

PROJECT : CONSTRUCTION OF TISSUE-CULTURE FACILITY
LOCATION : DA-PREC, SOAL, PANGASINAN

GENERAL SPECIFICATIONS

• GENERAL REQUIREMENTS (PERMITS & PROJECT BILLBOARD)

- o The contractor shall be responsible for securing all necessary permits related to the project, which shall include but not limited to building permits, occupancy permit, etc.).
- o All related documents shall be submitted to the End User.
- o The contractor is responsible to secure and obtain information from the regulatory agencies in municipality for all and any other required permits not listed below. A copy of the required permits shall be submitted to the end user within 24 hours of obtaining such permits.
- o Building Permit/s, including the demolition of the building, the foundation are the general contractor's responsibility.
- o Electrical permit and plans (if required by Building Official), is the contractor's responsibility.
- o Health department approval and septic connections, contractor's responsibility. Contractor is required to check with the department to obtain information on the required plans and permits, if any.
- o The new billboard design layout and dimension shall be install on a standard billboard, measuring 2000mm x 2440mm (4' x 8') using 12mm (1/2 inch) thick marine plywood or tarpaulin posted on 3mm (3/16 inch) marine plywood.
- o For each building project, the billboard shall be installed in front of the project site.

• SAFETY AND HEALTH

- o Building premises shall have adequate fire, emergency or danger sign and safety instructions of standard colors and sizes visible at all times.
- o Other visible signs that may be needed to direct the driver of motorized vehicle such as STOP, YIELD, and DO NOT ENTER, properly positioned within the compound of the establishment shall be used to increase safety especially during the night.
- o Good housekeeping shall be maintained at all times through cleanliness of building, yards, machines, equipment, regular waste disposal, and orderly arrangement of processes, operations, storage and filing of materials.
- o All buildings, permanent or temporary shall be structurally safe and sound to prevent their collapse.

DA-PREC, SOAL, PANGASINAN

- o The contractor shall, at his own expense furnish his workers with protective equipment for the eyes, ears, hands and feet, protective shields and barriers whenever necessary by reason of the hazardous nature of the process or environment, chemical or radiological or other mechanical irritants or hazards capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact.
- o Deduction for the loss or damage of personal protective equipment shall be governed by Article 114, Book III, Labor Code of the Philippines, and Section 14, Rule VIII, Book III, Omnibus Rules Implementing the Labor Code.
- o At every construction site there shall be organized and maintained a Healthy and Safety Committee conforming with the rules of OSH.
- o In the application of this Rule, the construction, steps and arrangement of materials used may vary provided that the strength of the structure is at least equal to that herein prescribed.
- o Fire Protection equipment shall be provided in accordance with the requirements.

• MOBILIZATION & DEMOBILIZATION

- o The work shall consist of the mobilization and demobilization of the Contractor's forces and equipment necessary for performing the work required under the contract.
- o Mobilization shall include all activities and associated costs for transportation of Contractor's personnel, equipment, and operating supplies to the site; establishment of offices, buildings, and other necessary general facilities for the Contractor's operations at the site; premiums paid for performance and payment bonds, including coinsurance and reinsurance agreements as applicable; and other items specified in Section 4 of this specification.
- o Demobilization shall include all activities and costs for transportation of personnel, equipment, and supplies not required or included in the contract from the site; including the disassembly, removal and site clean up of offices, buildings and other facilities assembled on the site specifically for this contract.
- o This work includes mobilization and demobilization required by the contract at the time of award. If additional mobilization and demobilization activities and costs are required during the performance of the contract as a result of changed, deleted, or added items of work for which the Contractor is entitled to an adjustment in contract price, compensation for such costs will be included in the price adjustment for the item or items of work changed or added.

• DEMOLITION WORKS

- o Demolition of designated building structures.
- o Removal of hollow items or items which could collapse.
- o Submit for approval demolition schedule, including schedule and methods for capping utilities to be abandoned and maintaining existing utility service.
- o Comply with governing codes and regulations. Use experienced workers.

- Convene minimum two weeks prior to starting work of this section.
- Immediate areas of work will not be occupied during demolition.
- Do not damage building elements and improvements indicated to remain. Items of salvage value, not included on schedule of salvage items to be returned to Owner/ End User, shall be removed from site. Storage or sale of items at project site is prohibited.

• EARTHWORKS

EXCAVATION

- Stumps remaining from clearing operations shall be cut flush or removed as directed by the Owner. All stump holes shall be filled and the area rough graded. All debris shall be disposed of as specified in Paragraph 4 of Specification CAR-SH-CH-3 "Clearing and Grubbing." Burying of debris shall not be permitted within 1000ft of the area grubbed.
- During the course of all excavation work located in areas beyond the clearing and grubbing lines shown on the drawings, extreme care shall be exercised by the Contractor to preserve and avoid damage to trees, shrubs and all other vegetation which does not directly hamper work progress. The Contractor's plans for the dimensions and routes of required access roads shall be subject to the approval of the End-user.
- Adequate berms/banks shall be erected and maintained around excavations where required for safety.
- Unclassified excavation shall consist of the removal, storage and/or disposal of all materials required to be removed such as topsoil, clay, sand, gravel, rock fragments, boulders, soft and disintegrated rock or any other material that can be effectively removed.
- It is likely that fissures, cracks, joints, cavities, overhangs, or other irregularities in the rock surface may be encountered that will require excavation in excess of the foundation lines and grade initially shown on the drawings as specified. The right is reserved by the Owner to vary the depth, width and length of excavation and to increase or decrease the slopes of the excavations for the purpose of obtaining the most stable or economical foundation or the most desirable final result. The right is also reserved by the End-user to require that the additional excavation be performed after excavation has been commenced or has been completed to the lines and/or grades shown on the drawings, previously specified, ordered, or staked on the ground.

BACKFILL

- Backfill material around masonry structures shall not be placed until released by the End-user after consideration of curing and strength requirements for the concrete.
- Care shall be taken to place backfill symmetrically, and in uniform layers, to prevent harmful eccentric loading on a structure or foundation.
- Unless otherwise specified or directed by the End-user, heavy hauling or compacting equipment shall be permitted no closer than three feet to any structure or foundation during backfilling. In all areas closer than three feet, or where workspace is limited,

portable equipment such as vibratory plates, rammers, or pneumatic tampers shall be used. The equipment and procedures used shall be subject to the approval of the Owner.

GRAVEL FILL

- All such suitable materials shall be removed from the site and spread uniformly over the areas adjacent to the project site, or otherwise disposed of as maybe directed by the Architect or Engineer in charge of the construction.

