



Republic of the Philippines
DEPARTMENT OF AGRICULTURE
Regional Field Office No. 1
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SCOPE OF WORK AND SPECIFICATIONS

PROJECT NAME: Open Techno Demonstration Facility
LOCATION: Sual, Pangasinan, DA-PREC Station
PROJECT DESCRIPTION: Construction of one unit open techno demonstration facility with a floor area of 48.00 square meters.
AMOUNT: PHP. 1,000,000.00

GENERAL PROVISIONS

The contractor/implementer of the project shall verify all dimensions and conditions of the site and shall notify the DA Project Engineer for any discrepancies between actual conditions and information shown in the drawing before proceeding with the work.

The structural drawings and specifications represent the general framework of the structure. They do not indicate methods of construction, unless so stated, the contractor/implementer shall provide all necessary measures to protect the structure, the contractor/ implementer's obligation to notify the DA Project Engineer of any conditions that may endanger the stability or cause distress in the structure during phases of construction.

This set of specifications shall govern the methods of construction and kinds of materials to be used for the proposed Project shown on the accompanying plans and detailed drawings.

All parts of the construction shall be finished with first class workmanship to the fullest talent and meaning of plans and the specifications, and to the satisfaction of the Department of Agriculture through its Project Engineer. Any defective material or poor workmanship should be replaced or improved by the contractor without additional cost to the owner.

All other materials specifically indicated and illustrated on plans shall be taken as part of this specification regardless whether or not written and such other materials shall be approved by the owner before they are set in place.

DESCRIPTION

I. MOBILIZATION AND DEMOBILIZATION

- The work consists of the mobilization and demobilization of the contractor's personnel, equipment and construction supplies to the site necessary for performing the work required under the contract.
- All roads, culverts, sidewalks, structures, etc. Shall be protected from damages by the equipment.
- Access roads shall be as shown on the drawings. If alternate routes are obtained by the contractor, they must be approved by the municipal engineer or the inspector before use.

II. PROVISION OF CONSTRUCTION SAFETY AND HEALTH PROGRAM	
<p>A. FISRT AID KIT</p> <ol style="list-style-type: none"> The first aid kit shall contain the following <ol style="list-style-type: none"> Plasters in variety of different sizes and shapes Small, medium and large sterile gauze dressings At least 2 sterile eye dressings Triangular bandages Crepe rolled bandages Safety pins, tweezers, scissors and sticky tape Alcohol free cleansing wipes Skin rash cream such as hydrocortisone or calendula Antiseptic cream Painkillers Cough medicine Distilled water for wound cleansing Eyewash or eyebath. The contractor shall have at least one first aid practitioner (first aider) with certification. <p>B. SAFETY DEVICES</p> <ol style="list-style-type: none"> The contractor shall provide PPE for its workforce. The contractor shall provide safety devices like barricades, warning signs, fire blankets and high visibility caution tapes. The Contractor shall provide a full time safety practitioner (Safety Officer) to ensure the safety of its work force. The Contractor should comply with the latest Occupational Safety and Health Standards by the Department of Labor and Employment. Any work done beyond the height of 3m, the worker should wear a full body harness suspended on a solid anchor and to a life line. 	
III. CONSTRUCTION OF TEMPORARY FACILITY	
<ul style="list-style-type: none"> The contractor shall install/construct temporary facilities to expeditiously execute the work and shall remove them from the site when no longer required. The contractor shall obtain temporary and maintain in good condition a supply of potable water for construction use. The contractor shall install temporary electric services with sufficient capacity to supply proper current for various types of construction tools, motors, welding machines, pumps, testing, and other work required. 	
IV. CLEARING AND GRUBBING	
<ul style="list-style-type: none"> The work under this Section shall include clearing, grubbing and disposal, in a manner approved by DA-RFO I, of all vegetation, trees, stumps, roots, brush, rubbish and all objectionable or undesirable matters within the entire dam site, construction camp site borrow areas, road surfacing materials sources, stockpile areas and elsewhere as may be directed by the Project Engineer; all in accordance with Drawings and this Specifications or as directed by the Project Engineer. 	
V. EARTHWORKS	
<ul style="list-style-type: none"> The work under this Section shall include clearing removal, hauling and disposal of all excavated materials tamping and trimming of foundation bed required for the construction of permanent structure, pump sump, PV arrays foundation, perimeter fence foundation, control room, irrigation canals and distribution pipe trench. The contractor shall make all necessary excavation for foundations to grade indicated on the drawings. Work that is excavated to a greater extent than required by the drawings 	

