

Section VI

Specifications

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INTRODUCTION

1. Equivalency of Standards and Codes

Whenever reference is made in the Contract to specific standards and codes to be met by the goods and materials to be furnished, and work performed or tested, the provisions of the latest current edition, or revision of the relevant standards and codes in effect shall apply, unless otherwise expressly stated in the Contract. Where such standards and codes are national or relate to a particular country or region, other authoritative standards that ensure a substantially equal or higher quality than the standards and codes specified, will be accepted subject to the Engineer's prior review and written consent. Differences between the standards specified and the proposed alternative standards shall be fully described in writing by the Contractor, and submitted to the Owner's Representative at least 28 days prior to the date when the Contractor desires to use them for the Owner's Representative consent. In the event the Owner's Representative determines that such proposed deviations do not ensure substantially equal or higher quality, the Contractor shall comply with the standards specified in the documents.

2. The Standard Specifications

The Standard Specifications applicable to this Contract shall be the Republic of the Philippines, Department of Public Works and Highways (DPWH) "Standard Specifications" for Highways, Bridges and Airports (Volume II) 2013 or latest edition and orders of the department. "Item" herein refers to the item number with the Standard Specifications.

3. Special Specifications

To supplement the Standard Specifications, reference should be made to the attached Special Specifications for the special item of works and the Environmental Special Specifications.

4. Other Generally-Accepted Principles and Practices in Civil Engineering

The generally-accepted principles and practices in Civil Engineering are hereby adopted in so far as they do not run in conflict with established specifications.

DEFINITION OF TERMS

Whenever the following terms are used in these specifications, the intent and meaning shall be interpreted as follows:

AASHTO

The American Association of State Highway and Transportation Officials, the successor association to AASHTO.

ASTM

The American Society for Testing and Materials

BS

British Standard Institution.

BRS

Bureau of Research and Standard

DOST

Department of Science & Technology

DTI

Department of Trade & Industry

CONTRACT

The written agreement covering the works to be performed. The Contract shall include, but is not limited to: The Contract Agreement, the Conditions of Contract, the Contract Specifications, drawings, plans and other legal requirements as may be required.

CONTRACTOR

The party or parties on whose behalf the Bid was submitted including its or their respective permitted assignees and where the Contractor comprises more than one party and the context so requires, each and every such party.

PROJECT SITE

The project site refers to the whole road network including related structures within the Subic Bay Freeport Zone

ENGINEER/PROJECT-IN-CHARGE FOR SBMA

Any person, firm or company appointed by the owner, Subic Bay Metropolitan Authority (SBMA) to perform the duties set out in the Conditions of Contract.

LABORATORY

The official testing laboratories of the Contractor as required.

MATERIALS

Any substance specified or required for use in the construction of the Contract work.

PLANS

The official drawings or exact reproductions which show the location, character, dimensions and details of works to be done.

WORK

The furnishing of all labor, materials, tools, equipment and incidentals necessary or convenient to the Contractor's performance of all duties and obligations imposed by the Contract.

SPECIFICATIONS

The meaning as identified on the Contract conditions and requirements.

For additional Definition of Terms and interpretations, please refer to clauses applicable in the Conditions of Contract.

PART A:
GENERAL AND OTHER REQUIREMENTS

DIVISION I: GENERAL AND OTHER REQUIREMENTS

B.5 Project Billboard / Signboard

A. Description

This item shall consist of furnishing, installing and maintaining during the duration of the project, the project information signboard of the type specified in accordance with this Specifications and the details as shown in the drawings. Location for signboard shall be identified by the Project-in-Charge for SBMA.

The Project Information Signboard shall be a tarpaulin signboard that must be suitably framed for outdoor display at the project location and shall be posted as soon as the award has been made.

B. Material Requirements

Sign Panel

The panel for the project informational signboard shall be the standard 8 ft. x 8 ft. white tarpaulin suitably framed. The design and format of the tarpaulin, as shown in the drawings, shall have the following specifications:

Resolution	:	70 dpi
Font	:	Helvetica
Font Size	:	Main Information – 3”
	:	Sub-Information – 1”
Font Color	:	Black

Posts and Frames

The post and frames shall be hard wood of the specie indicated on the drawings.

Hardwares

All hardwares shall be of the kind and size specified on the drawings or as approved by the Project-in-Charge for SBMA.

C. Construction Requirements

Location

The project information signs shall be installed at the area designated by the Project-in-Charge for SBMA.

Excavation and Backfilling

Holes shall be excavated to the required depths of the bottom of the posts as shown on the drawings.

Erection of Posts

The posts shall be erected vertically in position at the locations identified by the Project-in Charge for SBMA.

Installation of Sign Panel

The sign panel shall be erected in accordance with the details shown on the drawings. Any chipping or bending of the sign panel shall be considered as sufficient cause to require replacement of the panel at the expense of the Contractor.

D. Method of Measurement and Basis of Payment

The accepted quantity, the number of set of signboard provided, shall be paid for at the contract unit price for item Project Information Signboard which price and payment shall constitute full compensation for furnishing and placing all materials including all labor, utilization of tools and equipment and incidentals necessary to complete the work.

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
B.5	Project Billboard / Signboard	Each

B.7(1) Occupational Safety and Health (PPE & Safety Personnel)

B.7(2) Occupational Safety and Health (Warning Signs)

A. Description

This item shall be in accordance with DOLE Department Order NO. 13, otherwise known as Guidelines Governing Occupational Safety and Health in the Construction Industry.

Personal Protective Equipment (PPE): All PPE and devices shall be in accordance with the requirement of the Occupational Safety and Health Standards (OSHS) and should pass the test conducted and/or standard sets by the Occupational Safety and Health Center (OSHC). The Contractor shall provide the required PPE for all its workers needing such equipment. All other persons entering the construction site must wear the necessary PPE. The following PPE required for the project is listed below;

- a) Safety Helmet
- b) Safety Shoes
- c) Working Gloves
- d) Rubber Boots

- e) Safety Goggles
- f) Dust mask

Safety and Health Officer/Personnel: The Contractor shall have over-all management and coordination of all safety and health officers/personnel responsible for ensuring compliance with the pertinent DOLE Guidelines within the construction site. All full time safety and health personnel must be accredited by DOLE.

Safety on Construction Equipment: All heavy equipment operators must be accredited and certified by TESDA while heavy equipment shall be tested and certified by DOLE recognized association/organization.

Construction Safety Signage and Barricades: Mandatory provision of safety and warning signs shall be in place on the construction site and nearby area to warn the workers and general public of the hazards existing in the worksite. Signs shall conform to the standard requirements of the OSHS. Refer to Plans for the details and recommended locations or as directed by the Architect/Engineer in Charge of the project.

The Contractor shall provide painted metal cladding temporary fence of the whole project site with necessary gate(s) for the whole duration of the project. The Contractor shall remove the fence and turnover all salvageable materials to SBMA-PPMD and all buildings shall be cleared and the area shall be graded as required by the Engineer.

B. Method of Measurement and Basis of Payment

The accepted quantity shall be paid for at the contract unit price for item Occupational Safety and Health Program which price and payment shall constitute full compensation for all the works and incidentals prescribe in this Item.

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
B.7(1)	Occupational Safety and Health Program (PPE & Safety Personnel)	Lump Sum
B.7(2)	Occupational Safety and Health (Warning Signs)	Lump Sum

B.9 Mobilization / Demobilization

A. Description

Mobilization: When the Contractor has executed the transport and furnishing of all necessary manpower including equipment but not limited to as tabulated below as well as all necessary preparations and requirements for the execution of permanent works.

Item No.	Equipment Description	Capacity	No. of Units
1	One Bagger Mixer	4.0 - 6.0 cu. ft/min	1
2	Bar Cutter	(20 mm Max. Rebar Ø (Gr. 40), Single Phase	1
3	Plate Compactor, Vibratory	5 HP	1
4	Pneumatic Breakers, Hand Held	4 HP	1
5	Dump Truck	12 cu.yds	1
6	Concrete Saw, 14" blade dia.	7.5 HP	1
7	Concrete Vibrator	5 HP	1
8	Cutting Outfit		1

The Contractor shall mobilize and bring out into work all personnel and equipment in accordance with his approved Construction Program, Equipment Moving and Utilization Schedule and Manpower Schedule, from its regular place of business or another project to the site to undertake the Contract. The Contractor shall begin mobilizing manpower and construction equipment as soon as the site has been formalized.

Mobilized equipment required in the contract shall be duly listed by the Contractor for approval, and, shall not be removed from the site by the same without prior written approval from the Project-in-Charge for SBMA.

All Contractor's initial mobilization costs such as planning and designing all temporary works and facilities and making submittals to the Project-in-Charge for SBMA, recruiting and transferring staff, obtaining all necessary government licenses, permits, clearances, etc., and any other costs involved in preparing to carry out the permanent works as stipulated in the contract and / or as required by the Project-in-Charge for SBMA, shall not be paid separately but shall be included in the unit prices in general or specific overheads.

All items prescribed above shall comprise the general aspects of the Mobilization Phase.

Demobilization: When the Contractor has moved out all its manpower and equipment that are no longer necessary, and when the area is cleaned and satisfactory to SBMA.

Upon completion of the Project, the Contractor shall clear all the areas under contract to the satisfaction of SBMA including the dismantling of temporary facilities, hauling of salvaged materials to designated areas and clearing, transport and disposal of all construction debris. The contractor shall also pullout all existing manpower and equipment as duly approved by the Project-in-Charge for SBMA.

Costs incurred in demobilization shall be included in this item.

All items prescribed above shall comprise the general aspects of the Demobilization Phase.

B. Method of Measurement and Basis of Payment

The accepted quantity shall be paid for at the contract unit price for item Mobilization and Demobilization which price and payment shall constitute full compensation for all the works and incidentals prescribe in this Item.

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
B.9	Mobilization / Demobilization	Lump Sum

B.14 Environmental Management and Monitoring

A. General Description

Waste Disposal:

1. The Contractor shall provide for its workers adequate and appropriate sanitary facilities, i.e. provision of portable toilet in accordance with guidelines to be provided by the Ecology Center, and ensure that all sewage is disposed of, if and as necessary, by a SBMA accredited sewage disposal company.
2. The Contractor shall ensure that oil and grease and other related hazardous wastes, such as paints, concrete epoxies admixtures, etc., which are generated during Contract implementation shall be properly contained, handled and disposed of outside SBMA Secured Area in accordance with provisions of Chapter VII of DAO 29 (IRR of RA 6969, otherwise known as the Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990). Disposal shall be done by a DENR and SBMA accredited hauler and transporter, who shall advise the disposal site.
3. The Contractor shall provide the Ecology Center with Material Safety Data Sheets (MSDS), to be supplied by the materials suppliers, for hazardous chemicals it intends to use (painting, coating, termite control, soil poisoning, etc.). These shall be properly stored, handled and disposed of in accordance with provisions of DAO 29 (see 2. above).
4. The Contractor shall ensure that recyclable items such as metal scraps shall be stored in an appropriate manner and reused to the fullest extent feasible. All materials remaining after completion of the Project shall be either recycled or disposed of in SBMA approved disposal site. The designated disposal site is at the Olongapo City Landfill.
5. The Contractor is prohibited from maintaining a garbage dump within its leased premises. Construction debris and spoils such as excess and/or broken concrete, hollow blocks, tiles, etc. shall be disposed of in SBMA approved Landfill (see 4. above). All wastes shall be properly contained and disposed of in this landfill. The Contractor shall secure a dumping permit for each truckload of waste to be

disposed of in SBMA approved disposal site. Cost and requirements for disposal are the following:

a. Hauling by the Contractor

- Tipping Fee of Php 1,800 for every two (2) tons or one (1) dump truck load.
- Requirements to be processed by the Contractor:
 - i. Certification from the end user/implementing department of the project, which is the SBMA Engineering Dept.
 - ii. Clearances from the (i) Solid Waste Management Division of the SBMA Maintenance and Transportation Department, (ii) SBMA Procurement and Property Management Department and (iii) the Bureau of Customs in the Subic Bay Freeport Zone.

b. Hauling through the SBMA's Maintenance Services

- Service Charge of Php 4,500.00 for every two (2) tons or one (1) dump truck load.
- Requirements and/or clearances will be processed by the Solid Waste Management Division of the SBMA Maintenance and Transportation Department.

6. For debris and spoils which are unacceptable in SBMA approved Landfill because of their size, such as large metal and concrete scraps/sections, the Contractor shall dispose of these in a site located within the Secured Area of SBMA to be identified by the Engineering Department and/or Ecology Center.

Protected Areas:

7. No trees may be cut, pruned unless a joint inspection with the Proponent and the Ecology Center is done and a permit to do so has been issued by the Ecology Center. Hence, the Proponent shall comply with the SBMA Guidelines for Allowable Tree Cutting and Trimming within Subic Bay Freeport Zone.
8. The Contractor shall minimize effect of construction activities to mangrove areas. In case it is really necessary to touch portions of these areas, contractor shall submit a Mangrove Rehabilitation Program of the EC for approval prior to infringement of these areas.
9. All construction and related activities shall be limited to the identified right-of-way (ROW), unless approved by the Engineer. The Contractor shall not create trails and the like outside of the designated ROW and laydown areas, especially in forested areas, unless approved by the Engineer. Likewise, Contractor shall ensure light and other electrical equipment are kept away from trees and grasses. The Contractor is liable for fully restoring any area scarred or damaged outside of designated ROW's.

10. The Contactor shall ensure that no fishing, hunting, or collection of wild plants and animals is undertaken by his staff or the staff of his Sub-Contractors on or adjacent to the site. The Contractor shall be fully penalized as provided for by law.

Environmental Quality:

11. The Contractor shall strictly adhere to DENR standards on dust and smoke emissions as provided for in Section 62 of DAO 14. The Contractor shall also follow noise standards as provided for in Section 78 of PD 984. SBMA shall reserve the right to refuse entry into the Freeport at any vehicle which fails to comply with such standards. The Contractor shall be penalized for vehicles failing to comply with standards.
12. The Contractor shall ensure that all trucks use tarpaulins (spill catchers) to cover their top loads in order to prevent construction debris from falling on the roads. In the event of falling debris, the Contractor must take all necessary actions to recover the same. He shall be responsible for keeping the roads within the Freeport used by the Contractor's construction vehicles free from dirt and debris. Failure to do so will result in the imposition of necessary fines and penalties.
13. The Contractor shall ensure cleanliness of his leased premises and construction site at all times. This means that all construction materials shall be properly stored. He shall also ensure regular maintenance of trucks, vehicles and equipment. Failure to do so shall result in the imposition of necessary fines and penalties.
14. The Contractor shall conduct his construction activities so that they shall not be a nuisance and/or safety hazard to the public. A Traffic Management Plan shall be prepared by the Contractor and approved by the Engineer.
15. Contractor shall provide its personnel appropriate personal protective equipment including, as deemed necessary, eye and face protective devices, hard hats, safety shoes, electrical protective devices, respirators, gloves, ear plugs/muffs, etc. The appropriate protective devices must be worn as necessary. Mandatory safety provisions in accordance with standard industry practice must be strictly observed. The Contractor shall prepare a Health and Safety plan for approval and appoint/designate a Safety Officer to oversee the implementation of all safety requirements and guidelines.
16. The Contractor shall conduct monthly effluent monitoring of water bodies, potentially affected by the project including parameters such as color, temperatures, TSS, oil and grease and BOD as mandated with provisions of Section 5 of DAO 35.
17. Throughout the Contract period, the Contractor shall provide for adequate temporary drainage at all locations along the project to prevent damage from rainfall and flooding in the form of erosion, loss of strength, contamination, etc. to adjacent pavements, water bodies/streams, etc.

Provision of One (1) Unit Portable Toilet

A. Description

This item shall consist of provision of one (1) unit portable toilet on rental basis including cleaning and disposal services and all other incidentals necessary to complete the work in accordance with this Specification or as directed by the Engineer.

The Contractor must ensure that portable toilets are to be compliant with all applicable codes, regulations, and industry standards, including proper disposal.

The Contractor and service provider agreement shall be in satisfaction to the Engineer in accordance to the Environmental Management Program required for the duration of the project.

B. Basis of Payment

The accepted quantities, measured as Month, shall be paid for at the contract unit price, for the pay item listed below that is included in the Bill of Quantities, which price and payment shall constitute full compensation for the provision for Portable Toilet including all other incidentals necessary to complete this item.

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
B.14	Environmental Management and Monitoring	Lump Sum

OTHER INSTRUCTIONS TO CONTRACTOR

Photographs and Contract Documentation

Provide necessary documents as stipulated in the contract and as required by the Project-in-Charge for SBMA including photographs taken at the jobsite at the specified stages of the contracted work or as again directed by the Project-in-Charge for SBMA.

At all instances requiring progress photograph presentation, the following guidelines must be maintained:

- Size : 5R
- Type: Smooth surface, glossy print, single weight paper with white base mounted on muslin or on double weight glossy paper.
- Photographs and prints must be of professional quality; clear, in focus, with high resolution and sharpness, and with minimum distortion.
- Photographs must be of the same view position of the works to show continuous progress of the works until the works are completed or as directed by the Project-in-Charge for SBMA.

- Photographer should identify each photograph location or by such other means as acceptable to the Project-in-Charge for SBMA, to enable future photographs to be taken from the same location and position.

Progress photographs shall not be measured and paid but shall be considered part of necessary documents to be provided as stipulated in the contract and as required by the Project-in-Charge for SBMA.

Material Testing

Seven (7) days upon receipt of the notice to proceed, The Contractor together with the Materials Engineer of SBMA shall jointly undertake sampling and testing of all material requirements of the contract, the Contractor intends to use for this project. The Materials Engineer of SBMA will see to it that extra sample be set aside in his/her office for future reference purposes.