• RSB WORKS

- All reinforcement shall be placed in accordance with plans furnished by the Engineer. In case of any doubt or ambiguity in placing of steel, the Contractor shall consult the Engineer whose decision shall be final in such cases.
- All reinforcing steel bars used shall be new and free from rust, oil, defects, grease or links. All loose rust or scale, adhering materials and all oil or either materials which tend to destroy bond between the concrete and the reinforcement shall be removed before placing the steel and before concreting begins.
- Metal reinforcement shall be accurately placed and adequately secured by concrete or metal chair spacers. The minimum distance between the parallel bars shall be one and one-half times the diameter for round bars and twice the side dimensions for square bars. In no case shall the clear distance between bars shall be less one or more than one and one-third times the minimum size of the coarse aggregate. Where bars are used in two or more layers, the bars in the upper layers at distance of not less than one inch.
- All steel reinforcing bars shall be accurately placed and secured against displacement by tying them together at each bar intersection with Gauge No. 16 galvanized iron wire.
- All main reinforcing steel used in the structure shall conform to ASTM Grade 40 (Intermediate Grade) with yield strength of 40 ksi (276 MPa).
- All temperature bars shall conform to ASTM Grade 30 Structural Grade with minimum yield strength of 30 ksi (207 MPa).
- Always apply red oxide for the exposed RSB to eliminate from rusting.

• FORM WORKS & SCAFFOLDINGS

- Provide forms that will produce correctly aligned concrete. Column forms shall be checked for plumpness before concrete is deposited. Hand holes shall be provided in column forms at lowest points of pour lifts to render this space accessible for cleaning.
- Joints in forms shall be horizontal or vertical. Lumber once used in forms shall be nailed withdrawn and surfaces to be in contact with concrete shall be thoroughly wetted with water in advance of pouring. Woods to be used shall be kiln dried and treated with anti-termite chemical. And all lumber surfaces in contact with concrete and masonry shall receive one brush of bituminous paint.
- Immediately after the removal of the form, all projecting wires and bolts and other devices used for holding forms shall be cut off at least one-half centimetre beneath the finished surfaces. All holes and defects shall be thoroughly wetted and then painted up solid with

cement putty mortar of the same proportions as the mortar used in the body of the work. All parts protruding beyond the finishing shall be treated in such manner as to effectively remove all the lines and marks impressed by the form works.

- Forms shall be removed in a manner which will prevent damage to the concrete and shall not be removed until the concrete has attained sufficient strength to support its own weight and any loads that may be placed on it. Side forms of beams and girders may be removed earlier than the bottom forms but additional posts or shoring must be placed under the beams or girders until they have gained their strength. Forms shall not be removed until approval of the Design Engineer. Any repair of surface imperfections shall be performed at once and airing shall be started as soon as the surface is sufficiently hard to permit it without further damage.

• CONCRETE WORKS (CLASS A)

o Materials

Fine aggregates shall be clean, well graded, hard, natural sand or manufactured sand or a combination of both. The maximum size of the aggregates shall not be larger than one-fifth (1/5) of the narrowest dimension between forms and not larger than three-fourths (3/4) of the minimum clear spacing between reinforcing bars, and in no case larger than two inches in diameter. Coarse aggregates shall be hard, durable, uncoated gravel, crushed gravel, free from any deleterious materials like alkali, loam, silt and any organic matter.

Water used in making the concrete mass shall reasonably clean, potable, and free from injurious amount of oils, acids, salts, organic materials and other deleterious substances.

o Mixing Compounds

No hand mixing shall be allowed except in cases of emergency such as mixer breakdown during pouring operations. It shall stop at the first allowed construction joint. All concrete shall be machine-mixed for at least one and one-half minutes after all materials, including water, are in the mixing drum.

The mixer shall be of approved size and type which will ensure a uniform distribution of materials throughout the mass. It shall be equipped with a device for accurately measuring and controlling the amount of water in each batch.

The first batch of concrete materials placed in the mixer shall contain a sufficient excess of cement, sand and water to coat inside of the drum without reducing the cement content of the mix to be discharged.

• Specified Compressive Strength

Class	Psi	MPa
AA	4,000	27.57
A	3,000	20.68
B	2,500	17.23
C	2,000	13.78

- Class AA: For septic tanks and other work as indicated.
- Class A: For slabs, beams, and wall above grade, columns and for all reinforced work not otherwise indicated or specified.

- Class B: For slabs on grade, and the beams, footings and for such concrete work as indicated or specified. (Not indicated in the plan).
- Class C: For all concrete not reinforce except as otherwise indicated or specified. (Not indicated in the plan).

o Conveying and Placing of Concrete

Concrete shall be conveyed from mixer to form as rapidly as practicable. There will be no vertical drop greater than 1.50 meters except where suitable equipment is provided to prevent segregation and where specifically authorized by the Architect and or the Structural Engineer or Project Engineer.

Concrete shall be worked readily into the corners and angles of the forms and around all reinforcements and embedded items without permitting materials to segregate. Concrete shall be deposited as close as possible to its final position so that flow within the mass does not exceed two meters and consequently segregation is reduced to a minimum near forms or embedded items, or elsewhere is directed, the discharge shall be so controlled that the concrete may be effectively connected into horizontal layers not exceeding 30 centimeters in depth within the maximum lateral movement specified.

In placing concrete through reinforcement, care shall be taken that no segregation of the coarse aggregate occurs. On the bottom of beams and slabs, where the congestion of steel near the forms makes placing difficult, a layer of mortar of the same cement-sand ratios as used in concrete shall be first deposited to cover the surfaces.

o Curing

Compressive strength of concrete at 28 days curing period shall attain 3000 psi (20.7 MPa) with well graded aggregates having a maximum size of 2 inches (50mm).

All plumbing and sanitary work for the building will be done in accordance with the provisions of the National Plumbing Code of the Philippines and such other regulations prescribed by the plumbing and sanitary regulations of the Municipality.

• MASONRY WORKS (Including Plastering)

- o All hollow blocks are contemplated herein shall be of good quality and readily available in the locality.
- o The cells of the concrete hollow blocks to be laid shall be filled with 1:3 cement mortars (1 part Portland cement and three parts sand, by volume). They shall be reinforces with 10mm diameter horizontal deformed bars every three blocks and 10mm diameter vertical bars deformed bars at 800mm O.C. Unless specified on the elevation drawing, the cement plaster mixture for masonry walls shall be 1:3 (1 part cement, and 3 parts sand, by volume).

