TECHNICAL SPECIFICATIONS

UP COLLEGE OF MEDICINE
MEDICAL SCIENCES BUILDING
UNIVERSITY OF THE PHILIPPINES, MANILA

PROSPERIDAD C. LUIS, LIKHA, fuap, apec/asean architect
Principal Architect

LUIS and Associates Co.
ARCHITECTS ENVIRONMENTAL PLANNERS
4F, CUR HOME BUILDING, NO. 114 MALAKAS COR. MATULUNGIN STS.
DILIMAN, QUEZON CITY
TEL NO.: 8866-4611

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TECHNICAL SPECIFICATIONS

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Division 01

GENERAL REQUIREMENTS

DIVISION 01 : GENERAL REQUIREMENTS
01340 : SHOP DRAWINGS

1.00 DETAILED DRAWINGS AND INSTRUCTIONS

1.01 Supplementary Drawings and Instructions

a. The drawings referred to in these Specifications may be further supplemented by additional detail drawings and instructions essential to the proper interpretation of the Drawings and the proper execution of work. The Architect shall furnish with reasonable promptness such additional detail Drawings and Instructions. All such additional detail drawings and instructions shall be consistent with the Contract Documents, true development thereof, and reasonable inferable therefrom. All such additional drawings and instructions are to be considered of equal force as those which originally accompany the specifications.

b. The work shall be executed in conformity with such detail drawings and instructions, and the Contractor shall do no work without proper drawings and instructions.

1.02 Schedule for Submission of Detail and Shop Drawings

The Contractor and the Architect, if either one so requests, shall jointly prepare a schedule subject to change from time to time in accordance with the progress of the work, fixing the dates at which the various detail drawings will be required, and the Architect shall furnish them in accordance with that schedule. Under like conditions, a schedule shall be prepared, fixing the dates for submission of the shop drawings, for the beginning of manufacture and installation of materials and for the completion of the various parts of the work.

2.00 SHOP DRAWINGS

2.01 Conditions in the Preparation of Shop Drawings

a. The Contractor shall prepare at his own expense and submit with such promptness as to cause no delay in his own work or in that of any other contractor doing work on the same building, two copies of all shop or setting drawings, templates, patterns and models, as well as schedule required for the work of various trades, and the Architect shall pass upon them with reasonable promptness, making desired corrections.

b. The Contractor shall make any corrections required by the Architect, file with him two corrected copies and furnish such other copies as may be needed.

2.02 Checking Drawings of Sub-Contractors

Before submitting shop drawings for approval, the Contractor shall check drawings of all sub-contractors for accuracy. He shall see that all work contiguous with and having bearing on work indicated on shop drawings is accurately and distinctly illustrated and that work shown is in conformity with Contract requirements.

2.03 Identification

Shop drawings shall be numbered consecutively and represent :

a. All working and erection dimensions

b. Arrangements and sectional views.

c. Necessary details including complete information for making connections with other work

d. Kinds of materials and finishes

Shop drawings shall be dated and shall contain: a) name of project; b) descriptive names of equipment, materials and classified item numbers; c) location at which materials or equipment are to be installed kin work.

2.04 Letter of Transmittal

Submission of Shop Drawings shall be accompanied by a Letter of Transmittal in duplicate, containing : name of project, Contractor's name, number of drawings, titles and other pertinent data.

2.05 Corrections, Changes and Variations

The Contractor shall submit three sets of shop drawings to the Architect for approval. Satisfactory shop drawings will be so identified by the Architect, dated, and one copy thereof returned to the Contractor should shop drawings be disapproved by the Architect, one set of such drawings will be returned to the Contractor with necessary corrections and changes to be made as indicated.

a. The Contractor shall make required corrections and changes and re-submit shop drawings in duplicate until the Architect's approval is obtained

b. Upon receipt of approval, the Contractor shall insert the date of approval on tracings and promptly furnish the Architect with three additional prints of approved drawings

c. No work called for by shop drawings shall be executed until the Architect's approval is given

d. If shop drawings show variations from Contract requirements because of standard shop practice or other reasons, the Contractor shall make mention of such variation in his letter of submittal

2.06 Responsibility for Accuracy

Approval of shop drawings will be general. It shall not relieve the Contractor of responsibility for accuracy of such drawings, nor for proper fitting and construction of work, nor for furnishing of materials or work required by the Contractor and not indicated on shop drawings. The Architect's approval of such drawings or schedule shall not relieve the Contractor from responsibility for deviations from Drawings or Specifications, unless he has in writing, called the Architect's attention to such deviations at the time of submission and secure his written approval, nor shall it relieve him from responsibility for errors of any sort in shop drawings or schedules.

2.07 Shop / Placement / Fabrication Drawings

The Contractor is put on notice that if he proceeds with the Work without securing the approved Shop/Placement and/or Fabrication Drawings from the Architect, and all expenses incurred by inadequate or incorrect fabrication or installation, including time delays, will be borne exclusively by the Contractor and his sub-contractors/suppliers. The Owner and his representatives will be absolved of any liability or prior approvals.

DIVISION 01 : GENERAL REQUIREMENTS
01600 : MATERIALS AND EQUIPMENT

1.00 GENERAL

Notwithstanding anything herein specified or provided that may be construed to the contrary, all materials and equipment must conform to all laws, ordinances, regulations, and building codes now or hereafter that may be in force and applicable during the period of construction, which the Contractor shall obtain the necessary permits and pay the required fees therefore to the proper authorities. The Contractor shall bear any damages by reason of any delay in the work arising from his failure to comply with the provisions of this clause. Provided, however, that should any revision or amendments to such laws, ordinances, regulations and building codes made during the construction period affect the cost or time of completion of the contract, a corresponding adjustment shall be made.

2.00 EQUIPMENT

2.01 QUALITY OF EQUIPMENT

In order to establish standards of quality, the Architect and the Engineer has in detailed Specifications, referred to certain equipment by name and catalogue number. This procedure should not be construed as eliminating from competition other products of equal or better quality by other manufacturers which are fully suitable in design.

a. The Contractor shall furnish the complete list of proposed substitutes prior to the signing of the Contract, together with such engineering and catalogue data as the Architect and the Engineer may require.

b. The Contractor shall abide by the Architect's and the Engineers' judgments when proposed substitute items of equipment are judged to be acceptable and shall furnish the specified item of equipment in such case. All proposals for substitutions shall be submitted in writing by the General Contractor and not by individual trades or material suppliers. The Architect and the Engineers will approve or disapprove proposed substitutions in writing within a reasonable time. No substitute equipment shall be used unless approved in writing.

2.02 EQUIPMENT APPROVAL DATA

The Contractor shall furnish three copies of complete catalogue data for every manufactured item of equipment and all components to be used in the work, including specific performance data, material description, rating, capacity, working pressure, material gauge or thickness, brand name, catalogue/model number and general type.

a. This submission shall be compiled by the Contractor and approved by the Architect and the Engineer before any of the equipment is ordered.

b. Each data or catalogue in the submission shall be indexed according to specification section and paragraph for easy reference.

c. After written approval, this submission shall become part of the Contract, and may not be deviated from except upon written approval of the Architect and the Engineer.

d. Catalogue data for equipment approved does not in any case supersede the Contract Documents. The approval of the Architect and the Engineer shall not relieve the Contractor from responsibility for deviations from Drawings or Specifications, unless he has, in writing, called their attention to such deviations at the time of submission, nor shall it relieve him from responsibility for errors of any sort in the items submitted. The Contractor shall check the work described by the catalogue data with the Contract Documents for deviations and errors.

e. It shall be the responsibility of the Contractor to insure that items to be furnished fit the space available. He shall make necessary field measurements to ascertain space requirements, including those for connections, and shall order such sized and shapes of equipment that the final installation shall suit the true intent and meaning of the Drawings and Specifications.

f. Where equipment requiring different arrangement of connections from those shown is approved, it shall be the responsibility of the Contractor to install the equipment, let it operate properly and in harmony with the intent of the Drawings and Specifications, and to make all changes in the work required by the different arrangement of connections.

3.00 MATERIALS, FIXTURES, APPLIANCES, & FITTINGS FURNISHED by the CONTRACTOR

3.01 MANUFACTURERS AND DEALERS

Names of proposed manufacturers, material men, and dealers who are to furnish materials, fixtures, appliances or other fittings shall be submitted to the Architect for approval as early as possible, to afford proposed investigation and checking.

a. No manufacturer will be approved for any materials to be furnished under this Contract unless he shall be of good reputation, he shall have a plant of ample capacity and adequate quality control, and shall have successfully produced similar products.

b. All transactions with manufacturers or sub-contractors shall be through the Contractor.

c. In asking for prices on materials, the Contractor shall provide manufacturer or dealer with complete information from Specifications and Drawings, and shall inform manufacturers or dealers of all pertinent contract requirements.

d. The manufacturer or dealer shall have the materials, equipment, fixtures, appliances or other fitting supplied by him properly coded or identified in accordance with existing standards for same to indicate class grade or quality.

