dirty or oily rabbets.

- END OF SECTION -

DIVISION 8.0 DOORS & WINDOWS

SECTION 08877 SAFETY AND SECURITY FILM

PART 1.0 GENERAL

1.1 **SECTION INCLUDES:** Safety and Security film factory applied to glazed surfaces.

1.2 **REFERENCES**

- A. American Society for Testing Materials (ASTM)
- B. American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)
- C. Association of Industrial Metallizers, Coaters and Laminators (AIMCAL)
- D. American National Standards Institute (ANSI)
- E. International Standards Organization (ISO)
- F. International Window Film Association (IWFA)

1.3 **SUBMITTALS**

- A. **Product Data:** Manufacturer's data sheets on each product to be used, including:
 - 1. Physical properties and independent testing agency reports showing compliance with specified tests.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Installation methods.
- B. **Shop Drawings:** Detailing installation of film, anchoring accessories, and sealant
- C. **Verification Samples:** For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns
- D. **Manufacturer's warranty information.**

1.4 **QUALITY ASSURANCE**

- A. **Manufacturer Qualifications:** Solar film manufacturer shall be the standard product of a manufacturer regularly engaged in the manufacture and distribution of such products in satisfactory use for a minimum of 5 years. Manufacturing facility shall be ISO 9001-2000 registered.
- B. **Installer Qualifications:** Documented experience in the application of selfadhesive window films with at least 3 applications of similar size and complexity, and approved by the solar film manufacturer.
- C. **Mock-Up.** Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Apply film to one window designated by Architect.
 - 2. Do not proceed with remaining work until workmanship and color is approved by Architect

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SECTION 08877 SAFETY AND SECURITY FILM**

1.5 PART 2.0 DELIVERY, STORAGE, AND HANDLING

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

1.6 PROJECT CONDITIONS

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

1.7 WARRANTY

Provide film manufacturer's limited warranty against failure of film, including change of color, peeling, bubbling, rapping, cracking, delamination and demetalization; include cost of material and labor for removal and reinstallation. All installed materials shall have Manufacturer's and Distributor's minimum of 5 years warranty from date of customer's acceptance.

PART 2.0 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

- A. Lumar Distributed by Luminex
- B. 3M by 3M Philippines.

2.2 SAFETY AND SECURITY FILM

- A. Lumar SCLSRPS4 4 mil or approved equal, use with tempered glass for personal safety (i.e. earthquakes, typhoons, accidental breakage)
 - 1. Tensile Strength: 32,000 lbs/sq. inch
 - 2. Break Strength: 132 lbs/inch
 - 3. Peel Strength: >3200 g/inch
 - 4. Puncture Strength: 74 lbs.

2.3 TESTING: GSA: US General Services Administration Standard Test Method for Glazing and Window Systems Subject to Dynamic Overpressure Loadings

- A. ASTM: Glazing and Glazing Systems subject to Airblast Loading
- B. Explosive Charge: 300lbs Ammonium Nitrate Fuel Oil (ANFO)
- C. Standoff Distance: 63 ft.
- D. GSA Rating: 3b
- E. ASTM Rating: Very Low Hazard

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PART 3.0 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared
- B. If substrate preparation is the responsibility of another installer, notify the Owner / Architect and Project / Construction Manager of unsatisfactory preparation before proceeding

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions. Installation must be accomplished by a recognized professional installer of film for energy control purposes or safety and security purposes. Completed work must meet IWFA visual acceptance standard.
- B. Install without bubbles, ripples, drips, dirt, cuts, tears or gaps between film and frame.
- C. Clean newly installed film and window frames after installation.
- D. Clean up cleaning solutions, run-off cleaning water and adhesive mounting solution.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Where installed film could be damaged by subsequent construction provide tape warning strips or barricades to prevent contact.

- END OF SECTION -



DIVISION 9.0 FINISHES

SECTION 09220: PLASTERING

PART 1.0 GENERAL

1.1 **APPLICABLE PUBLICATIONS.** The publications listed form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

A. Federal Specification:

SSS-S-111C Sound Controlling Materials (Trowel & Spray Application)

B. American Society for Testing Materials (ASTM) Publications:

C 91-83 (Rev. A) Masonry Cement
 C 144-84 (Rev. A) Aggregate For Masonry
 C 150-84 (Rev. A) Mortar Portland Cement

1.2 **DEFINITIONS:** The term plastering for this work shall apply to both interior and exterior works of walls and ceilings in smooth finish.

1.3 ENVIRONMENTAL CONDITIONS

A. **PORTLAND CEMENT PLASTER:** Maintain an ambient temperature of not less than 40°F continuously where plastering work will be done. Maintain this temperature for not less than 48 hours prior to the application of plaster while the plastering is being done and during the curing operation. In interior plastering work, maintain heat within the building until normal occupancy conditions are established. When the building is exposed to hot dry winds or day-to-night temperature differentials of 20°F or more, cover openings that are not glazed.

B. **PROTECTION FROM SUN & DRY WINDS:** During the application of the finish coat, and for a period of 48 hours following the completion of finish coat application for any given area, the surface of the plaster shall be protected from direct sunlight and direct winds. Use of tarpaulins or other temporary means may be acceptable.

PART 2.0 PRODUCTS

2.1 MATERIALS:

A. **PORTLAND CEMENT:** ASTM C 150, gray Portland cement type I, II or III, white Portland cement, Type I or III with 1/2-inch chopped alkali resistant fiberglass strands, minimum 1-1/2 pounds per sack cement.

B. **PLASTIC CEMENT:** ASTM C 150, Type I or II, except for the limitations on insoluble residue, air entrainment, and additions subsequent to calcination. Plasticizing agents may be added to Portland cement Type I and II in the manufacturing process, but not in excess of 12 percent of the total volume with 12.5mm (1/2") chopped alkali resistant fiberglass strands, minimum 1-1/2 lbs. per sack of cement.

C. **MASONRY CEMENT:** ASTM C 91 natural in color.

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- D. **AGGREGATE:** Sand for Portland Cement Plaster - ASTM C 144, except gradation of sand shall conform to the following requirements:

- 1 Sand Gradation for Basecoats: Percentage Retained by weight (± 2%) on each sieve

<u>Sieve Size</u>	<u>Min.</u>	<u>Max.</u>
No. 4		0
No. 8	0	10
No. 16	10	40
No. 30	30	65
No. 50	70	90
No. 100	85	100

- 2 Sand for finish Coats: Sand for finish coat shall be white and graded within the limit shown above for basecoats, except that the sand shall pass the NO.8 sieve, and for smooth the sand shall pass the NO.30 sieve.

- E. **WATER:** Clean, fresh, suitable for domestic consumption, and free of mineral and organic substances that affect the hardening or durability of the plaster.

- 2.2 **PROPORTIONING & MIXING:** Except where specified otherwise, materials are specified on a volume basis and shall be measured in approved containers, which will ensure that the specified proportions will be controlled and accurately maintained during the progress of the work. Measuring materials with shovels "shovel count" will not be permitted. Ready-mix plaster(s) shall be prepared for use by the addition of water only.

A. **BASECOAT PROPORTION:**

- Portland Cement Plaster Basecoats: Mix scratch coat in 1 part by volume of Portland cement to not less than 2-1/2 nor more than 4 parts by vol. of damp loose sand. Mix brown coat in the proportion of 1 part by vol. of Portland cement and not less than 3 nor more than 5 parts by volume of damp loose sand. Workability shall govern the actual amount of lime and sand used in the scratch and brown coats.
- Masonry Cement Plaster Basecoat: Mix scratch coat in 1 part by volume of masonry cement to not less than 2-1/2 nor more than 4 parts by volume of damp loose sand. Mix brown coat in the proportion of one part by volume of masonry cement to not less than 3 nor more than 5 parts by volume of damp loose sand. Brown coat shall have the same proportion of sand used in the scratch coat or a greater proportion of sand than used in the scratch coat, within the limit specified.
- Scratch Coat for Homogeneous Tile Backing: Mix scratch coat in 1 part by volume of Portland cement to 3 parts by volume of damp loose sand

2.3 **FINISH COAT PROPORTIONS**

- A. **PORTLAND CEMENT PLASTER FINISH COAT:** Mix finish in 1 part by volume of Portland cement to not more than 2 parts by volume of damp loose sand. Workability shall govern the actual amount of sand used in the finish coat, within the limits specified herein. Approved coloring compounds shall be added to produce the required color may be provided as approved.

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Where smooth trowelled finish is indicated, allow plaster to set up to the extent that it does not flow ahead or under the trowel, yet has not solidified, then trowel the face lightly to embed the granules. Do not over-trowel or burnish the surface.