Minimum Compressive Strength of Concrete Hollow Blocks is as follows:

Class A	900 psi
Class B	750 psi

SECTION OF THE MUNICIPALITY

DA-PREC. STATE, PANGASINAN

- o Held in place by horizontal and vertical reinforcing and interior surfaces of hollow blocks shall be thoroughly soaked with water before laying. Hold all units in storage for a period not less than 20 days (including curing period) and do not deliver prior to that time unless strength and moisture tests indicate compliance with specification.
- o Mortar aggregates shall be natural river sand, clean and free from soluble salts and organic matter, graded from fine to coarse, compatible with the thickness of joints in which used. Mix mortar from three to five minutes in such quantities as are needed for immediate use. No re-tempering will be permitted if mortar stiffens because of premature setting. Discard such materials as well as those which have not been used within one hour after mixing.
- o Lay units in common bond with uniform coursing and jointing. All concrete block jointing shall be of uniform thickness. Butter vertical and horizontal jointing full with mortar. Bond courses and corners and intersections and tie to abutting walls. Do not lay cracked, broken or decay blocks. Cut edges shall be clean and sharp. The FIRST row of block shall be properly and thoroughly anchored to the concrete columns, walls of slabs. Course shall be laid straight and well plumbed.

PLASTERING

- o Use Portland Cement and Sand 20mm thick. Mixture is [1:3] and plastering of the exterior wall.

TILE WORKS

- o Tile work not is started until rough-in for plumbing and electrical work has been completed and treated. The work of all other trades in the area where the work is to be done shall be protected from damage in the workmanlike manner and as directed.
- o The work shall not be started unless the rough-in for plumbing and electrical has been completed and tested.
- o Manufactured materials shall be delivered in the manufacturer original unbroken package or containers that are leveled plainly with the manufacturer's names and brands container for tiles shall be grade-scaled. Materials shall be handled in a manner that will prevent the inclusion of foreign materials and damages by water or dampness.
- o Tiles shall be ceramic standard grade. Colors specified shall be approved shade. All tile work shall include the matching trim units.
- o Unglazed tiles shall have the same color throughout the body of the tile and the surface texture shall be uniform throughout. Glazed tiles shall have smooth ceramic finish. The finish shall have an impervious glossy texture and shall be either bright lustrous or dull matted as noted or as approved by the Architect.
- o Plain colored tiles (whether glazed or unglazed) shall have as nearly one solid on each tiles as possible. Slight variations in color between tiles may be permitted only with approval of the Architect.
- o Before tile for floor and walls are purchased samples of the same with their accessories shall be submitted to the Architect for the approval as quality and color or shade.

- o Wall and wainscot tiles shall cover walls and partition to nominal height as indicated on the drawings. Finish of wall and wainscot tile shall be in uniform for any one room or unit.
- o Trimmers such as step tile, window trims, door trims, coves, miters, plinths and other special complete and acceptable installation. Coves, quarter-round, miters and returns may be integral with the wall tile. Wall finish shall extend into edges of openings, unless otherwise indicated.
- o Tile wainscot on walls shall have glazed tile capping complete with interior and exterior corner caps. Provide glazed tile moulding at intersections of floor and wall tiles.
- o Floor under tile is included as part of the work under **"CONCRETE CONSTRUCTION"**. It shall be reinforced with shrinkage reinforcement and struck-off to a true, even surface one inch below the finish floor level.
- o A scratch coat back for wall tile shall consist of one part Portland cement, ¼ part lime putty and 3 parts sand by volume.
- o The buttering mortar for setting wall tile and mortar setting bed for floor tiles shall consist of 1 part Portland cement, ¼ part lime putty and 3 parts sand volume. Dusting the mortar bed with cement as the floor tiles are laid will be permitted only to take up excess water and to give better adhesion. The proportions actually used shall be those that will produce the best results under the prevailing conditions.
- o No tile is set on surface unless other work as shown or specified to be embedded in the tile shall have been installed and approved.
- o Glazed wall tile shall be thoroughly soaked in clean water before being set.
- o Tiles shall be firmly secured in place, joints shall be well filled; lines kept straight and true, and finish surfaces brought to a true plane. The complete work shall be free from loose, cracked or broken tile. Tile shall be laid out on floors in a manner such that no tile less than ½ sizes shall occur on the borders.
- o Wall filled tiles shall be set with horizontal and vertical straight line joints, except as indicated otherwise in the drawings. Setting beds of floor tiles shall be thick enough to bring the top of the tiles to the finish slopes. be worked to a true and even plain, either leveled or sloped to drain as required. For areas of more than 100 square feet, screed strips shall be used as temporary guides to secure these results. As large a floor as can be covered with the tile before the mortar has reached its initial set shall be placed in one operation. When more setting mortar has been spread that it can be thus covered it must be cut to a clean, beveled edge close to the tile and removed. Under no circumstances shall be tempered mortar be used. Tiles on floor of more than 100 square feet areas shall be laid to straight edge at regular intervals.
- o The provision of all vinyl tiles and all materials indicated, specified or necessary for complete and finish installation is included. Floor covering work shall not be started until the work of the trades, including painting is substantially completed. Adequate ventilation shall be provided to remove moisture and fumes from the area.
- o Manufacturer's materials shall be delivered to the job site in the manufacturer's original unopened containers, with the brand and name clearly marked thereon. All materials

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6-PRC/SOAL/PANCASIRAN

shall be carefully handled and shall remain in their original containers. Containers shall not be opened until approved.

- o Floor covering shall be provided in colors as selected from manufacturer's standard colors. The colors and pattern of tile shall be uniformly distributed throughout the thickness of the tile.
- o Concrete or plywood sub-floor that is to receive floor covering shall be even and true without depressions by rubbing or grinding evenly before application. If minor floor depressions are to be corrected, use fillers to level concrete. Sub-floors shall be clean, thorough dry, smooth, firm and sound; and they shall be free from springiness, oil, dirt, curing compounds, and other deleterious materials. Sub-floors shall be swept and damp mopped, when necessary to remove dust and soil; and shall be scrubbed with a strong detergent solution, thoroughly rinsed, and spot primed, when necessary to remove oil or grease stains. All ridges shall be ground smooth and small holes and all cracks less than 1.59mm shall be filled with an approved plastic material. Large holes or depressions shall be filled with mastic type underlay, and steel trowelled on to a smooth surface. All cracks 1.59mm or wide shall be cut out and filled with non-shrinking cement mortar. Chalky or dusty surfaces shall be primed with an approved primer, recommended by the floor covering manufacturer.
- o Floor coverings and accessories shall be applied in accordance with the approved installation procedure. Work shall be performed by workers thoroughly experienced in the installation of such coverings. Adhesives shall be the type specified or the type application, subject to approval. Adhesives shall be applied in accordance with the adhesive manufacturer's printed directions, unless specified or directed otherwise. Floor covering shall be applied in the patterns indicated or selected, starting at the center of the room or area, and working towards the edges or borders. Tile lines and joints shall be kept square, symmetrical, tight, and even; and each floor shall be in true, level plane except where indicated as sloped. Border width shall vary as necessary to maintain full sized tiles in the field, but no border tile shall be less one-half tile size.
- o Floor covering shall be cut to and fitted around all permanent fixture, built-in furniture and cabinets, pipes and outlets. Border shall be cut, fitted and scribed to walls and partitions after field covering have been applied.
- o Surfaces to receive the tile shall be clean and free of dust, dirt, oil, grease, and other deleterious substances, floor tile operation to spaces receiving a wall tile installation has been completed.
- o All tiles and moldings shall be set with tile adhesive. They shall be thoroughly soaked in water before they are laid in place. All joints between tiles and moldings shall be filled with tile grout and then carefully wiped. Verify color of tile grout before application. Verify color of ceramic tiles before application.