3.02 SAMPLES OF MATERIALS

The Contractor shall furnish for approval, with such promptness as to cause no delay in work, samples as specified or required. Work shall be in accordance with approved samples.

a. Unless otherwise specified, three samples shall be submitted, and of adequate size to show quality, type, color, range, finish and texture of material.

b. Each sample shall be labeled, bearing material name and quality, the Contractor's name, date, project name and other pertinent data.

c. Where specifications require manufacturer's printed installation directions, such directions shall accompany samples submitted for approval.

d. A letter of transmittal in triplicate from the Contractor requesting approval shall accompany all sets of samples.

e. Transportation charges to the Architect's office must be prepaid on all samples forwarded.

f. Materials shall not be ordered until approval is received in writing from the Architect. All materials shall be furnished substantially equal in every respect to approved samples.

3.03 TRADE NAME MATERIALS AND SUBSTITUTES

a. Whenever item or class of material is specified exclusively by trade name, by manufacturer's name or by catalogue reference, only such item shall be used except as provided for in paragraph (B) hereof.

b. No substitution shall be made for any mat, article, or process required under Contract unless approved in writing by the Architect.

c. Materials and articles installed or used without such approval shall be at the risk of subsequent rejections.

d. Samples of materials for use in reinforced concrete work such as steel bars, cement, and aggregates and their certificates of origin are to be approved by the Architect.

3.04 TESTING SAMPLES OF MATERIALS

The Contractor shall submit to the Architect as many samples as may be required for testing. Testing of all samples shall comply with the Specifications and government standards and shall be performed by a competent entity or testing laboratory approved by the Architect.

All costs for shipment, delivery, handling and testing of samples are to be paid by the Contractor.

3.05 QUALITY OF MATERIALS

Unless otherwise specified, all materials shall be new. The quality of materials shall be of the best grade of their respective kinds for the purpose. The work shall be performed on the best and most acceptable manner in strict accordance with the requirements of the Drawings and Specifications.

The decision of the Architect as to quality and quantity of work and materials shall be final and precedent to the Contractor's right to receive any money hereunder.

3.06 STORAGE AND STOCKPILING OF MATERIALS

a. The Contractor shall allot suitable space to sub-contractors for storage of their materials and for erection of their sheds and tool houses.

b. All cement, lime and other materials affected by moisture shall be stored on platforms and protected from weather. Materials shall be so stored as to insure the preservation of their quality and fitness for the work. Stored materials shall be located so as to facilitate prompt inspection.

c. Should it be necessary at any time to move materials, sheds or storage platforms, the Contractor shall do so at his own expense.

3.07 DEFECTIVE MATERIALS

All materials not conforming to the requirements of these Specifications shall be considered as defective. No defective materials, the defects of which have been subsequently corrected, shall be used until approval has been given. Upon failure on the part of the Contractor to comply forthwith with any order of the Architect made pursuant to the provisions of this Article, the Architect shall have the authority to remove and replace defective materials and to deduct the cost of removal and replacement from any money due or to become due to the Contractor.

a. The apparent silence of the Specifications, Drawings, Special Provisions and Supplementary Specifications, as to any detail or description concerning any point shall be regarded as meaning that only the best general practice is to prevail and that only materials and workmanship of first class quality are to be used.

b. Failure or neglect on the part of the Architect, or any of his agents to condemn or reject bad or inferior materials shall not be construed to imply an acceptance of the materials if said bad or inferior materials are discovered at any time prior to the final acceptance of the work by the Owner and the release of the Contractor.

3.08 IMPORTED MATERIALS, FIXTURES AND EQUIPMENT

The Contractor shall take cognizance of the time element of the Contract. He shall make early arrangements for the purchase and delivery of all specified imported materials, fixtures, appliances and equipment in order to avoid delay in the completion of work.

No extension of time or substitution of materials shall be allowed due to negligence or inadvertence of the Contractor.

3.09 INITIAL TESTING COSTS

All initial testing costs, especially those to confirm the acceptability of materials prior to or in conjunction with the purchase of materials (covering among others --- steel bars, aggregates, concrete hollow blocks, fill and backfill soils, concrete trial mixes, etc.) shall be borne exclusively by the Contractor. Subsequent testing, specifically those that will affirm the conformity of on-site materials and/or methodology shall be to the account of the Owner.

3.10 MAINTENANCE TILE STOCK

As an additional requirement during turn-over and prior to Final Turn-over, Contractor will endorse to Owner the following materials :

a. One box/or 30 pieces of all general tile flooring material

b. One box/or 30 pieces of all vinyl floor tile (30 pieces of each color and type used)

Note: Refer to Division 09650: Resilient Flooring for tile descriptions and locations.

All of the above shall be of the exact brand and type used within the project, with the end in view of providing stock which will flawlessly blend with the completed work in the event that the replacement of pieces should become necessary.

4.00 ITEMS FURNISHED BY THE OWNER

Materials, equipment, fixtures, appliance and fittings specifically indicated shall be furnished by the Owner in accordance with a schedule of delivery agreed between the Owner and the Contractor. The fact that the Owner is to furnish material is conclusive evidence of its acceptability for the purpose intended, and the Contractor may continue to use it until otherwise directed. If the Contractor shall be responsible for material loss or damage after the receipt of any material, equipment, fixture, appliance or fitting unless same has been installed and accepted for safekeeping by the Owner or his representative.

5.00 ROYALTIES AND PATENTS

The Contractor shall pay all royalties and license fees on all patented materials furnished by him. He shall defend all suits or claims corresponding thereto for infringement of any patent rights and shall save the Owner harmless from loss on account thereof.

6.00 MANUFACTURER'S DIRECTIONS

All manufactured articles, materials, equipment, appliances, fixtures and fittings shall be applied, installed, connected, erected, used, cleaned and conditioned, in accordance with manufacturer's printed directions; the Contractor shall submit specified number of copies of such directions to the Architect.

Division 05

METALS

DIVISION 05 : METALS
05520 : HANDRAILS AND RAILINGS

1.00 GENERAL

1.01 DESCRIPTION

Work under this scope of specifications shall include handrails and railings.

1.02 SUBMITTALS

Shop Drawings : Submit detailed drawings showing actual layout and spacing of all vertical and horizontal railings, showing special jointing or other accessories.

2.00 PRODUCT

Stainless Steel handrails and railings at stairs where indicated; type 304, hairline finish. This includes all bends, escutcheons and other accessories as specified in the drawings. Refer to drawings for location and extent of work. Standard offsets of wall-mounted handrails shall be as approved by the Architect.

3.00 EXECUTION

a. General : Provide units of types shown; install with vertical railings equally spaced as indicated in the drawings.

b. Layout : Place and adjust units into final position prior to permanent fastening. Place units in straight alignment for entire length.

c. Welding : Attach railings to all structural supports with appropriate welds, ensuring that all joints are properly welded.

d. Defective or Damaged Units : Not permitted.

e. Touch-up affected surfaces.

Division 06

WOOD AND PLASTICS

DIVISION 06 : WOOD AND PLASTICS
06100 : ROUGH CARPENTRY

1.00 GENERAL

1.01 SCOPE

a. Furnish materials and equipment and perform labor required to complete wooden framing and related rough carpentry work as indicated in the drawings and/or specified herein.

b. Include in the works: nailing strips, scaffoldings, plates, straps, joints, hangers, rods, dowels, rough hardware, fasteners and other miscellaneous iron and steel items pertinent to rough carpentry work.

1.02 STORAGE AND PROTECTION

a. Stack framing lumber to ensure against deformation and maintain proper ventilation.

b. Protect lumber from elements.

c. Lumber in contact with concrete or masonry shall be coated with two (2) coats of asphalt, applied hot.

d. Temporary Protection

- Provide and maintain temporary protection of the work as required to safeguard completed or partially completed work during the progress of the construction.
- Provide all the necessary rough stairs, ladders, runways for convenient access to all parts of the building until other pertinent facilities are in place.

2.00 PRODUCT

2.01 LUMBER. Local brand or approved equal.

a. Moisture Content : not to exceed 18 percent.

b. Grade and Trademark : required on each piece of lumber. All lumber, excluding scaffoldings to be pressure-treated conforming to 67% stress grade lumber in accordance to the requirements of the Phil. National Building Code.

c. Substitution of Work : Any lumber equally good for the purpose intended may be substituted for kinds specified, provided however that the substitution be authorized in writing by the Architect

2.02 ROUGH HARDWARE AND METAL FASTENERS

Plate, straps, nails, spikes, bolts, joints, hangers, rods, dowels, fasteners and miscellaneous iron and steel items shall be of sizes and types to rigidly secure member in place.

3.00 EXECUTION

a. Fit carefully mortise and tenon joints of all framing including tongues and grooves of sheathing. Anchor all frames coming in contact with concrete, unless otherwise specified by means of 20 D nails, spaced not more than 200mm (8") apart all around the contact surfaces. Plane and dress side of frames that will receive the wallboards of sidings.

b. Wood nailers shall be in accordance with detailed drawings. Where not indicated on the drawings or mentioned herein, nailing strips shall be 25mm x 50mm (1" x 2") spaced at 400mm (16") on center bothways. Fasten securely by expansion bolts or other approved device at every 600mm (24") on center.

c. Make all exposed nails countersunk. Do scribbling, mitering and joining accurately and neatly to conform to details.

DIVISION 06 : WOOD AND PLASTICS
06220 : MILLWORKS

1.00 GENERAL

1.01 SCOPE

Furnish materials and equipment and perform labor required to complete wood shelvings, cabinets and closets, wood trims, and related finish carpentry work as indicated on the drawings and/or specified herein. Coordinate work with all other related trades.