All tests shall be normally carried out on the site, except that certain special tests may, subject to the approval of the Materials Engineer for SBMA, be carried out at an approved independent accredited testing laboratory. The Contractor shall, if so approved, make all necessary arrangements for the supply and delivery of samples to, and collection of samples from such independent Laboratory. Unless otherwise specified, the Contractor shall arrange for one (1) copy of the independent testing laboratory' test certificate to be delivered to the Materials Engineer for SBMA not less than three (3) days before the materials covered by the relevant test certificate are incorporated in the Works, and test certificates shall be relatable to the materials from which the sample was taken.

Accredited Testing Laboratory

Testing of materials shall be carried out, conducted or be performed at testing laboratory accredited by the Bureau of Research and Standard (BRS) of the Department of Public Works and Highways (DPWH) and Department of Science and Technology (DOST).

SCHEDULE OF MINIMUM TEST REQUIREMENTS

ITEMS OF WORK	MINIMUM TEST REQUIREMENTS
Removal of Structures & Obstruction	None
Clearing & Grubbing	None
Masonry Units	Test: 1-Q, Quality Test for every 10,000 units or fraction thereof
Structural Concrete	<i>* This item shall consist of furnishing, bending, and placing and finishing concrete in all structures except pavements.</i> Cement Quantity: (40 kg/bag) Class A ----- 9.0 bags/cu.m. of concrete

	<p>Class B ----- 8.0 bags/cu.m. of concrete</p> <p>Tests: For every 2000 bags or fraction thereof</p> <p>1-Q, Quality Test</p> <p>B. Fine Aggregate</p> <p>Quantity: cu.m./cu.m. of concrete</p> <p>For Rounded For Angular</p> <p>Class A ----- 0.50 ----- 0.54</p> <p>Class B ----- 0.45 ----- 0.52</p> <p>Class C ----- 0.53 ----- 0.59</p> <p>Tests: For every 1500 cu.m or fraction thereof</p> <p>a. For a source not yet tested or failed in previous quality test</p> <p>1-Q, Quality Test for: Grading, Elutriation (Wash), Bulk Specific Gravity, Absorption, Mortar Strength, Soundness, Organic Impurities, Unit Weight, % Clay Lumps and Shale</p> <p>b. For a source previously tested and passed quality test:</p> <p>1-Q, Quality Test for: Grading, Elutriation (Wash), Bulk Specific Gravity, Absorption, and</p> <p>Mortar Strength</p> <p>For every 75 cu.m. or fraction thereof:</p> <p>1-G, Grading Test</p> <p>C. Coarse Aggregates</p> <p>Quantity: cu.m./cu.m. of concrete</p> <p>For Rounded For Angular</p> <p>Class A ----- 0.77 ----- 0.68</p> <p>Class B ----- 0.82 ----- 0.73</p> <p>Class C ----- 0.70 ----- 0.68</p> <p>Class P ----- 0.68 ----- 0.65</p> <p>Tests: For every 1500 cu.m or fraction thereof a. For a source not yet tested or failed in previous quality tests:</p> <p>1-Q, Quality Test for: Grading, Bulk Specific Gravity, Absorption, Abrasion, Soundness and Unit Weight</p> <p>b. For a source previously tested and passed quality test:</p>
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	<p>1-Q, Quality Test for Grading, Absorption, Bulk Specific Gravity and Abrasion</p> <p>For every 75 cu.m. or fraction thereof:</p> <p>1-G, Grading Test</p> <p>D. Water</p> <p>1-Certificate from Project Engineer</p> <p>1-Q, Quality Test, if source is questionable</p> <p>E. Premolded Filler for expansion joints</p> <p>1-Q, Quality Test on each thickness of filler for each shipment</p> <p>F. Steel Reinforcement</p> <p>1-Q, Quality Test for every 10,000 kg or fraction thereof for each size</p> <p>G. Concrete</p> <p>Compressive strength test on concrete cylinder samples. 1 set consisting of 3 concrete cylinder samples shall be taken from each day's pouring and to represent not more than 75 cu.m of concrete or fraction thereof</p>
Timber Structures	<p>* This item shall consist of construction of timber structures to the dimensions, lines and grades as shown on the plans.</p> <p>Tests:</p> <p>1 – Q, Quality Test or Manufacturer's Certificate for each type of material used</p> <p>1 – IR, Inspection Report for each type and shipment of timber</p>
Metal Structures	<p>* This work shall consist of steel structures portions of composite structures, constructed in reasonably close conformity with the lines, grades and dimension.</p> <p>1-Q, Quality Test or Mill Test Certificate for each type of materials used</p> <p>1-Inspection Report for each type and shipment of metal used</p>
Paint	<p>1-Q, One 20-L can for every 100 cans or fraction thereof or</p> <p>1-Q, one 4-L can for every 100 cans or fraction thereof</p>

All Quality/Material Testing requirements shall not be measured and paid separately but shall be considered integral with the other pay items of the contract.

As-stake & As-built Plans

Within seven (7) calendar days upon receipt of Notice to Proceed, the Contractor shall initiate joint as-stake survey with the Project-in-Charge for SBMA to make certain the work scope and quantities as originally proposed for the contract, the Contractor shall provide qualified surveyor, rod-man, utility personnel and traffic personnel with necessary protective equipment, safety gears, tools, and gadgets to perform the work safely and efficiently.

The Contractor shall provide and maintain surveying equipment necessary for this purpose.

During and after each phase of work, joint surveys shall be done which will serve as basis to every interim payment certificate being submitted by the contractor.

The Contractor is responsible for the production of the plans, and presentation of the survey data as designed and approved by the Project-in-Charge for SBMA.

As the work progresses, the Project-in-Charge for SBMA may instruct additional surveys that may or may not be included in the project and which the Contractor must be willing to comply.

As-built plans will be based from the compiled summary of all the individual surveys for all of the completed work items.

Water and Electrical Charges

SBMA shall provide assistance for necessary coordination for the provision of water and electrical supply for project related activities by the Contractor during the duration of the contract.

Necessary temporary connections/extensions, etc. (labor and materials) shall be provided by the Contractor upon identification by the Project-in-Charge for SBMA of the source/tapping point for water and electrical supply to be used for the project. The Contractor shall dismantle all temporary connections/extensions, etc., and restore to original state the sources of the utility supplies upon project completion.

In case no source/tapping point can be found within the site, the Project-in-Charge for SBMA and the Contractor shall agree with any means that will satisfy the needs for water and electrical supply during the duration of the project.

Note that all expenses incurred, tapping, consumption and restoration, for this item shall be shouldered by the Contractor.

- End of Part A -

PART B:
RENOVATION OF OFFICE BUILDING

DIVISION I: REMOVAL AND DEMOLITION WORKS

801(12)a	Removal of Existing Ceiling Boards and Framings
801(12)b	Removal of Existing Floor Finishes (Carpet & Vinyl Tiles)
801(12)c	Removal of Existing Doors and Frames
801(12)d	Removal of Existing Wood Partition
801(12)e	Removal of Existing Acoustic/Gypsum Board Wall Cladding
801(12)f	Demolition of Concrete/Masonry Wall for Wall Opening

PART 1 - General

A. Description of Work

1. General

This item shall consist of furnishing of labor, tools and equipment necessary for the removal/dismantling of existing structures and obstructions and all other materials, accessories and incidentals including hauling and disposal of debris in accordance with the specification as shown herein.

Removed materials that are not deformed/damaged and/or in good condition but are not to be re-used, must be properly documented and to be turned over to SBMA.

Disposal of removed materials and debris should be at the SBMA designated disposal area approved by SBMA.

2. Removal of Parts of Building Structures

Unless directed otherwise in the Contract Documents, the Contractor shall:

- a. Remove and properly dispose of all structures, trash, rubbish, walls (CHB & wood), floor finishes including raised floor, ceiling, ducting and piping and all other incidentals from the specified structures.
- b. Removal and disposal of all materials from the demolition site shall be in accordance with guidelines to be provided by the Ecology Center.
- c. Remove and dispose of appliances and other items that may contain refrigerants in accordance with IRR of RA 6969, otherwise known as the Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990. Appliances and other items that may contain refrigerants include,

but are not limited to, refrigerators, freezers, dehumidifiers and portable or central air conditioners. A manifest will be required for all hazardous waste material disposal.

- d. Remove and legally dispose of mercury-containing materials including fluorescent, high-pressure sodium, mercury vapor, metal halide light bulbs, and thermostats containing a liquid filled capsule. PCB-containing materials include capacitors, ballasts, and transformers where the component is contained within a metal jacket and does not have a specific, legible label stating no PCBs are present.
- e. Disconnect and cap all utility services at property line before demolition.
- f. Perform site clearance, grading and restoration.
- g. Complete the demolition work in accordance with the Plans and these Technical Specifications and any special provisions included in the Contract Documents.
- h. At no time shall demolition debris be buried on the property or be brought in and used as backfill unless otherwise approved by the Engineer in Charge.
- i. Contractor shall obtain all necessary permits prior to execution of demolition work.

B. Protection of the Public and Properties

1. Littering Streets

- a. The Contractor shall be responsible for removing any demolition debris or mud from any street, alley or right-of-way resulting from the execution of the demolition work. Any cost incurred by the SBMA in cleaning up any litter or mud shall be charged to the Contractor with no additional cost.
- b. Littering of the site shall not be permitted.
- c. All waste materials shall be promptly removed from the site.

2. Street Closure

- a. If it should become necessary to close any traffic lanes, it shall be the Contractor's responsibility to obtain necessary permits and approvals from the appropriate authority. Contractor shall be responsible for submitting traffic control plans created in accordance with the traffic rules and regulations in SBFZ.
- b. Street or lane closures shall be coordinated with the appropriate authority.

3. Protection of the Public by the Contractor

- a. Dedicated Public Improvements: The Contractor shall be responsible for any damage to public improvements including sidewalks abutting or adjacent to the demolition properties resulting from the execution of the demolition work. The cost of repair or replacement shall be considered

incidental to the work. And the Contractor shall obtain all permits and pay any fees.

- b. Pedestrian Access: It shall be the Contractor's responsibility to place and construct the necessary warning signs, barricades, fencing and temporary pedestrian sidewalks, as directed by the Engineer in Charge, and to maintain alternate pedestrian access for sidewalk around the demolition site. The cost of these items shall be considered incidental to the work.
- c. Temporary Fence: Temporary fence shall be erected around all excavation, dangerous building(s) or structure(s) to prevent access to the public. The fence shall be erected before demolition and shall not be removed until the hazard is removed or as directed by the Engineer in Charge.

4. Demolition Hours

- a. The Contractor shall comply with any restrictions to working hours as included in the Contract Documents.
- b. The Contractor shall comply with all applicable laws, orders, rules and regulations and restrictions of SBMA.

5. Noise Pollution

All construction equipment used in conjunction with this project shall be in good repair and adequately muffled. The Contractor shall comply with any noise pollution requirements of Ecology Center.

6. Dust Control

The Contractor shall comply with applicable air pollution control requirements of Ecology Center. The Contractor shall take appropriate actions to minimize atmospheric pollution. To minimize atmospheric pollution, the Ecology Center shall have the authority to require that reasonable precautions be taken to prevent particulate matter from becoming airborne. Such reasonable precautions shall include, but not limited to:

- a. The use of water or chemicals for control of dusts in the demolition of existing buildings or structures, construction operations, the grading of roads, or the clearing of land.
- b. Covering, at all times when in motion, open-bodied trucks transporting materials likely to give rise to airborne dusts.

7. Requirements for the Reduction of Fire Hazards

- a. Removal of Material: Before demolition of any part of any building, the Contractor shall remove all volatile or flammable materials, such as gasoline, kerosene, benzene, cleaning fluids, paints or thinners in containers and similar substances.

- b. Fire Extinguishing Equipment: The Contractor shall be responsible for having and maintaining the correct type and class of fire extinguisher on site. When a cutting torch or other equipment that might cause a fire is being used, a fire extinguisher shall be placed close at hand for instant use.
- c. Fire: No fires of any kind will be permitted in the demolition work area.
- d. Hydrants: No material obstructions or debris shall be placed or allowed to accumulate within fifteen feet of any fire hydrant. All fire hydrants shall be accessible at all times.
- e. Debris: Debris shall not be allowed to accumulate on roofs, floors or in areas outside of and around any structure being demolished. Excess debris and materials shall be removed from the site as the work progresses.

8. Protection of Public Utilities

The Contractor shall not damage existing fire hydrants, street lights, traffic signals, power poles, telephone poles, fire alarm boxes, wire cables, poly guys, underground utilities or other appurtenances in the vicinity of the demolition sites. The Contractor shall pay for temporary relocation of utilities as necessary, which are relocated at the Contractor's request for his convenience.

9. Protection of Adjacent Property

- a. The Contractor shall not damage or cause to be damaged any public right-of-way, structures, parking lots, drives, streets, sidewalks, utilities, lawn or any other property adjacent to parcels released for demolition whether or not the property is scheduled for future demolition. The Contractor shall provide such sheeting and shoring as required to protect adjacent property during demolition. Care must also be taken to prevent the spread of dust and flying particles.
- b. The Contractor shall restore existing roadway subdrains that are cut or removed, including drainable backfill, to original condition. Repair shall be subject to the approval by the property owner where applicable and the proper Authority.

C. Risk of Loss

The Contractor shall accept the site in its present condition and shall inspect the site for its character and the type of structure to be demolished. The SBMA assumes no responsibility for the condition of existing buildings, structures and other property within the demolition area, or the condition of the property before or after the solicitation for proposals. No adjustment of proposal price or allowance for any change in conditions that occur after the acceptance of the lowest responsible, responsive proposal will be allowed.

D. Property Ownership

- 1. Title:** The property address, legal description, and ownership will be included in the Contract Documents. Upon execution of the contract for the work of demolition and site clearance on all or any part of the demolition area, all rights, title, and interest of SBMA in and to buildings, structures and other property to be demolished and/or removed by the Contractor on part or all of said project area as described in the Contract Documents and contract addenda thereto, shall be deemed to be vested in the Contractor.
- 2. Land:** No property rights, title, or interest of any kind whatsoever, in or to the land or premises upon which such buildings or structures stand, is created, assigned, conveyed, granted, or transferred to the Contractor, or any other person or persons, except only the license and right of entry to remove such buildings and structures in strict accordance with the Contract Documents. Contractor shall not use the land or premises, or allow any other party to use the land or premises, for any purpose other than activities in direct support of the demolition of the building.

E. Vacating of Buildings

The structures identified in the Contract Documents shall be vacated before a Notice to Proceed is issued and the Contractor begins work. In case the Contractor finds that any structure is not vacated, the Contractor shall immediately notify SBMA and/or Architect/Engineer in Charge and shall not begin demolition or site clearance operations on such property until further directed by Architect/Engineer in Charge. The Contractor's responsibility for such buildings will not begin until the SBMA issues a Notice to Proceed the Demolition Order. No claim for extension of time or increase in price will be considered because of occupancy of any buildings. In case such occupancy is prolonged, the SBMA reserves the right to delete the structure from the work.

F. Release of Building

The demolition area shall be released to the Contractor upon Notice to Proceed. Said Notice to Proceed shall give any sequence of the demolition and the portion of work that is available to be released if all areas are not ready at the same time. The SBMA Project in Charge shall approve any change in the sequence. The Contractor shall have full control of the demolition progress and clearance of the site, subject to the provisions of the Contract Documents.

G. Permits and Fees

The Contractor shall obtain all the necessary permits and pay all permit fees that are required by the SBMA and other agencies and/or departments in conjunction with the demolition work. This shall not be paid separately but shall be included in the unit prices in general or specific overheads.

PART 2 – Construction Requirements

A. Demolition Schedule

The Contractor shall be responsible for providing, the Architect/Engineer in Charge, with a minimum of 24 hours advance notification prior to beginning the execution of demolition of any structure.

B. Demolition and Removals

Before starting a demolition, the person or persons in charge must adequately prepare for the task with regards to the health and safety of the workers. These preparatory operations involve the overall planning of the demolition job, including the methods to be used to bring the structure down, the equipment necessary to do the job, and the measures to be taken to perform the work safely. Before doing demolition work, inspect available personal protective equipment (PPE), and select, wear and use the PPE appropriate for the task.

1. Structural Parts of Buildings

- a. No wall or part thereof shall be permitted to fall outwardly from any building except through chutes or by other controlled means or methods, which will ensure safety and minimize dust, noise and other nuisance.
- b. Any part of a building, whether structural, collateral, or accessory, which has become unstable through removal of other parts, shall be removed as soon as practicable, and no such unstable part shall be left free-standing or inadequately braced against all reasonably possible causes of collapse at the end of any day's work.

2. Concrete Slabs

The Contractor shall remove all concrete slabs, asphalt, surface obstructions, masonry slabs and appurtenances.

3. Partially Buried Objects

All piping, posts, reinforcing bars, anchor bolts, railings and all other partly buried objects protruding from the ground shall be removed. The remaining void shall be filled with soil and compacted in accordance with these specifications.

4. Vegetation

The Contractor shall remove all dead trees, trees identified for removal, stumps, all trees which are not an asset to the property, bushes, vegetation, brush and weeds, whether standing or fallen, unless specifically stated otherwise by the Architect/Engineer in Charge. The Contractor shall protect all trees not removed from damage by the demolition operation. In the event that the Contractor damages a tree, it shall be repaired or removed by the Contractor as directed by the Architect/Engineer in Charge.

C. Disposal of Demolition Debris and Solid Waste

1. Debris

All materials, rubbish and trash shall be removed from the demolition area leaving demolition area free of debris. Any cost incurred by SBMA in cleaning up such materials and debris left behind shall be deducted from the accordingly.

2. Disposal of Demolition Debris and Solid Waste

All debris and solid waste shall be delivered by the Contractor to the SBMA designated disposal facilities, or to an approved disposal facility licensed in accordance with SBMA and/or local regulations, laws, and zoning. The Contractor shall be responsible to pay all fees for waste disposal. The Contractor shall submit to the SBMA copies of all disposal tickets for each structure demolished, where available, which identify the specific address of the origin of the debris associated with each ticket. The cost of all disposal fees shall be considered incidental to the demolition.