• STEEL WORKS

- o The fabrication and erection shall be done to conform to AISC Specification and TOTAL Steel System Technical Manual Pre-Engineered Buildings. The Contractor generally has to make or provide shop drawings, which are to be used in actual construction. These shop or working drawings are to be approved by the Architect / Engineer before implementation. The approval of any shop or working drawings, shall not in any way deemed to release the Contractor from full responsibility for complete and accurate

performance of the work in accordance with the Contract Drawings and Specifications; neither shall such approval release the Contractor from any liability placed upon him in the Contract.

- This specification shall only apply to members specifically designated on the design drawing as "architecturally exposed structural steel" which shall be fabricate and handled and erected as directed in this specifications, and except as noted in conformity with the American Institute of Steel Construction Specification for the design, fabrication and erection of Structural Steel for Buildings. All fabrication tolerance of the code of the standard practice.
- Materials shall be the same as specified for Structural Steel by AISC Specification.
- Overall profile dimensions of built-up members shall be adequate to provide for the accumulated permissible overrun of the component parts.
- Fabrication shall be performed with special care and necessary straightening to maintain the condition of the material as described above.
- Shop details, shall show clearly the required fabrication tolerances. Erection plans and/or anchor bolt plans shall show the required tolerances for setting embedded items.
- All gapes, miters and butt cuts in surfaces exposed to view shall be made with uniform gaps of $1/8"$ if shown by the Architect to be open joints, or in uniform contact if shown without gap.
- Where the fit-up of adjacent members is such that permissible tolerances specified in Sections 2b and 2c may result in unsightly joint, the Architect shall specify on the design plans tolerances required. This tolerances shall be maintained by special attention in detailing the joint, or if necessary by refined fabrication techniques.
- Faces of welds exposed to view shall have as welded surfaces that are reasonably smooth and uniform. No finishing or grinding shall be required except where clearances or fit of other items may so necessitate, or as specifically required by design drawings.
- Butt and plug welds exposed to view shall have as welded surfaces that are reasonably smooth and uniform and shall not project more $1/6"$ above the surfaces joined. No finishing or grinding shall be required except where clearances or fit of other items may so necessitate, or as specially required by design drawings.
- After inspection and approval and before leaving the shop, all steel works shall be cleaned by hand wire brushing, or by other means, erected by fabricator, or loose mill scale, loose rust, accessible weld slag or flux deposit, dirt and other foreign matter. Oil and grease deposits shall be removed by solvent.
- After cleaning all steel works shall be given one coat of shop paint applied thoroughly and evenly to dry surfaces, by rush, spray, roller coating, brush coating or dripping, at the selection of the fabricator.
- Surfaces within two inches of any field weld location shall be free of materials that would prevent proper welding or produce objectionable fumes while welding is being done. If shop painted surfaces to be welded shall be wire brushed in the field before welding to reduce the paint film to a minimum.

CONSTRUCTION OF TENSILE CURTAIN WALLS

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- o The erection shall use special care in unloading, handling and erecting the steel to avoid bending, twisting or otherwise distorting the steel members. The erector shall handle the material in such a way as to minimize the damage to shop coat paint.
- o The erector plans and executes the erection in such a way that the close fit and meets appearance of the joints and the structure as a whole will not be impaired.
- o If temporary braces or erection clips re-employed, care shall be taken to avoid any unsightliness upon removal. Tack welds shall be ground smooth and holes shall be filled with weld metal or body solder and smoothed by grinding or filling.

- **TINSMITHRY WORKS**

- o The work includes furnishing all materials and performing all operations to provide metal color roofing and bended sheet metal items as required providing a watertight installation. Surfaces to which roofing is to be applied shall be thoroughly clean and dry and free from any defect that might affect the application.
- o Specific installation details shall be in accordance with recognized sheet metal installation practice.
- o Aluminum coated long span roofing, Ribtype Ga 24.
- o Except as specified herein, all materials shall be installed in accordance with the manufacturer's printed erection instruction.
- o Flashing shall be done according to standard procedures in securing non-leakage and or capillary action of water through joints and laps.
- o The roofing shall be pre painted with roof guard. All design and brand of roofing is specified by the end user.

- **CEILING WORKS**

- o Framing is not required for ceilings attached to structural members, except for framing openings as specified. Furring as hereinafter specified shall be attached directly to structural members.
- o Steel channels or steel studs shall be provided where steel furring is indicated for screw attachment of furring board.
- o Hat - shaped furring members shall be spaced 0.40m on centers and securely attached across suspended runner channels or structural framing members with wire clips or double-strand of 1.0mm tie wire saddle-tied at each crossing. End of wire tie shall receive three full twists. Furring shall be spliced with 0.20m nested laps securely tied near each end lap, with two loops of 1.0mm tie wire. Splices shall be staggered. Furring channels shall be located within 50mm of walls. Where wall borders abut dissimilar wall materials, perimeter of ceilings shall be finished with an edge bead trim strip applied to wall and accurately aligned with the finished ceiling. Wallboard edges adjoining walls shall be laid on the horizontal leg of the trim strip against a continuous bead of approved type sealant.

- ## • PAINTING WORKS

- o Furnish all labor, materials, equipment, plant and other facilities to complete all painting and varnishing as shown and hereafter as specified.
- o The contractor shall examine the Specifications for the various other trades and shall thoroughly familiarize himself with all of the items and surfaces of work to be included.
- o All work included under this Division shall be subject to the General Conditions accompanying these specifications. The Contractor and Sub-contractor for the type of job in this Division are enjoined to strictly follow the provision thereto.
- o This work includes interior and exterior painting and varnishing and finishing of all items as required to produce a finished painting job throughout all of the areas affected by work under this contract, except items which are specifically excluded. Complete color scheme for the painting and varnishing of the building [exterior and interior] shall be furnished by the Architect to the Contractor. Color schemes and varnish samples required by these Specifications and/or by the Architect shall be submitted by the Contractor for approval at his expense.
- o All exposed work shall be protected while the building is being painted or varnished. The floors, steps and all other surfaces not to be painted shall be well protected during painting with sufficient covers. Any stain, dirt, sugar, etc. shall be removed by the Contractor to the satisfaction of the Architect.