1.02 STORAGE AND PROTECTION

a. Protect millwork against dampness during and after delivery.

b. Do not bring interior finish including doors, into the building until plaster is thoroughly dry.

2.00 PRODUCT

2.01 LUMBER.

Local brand or approved equal. Kiln-dried, S4S, sound, hard and free from defects lumber. Use one color or shade for assembly framings that are exposed. Maximum moisture content, 12% for lumber with thickness of 25mm (1") or less; 16% maximum moisture content for all others. For framings of counters, cabinets and other areas as indicated in the Drawings.

2.02 PLYWOOD.

Local brand or approved equal. For interior plywood, use Class B Plywood that conform to schedule and drawings. Provide solid wood edging for all exposed sides of plywood; Refer to Drawings for design, size, shape, location and extent of work.

a. 19mm (3/4") ordinary plyboard, painted finish. For miscellaneous backing, patching, cabinet doors, drawers, countertop, flooring and dividing components of wood based units such as counters, overhead and base cabinets which are concealed or intended to be painted.

b. 6mm (1/4") thick ordinary and marine plywood, for door sash of flush hollow-core wooden doors and cabinetworks; stained finish. Also for backing of vanity mirrors.

c. 12mm (1/2") thick and larger on all sides of detachable shelves, painted finish.

2.03 FINISH HARDWARE

a. Concealed Hinges: German brand or approved equal. Exceeds ANSI/ BHMA standards, A156.9 2010. Two (2) sets minimum per cabinet door leaf, with 1m spacing interval for closet doors. For cabinets.

b. Cabinet Handles : German brand or approved equal. Architect or owner-approved model and profile. For all cabinet doors as specified in the drawing details.

c. Cabinet Locks: US brand or approved equal. Meets ANSI/ BHMA A156.11 Grade 2. Brass nickel plated matte round cylinder, 28mm diameter. For all counter drawers, and where indicated.

d. Drawer Guides : : US brand or approved equal. Meets or exceeds ANSI/ BHMA standards, A156.9. Ball bearing drawer slide with end locks. For drawers.

3.01 WORKMANSHIP

a. Make all finish and millwork to detail; clean and sharply defined.
b. Set panels to allow for free movement in case of swelling or shrinkage.
c. Conceal means of fastening various parts together.

3.00 EXECUTION

3.01 WORKMANSHIP

a. Make all finish and millwork to detail; clean and sharply defined.
b. Set panels to allow for free movement in case of swelling or shrinkage.
c. Conceal means of fastening various parts together.

3.02 FINISH

a. Mill, fabricate and erect interior finish as indicated on the drawings. Machine sand at the mill and manual smooth at the job.
b. Separate with 6mm stone-cut joints all interior trims set against concrete, masonry or wood.
c. Make joints tight and in a manner to conceal shrinkage. Secure trim with fine finishing nails, screws, or glue where required.
d. Set nails for Putty Stopping.
e. Make window and door trims single length.
f. Miter mouldings at corner, cope at angles.

3.03 WOOD SHELVING

a. Each shelf shall be ably supported on a continuous wood cleat at walls.
b. Secure cleats to masonry walls by expansion bolt or approved fastening device.

3.04 BUILT - IN CABINETS AND CLOSETS

a. Fabricate cabinets and closets in accordance with details.
b. Use sound kiln-dried lumber or plywood.
c. Erect cabinets straight, level and plumb and securely anchor in place.

3.05 HARDWARE

a. Accurately fit and install required finish hardware items.
b. If surface-applied hardware is fitted and applied before painting, remove all such items, except butts and reinstall after painting work is completed.

DIVISION 06 : WOOD AND PLASTICS
06240 : LAMINATED PLASTICS

1.00 GENERAL

Furnish materials and equipment and perform labor required to complete :

plastic laminate finish

See drawings for details and location of work required.

2.00 PRODUCT

1/16" thick plastic laminate, Architect-approved color. European brand or approved equal. Conforming to BS EN 438-3 and BS EN 438-7. For cabinets where indicated.

3.00 EXECUTION

3.01 PREPARATION

Smooth thoroughly and clean all woodwork to receive the plastic finish. Fill carefully all cracks, nail holes and other defects with first quality putty.

3.02 INSTALLATION

a. Use only the type of adhesive recommended by the manufacturer or supplier and apply strictly in accordance with instructions.

b. Apply the adhesive in a thin layer and while tacky, spread evenly with a finisher trowel.

c. Immediately press the laminate finish onto the surface with the adhesive and roll the laminate panel in all directions to assume contact with the adhesive.

d. Keep the plastic laminate pressed onto the surface.

3.03 CLEANING

Clean all laminates after complete installation with a cleaner recommended by the manufacturer.

3.04 PROTECTION

Protect all laminate from damage with the use of heavy building paper until ready for service.

Division 07

THERMAL AND MOISTURE PROTECTION

DIVISION 07 : THERMAL AND MOISTURE CONTROL
07200 : INSULATION

1.00 GENERAL

1.01 SCOPE

Furnish materials and perform labor to complete insulation for wall application; refer to drawings for location and extent of work required.

1.02 SUBMITTALS

Submit to the Architect samples of materials to be used clearly labeled as to brand name and manufacturer's name to secure approval.

2.00 PRODUCT

Manufactured from Europe, US, Australia or approved equal. Conforming to GB/T 19686-2015. Drywall sound insulation, 45mm thick, 38kg/m^3 nominal density insulation blankets, bare, lightweight, flexible and resilient material, made of long-glass wool bonded with a thermosetting resin. For interior drywall partition.

3.00 EXECUTION

a. After erecting the metal frame, the insulation batts shall be friction fitted between the metal studs.

b. All materials joints must be tightly butted.

c. Fix wall plasterboards to both sides of the studs.

DIVISION 07 : THERMAL AND MOISTURE PROTECTION
07213 : REFLECTIVE INSULATION / RADIANT HEAT BARRIER

1.00 GENERAL

1.01 SCOPE

Furnish materials and equipment and perform labor required to complete reflective insulation / radiant heat barrier material.

1.02 REFERENCES

A. ASTM C 236 - Standard Test Method for Steady-State Thermal Performance of Building Assemblies by Means of a Guarded Hot Box.
B. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
C. ASTM E 96 - Test Methods for Water Vapor Transmission of Materials.
D. ASTM E 408 - Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.

1.03 DEFINITIONS

A. Radiant Barrier System (RBS): Radiant barrier material is sight-exposed to building interior, not concealed in system by subsequent building finishes.
B. Reflective Insulation System (RIS): Reflective insulation material is concealed in system by subsequent building finishes; additionally, RIS incorporates air spaces between the two reflective surfaces.

1.04 SUBMITTALS

A. Submit under provisions of Section 01340.
B. Product Data: Manufacturer's descriptive literature for reflective insulation material; indicate compliance to specified product characteristics, including documentation of code compliance, if documentation is required.
C. 2 samples, minimum size 8 inches (203 mm) square, of actual products to be installed.
D. Quality Assurance Submittals: Manufacturer's printed installation instructions for each indicated project condition; include recommended fastening materials and techniques.

1.05 DELIVERY, STORAGE, AND HANDLING

Store products of this section in manufacturer's unopened packaging until installation; maintain storage conditions recommended by manufacturer. Store in clean dry area. Do not expose to rain, or dew while still in roll form.

2.00 PRODUCT

2.01 Provide reflective insulation system (RIS) in the following locations:

a. Over roof trusses/rafters, encapsulated.
b. Over roof trusses/rafters, exposed.
c. Interior side of wall studs/furring, exposed.
d. Interior side of wall studs/furring, encapsulated.
e. Underside of floor joists/trusses, exposed.
f. Underside of floor joists/trusses, encapsulated.
g. Underside of first floor joist/trusses at crawl spaces, exposed.
h. Below interior ceiling joists/trusses/rafters, exposed.
i. Below interior ceiling joists/trusses/rafters, encapsulated.
j. Over metal roof purlins, exposed.
k. Over metal roof purlins, encapsulated.
l. Exterior side of metal wall purlins, encapsulated.
m. Interior side of upward-acting sectional doors, exposed.
n. Wrap HVAC supply ducts, exposed.
o. Wrap water heaters, exposed.
p. Wrap water supply piping, exposed.

2.02 Provide radiant barrier system (RBS) in the following locations:

a. Over roof trusses/rafters, exposed.
b. Interior side of wall studs/furring, exposed.
c. Underside of floor joists/trusses, exposed.
d. Underside of first floor joist/trusses at crawl spaces, exposed.
e. Below interior ceiling joists/trusses/rafters, exposed.
f. Over metal purlins, exposed.
g. Interior side of upward-acting sectional doors, exposed.
h. Wrap HVAC supply ducts, exposed.
i. Wrap water heaters, exposed.
j. Wrap water supply piping, exposed.