<ol style="list-style-type: none"> The material shall have a soaked CBR value of not less than 25% as determined by AASHTO T 193. The CBR value shall be obtained at the maximum dry density and determined by AASHTO T 180, Method D. Surface Preparation. The existing surface shall be graded and finished as provided under Item 105, Subgrade Preparation, before placing the subbase material. 	
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and specifications and which is within the bearing area of walls, footings, or floor slabs shall be filled structural specifications. The structure foundation shall be staked out accurately, after which, approval by the Architect/Engineer shall be secured before any excavation work is done. The Contractor shall secure the surrounding properties from all forms of damage and destruction caused by the excavation.

- No foundation shall rest on fill. All excavation shall be done with the proper allowances for floor slabs, forms and centers. Bottom of foundation shall be approximately level, clean and clear of loose materials and lower sections true to size. All roots, stumps, organic materials and weathered rocks shall be removed and the cavities cleaned and filled with well-compacted sand and gravel.
- Soil bearing capacities of foundation shall be as specified by the Structural engineer. Should the soil at the proposed level of footing bases be found not capable of resisting said pressure, the Architect or the Structural engineer or Project Engineer, shall be notified and they shall revise foundation details as required.
- Upon completion of foundation no steel reinforcement shall be installed and concrete shall be poured until the contractor has approved the soil for each individual footing. Further supervisions for any indication of weak soil conditions before placing steel reinforcements and concrete.
- After concrete for foundations is hard enough to withstand pressure resulting from fills, the materials removed from excavations shall be used for backfill around them. Backfill and fills shall be placed in layers not exceeding 150mm in thickness, and each layer shall be thoroughly compacted by wetting, tamping and rolling.

Gravel Fill

1. Aggregate for subbase shall consist of hard, durable particles or fragments of crushed stone, crushed slag, or crushed or natural gravel and filler of natural or crushed sand or other finely divided mineral matter. The composite material shall be free from vegetable matter and lumps or balls of clay, and shall be of such nature that it can be compacted readily to form a firm, stable subbase.
2. The subbase material shall conform to Table 200.1, Grading Requirements

Table 200.1 – Grading Requirements

Sieve Designation		Mass Percent Passing
Standard, mm	Alternate US Standard	
50	2"	100
25	1"	55 – 85
9.5	3/8"	40 – 75
0.075	No. 200	0 - 12

3. The fraction passing the 0.075 mm (No. 200) sieve shall not be greater than.
4. 0.66 (two thirds) of the fraction passing the 0.425 mm (No. 40) sieve.
5. The fraction passing the 0.425 mm (No. 40) sieve shall have a liquid limit not greater than 35 and plasticity index not greater than 12 as determined by AASHTO T 89 and T 90, respectively.
6. The coarse portion, retained on a 2.00 mm (No. 10) sieve, shall have a mass percent of wear not exceeding 50 by the Los Angeles Abrasion Tests as determined by AASHTO T 96.
7. The material shall have a soaked CBR value of not less than 25% as determined by AASHTO T 193. The CBR value shall be obtained at the maximum dry density and determined by AASHTO T 180, Method D.
8. Surface Preparation. The existing surface shall be graded and finished as provided under Item 105, Subgrade Preparation, before placing the subbase material.

9. Placing

- a) The aggregate sub-base material shall be placed at a uniform mixture on a prepared subgrade in a quantity which will provide the required compacted thickness. When more than one layer is required, each layer shall be shaped and compacted before the succeeding layer is placed.
- b) The placing of material shall begin at the point designated by the Engineer. Placing shall be from vehicles especially equipped to distribute the material in a continuous uniform layer or windrow. The layer or windrow shall be of such size that when spread and compacted the finished layer be in reasonably close conformity to the nominal thickness shown on the Plans.
- c) When hauling is done over previously placed material, hauling equipment shall be dispersed uniformly over the entire surface of the previously constructed layer, to minimize rutting or uneven compaction.