- B. **MASONRY CEMENT PLASTER FINISH COAT:** Mix finish coat in the proportion of 1 part by vol. of masonry cement to not less than 2 parts by vol. of damp loose sand.

- 2.4 **MIXING:** Mix materials in approved mechanical mixers of the type in which the quality of water can be controlled accurately and uniformly. While the mixer is in continuous operation, add approximately 90% of the estimated quantity of water, half of the sand, all of the cementitious materials, and introduce the other 1/2 of the sand into the mixer in that sequence and mix thoroughly with the remainder of the water until the mixture is uniform in color and consistency. Avoid excessive mixing or agitation. Discard plaster and stucco which has begun to set before it is used; retempering will not be permitted. Do not use frozen, caked, or lumpy materials. Empty mixers and mixing boxes after each batch is mixed and keep free of old plaster. Mix ready-mixed plaster in accordance with the printed instruction.

PART 3.0 EXECUTION

3.1 PREPARATION OF SURFACES:

- A. Clean surfaces to which plaster is to be applied of all projection, dust, loose particles, grease, bond breakers, and foreign matter.
- B. Do not apply plaster directly to (1) surfaces of masonry or concrete that have been coated with bituminous compound or other waterproofing agents, or (2) to surfaces that have been painted or previously plastered.
- C. Before plaster work is started, wet masonry and concrete surfaces thoroughly with a fine fog spray of clean water to produce a uniformly moist condition. Check metal grounds, corner beads, screeds, and other accessories carefully for alignment before the work is started. Check expansion and control joints and supporting metal structures to ensure that expansion and control joints can move unrestrained.

3.2 APPLICATION OF PLASTER:

- A. **GENERAL** Plaster may be applied by hand or by machine. When a plastering machine is used the fluidity of Portland cement plaster shall be controlled to have a slump of not more than 2-1/2 inches when tested using a 2-by 4-by 8-inch high slump cone. Subsequent to determining water content to meet this slump, do not add additional water to the mix. Conduct the slump test according to the following procedure:
 - (1) Place cone on level, dry, non-absorptive base plate
 - (2) While holding cone firmly against base plate, fill cone with plaster taken directly from the hose or nozzle of the plastering machine, tamping with a metal rod during filling to release air bubbles.
 - (3) Screed off plaster level with top of cone. Remove cone by lifting it straight up with a slow and smooth motion.
 - (4) Place cone in a vertical position adjacent to fresh plaster sample, using care not to jiggle base plate.

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- (5) Lay a straightedge across top of cone, again being careful not to vibrate cone. Measure slump in inches from the bottom edge of the straightedge to the top of the slumped plaster sample.

B. **WORKMANSHIP:** Apply plaster in three coats, except as follows:

Provide scratch coat, or scratch coat with leveling coat as backing for homogenous tile. Apply base coats with sufficient pressure and plaster shall be sufficiently plastic to provide a good bond to bases. Work base coats into screeds at interval of 5-to 8-feet. Plaster shall not be continuous across expansion and control joints occurring in walls, partitions, and ceilings. Finish plaster work level, plumb square, and true, within a tolerance of 1/8 inch in 8 feet, without waves, cracks, blisters, pits, crazing, discoloration, projections, or other imperfections. Form plaster work carefully around angles and contours, and well-up to screeds. Special care shall be taken to prevent sagging and consequent dropping of applications. There shall be no visible junction marks in finish coat where one day's work adjoins another. Plastered surfaces to which vinyl or wood base boards will be applied shall extend to ground indicated as backing for base. Plaster will not be required behind built-in cabinets and equipment.

3.3 **PORTLAND CEMENTPLASTER:** Apply base coats with sufficient pressure to curl the keys around the back of metal lath or wire fabric and to provide good bond on masonry or concrete bases.

A. **PLASTER EXCEPT SCRATCH COAT FOR HOMOGENOUS TILEBACKING:**

Apply in 3 coats to a thickness of not less than 7/8 inch. Apply the scratch coat not less than 3/8-inch thick, lightly score horizontally, and moist cure for not less than 24 hours. Apply the brown coat after the scratch coat has been aged at least 24 hours in addition to the moist curing period. Apply the brown coat to bring the base coat out to the screeds, compact and straighten to a true surface with rod and darby, and float to receive the finish coat. After the brown coat has been moist cured for not less than 24 hours and aged at least an additional 5 days, apply the finish coat to a thickness of not less than 1/8 inch. Where any previous coat has become dry, dampen the surface evenly with water, prior to the application of the next coat. The finish coat for plaster shall have a trowelled finish. Moist cure plaster for 24 hours using fine fog spray of water and apply to the finish coat as frequently as required to prevent dry-out of the plaster. Do not saturate the plaster to the point where free water stands on the surface. Prevent staining of the finish coat. Provide moist curing.

B. **SCRATCH COAT FOR HOMOGENOUS TILEBACKING:** Apply scratch coat and keep continuously damp for not less than 24 hours before tile is to be set. Apply scratch coat in the thickness necessary to bring the face of the tile to the required plane, but not less than 1/4 inch from the face of the material it is being applied to and with a level surface within a tolerance of 1/4 inch in 8 feet. Apply scratch coat after substantial grounds, plugs, hangers, and other such accessories have been installed for plumbing fixtures, electrical outlets, and other fixtures and fittings, have been installed that are to be secured to tiled surfaces. Apply scratch coat with sufficient pressure to ensure a proper bond and key with the base and a proper base for the setting bed. While the mortar is still plastic, cut the scratch coat with a trowel at internal vertical angles to the depth of the coat and for the full height of the tile bed, score horizontally or on one inch centers for the extent of the tile bed, score horizontally or cross-scratch on coats within one hour after mixing, and at no time shall the mortar be retempered. Protect scratch coat and keep moist during curing period. A leveling coat of the same mix specified for the scratch coat when the surface of

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the scratch coat is not level within the specified tolerance or when a base coat thickness of more than 3/4 inch is required. Scratch leveling coat and cure for not less than 24 hours.

- 3.4 **PATCHING AND POINTING:** Upon completion of the building, cut out and patch loose, cracked, damaged or defective plaster. Patching shall match existing work in texture, color and shall be finished flush with plaster previously applied. Do pointing and patching of plastered surfaces abutting or adjoining any other finish work in a neat and workmanlike manner. Remove plaster droppings or splatterings from surfaces. Leave clean exposed plastered and stuccoed surfaces, in condition ready to receive paint or other finish. Remove protective covering from floors and other surfaces, and rubbish and debris from the building.

• END OF SECTION -



DIVISION 9.0 FINISHES

SECTION 09240; CONCRETE FINISHES

PART 1.0 GENERAL

- 1.1 **WORK INCLUDED:** Specification of this Section includes the materials and procedures required to achieve finishes on concrete surfaces such as fair-faced finish, form finish, grooved surface (rustication) and steel trowel finish.

PART 2.0 PRODUCT

- 2.1 **COMPRESSIVE STRENGTH OF SUBSTRATE MATERIAL.** Concrete floor slabs subject to live loads shall have a concrete screed with a minimum thickness of 2" (50 mm) and a minimum compressive strength of 3000 psi (20 MPa).

2.2 FORMS

- A. **PLYWOOD:** For Form Finish
- B. **PHENOLIC FILM FACED PLYWOOD:** 12-18 mm thick. Use Armor-Ply as manufactured by Formaply Industries, Inc. or its approved equivalent. Use this on areas designated as having Fair-Faced Concrete Finish.

2.3 SCHEDULE OF FINISHES

- A. **FORM FINISH:** Use plywood form for ceiling designated as unpainted, specifically for storage rooms, electrical rooms, mechanical rooms, machine rooms.
- B. **FAIR-FACED CONCRETE FINISH:** Use phenolic film-faced plywood for ceiling designated as unpainted for the stairs and service hallways/corridors. Plywood may be used up to 40 times.
- C. **HARDENED CONCRETE FLOORS:** Use non-metallic aggregate anti-dust floor hardeners.
- D. **STEEL TROWELLED FINISH:** For floors intended as walking surface or for reception of floor covering.

2.4 FINISH TOLERANCES:

- A. Class A tolerances shall be true planes within 1/8-inch in 10 feet as determined by a 10-foot straightedge placed anywhere on the slab in any direction.
- B. Class B tolerances shall be true planes within 1/4-inch in 10 feet as determined by a 10-foot straightedge placed anywhere on the slab in any direction.
- C. Class C tolerances shall be true planes within 1/4-inch in 2 feet as determined by a 2-foot straightedge placed anywhere on the slab in any direction.

