Republic of the Philippines
Department of Agriculture
Bureau of Fisheries and Aquatic Resources
REGIONAL FISHERIES OFFICE - MIMAROPA

PHILIPPINE BIDDING DOCUMENTS

REHABILITATION AND IMPROVEMENT OF FRESHWATER TECHNOLOGY STATION IN BARCENAGA, NAUJAN, ORIENTAL MINDORO

***LOT 2:* REHABILITATION AND IMPROVEMENT OF SOLAR POWER AND WATER SYSTEMS IN FRESHWATER TECHNOLOGY STATION (FTS)**

Bid Reference Number	**2022-020**
Price of Bid Documents	**Php 1,000.00**
Approved Budget for the Contract	**Php 820,000.00**
End-User & Procuring Unit	**Mercilyn V. HJ Rebuan; BFRS**
Pre-Bid Conference Schedule	**February 27 , 2023; 10:00 am**
Bid Submission, Opening & Evaluation	**March 13, 2023; 10:00 am**

Sixth Edition

Preface

These Philippine Bidding Documents (PBDs) for the procurement of Infrastructure Projects (hereinafter referred to also as the "Works") through Competitive Bidding have been prepared by the Government of the Philippines for use by all branches, agencies, departments, bureaus, offices, or instrumentalities of the government, including government-owned and/or -controlled corporations, government financial institutions, state universities and colleges, local government units, and autonomous regional government. The procedures and practices presented in this document have been developed through broad experience, and are for mandatory use in projects that are financed in whole or in part by the Government of the Philippines or any foreign government/foreign or international financing institution in accordance with the provisions of the 2016 revised Implementing Rules and Regulations (IRR) of Republic Act (RA) No. 9184.

The PBDs are intended as a model for admeasurements (unit prices or unit rates in a bill of quantities) types of contract, which are the most common in Works contracting.

The Bidding Documents shall clearly and adequately define, among others: (i) the objectives, scope, and expected outputs and/or results of the proposed contract; (ii) the eligibility requirements of Bidders; (iii) the expected contract duration; and (iv) the obligations, duties, and/or functions of the winning Bidder.

Care should be taken to check the relevance of the provisions of the PBDs against the requirements of the specific Works to be procured. If duplication of a subject is inevitable in other sections of the document prepared by the Procuring Entity, care must be exercised to avoid contradictions between clauses dealing with the same matter.

Moreover, each section is prepared with notes intended only as information for the Procuring Entity or the person drafting the Bidding Documents. They shall not be included in the final documents. The following general directions should be observed when using the documents:

a. All the documents listed in the Table of Contents are normally required for the procurement of Infrastructure Projects. However, they should be adapted as necessary to the circumstances of the particular Project.

b. Specific details, such as the "*name of the Procuring Entity*" and "*address for bid submission*," should be furnished in the Instructions to Bidders, Bid Data Sheet, and Special Conditions of Contract. The final documents should contain neither blank spaces nor options.

c. This Preface and the footnotes or notes in italics included in the Invitation to Bid, BDS, General Conditions of Contract, Special Conditions of Contract, Specifications, Drawings, and Bill of Quantities are not part of the text of the final document, although they contain instructions that the Procuring Entity should strictly follow.

d. The cover should be modified as required to identify the Bidding Documents as to the names of the Project, Contract, and Procuring Entity, in addition to date of issue.

e. Modifications for specific Procurement Project details should be provided in the Special Conditions of Contract as amendments to the Conditions of Contract. For easy completion, whenever reference has to be made to specific clauses in the Bid Data Sheet or Special Conditions of Contract, these terms shall be printed in bold typeface on Sections I (Instructions to Bidders) and III (General Conditions of Contract), respectively.

f. For guidelines on the use of Bidding Forms and the procurement of Foreign-Assisted Projects, these will be covered by a separate issuance of the Government Procurement Policy Board.

TABLE OF CONTENTS

Glossary of Terms, Abbreviations, and Acronyms

ABC – Approved Budget for the Contract.

ARCC – Allowable Range of Contract Cost.

BAC – Bids and Awards Committee.