VI. 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.
- Steel reinforcing bars to be used for this project shall consist of standard deformed structural bars meeting ASTM specifications. All reinforcement shall be placed in accordance with plans furnished by the Engineer.
- 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.
- The steel reinforcements for concrete shall be formed accurately according to the sizes of footings, inlet works, pump house and sump, etc., where they are to be used. They shall be tied together at each bar intersection with Gauge No. 16 G.I. wire or by welding.
- 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 rusting.
- All hooks shall be in accordance with all standard hooks and anchorages specified in ACI 318-83 Building Code.

VII. FORMS WORKS AND 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 centimeter 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 surfacing 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 attained 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.

VIII. CONCRETE WORKS

- This section covers all the materials as cement, aggregates, water, admixtures and proportioning, mixing, transporting, placing, finishing, curing and protecting of concrete, including supplies, equipment, tools and all other incidentals necessary for concrete works.
- All the applicable provisions of the latest revision of the ACI Building Code (ACI- 318 -85) and American Society for Testing Materials (ASTM) shall govern in all cases not specifically provided for herein.
- All cement requirements of concrete works for the contract shall contractor-furnished. The cement shall conform to the requirements of the standard specification of Portland Cement (ASTM: C150 Type 1).
- Fine aggregates shall be clean, well-graded, hard, natural sand or manufactured sand or a combination of both. The minimum 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, alkali organic materials and other deleterious substances.
- Class A mixture shall be used for inlet works, pump house, sump, foundation and for all reinforced work not otherwise indicated or specified.

Mixing of concrete

- 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 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).

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.
- 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.

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).

IX. MASONRY WORKS

- 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 reinforced 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:

Load Bearing	700 psi
Non-Load Bearing	350 psi

- Structural grade, billet steel plain bars conforming to the requirements of "Specifications for Billet Steel Bars of Concrete Reinforcement" ASTM A-615 Allowable $f_s=20,000$ psi deformed.
- 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 28 days (including curing period) and do not deliver prior to that time unless strength and other tests indicate compliance with these specifications.
- 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.
- Lay units in common bond with uniform causing and jointing. All concrete block jointing shall be of uniform thickness. Butler vertical and horizontal jointing full with mortar. Bond course and corners and intersections and tie to abutting walls. Do not lay cracked,

broken or deface 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

- The Plastering of CHB wall should be 20mm thick using Portland Cement and sand. The mixture ratio should be (1:2).
- High-Performance Acrylic Skim coat is a high performance, acrylic-based special bonding paste for interior and exterior use that is mixed with cement and applied on concrete to correct surface imperfections prior to painting. It repairs bubbles, honeycomb and concrete defects on waviness and plumbness from 1mm to 3mm thick.

X. STEEL WORKS

- All material and workmanship shall conform to the latest edition of American Institute of Steel Construction Manual unless otherwise shown or noted.
- All Structural Steel including that of gusset plates, wide flanges, hssp and the likes shall conform to ASTM A36 with yield strength of $F_y = 248$ MPA.
- All bolts and Threaded Fasteners shall conform to the ASTM A325.
- Pull out testing shall be performed to the 10% of the total anchor bolts shall be done in situ by the contractor/supplier.
- All welds shall be E70XX electrode and shall develop at least 100% of the strength of the connected member.
- Dye penetration test shall be performed to the 10% of the total length of the welds done with the building by the contractor.
- All double angle structural members must be provided with the filler plates at 0.30m O.C. maximum spacing.
- All exposed structural steel members shall have at least two coats of grey lead or zinc chromate primer paint.
- All trusses, beams and girders must be provided with a camber at a rate of 3mm for every 3.0M of clear span in a parabolic layout.
- All structural steel should be tested for yield strength as per ASTM A36 and at least yield a strength of $F_y = 248$ MPA.
- The contractor shall submit fabrication drawings to the supervising engineer the shop/fabrication drawings for inspection and approval before works shall commence.
- The supervising engineer shall inspect and verify the steel assembly before installation.