3. Asbestos Abatement

The handling of asbestos material is subject to all applicable DENR mandates. Asbestos removal is not required on privately owned property that may be included in this work as part of a public nuisance abatement court order; however, the Contractor shall comply with applicable regulations regarding its handling and disposal. Asbestos will be removed by a licensed abatement contractor by a separate contract or in accordance with special provisions on SBMA-owned properties. In the event that asbestos is discovered on an SBMA-owned property during demolition, the Contractor shall notify the SBMA Architect/Engineer in Charge and the asbestos shall be removed by a licensed abatement contractor by contract or in accordance with the special provisions and/or Ecology Center guidelines.

4. Freon Removal and Disposal

The handling of Freon containing appliances is subject to all applicable DENR mandates and regulations. The Contractor shall be responsible for the identification and removal and disposal of the material in accordance with applicable regulations. All costs associated with said removal and disposal shall be considered incidental and shall be included in the lump sum bid for demolition.

5. PCB and Mercury Removal and Disposal

The handling of any fluorescent lighting fixtures and ballasts containing PCB or mercury is subject to all applicable state and federal mandates and regulations. The Contractor shall be responsible for the removal and disposal of the material in accordance with applicable regulations. All costs associated with said removal and disposal shall be considered incidental and shall be included in the lump sum bid for demolition

D. Sanitary Sewer and Water Service Disconnections

1. Sanitary Sewer Service Disconnection

All sanitary sewer services if required shall be disconnected and plugged in conformance with SUBICWATER. Sanitary sewer abandonment must be completed by a licensed plumber, and inspected by SUBICWATER, if applicable, prior to demolition or excavation.

2. Service Disconnection

All water services and stubs for the buildings or properties within the demolition work shall be disconnected by a licensed plumber and inspected and approved by the SBMA Architect/Engineer in Charge prior to demolition or excavation.

E. Safety and Fencing

1. Safety

The Contractor shall comply with all applicable current local safety and health regulations

2. Safety Fencing

The Contractor shall furnish and place a safety fence around the site of the work adequate to secure the demolition site, including any resulting debris or excavation, and to prevent pedestrian access. The fencing, including all materials, shall be considered incidental to the demolition. The safety fence shall remain in place until the demolished materials are removed from the site and all holes or excavated areas are backfilled. The fencing material shall remain the property of the Contractor.

F. Authorized Workers

Only the Contractor and its employees are allowed to demolish, dismantle, detach or dispose of any part of the demolition structure or its contents.

G. Daily Clean Up of Right-of -Way and Private Property

At the end of each workday, the Contractor shall clean sidewalks, streets, and private property of any debris caused by the demolition operation.

H. Method of Measurement and Basis of Payment

The accepted quantities, provided and installed as prescribed, shall be paid for at the contract unit price for each of the particular pay items that are listed in the Bill of Quantities. The payment shall constitute full compensation for provision for furnishing and placing all labor, tools and equipment and other incidentals necessary to complete the work prescribed in this item.

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
801(12)a	Removal of Existing Ceiling Boards and Framings	Square Meter
801(12)b	Removal of Existing Floor Finishes (Carpet & Vinyl Tiles)	Square Meter
801(12)c	Removal of Existing Doors and Frames	Set
801(12)d	Removal of Existing Wood Partition	Square Meter
801(12)e	Removal of Existing Acoustic/Gypsum Board Wall Cladding	Square Meter
801(12)f	Demolition of Concrete/Masonry Wall for Wall Opening	Square Meter

DIVISION II: PARTITION WORKS

B.3.1 12 mm thick Gypsum Board on Metal Stud Wall Partition

B.3.2 Supply and install ½” thick Smoke Frosted Tempered Glass Wall Partition

B.3.2 Supply and install 10mm thick PVC Accordion Type Wall

A. Description

1. Scope of Works

The work consists of furnishing all labor, materials, accessories and equipment necessary to cover the installation of 12mm thk gypsum board drywall partition on metal studs to be painted with High Quality Flat Latex paint of all areas shown on the drawings and specified herein.

The gypsum board shall be installed only by an approved gypsum board installer/contractor. The contractor shall furnish all labor, materials and equipment necessary for the complete ceiling board installation as shown in the drawings and as specified.

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

2. Submittal

Submit manufacturer’s product specifications including certified laboratory test reports and other data as required to show compliance with the specification. Submit drawings showing details and sections, system thickness, and any other detailed information necessary to describe installation. Submit samples of gypsum board in manufacturer’s memorandum size, and core samples of type required by project.

3. References

Where the Specifications refer to a specific standard, other authoritative standards that ensure an equal or higher quality than the standards mentioned will also be acceptable. It will be incumbent on the Contractor to verify the equal or higher quality and submit comparative standards for review.

4. Delivery, Storage and Handling

- a. Deliver materials in the original packages, containers, or bundles with each bearing the brand name, applicable standard designation and name of manufacturer, supplier.
- b. Neatly stack gypsum board flat to prevent sagging or damage to the edges, ends and surfaces.
- c. Keep materials dry storing inside a sheltered building. Where necessary to store gypsum board outside, store off the ground, properly supported on a level platform, and protected from direct exposure to rain, sunlight and other extreme weather conditions. Provide adequate ventilation to prevent condensation.

B. Material Requirements

1. Materials – Shall conform to respective specifications and standards and to the requirements specified herein. Provide gypsum board manufactured from asbestos-free materials.

Wall Board

- a. Gypsum Board: 12mm thick, with specially formulated core affording increased fire resistance rating tested in compliance with Underwriter's Laboratories Fire Resistance Directory.
- b. Embedding Compound: Specifically formulated and manufactured for use in embedding tape at gypsum board joints and completely compatible with tape, substrate and fasteners.
- c. Finishing or Topping Compound: Specifically formulated and manufactured for use as a finishing compound.
- d. Joint Tape: Cross-laminated, tapered edge, reinforced paper, or special tape recommended by the manufacturer.
- e. Screws: Use special designated steel screws as recommended by the manufacturer of the gypsum board for the screw application of gypsum board to steel or wood framing.
- f. Corner Bead and Edge Trim: Fabricated from corrosive protective coated steel or plastic designed for its intended use. Flanges shall be free of dirt,

grease and other materials that may adversely affect the bond of joint treatment.

Wall Framing

- a. Metal Studs – 0.60mm thk x 50x100 mm, GI, hot-dip galvanized steel with protective zinc coating; spaced at 400mm O.C. vertically; provide additional horizontal/lateral support as necessary.
- b. Metal Tracks – 0.60mm thk x 50mm x 100mm x 3.0m, GI, hot-dip galvanized steel with protective zinc coating; top and bottom
- c. Fasteners – use manufacturer's recommended size (blind rivets, drive pin etc.)

Painting

- a. Any top quality, acceptable first class paints shall be used to meet the standards of grade and quality desired for the work.
- b. Materials of one manufacturer shall not be applied over that of another, except in the case of shop primer coat.
- c. Colors, Gloss and Texture

Color scheme shall be as selected and approved by SBMA. Coordinate with PWTSG/Engineering Department. Tint prime and undercoats approximately to the shade of the final coat but sufficient variation to distinguish them from the preceding coat.

Glass Panel Wall Partition

- a. Glass – ½" (12mm) Tempered Glass
- b. Finish – Smoke Frosted
- c. Framing – Aluminum, Analok Finish

Accordion Type Wall Partition

- a. Material – 10mm PVC
- b. Dimensions – (2650mm + 3700mm) x 2400 mm (as shown on plans)
- c. Complete with Standard Accessories

C. Execution

1. Inspection

- a. Examine the substrates, adjoining construction and the conditions under which the work is to be installed. Do not proceed with the work until unsatisfactory conditions have been corrected.
- b. Verify that framing and furring are securely attached and of sizes and spacing to provide a suitable substrate to receive gypsum board. Verify

that all blocking, headers and supports are in place. Do not proceed with work until framing and furring are acceptable for application of gypsum board.

- c. Verify that surfaces of gypsum board and framing to be bonded with an adhesive are free of dust, dirt, grease and other foreign matter. Do not proceed with work until surfaces are acceptable for application of gypsum board with adhesive.

2. Installation

Wall Framings

- a. Prior to the commencement of fabrication of framing, contractor shall submit fabrication and erection drawings to Architect/Engineer-in-charge and obtain approval.
- b. Align and secure top and bottom runners/tracks.
- c. Fit runners under and above opening; secure intermediate studs to same spacing as wall studs.
- d. Install studs vertically at spacing indicated on drawings.
- e. Align stud web openings horizontally.
- f. Secure studs to tracks using crimping method. Do not weld.
- g. Stud splicing is not permissible.
- h. Fabricate corners using a minimum of three studs.
- i. Double stud at wall openings, door and window jambs, not more than 2 inches (50mm) from each side of openings.
- j. Coordinate installation of bucks, anchors and blocking with electrical, mechanical and other work to be placed within or behind the stud framing.
- k. Blocking: Use wood blocking secured to studs. Provide blocking for support of plumbing fixture, toilet partitions, wall cabinets, toilet accessories, hardware and opening frames.

Ceiling Boards

- a. Apply gypsum board to framing and furring members in accordance with plans and specification and the requirements specified herein. Apply gypsum board with separate boards in moderate contact; do not force in place. Stagger end joints of adjoining boards. Neatly fit abutting end and edge joints. Use gypsum board and substrate members may be bonded together with an adhesive, except where prohibited by fire rating.
- b. The gypsum board shall be fixed by recommended gypsum screws at

200mm max. to the metal studs.

- c. All gypsum board installation and application methods must conform to gypsum board manufacturers recommended installation procedures, details and handbook.

3. Finishing of Gypsum Board

- a. Fill openings around cutouts with acoustical sealant as recommended by manufacturer. Pre-fill joints of wallboard having eased edges in accordance with gypsum board manufacturer's direction.
- b. Reinforce joints and interior corners with joint reinforcing tape set in joint compound.
- c. Fill joints, fastener heads, trim, recesses, cracks and other depressions with joint compound. Finish smooth and flush as recommended by manufacturer so that location of joints, nail, screws and other items will not be visible after painting.
- d. Patch surface defects in gypsum board to a smooth, uniform appearance, ready to receive finish as specified.
- e. Apply 2 coats of High Quality Flat Latex paint.

4. Adjusting and Cleaning

After installation, thoroughly clean exposed surface and restore damaged work to its original condition or replace with new work.

D. Method of Measurement and Basis of Payment

The accepted quantities as prescribed shall be paid for based on the contract unit price of the particular pay items that are listed in the Bill of Quantities. The payment shall constitute full compensation all works including all labor, equipment, tools and incidentals necessary to complete the work prescribed in this item.

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
1041(1)a	12 mm thick Gypsum Board on Metal Stud Wall Partition	Square Meter
1012(a3)a	Supply and install 1/2" thick Smoke Frosted Tempered Glass Wall Partition on Aluminum, Analok Framing (GP)	Square Meter
1012(a3)a1	Supply and install 10mm thick PVC Accordion Type Wall	Set

DIVISION IV: CEILING WORKS

- 1031(1)a 15 mm thick x 600mm x 1200mm Acoustic Board Tile Ceiling (Rigid Glass Fiber, Washable, Abuse Resistance, Non-Sagging and with PVC Film Facing) on Powder Coated Runners**

A. Description

The work consists of furnishing all labor, materials, accessories and equipment necessary to cover all areas shown in the drawings and specified herein.

The acoustical ceiling board shall be installed only by an approved acoustical ceiling board installer/ contractor. The contractor shall furnish all labor, materials and equipment necessary for the complete installation as shown on the drawings and as specified herein.

B. Construction Requirements

1. References

Where the Specifications refer to a specific standard, other authoritative standards which ensure an equal or higher than the standards mentioned will also be acceptable. It will be incumbent on the Contractor to verify the equal or higher quality and submit comparative standards for review.

2. Submittals

- a. Shop Drawings: Submit shop drawings and manufacturers' data for the following items:

(1) Reflected Ceiling Plans showing location of components, including electrical lighting fixtures layout.

- b. Samples: Submit samples of the following items:

(1) Acoustical Tiles

(2) Edge Mounting

(3) Suspension Runner

(4) End Mounting

3. Delivery and Storage

Store acoustical board in a dry place. Do not place in contact with floors or walls. Ceiling panel packages must be protected against marring, soil or damage during storage and installation. Cover the bottom of tiles with moisture proof materials and allow for circulation under cover to prevent condensation. Acoustical tiles must not be subjected to water.

4. Execution

1. Inspection

- a. Examine surfaces to receive directly attached acoustical units for unevenness, irregularities, and dampness that would affect quality and execution of the work.
- b. Examine the substrates, adjoining construction and the conditions under which the work is to be installed. Do not proceed with the work until unsatisfactory conditions have been corrected.

2. Installation

- a. Install materials and systems in accordance with manufacturers' printed instructions. Use procedures that will minimize damage or soiling of the units during installation.
- b. Ceiling suspension system is to be installed with the approval of the Engineer for installation of metal ceiling suspension system for acoustical tile and lay in panels.
- c. Space hangers 1200 mm on center each direction. Install additional hangers where required to support framing around beams, ducts, columns, grills and other penetrations through the ceiling.
- d. Keep main runners and carrying channels clear of abutting walls and partitions. Provide at least two main runners for each ceiling span.
- e. Edges of ceiling tiles shall be in close contact with metal supports and in true alignment.

3. Adjusting and Cleaning

Clean soiled or discoloured unit surfaces after installation. Touch up scratches, abrasions, voids and other defects in painted surfaces. Removed damaged or improperly installed units and install new materials.

4. Extra Stock

Maintenance Materials: Delivery to the Owner at the Project site, five (5) acoustical units for each 100 units installed. Store in location directed in unopened containers and in a manner recommended by the Engineer.

C. Material Requirements

1. Materials

a. Acoustical Tile Ceiling Units

All panels shall be of Class A, Flame Spread and **with No Sagging, Warping or Delaminating**. 15 mm (at least) thick panels, 600 mm x 1200 mm in size. Should not be used where relative humidity will exceed 90%. Panels thicker than 1" are not restricted by humidity conditions.

Ceiling tiles consist of a light weight fiberglass wool with an attractive, washable and abuse-resistant PVC film facing.

b. Ceiling Suspension System

- (1) Type: Exposed grid
- (2) Structural Classification: Heavy duty for main runners and cross tee.
- (3) Finish: Surfaced exposed to view shall be of uniform width and shall be powder coated.
- (4) Accessories: Provide wall or edge moldings and cornices.

c. Hanger Rods: use manufacturer recommended type.

D. Method of Measurement and Basis of Payment

The accepted quantities, measured as prescribed, shall be paid for based on the contract unit price for each of the particular pay items that are listed in the Bill of Quantities. The payment shall constitute full including all labor, tools and incidentals necessary to complete the work prescribed in this Item.

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
1031(1)a1	15 mm thick x 600mm x 1200mm Acoustic Board Tile Ceiling (Rigid Glass Fiber, Washable, Abuse Resistance, Non-Sagging and with PVC Film Facing) on Powder Coated Runners	Square Meter

1003(1)a1 4.5mm thick Fiber Cement Board on 1.00mm thick Metal Frame Ceiling

A. Description

The work shall consist of furnishing all labor, materials, accessories and equipment necessary to cover all areas shown on the drawings and specified herein.

The fiber cement board shall be installed only by an approved installer/contractor. The contractor shall furnish all labor, materials and equipment necessary for the complete wall board installation as shown on the drawings and as specified.

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

B. Construction Requirements

1. References

Where the Specifications refer to a specific standard, other authoritative standards that ensure an equal or higher quality than the standards mentioned will also be acceptable. It will be incumbent on the Contractor to verify the equal or higher quality and submit comparative standards for review.

2. Submittals

Submit manufacturer's product specifications including certified laboratory test reports and other data as required to show compliance with the specification. Submit drawings showing details and sections, system thickness, and any other detailed information necessary to describe installation. Submit samples of ficem board in manufacturer's memorandum size and core samples of type required by project.

3. Delivery, Storage and Handling

- a. Deliver materials in the original packages, containers or bundles with each bearing the brand name, applicable standard designation and name of manufacturer, supplier.
- b. Neatly stack ficem board flat to prevent sagging or damage to the edges, ends and surfaces.
- c. Keep materials dry storing inside a sheltered building. Where necessary to store ficem board outside, store off the ground, properly supported on a level platform, and protected from direct exposure to rain, sunlight and other extreme weather conditions. Provide adequate ventilation to prevent condensation.

4. Execution

1. Inspection

- a. Examine the substrates, adjoining construction and the conditions under which the work is to be installed. Do not proceed with the work until unsatisfactory conditions have been corrected.
- b. Verify that framing and furring are securely attached and of sizes and spacing to provide a suitable substrate to receive ficem board. Verify that all blocking, headers and supports are in place. Do not proceed with work until framing and furring are acceptable for application of ficem board.
- c. Verify that surfaces of gypsum board and framing to be banded with an adhesive are free of dust, dirt, grease and other foreign matter. Do not proceed with work until surfaces are acceptable for application of ficem board with adhesive.

2. Installation

- a. Apply ficem board to framing and furring members in accordance with plans and specification and the requirements specified herein. Apply ficem board with separate boards in moderate contact; do not force in place. Stagger end joints of adjoining boards. Neatly fit abutting end and edge joints. Use ficem board and substrate members may be bonded together with an adhesive except where prohibited by fire rating.

- b. Treat edges of cutouts for screw heads and joints with water resistant compound as recommended by the ficem board manufacturer or treat with two coats of sizing varnish. Extend treatment not less than 100 millimeters out on paper on both sides of board.
- c. All ficem board installation and application methods must conform to ficem manufacturers recommended installation procedures, details and handbook.
- d. Finishing of Ficem Board
 - i. Fill openings around cutouts with acoustical sealant as recommended by manufacturer. Pre-fill joints of wallboard having eased edges in accordance with ficem board manufacturer's direction.
 - ii. Reinforce joints and interior corners with joint reinforcing tape set in joint compound.
 - iii. Fill joints, fastener heads, trim, recesses, cracks and other depressions with joint compound. Finish smooth and flush as recommended by manufacturer so that location joints, nail, screws and other items will not be visible after painting.
 - iv. Patch surface defects in ficem board to a smooth, uniform appearance, ready to receive finish as specified.
 - v. Apply 2 coats of High Quality Flat Latex paint.