Bid – A signed offer or proposal to undertake a contract submitted by a bidder in response to and in consonance with the requirements of the bidding documents. Also referred to as *Proposal* and *Tender.* (2016 revised IRR, Section 5[c])

Bidder – Refers to a contractor, manufacturer, supplier, distributor and/or consultant who submits a bid in response to the requirements of the Bidding Documents. (2016 revised IRR, Section 5[d])

Bidding Documents – The documents issued by the Procuring Entity as the bases for bids, furnishing all information necessary for a prospective bidder to prepare a bid for the Goods, Infrastructure Projects, and/or Consulting Services required by the Procuring Entity. (2016 revised IRR, Section 5[e])

BIR – Bureau of Internal Revenue.

BSP – Bangko Sentral ng Pilipinas.

CDA – Cooperative Development Authority.

Consulting Services – Refer to services for Infrastructure Projects and other types of projects or activities of the GOP requiring adequate external technical and professional expertise that are beyond the capability and/or capacity of the GOP to undertake such as, but not limited to: (i) advisory and review services; (ii) pre-investment or feasibility studies; (iii) design; (iv) construction supervision; (v) management and related services; and (vi) other technical services or special studies. (2016 revised IRR, Section 5[i])

Contract – Refers to the agreement entered into between the Procuring Entity and the Supplier or Manufacturer or Distributor or Service Provider for procurement of Goods and Services; Contractor for Procurement of Infrastructure Projects; or Consultant or Consulting Firm for Procurement of Consulting Services; as the case may be, as recorded in the Contract Form signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein.

Contractor – is a natural or juridical entity whose proposal was accepted by the Procuring Entity and to whom the Contract to execute the Work was awarded. Contractor as used in these Bidding Documents may likewise refer to a supplier, distributor, manufacturer, or consultant.

CPI – Consumer Price Index.

DOLE – Department of Labor and Employment.

DTI – Department of Trade and Industry.

Foreign-funded Procurement or Foreign-Assisted Project – Refers to procurement whose funding source is from a foreign government, foreign or international financing institution as specified in the Treaty or International or Executive Agreement. (2016 revised IRR, Section 5[b]).

GFI – Government Financial Institution.

GOCC – Government-owned and/or –controlled corporation.

Goods – Refer to all items, supplies, materials and general support services, except Consulting Services and Infrastructure Projects, which may be needed in the transaction of public businesses or in the pursuit of any government undertaking, project or activity, whether in the nature of equipment, furniture, stationery, materials for construction, or personal property of any kind, including non-personal or contractual services such as the repair and maintenance of equipment and furniture, as well as trucking, hauling, janitorial, security, and related or analogous services, as well as procurement of materials and supplies provided by the Procuring Entity for such services. The term "related" or "analogous services" shall include, but is not limited to, lease or purchase of office space, media advertisements, health maintenance services, and other services essential to the operation of the Procuring Entity. (2016 revised IRR, Section 5[r])

GOP – Government of the Philippines.

Infrastructure Projects – Include the construction, improvement, rehabilitation, demolition, repair, restoration or maintenance of roads and bridges, railways, airports, seaports, communication facilities, civil works components of information technology projects, irrigation, flood control and drainage, water supply, sanitation, sewerage and solid waste management systems, shore protection, energy/power and electrification facilities, national buildings, school buildings, hospital buildings, and other related construction projects of the government. Also referred to as *civil works or works*. (2016 revised IRR, Section 5[u])

LGUs – Local Government Units.

NFCC – Net Financial Contracting Capacity.

NGA – National Government Agency.

PCAB – Philippine Contractors Accreditation Board.

PhilGEPS - Philippine Government Electronic Procurement System.

Procurement Project – refers to a specific or identified procurement covering goods, infrastructure project or consulting services. A Procurement Project shall be described, detailed, and scheduled in the Project Procurement Management Plan prepared by the agency which shall be consolidated in the procuring entity's Annual Procurement Plan. (GPPB Circular No. 06-2019 dated 17 July 2019)

PSA – Philippine Statistics Authority.

SEC – Securities and Exchange Commission.

SLCC – Single Largest Completed Contract.

UN – United Nations.