2.03 MATERIAL

A. Reflective Insulation/Radiant Barrier Material: Manufactured in US or approved equal. Products manufactured and/or assembled in China and China territories not acceptable.; two layers of polyethylene bubble, sandwiched between two layers of metalized film; fungi-resistant, with the following characteristics:

a. Thickness: Nominal 5/16 inch (8mm)
a. Weight: 1.25 ounces per square foot (382 grams per square meter).
b. Surface Burning Characteristics: Flame spread index of 0, maximum; smoke developed index of 30, maximum; when tested in accord with ASTM E 84 (NFPA Class A / UBC Class 1`).
c. Linear Shrinkage: None
d. Puncture Resistance: <100 pounds per square inch.
e. R-Value: 13.9 down; 8.2 horizontal; 6.1 up; when tested in accordance with ASTM C 236
f. U-Value: 0.071 down; 0.121 horizontal; 0.163 up.
g. Emittance: 0.06 - 0.07 when tested in accordance with ASTM C 1371
h. Reflectivity: 0.93 – 0.94
i. Degradation: 0
j. Perm Rating 0.005 perm, when tested in accordance with ASTM E 96
k. Roll width: Nominal 4 feet (1220mm)
l. Roll width: Nominal 6 feet (1830).
m. Approval: Mark materials to indicate compliance in accordance with requirements of regulating authority before delivery of materials to project site.

B. Reflective Insulation/Radiant Barrier Material: Manufactured in US or approved equal. Products manufactured and/or assembled in China and China territories not acceptable.; one layer of polyethylene bubble film sandwiched between two layers of metalized film; fungi-resistant, with the following characteristics:

a. Thickness: Nominal 3/16 inch (4.76mm)
b. Weight: 0.811 ounces per square foot (247 grams per square meter).
c. Surface Burning Characteristics: Flame spread index of 0, maximum; smoke developed index of 20, maximum; when tested in accord with ASTM E 84 (NFPA Class A / UBC Class 1).
d. Linear Shrinkage: None.
e. Puncture Resistance: <100 pounds per square inch
f. R-Value: 13.8 down; 7.7 horizontal; 5.6 up; when tested in accordance with ASTM C 236.
g. U-Value: 0.072 down; 0.072 horizontal; 0.178 up.
h. Emittance: 0.06 – 0.07, when tested in accordance with ASTM C 1371
i. Reflectivity: 0.93 – 0.94
j. Degradation: 0.
k. Perm Rating: 0.180 perm, when tested in accordance with ASTM E 96.
l. Roll width: 4 feet (1220 mm).
m. Roll width: 6 feet (1830 mm)
n. Approvals: Mark materials to indicate compliance in accordance with requirements of regulating authority before delivery of materials to project site.

C. Fasteners: Type and size recommended by manufacturer for project conditions.

3.00 EXECUTION

3.01 EXAMINATION

Ensure that electrical wiring adjacent to reflective insulation/radiant barrier material installations is in good condition.

3.02 PREPARATION

Turn off electricity in each area of reflective insulation/radiant barrier material installation until installation in that area is complete.

3.03 INSTALLATION

a. Install reflective insulation/radiant barrier material in accordance with drawing details and manufacturer's installation instructions.

b. Maintain minimum 3 inches (76 mm) distance from heat-producing devices such as blowers and lighting fixtures.

c. Maintain minimum 3/4 inch (19 mm) airspace each side of reflective insulation/radiant barrier material.

Division 08

DOORS AND WINDOWS

DIVISION 08 : DOORS AND WINDOWS
08100 : METAL DOORS AND FRAMES

1.00 GENERAL

1.01 SCOPE

Furnish materials and equipment and perform labor required to complete hollow metal doors and frames, including installation of hardware.

See drawings and details for sizes, location and extent of work required.

1.02 SUBMITTALS

a. Submit for the approval of the Architect, shop drawings of fabricated items showing sizes of all members and method of joining and anchoring. Refer to DIVISION 01340 : SHOP DRAWINGS.

b. Submit sample corner sections of metal doors and metal buck of jambs in accordance with Item 3.02 of DIVISION 01600 : MATERIALS AND EQUIPMENT.

c. Secure approval of all shop drawings prior to start of fabrication work.

2.00 PRODUCT

Hollow Metal Doors. Conforming to NAAMM/ HMMA 861-06. Refer to Schedule of Doors for door types and locations.

2.01 Door Frames : Gauge 16 cold-rolled pickled and annealed steel

a. 1-1/2 hours fire-rated jamb, UL listed. For all fire-rated doors.

b. Regular jamb, fabricated by a reputable supplier. For all other doors.

2.02 Hinge Plate : Gauge 10 or heavier

2.03 Plates for lock and closer : Gauge 12 or heavier

3.00 EXECUTION

3.01 Flush type : flush type doors shall be 45mm (1-3/4") thick. Reinforcement of doors from steel sections extending full height of doors and spaced not over 200mm (8") O.C. vertically.

3.02 Tops and bottoms of doors shall have continuous stiffener channels welded to side plates.

3.03 Insulate each space between reinforcements with fiberboard or cork to deaden metallic sound. Edges to top sides shall be reinforced and finished flush.

3.04 Install hardware to fit details and manufacturer's specifications for proper functioning.

DIVISION 08 : DOORS AND WINDOWS
08110 : STEEL DOORS

1.00 GENERAL

1.01 SCOPE

Furnish materials and equipment and perform labor required to complete steel doors.

See drawings and details for sizes, location, extent and other requirements.

1.02 SAMPLES

Submit sample corner sections of steel doors and jambs for approval of the Architect.

1.03 PROTECTION

Protect doors adequately from scratches and other stains with heavy building paper. Doors shall also be protected from damage and dampness.

1.04 SHOP DRAWINGS

Submit shop drawings for approval of Architect.

2.00 PRODUCT

Conforming to NAAMM/ HMMA 810-09 Z Louvered Blade. Refer to Schedule of Doors for door types and locations.

3.00 EXECUTION

INSTALLATION

3.01 Set and anchor frames as shown in detail and in approved shop drawings.

3.02 Set frames plumb and square and brace where necessary to prevent distortion.

DIVISION 08 : DOORS AND WINDOWS
08112 : CUSTOM STEEL DOORS AND FRAMES

1.00 GENERAL

1.01 SCOPE

Furnish materials and equipment and perform labor required to complete fire-rated steel doors and frames.

1.02 SUBMITTALS

A. Submit for the approval of the Architect, shop drawings of fabricated items showing sizes of all members, details of connections, fabrication and installation.

B. Submit sample of typical frame showing welded corner joint, welded hinge reinforcements, etc.

C. All samples submitted shall be of the production type and shall represent in all aspects the minimum quality of work to be furnished by the manufacturer. No work represented by the samples shall be started until the samples are approved and any downgrading of quality from what was demonstrated by the samples may be cause for rejection of work.

1.03 SITE STORAGE AND PROTECTION OF MATERIALS

A. Scratches or disfigurement caused by shipping or handling are promptly cleaned and touched-up with a rust-inhibitive primer.

B. Materials shall be properly stored on planks in dry location. Doors shall be stored in a vertical position and spaced by blocking. Materials shall be covered for protection but shall permit circulation.

2.0 PRODUCT

2.01 Fire-rated Door and Frame, with flame, smoke, and heat seal system. Labeled doors and frames with fire protection ratings shall be constructed as tested and approved by UL, Inc. (US) by means of fire exposure and hose stream tests conducted in accordance with the standard, "Positive Pressure Fire Tests of Doors Assemblies," UL 10C (UL 10B, NFPA 252, CAN4 S-104, UBC 7-2), BS 476.

2.02 For Electrically Controlled Locks and Hinges : where these are required, doors and frames shall be constructed in accordance with the procedures prescribed by UL for electrically operated locks and hinges.

a. Door

- Face : commercial quality, level, cold rolled steel conforming to ASTM A366 or hot-rolled, pickled and oiled steel conforming to ASTM A569 and free of scale, pitting or surface defects. Door face sheets shall be Ga. 18.
- Fully welded construction with no visible seams or joints on their face. Seams at the vertical door edges may be visible or fully welded seamless. Minimum door thickness shall be 1-3/4"
- Strong, rigid and neat in appearance, free from warpage or buckle. Corner bends shall be true and straight and of minimum radius for the gauge of metal used.

b. Door Edges

- Door faces shall be joined at the vertical edges by a continuous weld extending the full height of the door. All such welds to be ground, filled and dressed smooth to make them invisible and provide a smooth flush surface.
- Door edges shall be joined by an interlocking seam the full height of the door (lock seam) with at least 4 thickness of metal. Edge seam shall be welded at top and bottom of door. There shall be a vertical visible seam at both edges of door.
- Top and bottom edges of all doors shall be closed with a continuous recessed steel channel not less than Ga. 16, extending the full width of the door and spot welded to both faces. Exterior doors shall have an additional flush closing channel at its top edges. Openings shall be provided in the bottom closure of exterior doors to permit the escape of entrapped moisture.

c. Recessed Hinge

d. Lock and Lock Reinforcement

- Frames shall be mortised, reinforced, drilled and tapped at the factory for fully templated mortised hardware; where surface mounted hardware is to be applied, frames shall be reinforcing plates.
- Minimum thickness of hardware reinforcing plates shall be as follows :
  - Hinge - Ga. 7, 1-1/4 x 10" minimum size
  - Strike reinforcements - Ga. 16 formed combination and dust cover
  - Flush bolt reinforcements - Ga. 12
  - Closer reinforcements - Ga. 12
  - Reinforcements for surface-mounted hardware - Ga. 12

e. Frames

- Provide frames with flame, smoke, and heat seal system to prevent penetration of smoke and gases. Provide recessed strip to protect and conceal the seal.
- Frames shall be commercial grade cold-rolled steel conforming to ASTM A 366 or commercial grade hot-rolled and pickled steel conforming to ASTM A 569, Ga. 16.
- Jamb depths and backbends shall be per NAAMM standards
- Corner joints at welded corners shall have all contact edges closed tight, with trim faces mitered and continuously welded, and stops mitered or butted.