3. Adjusting and Cleaning

After installation, thoroughly clean exposed surface and restore damaged work to its original condition or replace with new work.

C. Material Requirements

Materials – shall conform to respective specifications and standards and to the requirements specified herein. Provide fiber cement board manufactured from asbestos-free materials.

Ceiling Boards

- a. Fiber Cement Board – with Cement and cellulose fiber formed under high pressure into boards with integral surface texture; complying with ASTM C 1186 Type A Grade II; machined edges; for nail attachment.
 - 1. Thickness: 4.5 mm nominal.
 - 2. Size: 4' x 8' nominal board panels.
 - 3. Surface Burning Characteristics: Flame spread index of 0, smoke developed index of 6, maximum when tested in accordance with ASTM E 84 (Class I/A).

4. Flammability: Noncombustible, when tested in accordance with ASTM E 136.
 5. Flexural Strength: At least 1450 psi (10 MPa) when in equilibrium condition, and at least 1015 psi (7 MPa) when in wet condition, when tested in accordance with ASTM C 1185.
 6. Coefficient of Thermal Expansion: Less than $1 \times 10^{-5}/\text{degree C}$), when tested with ASTM E 228.
 7. Water Vapor Transmission: Less than 7.0 perm-inch (10ng/(Pas sm), when tested in accordance with ASTM E 96.
 8. UV Resistance: No cracking, checking, or erosion, when tested for 2000 hours in accordance with ASTM G 26.
 9. Water Tightness: No water droplets on underside, when tested in accordance with ASTM C 1185.
- b. Embedding Compound – specifically formulated and manufactured for use in embedding tape at fiber cement board joints and completely compatible with tape, substrate and fasteners.
 - c. Finishing or Topping Compound – specifically formulated and manufactured for use as a finishing compound.
 - d. Joint Tape – cross-laminated, tapered edge, reinforced paper or special tape recommended by the manufacturer
 - e. Screws – use special designated steel screws as recommended by the manufacturer of the Fiber cement board for the screw application of fiber cement board to steel or wood framing.
 - f. Corner Bead and Edge Trim – fabricated from corrosive protective coated steel or plastic designed for its intended use. Flanges shall be free of dirt, grease and other materials that may adversely affect the bond of joint treatment.

Ceiling Framing

- a. Metal Double J Furring – 0.5mm thk x 19mm x 50mm, GI, hot-dip galvanized steel with protective zinc coating; spaced at 400mm on center or as per manufacturer specifications.
- b. Metal Carrying Channel – 1.0mm thk x 12mm x 38mm, GI, hot-dip galvanized steel with protective zinc coating spaced at 1.20m on center or as per manufacturer specifications.
- c. Blind rivets – use manufacturer's recommended size.

Painting

- a. Any top quality, acceptable first-class paints shall be used to meet the standards of grade and quality desired for the work.

- b. Materials of one manufacturer shall not be applied over that of another, except in the case of shop primer coat.
- c. Colors, Gloss and Texture

Color scheme shall be as selected and approved by SBMA. Coordinate with PWTSG/Engineering Department. Tint prime and undercoats approximately to the shade of the final coat but sufficient variation to distinguish them from the preceding coat.

D. Method of Measurement and Basis of Payment

The accepted quantities, measured as prescribed, shall be paid for based on the contract unit price for each of the particular pay items that are listed in the Bill of Quantities. The payment shall constitute full compensation including all labor, tools and incidentals necessary to complete the works prescribed in this section.

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
1003(1)a1	4.5mm thick Fiber Cement Board on 1.00mm thick Metal Frame Ceiling	Square Meter

DIVISION VI: DOORS AND WINDOWS

- 1007(1)b **Supply & Install New 3/8" thick Brown Tempered Glass with Aluminum, Analok Framing Single Leaf Door (D1)**
- 1010(2)b1a **Provide & Install New 40 mm thick Single Leaf Wood Panel Door Wood Stain Finish (D2)**
- 1010(2)b1b **Provide & Install New 40 mm thick Single Leaf Wood Panel Door Wood Stain Finish with Screen and Grills (D3)**
- 1012(1)a **Replace Broken Tempered Glass (6.00mm x 800mm x 2000mm)**

A. Description

This section covers the furnishing of all materials, labor, equipment and everything listed, mentioned in the drawings and in performing all operations necessary for the supply/fabrication and installation of the doors, frames and jamb including painting and all finish hardware and other incidentals necessary to complete the works.

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

B. Construction Requirements

Submittal

Submit drawings showing details and sections, system thickness and other detail information necessary to describe the installation. Secure approval from SBMA prior to installation. Also clearly show details for each frame types, elevations of each door type, conduction of opening with various wall thickness and materials, typical and special details of door construction method of assembling sections, location, reinforcement and installation requirements for door finishes, hardware, size, shape and thickness of materials.

C. Material Requirements

Materials shall conform to respective specifications and standards and to the requirements specified herein as follows:

1. *Single Leaf, Single Swing Glass Panel Door (D1)*
 - a. Door Size/Type – 3/8" (12 mm) thk. Tempered Glass (Brown)
 - b. Jamb/Frame – Aluminum, Analok Finish
 - c. Dimensions – 900 x 2100 mm (as shown on plans)
 - d. Complete with Standard Accessories

2. *Single Leaf, Single Swing Wood Panel Door Wood Stain Finish (D2)*
 - a. Door Size/Type – 40mm thk Wood Panel Door
 - b. Door Jamb – 2" x 5" (50x125mm) kiln dry; termite treated
 - c. Finish – Wood Stain and Varnish Finish
 - d. Dimensions – 600 x 2100 mm (as shown on plans)
 - e. Finish hardware:
 - (1) Hinges and Lockset
 - (a) Hinges: Three (3) sets of hinges (heavy duty)
 - (b) Lockset: One (1) set of lockset (heavy duty)
 - (2) Extra Heavy Duty Door Closer
 - (a) All door closers shall be as manufactured by reputable manufacturers acceptable to SBMA.
 - (b) Closer shall be of full rack and pinion construction with cast aluminium body. Spindle and piston are machined from one piece, high tensile alloy steel, heat treated and precision ground. Case shall be high-density special hydraulic alloy cast iron.
 - (c) Closing and latching speed shall be controlled separate, non-critical valves. All valves shall be concealed to provide protection against unauthorized tampering. Arms shall be forged steel and wrought parts.
 - (d) Door closers shall be universal type, non-handed. The same model is to be mounted for regular, top jamb and parallel

application. Separate mounting bracket shall be used to ensure quick and accurate installation.

(3) Door Stop

Shall be of approved type acceptable to SBMA.

3. *Single Leaf, Single Swing Wood Panel Door Wood Stain Finish (D3)*

- a. Door Size/Type – 40mm thk Wood Panel Door
- b. Door Jamb – 2" x 5" (50x125mm) kiln dry; termite treated
- c. Finish - Wood Stain and Varnish Finish
- d. Insect Protection – Screen on Aluminum Frame
- e. Intrusion Protection – ½" x ½" Square Bar Grill
- f. Dimensions – 600 x 2100 mm (as shown on plans)
- g. Finish hardware:
 - (1) Hinges and Lockset
 - (a) Hinges: Three (3) sets of hinges (heavy duty)
 - (b) Lockset: One (1) set of lockset (heavy duty)

(2) Extra Heavy Duty Door Closer

- (a) All door closers shall be as manufactured by reputable manufacturers acceptable to SBMA.
- (b) Closer shall be of full rack and pinion construction with cast aluminium body. Spindle and piston are machined from one piece, high tensile alloy steel, heat treated and precision ground. Case shall be high-density special hydraulic alloy cast iron.
- (c) Closing and latching speed shall be controlled separate, non-critical valves. All valves shall be concealed to provide protection against unauthorized tampering. Arms shall be forged steel and wrought parts.
- (d) Door closers shall be universal type, non-handed. The same model is to be mounted for regular, top jamb and parallel application. Separate mounting bracket shall be used to ensure quick and accurate installation.

4. *Replace Broken Tempered Glass (6.00mm x 800mm x 2000mm)*

- a. Glass – 1/4" (6 mm) thk. Tempered Glass (Clear)
- b. To be installed on existing Aluminum Door

D. Method of Measurement and Basis of Payment

The accepted quantities, measured as prescribed, shall be paid for based on the contract unit price for each of the particular pay items that are listed in the Bill of Quantities. The payment shall constitute full compensation including all labor, tools and incidentals necessary to complete the works prescribed in this section.

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
1007(1)b	Supply & Install New 3/8" thk Brown Tempered Glass with Aluminum, Analok Framing Single Leaf Door (D1)	Set
1010(2)b1a	Provide & Install New 40 mm thk Single Leaf Wood Panel Door Wood Stain Finish (D2)	Set
1010(2)b1b	Provide & Install New 40 mm thick Single Leaf Wood Panel Door Wood Stain Finish with Screen and Grills (D3)	Set
1012(1)a	Replace Broken Tempered Glass (6.00mm x 800mm x 2000mm)	Set

1008(1)c1 Supply & Install New 3/8" thick Brown Tempered Glass Awning Type Window on Aluminum, Analok Frames with Screen and Grills (W1)

1008(1)c2 Supply & Install New 3/8" thick Brown Tempered Glass Awning Type Window on Aluminum, Analok Framing with Screen and Grills (W2)

A. Description

1. Scope

This section covers the furnishing of all materials, labor, equipment and everything listed, mentioned in the drawings and in performing all operations necessary for the supply and installation of the glass windows and glass partitions and all finish hardware and other incidentals necessary to complete the works.

2. Submittals

Submit shop drawings and samples of materials to be used and secure approvals from SBMA prior to installation.

B. Material Requirements

1. Materials – Supply and install new fixed and sliding glass window (*see plans for schedule of windows*)

Fixed Window (W1)

- a. Glass Window – 3/8" (10 mm) thk. Tempered Glass (Brown)
- b. Window Type – Awning, 1-panels
- c. Window Frame – Aluminum, Analok Finish
- d. Insect Protection – Screen on Aluminum Frame

- e. Intrusion Protection – ½” x ½” Square Bar Grill
- d. Dimensions – 600 x 600 mm (*as shown on plans*)
- e. Complete with Standard Accessories

Fixed Window (W2)

- a. Glass Window – 3/8” (10 mm) thk. Tempered Glass (Brown)
- b. Window Type – Awning, 2-panel
- c. Window Frame – Aluminum, Analok Finish
- d. Insect Protection – Screen on Aluminum Frame
- e. Intrusion Protection – ½” x ½” Square Bar Grill
- d. Dimensions – 600 x 1200 mm (*as shown on plans*)
- e. Complete with Standard Accessories

Frame and panel members shall be fabricated from extruded aluminum section true to details with clean, straight, sharply defined profiles and free from defects impairing strength or durability. Extruded aluminum section shall conform to the specification requirements defined in ASTM B 211.

Screws, nuts, washers, bolts, rivets and other miscellaneous fastening devices shall be made of non-corrosive materials such as aluminum, stainless steel, etc.

Hardware for fixing and locking device shall be closely matched to the extruded aluminum section and adaptable to the type and method of opening.

Weatherstrip shall be first class quality flexible vinyl forming an effective seal and without adverse deformation when installed.

Glazing shall conform to the requirements specified in Item 1012 of DPWH Standard Specifications for Public Works Structures Volume III.

C. Construction Requirements

For all assembly and fabrication works the cut end shall be true and accurate, free of burrs and rough edges. Cut-outs recesses, mortising and grinding operation for hardware shall be accurately made and properly reinforced.

1. Installation Procedure

- a. Main frame shall consist of head, sill and jamb.
- b. Window Sash
- c. Window panel shall be jointed at corners with miter and fixed rigidly to ensure weather tightness.
- d. The locking device shall be a spring loaded extruded latch that automatically engages special frame hips.
- e. All joints between metal surface and masonry shall be fully caulked.
- f. Aluminum parts in contact with steel members shall be properly insulated by a coat of zinc chromate, primer/bituminous paint applied to the steel surface.

- g. Weatherstrip shall be furnished on edges at the meeting stiles.
2. Shop Finish

Exposed aluminum surfaces shall be electrotype hard coats such as anodize, satin, etc.
 3. Protection

All aluminum parts shall be protected adequately to ensure against damage during transit and construction phase.
 4. Replacements

In the events of damage by which the structural specifications and properties of the materials is not greatly affected immediate repair shall be done as directed, otherwise, replace the material with new one at no additional cost to the contract.
 5. Cleaning
 - a. The Contractor does not only protect all entrance units during the construction phase but shall also be responsible for removal of protective materials and cleaning the aluminum surface including glazing before work is accepted by the Architect/Engineer in Charge.
 - b. Aluminum shall be thoroughly cleaned with kerosene or gasoline diluted with water and then wipe surface using clean cloth rags.
 - c. No abrasive cleaning materials shall be permitted in cleaning surface

D. Method of Measurement and Basis of Payment

The accepted quantities, measured as prescribed, shall be paid for based on the contract unit price for each of the particular pay items that are listed in the Bill of Quantities. The payment shall constitute full compensation including all labor, tools and incidentals necessary to complete the works prescribed in this section.

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
1008(1)c1	Supply & Install New 3/8" thick Brown Tempered Glass Awning Type Window on Aluminum, Analok Frames with Screen and Grills (W1)	Set
1008(1)c2	Supply & Install New 3/8" thick Brown Tempered Glass Awning Type Window on Aluminum, Analok Framing with Screen and Grills (W2)	Set

DIVISION VI: FINISHING WORKS

1020(1) Vinyl Floor Tiles (3.00mm x 300mm x 300mm)

A. Description

This section consists of furnishing all floor and wall tile finish materials, tools and equipment including labor required in undertaking the proper installation of vinyl floor tiles as shown on the Plans and in accordance with this Specification.

B. Submittals

- a. Submit product specifications including certified laboratory test reports and other data as required to show compliance with the specification. Submit drawings showing details sections, system thickness, and any other detailed information necessary to describe installation.
- b. Submit samples of the following items:
 - Vinyl Floor Tiles : 300mm x 300mm x 3.0mm thk
- c. Immediate submittal of samples to secure final approval from SBMA should be initiated by the contractor; Project delay(s) concerning delivery schedule, and the likes, is/are not considered ground(s) for project time extension.

C. Material Requirements

Materials shall conform to respective specifications and standards and to the requirements specified herein as follows:

1. Vinyl Floor Tiles

- a. Sizes of Tiles : 300 mm x 300 mm
- b. Thickness : 3.0 mm
- c. Specifications: Homogenous resilient with anti-bac properties
- d. Colors: All vinyl floor tiles shall be in colors selected by SBMA from the above submitted samples.

2. Adhesive

Adhesive shall be of approved type recommended by the SBMA Project Architect/Engineer in charge.

3. Disturb floor Areas

Provision for preparation and patching of disturb floor area with mortar cement including plain cement smooth finish for vinyl floor tile preparation.

C. Execution

1. EXAMINATION

- a. Do not begin installation until work of other trades within the area has been completed.
- b. Verify that surfaces to receive resilient flooring, vinyl tiles, are smooth, level and flat.
- c. Verify that surfaces to receive resilient flooring are clean, and free of grease, oil, construction films, other coatings, stains, dust and other deleterious materials that might affect final appearance or adhesive bond.
- d. Concrete: Do not install resilient flooring over concrete until concrete has cured and is dry to bond with adhesives.
- e. Inspect materials prior to installation. Do not install materials with visible defects.
- f. Notify Project Manager of deficiencies detrimental to proper installation. Do not proceed with work until deficiencies are corrected. Commencing installation implies acceptance of surfaces.

2. PREPARATION

- a. Prepare surfaces in accordance with manufacturer's instructions and recommendations.
- b. Prepare substrates to be smooth, flat, level, permanently dry, clean and free of foreign materials such as grease, oil, solvents, curing and hardening compounds, sealers, asphalt, old adhesive residue, construction films and coatings, stains and dust.
- c. Level substrates to maximum 1/8 inch (3 mm) in 10 ft (3 m) and fill cracks using Portland-cement based levelling and patching compounds in accordance with manufacturer's instructions. Do not lay resilient flooring over gypsum-based compounds.
- d. Prepare concrete surfaces in accordance with ASTM F710 or Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.

3. INSTALLATION

- a. Install in accordance with manufacturer's instructions.
- b. Prime substrates, as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed, in accordance with manufacturer's recommendations.
- c. Spread adhesive uniformly at coverage rate recommended by manufacturer. Apply only enough adhesive to permit installation of flooring before initial set
- d. Set flooring in place, press with heavy roller to attain full adhesion.
 - 1. Adhere flooring to substrates without producing open cracks, voids,

raising or puckering at joints, telegraphing of adhesive spreader marks and other surface imperfections in completed installation.

- e. Fit joints tight, straight, and aligned square with room axes unless indicated otherwise.
- f. Scribe flooring to walls, columns, cabinets, floor outlets, pipes and other items to produce tight joints.
- g. Terminate flooring at centerline of door openings where adjacent floor finish is dissimilar.
- h. Install reducer strips at unprotected or exposed edges, where flooring terminates, and where indicated.
- i. Install flooring in recessed floor access covers. Maintain floor pattern.
- j. Do not install flooring over expansion joints.

4. RESILIENT TILE FLOORING

- a. Where tile has a predominate direction, lay in single direction determined by Project Manager.
- b. Mix tiles from container to ensure shade variations are consistent.
- c. Install tiles in accordance with pattern shown on Drawings. Where no pattern is shown, lay tile symmetrically about centerlines of each room or space. Lay out to avoid tiles of less than 1/2 size except at irregularly shaped areas

5. RESILIENT BASE

- a. Fit joints tight and vertical, with surfaces aligned. Maintain 24" minimum between vertical joints.
- b. Bond tightly to wall with bottom edge in uniform contact with floor.
- c. Use premolded shapes for external corners and exposed ends. Miter internal corners.
- d. Scribe and fit to abutting materials.