- o Neither paint nor varnish shall be applied on finished surfaces like washout finish, synthetic rubble finish, adobe rubble facing, glazed tiles, glass plastic brass, bronze, aluminum, chrome and other non-corrosive metal finishes.
- o The Contractor shall inspect all surfaces to be painted and all defects shall be remedied before starting the work. Commencing of work by the Contractor indicates his acceptance of the surface. No work shall be started unless the Contractor shall have made certain as to dryness of surfaces. Tests shall be made, in the presence of the Architect or his authorized representative, to verify dryness of surfaces to be painted.
- o All concrete shall be allowed to weather for two [2] months or applications of concrete neutralizes before painting
- o Clean all surfaces to be painted and varnished of loose dirt and dust. Do the customary amount of sanding, depending on the Architect's opinion to make the surface acceptable for painting or varnishing.
- o Inspect all surfaces to insure suitability. In the event imperfections due to materials or workmanship appear on any surface after the application of paint, the cost of all correction shall be borne by the Contractor. Damage to any painted or varnished finish due to carelessness or negligence shall be corrected.
- o Patch up all knots, pitch streaks and sappy spots with shellac or other approved sealer. Putty nail holes, cracks, etc. after the first coat non-shrinking putty of a color to match that of the finish.
- o Wash all metal surfaces with mineral spirits or detergent to remove any dirt or grease before applying materials. Where rust or scale is present, clean by wire brush or sandpaper before painting. Where shop coats of paint have become marred, clean and touch up with rust inhibitive primer. Treat all galvanized metal surfaces with a compound designed for this purpose, or approved acid solution before applying the first coat paint.
- o Prepare masonry surface to be painted by removing all dirt, dust, oil and grease stains and efflorescence. The method of surface preparation shall be left to the discretion of the Contractor, provided that, the results are satisfactory to the Architect. Masonry surfaces to be painted shall be free from alkali and thoroughly dry before paint is applied.
- o Before applying succeeding coats, primers and undercoats shall be completely integral and performing the functions for which they are specified
- o Property prepares and touches up scratches, abrasions or any other disfigurement and removes any foreign matter before proceeding with the following coat.
- o Do not apply final coat on interior work until after other trades are finished with their work in any given area in normal sequence and all materials and debris removed, and the premises left in satisfactory broom cleaned condition as approved.
- o Remove or protect hardware, hardware accessories, plates, fixtures and similar items prior to painting. Move equipment and furniture adjacent to walls to permit painting of areas covered by them. Upon completion of the job, place back, reconnect and reposition all items accordingly.
- o Paint the backsides of access panels, removable or hinged covers and the like.

CONSTRUCTION OF THE BUILDING

PERMISSION, PANGASIAN

- All woodwork shall be sanded lightly with No. 100 sandpaper between coats. Paint coats shall be thoroughly dried before sanding.
- All exposed nail head shall be countersunk and puttied after application of primer. Putty shall be whitening putty tinted to match that of finish.
- All painting and varnish work shall be done by skilled house painters and varnishes only.
- All materials shall be evenly applied so as to form a film of uniform thickness, free from sags, runs, crawls or other defects.
- Paints shall be thoroughly stirred so as to have the pigment evenly in suspension while paint is applied.
- In general and unless otherwise specified, and/or instructed by the Architect due to actual conditions on the job, no less than 24 hours time shall elapse between application of succeeding coats. Each coat of paint shall be allowed to dry thoroughly and inspected for approval before the succeeding coat is applied.
- No paint shall be done in damp weather.
- Except where otherwise noted or specified, all paints shall be applied in three [3] coats [priming, body, finish coats]. Each coat shall be roller or brush applied, [except as otherwise noted], spread evenly and in full covering body.
- No work shall be done under conditions unsuitable for the production of good results. No painting or varnishing on woodwork shall be done while plastering is in process or is drying.
- Surfaces which cannot be satisfactorily finish on the number of coats specified shall have additional coats, or such preparatory coats and subsequent coats as may be required to produce satisfactory finished work at the expenses of the Contractor.
- Spray gun application shall be used wherever specified.
- All parts of mouldings and ornamentals shall be left clean and true to details.
- All finishes shall be uniform as to sheen, color, texture, except when glazing is required.
- The painting Contractor, being the last tradesman on the project, shall include in his work all final clean-up and washing of window glass, spots on the floors, hardware, fixtures, etc.
- The types of paint specified are intended to illustrate the quality and are taken from Davies paints catalogue. Equivalent materials from the manufacturer's listed herein, which the Contractor desires to use other than those specified accompany proposal with such request in writing for approval of the Architect. Give manufacturer's name, and the specific name of each product offered as substitute. After the award, no substitution of materials for those mentioned in the accepted proposal will be permitted.

• STAINLESS LETTERING

- Providing and fixing of Stainless Steel Grade 304 letters in English with main letter of name of facility (MULTIPURPOSE FACILITY) of minimum height size of 12" with 25mm raising.
- The letters shall be fixed with the help of stainless steel studs on existing wall which shall not be visible from the front.
- The stainless steel studs shall be properly grouted with suitable sealant.
- Stainless Lettering must be fabricated (see Detailed Engineering Design for reference)
- Test report for conformity of material specifications shall be provided.
- The work shall be executed to the satisfaction of the Designer.
- 304# Brushed Finish: 80-140 grit Hairline pre-finished sheet, face and/or returns, no clear coating.

• ELECTRICAL WORKS

- The work under this Section shall be subjected to the requirements of the General Conditions, which shall be included as part of this Specifications and which shall apply to all work to be performed under the Electrical Division. The contract documents, instructions, drawings and specifications shall be considered as one. Whatever is called for by any of the documents shall be binding as if called for by all.
- The work to be done under this Division of the Specification consists of the fabrication, furnishing, delivery, and installation, complete in all detail of Electrical Work at the subject premises and all work materials incidental to the proper completion of the projects, except those portion of the work which are expressly stated to be done by others. All work shall be in accordance with the governing Codes and Regulations and with the Specifications, except where some shall conflict with codes, etc., which the latter shall then govern. The requirements in regard to materials and workmanship specify the required standard for the furnishing of all labor, materials and appliances necessary for the complete installation of the work specified herein and indicated on the drawings. These specifications are intended to provide a broad outline of the required equipment but are not intended to include all details of the design and construction.
- Under this Division and together with the specifications, provide all materials and equipment and perform all the work necessary for the complete execution of the electrical system shown on the electrical drawings with reference to the general construction drawings as herein specified, or both except as otherwise excluding the generality of the foregoing, shall include both not limited to the following principal items of works:
 - Supply and installation of complete power, telephone and auxillary system services.
 - Supply and installation of the complete grounding system.
 - Supply and installation of the lighting fixtures, battery operated exit and emergency lights and wiring devices.
 - Supply and installation of capacitor banks.