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SECTION 09240: CONCRETE FINISHES

PART 3.0 EXECUTION

- 3.1 **AS-CAST PLYWOOD FINISH (Form Finish and Fair-Faced Concrete Finish).**
Concrete shall be cast against forms constructed of plywood not less than 16mm (5/8") thick or of boards lined with tempered hardboard not less than 5mm (3/16") thick. The arrangement of plywood sheets or liner sheets shall be orderly and symmetrical, and sheets shall be in as large sizes as are practicable. Sheets showing torn grain, worn edges, patches or holes from previous use or other defects which will impair the texture of concrete surfaces shall not be used. All fins on the surface shall be completely removed.
- 3.2 **TROWELLED FINISH FOR FLATWORK**
- A. Where a trowelled finish is specified, the surface shall be finished first with power floats, as specified above where applicable, then with power trowels, and finally with hand trowels.
 - B. The first trowelling after power floating shall be done by a power trowel and shall produce a smooth surface which is relatively free of defects which may still contain some trowel marks. Additional trowelling shall be done by hand after the surface has hardened sufficiently. The final trowelling shall be done when a ringing sound is produced as the trowel is moved over the surface.
 - C. The surface shall be thoroughly consolidated by the trowelling operations. The finished surface shall be free of any trowel marks, uniform in texture and appearance, and shall be planed to a Class A tolerance.
 - D. On surfaces intended to support floor coverings, any defects of sufficient magnitude to show through the floor covering shall be removed by grinding.
 - E. All edges and tooled joints shall be finished with a 3 mm (1/8") radius tool.
- 3.3 **BROOMED FINISH FOR FLATWORK:** Sidewalk slabs, and slabs in other locations so specified, shall be given a coarse transverse scored texture by drawing a broom across the surface. This operation shall follow immediately after floating.
- 3.4 **SMOOTH RUBBED FINISH:** Smooth rubbed finish shall be produced on freshly hardened concrete. All necessary patching shall have been done immediately after forms have been removed, and rubbing shall be completed not later than the following day. Surfaces shall be wetted and rubbed with Carbonundum brick or other abrasive until a uniform color and texture is produced. No cement grout or slush shall be used other than the cement paste drawn from the "green" concrete itself by rubbing process. Rubbing procedure shall be approved by the Architect before starting the work.
- 3.5 **SCRATCHED FINISH FOR FLATWORK:** After the concrete has been placed, struck off, and floated to a Class B tolerance the surface shall be roughened with stiff brushes or rakes before final set.

- END OF SECTION -

DIVISION 9.0 FINISHES

SECTION 09250: GYPSUM BOARD

PART 1.0 GENERAL

- 1.1 **WORK INCLUDED:** This section covers the furnishing of all materials, labor, equipment necessary for the installation of all Gypsum boards requirement for both ceiling and wall.

PART 2.0 PRODUCTS

2.1 MATERIALS

A. GYPSUM BOARD: ASTM C 36-76a.

1. Interior Ceiling on metal or wood joist: Use 10mm thick x 1200mm x 2400mm Boral Unispan Plasterboard with tapered edge and paintable exposed face or approved equal.
2. Exterior and Toilet Ceiling / Walls: Use 10mm thick x 1200mm x 2400mm Boral Wet Area Plasterboard for Ceiling on metal or wood framing; Use 10mm thick x 1200mm x 2400mm Boral Shades Vinyl-laminated Gypsum Board for Ceiling on white t-runners; Use 16mm thick x 1200mm x 2400mm Boral Wet Area Plasterboard for Walls.
3. Acoustic Furred Wall or Ceiling: Use 12.5 mm thick x 1200mm x 2400mm Boral Echostop S-8 Plasterboard with tapered edge, square hole punching (10.0 x 10.0mm), 8 groups per sheet, 13.4% perforation and NRC rating of 0.75 minimum, or approved equal. Use 12mm thick Boral Gypsum Board in conjunction with the Echostop board assemblies as shown on the drawings.
4. Other Walls: Use 16mm thick Boral Standard Core Plasterboard with tapered edge and paintable exposed face or approved equal. Verify location.
5. Fire rated application: Use 13mm or 16mm thick Boral Firestop Plasterboard assemblies per manufacturer's recommendations. Verify location.

B. CEILING BOARD FRAMING ACCESSORIES: All metal accessories shall be hot-dipped galvanized steel. Materials shall be supplied by PPR Light Steel Framing System, Inc. or approved equal.

1. Double Furring Channel: 19mm x 50mm x 0.40mm thick Galvanized Steel at 1200 mm o.c.
2. Single Furring Channel: 19mm x 25mm x 0.40mm thick Galvanized Steel at 400 mm o.c.
3. Carrying Channel: 12.5mm x 38mm x 1.0mm thick Galvanized Steel at 1200mm o.c.
4. Tension/Hanger Rod: 6.0 mm diameter spaced at 1000mm o.c.
5. Suspension Rod Hanger: 2.0mm thick Electroplated Black Iron 6.0mm diameter
6. Double/Single Furring Clip: 0.6 mm thick Galvanized Steel.
7. Carrying Channel Hanger: 0.85mm thick Spring Steel
8. Double/Single Furring Joiner: 0.4mm thick Galvanized Steel
9. Wall Angle 'Z'-type for shadowline: 25.4mm x 25.4mm x 25.4 x 0.4mm thick Powder-coated Galvanized Steel
10. Wall Angle 'J'-type: 12mm x 20.2mm x 31mm x 0.60mm thick Galvanized Steel
11. Adhesive: Ready-wire joint compound taping or equal

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SECTION 09250: GYPSUM BOARD

- 12. Fasteners:
 - a. Angle to Stud - Drive pins for use of power driven tools.
 - b. Board to Framing - Type S Bugle Head for use with power driven tools.

13. Sealant and Caulking: As recommended by Ceiling Board Manufacturer.

G. WALLBOARD FRAMING ACCESSORIES: All metal accessories shall be hotdipped galvanized to G-60 to G-90 of ASTM A525. The zinc coating are tested to be lockforming quality and conforms to ASTM A597. The structural strength should be 55ksi for tensile strength (minimum), 40 ksi for yield point (minimum) and 45 to 60 for Rockwell B Hardness and shall conform to ASTM 446 and according to Philippine National Standard PNS67:1986.

- 1. Top and Bottom Track: 32mm x 92mm x 1.2mm thick Galvanized Steel
- 2. Horizontal & Vertical Studs: 35mm x 92mm x 1.5mm thick Galvanized Steel.
Provide Double Channel Horizontal and Vertical Studs for structural stability as well as for support of wall-mounted cabinetry and furnishings. Coordinate with qualified Framing Manufacturers on construction methodology.

2.2 SUSPENDED CEILING SYSTEM

A. GRILLAGE ERECTION

- 1. Level the ceiling height by the use of a water level or laser beam.
- 2. Install wall angles using screws, stub nails or drywall fasteners depending on wall type.
- 3. The ceiling is to be set out from the center of the room to balance the widths of the boards at the perimeter. Center to center distance for main runners and cross tees at 600mm x 1200mm
- 4. Maximum hanger distance is 1 m. Maximum distance from wall to first hanger is 0.6m.
- 5. Main runners are joined together by inserting a tab on the end of one section into a slot in the adjoining section.
- 6. Cross tees are inserted in slots in the main runners and locked in position with minimal downward force.
- 7. When all sections have been installed, adjustment can be made to ensure that the whole suspension is leveled.
- 8. Ceiling boards are then laid on the grid.
- 9. Make sure all ceiling boards are carefully arranged.
- 10. Insulation: Unless otherwise specified, use 2" thick fiberglass blanket type insulation.
- 11. Fasteners. Use 6 x 30 and 8 x 45mm Gypsum screws.

B. CONCEALMENT TREATMENT MATERIALS: Comply with ASTM C475 - 70, including joint tape, and embedding and finished types of joint compound. Concealment treatment materials shall be the products of a single manufacturer.

PART 3.0 EXECUTION

3.1 GENERAL

- A. Examine work-in-place on which work is in any way dependent. Report, in writing, to the Owner /Architect any defects which may influence satisfactory completion and performance of work. Absence of such notification will be construed as acceptance of work-in-place.
- B. Installation of specified work shall be in accordance with the manufacturer's latest printed directions as approved by the Architect.