f. Panel Construction

- Hat-shaped vertical sections to stiffen face sheets, spanning full thickness of the interior space between door faces; stiffeners shall be Ga. 22, spaced not more than 6" apart and securely attached to face sheets by spot welds not more than 5" on center. With areas between stiffeners filled with fiberglass insulation made of inorganic non-combustible batt-type material.
- Sandwich-constructed face sheets with laminated honeycomb insulation for high strength-to-weight ratio

g. Intumescent Seal

3.00 EXECUTION

a. Prior to installation all frames shall be checked and corrected for size, swing, squareness, alignment, twist and plumbness. Permissible installation tolerances shall not exceed the ff. :

- Frame jambs shall be fully grouted to provide added security protection against battering, wedging, spreading and other means of forcing open the door. Jamb mounted lock preparations, grout guards and junction boxes are intended to protect the hardware mortises and tapped mounted holes form masonry grout of 4" maximum slump consistency which is hand trowelled in place.
- Grout or other bonding material shall be cleaned off of frames or doors immediately following installation. Steel door surfaces shall be kept free of grout, tar, or other bonding material or sealer.
- Proper door clearances must be maintained. Where necessary, metal hinge shims are acceptable to maintain clearances.
- Hardware must be applied in accordance with hardware manufacturer's templates and instructions.
- Exposed field welds shall be finished smooth and touched up with a rust inhibitive primer.
- Primed or painted surfaces that have been scratched or otherwise marred during installation shall be touched up with a rust inhibitive primer.

DIVISION 08 : DOORS AND WINDOWS
08120 : ALUMINUM DOORS AND FRAMES

1.00 GENERAL

a. The Contractor shall furnish materials and equipment and perform labor required to complete aluminum frames for doors. See drawings and schedules for sizes, details and location of required work.

b. Shop Drawings and Samples : Submit shop drawings and secure Architect's approval.

c. Submit sample corner sections, hinges, tracks, handles and all other accessories.

2.00 MATERIAL

2.01 Aluminum extrusions : ASTM Specification 6063 - 15

2.02 Fastening devices : Cadmium or zinc plated

2.03 Anchor bolts, pressed or rolled anchor accessories : galvanized

3.00 EXECUTION

3.01 Fabrication : Factory pre-fabricate all frames in accordance to the designs and dimensions indicated in the drawings. Cut, join and fit rails and stiles to hairline joints securely reinforced and jointed by means of concealed fastening wherever possible. Protective Coating : Clean all surfaces and apply a protective coating of clear, water-white methacrylate-type lacquer, resistant to alkaline, mortar and plaster immediately after fabrication and may not be removed even after completion of installation.

3.02 Installation : Set and anchor as shown in details and in approved shop drawings. Set frames plumb and square and brace where necessary to prevent distortion. Wedge clear of masonry all frames set in prepared openings 4.5mm (3/16") to 6mm (1/4") to allow for caulking.

3.03 Adjustments : Adjust all frames and attach hardware before glazing. Secure all windows to be watertight and all hardware operating free and easy.

DIVISION 08 : DOORS AND WINDOWS
08200 : WOOD DOORS

1.00 GENERAL

1.01 SCOPE

a. Furnish materials and equipment and perform labor required to complete flush doors, louver doors and other wood doors.

b. See drawings and details for sizes, location, extent and other requirements.

1.02 SAMPLES

Submit sample corner sections of wood doors and jambs for approval of the Architect.

1.03 PROTECTION

Protect doors adequately from scratches and other stains with heavy building paper. Doors shall also be protected from damage and dampness. Wood doors shall not be brought into the building until all plastering works has been completed and dry.

2.00 PRODUCT

2.01 MATERIAL : Hollow Core Wood Door, 44mm (1-3/4") thick; wood stain finish. Refer to Schedule of Doors for door types and locations.

2.02 FABRICATION

a. Assemble joints in doors with water-resistant glue; keep doors under pressure until glue has thoroughly set.

b. Sand smooth finished door. Provide doors with joints and clean cut mouldings.

c. Keep faces free from defects or machine marks that will show through the finish.

d. Flush Hollow Core Doors: Provide doors with cross banding and edgings. Make face veneer first-quality selected ribbon grain plywood as directed in the drawings or as specified herein. Provide lock blocks of size required for hardware used.

3.00 EXECUTION

3.01 INSTALLATION

a. Cut, trim and fit each door to its frame and hardware accurately.

b. Give allowance for painter's finish and possible swelling or shrinkage.

c. Provide not more than 3mm (1/8") clearance at lock and hanging stiles and not more than 6mm (1/4") at bottom.

d. Round all corners to 1mm (1/16") radius. Bevel slightly all rail edges.

e. All doors shall operate freely and all hardware shall be properly adjusted and functioning.

f. Install hardware to fit details and manufacturer's specifications for proper functioning.

DIVISION 08 : DOORS AND WINDOWS
08300 : SPECIAL DOORS – OPERABLE WALL

1.00 GENERAL

1.01 SCOPE

Furnish materials and equipment and perform labor required to complete operable wall system

See drawings and details for sizes, location, extent and other requirements.

1.02 SAMPLES

Submit sample corner sections of doors and jambs and wall panel finish for approval of the Architect.

1.03 PROTECTION

Protect doors adequately from scratches and other stains with heavy building paper. Doors shall also be protected from damage and shall not be brought into the building until all plastering works has been completed and dry.

2.00 PRODUCT

Operable Wall System with STC 48-50; Local brand or approved equal. 82mm thick partition MDF panel door with wood veneer finish and 60kg/m3 50mm mineral wool acoustic infill; with aluminum alloy rail track system and retractable upper and floor seals with magnetic vertical seals. Refer to Schedule of Doors for door types and locations.

2.01 MATERIAL

a. Panels : Constructed of bolted non-deflecting steel tubular frame and aluminum profiles. Pre-finished panel frame clad with 6mm thick MDF and finished with decorative laminate. Panel cavity filled with high density mineral wool insulation.

b. Panel Suspension and Track System : Each panel suspended on a 4-wheel ball bearing trolley or two multi-directional polymer trolleys. Aluminum track system fixed to an adjustable, corrosion-protected steel suspension system.

c. Panel to Panel Connection : Panels are interconnected by means of a positive locking concave/convex aluminum profile. With two additional vertical gaskets / seals per concave profile. Each panel with spring-loaded top and bottom aluminum retractable flexible PVC seal operable by a detachable crank handle and engaged by a winding mechanism.

d. Overhead rollers : shall be bearing type or heavy-duty plastic

e. Jambs : shall be 50 x 100mm kiln-dried Tanguile

Note : Construct a sound barrier above the operable wall, inside the ceiling cavity, to achieve sound insulation.

2.02 WARRANTY

Operable wall system shall have a guarantee against defects in workmanship and material for a period of one year from date of acceptance.

3.00 EXECUTION

Assemble doors such that members hang plumb and fit accurately with jambs as per manufacturer's recommendations.

DIVISION 08 : DOORS AND WINDOWS
08520 : ALUMINUM WINDOWS

1.00 GENERAL

1.01 SCOPE

Furnish materials and equipment and perform labor required to complete aluminum framed glass windows.

See drawings and schedules for sizes, details, and location of required work.

1.02 SHOP DRAWINGS AND SAMPLES

A. Available brochures, catalogs showing types of frames, finish and glass shall be submitted for approval.

B. Submit shop drawings and secure Architect's approval.

C. Submit sample corner sections, hinges, tracks, handles, and all other accessories.

1.03 STORAGE

Materials shall not be in contact with the ground and shall be placed and arranged to avoid bending or damage.

2.00 PRODUCT

Windows shall be horizontal type with frames of standard size or as indicated in the drawings.

2.01 Casement, sliding type operation, and fixed type, aluminum with finish as indicated.
2.02 Aluminum frame windows shall be rendered watertight.

- Aluminum extrusions : ASTM Specification 6063 - 15
- Fastening devices : Cadmium or zinc plated
- Anchor bolts, pressed or rolled anchor accessories : galvanized

3.0 EXECUTION

3.01 FABRICATION

a. Factory pre-fabricate all frames in accordance to the designs and dimensions indicated in the drawings.
b. Cut, join and fit rails and stiles to hairline joints securely reinforced and jointed by means of concealed fastening wherever possible.
c. Protective Coating : Clean all surfaces and apply a protective coating of clear, water-white methacrylate-type lacquer, resistant to alkaline, mortar and plaster immediately after fabrication and may not be removed even after completion of installation.

3.02 INSTALLATION

a. Set and anchor as shown in details and in approved shop drawings.
b. Set framed plumb and square and brace where necessary to prevent distortion. Windows shall not be forced and shall be securely anchored into the supporting construction.
c. Wedge clear of masonry all frames set in prepared openings 4.5mm (3/16") to 6mm (1/4") to allow for caulking.

3.03 ADJUSTMENTS

a. Adjust all frames and attach hardware before glazing.
b. Secure all windows to be watertight and all hardware operating free and easy.
c. Surfaces, stains, and discoloration shall be cleaned and restored or the window shall be replaced.