6. RESILIENT STAIR TREADS, RISERS AND STRINGERS

- a. Treads and Risers:
 - i. Install in single pieces full width and depth of stair. Where depth of stair tread exceeds maximum available material, provide matching fillers.
 - ii. Install safety strips on upper approach and lower tread of each flight of stairs in accordance with National Building Code.

b. Stringers:

Provide single piece for each edge up to 6 feet long. For edges longer than 6 feet, butt end joints, but with no piece less than 2 feet (600 mm) in length. Scribe stringers to abutting surfaces.

c. Landings:

Install tiles on each stair landing.

d. Install stair treads and landing tiles with raised patterns aligned vertically from the top to the bottom of each floor.

7. CLEANING

a. Remove and replace all defective and damaged materials, including those which failed to bond to the substrate.

b. Sweep and vacuum floor after installation.

c. Clean in accordance with manufacturer's instructions, removing all exposed adhesive and visible blemishes. Reclean surfaces soiled prior to acceptance of project at no additional cost to SBMA.

i. Do not wash floor until after time period recommended by manufacturer.

d. Seal and wax flooring in accordance with manufacturer's recommendations.

e. Dispose of sealant and adhesive remnants and containers in accordance with applicable regulations, and protective coverings.

8. PROTECTION

a. Prohibit traffic on floor finish for period recommended by manufacturer, but for at least 48 hours after installation.

b. Do not place any equipment, casework or furnishings on resilient flooring until the flooring adhesive is fully cured and dried, and the flooring is tightly bonded to the substrate.

c. Protect installed flooring from until date of Final Acceptance. Remove protection immediately prior to acceptance.

d. Protect work of other trades [and existing work]; correct damage by cleaning, repairing or replacing, as acceptable to Project Manager.

9. WASTE MANAGEMENT

a. Separate waste in accordance with guidelines to be provided by the Ecology Center.

E. Method of Measurement and Basis of Payment

The accepted quantities, measured as prescribed, shall be paid for based on the contract unit price for each of the particular pay items that are listed in the Bill of Quantities. The payment shall constitute full compensation including all labor, tools and incidentals necessary to complete the works prescribed in this section.

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
1020(1)	Vinyl Floor Tiles (3.00mm x 300mm x 300mm)	Square Meter

B.6.2 Unglazed Ceramic Floor Tiles (6.35mm x 300mm x 300mm)

A. Description

1. Scope

This item shall consist of furnishing of all materials, equipment, tools, and providing labor required to provide and install floor and wall tiles as indicated on plan including preparation and all other materials, accessories and incidentals necessary to complete the work in accordance with this specification and to the dimensions shown on the plans and details.

2. Submittals

Submit shop drawings and samples of the following materials to be used and secure approval from SBMA prior to installation.

- 300mm x 300mm x 6.35mm thk unglazed ceramic floor tiles

B. Material Requirements

1. Unglazed Ceramic Tiles

- a. Sizes of Tiles: 300mm x 300mm
- b. Thickness: 6.35mm thk
- c. Colors: All ceramic tiles shall be in colors selected by SBMA from the above submitted samples.

2. Cement Grout Spacer

Cement grout spacer shall be of approved type recommended by the SBMA Project In-Charge.

3. Specified Floor Area

Preparation of specified wall area with mortar cement including plain cement smooth finish for ceramic wall tile preparation.

C. Execution

1. Installation of ceramic tiles – shall be installed only by qualified installer.
2. Install in accordance with manufacturer's instructions.
3. Final cleaning – sponge and wash specified work thoroughly. Final polish with clean cloth. Use only manufacturer's recommended vinyl polisher compound for cleaning.

D. Method of Measurement and Basis of Payment

The quantity to be paid for shall be the number of square meters (m²) of ceramic tiles measured, completed in-place and accepted.

The accepted quantities, measured as prescribed, shall be paid for at the contract unit price per square meter which price and payment shall constitute full compensation for furnishing and placing all materials including labor, equipment, tools and incidentals necessary to complete the work prescribed in this Item.

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
1020(1)	Unglazed Ceramic Floor Tiles (6.35mm x 300mm x 300mm)	Square Meter

1003(17)a Wall-Mounted Wood Cabinet

A. Description

The work under this Items shall consist of furnishing all required materials, fabricated woodwork, tools, equipment and labor and performing all operations necessary for the satisfactory completion of carpentry and joinery works in strict accord with applicable drawings, details and this Specifications.

B. Material Requirements

Materials shall meet the requirements of Item 1003, Carpentry and Joinery Works and Item 1004, Hardware of DPWH Standard Specifications for Public Works Structures, Volume III (1995).

Materials shall conform to respective specifications and standards and to the requirements specified herein as follows:

Item #1: Wall-mounted Wood Cabinet

- a. Dimension: 4800mm (L) x 600mm (H) x 400mm (W)

b. For Wood Cabinet:

- Use ¾" Marine Plywood (Type I)
- Open Type
- Painted with Enamel

C. Construction Requirements

1. Quality of Materials

All materials to be incorporated in the carpentry and joinery works shall be of the quality specified under the section, Material Requirements. Before incorporation in work, all materials shall have been inspected/accepted by the Engineer or his authorized representative.

2. Storage and Protection of Materials

Lumber and other materials shall be protected from dampness during and after delivery at the site. Materials shall be delivered well in advance of actual need and in adequate quantity to preclude delay in the work. Lumber shall be piled in orderly stack at least 150 mm above ground and at sheltered place where it will be of least obstruction to the work.

3. Shop Drawings

Shop drawings complete with essential dimensions and details of construction, as may be required by the Engineer in connection with carpentry and joinery work, shall be submitted for approval before proceeding with the work.

4. Finished Carpentry

- a. Framing lumber shall be select grade, free from defects and where exposed in finished work, shall be selected for color and grain.
- b. Joints of framing shall be tenoned, mortised or doweled where suitable, closely fitted and secured with water resistant resins glue. Exterior joints shall be mitered and interior angles coped.
- c. Panels shall be fitted allow for contraction and expansion and insure that the panels remain in place without warping, splitting and opening of joints.
- d. Plywood shall be as specified under section, Material Requirements.
- e. Exposed edges of plywood or plywood for cabinets/shelves shall be provided with select grade hardwood strips, rabbeted as necessary, glued in place and secured with finishing nails. To prevent splitting, hardwood for trims shall be drilled before fastening with nails or screws.
- f. Fabricated woodwork shall be done preferably at the shop. It shall be done true to details and profiles indicated on the Plans.
- g. Exposed wood surfaces shall be free from disfiguring defects such as raised grains, stains, uneven planing, sanding, tool marks and scratches.

Exposed surfaces shall be machine or hand sanded to an even smooth surface, ready for finish.

D. Method of Measurement and Basis of Payment

The accepted quantities, measured as prescribed, shall be paid for based on the contract unit price for each of the particular pay items that are listed in the Bill of Quantities. The payment shall constitute full compensation for fabrication and installation of wood cabinets and shelves including all labor, tools and incidentals necessary to complete the works prescribed in this section.

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
1003(17)a	Wall-Mounted Wood Cabinet	Lump Sum

DIVISION VII: PAINTING WORKS

1032(1)a1 **Painting of Existing Concrete/Masonry Wall**

1032(1)d **Painting of Drywall Partition**

1032(1)e **Painting of Fiber Cement Board Ceiling (Roof Eaves)**

A. Description

The work under this section consists of furnishing all labor, painting equipment, scaffolding, and protective coverings required for the painting and finishing of all surfaces as designated in the drawings and specifications.

The term "paint" as herein includes emulsions, latex, paints, varnishes, sealers, and other coatings, whether used as prime, intermediate, or finish coats.

B. Construction Requirements

1. Quality Assurance

The SBMA reserves the right to subject materials samples to test at his expense. If such material sample test does not meet the specified standards, the cost will be charged to the Contractor.

Number of coats, where specified, shall be in minimum. Contractor shall apply as many as are required to meet specifications for solid, uniform appearance. Where film thickness in mils is specified, spot checks will be made to determine compliance with specified thickness.

2. Submittals

Submit two (2) samples of each and every color or finish (including all coats). Where the same color or finish is to be applied over different materials, samples of each shall be submitted on different materials, where practical. Sample size shall be 152 mm x 152 mm.

3. Delivery, Handling and Storage

Deliver specified materials to the jobsite in manufacturer's unopened sealed containers with manufacturer's name, brand name, type of paint, analysis showing all important constituents of the paint, color or paint and instructions for thinning.

Handle specified item and/or its components in such manner as to prevent damage or deformation. Properly secure same from harmful elements or damage by other Work prior to its incorporation into the Project.

Store materials in a well-ventilated space designated for the storage and mixing of paint. Materials delivered to the site shall be properly stored as to minimize exposure to extremes of temperature.

4. Protection

Protect paint materials from damage, providing for adequate storage space. Take all necessary precautions to prevent fire, such as keeping oily rags in U.L. approved metal containers or removing from building at end of each day's work.

All work fittings, furniture, etc. are to be suitably protected during execution of work. Splashes on floors, walls, etc. are to be removed during progress of work and overall, left clean and perfect on completion.

No exterior or exposed painting shall be carried out under adverse weather conditions, such as extremes of temperature, during rain, fog, etc. or if there is excessive dust in the air.

The material manufacturer shall state the lead content on the label of any paint product container based on metal percentage of the total solids.

5. Repair of Defective Work

Restore all defective or damage work to initial condition.

All voids, cracks, etc. will be repaired with proper material.

Damaged shop coats on metal shall be spot painted with appropriate metal primer.

Defective or damaged items and/or components which cannot be repaired or restored it initial conditions shall be removed and replace to the satisfaction of the Project-in-Charge for SBMA at no additional cost to the SBMA.

6. Cleaning

Upon completion of the project, painting contractor shall remove all paint spots from all finished work and shall remove all empty cans and leave the entire premises free from rubbish or other debris caused by his work. He shall clean off all surfaces free from paint spots and smears and shall present the work clean and free from all types of blemishes.

C. Material Requirements

Any top quality, acceptable first-class paints shall be used to meet the standards of grade and quality desired for the work.

Materials of one manufacturer shall not be applied over that of another, except in the case of shop primer coat.

Colors, Gloss and Texture

Color scheme shall be as selected and approved by the Project-in-Charge for SBMA. Coordinate with PWTSG/Engineering Department. Tint prime and undercoats approximately to the shade of the final coat but with sufficient variation to distinguish them from the preceding coat.

D. Execution

General

- Examine work-in-place on which specified work is to be applied to ensure the conditions are satisfactory for application of specified materials. Report in writing, to the Project-in-Charge for SBMA defects which may influence satisfactory completion and performance of the work. Absence of such notification shall be construed as acceptance of work-in-place.
- Do not apply paint in damp or rainy weather or until surfaces have thoroughly dried from the effects of such weather.
- Before the start of painting, remove finish hardware, accessories, plates, lighting fixtures, and similar items approved by the Architect. Use only skilled workmen in the applicable building trade for removal and reinstallation of finished items in place.

Surface Preparation as Applied to Various Substrate

Ferrous Metal: Steel and iron surfaces that not have been prime coat-painted shall be cleaned and painted with specified red metal primer. Before finish painting, shop-prime coat painted steel and from surfaces, remove grease, rust, scale and dust spots with metal primer. Where steel and iron surfaces have a heavy coating of rust or scale, it shall be removed by wire brushing or sand blasting as necessary to produce a satisfactory surface for painting.

Paint Application

General: Specified work shall be done by skilled painters in a workman-like manner. All spaces shall be broom cleaned before painting started. Surfaces to be painted shall be cleaned, dry, smooth and adequately protected from dampness. Each coat of paint shall be allowed to dry at least 24 hours before succeeding coat is applied. Finished work shall be uniform, of approved color, smooth and free from runs, sags, defective coverage, clogging or excessive flooding. If surface area is not adequately covered as determined by the Project-in-Charge for SBMA, further coat shall be applied to the Satisfaction of the Project-in-Charge for SBMA. Edges of paint adjoining other materials or colors shall be sharp and clean without overlapping.

Methods of Painting: Apply paints in accordance with the manufacturer's specifications.

Coatings: Consecutive coats of paints are to be slightly differing tints except in case of white. Each coat shall be allowed to harden before the next is applied. Rubbing down between coats is to be done with fine abrasive paper.

Metal Work: Metal work shall not be left in an exposed or unsuitable situation for an undue period before completing the painting process. Stopping and filling shall be deemed to be included for all metal works and plaster works specified to be painted. Only suitable materials should be used to produce a surface ready for priming and painting.

Final Touch-Ups: At completion, touch-up and restore finish where damaged and leave in good condition.

Painting Schedule

As specified hereunder or per manufacturer's direction.

A. Concrete

Interior & Exterior Masonry

1. For Exterior Walls: one (1) coat flat latex paint and one (2) coat semi-gloss latex paint
2. For Interior Walls: one (1) coat flat latex paint and two (2) coats semi-gloss latex paint

Primer – Acrylic Concrete Primer and Sealer
Finish – 100% Acrylic Latex Paint

B. Gypsum/Fiber Cement Board

For Interior Walls/Ceiling: one (1) coat flat latex paint and one (1) coat semi-gloss latex paint

Color/paint shall be selected or approved by SBMA.

C. Structural Steel Members

one (1) coat epoxy primer paint and
one (1) coat epoxy enamel paint

- General: Painting system shall be applied to surfaces as scheduled. All surfaces shall be smooth finished prior to painting.
- Film Thickness: As recommended by paint manufacturer for the paint specified, include thickness in mils and number of coats.
- Paint Systems: New surfaces and existing surfaces made bare by cleaning operations shall receive the following coatings conforming to the respective specifications listed.

Mechanical and Electrical Items

- Paint all apparatus, equipment piping, conduit, enclosures and support; except copper, galvanized and cast-iron surfaces in concealed spaces and surfaces to receive a covering.
- All metal surfaces within exposed spaces shall be given a suitable prime coat and two (2) finish coats.
- No name plate, rotating shafts, bearing, bronze, electrical windings or valve stems shall be painted nor shall any part furnished in nickel or chrome plated be painted.
- All metal surfaces in concealed spaces except copper, cast-iron, aluminum and galvanized iron shall be given one coat of rust-inhibitor prime coat.

Adjusting and Cleaning

Remove paint spots, oil or stains from surfaces not requiring painting. Touch-up damaged or soiled finish to match adjacent surfaces.

Protection

Provide suitable coverings to protect surfaces not requiring painting.

Remove or protect items such as hardware, hardware accessories, plates, lighting fixtures and similar items placed prior to painting. Reposition or remove protection upon completion of each space.

E. Method of Measurement

The areas of concrete, gypsum board, wood and metal surfaces applied with varnish, paint and other related coating materials shall be measured in square meters as desired and accepted to the satisfaction of the Architect/Engineer in Charge.

F. Basis of Payment

The accepted quantities, measured as prescribed, shall be paid for at the contract unit price per square meter which price and payment shall constitute full compensation for furnishing and placing all materials including labor, equipment, tools and incidentals necessary to complete the work prescribed in this Item.

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
1032(1)a1	Painting of Existing Concrete/Masonry Wall	Square Meter
1032(1)d	Painting of Drywall Partition	Square Meter
1032(1)e	Painting of Fiber Cement Board Ceiling (Roof Eaves)	Square Meter

DIVISION VIII: ELECTRICAL WORKS

- 1103(5) Provide and install new Pinlights, 4"Dia., metal casing, complete with 9W LED lamp and all other materials, accessories and incidentals necessary to complete the work.
- 1103(6) Provide and install new Troffer Lamp Luminaire, 1200mm, 2X20W LED lamp and all other materials, accessories and incidentals necessary to complete the work.
- 1103(9)a Provide and install new Emergency light, Maintenance free, 230V,2hrs rated duration, 2X3Watts, Sealed Lead Acid Battery complete w/ receptacle outlet, utility box, wires & conduit and all other materials, accessories and incidentals
- 1103(9)b Provide and install new Surface Mounted Exit light, 2hrs rated duration, 230V, Nickel Metal Hydride battery complete w/ receptacle outlet, utility box, wires & conduit and all other materials, accessories and incidentals necessary to complete the work.
- 1101(8) Provide and install new 1 Gang Switch complete with utility box, switches, cover plates and all other materials, accessories and incidentals necessary to complete the work.
- 1101(9) Provide and install new 2 Gang Switch complete with utility box, switches, cover plates and all other materials, accessories and incidentals necessary to complete the work.

- 1102(7)a Provide and install new 30AT, 50AF, enclosed circuit breaker for ACU complete with wires, conduit and all other materials, accessories and incidentals necessary to complete the work.
- 1102(7)b Provide and install new 20AT, 50AF, enclosed circuit breaker for ACU complete with wires, conduit and all other materials, accessories and incidentals necessary to complete the work.
- 1102(1) Provide and install new PanelBoard "LP" complete set with feeder wires, conduit interconnected to existing service entrance, circuit breaker, including all other materials, accessories and incidentals necessary to complete the work.

A. Description

The work to be done under this section of these specifications consist of furnishing all labor, materials, accessories and equipment including all other incidentals necessary to complete the works. All works shall be in accordance with the governing codes and regulations and with the specifications, except where same shall conflict with such codes, etc. which, later shall then govern. The requirements in regards to materials and workmanship specify the required standards for the furnishing of all labor, materials and appliances necessary for the complete installation of the work specified herein and indicated on the drawings.

B. Scope of Works

The work shall consist of but not limited to the following

- a. Provisions for the project supervision, supply of all labor, materials and equipment required for the following:

Installation of new Panel board, wires, conduit, lighting fixture, convenience outlet, enclosed circuit breakers and other incidentals necessary for competing the works.

- b. Other Work Items

Trace and test all electrical circuits against any defect prior to alteration and /or addition to existing electrical system

Coordination works with SBMA Engineering Department during construction phase.

Cleaning and housekeeping.