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SECTION 09250: GYPSUM BOARD

3.2 SUSPENDED DRYWALL CEILING

A. GRILLAGE ERECTION

1. Space hanger rods at 1200mm o.c. along carrying channels and within 150 mm of ends of carrying channel run.
2. Install carrying channels 1200mm o.c. and within 150mm of walls. Position channels for proper ceiling height, level, and secure with hanger wire saddled along channel. Provide 25 mm clearance between runners and abutting walls and partitions. At channel splices, interlock flanges, overlap ends 300mm and secure each end with double-strand Ga. 18 tie wire.
3. Erect metal furring channels at right angles to 1-1/2" carrying channels or main support members. Space furring 300mm o.c. and within 150mm of walls. Provide 25mm clearance between furring ends and abutting walls and partitions. Securing furring to carrying channels with clips or saddle-tie to supports with double-strand 18 Ga. tie wire. At splices, nest furring channels at least 20mm and securely wire-tie each end with double-strand 18-gauge tie wire.
4. At light troffers or any opening that interrupt the carrying or furring channels, install additional cross reinforcing and hangers as required to restore lateral stability of grilleage.

B. GYPSUM PANEL ERECTION

1. Apply gypsum panels of maximum practical length with long dimension perpendicular to furring channels. Position and joints over channel web and stagger in adjacent rows.
2. Fit ends and edges closely, but not forced together. Fasten panels to channels with Type "A" screws spaced at 400 mm o.c. in field of panels and 200 mm o.c. staggered along abutting ends and edges.

3.3 WALLBOARD PARTITION

A. WALL STUD ERECTION

1. Install top and bottom wall track.
2. Install vertical studs at 600mm, on center. Install horizontal studs at door frames and where additional reinforcement is required. Provide horizontal bracing for walls exceeding 2.0m. Use Double Channel Horizontal and Vertical Studs for structural stability as well as for support of wall-mounted cabinetry and furnishings. Coordinate with qualified Framing Manufacturers on construction methodology.
3. All walls are intended to extend beyond ceiling height and should be anchored securely to the underside of slab, beam or framing above as well as to the existing slab below. Provide steel bracing, as needed to ensure structural stability.

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SECTION 09250: GYPSUM BOARD

B. GYPSUM PANEL ERECTION

1. Apply one side gypsum panel(s) of maximum practical length with long dimension perpendicular to wall studs. Fasten 1 0-16mm from edge of sheet. Fasteners shall be installed at a maximum of 200mm on center at the edge and 300mm on center at the middle.
2. Fit blanket insulation into the cavity then apply the other gypsum panel(s) using the same procedure.

- 3.4 **CONCEALMENT OF JOINTS AND DEPRESSIONS:** Joints between panels shall be reinforced with joint tape and embedding type joint compound and concealed with at least two (2) applications of finishing type joint compound. Screw depression shall be filled with at least three (3) coatings of joint compound. All coats shall be sanded when dry as necessary after each application of joint compound. The final coat and sanding shall leave Gypsum board uniformly smooth and ready for paint.

- END OF SECTION -

DIVISION 9.0 FINISHES

SECTION 09310: HOMOGENOUS TILES

PART 1.0 GENERAL

- 1.1 **SUBMITTALS:** Submit samples of each type and color of Homogenous tiles, grout, metal trim and joint fillers
- 1.2 **PROTECTION AND DAMAGED WORK:** Protect specified work and adjacent work and materials against damage during progress of specified work until completion. Spaces in which tile work is being set shall be closed to traffic and other work until tile has firmly set. Post suitable notices or make other provisions to the effect that no one shall work around freshly-tiled walls not walk upon freshly-tiled floor for not less than seven (7) days after the tile has set. Damaged or defective work shall be repaired or replaced to the Architect's satisfaction. Cracked, chipped or defective tile will not be accepted
- 1.3 **ADDITIONAL TILES FOR MAINTENANCE:** Add 10% to the total number of tiles required for maintenance purposes and submit these to the Owner / Construction Manager.

PART 2.0 PRODUCTS

2.1 HOMOGENOUS TILES

A. **MANUFACTURER:** Polished or Unpolished tiles as distributed by Italfil, Gruppo Armani, Falport or any approved equal.

B. **DESIGN & COLOR:**

- 1. Use 300mm x 300mm polished or unpolished: For lobbies, corridors, lounges, bathrooms, restrooms, stairs and other rooms as indicated on the plans.
- 2. Use 300mm x 300mm Homogenous Tile Tread with grooves: For stairs as indicated on the plans.

2.2 **MORTAR:** All mortar setting bed for use on floors and walls shall be a blend of Portland Cement, graded sand and additives, ABC Grout or Piedra Adhesive Mortar or equal.

2.3 **GROUT:** ABC Grout or Piedra Rainbow tile grout as manufactured by Piedra Product Systems. Grouting shall be in colors selected by the Architect from the standard range of colors.

2.4 **OTHER MATERIALS:** All other materials, not specifically described but required for a complete and proper tile installation, shall be as selected by the Contractor subject to the approval of the Architect.



DIVISION 9.0 FINISHES

SECTION 09310: HOMOGENOUS TILES

PART 3.0 EXECUTION

3.1 HOMOGENOUS TILE FLOORS, CURB, WALLS AND BASE:

- A. Mix and use proprietary or trade-marked materials in strict accordance with Manufacturer's instructions, unless otherwise specified. Cut and drill tile for proper fitting around all equipment-in-place without damaging work. Rub down with an abrasive stone the exposed sharp edges of cuts. Grind and fit carefully at intersection, against trim, finish, and built-in items. Fit tile closely around outlets, pipes, fixtures and fittings, so that plates, collars and escutcheons will overlap cuts. Before applying mortar setting bed, establish border lines, if any; center field work in both direction to permit laying pattern with minimum of cut tiles. Lay floor without borders from center lines outwards. Make necessary adjustments at walls.
- B. No tile trim shall be used for corners, edges and terminations, see details.
- C. The tile base shall join the floor surface with a cove shape, the top of the base shall be a bullnose or as specified by Architect; see details.

3.2 SETTING

- A. Set homogenous floor tile firmly in setting bed, for a true surface. Joints shall be straight, level, perpendicular, and of even width not exceeding 1/16 inch. Joints in floor and wall tilework shall be level.
- B. Setting bed for mortar-set floor tile shall be placed to a thickness of 3-8 mm on a working area of not more than 1 sq. m. Solid-bed fixing is recommended for wet conditions and homogenous floor tiles but otherwise the adhesive should be horizontally ribbed with a notch trowel before fixing the tiles.
- C. Fix tiles by pressing into place, beginning at the bottom in the case of wall tiles, and at center markings in the case of floor and pool tiles. Make sure that the back of each tile is not less than 75% in contact with the adhesive.
- D. Clean off surplus adhesive with a damp cloth. Leave for a minimum of 24 hours to set before grouting homogenous wall tiles with Pledra Rainbow Grout. When fixing homogenous floor tiles, no traffic should be allowed for 4 days after completion.

3.3 GROUTING

- A. Mix the grout powder with water to a smooth thick consistency. Avoid overwelling. Leave to stand for about 15 minutes before using.
- B. Apply to the tile joints with the squeegee, brush, or sponge working the grout in thoroughly to ensure total compaction. Remove surplus grout with a damp sponge.

- END OF SECTION -



DIVISION 9.0 FINISHES

SECTION 09510: CEILING SUSPENSION SYSTEM

PART 1.0 GENERAL

1.1 DESCRIPTION

- A. **INCLUDED:** All items and components forming any portion of the Suspended Ceiling Sub-system and all work to install same.
- B. **LOCATION:** All areas designated in plans and Schedule of Finishes to receive Acoustic Type Ceilings.

1.2 SUBMITTALS

- A. **SHOP DRAWINGS:** Submit copies of ceiling layout indicating the location of all light fixtures, diffusers, etc. Show details of installation, including all special conditions, such as hanger spacing, fastening details, splicing method for main and cross runners, change in levels, and supports at ceiling fixture. Layout system to permit as large border units as possible.
- B. **SAMPLES:** Submit representative samples of all components of each type of ceiling sub-system.
- C. **MAINTENANCE PROGRAM:** Submit manufacturer's latest printed recommendations for proper owner maintenance program.

PART 2.0 PRODUCTS

2.1 EXPOSED TEE GRID SYSTEM: Verify Location and Preferred Profile

- 1. 24 mm thk. x 600mm x 1200mm Armstrong Dune Max (NRC>0.70) acoustic boards
- 2. 10mm x 600mm x 1200mm Vinyl Laminated Plasterboard in Shades design by Boral or approved equal
- 3. Other Ceiling Board as shown on plans.

2.2 EXPOSED T-BAR CEILING SYSTEM

All metal frames shall be hot-dipped galvanized, capped with white powder coated galvanized steel manufactured by CKM Building Materials or approved equal. Color of Powder Coating should be approved by the Architect.