Section I. Invitation to Bid

BUREAU OF FISHERIES AND AQUATIC RESOURCES
REGIONAL FISHERIES OFFICE – MIMAROPA

INVITATION TO BID
Bid Reference No.: 2022-020
REHABILITATION AND IMPROVEMENT OF FRESHWATER TECHNOLOGY STATION IN BARCENAGA, NAUJAN, ORIENTAL MINDORO

1. The Bureau of Fisheries and Aquatic Resources (BFAR) Regional Fisheries Office - MIMAROPA, Department of Agriculture, through the General Appropriations Act FY 2022 intends to apply the sum of **THREE MILLION (Php 3,000,000.00) PESOS** being the ABC to payments under the contract for Bid Reference No.: 2022-020 entitled "**REHABILITATION AND IMPROVEMENT OF FRESHWATER FISHERIES RESEARCH STATION IN BARCENAGA, NAUJAN, ORIENTAL MINDORO**". The said procurement project composed of **TWO (2) LOTS** is particularly described as follows:

PROCUREMENT DETAILS	LOT NO.	ITEM/DESCRIPTION	APPROVED BUDGET FOR THE CONTRACT	PRICE OF BID DOCUMENTS
PR # 2022-11-0381 **END USER: MERCILYN V. HJ REBUAN, OIC-BFRS**	1	**REHABILITATION AND IMPROVEMENT OF INFRASTRUCTURE IN FRESHWATER TECHNOLOGY STATION (FTS)** *(inclusive of materials and labor)* **Sub-Lot 1: Perimeter fence with an area of 170 meters** **Sub-Lot 2: Waterways (Drainage Canal)** **Sub-Lot 3: Stock/ Storage Room***)* **Sub-Lot 4: Minor Repair and Rehabilitation of Other Structures**	**Php 2,180,000.00**	**Php 4,000.00**
	2	**REHABILITATION AND IMPROVEMENT OF SOLAR POWER AND WATER SYSTEMS IN FRESHWATER TECHNOLOGY STATION (FTS)** *(inclusive of materials, equipment and installation services)* **Sub-Lot 1: Supply, delivery and installation of Solar Power System** **Sub-Lot 2: Supply, delivery and installation of Water Supply System**	**Php 820,000.00**	**Php 1,000.00**

2. BFAR-MIMAROPA now invites bids for the above Procurement Project. Bids received in excess of the ABC for each lot shall be automatically rejected at bid opening. Completion of the Works is required within one hundred twenty (120) days after the receipt of Notice to Proceed. Bidders should have

completed a contract similar to the Project. The description of an eligible bidder is contained in the Bidding Documents, particularly, in Section II (Instructions to Bidders).

3. Bidding will be conducted through open competitive bidding procedures using a non-discretionary "pass/fail" criterion as specified in the 2016 revised Implementing Rules and Regulations (IRR) of Republic Act (RA) No. 9184.

4. Prospective bidders may obtain further information through MR. DEEJAY A. LABIAGA, BAC Secretariat Head of the BFAR MIMAROPA BAC OFFICE, at Telephone No. (043) 288-6322 and inspect the Bidding Documents at the address given below from 8:00 AM to 5:00 PM only, during Mondays thru Fridays.

5. A complete set of Bidding Documents may be acquired by interested Bidders from the given address below and upon payment of the applicable fee for the Bidding Documents, pursuant to the latest Guidelines issued by the GPPB, until March 13, 2023; 8:30 AM, and may opt to purchase any or all lots.

6. The BFAR-MIMAROPA will hold a Pre-Bid Conference on February 27, 2023; 10:00 AM at the address given below and/or through videoconferencing/webcasting via Google Meet. Participants as well as qualified bidders shall be notified of the link by the BAC Secretariat.

7. Bids must be duly received by the BAC Secretariat through manual submission at the office address indicated below, on or before March 13, 2023; 10:00 AM. Late bids shall not be accepted.

8. All Bids must be accompanied by a bid security in any of the acceptable forms and in the amount stated in ITB Clause 14.

9. Bid opening shall be on March 13, 2023; 10:00 AM at the given address below and/or through videoconferencing/webcasting via Google Meet. Bids will be opened in the presence of the bidders' representatives who choose to attend the activity.