- Painting of all exposed electrical conduits, enclosures and equipment.
- Termination of all electrical system.
- Complete testing and commissioning of all electrical and auxiliary systems.
- Securing and payment of electrical wiring permit and certificate of electrical inspections.
- If anything has been omitted for any items or materials usually furnished, which are necessary for the completion of the entire work as outlined herein before, then such items must be and hereby included in this division of work.
- The work under this Contract is to install according to the requirements of the latest Philippine Electrical Code, the rules and regulations of the municipality, and the requirements of the local power and Telephone Company. Nothing contained in these specifications or shown on the drawings shall be constructed as to conflict with the National and local Ordinances or Laws governing the installation of the electrical work and all such laws and ordinances are hereby made part of these specifications. The Contractor is required to meet the requirements thereof.
- All permits and electrical fees required for this work shall be obtained by and at the expense of the Contractor. The Contractor shall furnish the Architect, the Engineers, Project Managers and the Owner the final certificate of inspection and approval from the proper government authorities after the completion of the work. The Contractor shall prepare all "As-Built" electrical plans and all paperwork required by the approving authorities.
- The work throughout shall be executed in the best and thorough manner under the direction of and to the satisfaction of the Architect and the Engineer, who will jointly interpret the meaning of the drawings and specifications and shall have the power to reject any work and materials which, in their judgement are not in full accordance therewith.
- The Contractor shall have in his file, for ready access and reference, a set of drawings indicating all work as normally installed, incorporating in same all changes and additions. Upon the termination of the Contract, he shall prepare a set of tracings indicating thereon on the electrical work as actually and finally installed and tested. These tracings turned over to the Engineer.
- Approval of equipment and materials: All electrical materials shall be new and must meet the requirements of the specifications and shall bear the inspection label wherever such standard has been established. As soon as practicable and within thirty (30) days after the official award of the Contract and before any materials or equipment is ordered, the Contractor shall submit to the Engineer for approval, one complete list of materials, apparatus and equipment, in triplicate, giving the manufacturer's name, address, descriptive data, trade name of items, rated capacities, certified analysis catalogue number, etc. and when called upon to do so, the complete specifications and cut of drawings of such item, of whole or portion of list, as required by the Engineer, which he proposes to use or install.
- Ground Test: The entire installation shall be free from improper ground and from short circuits. These shall be made and recorder in the presence of a

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representative of the Owner, Project Manager and the Engineer. Each panel shall be tested with main connected to the feeder, branches connected and switches closed, all fixtures in place and permanently connected, lamp removed or omitted from the sockets, ballast disconnected and all wall switches closed. Each individual power feeder shall be tested with the power equipment connected for proper and intended operation. In no case shall be the insulation resistance is less than that allowed by the regulations for electrical equipment and buildings. Failures shall be corrected in a manner satisfactory to the Engineers.

- **Performance Test:** It shall be the responsibility of the Electrical Contractor to test all items of the entire electrical installation for proper operational conditions. This condition shall apply to the power, lighting and auxiliary installation. Where sequence operation is required, the electrical contractor shall test for proper sequence and he shall leave the entire electrical installation in satisfactory working conditions.
- **Cutting and Fittings:** The Contractor shall do all cutting and fittings required for the installation of the work to make and join the several parts joint and coordinate with the work of other trades, in accordance with the drawings and in a manner satisfactory to the Engineer.
- **Protection:** The Contractor shall effectually protect his own work from damage during and as maybe necessary after installation and he shall likewise protect adjoining work of other trades from damage resulting from the installation of electrical work.
- All wires shall be copper, soft-drawn and annealed, shall be of 99% conductivity, shall be smooth and true and of cylindrical form and shall be within 1% of the actual size called for.
- Wires and cables for lighting, power and auxiliary system shall be nylon jacketed, plastic insulated for 600 volts working pressure, type THNN/THWN unless otherwise noted on plans.
- For lighting and power system, no wire smaller than 2.0mm diameter [AWG No. 12 solid] shall be used and must be color coded.
- All wires and cables shall be color coded Color coding wires are as follows:

Line A - Black	Ground -	Green
Line B - Red	Control wire #01	White
Line C - Yellow	Control wire #02	Blue

- Metallic conduits for interior and exterior system shall be a standard weight, mild steel, hot dip galvanized with an interior coating as manufactured.
- No conduit shall be used in any system smaller than 15mm diameter electric trade size, nor shall have more than four 90 degrees bends in any one run and when necessary, pull boxes shall be provided as directed. Location and sizes of pull boxes shall be cleared to the Engineer prior to fabrication and installation.
- No wires shall be pulled into any conduits unless the conduit system is complete in all detail. In case of concealed work, until all rough plastering or masonry has

been completed and in the case of exposed work, until the conduit has been completed in every detail.

- The ends of all conduits shall be tightly plugged to exclude plaster, dust and moisture while the building is in the process of construction.
- All pipes and fittings on exposed work shall be secured by means of KINDORFF CHANNELS and CLAMPS. Conduit layouting, in all cases shall run perfectly straight and true, satisfactory to the Architect and to the Engineer.
- All outlets of whatever kind, for all items, shall be provided with suitable fittings, which shall be either a box or other devices especially designed to receive the type of fittings to be mounted thereon.
- The Contractor shall consult with the Architect and the Engineer as to the nature of the various fittings to be used before installing and shall conform strictly in the use of such fittings when finished with the completed design.
- In the case of fixtures, the outlet fittings shall be provided with suitable fixture supports of a size and kind required for the fixture to be hung. Fixture studs in general shall be 9.375mm diameter.
- At all outlets on concealed conduit work, provide galvanized deep-type pressed-steel outlet boxes of standard make. These boxes shall be especially designed for apparatus required and in all cases where such boxes are not available on the market, special boxes shall be made by the Contractor at his own expense. Outlet boxes shall be deep type gauge #16 as manufactured by Matsushita, Steel City, HKK or approved equal.
- For all exposed installations provide cast device boxes and the necessary conduit bodies, boxes and fittings. Brand of cast device shall be either Appleton or Crouse-Hinds or approved equal.
- Bus bars and circuit breaker gutters shall be powder finished sheet steel having code required minimum thickness and cross-section and shall be provided with a cover along one side hinged with galvanized screw. The length shall fit into each other (male-female) or shall be bolted in a manner approved by the Engineer. Gutter shall be installed complete with all fittings and accessories and supports as shown on drawings and/ directed by the Engineer. Each section of the gutters shall be fixed in at least two places and shall be effectively grounded in accordance with code requirements.
- Cables shall not be terminated in gutters until the whole gutters have been erected. Insulated bushing shall be used in all conduit entries and all such entries shall be made dust-tight, moisture or waterproof as required.
- Bus bar shall be 99% pure copper with regular cross sections. All bus bars shall be silver plated. Ground bus shall be sized at 50 % of the phase buses.
- Bus bar must be braced enough to withstand the expected fault current as indicated in the local schedule.