- 1. Main T-bar: 38mm x 22mm x 12 feet
- 2. Cross T - bar: 26mm x 24mm x 2 - 4 feet
- 3. Wall Angle for shadow line: 24mm x 24mm x 24mm x 10 feet
- 4. Hanger Bracket: adjustable length, hot-dipped galvanized

PART 3.0 EXECUTION

3.3 INSTALLATION: Install in exact pattern indicated and detailed on the drawings, and in strict accordance with manufacturer's latest printed instructions. Space hangers so that maximum deflection does not exceed 1/360 of span between same. Re-level ceiling as required.

3.4 CUTTING AND FITTING: Do all cutting and fitting of acoustical materials as required to complete the specified work and to accommodate the work of Other Trades.

- END OF SECTION -

DIVISION 9.0 FINISHES

SECTION 09650: RESILIENT BASE

PART 1.0 GENERAL

1.1 DEFINITION: The term "RESILIENT BASE" as used herein means vinyl wall base.

1.2 QUALITY ASSURANCE

- A. The vinyl wall base specified shall be installed in accordance with the manufacturer's installation specifications. All accessory products used for their installation of the flooring shall be those recommended by the manufacturer, following their specifications.

PART 2.0 PRODUCTS

- A. Materials: Armstrong Velocity Wall Base

Thickness: 2.15mm

Height: 100mm

Length: 1200mm

Type: Cove

Flame Spread: 2.0 or less (UL-992)

PART 3.0 EXECUTION

3.1 PREPARATION

- A. Ensure contact wall surface to 1/2 inch below top of base is clean and free from dirt, paint, oil, grease, wall covering, old adhesives, and other extraneous substances.
- B. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. The job site, all materials and adhesive should be conditioned at a minimum temperature of 20°C 48 hours prior to, during and 48 hours after installation. Thereafter, maintain room temperature between 13°C and 38°C.
- B. Coiled wall base shall be uncoiled and lay flat for at least 24 hours at 18°C prior to installation. Floors and walls shall be clean, dry, free of dust, all paints, wallpaper, and all other foreign material, which may effect proper adhesive bonding. Wall Base may be installed on interior plaster, gypsum wallboard, concrete, masonry, mineral-reinforced cement board or similar porous surfaces. Wall Base shall not be installed on surfaces that will be exposed to drastic temperature changes or moisture.
- C. Fit top set base joints tight and vertical. Install base on solid backing; adhere tightly to wall surfaces. Miter and form internal and external corners as detailed in manufacturer's installation and maintenance instructions.
- D. Scribe and fit to door frames and other obstructions.

3.3 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage, while adhesive is still wet.
- B. Clean floor and base surfaces.

- END OF SECTION-

DIVISION 9.0 FINISHES

SECTION 09652: RESILIENT TILE FLOORING

PART 1.0 GENERAL

1.1 SECTION INCLUDES

- A. Flooring and accessories as shown on the drawings and schedules and as indicated by the requirements of this section.

1.2 RELATED SECTIONS

- A. Other Division 9 sections for floor finishes related to this section but not the work of this section.
- B. Division 3 Concrete; not the work of this section.

1.3 QUALITY ASSURANCE AND REGULATORY REQUIREMENTS

- A. Select an installer who is competent in the installation of the resilient tile flooring.
- B. If required, provide types of flooring and accessories supplied by one manufacturer, including levelling and patching compounds, and adhesives.

1.4 SUBMITTALS

- A. Submit shop drawings, seaming plan, coving details, and manufacturer's technical data, installation and maintenance instructions for flooring and accessories.
- B. Submit the manufacturer's standard samples showing the required colors for flooring and applicable accessories.
- C. **MANUFACTURER'S MAINTENANCE DATA AND INSTRUCTION:** Upon completion and prior to acceptance of work, submit current copies of the flooring manufacturer's printed recommendations for maintenance methods.
- D. **EXTRA STOCK:** Upon completion of work, deliver additional tiles and base to the Owner for use in repairs and maintenance. Additional materials of each color shall be from the same lot as the materials installed. Add 10% to the total number of tiles required for maintenance purposes and submit these to the Owner / Construction Manager.

1.5 ENVIRONMENTAL CONDITIONS

- A. Deliver materials in good condition to the jobsite in the manufacturer's original unopened containers that bear the name and brand of the manufacturer, project identification, and shipping and handling instructions.
- B. Store materials in a clean, dry, enclosed space off the ground, and protected from the weather and from extremes of heat and cold. Protect adhesives from freezing. Store flooring, adhesives and accessories in the spaces where they will be installed for at least 48 hours before beginning installation.
- C. Maintain a minimum temperature in the spaces to receive the flooring and accessories of 55°F (13°C) and a maximum temperature of 100°F (38°C) for at least 48 hours before, during, and for not less than 48 hours after installation. Thereafter, maintain a minimum temperature of 55°F (13°C) in areas where work is completed. Protect all materials from the direct flow of heat from hot-air registers, radiators, or other heating fixtures and appliances.



DIVISION 9.0 FINISHES

SECTION 09662: RESILIENT TILE FLOORING

- D. Install flooring and accessories after the other finishing operations, including painting, have been completed. Close spaces to traffic during the installation of the flooring. Do not install flooring over concrete slabs until they are sufficiently dry to achieve a bond with the adhesive, in accordance with the manufacturer's recommended bond and moisture tests.

PART 2 PRODUCTS

2.1 RESILIENT TILE FLOORING MATERIALS

- A. Provide Tile Flooring manufactured by Armstrong or approved equal; having a nominal total thickness of 3.2 mm, 305 mm x 305 mm (minimum dimension), composed of polyvinyl chloride resin binder, plasticizers, fillers, and pigments with colors and texture dispersed uniformly throughout the thickness of the wear layer.
- B. Submit two (2) sets of material samples for selection / approval by the Architect and Owner.

2.2 WALL BASE MATERIALS

- A. Provide 3.2 mm thick, Color-Integrated Wall Base with a matte finish, Cove Style
- B. Submit two (2) sets of material samples for selection / approval by the Architect and Owner.

2.3 ADHESIVES

- A. For Tile Installation System, Full Spread; Provide Resilient Tile Adhesive under the tile and Wall Base Adhesive at the wall base as recommended by the flooring manufacturer.

2.4 ACCESSORIES

- A. For patching, smoothing, and leveling monolithic subfloors (concrete, terrazzo, quarry tile, ceramic tile, and certain metals), provide Fast-Setting Cement-Based Undertayment.
- B. For sealing joints between the top of wall base and irregular wall surfaces such as masonry, provide plastic filler applied according to the manufacturer's recommendations.
- C. Provide metal edge strips of width shown on the drawings and of required thickness to protect exposed edges of the flooring. Provide units of maximum available length to minimize the number of joints. Use butt-type metal edge strips for concealed anchorage, or overlap-type metal edge strips for exposed anchorage. Unless otherwise shown, provide strips made of extruded aluminum with a mill finish.

DIVISION 9.0 FINISHES

SECTION 09662: RESILIENT TILE FLOORING

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine subfloors prior to installation to determine that surfaces are smooth and free from cracks, holes, ridges, and other defects that might prevent adhesive bond or impair durability or appearance of the flooring material.
- B. Inspect subfloors prior to installation to determine that surfaces are free from curing, sealing, parting and hardening compounds; residual adhesives; adhesive removers; and other foreign materials that might prevent adhesive bond. Visually inspect for evidence of moisture, alkaline salts, carbonation, dusting, mold, or mildew.
- C. Report conditions contrary to contract requirements that would prevent a proper installation. Do not proceed with the installation until unsatisfactory conditions have been corrected.
- D. Failure to call attention to defects or imperfections will be construed as acceptance and approval of the subfloor. Installation indicates acceptance of substrates with regard to conditions existing at the time of installation.

3.2 PREPARATION

- A. Smooth concrete surfaces, removing rough areas, projections, ridges, and bumps, and filling low spots, control or construction joints, and other defects with Fast-Setting Cement-Based Underlayment or approved equal.
- B. Remove paint, varnish, oils, release agents, sealers, and waxes. Remove residual adhesives as recommended by the flooring manufacturer. Remove curing and hardening compounds not compatible with the adhesives used, as indicated by a bond test or by the compound manufacturer's recommendations for flooring. Avoid organic solvents.
- C. Perform subfloor Calcium Chloride Tests and Bond Tests to determine if surfaces are dry; free of curing and hardening compounds, old adhesive, and other coatings; and ready to receive flooring.
- D. Vacuum or broom-clean surfaces to be covered immediately before the application of flooring. Make subfloor free from dust, dirt, grease, and all foreign materials.