DIVISION 08 : DOORS AND WINDOWS
08710 : FINISH HARDWARE

1.00 GENERAL

1.01 SCOPE

a. Furnish materials and equipment and perform labor required to complete finish
b. hardware for doors and windows.
c. Submit samples of locksets, hinges, door pulls, door stops, door closers and
d. other finish hardware accessories for Architect's approval.

1.02 SAMPLES

Submit catalog cuts, or samples of hinges, door pulls and other finish hardware accessories for Architect's approval.

1.03 DELIVERY AND STORAGE

Hardware shall be delivered to the job site in their original containers and accessories (keys, screws, templates, instructions) and shall bear model number and manufacturer's name.

2.00 PRODUCT

2.01 MATERIAL

a. Door Lock and Locksets : German brand or approved equal. Products manufactured and/or assembled in China and China territories not acceptable. ADA Compliant, BHMA Grade 2. Solid cast zinc handles, US26D finish. Commercial use, UL/cUL Listed up to 3 hours. Refer to Schedule of Doors for quantity and location.

- Entrance Function for all doors intended to be locked. This includes main entrance of Female and Male Public Toilets.
- Privacy Function for all Toilets, PWD Toilets.
- Single Dummy Lever for passive leaf of double-leafed doors.
- Classroom Function for Rentable Meeting Rooms, and where indicated.

Note :

- Refer to Schedule of Doors for Hardware List
- Provide masterkeying for all keyed locksets.

b. Hinges : German brand or approved equal. Products manufactured and/or assembled in China and China territories not acceptable. US32D finish.

- 4" x 3.5" full-mortise, standard weight, stainless steel hinge with stainless steel pin. Meets BS EN 1935 Grade 13, and Corrosion Resistance Grade 4. For single-leaf doors.
- 4.5"x 4" five knuckle, 2 ball bearings, full mortise standard weight, stainless steel hinge with stainless steel pin. Conforming to ANSI A5112, and NFPA 80 compliant. For double-leafed doors and fire-rated doors.

c. Door Closers : German brand or approved equal. ADA Compliant, BHMA Certified ANSI 156.4, and UL/ cUL Listed for up to 3 hours. Products manufactured and/or assembled in China and China territories not acceptable. Standard arm door closer. For all Fire Exit Doors, and Fire Rated Doors. Also for PWD Toilets, and where indicated. Refer to Hardware List of Door Schedule.

d. Sliding Door Operators : Italian brand or approved equal. Conforming to ANSI/ BHMA A156.14. Products manufactured and/or assembled in China and China territories not acceptable. Track and Roller Set. For doors with lock : Use flush pull handle and double-key sliding door lock. For double-leaf and single-leaf sliding doors as indicated.

e. Fire Exit Hardware : German brand or approved equal. Confomring to ANSI 117.1, and UL and cUL Listed for up to 3 hours. Products manufactured and/or assembled in China and China territories not acceptable. Fire rated, sprayed aluminum finish. For fire exit doors. Use with standard duty surface vertical rod with lever trim, with cylinder where indicated. Provide fire rating testing certificate.

f. Deadbolts : German brand or approved equal. Products manufactured and/or assembled in China and China territories not acceptable. Double deadbolt lock. Meets ANSI A156.5, 2001, Grade 2 Lock. 6-pin solid brass cylinder, keyed 6-pin, 1" wrought brass or bronze, reinforced with security insert trim ring. Satin chrome finish. For doors where indicated.

g. Door Stops : US brand or approved equal. Meets ANSI/ BHMA A156.16, L12141. Products manufactured and/or assembled in China and China territories not acceptable. Floor Dome Stop US26D Satin Chrome Finish, height 1", base height 5/32", base diameter 1-3/4". Heavy duty cast dome stops constructed of brass, replaceable grey rubber bumper. For all doors unless otherwise indicated.

h. Others : German brand or approved equal. Products manufactured and/or assembled in China and China territories not acceptable

- Flush Bolt : Slide flush bolt, 19mm x 153mm faceplate, 13mm bolt diameter. Meets ANSI 156.16 for L04201, US26D finish. For double-leaf doors, where indicated.
- Door Coordinator : 140 x 29mm plate, brass door coordinator with rubber roller. Meets ANSI A156.3 Type no.21B. For double-leaf doors, where indicated.
- Door Pull : Round door pull, 25mm base diameter, 70mm projection, 45mm clearance. Meets ANSI A156.6 for J401 Pulls. For glass doors where indicated.

2.02 MISCELLANEOUS DOOR HARDWARE

a. For doors that will strike an object, provide rubber bumper or door stop. Type and location of installation to be approved by the Architect.

b. For double-leaf wooden doors, provide 2 flush bolts.

c. For silencing doors when it strikes the stop strip and to prevent rattles, install three (3) silencers on the top of the frames.

d. Provide rubber silencer installed at the jambs.

3.00 EXECUTION

3.01 Install hardware to fit details as shown in the drawings and as per manufacturer's specifications. Supply all necessary templates and instructions required.

a. Hinges :

- Top – center of hinge not more than 20cm below top of door
- Bottom – center of hinge not more than 20cm above finished floor
- Intermediate hinges – shall be equidistant between top and bottom hinges

b. Door closers : unless otherwise indicated, install door closers on the interior side (room side) of doors opening to a hallway or corridor; provide door closers for all toilet main entrance doors.

3.02 After installation, protect hardware from paint, stains and discoloration until acceptance of work. All hardware shall be checked and adjusted such that they operate properly or else shall be replaced by Contractor. Keys shall be identified and labeled and submitted to the Owner.

DIVISION 08 : DOORS AND WINDOWS
08730 : WEATHERSTRIPPING AND SEALS

1.00 GENERAL

1.01 SCOPE

Furnish materials and equipment and perform labor required to complete weatherstripping in the form of rubber, vinyl strip and caulking.

1.02 SAMPLES

Submit samples of weather strip elements for approval of the Architect.

2.00 PRODUCT

CAULKING: American brand or approved equal. Silicone building sealant that conforms to ISO 11600F-25LM.

3.00 EXECUTION

Install for all joint gaps between aluminum frames and concrete.

Division 09

FINISHES

DIVISION 09 : FINISHES
09220 : PORTLAND CEMENT PLASTER

1.00 GENERAL

1.01 SCOPE

a. Furnish all materials and equipment and perform labor required to complete plain cement plaster finish.

b. See drawings for details of Materials and Finishes.

1.02 DELIVERY AND STORAGE

Materials shall be delivered in their original containers bearing manufacturer's name and brand. Cement and lime shall not have any contact with the ground and shall be protected against dampness.

2.00 PRODUCT

2.01 MATERIAL

SMOOTH : Consisting of the scratch and finish coats, both consisting of one (1) part Portland cement and two (2) parts of clean, washed sand, measured by volume. For all interior walls and column surfaces, including designated existing walls, as called for in the Drawings and where plastering is essential to complete the work.

3.00 EXECUTION

3.01 PLAIN CEMENT PLASTER FINISH

a. Provide all walls indicated with three coats of cement plaster (scratch coat and finish coat). Mix each coat in the proportion of one part Portland cement to three parts sand by volume.

b. Apply the scratch coat with sufficient material and pressure to ensure a good bond and then scratch to a rough surface. Dampen with water before applying brown coat. Apply brown coat one day after applying a scratch coat with a thickness of 10mm and level to flat even surface.

c. When stiff enough, trowel with wooden float and cross-hatch or broom lightly and evenly to secure a good mechanical bond for the finish coat. Wet the surface and keep from drying out at least three (3) days.

d. Apply finish coat seven (7) days after the application of brown coat. Provide thickness of 3mm (1/8"). Keep the finish coat not saturated for a period of seven (7) days.

DIVISION 09 : FINISHES
09240 : NOSINGS / BASEBOARDS

1.01 GENERAL

1.01 SCOPE

a. Furnish material, labor and tools required to complete all brass stair nosing.

b. See drawings for location and extent of work required.

1.02 SUBMITTAL

Submit actual samples showing specified size and color/style for approval.

1.03 DELIVERY AND STORAGE

Materials shall be delivered in their original containers bearing manufacturer's name and brand. Tiles shall be protected against wear and dampness.

2.00 PRODUCT

2.01 Stainless steel nosing : Type 316; with safety grip, for termination between different flooring materials, at different height elevations

2.02 Brass nosing: With safety grip, for stair nosing

3.00 INSTALLATION

a. Clean surface of stair.

b. Measure width of stair and size of tread and riser.

c. Cut off the required length with saw and round off sharp edges.

d. Anchor brass stair nosing with bolts evenly spaced along entire length of stair, ensuring anchor heads are embedded and do not protrude above stair nosing surface. Provide anchorage at regular intervals for each step.

DIVISION 09 : FINISHES
09260 : GYPSUM BOARD

1.00 GENERAL

1.01 SCOPE

Furnish materials and equipment and perform labor required to complete gypsum board work.

1.02 SUBMITTALS

Product Data : Manufacturer's specifications and installation instructions for each product.

1.03 DELIVERY, STORAGE, AND HANDLING

a. Packaging and Shipping : have materials shipped in manufacturer's original packages showing manufacturer's name and product brand name.

b. Storage and Protection : store materials under cover and protect from damage by the elements. Protect ends, edges, and faces of gypsum boards from damage. Protect steel studs and accessories from bending.