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- Quality controlled and approved panels and cabinets as far as possible shall be used assembled on the job. All panels shall be dead-front construction furnished with trim for flush or surface mounting as required. Cabinets shall be of code gauge metal with gutter at least 150mm and wider, if necessary. The trim for all panels shall be finished in gray enamel over a rust inhibitor.
- Panels and cabinets shall be fabricated by a reputable fabricator. Fabricator's shop drawings in triplicate copies shall be submitted for approval before fabricating the panels. Only one brand of circuit breaker and fabricator shall be used for the entire requirements of the project. Combinations of brand shall be rejected.
- Lighting panels shall be equipped with two-pole-circuit breaker in the branch circuits and in the main unless noted otherwise on the plans.
- The Contractor shall coordinate his work with all trades involved so that exact locations may be obtained for all outlets, apparatus, appliance and equipment. The circuit numbers indicated as numbers 1, 2, 3 may not correspond to actual panel circuit connection numbers but must be balanced for better load distribution.
- The locations of outlet shown on diagrammatic wiring plans shall be considered as approximate and it shall be incumbent upon the Contractor, before installation of outlet boxes, to study all pertinent drawings and obtain precise information from the architectural schedules, scale drawings, large scale and full size details of finished rooms and the approved shop drawings of the other trades or from the Architects. In centering the outlets, due allowance shall be made for window and door trims, variations in thickness of pouring, plastering, etc. as erected, regardless of conditions which may be otherwise shown on small scale drawings. Outlet incorrectly located shall be properly relocated at the contractor's expense. Local switches shown near the doors shall be verified with the Architect's drawings before installation.
- Furnish and install lighting receptacle and power panels as indicated on plans and panel boards schedules.
- From the main breaker, install feeders to the various outlying panels, motor or equipment as shown on the plans. Feeders shall be underground in reinforced concrete encasement unless otherwise noted.
- The lighting system shall be complete in every respect, all as indicated on the plans as specified.
- All wiring shall be indicated in electrical metallic tubing or as indicated in the plans and in general shall be concealed in the structure.

Mounting heights of devices shall be as detailed on the plans or as follows:

Local Switches	1370mm from the center of device to finished floor line
Receptacles	300mm floors or 150mm above counters, or as shown in the architectural plans.

- Provide all lighting fixtures and lamps at locations shown on the plans or as directed by the Architect.

• PLUMBING WORKS

○ EXCAVATION

Trenches of all underground pipelines shall be excavated to the required depth and grades. Bell holes shall be provided so that the pipe will rest on well-thumped solid ground for its entire length. Where rock is encountered, excavation shall extend to a depth six inches below the pipe bottom and before pipe is laid, the space between the bottom of pipe or other approved filling materials.

○ PIPE LAYING

Pipe in trenches shall be laid true to line and grade on a stable and suitable prepared foundations, each section of the pipe being bedded and bottom of the trench shaped to fit the lowest quadrant of the pipe circumference. All pipes, except concrete pipes, that will run underground shall be protected with concrete, Class "B" casing with a minimum protection of four inches around the perimeter of the pipe, then inches below the finished grade. Where vehicles shall pass over the pipe laying shall be made deeper, depth shall be lower than 0.90 meters. Pipes to be used for water lines must be PPR type.

○ BACKFILLING

After pipe lines have been tested, inspected and approved prior to the backfilling all forms and bracing shall be removed and the excavated materials cleaned from debris. Materials for backfilling shall be free from large or big rocks. Backfilling shall be placed in horizontal layers, properly moistened and compacted to an optimum density that will prevent excessive settlement and shrinkage. Maximum 6 inches layer of backfill shall be overlaid for another compaction process.

○ INSTALLATION

Install plumbing fixtures free and open to afford easy access for cleaning. Install plumbing fixture as indicated on drawings, furnishing all brackets, cleats, plates and anchors required to support fixtures rigidly in place. Install all fixtures and accessories in locations directed in accordance with manufacturer's instructions, minimizing pipe fittings. Protect items with approval means to maintain perfect conditions. Remove worked damage or defective and replace with perfect work without extra cost to end user.

Provide in each bathroom and toilet a standard water closet, compact type, complete with fittings and all incidental materials of local procedures or equally good quality. Provide in each bathroom and toilet and other rooms as provided with a standard lavatory, with complete fittings. Shower heads shall be provided in all bathrooms, spray type, shivel head, chrome plated with valve. Provide and set in place soap holders for each bathroom. Provide and set in place holders in each toilet near the water closet. Provide and set in place as shown in the plans, floor drains, and traps complete.

All soil and drainage pipes shall have a minimum slope of 1% and a maximum slope of 2%. Vertical pipes shall be secured strongly by hooks to building frame. Provide suitable brackets or

chairs at the floors from which they can start. Where an end or circuit vent pipe from any fixtures or any line of fixtures is connected to a vent line serving other fixtures, connection shall be at least four feet (1.20 meters) above floor in which fixtures are located, to prevent use of any vent line as a waste. Horizontal pipes shall be supported by well-secured strap hangers.

o ROUGH-IN

Provide correctly located opening of proper sizes where required in walls and floors for passage of pipes. All items to be embedded in concrete shall be thoroughly cleaned and free from all rust, scale and paint. All changes in pipe size on soil wash and draft lines shall be provided with reducing fitting or recesses reducers. For changes in pipe sizes, provide reducing fittings. High corrosive natural ground within site shall be taken into account by the plumber. Protective features shall be installed to prevent corrosion of all water pipes installed underground.

Extend piping to all fixtures, outlets and equipment from gate valves installed in the branch, near the riser. All pipes shall be cut accurately to measurements, and worked into place without springing or forcing. Care shall be taken as not to weaken structural portion of the building.