3.3 INSTALLATION OF TILE FLOORING

- A. Install flooring wall to wall before the installation of floor-set cabinets, casework, furniture, equipment, movable partitions, etc. Extend flooring into toe spaces, door recesses, closets, and similar openings as shown on the drawings.
- B. Scribe, cut, and fit to permanent fixtures, columns, walls, partitions, pipes, outlets, and built-in furniture and cabinets.
- C. Install flooring with adhesives, tools, and procedures in strict accordance with the manufacturer's written instructions. Observe the recommended adhesive trowel notching, open times, and working times.

DIVISION 9.0 FINISHES

SECTION 09652: RESILIENT TILE FLOORING

3.4 INSTALLATION OF ACCESSORIES

- A. Apply top set wall base to walls, columns, casework, and other permanent fixtures in areas where top-set base is required. Install base in lengths as long as practical, with inside corners fabricated from base materials that are mitered or coped. Tightly bond base to vertical substrate with continuous contact at horizontal and vertical surfaces.
- B. Fill voids with plastic filler along the top edge of the resilient wall base or integral cove cap on masonry surfaces or other similar irregular substrates.
- C. Place resilient edge strips tightly butted to flooring, and secure with adhesive recommended by the edge strip manufacturer. Install edge strips at edges of flooring that would otherwise be exposed.

3.5 **CLEANING:** Immediately upon completion of the installation in an area, dry-clean flooring and adjacent surfaces with a cleaner to remove surplus adhesive. No sooner than 5 days after installation, wash all flooring with a non-alkaline cleaning solution, rinse thoroughly with clear cold water, and finish as specified below.

3.6 **FINISHING:** All flooring, except pre-waxed flooring, shall be buffed to an even sheen without polishing. For polished flooring, two coats of polish shall be applied and each coat buffed to an even luster with an electric polishing machine. Clean bases and stair treads but do not polish.

3.7 **PROTECTION:** From the time of laying until acceptance, protect flooring from damage. Remove and replace defects which develop, such as damaged, loose, broken, or curled sheets prior to final inspection.

- END OF SECTION -



DIVISION 9.0 FINISHES

SECTION 09900: PAINTING

PART 1.0 GENERAL

- 1.1 **DEFINITION:** The term "PAINT" as used herein, includes emulsions, enamels, paints, varnishes, sealers, and other coatings, whether used as prime, intermediate, or finish coats.
- 1.2 **QUALITY ASSURANCE**
- A. The Owner reserves the right to subject material samples to test at his expenses. If such material tests do not meet the specified standards, the cost will be charged to the Contractor.
 - B. Contractor shall apply as many as required to meet specifications for solid, uniform appearance. Where film thickness in mils is specified, spot checks will be made to determine compliance with specified thickness.
- 1.3 **SUBMITTALS**
- A. Submit 2 samples of each color or finish (including all coats). Where the same color or finish is to be applied over different materials, samples of each shall be submitted on different materials, where practical.
 - B. Sample size shall be a minimum of 150 x 150 mm (6" x 6").
- 1.4 **PRODUCT DELIVERY, HANDLING, AND STORAGE**
- A. Deliver specified materials to job site in manufacturer's name, brand name, type of paint, analysis showing all important constituents of the paint, color of paint and instructions for thinning.
 - B. Handle specified item and/or its components in such manner as to prevent damage. Properly protect same from harmful elements or damage by other work prior to its incorporation into the Project.
 - C. Store materials in a well-ventilated space designated for the storage and mixing of paint. Materials delivered to the site shall be properly stored as to minimize exposure to extremes of temperature.
- 1.5 **PROTECTION**
- A. Protect paint materials from damage, providing for adequate storage space. Take all necessary precautions to prevent fire. Keep oily rags in U.L. approved metal containers or removing from building at the end of each day's work.
 - B. All work fittings, furniture, etc., are to be suitably protected during execution of the work. Splashes on floors, walls, etc. are to be removed during progress of work and on the whole, left clean and perfect on completion.
 - C. No exterior exposed painting shall be carried out under adverse weather conditions, such as extremes of temperature, during rain, etc., or if there is excessive dust in the air.
 - D. **LEAD CONTENT AND WARNING LABELS**
 - 1. The material manufacturer shall state the lead content on the label of any paint product container based on metal percentage of total solids.



DIVISION 9.0 FINISHES

SECTION 09800: PAINTING

2. The label of any paint product exceeding 0.5% lead content shall include the following statement: This paint contains more than 0.55 lead content and shall not be used on surfaces accessible to children.

1.6 REPAIR OF DEFECTIVE WORK

- A. Restore all defective or damaged work to initial condition
- B. All voids, cracks, nicks, etc., will be repaired with proper patching material and finished flush with surrounding surfaces. Marred or damaged shop coats on metal shall be spot-primed with appropriate metal primer.
- C. Defective or damaged items and/or components which cannot be repaired or restored to initial conditions shall be removed and replaced to the satisfaction of the Owner / Architect at no additional cost to the Owner.

1.7 MECHANICAL AND ELECTRICAL ITEMS: Painting Contractor shall be responsible for painting mechanical & electrical items as specified herein. No name plates, rotating shafts, bearing bronze, electrical windings or valve stems shall be painted, nor shall any part furnished in nickel or chrome plated be painted.

1.8 CLEANING: Upon completion of the building, the Painting Contractor shall remove all paint spots from all finished work and shall remove all empty cans and leave the entire premises free from rubbish or other debris caused by his work. He shall remove his equipment from the premises. He shall clean off all glass free from paint spots and smears and shall present the work clean and free from all types of blemishes.

PART 2.0 PRODUCTS

2.1 GENERAL

- A. Materials are specified to establish the standards of grade and quality desired for the work, principal pigments and vehicle types and minimum percentage of solids content by volume.
- B. The top quality/first class paints by Boyesen or approved equal.
- C. The products of manufacturers not named may be submitted for use provided they are equal in quality and grade to the primers and finishes specified by the Architect. If substitute paint products are desired, a statement shall be submitted to the Architect giving the Manufacturer's name, proposed primer and finish for each paint system, analysis for each type of paint, and the use or uses intended. Failure to submit such statements will be cause for rejection.
- D. In cases where the name of a brand or supplier is mentioned under a particular specification, only paint or primer of that manufacturer is acceptable and no substitution shall be permitted on the grounds that the brand specified is not available in the local market. Materials of one manufacturer shall not be applied over that of another, except in the case of shop primer coat.

2.2 COLOR, GLOSS AND TEXTURE. Refer to Finish Schedule. All work is to be completed without deviation from these unless written approval is received from the Architect. No extra cost shall be allowed because of the color variety scheduled.

7

DIVISION 9.0 FINISHES

SECTION 09900: PAINTING

PART 3.0 EXECUTION

3.1 GENERAL

- A. Examine work-in-place on which work is to be applied to insure that conditions are satisfactory for application of materials. Report in writing, to the Architect any defects which may influence satisfactory completion of specified work. Absence of such notification will be construed as acceptance of work-in-place.
- B. Do not apply exterior paint in damp or rainy weather or until surfaces have thoroughly dried from the effects of such weather.
- C. Before start of painting, remove finish hardware, accessories, plates, lighting fixtures, and similar items as approved by the Architect, except U.L. Labels on Fire Door and Frames which must not be removed. Use only workmen skilled in the applicable building trade for removal and reinstallation of finished items in-place.
- D. The following items shall be masked or protected with suitable covering:
 - 1. Sealing, caulking and glazing compounds (unless otherwise directed by the Architect).
 - 2. Glass.
 - 3. Gauges, thermometers and other recording devices.
 - 4. Moving parts of machinery and other mechanical equipment such as shafts, couplings, valve stems, and the like.
 - 5. Coated decorative steel metal work.
 - 6. Sprinkler heads and the like.
 - 7. U.L. Labels

3.2 SURFACES PREPARATION AS APPLIED TO VARIOUS SUBSTRATE

- A. **WOOD:** Wood surfaces to be painted shall be dry, cleaned of all dirt, oil, or other foreign substances with mineral spirits, scrapers, sandpaper and/or brush which may impair adhesion. Finish surfaces exposed to view shall be handsandpapered to smooth even surface then dusted clean. All knot-holes, pitch pockets or sappy portions shall be shellacked, or sealed with aluminum paint or Spar Varnish. After prime coat/stain has been applied, thoroughly fill nail holes, cracks or other defects with putty patching color, paint or stain. Interior wood finishes shall be sandpapered between coats.
- B. **FERROUS METAL:** Steel and Iron surfaces that have not been shop-primed coat painted shall be cleaned and painted with specified red metal primer. Before finish painting shop-primed coat painted steel and iron surface remove grease, rust, scale and dust and touch-up paint any chipped or abraded places, weld scars and rust spots with metal primer. Where steel and iron surfaces have a heavy coating of rust or scale, it shall be removed by wire brushing or sandblasting as necessary to produce a satisfactory surface for painting.
- C. **GALVANIZED METAL:** Surfaces to be painted shall be washed with mineral spirits, allowed to dry, and prime-coat painted with galvanized metal primer.