Conduct insulation test of all the wires and continuity test for wirings after completion

Conduct grounding test to assure continuity and the resistance to ground is within the specified limits.

C. Details

1. Materials- shall conform to respective manufacturer's specifications and standards and to the requirements specified herein.

a. Lighting fixtures

- i. Ceiling mounted lighting fixture shall be 2x18W LED tube light, 1200mmX600mm, 220V, 60HZ, minimum burning life hours of 25,000 hrs. w/ louver type diffuser.
- ii. Pin light shall be 4 inch diameter, metal casing, 9W LED bulb minimum 25000 burning life hours, 220V, 60HZ with glass diffuser
- iii. Battery operated Emergency lights, maintenance free, 230Vac, 6VDC, 10watts, Sealed Lead Acid Battery, AC Pilot & Test Switch
- iv. Exist Signage, aluminum finish, Clear acrylic panels, LED lights low energy consumption, sealed nickel cadmium battery up to 90 minutes capacity.

b. Switches

- i. Switches shall be flush mounted, 250V, rated 15A, 60HZ
- ii. Switches shall be quiet type, illuminated, spring loaded and the cover plates shall be subject to the approval of the SBMA

c. Wires and Cables

- i. Wires and Cables shall be soft-drawn and annealed copper.
- ii. Wires and Cables shall be plastic insulated for 600V, THHN for line conductor and TW for ground conductor.
- iii. All wires shall be stranded
- iv. Bare copper wire for grounding electrode
- v. All wires shall be color coded, green for ground conductor, white for neutral line conductor and black for line conductor.
- vi. Wires shall be labeled and tag after installation.
- vii. Wire connectors and Terminals for use with copper shall conform to UL 486A.

d. Circuit Breakers

- i. Circuit breakers shall be thermal magnetic type with quick melt, quick trip free operating mechanism with contacts.
- ii. Circuit breakers shall be bolt-on type complying with NEMA and UL standard
- iii. Enclosure of circuit breaker shall be galvanized steel, gauge #16 and weather proof (NEMA 3R), painted in gray enamel finish.
- iv. Individual circuit breakers for air conditioning units must be mounted securely on the wall.

e. Conduit

- i. Intermediate Metal Conduit (IMC): UL 1242, zinc coated steel only
- ii. Fittings for IMC shall be threaded type. Split couplings are not acceptable.
- iii. Rigid Steel Conduit (Zinc-Coated): ANSI C80.1.
- iv. (PVC) Polyvinyl Chloride schedule 40

f. Panel Boards

- i. Panel board Enclosure shall be hot-dip galvanized steel. Thickness of the enclosure shall be code gauge and no less than gauge #16 in NEMA 1 enclosure
- ii. Main circuit breaker for Power panel shall be molded case bolt-on type complying with NEMA and UL standards minimum 10kAIC.
- iii. Branch circuit breaker for Power Panel shall be molded case bolt-on type complying with NEMA and UL standards
- iv. Busbars shall be made of copper and shall be supported on bases independent of the circuit breaker. Main buses and back pans shall be designed so that circuit breakers may be changed without machining, drilling or tapping. Separate grounding and neutral bus shall be provided.

D. Drawings and Specification

The contract drawing and specifications are complementary to each other and any labor or materials called for by either, whether or not called for by both, if necessary for the successful operation of any of the particular type of equipment furnished and installed without additional cost to the Owner.

All dimension locations of fixtures, equipment, boxes, outlets, and other electrical fixtures shall be verified on the electrical plans, architectural drawings and actual site condition/location.

E. Intent

It is not intended that the drawings shall show every pipes, fittings, boxes and equipment. All such items whether specifically mentioned or not, or indicated on the drawings, shall be furnished and installed if necessary to complete the system in accordance with the best practice of the electrical trade and to the satisfaction of the SBMA

F. Site Investigation

The Contractor is required to visit the site and to ascertain himself to the local conditions and facilities that may affect his work. He will be deemed to have

done this before preparing his proposal and any subsequent claims on the ground of inadequate or inaccurate information will not be entertained.

G. Shop Drawings

The Contractor shall submit to SBMA, for approvals, all shop drawings where the details and connections are not shown on the drawings or deviations thereof but required for the work. The Contractor shall certify the drawing details and conform to the intent of the drawings and specifications.

H. Codes and Standards

The work under this contract is to be installed with reference to the latest requirement of the following:

Philippine Electrical Code (Latest Edition)
Subic Enerzone
National Electrical Manufacturers Association (NEMA)

I. Material Requirements

Quality Assurance – All materials to be used shall be new and shall conform to the reference codes and standards.

Alternate Materials – Use of any material, not specified in this specifications may be allowed provided such alternate has been approved by SBMA and provided further that a test, if required, shall be done by an approved agency in accordance with generally accepted standards.

J. Construction Requirements/Method

Workmanship

- a. The work throughout shall be executed in the best and most thorough manner to the satisfaction of the SBMA, who will jointly interpret the meaning of the drawings and specifications and shall have power to reject any work and materials, which in their judgment, are not in full accordance therewith.
- b. The Contractor shall provide the services of a qualified Electrical Engineer to supervise the complete installation of equipment and systems and who shall be available for conduction the final acceptance test.
- c. All equipment shall be installed in accordance with the manufacturer's standard.

Wires and Cables

- a. All wires and cables shall be new in every aspect and continuous from junction to junction as may be necessary.

Grounding System

- a. All metallic conduits, panel boards and equipment-requiring grounding system shall be properly grounded and bonded by means of copper straps, Earth grounding system is applicable.

K. Method of Measurement and Basis of Payment

The accepted quantities, provided and installed as prescribed, shall be paid for at the contract unit price for each of the particular pay items that are listed in the Bill of Quantities. The payment shall constitute full compensation for provision for furnishing and placing all labor, tools and equipment and other incidentals necessary to complete the work prescribed in this item.

Pay Item No.	Description	Unit of Measurement
1103(5)	Provide and install new Pinlights, 4"Dia., metal casing, complete with 9W LED lamp and all other materials, accessories and incidentals necessary to complete the work	Set
1103(6)	Provide and install new Troffer Lamp Luminaire, 1200mm, 2X20W LED lamp and all other materials, accessories and incidentals necessary to complete the work	Set
1103(9)a	Provide and install new Emergency light, Maintenance free, 230V, 2hrs rated duration, 2X3Watts, Sealed Lead Acid Battery complete w/ receptacle outlet, utility box, wires & conduit and all other materials, accessories and incidentals	Set
1103(9)b	Provide and install new Surface Mounted Exit light, 2hrs rated duration, 230V, Nickel Metal Hydride battery complete w/ receptacle outlet, utility box, wires & conduit and all other materials, accessories and incidentals necessary to complete the work	Set
1101(8)	Provide and install new 1 Gang Switch complete with utility box, switches, cover plates and all other materials, accessories and incidentals necessary to complete the work	Set
1101(9)	Provide and install new 2 Gang Switch complete with utility box, switches, cover plates and all other materials, accessories and incidentals necessary to complete the work	Set
1102(7)a	Provide and install new 30AT, 50AF, enclosed circuit breaker for ACU complete with wires, conduit and all other materials, accessories and incidentals necessary to complete the work	Set
1102(7)b	Provide and install new 20AT, 50AF, enclosed circuit breaker for ACU complete with wires, conduit and all other materials, accessories and incidentals necessary to complete the work	Set

1102(1)	Provide and install new PanelBoard "LP" complete set with feeder wires, conduit interconnected to existing service entrance, circuit breaker, including all other materials, accessories and incidentals necessary to complete the work	Set
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DIVISION IX: MECHANICAL WORKS

1200(4)a4 3.0 TR Ceiling Mounted Air Conditioning Unit (Inverter).

1200(4)a5 1 HP Wall-Mounted Air Conditioning Unit (Inverter).

1200(4)a3 1 HP Window Type Air Conditioning Unit (Inverter)

A. Description

This item shall consist of furnishing and installation of air conditioning, refrigeration and ventilation systems, inclusive of necessary electrical connections, ductworks, grilles, pipes and condensate and all other necessary accessories, ready for service in accordance with the Plans and Specifications.

B. Material Requirements

This item shall consist of furnishing and installation of air conditioning, refrigeration and ventilation systems, inclusive of necessary electrical connections, ductworks, grilles, pipes and condensate and all other necessary accessories, ready for service in accordance with the Plans and Specifications.

Refrigerant Pipes

Refrigerant pipes shall be copper tubing, type L or K or black steel pipe, Schedule 40 for size of 100mm diameter and smaller. Pipes over 100mm shall be black steel pipe Schedule 40.

Black steel pipe shall be standard seamless, lap welded, or electric resistant welded for size 50 mm diameter and larger, screw type for size 38mm diameter and smaller, fittings for copper tubing shall be cast bronze fitting designed expressly for brazing.

Pipes for Cooling Water

Chilled and condenser cooling water pipes shall be black steel pipe, Schedule 40.

Pipes and fittings for size 50 mm diameter and smaller shall be screwed type. Pipes and fittings for size 62 mm diameter and larger shall be welded or flanged type.

Pipe Insulations

Insulations shall be performed fiberglass or its equivalent.

The insulating materials shall be covered with 100 mm x 13 mm thick polyethylene film which shall be overlapped not less than 50 mm. Pipe insulation shall be

adequately protected at point of support by means of suitable metal shield to avoid damage from compression. Insulated pipes, valves and fittings located outdoors shall be provided with metal jackets.

Ductworks

Insulations shall be performed fiberglass or its equivalent.

The insulating materials shall be covered with 100 mm x 13 mm thick polyethylene film which shall be overlapped not less than 50 mm. Pipe insulation shall be adequately protected at point of support by means of suitable metal shield to avoid damage from compression. Insulated pipes, valves and fittings located outdoors shall be provided with metal jackets.

Ducts shall be galvanized sheet steel of not less than the following gauges:

1. No.26 for 300 mm wide and smaller
2. No.24 for 350 mm to 750 mm wide
3. No. 22 for 775 mm to 1500 mm wide
4. No. 20 for 1525 mm to 2250 mm wide
5. No. 18 for 2275 mm to 2500 mm or larger
6. For aluminum sheets use one gauge higher

Joints and stiffeners of ducts using slip joints shall be as follows:

1. 300 mm wide and smaller, without bracing
2. 325 mm to 750 mm wide, brace with 25mm x 25 mm x 3 mm steel angles
3. 775 mm to 1500 mm, brace with 31 mm x 31 mm x 3 mm steel angles
4. 1525 mm up, brace with 38 mm x 38 mm x 3 mm steel angles

Stiffeners shall be located not more than 1200 mm from each joint.

Ductwork Insulation

The application insulation materials shall be rigid board made of polystyrene or equivalent 25 mm thick for ground and top floor, 13 mm thick for intermediate floor.

Galvanized metal bands for ducts shall be secure and spaced 300 mm minimum center to center and corners shall be protected with galvanized metal angles.

Diffusers

The type, shape, capacity, size and location shall be as shown in the Plans.

Diffusers shall be complete with frame and gasket, equalizing deflector and volume control indicated or specified and shall have factory-applied prime coat of paint.

Samples of supply and return air diffusers shall be submitted for approval before mass fabrication and installation.

Dampers

Dampers shall be of same materials as duct, at least one gauge heavier and shall have accessible location, complete with locking damper in position.

Where necessary, splitters, butterflies and louvers damper deflecting vanes for control of air volume and direction and for balancing the system shall be provided whether or not they are indicated on the Plans.

Fire Dampers

Main duct shall be provided with proper fire dampers of the fusible link actuated type.

Access door shall be provided in ductwork for renewal fusible link and to reset damper

Equivalent Foundation

Foundation shall be provided and shall conform to the recommendation of the manufacturer of the equipment. Equipment shall be leveled on foundation by means of jacks or steel wedges. All spaces between equipment bases and concrete foundations shall be filled with cement mortar

Electrical Works

Power supply shall be provided by the Contractor at the pull box installed inside the machine room and furnish and install the main circuit breaker and starter with suitable ratings and capacities, conduits, wirings, fittings, devices and all other equipment and electrical connections needed to complete the electrical installation of the system. All electrical works shall comply with the latest edition of the Philippine Electrical Code, with the applicable ordinance of the local government and all rules and requirements of the local power company.

C. Construction Requirements

The air conditioning system shall be entirely automatic in operation and shall not require the presence of an attendant except for periodic inspection for lubrication. All equipment and materials shall be inspected upon delivery and shall be tested after installation. Piping shall not be buried, concealed, or insulated until it has been inspected, tested and approved. Walls, floors and other parts of the building and equipment damaged by contractor in the prosecution of the work shall be replaced as shown on the Plans.

Operating Tests

Refrigerating equipment shall be tested for 8-hours per day for three consecutive days or longer when so directed, under the supervisions of manufacturers qualified and authorized representative, who will make necessary adjustments and instruct designated plant operating personnel for each operation and maintenance of refrigerating equipment and controls.

Operating test of complete air conditioning system shall be 6-hours minimum for each system. Test of air flow, temperature and humidity shall be made to

demonstrate that each complies with the requirements of the Plans and Specifications.

Guarantee and Services

All equipment, materials and workmanship shall be guaranteed for a period of one (1) year from date of acceptance at any time within the period of guarantee and upon notification, the contractor shall repair and rectify the deficiencies, including replacement of parts or entire units.

Miscellaneous

The owner shall provide with three (3) bound copies "AS BUILT" diagrams, shop drawings, part lists, serial number and inventory of equipment including manufacturers operating and maintenance manuals.

All standard tools and equipment shall be furnished for proper and regular maintenance of installed equipment.

D. Method of Measurement and Basis of Payment

The accepted quantities, provided and installed as prescribed, shall be paid for at the contract unit price for each of the particular pay items that are listed in the Bill of Quantities. The payment shall constitute full compensation for provision for furnishing and placing all labor, tools and equipment and other incidentals necessary to complete the work prescribed in this item.

Pay Item No.	Description	Unit of Measurement
1200(4)a4	3.0 TR Ceiling Mounted Air Conditioning Unit (Inverter)	Set
1200(4)a5	1 HP Wall-Mounted Air Conditioning Unit (Inverter)	Set
1200(4)a3	1 HP Window Type Air conditioning Unit (Inverter)	Set

- End of Part B -

PART C:
CONSTRUCTION OF BUILDING EXTENSION

DIVISION I: SITE WORKS

800(1) Clearing and Grubbing

A. Description

This item shall consist of clearing, grubbing, removing and disposing all vegetation and debris as designated in the Contract, except those objects that are designated to remain in place or are to be removed in consonance with other provisions of this Specification. The work shall also include the preservation from injury or defacement of all objects designated to remain.

B. Construction Requirements

General

The Engineer will establish the limits of work and designate all trees, shrubs, plants and other things to remain. The Contractor shall preserve all objects designated to remain. Paint required for cut or scarred surface of trees or shrubs selected for retention shall be an approved asphaltum base paint prepared especially for tree surgery.

Clearing shall extend one (1) meter beyond the toe of the fill slopes or beyond rounding of cut slopes as the case maybe for the entire length of the project unless otherwise shown on the plans or as directed by the Engineer and provided it is within the right of way limits of the project, with the exception of trees under the jurisdiction of the Forest Management Bureau (FMB).

Clearing and Grubbing

All surface objects and all trees, stumps, roots and other protruding obstructions, not designated to remain, shall be cleared and/or grubbed, including mowing as required, except as provided below:

- (1) Removal of undisturbed stumps and roots and nonperishable solid objects with a minimum depth of one (1) meter below subgrade or slope of embankment will not be required.
- (2) In areas outside of the grading limits of cut and embankment areas, stumps and nonperishable solid objects shall be cut off not more than 150 mm (6 inches) above the ground line or low water level.
- (3) In areas to be rounded at the top of cut slopes, stumps shall be cut off flush with or below the surface of the final slope line.
- (4) Grubbing of pits, channel changes and ditches will be required only to the depth necessitated by the proposed excavation within such areas.

- (5) In areas covered by cogon/talahib, wild grass and other vegetations, top soil shall be cut to a maximum depth of 150 mm below the original ground surface or as designated by the Engineer, and disposed outside the clearing and grubbing limits as indicated in the typical roadway section.

Except in areas to be excavated, stump holes and other holes from which obstructions are removed shall be backfilled with suitable material and compacted to the required density.

If perishable material is burned, it shall be burned under the constant care of component watchmen at such times and in such a manner that the surrounding vegetation, other adjacent property, or anything designated to remain on the right of way will not be jeopardized. If permitted, burning shall be done in accordance with applicable laws, ordinances, and regulation.

The Contractor shall use high intensity burning procedures, (i.e., incinerators, high stacking or pit and ditch burning with forced air supplements) that produce intense burning with little or no visible smoke emission during the burning process. At the conclusion of each burning session, the fire shall be completely extinguished so that no smoldering debris remains.

In the event that the Contractor is directed by the Engineer not to start burning operations or to suspend such operations because of hazardous weather conditions, material to be burned which interferes with subsequent construction operations shall be moved by the Contractor to temporary locations clear of construction operations and later, if directed by the Engineer, shall be placed on a designated spot and burned.

Materials and debris which cannot be burned and perishable materials may be disposed off by methods and at locations approved by the Engineer, on or off the project. If disposal is by burying, the debris shall be placed in layers with the material so disturbed to avoid nesting. Each layer shall be covered or mixed with earth material by the land-fill method to fill all voids. The top layer of material buried shall be covered with at least 300 mm (12 inches) of earth or other approved material and shall be graded, shaped and compacted to present a pleasing appearance. If the disposal location is off the project, the Contractor shall make all necessary arrangements with property owners in writing for obtaining suitable disposal locations which are outside the limits of view from the project. The cost involved shall be included in the unit bid price. A copy of such agreement shall be furnished to the Engineer. The disposal areas shall be seeded, fertilized and mulched at the Contractor's expense.