• DOORS AND WINDOWS

- o This section includes wood flush and sliding doors and frames, complete.
- o Interior wood flush, panel and sliding doors shall conform to the best commercial standard. Doors shall have wood preservative treatment, insectreated and kiln-dried.
- o Wood flush, panel and sliding doors and frames shall be protected against damage and dampness. Doors shall be stored under cover in a well-ventilated building where they will not be exposed to extreme changes of humidity. They shall not be brought into the building until plastering has been completed and is thoroughly dry.
 - Flush Doors shall be hollow core from tanguile kiln dried frames with 6mm thick tanguile plywood veneer or marine plywood as indicated.
 - Panel Doors shall be decorative or carving type, from tanguile or narra configuration and sizes as shown.
 - Wood Door Frames shall be of the design, size and thickness indicated. This shall be set plumb and true, well-braced to prevent distortion. Frames in masonry or concrete walls shall be secured as indicated, and shall be guijo, paitan or yakal good grade.
- o Flush, panel and sliding doors shall be leveled, hung plumb and fitted accurately allowing 2mm clearance at the jamb and heads. Lock stiles of doors, 45mm thick or thicker, shall be beveled 3mm in the center knobs.
- o This section shall include steel doors and frames as indicated in the drawings or as specified herein, complete.
- o All painted doors and frames and other steel works delivered to the site shall be stored and handled in a manner as to protect them from damage during the construction period. Installation shall commence only when all flooring finishes have been completed.

- o Steel doors and frames shall conform to the best commercial standard as approved and as specified herein.
- o Steel-steel doors, louvers and frames shall be factory fabricated from steel conforming to ASTM Specifications A36. Steel shall be zinc coated stretcher level degree of flatness, pickled and oiled of hot rolled materials, and with manufacturer's standard gauges specified hereinafter for the various uses.
- o Pressed Steel Frames for doors and other openings shall be of the combination buck, frame, frame and trim type; sizes and details as shown and shall include tubular mullions and transform bars used in conjunction with the frames. Frames shall be gauge 14, knock-down type or welded-unit type, and of continuous channel.
- o Welded Unit Type Frames shall have headers and jambs secured at the corners either by internal welding of faces by welded splice plates and shall be further secured at the rabbet either by welding or by mechanical interlock.
- o The headers and jambs, as an alternate, shall be secured at the corners by external welding of faces and grounded smoothly. Faces of frames at junction of head and jamb shall present next line joints. Mullions and transform bars shall be member with heads or jambs, as applicable and shall be butt-welded thereto.
- o Anchors, Frames shall be provided with a minimum of three wall anchors per jambs as required for the adjoining wall construction, including ceiling strut anchors as required by the drawings, and anchors for attachment of frame to the floor. Anchors shall be of not less than 18 gauge steel.
- o Door Steel Gauges shall not be lighter than 18 gauge for 44mm thick doors nor lighter than 18 gauge for 35mm thick doors or for glazed panels. Doors shall be of the type, size, and design shown and provided with honeycomb core insulation for a high degree of sound deadening. Door clearance shall not exceed the following: 3mm at jambs and heads; 5mm at meeting stiles of pair of doors and 20mm at bottom measured from finished floor line.
- o Preparation for Hardware - cutting, reinforcing, drilling and tapping of doors and frames shall be done at the factory except drilling and tapping for surface-applied hardware that shall be done in the field when the hardware is applied.
- o Steel Work Painting finishes - all steel doors and frames shall be provided with anti-corrosive primer and oven-baked finish with acrylic enamel paint or powder coated as indicated. Color shall be beige, ivory or wood grain as approved.
- o Workmanship - the finished items shall be rigid, neat in appearance and free from defects, warp or buckle. Molded members shall be sharp in detail, straight and true. Corner joints shall be coped or mitered, well formed, and in true alignment. Exposed welded joints shall be dressed smoothly.
- o Installation - Frames shall be plumbed, leveled and rigidly secured in place. Temporary spreaders shall be installed until the wall at the frame is completed and the frame is securely anchored in its final position. Wall anchors on door frames shall be installed approximately at the hinge and strike levels. Doors shall be installed in conjunction with the application of hardware.

APPROVED (Signature) _____ DATE _____

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- o Submittal Requirement – Prior to procurement and delivery, brochures or catalogs of the product to be used shall be submitted for approval.
- o This section includes aluminum frame windows, complete.
- o Materials shall be stored out of contact with the ground and shall be arranged to avoid bending, warping or otherwise damaging the fabricated windows.
- o Shall be horizontal type; frames shall be standard sizes or as indicated with powdered coated finish. Glass shall be tempered, 6mm thick, tinted or clear, as specified in section: Glass and Glazing and as indicated.
- o Windows shall be installed without forcing or distortion so that sills and heads are level and jambs are plumb. Windows frames shall be securely anchored into the supporting construction. Joints between aluminum windows and aluminum members including mullions shall be set in mastic and weather stripping of the type recommended by the window manufacturer and as approved, to provide completely water-tight joints.
- o Prior to fabrication and delivery, brochure, catalogs or shop drawings, samples of aluminum frames, mullions, weather stripping, type of finish and glass shall be submitted for approval.
- o This section includes shower enclosure and toilet cubicle partitions, complete.
- o Toilet partitions shall be flush type. The partitions shall be provided complete with all fastenings, fittings and hardware necessary for satisfactory installation.
- o Materials are dividers enclosing one or more cubicles with door panels that swing on one side. Suitable for high-rise industrial buildings, schools, sports, stadiums, commercial establishments and other community buildings.
- o Light weight rigid vinyl frame with specially designed sill slope to allow free drainage system.
- o Provided with non-corrosive rollers to insure smooth operation against sill.
- o Flushes dirt that accumulates on the sill.
- o 3.5 thick polystyrene sheet in figured surface design.
- o Shall be strong, straight, clean cut, smooth, neat and free from defects in workmanship, materials and appearance. The finished thickness is subject to a tolerance of plus or minus 1.59mm. The finished colors shall be as selected from the manufacturer's standard color charts.

- o The work shall be secured in a rigid and substantial manner, straight and plumb, with uniform clearance of 10mm between pilaster and panels 25mm between pilasters and walls, panels and walls, and not more than 4mm between pilasters and doors. Evidence of drilling in walls shall be concealed in the finish work. After installation, all exposed surfaces shall be thoroughly cleaned and all damaged work shall be restored to its original condition, or replaced with new work.

The above specifications are intended for the **CONSTRUCTION OF TISSUE-CULTURE FACILITY.**

Prepared and Submitted By:


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Checked and Reviewed By:


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FOR THE DIRECTOR OF THE BUREAU OF RESEARCH

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