DIVISION 9.0 FINISHES

SECTION 09900: PAINTING

- D. **CONCRETE MASONRY:** Masonry to be painted will be cleared by Masonry Contractor.
- E. **CAULKING** Oil Base caulking compound surfaces to be painted shall be prepared by removing all foreign materials.

3.3

PAINT APPLICATION

3.4

- A. **GENERAL:** Work shall be done by skilled painters in a workmanlike manner. All spaces shall be broom-cleaned before painting is started. Surface to be painted shall be clean, dry, smooth and adequately protected from dampness. Each coat of paint shall be allowed to dry at least 24 hours before succeeding coat is applied. Finish work shall be uniform, of approved color, smooth and free from runs, sags, defective coverage, clogging or excessive flooding. If surfaces are not adequately covered as determined by the Architect, further coat shall be applied to the satisfaction of the Architect. Edges of paint adjoining other materials or colors shall be sharp & clean without overlapping.
- B. **PAINT MIXING:** Paint mixing and thinning shall be done only in accordance with directions of Manufacturer. Paint must be strained free from all skin and extraneous substances and shall be thoroughly mixed in a clean container during use.
- C. **METHODS OF APPLICATION:** Exterior and Interior first coats shall be applied by brush, except on shop-primed surfaces which shall be applied by brush or roller. All primer shall be applied by brush. Succeeding coats over field-primed surfaces and all coats over shop-primed surfaces may be applied by brush roller or spray. Distemper brushes are to be of approved type and less than 15cm in width. Rollers for applying enamel shall have a short nap. Spray equipment shall be as recommended by the manufacturer of the paint. Areas inaccessible to spray painting shall be coated by brushing or suitable method.
- D. **COATING:** Consecutive coats of paints are to be slightly differing tints except in the case white. Each coat shall be allowed to harden before the next is applied. Rubbing down between coats is to be done with fine abrasive paper.
- E. **WOOD FINISHING:** Wood to have natural satin varnish finish shall be stained as required and sealed as soon as such items are delivered to the Job Site. Seal all ends to exclude moisture. Knotting shall be carried out by using shellac dissolved in spirit or approved ready mixed compound.
- F. **DEFECTS IN MASONRY, CONCRETE, PLASTER & GYPSUM BOARD:** Small cracks, holes, and other similar imperfections in masonry, concrete and plaster surfaces which show up after the prime-sealer has been applied to the surface shall be filled with an approved sparkling compound before application of succeeding coats.
- G. **WOODWORK & METALWORK:** Primed or undercoated woodwork and metalwork shall not be left in an exposed or unsuitable situation for an undue period before completing the painting process. Stopping and filling shall be deemed to be included for all metal works, plaster works, and wood work specified to be used to produce a surface ready for priming and painting.
- H. **FINAL TOUCH-UPS:** At completion, touch-up and restore finish where damaged and leave in good condition.



DIVISION 9.0 FINISHES

SECTION 09900: PAINTING

PART 4.0 PAINTING SCHEDULE

- 4.1 GENERAL: Painting Systems shall be applied to surfaces as scheduled. All walls to be painted shall be plastered prior to painting. All under slabs to be painted shall have fair-faced concrete.
- 4.2 FILM THICKNESSES: As recommended by paint manufacturer, includes thick-ness in mils and number of coats.
- 4.3 SCHEDULE

A. MASONRY AND CONCRETE

1. Exposed and Exterior Rough Surfaces- Flat Finish (Latex Type)
 - 1 st Coat Latex Primer - Sealed
 - 2nd Coat Acrylic Latex
 - 3rd Coat Same as 2nd coat
 - 4th Coat Same as 2nd coat
2. Interior Surfaces - Flat Finish (Latex Type)
 - 1 st Coat Latex Primer - Sealed
 - 2nd Coat : Acrylic Latex
 - 3rd Coat : Same as 2nd coat
3. Interior Surfaces - Semi-gloss Finish (Latex Type)
 - 1 st Coat Latex Primer - Sealed
 - 2nd Coat : Semi-gloss Latex
 - 3rd Coat : Same as 2nd coat
4. Interior Surfaces - Textured Flat Finish (Acrylic Type)
 - Primer : Acrylic-based Cast (brush, then roller applied)
 - 2nd Coat : Acrylic Latex Topcoat
 - 3rd Coat Same as 2nd coat
5. Interior Surfaces - Flat Semi-gloss Gloss Finish (Polyurethane Type) Pre-Treatment : Concrete Neutralizer
 - 1 st Coat : Polyurethane Penetrating Primer
 - 2nd Coat : Polyurethane Topcoat
 - 3rd Coat : Same as 2nd coat
6. Non-skid Epoxy Flooring: BoyserAcqua Epoxy
 - Primer Boyser Epoxy Primer White #2200
 - 1 st Coat Boyser Epoxy Reducer #56
 - 2nd Coat BoyserAcqua Epoxy #2900
 - 3rd Coat same as 2 coat

B. WOOD SURFACES

1. Flat Finish-Alkyd type
 - 1st coat : Interior Primer and Sealer
 - 2nd coat : Flatwall Enamel
 - 3rd coat : same as 2nd coat
2. Flat Finish, Stained -Oil type
 - Primer : Natural wood paste filler as needed
 - 2nd coat : Oil wood stain
 - 3rd coat : Lacquer Sanding Sealer
 - 4th coat : Clear Dead Flat Lacquer

DIVISION 9.0 FINISHES

SECTION 09900: PAINTING

- 3. Textured Flat Finish - Acrylic type
 - Primer : Acrylic Base Coat
 - 2nd coat : Acrylic Base topcoat
 - 3rd coat : Same as 2nd coat
- 4. Semi-gloss/Gloss finish - lacquer type spray
 - 1 st coat : Lacquer Primer Surfacer
 - 2nd coat : Lacquer Spot Putty
 - 3rd coat : Lacquer Primer Surfacer
 - 4th coat : Semi - gloss lacquer enamel
- 5. Varnishing: Flat Finish, Stained - Lacquer type
 - Primer : Acrylic Base Coat
 - 2nd coat : Acrylic Base topcoat
 - 3rd coat : Same as 2nd coat
- 6. Gloss finish - Acrylic type
 - Primer : White Enamel Undercoat
 - 2nd coat : Glazing Putty as needed
 - 3rd coat : Primer Surfacer
 - 4th coat : Quick Drying enamel

B. METAL SURFACES

- 1. Gloss Finish for G. I. Pipes, etc.
 - 1 st coat : Lacquer Primer Surfacer
 - 2nd coat : Automotive Lacquer Paint
 - 3rd coat : Same as 2nd coat
- 2. Gloss Finish (Epoxy type) for metal elements and doors, wrought iron grilles, W. I. railing, B. I. and G. I. pipe handrails (Spray-painted)
 - 1 st coat : Epoxy Red Lead Primer or Epoxy Zinc Chromate Primer
 - 2nd coat : Boysen Epoxy Enamel
 - 3rd coat : same as 2nd coat

4.4 MECHANICAL AND ELECTRICAL ITEMS

- A. All metal surfaces in concealed spaces except Copper, galvanized and cast iron, and aluminum shall be given one coat of rust-inhibitive prime coat.
- B. All metal surfaces within exposed spaces shall be given a suitable prime coat and 2 finish coats.
- C. No name plates, rotating shafts, bearing bronzes, electrical windings or valve stems shall be painted, nor shall any item furnished in nickel or chrome plated to be painted.
- D. Ductwork visible through grilles or diffusers shall be painted flat Black.
- E. All metal surfaces in direct contact with concrete will be given a coat of mastic.
- F. All motors, equipment and other apparatus shall be given a suitable prime coat and 2 finish coats of enamel. For items furnished with an enamel finish from the factory, such will be touched-up on abraded surfaces.
- G. Piping shall be color-coded as required by the Governing Codes. Color for other items shall be selected.