2.00 PRODUCT

2.01 Gypsum Board : Australian brand or approved equal. Products manufactured and/or assembled in China and China territories not acceptable. Installed in such lengths and cuts to result in a minimum of joints. Applied to ceiling and walls of areas indicated and specified on the Schedule of Finishes and shall include furred soffits and other appurtenances prepared for gypsum wallboard.

a. Regular Ceiling Application – 12mm thick Regular Gypsum Core; tapered edge, surface paper on front, back and long edges, complies with ASTM C 1396.
b. Wet Type Ceiling Application – 12mm thick Wet-Type Gypsum Core.

2.02 Ceiling Metal Framing :

a. Hanger – pre-punched, hot dipped galvanized steel 1.0mm thick
b. Suspension Rod – hot dipped galvanized steel 6mm diameter
c. Carrying Channel
   - Clip – spring steel clip 0.6mm thick
   - Channel and Wall Angle – channel shall be 5m long, Ga. 19 and 2.4-3.0m long, Ga. 24 thick respectively, configuration and sizes as shown.
d. Furring
   - Channel Joiner and Clip – galvanized steel, Ga. 24 thick
   - Member – double carding, galvanized steel 5.0m long, 0.40mm thick.

2.03 Adhesives : for concealment of joint and fastening; per manufacturer's recommendation. Embedding compound for 1st and 2nd coats, finishing compound for top coat.

2.04 Wall and Partition Assembly :

a. Stud – galvanized steel, Ga. 22 or 24
b. Track, Top and Bottom – galvanized steel, Ga. 22

2.05 Fasteners :

a. Bolt and Nut – steel and zinc-coated; expansion shields shall be of the type and class applicable.
b. Screw – shouldered flat-head design for use with special power-driven tools. Self-tapping threads and self-drilling points.

3.00 EXECUTION

3.01 Ceiling framing system :

a. Use 38mm main runner channels suspended plumb from structural slab or frame by hanger wires or straps, spaced not less than 1.20m on centers.
b. Shape hanger wires into a 100mm diameter loop and embed at least 50mm into the concrete, or attach to approved inserts.

c. Hang hanger straps plumb and connected with 10mm galvanized bolts and nuts to anchors made of hanger strap set in concrete.

d. Locate main runner channels within 150mm of parallel walls and cut short of abutting wall 12mm ± 6mm. Where channels are spliced, overlap ends not less than 300mm with flanges of channels interlocked and securely tied near each end of the splice with 2 loops of 1mm tie wire, or join the end by approved standard main runner couplings. Stagger splices.

3.02 Steel framing : Frame non-load bearing walls with 64mm and 92mm steel studs and runners, spacing studs 0.60m on center.

a. Floor and ceiling runner – aligned and securely attached to floors, attached by means of expansion shields, machine bolts, or other approved methods, at 0.60m on center and to furred ceilings by wallboard screws at each furring member. Provide furring at ceiling runners oriented parallel to the direction of furring members.

b. Studs – position plumb in ceiling and floor runners and securely attached with one wallboard screw on each side of stud ends. Install studs in continuous lengths with no splicing in lengths of 5m for 92mm studs, 3.5m for 75mm studs, and 2.7m fro 64mm studs.

3.03 Furring : provide where steel furring is indicated for screw attachment of wallboard.

a. Walls – Space furring channels 0.40m on centers. Secure furring to masonry or concrete with concrete nails, toggle bolts, or screws with expansion shields at 06.0m on centers. Stagger fasteners. Set furring plumb or level and rigid using shims of galvanized steel to assure an even finished wall surface.

b. Ceiling – Space hat-shaped furring members 0.40m on centers, securely attaching across suspended runner channels with wire clips or double strand of 1mm tie wire saddle-tied at each crossing. End of tie wires to receive 3 full twists. Splice furrings with 2mm nested laps securely tied near each end of lap with 2 loops of 1mm tie wire. Stagger splices. When wallboard abuts dissimilar wall material, perimeter of ceiling shall be finished with edge bead trim strip aligned with finishing ceiling.

3.04 Walls :

a. Single-ply application – Place long dimension of panels parallel to the furring or framing members. Panels shall be of the length required to reach from the ceiling line to the floor line in one continuous length. Joints shall be made over framing or furring members.

b. Control joints – formed of casing bead trim installed back to back over separate framing or furred members. Maintain spacing of 3mm between opposite beads.

3.05 Attachment : use screw fasteners only to attach wallboard to steel furring and steel framing. Proceed nailing or screw attachment from center of wallboard toward end and edges.

3.06 Joint and fastener concealment

a. Embedding compound – apply to wallboard joints and fastener heads in a thin uniform layer. Spread no less than 75mm wide at joints, placing reinforcing tape at center of joint and embedded in the compound. Spread a thin layer of compound over the tape, and after it has dried, apply a second coat. Sand areas to eliminate ridges.

b. Finishing compound – after embedding compound has set and dried, apply a coat of finishing compound to joints and fastener heads, feathering out. After finishing compound has dried, sand areas to produce even smooth surface.

DIVISION 09 : FINISHES
09510 : ACOUSTIC CEILING TILE

1.0 GENERAL

1.01 SCOPE

a. Furnish all materials and equipment and perform labor required to complete acoustic ceiling tile system. This includes acoustic ceiling tile and suspension system.

b. See drawings for details of location and extent of work involved.

1.02 SUBMITTALS

Submit sample of acoustic tile material samples to Architect for approval.

1.03 DELIVERY AND STORAGE

Materials shall be delivered in their original containers bearing manufacturer's name and brand. Tiles shall be protected against wear and dampness and stored to avoid contact with the ground.

2.00 PRODUCT

2.01 Manufactured in US, or approved equal. Products manufactured and/or assembled in China and China territories not acceptable. 15mm thick, 600 x 600mm fine fissured acoustic tile, square-edged to receive aluminum runners. As general ceiling material.

a. Non-sag, lay-in type.
b. Ceramic and mineral fiber composite material
c. Scrubbable factory-applied plastic paint
d. UL Classified Acoustics: NRC 0.55 + CAC 38
e. GREENGUARD Gold Certified
f. Light Reflectance : 0.82
g. Flame Spread : Class A Flame Spread 25 BS476 part 6 & 7 Class 0/Class 1
h. White color

3.00 EXECUTION

3.01 Examination

Do not proceed with installation until all wet work such as concrete, terrazzo, plastering and painting has been completed and thoroughly dried out.

3.02 Preparation

a. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders, and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures.

b. Coordination : Furnish layouts for preset inserts, clips and other ceiling anchors which installation is specified in other sections.

c. Furnish concrete inserts and similar devices to other trades for installation well in advance of time needed for coordination of other work.

3.03 Installation

a. Install suspension system and panels in accordance with the manufacturer's instructions, and in compliance with ASTM C 636 and with the authorities having jurisdiction.

b. Suspend main beams from overhead construction with hanger wires spaced 4-0 on center along the length of the main runner. Install hanger wires plumb and straight.

c. Install wall moldings at intersection of suspended ceiling and vertical surfaces. Miter corners where wall moldings intersect or install corner caps.

d. Install acoustical panels in coordination with suspension system, with edges resting on flanges of main runner and cross tees. Cut and fit panels neatly against abutting surfaces. Support edges by wall moldings.

3.04 Adjusting and Cleaning

a. Replace damaged and broken panels.

b. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings and suspension members. Comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

DIVISION 09 : FINISHES
09650 : RESILIENT FLOORING

1.00 GENERAL

1.01 SCOPE

Furnish all materials and equipment and perform labor required to complete vinyl tile and vinyl sheet flooring. See drawings for details of Materials and Finishes.

1.02 SUBMITTALS

Submit sample of vinyl tiles and vinyl sheet in colored material samples to the Architect for approval.

1.03 DELIVERY AND STORAGE

Materials shall be delivered in their original containers bearing manufacturer's name and brand. Tiles shall be protected against wear and dampness.

2.00 PRODUCT

Architect approved color. Use manufacturer's recommended tile adhesive only. Manufactured in France, US, Canada, or approved equal.

2.01 VINYL TILE FLOOR FINISH : 3mm thick, 300 x 300mm vinyl tile. Meets performance requirements of ASTM F 1066. For Stairs to Pump Room, Staff Room, Control Rooms, Fire Exit Stairs and all Storage Rooms at Ground to 7th floor. Also for Ante-Rooms, Seating area, Stairs and Equipment Rooms of Auditoria at Third and Fourth Floors.

2.02 CONNECTING PROFILES : Floor to floor connecting profile, whichever is suitable for the required application.

a. PVC Profiles : Polychloroprene double bonding. Architect approved color.

- Profile A : junction between two floors ranging up to 4mm thick.
- Profile B : junction between two floors of 2.2mm and 5mm. Can also be used as finishing profile.

b. Aluminum Profiles : For high traffic areas.

- Profile A – suitable for 2.5mm, 5mm, and 6mm floor coverings.
- Profile B – suitable for 5mm and 5mm floor coverings

2.03 FLEXIBLE SKIRTING : 2mm thick flexible vinyl cove skirting, 150mm high; for coved floor-to-wall termination.

3.00 EXECUTION

3.01 PREPARATION OF SUBSTRATE

Grind or rub substrate (concrete or wood floors) evenly prior to vinyl tile application, using fillers whenever necessary. Substrate shall be clean, dry and free from deleterious materials.