10. The BFAR-MIMAROPA does not condone any form of solicitation on any prospective winning and losing bidders by any of our staff/ employees or any other party. Any sort of this kind shall be reported immediately to the Office of the Secretary or the National Bureau of Investigation (NBI) for entrapment and proper investigation.

11. The BFAR-MIMAROPA reserves the right to reject any and all bids, declare a failure of bidding, or not award the contract at any time prior to contract award in accordance with Sections 35.6 and 41of

the 2016 revised IRR of RA No. 9184, without thereby incurring any liability to the affected bidder or bidders.

12. For further information, please refer to:

MR. DEEJAY A. LABIAGA ,
Head, Bids and Awards Commi0ttee (BAC) Secretariat
BFAR MIMAROPA BAC OFFICE
2/F Le Grace Bldg., Brgy. Guinobatan, Calapan City, Oriental Mindoro
bacsecbfar4b@gmail.com
Tel: (043) 288-6322

13. You may visit this website:

https://mimaropa.bfar.da.gov.ph/

14 February 2023

HOPE JARAVATA RELAYSON
Chairperson, BFAR MIMAROPA
Bids and Awards Committee

Section II. Instructions to Bidders

1. Scope of Bid

The Procuring Entity, ***BUREAU OF FISHERIES AND AQUATIC RESOURCES REGIONAL FISHERIES OFFICE - MIMAROPA (BFAR-MIMAROPA, for brevity)*** invites Bids for the ***"REHABILITATION AND IMPROVEMENT OF FRESHWATER TECHNOLOGY STATION IN BARCENAGA, NAUJAN, ORIENTAL MINDORO - LOT 2: REHABILITATION AND IMPROVEMENT OF SOLAR POWER AND WATER SYSTEMS IN FRESHWATER TECHNOLOGY STATION (FTS)"***, with Project Identification Number ***2022-020***.

The Procurement Project (referred to herein as "Project") is for the construction of Works, as described in Section VI (Specifications).

2. Funding Information

2.1. The GOP through the source of funding as indicated below for ***FY 2022*** in the amount of ***EIGHT HUNDRED TWENTY THOUSAND (Php 820,000.00) PESOS ONLY.***

2.2. The source of funding is the *General Appropriations Act or Special Appropriations.*

3. Bidding Requirements

The Bidding for the Project shall be governed by all the provisions of RA No. 9184 and its 2016 revised IRR, including its Generic Procurement Manual and associated policies, rules and regulations as the primary source thereof, while the herein clauses shall serve as the secondary source thereof.

Any amendments made to the IRR and other GPPB issuances shall be applicable only to the ongoing posting, advertisement, or invitation to bid by the BAC through the issuance of a supplemental or bid bulletin.

The Bidder, by the act of submitting its Bid, shall be deemed to have inspected the site, determined the general characteristics of the contracted Works and the conditions for this Project, such as the location and the nature of the work; (b) climatic conditions; (c) transportation facilities; (c) nature and condition of the terrain, geological conditions at the site communication facilities, requirements, location and availability of construction aggregates and other materials, labor, water, electric power and access roads; and (d) other factors that may affect the cost, duration and execution or implementation of the contract, project, or work and examine all instructions, forms, terms, and project requirements in the Bidding Documents.

4. Corrupt, Fraudulent, Collusive, Coercive, and Obstructive Practices

The Procuring Entity, as well as the Bidders and Contractors, shall observe the highest standard of ethics during the procurement and execution of the contract. They or through an agent shall not engage in corrupt, fraudulent, collusive, coercive, and obstructive practices defined under Annex "I" of the 2016 revised IRR of RA No. 9184 or other integrity violations in competing for the Project.

5. Eligible Bidders

5.1. Only Bids of Bidders found to be legally, technically, and financially capable will be evaluated.

5.2. The Bidder must have an experience of having completed a Single Largest Completed Contract (SLCC) that is similar to this Project, equivalent to at least fifty percent (50%) of the ABC adjusted, if necessary, by the Bidder to current prices using the PSA's CPI, except under conditions provided for in Section 23.4.2.4 of the 2016 revised IRR of RA No. 9184.

A contract is considered to be "similar" to the contract to be bid if it has the major categories of work stated in the **BDS**.