XI. CEILING WORKS

Materials:

- a) Unless otherwise indicated in the Drawings or specified hereinafter use;

Fasteners:

- a) Nails-smooth, copper shank, zinc coated common wire nails of local manufacture.
- b) Screws must be of the best available commercial quality, rust resistant.
- c) Bolts, Nuts and Studs shall be zinc coated regular commercial grade of style, class and style suited for the purpose or as indicated. Shields shall be accurately recessed into concrete and masonry.

Rough Carpentry:

- a) All work is well-fitted accurately set and rigidly secured in place. Anchors and anchor bolts [with eye, nuts and washer], straps and hanger wires shall be provided as required. Anchor straps shall be punched where required.

Joinery Carpentry:

- a) All joints shall be made in an approved manner, installed tight and securely fastened. Exterior joints shall be metered and interior angles coped. Panel shall be fitted to allow for shrinkage, avoid swelling and insure that the work remain in place without warping, splitting and opening of joints.
- b) Joints for cabinet work shall be glued aside from nails or other fastening device required.
- c) All exposed surfaces shall be machine or hand sanded to an even smooth surface ready for finish.

Ceiling

- a) All interior and ceiling eaves ceilings used are 6mm Fiber Cement Board held by carrying channel, double furring, wall angle & clip.

XII. TINSMITRY WORKS

- All materials shall be installed in accordance with the plans or unless otherwise specified by the Engineer. Care shall be exercised in storing, handling, and to prevent any damage to roofing siding sheets. The sheets shall be of the length indicated of the plan, or greatest length suits the purlins. Extreme cares shall be exercised in drilling pilot holes for fastening centered in valleys or crowns as applicable. All metal shaving shall be swept from roofs in competition to prevent rusting and discoloration.
- The roof used is 0.6 mm thick pre-painted Rib-type GI sheet. All sheets to be supported at both ends, at the middle end laps to be properly secured.
- Ridge rolls and hip rolls to be used shall be compatible with the Rib-type roofing with a thickness of 0.6mm. They shall be lap the roofing sheets at least 25 cm. The ridge roll and hip rolls shall be riveted to the roofing sheets, in addition to the rivets engaging the GI straps in securing the roofing sheets to the purlins.

XIII. ELECTRICAL WORKS

- The work throughout shall be executed in the best and thorough manner under the direction of and to the satisfaction of the Architect or the Designer, 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 judgment are not in full accordance therewith.
- 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.
- 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.
- 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 will be completed design.

- Junction and pull boxes per code gage steel shall be provided as indicated or as required for facilitating the pulling of wires and cables. Pull boxes in finished places shall be located and installed with the permission of and to the satisfaction of the Architect and Engineer. Sizes shall be subject to the approval of the Engineer.

IV. PLUMBING WORKS

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.

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.

Rough-In

- Provide correctly located opening of proper sizes where required in walls and floors for past 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.

XV. TILE WORKS

A. Scope of work:

1. The work includes tile work, complete.

B. General:

2. 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 on the workmanlike manner and as directed.

C. Materials:

1. 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.
2. Tiles shall be ceramic standard grade. Colors specified shall be approved shade. All tile work shall include the matching trim units.
3. Unglazed tiles and wall cladding 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. Unglazed tiles shall have shall have 8" x 8" and wall cladding tiles 15cm x 60cm Mariwasa, Euro or its equal [see schedule of finishes].
4. 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.
5. 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.

D. Wall and Wainscot Tiles:

1. 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.
2. Trimmers such as stop 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.
3. 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.

E. Preparatory Work:

1. 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.
2. A scratch coat back for wall tile shall consist of one part Portland cement, $\frac{1}{4}$ part lime putty and 3 parts sand by volume.
3. The buttering mortar for setting wall tile and mortar setting bed for floor tiles shall consist of 1 part Portland cement, $\frac{1}{4}$ 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.
4. 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.
5. Glazed wall and cladding tile shall be thoroughly soaked in clean water before being set.

F. Setting Tiles:

1. Tiles shall be firmly secured in place. Joints shall be well filled; lines kept straight and true, and finish surfaces brought to a true place. 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 $\frac{1}{2}$ sizes shall occur on the borders.
2. 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 tops 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 or more than 100 square feet, screed strips shall be set 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.