3.02 INSTALLATION

a. Vinyl tiles shall be installed according to manufacturer's instructions, with layout and pattern starting at the center of the room or area working towards the edges of the room. Cut and fit vinyl tile flooring around built-in fixtures and furniture.

b. Dry-clean finished surface immediately after vinyl tile installation with manufacturer's recommended cleaner. After 5 days of installation, wash surface with recommended non-alkaline cleaning solution, rinse with water and waxed with emulsion wax if required.

c. VINYL TILE FLOORING

- Unpack the vinyl tiles 24 hours before laying; stack tiles horizontally.
- Trace a line perpendicular to the main entrance, using this as center axis and laying equal cuts for tiles on both sides.
- Apply adhesive to a few square meters of subfloor in one quarter.
- Press each tile into position ensuring joints are butted tight.
- Smooth down tiles manually then roll with a 50kg flooring roller.
- Ensure that there is no foot traffic for 48 hours after installation.

d. VINYL SHEET FLOORING

- Sheets must be unrolled and left in the room to be covered, along with the sheet adhesive for at least 24 hours prior to laying.
- Lay first length along guide line, ensuring sheets are laid lengthways in the same direction.
- Fold back sheets half way.
- Using a finely serrated trowel, apply adhesive following adhesive manufacturer's installation instructions.
- Smooth down manually then roll with a 50kg flooring roller.
- Ensure that there is no foot traffic for 48 hours after installation.

Division 15

MECHANICAL

UP COLLEGE OF MEDICINE, MEDICAL SCIENCES BUILDING

University Of The Philippines, Manila

TECHNICAL SPECIFICATIONS

FOR

AIR CONDITIONING SYSTEM

RAMON D. AGUILOS, PME, FPSME, AA

Professional Mechanical Engineer

PRC NO : 2736

PTR NO : 5611839 C

DATE : 01-09-18

PLACE : Quezon City

MEMBER:

PSME ASHRAE NFPA PHILIPPINE GREEN BUILDING INITIATIVE gr n

SECTION 15000

MECHANICAL GENERAL REQUIREMENTS

PART 1 - GENERAL

1.01 APPLICATION:

This section applies to all sections of the specifications of the Air Conditioning and Ventilation System for the Proposed UP College of Medicine, Medical Sciences Building.

1.02 DESCRIPTION OF WORK:

The work includes providing Air Conditioning and Ventilation System for the Proposed UP College of Medicine, Medical Sciences Building located at University of The Philippines, Manila. The works includes the following:

a. Supply and installation of air conditioning and ventilation system. The air conditioning and ventilation system include the air cooled condensing units, fan coil units, refrigerant piping and accessories, fans, ductworks, registers, dampers, equipment, piping and duct supports, concrete pad, vibration isolator, air conditioning control system, electrical wiring and conduits and all required accessories necessary to have an operational air conditioning and ventilation system.

b. Supply and installation of air conditioning ducts. The air conditioning duct system include the supply, return and fresh air ducts, registers, diffusers, grilles, duct insulation, supports, and flexible duct connection.

c. Supply and installation of condensate drain piping system. The condensate drain piping system includes pipes, fittings, p-traps, insulation, supports and all required accessories.

d. Painting of pipes, hangers, supports and equipment.

e. Grouting of all opening in floors and walls after all pipes and ducts are in place and sealing of all such opening is not used.

f. Testing, adjusting and commissioning of the system after complete installation.

1.03 PROJECT INFORMATION:

Contract Drawings: The work shall conform to the contract drawings, all of which form a part of these specifications:

A. Omissions from the drawings or specifications or the unclear description of details of work which are manifestly necessary to carry out the intent of the drawings and specifications or which are customarily performed, shall not relieve the Contractor from performing such omitted or unclear description of the work but shall be performed as if fully and correctly set forth and described in the drawings and specifications.

B. Drawings do not attempt to show exact details of piping and ductwork. Provide offsets as necessary to avoid local obstruction or interference with other trades.

1.04 QUALIFICATION OF INSTALLER:

In accordance with DILG Memorandum Circular No. 2004-65-A dated June 11, 2008 and DPWH NBCDO Memorandum Circular No. 04, series of 2007 dated April 13, 2007 Contractor shall have a Philippine Contractor's Accreditation Board (PCAB) license as a Contractor or as a specialty Contractor.

The Contractor shall submit with the Bid, Data for approval showing that the Contractor has successfully installed Air Conditioning system and equipment of the same type and design as specified. Indicate the type and design of each system and certify that each system has performed satisfactorily in the manner intended for a period of not less than 18 months. The data shall include the following:

a. Professional Mechanical Engineer in charge of the project
b. Contractor's PCAB Rating
c. List of projects that has been completed
d. Company profile
e. Organizational Chart
f. Contractor's financial statement

1.05 SUBMITTALS:

Each submittal is to be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Submit shop drawings, manufacturer's data and certificates for equipment, materials and finish, and pertinent details for each system as specified in each individual section, and obtain approval from the Consultant before procurement, fabrication, or delivery to the job site. Approval of submittal shall not relieve the Contractor of the responsibility of inspecting such material or equipment for defects or non-conforming to the specifications. Partial submittals are not acceptable and will be returned without review. Submittals shall include the manufacturer's name, trade name, catalog model or number, nameplate data, size, layout dimensions, capacity, project

specification and paragraph reference, applicable, industry, and technical society publication references, years of satisfactory service, and other information necessary to establish contract compliance of each item the Contractor proposes to provide. Photographs of existing installations and data submitted in lieu of catalog data are not acceptable and will be returned without approval.

A. Shop Drawings: Drawings shall include floor plans, sectional views, wiring diagrams, and installation details of equipment, and equipment spaces identifying and indicating proposed location, layout and arrangement of items of equipment, control panels, accessories, piping, and other items that must be shown to assure a coordinated installation. Drawings shall indicate adequate clearance for operation, maintenance, and replacements of operating equipment devices. If equipment is disapproved, drawings shall be revised to show acceptable equipment and be resubmitted.

   Manufacturer's Data: Submittals for each manufactured item shall be manufacturer's descriptive literature of cataloged products, equipment drawings, diagrams, performance and characteristic curves, and catalog cuts.

B. Manufacturer's Installation Instructions: Where installation procedures or any part thereof are required to in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations shall be furnished prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.

C. Samples: Fabricated or unfabricated physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged.

D. Certificates: Statements printed on the manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.

1.06 OPERATION AND MAINTENANCE MANUAL:

Furnish an operation and maintenance manual as required for each item of equipment as specified in each individual each item of equipment as specified in each individual section. Furnish 2 copies of the manual bound in hardback binders or an approved equivalent. Furnish one complete manual to the Consultant for review and approval within 15 calendar days after the equipment is approved, but at least 30 calendar days prior to field acceptance testing of the equipment or system. Furnish the remaining manuals at least 30 calendar days before the contract is completed. Inscribe the following identification on the cover: the words OPERATION AND MAINTENANCE

MANUAL, the name and location of the equipment or the building, and the names of the Contractor, The manual shall include the names, addresses, and telephone numbers of each subcontractor installing equipment, and of the local representatives for each item of equipment. The manual shall have a table of contents and be assembled to conform to the table of contents with the tab sheets placed before instructions covering the subject. The instructions shall be legible and easily read, with large sheets of drawings folded in. The manual shall include: wiring and control diagrams with data to explain detailed operation and control of each item of equipment, a control sequence describing start-up, operation and shutdown, description of the function of each principal item of equipment; the procedure for starting; the procedure for operating; shutdown instructions; installation instructions; maintenance instructions; lubrication schedule including type, grade, temperature range, and frequency; safety precautions, diagrams, and illustrations; test procedures performance data and parts list. The parts list for equipment shall indicate the sources of supply, recommended spare parts, and the service organization, which is reasonably convenient to the project site. The manual shall have complete information on the equipment, controls, accessories, and associated appurtenances provided.

1.07 POSTED OPERATING INSTRUCTIONS:

Furnish approved operating instructions for each system and principal item of equipment as specified in each individual section for the use of the operation and maintenance personnel. The operating instructions shall include wiring diagrams, control diagrams, and control sequence for each principal item of equipment. Operating instructions shall be printed or engraved, and shall be framed under glass or in approved laminated plastic and posted where directed. Operating instructions shall be attached to or posted adjacent to each principal item of equipment and include directions for start-up, proper adjustment, operating lubrication, shutdown, safety precautions, procedure in the event of equipment failure, and other areas as recommended by the manufacturer of each item of equipment.

1.08 DELIVERY STORAGE:

Equipment and materials shall be handled, stored, and protected to prevent damage before and during installation in accordance with the manufacturer's recommendations. Damaged or defective items shall be replaced.

1.09 STANDARD PRODUCTS/SERVICE AVAILABILITY:

A. Materials and equipment shall be standard products of a manufacturer regularly engaged in the manufacture of such products, which are of similar material, design and workmanship. The standard products shall have been in satisfactory commercial or industrial use for two years prior to bid opening. Acceptable products should come from USA, Japan, Korea and European countries.

B. Service Support: The equipment items shall be supported by service