Woody material may be disposed off by chipping. The wood chips may be used for mulch, slope erosion control or may be uniformly spread over selected areas as directed by the Engineer. Wood chips used as mulch for slope erosion control shall have a maximum thickness of 12 mm (1/2 inch) and faces not exceeding 3900 mm² (6 square inches) on any individual surface area. Wood chips not designated for use under other sections shall be spread over the designated areas in layers not to exceed 75 mm (3 inches) loose thickness. Diseased trees shall be buried or disposed off as directed by the Engineer.

All merchantable timber in the clearing area which has not been removed from the right of way prior to the beginning of construction shall become the property of the Contractor, unless otherwise provided.

Low hanging branches and unsound or unsightly branches on trees or shrubs designated to remain shall be trimmed as directed. Branches of trees extending over the roadbed shall be trimmed to give a clear height of 6 m (20 feet) above the roadbed surface. All trimming shall be done by skilled workmen and in accordance with good tree surgery practices.

Timber cut inside the area staked for clearing shall be felled within the area to be cleared.

C. Method of Measurement and Basis of Payment

The accepted quantities, measured as prescribed, shall be paid for based on the Contract unit price for each of the particular pay items that are listed in the Bill of Quantities. The payment shall constitute full compensation for furnishing all labor, equipment, tools and incidentals necessary to complete the work prescribed in this Item.

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
800(1)	Clearing and Grubbing	Square Meter

803(1) Structure Excavation (Column and Wall Footings)

804(1) Embankment from Structure Excavation

A. Description

This item shall consist of the necessary excavation for building foundations and other structures not otherwise provided for in the Specifications. The backfilling of completed structures and the disposal of all excavated surplus materials, shall be in accordance with these Specifications and in reasonably close conformity with the Plans or as established by the Project Engineer/Architect in Charge.

This item shall include furnishing and placing of approved foundation fill material to replace unsuitable material encountered below the foundation elevation of structures.

No allowance will be made for classification of different types of material encountered.

B. Construction Requirements

Coordination

Excavation activities must not commence until an authorization is secured from **Public Works and Technical Services Group (PWTSG) - Engineering Department**. The natural ground adjacent to the structure shall not be disturbed without permission of the Project Architect/Engineer.

Trenches or foundation pits for structures or structure footings shall be excavated to the lines and grades or elevations shown on the Plans or as staked by the Project Architect/Engineer. They shall be of sufficient size to permit the placing of structure or structure footings of the full width and length shown. The elevations of the bottom of footings, as shown on the Plans, shall be considered as approximate only and the Project Architect/Engineer may order, in writing, such changes in dimensions or elevations of footings as may be deemed necessary, to secure a satisfactory foundation.

Boulders, logs, and other objectionable materials encountered in excavation shall be removed.

After each excavation is completed, the Contractor shall notify the Project Architect/Engineer to that effect and no footing, bedding material or any other materials shall be placed until the Project Architect/Engineer in Charge has approved the depth of excavation and the character of the foundation material.

All excavated materials, so far as suitable, shall be utilized as backfill or embankment. The surplus materials shall be disposed off in such a manner as not to obstruct the stream or otherwise impair the efficiency or appearance of the structure.

No excavated materials shall be deposited at any time so as to endanger the partly finished structure.

Protection

When pedestrian safety is endangered in the area of excavation work, use traffic barricades anchored in a manner to prevent displacement. Notify the SBMA Project-in-Charge prior to relocation works.

Protect all plumbing lines.

Dust Control

Prevent the spread of dust and debris and avoid the creation of a nuisance or hazard in the surrounding area. Do not use water if it results in hazardous or objectionable conditions such as flooding or pollution.

Execution

The Contractor shall perform the work described in the above paragraph "Description" as shown in the drawings or as directed by the Project-in-Charge for SBMA.

Disposal of rubbish and debris – Hauling and disposal of excavated material shall be in a manner that there will be no spillage on the road. Clean up immediately spillage from adjacent areas in a manner approved by the Project-in-Charge for SBMA.

D. Method of Measurement and Basis of Payment

The accepted quantities, measured as prescribed, shall be paid for at the contract unit price for each of the particular pay items that are listed in the Bill of Quantities. The payment shall constitute full compensation for furnishing and placing all materials including all labor, equipment, tools and incidentals necessary to complete the work prescribed in this Item.

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
803(1)	Structure Excavation (Column and Wall Footings)	Cubic Meter
804(1)	Embankment from Structure Excavation	Cubic Meter

804(4) Gravel Fill (Bedding)

A. Description

The work shall consist of filling for construction of embankment (suitable backfill material) for plinth of building and include furnishing, placing, compacting and shaping suitable materials obtained from approved sources in accordance to lines, levels, grades, dimensions shown on the drawings. Backfill shall be placed in layers not exceeding 150 mm in thickness and each layer shall be thoroughly compacted by wetting, tamping and rolling to 95% dry density at optimum moisture content.

Provide 100mm thick G-3/4 gravel material for the area covered by slab on fills, column footings and wall footings as indicated on the plan, furnishing of labor and equipment and all other incidentals necessary to complete the work.

Unsuitable material to be disposed by the Contractor.

B. Definition

1. Open areas: Those areas that do not include building sites, paved areas, street rights-of-way and parking areas.
2. Maximum density: Maximum weight in pounds per cubic foot of a specific material.
3. Optimum moisture: Percentage of water in a specific material at maximum density.
4. Muck: Materials unsuitable for foundation because of organic content, saturation to the extent that it is somewhat fluid and must be moved by dragline, dredge, or other special equipment, are designated as muck. No extra payment will be made for muck removal.
5. Unsuitable material: Earth material unsatisfactory for its intended use and as classified by the soils technicians. In addition to organic matter, sod, muck, roots, and rubbish, highly plastic clay soils of the CH and MH descriptions, and

organic soils of the OL and OH descriptions, as defined in the Unified Soil Classification System shall be considered as unsuitable material.

6. Suitable material: Earth or materials designated as being suitable for their intended use by soils technicians or the soils engineer. Material which is acceptable in accordance with the Contract and which can be compacted in the manner specified in this item.
7. Crushed stone (gravel): No. 57 aggregate or equal conforming to ASTM C -33.
8. Excavation: Excavation of every description regardless of materials encountered.

C. Material and Construction Requirements

Material and construction requirements shall conform to the DPWH: Standard Specifications for Public Works Structures, Vol. III (1995) and Highways, Bridges, and Airports (2013)

D. Method of Measurement and Basis of Payment

The accepted quantities, measured as prescribed, shall be paid for at the contract unit price for each of the particular pay items that are listed in the Bill of Quantities. The payment shall constitute full compensation for furnishing and placing all materials including all labor, equipment, tools and incidentals necessary to complete the work prescribed in this Item.

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
804(4)	Gravel Fill (Bedding)	Cubic Meter

1000(1) Soil Poisoning

A. Description

This Item shall consist of furnishing and applying termite control chemicals, including the use of equipment and tools in performing such operations in accordance with this Specification.

B. Material Requirements

The materials shall conform to the requirement of ITEM 1000 – Termite Control Work, Volume III (BlueBook 1995) and specified in the following specifications:

Termite control chemicals or toxicants shall be able to immediately exterminate termites or create barriers to discourage entry of subterranean termites into the building areas. The toxicants may be classified into the following types and according to use:

- Type I. Liquid Termicide Concentrate

This type of toxicant shall be specified for drenching soil beneath foundations of proposed buildings. The concentrate shall be diluted with water in the proportion of 1 liter of concentrate material to 65 liters of water or as specified by the Manufacturer.

Type II. Liquid Termicide Ready Mixed Solution

This type of toxicant which comes in ready mixed solution shall be used as wood preservative by drenching wood surfaces to the point of run-off.

Type III. Powder Termicide

This type of toxicant shall be applied to visible or suspected subterranean termite mounds and tunnels where termites are exterminated through trophallaxes method (exchange of nourishment between termites while greeting each other upon meeting).

C. Construction Requirements

Before any termite control work is started, thorough examination of the site shall be undertaken so that the appropriate method of soil poisoning can be applied.

The Contractor shall coordinate with other related trades through the Engineer to avoid delay that may arise during the different phases of application of the termite control chemicals.

1. Soil Poisoning

There are two methods usually adopted in soil poisoning which are as follows:

a. Cordoning

This method is usually adopted when there is no visible evidence of termite infestation. Trenches in concentric circles, squares or rectangles are dug 150 mm to 220 mm wide and at least one meter apart and applied with Type I working solution at the rate of 8 liters per linear meter.

b. Drenching

When soil show termite infestation, this method shall be applied. The building area shall be thoroughly drenched with Type I working solution at the rate of 24 liters per square meter. When Powder Termicide is to be applied to eradicate subterranean termites, careful application and precaution shall be given considering that this toxicant is fatal to animal and human lives.

2. Application

At the time soil poisoning is to be applied, the soil to be treated shall be in friable condition with low moisture content so as to allow uniform distribution of toxicant agents. Toxicant shall be applied at least twelve (12) hours prior to placement of concrete which shall be in contact with treated materials.

Treatment of the soil on the exterior sides of the foundation walls, grade beams and similar structures shall be done prior to final grading and planting or landscaping work to avoid disturbance of the toxicant barriers by such operations.

Areas to be covered by concrete slab shall be treated before placement of granular fill used as capillary water barrier at a rate of 12 liters per square meter with Type I working solution after it has been compacted and set to required elevation. Additional treatment shall be applied as follows:

- a. In critical areas such as utility openings for pipes, conduits and ducts, apply additional treatment at the rate of 6 liters per linear meter in a strip 150 mm to 200 mm wide.
- b. Along the exterior perimeter of the slab and under expansion joint, at the rate of 2.5 liters per linear meter in a strip of 150 to 200 mm wide in a shallow trench.

3. Wood Protection

Where the application of wood preservative is necessary, the Contractor shall use Type II working solution as recommended by the manufacturer.

All wood materials not pressure treated as specified in item 1003 – Carpentry and Joinery, Volume III (BlueBook 1995) shall be treated with Type II ready mixed solution as herein called for or as directed by the Engineer in Charge.

4. Guarantee

The Contractor shall guarantee the work for one (1) year after final acceptance.

D. Method of Measurement and Basis of Payment

Liquid termite control chemicals or toxicants shall be measured by area applied in square meters in the cordoning and drenching of lot areas and soil poisoning of granular fill or actual number of liters used in drenching wood surfaces, while powder chemical/toxicant shall be measured by kilogram applied to suspected subterranean termite mounds and tunnels. The quantity to be paid for shall be determined and accepted by the Engineer in Charge.

The accepted quantities, measured as prescribed, shall be paid for at the Contract Unit Price for Termite Control Work which price and payment shall be full compensation for furnishing and applying termite control chemicals including the use of equipment and tools, labor and incidentals necessary to complete the work prescribed in this item.

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
804(4)	Soil Poisoning	Square Meters

DIVISION II: CONCRETE WORKS

900(1)c2a **Concreting of Column Footing, CF-1 (including Reinforcing Steel)**

900(1)c2b **Concreting of Wall Footing, WF-1 (including Reinforcing Steel)**

900(1)c4 **Concreting of Column, C-1 (including Reinforcing Steel)**

900(1)c6 **Concreting of Roof Beams, RB-1 (including Reinforcing Steel)**

900(1)c2c **Concreting of Slab on Grade (including Reinforcing Steel)**

A. Description

The work under this section shall include all materials, labor and equipment necessary to achieve a finished product, including but not limited to the items in these specifications and those shown on the working drawings. Work include but are not limited to concrete counters.

See drawings and details for sizes and location of work requirement.

B. Construction Requirements

Quality Assurance/Quality Control

Standards

Comply with standards specified in Specification for Structural Concrete of Buildings ACI 301 latest edition, ACI 315 and ACI 318

Submittals

Materials Data

- Within 7 calendar days after award of Contract, submit (1) complete material list of items proposed to be furnished and installed under this Section.
- Complete information on cement source of supply, physical and chemical characteristics, transportation from mill-to-site handling and site storage.
- Cement Mill Test Certification.
- Complete information on aggregate procurement, processing and storage.
- Complete concrete mix designs test results
- Reinforcement Mill Certificates

C. Material Requirements

The materials shall conform to the requirement of ITEM 900 – Reinforced Concrete, Volume II (BlueBook 2013) and specified in the following specifications:

Cement

Portland Cement shall conform to the requirements of ASTM C-150 or PNS07 (1983). Cement to be used in construction shall comply with the requirements of Type I ordinary Portland Cement. Do not use cement having a temperature of greater than 60 degrees centigrade or 140 degrees Fahrenheit.

Coarse Aggregates

Coarse aggregates shall consist of crushed stone, gravel or other approved materials of similar characteristics or combinations thereof having clean, hard, strong, durable, coated particles free from injurious amounts of soft, friable, thin elongated or laminated pieces of alkali and organic or other deleterious matter.

Fine Aggregates

Fine aggregates shall consist of sand, screened stone or other inert materials with similar characteristics, or a combination thereof, having clean, strong, durable, uncoated grain and free from injurious amounts of dusts, lumps, soft, or flaky particles, shale, alkali, organic matter, loam or other deleterious substances.

Water

Water used as an ingredient in concrete shall be clean, portable, and free from injurious amounts of foreign matter.

Reinforcement

Reinforcement shall comply with ASTM A-615 with the following grades:

- Reinforcing Steel Bars 16 mm diameter and smaller - Grade 40

Strength of Concrete shall be 3000 psi Class A at 28

D. Method of Measurement and Basis of Payment

The accepted quantities, measured as prescribed, shall be paid for based on the contract unit price for each of the particular pay items that are listed in the Bill of Quantities. The payment shall constitute full compensation for furnishing and placing all materials including all labor, equipment, tools and incidentals necessary to complete the work prescribed in this Item.

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
900(1)c2a	Concreting of Column Footing, CF-1 (including Reinforcing Steel)	Cubic Meter
900(1)c2b	Concreting of Wall Footing, WF-1 (including Reinforcing Steel)	Cubic Meter

900(1)c4	Concreting of Column, C-1 (including Reinforcing Steel)	Cubic Meter
900(1)c6	Concreting of Roof Beams, RB-1 (including Reinforcing Steel)	Cubic Meter
900(1)c2c	Concreting of Slab on Grade (including Reinforcing Steel)	Cubic Meter

903(3) Scaffolding Rentals

A. Description

This section shall consist of designing, constructing and removing forms and falsework to temporary support concrete, girders and other structural elements until the structure is completed to the point it can support itself.

This item also covers selecting, erecting and dismantling all types of scaffolds. It applies to workers, supervisors, scaffold qualified persons, scaffold custodians and Facilities. This ensure scaffolding is adequate for the work to be performed and properly erected and dismantled whenever it needed to complete the work.

B. Material Requirements

B.1 Forms and Falseworks

B.1.1 Forms

The materials used for smooth form finish shall be plywood, tempered concrete-form-grade hardboard, metal, plastic, paper or other acceptable materials capable of producing the desired finish for form-facing materials. Form-facing materials shall produce a smooth, uniform texture on the concrete. Form-facing materials with raised grain, torn surfaces, worn edges, patches, dents, or other defects that will impair the texture of concrete surfaces shall not be permitted. No form-facing material shall be specified for rough form finish.

a. Form accessories

Formwork accessories that are partially or wholly embedded in concrete, including ties and hangers shall be commercially manufactured. The use of non-fabricated wire form ties shall not be permitted. Where indicated in the Contract, use form ties with integral water barrier plates in walls.

b. Form release agents

Commercially manufactured formwork release agents shall be used to prevent formwork absorption of moisture, prevent bond with concrete, and hot stain the concrete surfaces.

B.1.2 Falsework

The materials to be used in the falsework construction shall be of the quantity and quality necessary to withstand the stresses imposed; it may be

timber or steel or a combination of both. The workmanship shall be of such quality that the falsework will support the loads imposed on it without excessive settlement or take-up beyond as shown on the falsework drawings.

B.2 Scaffoldings

Refer to Rule 1414 on Scaffoldings of the 1989 Occupational Health and Safety Standards, as Amended (Department Advisory No. 128-13 Series of 2013).

C. Construction Requirements

C.1 Forms and Falseworks

Forms and Falseworks design and drawings shall be in accordance, with Item 407 Concrete Structure subsection 407.3.9 and 407.3.12 respectively of DPWH Standard Specification for Public Work and Highways, Vol II.

C.2 Scaffoldings

Refer to Rule 1414 on Scaffoldings of the 1989 Occupational Health and Safety Standards, as Amended (Department Advisory No. 128-13 Series of 2013).

D. Method of Measurement and Basis of Payment

D.1 Forms and Falsework

When the Bill of Quantities contain an item for form and falsework, the pay item will include all materials and accessories needed in the work.

Whenever the Bill of Quantities does not contain an item for form and falsework, the work will not be paid directly but will be considered as a subsidiary obligation of the contractor under other Contract Items.

Forms and Falsework shall not be measured and paid separately but shall be considered integral with the other pay items of the contract.

D.2 Scaffoldings

The quantities for the rental of scaffoldings shall be for the time of mobilization and demobilization and the unit of the measure is "month".

The accepted quantities, measured as prescribed, shall be paid for based on the contract unit price for each of the particular pay items that are listed in the Bill of Quantities. The payment shall constitute full compensation for furnishing and maintaining such items.

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
903(3)	Scaffolding Rentals	Month

DIVISION II: MASONRY WORKS

1046(2)a2 150mm CHB Non-Load Bearing (including Reinforcing Steel)

1027(1) Cement Plaster Finish for New Concrete / Masonry Wall (25mm thick)

A. Description

These Items shall consist of furnishing of all necessary materials, tools, equipment and labor necessary to complete the execution of the masonry works using Concrete Hollow Blocks as shown on the Plans and herein specified.

B. Material Requirements

The materials shall conform to the requirement of ITEM 1046 – Masonry Works, DPWH D.O. No. 80 Series of 2018 and specified in the following specifications:

Hydraulic Cement

Hydraulic Cement shall conform to the applicable requirements of Portland Cement under Division II: Concrete Works.

Aggregates

Aggregates shall conform to the applicable requirements of Concrete Aggregates under Division II: Concrete Works.

Water

Water shall conform to the applicable requirements of Water under Division II: Concrete Works.