G. Protection:

1. Rooms or space, in which tiles are being laid, shall be closed to traffic or other work

and shall be kept free until the floors are completed and the tiles firmly set. Tile work shall be adequately protected from damage until the completion of contract.

XVI. PAINTING WORKS

- All painting works for this project, except as hereinafter specified, shall be done with the use of paint products.
- The contractor shall supply all labor, paint materials, tools, staging and equipment necessary, and shall perform all painting and finishing work as shown in the schedule of painting and finishing work for this project. The painting contractor shall store his materials in one place in the building to be kept near and clean, care being taken in the storage of paints, oils, etc. to prevent danger of fire. Oil rags shall be kept in metal containers and shall be removed from the building every end of the working day. All paintings are to be done in good workmanship manner. No painting shall be done on all surfaces before neutralizing and proper sand papering is through. No painting on damp weather is to be done.
- All concrete surfaces to be painted shall first be coated with concrete neutralizer. Exterior walls shall be finished with Solvent-Based Acrylic Paint, first coated with Penetrating sealer. Interior wall shall be finished with Latex Paint, first Painted with concrete sealer. Steel or iron surfaces must first be painted with anti-rust proofing. All color schemes for painting the building shall be decided by the Architect and end user, to be implemented upon completion of the construction. The Contractor shall submit color samples and finishes for approval by the Architect and End user before final application.
- Cracks and holes shall be filled with putty compatible with the surface to be painted and the paint materials to be applied. All wooden door jambs and cabinet frames and shelves to come in contact with masonry surfaces must be painted with SOLIGNUM wood preservative.
- Upon completion of the painting works, the painting Contractor shall remove any paint spots from all finished work. He shall present his work to the in charge of the Construction, free from blemishes and rubbish generated by his workers.
- Before any painting is done, all surfaces shall be cleaned, smoothed and freed from dust, dirt, grease, mortar, rust and other foreign substances. All parts where paint remover has been used shall be washed off with paint or lacquer thinner. All paints shall be spread evenly and carefully.
- All paint and paint materials shall be delivered to the building site in unbroken packages, bearing the marks of the specified brand. No adulteration of specified paints with other brands shall be allowed without the consent of the Architect and End user.
- All other materials specifically indicated and illustrated on plans shall be taken as part of this specification regardless whether or not written and such other materials shall be approved by the end user before they are set in place.

XVII. DOORS AND WINDOWS

Wood Doors

Scope

This section includes wood flush and sliding door and frames, complete.

General

Interior wood flush, panel and sliding door shall conform to the best commercial standard. Doors shall have wood preservative treatment, insectreated and kiln-dried.

Storage and Operation

Wood flush, panel and sliding door 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.

Materials

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,

Installation

Flush, panel and sliding doors shall be leveled, hung plumbed 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.

Apply hardware with fastening of the size, quality, quantity and finish to provide workable door system and as specified in Section: Builder's Hardware.

Submittal Requirements

Prior to the fabrication flush, panel and sliding doors, and frames, shops, drawings shall be submitted indicating materials used, sizes, fastening devices and finish for approval.

Analok Windows (see schedule)

a) Scope

1. This section includes analok frame windows, complete [Glass, Casement and Fixed].

b) Storage and Protection

1. Materials shall be stored out of contact with the ground and shall be arranged to avoid bending, warping or otherwise damaging the fabricated windows.

c) Analok Frame Windows

- 1) 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.

d) Weather Stripping

- 1) Shall be standard type of the manufacturer as approved, and shall be easily replaced without special tools.

e) Installation

- 1) 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.

f) Submittal Requirements

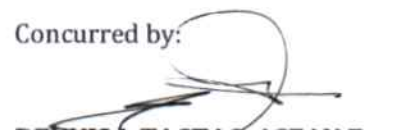
- 1) Prior to fabrication and delivery, brochure, catalogs or shop drawings, samples of analok frames, mullions, weather stripping, type of finish and glass shall be submitted for approval.

The above specifications are intended for the Open Techno Demonstration Facility project at Sual, Pangasinan, DA-PREC Station.

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