5.3. For Foreign-funded Procurement, the Procuring Entity and the foreign government/foreign or international financing institution may agree on another track record requirement, as specified in the Bidding Document prepared for this purpose.

5.4. The Bidders shall comply with the eligibility criteria under Section 23.4.2 of the 2016 IRR of RA No. 9184.

6. Origin of Associated Goods

There is no restriction on the origin of Goods other than those prohibited by a decision of the UN Security Council taken under Chapter VII of the Charter of the UN.

7. Subcontracts

7.1. The Procuring Entity has prescribed that: *Subcontracting is not allowed.*

8. Pre-Bid Conference

The Procuring Entity will hold a pre-bid conference for this Project on the specified date and time and either at its physical address at ***2/F Le Grace Bldg., Brgy. Guinobatan, Calapan City, Oriental Mindoro*** and/ or through videoconferencing/ webcasting via ***Google Meet*** as indicated in paragraph 6 of the **IB.**

9. Clarification and Amendment of Bidding Documents

Prospective bidders may request for clarification on and/or interpretation of any part of the Bidding Documents. Such requests must be in writing and received by the Procuring Entity, either at its given address or through electronic mail indicated in the **IB**, at least ten (10) calendar days before the deadline set for the submission and receipt of Bids.

10. Documents Comprising the Bid: Eligibility and Technical Components

10.1. The first envelope shall contain the eligibility and technical documents of the Bid as specified in **Section IX. Checklist of Technical and Financial Documents**.

10.2. If the eligibility requirements or statements, the bids, and all other documents for submission to the BAC are in foreign language other than English, it must be accompanied by a translation in English, which shall be authenticated by the appropriate Philippine foreign service establishment, post, or the equivalent office having jurisdiction over the foreign bidder's affairs in the Philippines. For Contracting Parties to the Apostille Convention, only the translated documents shall be authenticated through an apostille pursuant to GPPB Resolution No. 13-2019 dated 23 May 2019. The English translation shall govern, for purposes of interpretation of the bid.

10.3. A valid PCAB License is required, and in case of joint ventures, a valid special PCAB License, and registration for the type and cost of the contract for this Project. Any additional type of Contractor license or permit shall be indicated in the **BDS**.

10.4. A List of Contractor's key personnel (e.g., Project Manager, Project Engineers, Materials Engineers, and Foremen) assigned to the contract to be bid, with their complete qualification and experience data shall be provided. These key personnel must meet the required minimum years of experience set in the **BDS**.

10.5. A List of Contractor's major equipment units, which are owned, leased, and/or under purchase agreements, supported by proof of ownership, certification of availability of equipment from the equipment lessor/vendor for the duration of the project, as the case may be, must meet the minimum requirements for the contract set in the **BDS**.

11. Documents Comprising the Bid: Financial Component

11.1. The second bid envelope shall contain the financial documents for the Bid as specified in **Section IX. Checklist of Technical and Financial Documents**.

11.2. Any bid exceeding the ABC indicated in paragraph 1 of the **IB** shall not be accepted.

11.3. For Foreign-funded procurement, a ceiling may be applied to bid prices provided the conditions are met under Section 31.2 of the 2016 revised IRR of RA No. 9184.

12. Alternative Bids

Bidders shall submit offers that comply with the requirements of the Bidding Documents, including the basic technical design as indicated in the drawings and specifications. Unless there is a value engineering clause in the **BDS**, alternative Bids shall not be accepted.

13. Bid Prices

All bid prices for the given scope of work in the Project as awarded shall be considered as fixed prices, and therefore not subject to price escalation during contract implementation, except under extraordinary circumstances as determined by the NEDA and approved by the GPPB pursuant to the revised Guidelines for Contract Price Escalation guidelines.

14. Bid and Payment Currencies

14.1. Bid prices may be quoted in the local currency or tradeable currency accepted by the BSP at the discretion of the Bidder. However, for purposes of bid evaluation, Bids denominated in foreign currencies shall be converted to Philippine currency based on the exchange rate as published in the BSP reference rate bulletin on the day of the bid opening.