Reinforcing Steel

Reinforcing steel shall conform to the applicable requirements of Reinforcing Steel under Division II: Concrete Works.

Use 12 mm dia. deformed steel for dowels, vertical and horizontal bars on CHB at ground floor exterior and interior walls:

Vertical Bars	: 800mm O.C.
Development	: 264mm
Horizontal Bars	: every 3 layers
Reinforcement	: 12mm grade 40
Splicing	: 348 mm

Mortar

- a. Mortar Proportions: Mortar shall consist of sand, cement and water conforming to the requirements under Division II: Concrete Works, mixed in the proportion of one (1) part cement to three (3) parts sand by volume, sufficient water to obtain the required consistency.

- b. Mortar Joint: shall be uniform in thickness and the average thickness of any three consecutive joints shall be approximately 9.5 mm. Changing in coursing or bending after the work is started will not be permitted. Exposed joints shall be tolled slightly concave with rounded or other approved slightly larger than the width of the edge of the units, compressing and seating the surface of the joints.
- c. Jointing and Cleaning: Upon completion of all work, all holes in joints of exposed masonry surface shall be filled by completely filling with mortar. After jointing all exposed masonry surfaces shall be wetted and then cleaned with a solution of 10 percent by volume of muriatic (hydrochloric) acid applied with stiff fiber brushes leaving the masonry clean. Masonry surfaces shall be rinsed down with clean, clear water.

Concrete Hollow Blocks (Non-load bearing CHB)

Width, height and length of concrete hollow blocks shall be ± 3.20 mm from the specified dimension shown on the Plans.

CHB – 150 mm concrete hollow blocks shall be of standard machine vibrated and shall have fine and even texture and well defined edges. The minimum compressive strength is 350 psi.

Cement Plaster Finish

All hollow blocks wall surface to be applied with plain cement finish will be cleaned and evenly wet slashed with a wash of neat cement and sand followed by 1:3 cement mortar mix 1" (25mm) thick which shall be applied with wooden float.

C. Construction Requirements

C.1 Concrete Hollow Blocks

C.1.1 Mixing

Concrete shall be mixed well using the proportion specified by the Engineer. Hand mixing shall be done, using shovels, on a level concrete slab or steel plate. Mix aggregate and cement until the color is uniform. Spread the mixture out, sprinkle water over the surface and mix. Continue with this process until the right amount of water has been mixed in. Mixture shall be free from impurities such as dirt and grass.

If batch mixer is used, accurate timing and measuring devices shall be observed as per manufacturer's recommendation.

C.1.2 Moulding

Hand operated machines shall be used as manufacturer's recommendation.

The mould of a powered machine should be filled until six (6) to eight (8) cycles of compaction are required to bring the compacting head to its stops.

Demoulding or removal of the mould shall be done carefully so that the fresh blocks are not damaged. Fresh blocks shall be protected from rain with plastic sheets or any suitable covering during the first day and from the drying effects of the sun and wind until curing starts.

C.1.3 Curing

After being removed from the mold, the Concrete Hollow Blocks (CHB) shall be covered with a plastic sheet or tarpaulin and kept damp and shaded for at least seven (7) days in order to effectively cure. This can be achieved by continually spraying them with water or keeping them under water in tanks.

C.1.4 Installation

1. All masonry work shall be laid true to line, level, plumb and neat in accordance with the Plans.
2. Units shall be cut accurately to fit all plumbing ducts, opening for electrical works, and all holes shall be neat patched.
3. No construction support shall be attached to the wall except where specifically permitted by the Engineer in Charge.
4. Masonry unit shall be sound, dry, clean and free from cracks when placed in the structure.
5. Proper masonry units shall be used to provide for all window, doors, bond beams, lintels, plasters etc., with a minimum of unit cutting.
6. Where masonry units cutting is necessary, all cuts shall be neat and true to line.
7. Units shall be placed while the mortar is soft and plastic. Any unit disturbed to the extent that the initial bond is broken after initial positioning shall be removed and re-laid in fresh mortar.
8. Mortar should not be spread too far ahead of units, as it will stiffen and lose plasticity, especially in hot weather. Mortar that has stiffened should not be used. ASTM C270, Standard Specification for Mortar for Unit Masonry requires that mortar be used within 2 ½ hours of initial mixing.

C.1.5 Reinforcement for Concrete Hollow Blocks

Requirement shall be done in accordance with the structural Plans as to size, spacing and other requirements of Reinforcing Steel under Division II: Concrete Works.

C.1.6 Finish and Appearance

1. All units shall be sound and free of cracks or other defects that interfere with the proper placement of the unit or significantly impair the strength or permanence of the construction. Minor cracks, incidental to the usual method of manufacture or minor chipping resulting from customary methods of handling in shipment and delivery, are not grounds for rejection.
2. Where units are to be used in exposed wall construction, the face or faces that are to be exposed shall not show chips or cracks, not otherwise permitted, or other imperfections when viewed from a distance of not less than 6.1 m under diffused lighting.
 - a. Five (5) percent of a shipment containing chips, not larger than 25.4 mm in any dimension, or crack not wider than 0.5 mm and not longer than 25 percent of the nominal height of the unit, is permitted.
3. The color and texture of units shall be specified by the purchaser. The finished surfaces that will be exposed in place shall conform to an approved sample, consisting of not less than four (4) units, representing the range of texture and color permitted.
4. A shipment shall not contain more than five (5) percent of units, including broken unit that do not meet the requirements of the above provisions.

C.1.7 Sampling and Testing for Concrete Hollow Blocks

Method of Sampling for Quality Test shall be as follows:

1. One (1) Quality Test for every 10,000 units or fraction thereof.
2. Six (6) specimens to be submitted for one (1) quality test in which three (3) specimens for Compression Test and the remaining three (3) for Moisture Content and Water Absorption.

Units shall be tested in accordance with ASTM C140, Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units and ASTM C426, Standard Test Method for Linear Drying Shrinkage of Concrete Masonry Units.

C.1.8 Storage and Handling of Masonry Works

The blocks shall be stored in such a way as to avoid contact with moisture at site. They shall be stock-piled on planks or other supports free from contact with ground and covered to protect against wetting. The block shall be handled with care and damaged units shall be rejected.

D. Method of Measurement and Basis of Payment

The accepted quantities, measured as prescribed, shall be paid for based on the contract unit price for each of the particular pay items that are listed in the Bill of Quantities. The payment shall constitute full furnishing and placing all materials including all labor, equipment, tools and incidentals necessary to complete the work prescribed in this Item.

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
1046(2)a2	150mm CHB Non-Load Bearing (including Reinforcing Steel)	Square Meter
1027(1)	Cement Plaster Finish for New Concrete / Masonry Wall (25mm thick)	Square Meter

DIVISION IV: ROOFING WORKS

1047(8)a C 50mm x 150 mm Steel Rafter

1047(2)b C 50mm x 100 mm Steel Purlins

A. Description

1. Scope

The work includes furnishing all materials, equipment and providing all labor required to provide and complete the installation of 1.9mm x 50mm x 100mm LC-Purlins on 1.9mm thick x 50mm x 150mm C Rafter, bolted connection, including angular cleats, and all other incidentals necessary to complete the works.

This work will also include any incidental metal construction not otherwise provided for, all in accordance with these Specifications, Plans and Special Provisions.

See drawing and details for sizes and location of work required.

2. Quality Assurance/Quality Control

Standards

Materials must comply with standards specified in American Institute of Steel Construction (AISC) 9th Editions of American Iron and Steel Institute (AISI), American Society for Testing and Materials (ASTM)

3. Submittal

Submit shop drawings and samples of materials to be used and secure approval from SBMA prior to installation.

3.1 Materials Data

a. Submit within 20 days after the awarding of contract:

- (1) Complete list of item to be furnished supplied and installed under this section.
- (2) Specifications, mill certifications, certified test reports, welding procedures and other relevant documents.
- (3) Materials handling procedures on site and fabrication plan.

3.2 Samples

Accompanying the above submittals, submit samples of the following:

- (1) Structural Steel Rafter Section – 300 mm for ea. section
- (2) Structural Steel Purlins Section – 300 mm for ea. section
- (3) Structural Steel Angle bar – 300 mm for ea. section
- (4) Anchor bolt with nut & washer – 1 pc.
- (5) Machine bolt with nut & washer – 1 pc.
- (6) Welding Rod – 1 box
- (7) Painting – color chart and specifications

4. Materials Handling

a. Protection

Adequate means necessary to protect the materials covered by this section shall be employed before during and after installation and to protect the works and materials of all other trades.

b. Replacement

In the events of damage by which the structural specifications and properties of the materials is not greatly affected immediate repair shall be done as directed, otherwise, replace the material with new one at no additional cost to the contract.

c. Storage

- (1) Materials under this section shall be stored in such a manner that they are protected from direct exposure to weather.
- (2) Correct handling shall be observed during loading, unloading and transferring so as not to deform and primarily stressed the materials.
- (3) All materials shall not be laid directly to ground. They shall be properly piled at clearance accessible during hauling.

Rust protection coating shall be primarily supplied prior to transportation or site

delivery.

B. Material Requirements

Materials shall meet the requirements of Item 712, Structural Metal; Item 409, Welded Structural Steel; and Item 709, Paints of DPWH Standard Specifications, Volume II & III (Blue Book) and specified in the following specifications:

1. Structural Steel Sections

All Structural Steel shall be of tested quality. The Material Specification shall conform to standard of ASTM A 570 unless otherwise specified on the Plans.

Wherever the material is procured by the contractor, the Contractor shall submit the test certificated conforming to the said standards of all steel materials used for fabrication. All structural steel shall be free from blisters, rust, scales, seams, lamination, cracks, fissures and other surface defects.

a. Structural Steel Rafters

Use Channel, C 50mm x 150 mm (1.9 mm thk)

b. Steel C-Purlins

Use Lipped Channel, LC 50mm x 100mm (1.9 mm thk)

c. Cleats / Wall Support

Use L 50 x 50 x 6 mm thk

2. Bolts

a. Machine bolts including nut and washers conform to the standard of ASTM A325 or A490 high Strength and shall be 16mm (5/8") diameter x 25 mm long.

b. Machine bolts including nut and washers conform to the standard of ASTM A307 high Strength and shall be 25mm (1") diameter x 225 mm long.

c. Anchor bolts including nut and washers conform to the standard of ASTM A307 high Strength and shall be 2 - 16mm (5/8") diameter x 160 mm long (refer to drawing for details).

3. Filler Metal & Flux for Welding

Welding electrodes shall be of 60 ksi yield strength

4. Paint

Paint for steel materials under this section shall be epoxy primer and top with epoxy enamel, silver grey color.

D. Method of Measurement and Basis of Payment

The accepted quantities, provided and installed as prescribed, shall be paid for at the contract unit price for each of the particular pay items that are listed in the Bill of Quantities. The payment shall constitute full compensation for provision for furnishing and placing all labor, tools and equipment and other incidentals necessary to complete the work prescribed in this item.

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
1047(2)a	C 50mm x 150 mm Steel Rafter	Linear Meter
1047(2)b	C 50mm x 100 mm Steel Purlins	Linear Meter

C.4.3 0.60 mm thick Pre-Painted Rib Type Roofing

C.4.4 Fabricated Metal Roofing Accessory (Wall Flashing, 0.6 mm thick)

C.4.5 Fabricated Metal Roofing Accessory (Side Flashing, 0.6 mm thick)

C.4.6 12mm x 300 mm Fiber Cement Board Fascia

C.4.7 Reflective Insulation (10mm Double Sided Foil)

A. Description

1. Scope

The works include furnishing all prepainted metal sheet materials, tools and equipment including roof insulation, and labor required in undertaking the proper installation complete as shown on the Plans and in accordance with this specification.

This section also includes installation of fiber cement fascia board.

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

2. Submittals

Submit shop drawings and samples of materials to be used and secure approval prior to installation.

- i. Prepainted roof sheet color & thickness swatch – 3 pcs
- ii. Fabricated metal roofing accessories/components color & thickness swatch – 3 pcs. each
- iii. Tek Screws – 10 pcs.
- iv. Silicone Sealant – 2 Tubes

B. Material Requirements

- a. Roofing sheets: Pre-painted rib type metal roofing sheet 0.60mm thk (gauge #24) base metal thickness, zinc-aluminium coated. Color of roof must be approved by SBMA prior to installation.
- b. Roofing Accessories: 0.60mm thk (gauge #24) base metal thickness, pre-painted, zinc-aluminium coated, from plain sheets, preformed with matching shapes and fitting as per drawings. For metal flashing and counter flashing components, ridge rolls, straps, flashing, gutter.
- c. Fasteners and Fixation: Use appropriate connectors as recommended by the manufacturer and approved by the Engineer. Paint same color as roof all exposed fixation and fastening devices. Apply fasteners in a neat, consistent, even and standard manner. Apply strip of butyl rubber-based caulking compound along all end lap joints and passing over pre-drilled fixation holes, fixation of metal sheet to metal purlins and when lapped over another metal sheet. For fixation of flashings, use Tekscrew for roof eaves area, where roof frames are exposed. Tekscrew shall be not less 12 pcs per sq.m.
- d. Reflective Insulation

Use 10mm thk double-sided aluminum-foam reflective insulation including all other incidentals.
- d. Fiber Cement Board Parapet – 12mm thk to be painted. See material specifications on the other pay item. Color scheme must be approved by SBMA.

C. Construction Requirements

Before any installation work is commenced, the Contractor shall ascertain that the top face of the purlins are in proper alignment. Correct the alignment as necessary to have the top faces of the purlins on an even plane.

Fitting and installation of long span prepainted rib type roofing including fabricated metal roofing accessories/components as well as application of supplementary materials to make the roof unit watertight and leak proof including painting of installed incidentals.

1. Handling/Lifting/Positioning of Sheets

Sheets shall be handled carefully to prevent damage to the paint coating. Lift all sheets or sheet packs on to the roof frame with the overlapping downturned edge facing towards the side of the roof where installation will commence, otherwise sheets will have to be turned end-to-end during installation.

2. Installation Procedure

- a. Start roofing installation by placing the first sheet in position with the downturned edge in line with other building elements and fastened to supports as recommended.
- b. Place the downturned edge of the next sheet over the edge of the first sheet, to provide side lap and hold the side lap firmly in place. Continue the same procedure for subsequent sheets until the whole roofing area is covered and/or (Adopt installation procedure provided in the instruction manual for each type of Architectural molded rib profile section).
- c. For walling applications follow the procedure for roofing. Allow a minimum end lap of 100 mm (4") for vertical walling.

3. Gutters, Valley, Flashing ridge and Hip rolls

Gutters, valley, flashing ridge and hip rolls shall be fastened where indicated on the Plans by self-tapping screws or galvanized iron straps and rivets.

4. End Laps

In case handling or transport consideration requires to use two or more end lapped sheets to provide full length coverage for the roof run, install each line of sheets from the bottom to top or from eave line to apex of roof framing. Provide 150 mm minimum end lap.

5. Anchorage/Fastening

- a. Prepainted steel roofing sheets shall be fastened to the wood purlins with standard length GI strap and rivets.
- b. For steel frame up to 4.5 mm thick, use self-drilling screw No. 12 x 35 mm long hexagonal head with neoprene washer.
- c. For steel frame up to 5 mm thick or more, use self-drilling screw No. 12 x 40 mm long hexagonal head with neoprene washer.
- d. Side lap fastener, use self-drilling screw No. 10 x 16 mm long hexagonal head with neoprene washer.
- e. Valley fastened to lumber and for walling, use self-drilling wood screw No. 12 x 25 mm long hexagonal head with neoprene washer.
- f. Valley fastened to steel supports, use self-drilling screws, hexagonal head with neoprene washer. Drill size is 5 mm diameter.

6. Cutting of Sheets

- a. In cutting prepainted steel roofing sheets and accessories to place, the exposed color side down. Cutting shall be carried out on the ground and not over the top of other painted roofing product.

- b. Power cutting or drilling to be done or carried out on pre-painted products already installed or laid in position, the area around holes or cuts shall be masked to shield the paint from hot fillings.

7. Storage and Protection

Pre-painted steel roofing, walling products and accessories should be delivered to the jobsite in strapped bundles. Sheets and/or bundles shall be neatly stacked in the ground and if left in the open it shall be protected by covering the stack materials with loose tarpaulin.

D. Method of Measurement and Basis of Payment

The accepted quantities, measured by actual area covered or length installed, shall be paid for based on the contract unit price for each of the particular pay items that are listed in the Bill of Quantities. The payment shall constitute full compensation including labor, materials, tools and incidentals necessary to complete the work prescribed in this section.

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
C.4.3	0.60 mm thick Pre-Painted Rib Type Roofing	Square Meter
C.4.4	Fabricated Metal Roofing Accessory (Wall Flashing, 0.6 mm thick)	Linear Meter
C.4.5	Fabricated Metal Roofing Accessory (Side Flashing, 0.6 mm thick)	Linear Meter
C.4.6	12mm x 300 mm Fiber Cement Board Fascia	Linear Meter
C.4.7	Reflective Insulation (10mm Double Sided Foil)	Square Meter

DIVISION V: PAINTING WORKS

1032(1)a2 Painting of New Concrete/Masonry Walls

A. Description

The work under this section consists of furnishing all labor, painting equipment, scaffolding, and protective coverings required for the painting and finishing of all surfaces as designated in the drawings and specifications.

The term "paint" as herein includes emulsions, latex, paints, varnishes, sealers, and other coatings, whether used as prime, intermediate, or finish coats.

B. Construction Requirements

Refer to Division VII Item 1032(1)a1

C. Material Requirements

Refer to Division VII Item 1032(1)a1

D. Method of Measurement and Basis of Payment

The accepted quantities, measured as prescribed, shall be paid for at the contract unit price per square meter which price and payment shall constitute full compensation for furnishing and placing all materials including labor, equipment, tools and incidentals necessary to complete the work prescribed in this Item.

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
C.5.1	Painting of New Concrete/Masonry Walls	Square Meter

- End of Section

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