- END OF SECTION -

DIVISION 10.0 SPECIALTIES

SECTION 10005: MISCELLANEOUS SPECIALTIES

PART 1.0 GENERAL

- 1.1 **SCOPE:** This section includes specifications on toilet fixtures, fittings and accessories, selected lighting fixtures, and other miscellaneous specialties.
- 1.2 **SUBMITTALS:** (As Applicable)
 - A. **SHOP DRAWINGS:** Indicating layout, dimensions, and other pertinent construction and erection details.
 - B. **SAMPLES:** Submit sample sections of materials, finishes. Each with color standards with specified manufacturers.
 - C. **BROCHURE:** Submit manufacturer's latest manual describing materials, fabrication and methods of installation.
- 1.3 **EXAMINATION AND ACCEPTANCE OF WORK-IN-PLACE:** Examine work-in-place on which specified work is in any way dependent to insure that conditions are satisfactory for installation of specified work. Report, in writing, to the Contractor and the Owner, Architect any defect which may impair satisfactory completion and performance of included work.
- 1.4 **FIELD MEASUREMENTS:** Take field measurements to verify or supplement dimensions indicated. Be responsible for accurate fit for specified work.
- 1.5 **PROTECTION AND DAMAGED WORK:** Protect specified work from damage during transportation, storage at project site and throughout tenure of work. Protect adjacent work and materials from damage during progress of work. Damaged work shall be repaired or replaced to complete satisfaction of the Architect. Furnish receipts for all loose detachable parts.

PART 2.0 PRODUCTS

2.1 PANTRY FIXTURES, FITTINGS AND ACCESSORIES

- A. **MANUFACTURERS:** Shall be as noted for each product.
- B. **SAMPLES:** Submit samples of each type of accessory proposed for use as required by the Architect before starting. Only approved samples may be used.
- C. **TYPES:** It is the Contractor's responsibility to provide exact type of accessory by conditions of installation.
- D. Before any accessories are purchased, Contractor shall verify and locate all items specified. Plumbing accessories not included here shall be Owner supplied, Architect/Interior Designer approved, and Contractor installed.
- E. **FIXTURES' FITTINGS , ACCESSORIES:**

Countertops: All countertops for sinks and lavatories shall be set on a 50mm thick reinforced concrete slab. Provide matching back and side splashes as needed. Refer to Plans for Material, Finish and Location.

- 1. **Monolithic Solid Surface Countertop** manufactured by Corian, Polytek or approved equal in Architect Approved Color. See Details. Submit samples for selection approval.

DIVISION 10.0 SPECIALTIES

SECTION 10005: MISCELLANEOUS SPECIALTIES

- 2. 20mm thick Non-Porous Polished Granite Monolithic Countertop in Architect Approved Color. See Details. Submit samples for selection / approval.

Stainless Steel Sink: Use Single welded 18/10 stainless steel In-set (food grade type 316 or better) 400 x 400 mm (minimum) bowl with 250mm min. depth, fitted with large outlet with strainer and drain with small outlet. Strainer and drain should be SS type 304 or better. Provide complete waste unit with siphon, P-trap and pipes. Sink by Benthor or approved equal. Number of holes for fittings to match approved faucet fittings (verify).

Sink Faucet Fittings: Use Goose-neck type faucet with two (2) separate but matching lever-type handles, Chrome finish / Satin Finish by Delta Faucet Co. or approved equal. Submit samples for selection and approval.

- 2.2 LIGHTING FIXTURES/LUMINAIRES: Refer to drawings for type and location

Recess-Mounted Fluorescent Fixture: Use 2-36w/1-36w fluorescent light (daylight), 300 x 1200mm phosphated steel body in white powder coated finish, with white powder coated rim and 100 x 100mm egg-crate aluminum reflected matte finish complete with high power factor, high efficiency, high frequency, rapid start, electronic class "Po ballast. Fixture by Fumeco or approved equal.

Under-Shelf/Cabinet Fluorescent Fixture: Use 1-28w/14w fluorescent light (daylight), T5 fixture on zinc phosphate die-formed steel body, powder coated finish. Provide diffuser or separate toggle switch mounted under shelf/cabinet; verify exact location. See details and submit samples for selection / approval

Emergency Light: Self-contained wall-mounted High Intensity Floodlight with 2-10W (or 20w) high intensity quartz halogen for non-maintained emergency lighting of 3 hours minimum duration, 220V. Use Economiser model no. EL 7H or approved equal. Submit sample for approval.

Illuminated Exit Sign: Self-Contained, Ceiling (or wall) mounted, Double-sided (or one-sided), with 8w 300mm T5 Fluorescent exit sign for non-maintained emergency lighting of 3 hours minimum duration, 220V, and reflectorized green letters (with or without directional arrow) on white background. Submit sample for approval.

- 2.3 ELECTRICAL DEVICES: Switches, convenience outlets, telephones jacks and the like shall be National White Series or equal. Submit sample for approval; See also Electrical Specifications

- 2.3.01 Three gang / Two gang / One gang switch, 1 P, 250V (National/ Panasonic- White Wide Series)
- 2.3.02 Single / Duplex convenience outlet, 15A, 250V, 2P, 3W, Universal Grounding Type (Wall-mounted) National/ Panasonic - White Series
- 2.3.03 Single / Duplex convenience outlet, 15A, 250V, 2P, 3W, Universal Grounding Type (Ceiling-mounted) National/ Panasonic - White Series

DIVISION 1 0.0 SPECIALTIES

SECTION 10005: MISCELLANEOUS SPECIALTIES

- 2.3.04 Duplex convenience outlet, 15A, 250V, 2P, 3W, Universal Grounding Type; Weatherproof (Wall-mounted / Ceiling-mounted); National / Panasonic White Series
- 2.3.05 Duplex Convenience Outlet (Floor-Mounted); Grounding Duplex Universal Safety Shutter 16A 250V With Cover Unit and Outlet Box (Panasonic Duff1260M-1) or Approved Equal, National / Panasonic - White Series

2.4 EXHAUST / ELECTRIC FAN: Shall be KDK or approved equal. See Mechanical Drawings and Specifications.

2.5 FIRE DETECTION AND ALARM SYSTEM

- A. The CONTRACTOR shall furnish, install, and place in operating condition an addressable fire detection and alarm system as described herein. All equipment shall be brand new and conforming to the recognized international standard.
- B. The system shall consist of components such as smoke detectors, manual alarm stations, signal bells, heat detectors, and supervisory control devices as indicated on the plans.
- C. The location of manual alarm stations, automatic detectors and audible alarms are approximate and shall be adjusted on site to suit site conditions. No claim for extra cost will be allowed for such adjustments.

2.5.1 TYPE OF SYSTEM:

The Fire Alarm System shall be microprocessor-based control unit monitors and controls

addressable fire alarm devices with high integrity and reliability. The control unit can

monitor open circuit and short circuit status of the monitoring and signal circuits. It should have false alarm verification which discriminates condition of unstable pulses of any abnormal signal from real fire condition.

2.5.2 DEVICES:

- A. Manual alarm stations shall be with indication lamp to indicate the receipt of the signal. Material shall be constructed from 1.2mm thick steel with bright red color finish suitable for flush or semi-flush mounting.
- B. Photoelectric smoke detectors shall be UL listed and complies to EN54 requirements. It should contain a unique optical sensing chamber designed to sense the presence of smoke particles produced by a wide range of combustible sources. The smoke detector sends a signal to the fire alarm control panel for fire alarm status as soon as the density of smoke in its chamber reaches a pre-determined alarm level.



- C Fire alarm bells shall be vibrating type with minimum sound output of 92 dB at 3m (10ft), 150mm (6") diameter, designed for semi-flush mounting installation. It shall operate at 24 Vdc nominal

PART 3.0 AUDIO-VISUAL (AV) EQUIPMENT AND AUXILIARY SYSTEMS.

- 3.1 All AV equipment, such as projectors, speakers, cameras, televisions, monitors and speakers, shall be Owner-Supplied while the required Mounting Brackets / Supports, Roughing-ins, Cabling and AV Outlets shall be supplied and installed by the Contractor. Coordinate with the Owner and AV Equipment suppliers. See also Electrical Drawings for proposed layouts and riser diagrams.
- 3.2 IT/ Datacom System scope of work and specifications shall be determined by the Owner's IT /MIS Department. Coordinate with the Owner. See also Electrical Drawings for proposed layouts and riser diagrams. For Floor-Mounted Outlets (if required): Use Duplex Modular Jack with Cover Unit (Safety Shutter) and Outlet Box (Panasonic Duf225911-1) or Approved Equal, National / Panasonic - White Series

- END OF SECTION -