14.2. Payment of the contract price shall be made in ***Philippine Pesos.***

15. Bid Security

15.1. The Bidder shall submit a Bid Securing Declaration or any form of Bid Security in the amount indicated in the **BDS**, which shall be not less than the percentage of the ABC in accordance with the schedule in the **BDS**.

15.2. The Bid and bid security shall be valid until ***ONE HUNDRED TWENTY (120) CALENDAR DAYS FROM THE DATE OF THE OPENING OF BIDS***. Any bid not accompanied by an acceptable bid security shall be rejected by the Procuring Entity as non-responsive.

16. Sealing and Marking of Bids

Each Bidder shall submit one copy of the first and second components of its Bid.

The Procuring Entity may request additional hard copies and/or electronic copies of the Bid. However, failure of the Bidders to comply with the said request shall not be a ground for disqualification.

If the Procuring Entity allows the submission of bids through online submission to the given website or any other electronic means, the Bidder shall submit an electronic copy of its Bid, which must be digitally signed. An electronic copy that cannot be opened or is corrupted shall be considered non-responsive and, thus, automatically disqualified.

17. Deadline for Submission of Bids

The Bidders shall submit on the specified date and time and either at its physical address or through online submission as indicated in paragraph 7 of the **IB.**

18. Opening and Preliminary Examination of Bids

18.1. The BAC shall open the Bids in public at the time, on the date, and at the place specified in paragraph 9 of the **IB**. The Bidders' representatives who are present shall sign a register evidencing their attendance. In case videoconferencing, webcasting or other similar technologies will be used, attendance of participants shall likewise be recorded by the BAC Secretariat.

In case the Bids cannot be opened as scheduled due to justifiable reasons, the rescheduling requirements under Section 29 of the 2016 revised IRR of RA No. 9184 shall prevail.

18.2. The preliminary examination of Bids shall be governed by Section 30 of the 2016 revised IRR of RA No. 9184.

19. Detailed Evaluation and Comparison of Bids

19.1. The Procuring Entity's BAC shall immediately conduct a detailed evaluation of all Bids rated "*passed*" using non-discretionary pass/fail criteria. The BAC shall consider the conditions in the evaluation of Bids under Section 32.2 of 2016 revised IRR of RA No. 9184.

19.2. If the Project allows partial bids, all Bids and combinations of Bids as indicated in the **BDS** shall be received by the same deadline and opened and evaluated simultaneously so as to determine the Bid or combination of Bids offering the lowest calculated cost to the Procuring Entity. Bid Security as required by **ITB** Clause 16 shall be submitted for each contract (lot) separately.

19.3. In all cases, the NFCC computation pursuant to Section 23.4.2.6 of the 2016 revised IRR of RA No. 9184 must be sufficient for the total of the ABCs for all the lots participated in by the prospective Bidder.

20. Post Qualification

Within a non-extendible period of five (5) calendar days from receipt by the Bidder of the notice from the BAC that it submitted the Lowest Calculated Bid, the Bidder shall submit its latest income and business tax returns filed and paid through the BIR Electronic Filing and Payment System (eFPS), and other appropriate licenses and permits required by law and stated in the **BDS**.

21. Signing of the Contract

The documents required in Section 37.2 of the 2016 revised IRR of RA No. 9184 shall form part of the Contract. Additional Contract documents are indicated in the **BDS**.

Section III. Bid Data Sheet

Bid Data Sheet

<table>
<tr><th>ITB Clause</th><th></th></tr>
<tr><td>5.2</td><td>For this purpose, contracts similar to the Project refer to contracts which have the same major categories of work, which shall be: any contract pertaining to the herein bid project.</td></tr>
<tr><td>7.1</td><td>Subcontracting is not allowed.</td></tr>
<tr><td>10.3</td><td>The required PCAB license for this contract is as follows:
Classification: General Engineering
Size Range of Small B for License Category C & D,
with SLP of ≤Php15Million; and ARCC Up to Php 30Million</td></tr>
<tr><td>10.4</td><td>The key personnel must meet the required minimum years of experience set below:
<table>
<tr><th colspan="4">MINIMUM PERSONNEL REQUIREMENT</th></tr>
<tr><th>Expertise</th><th>No.</th><th>Min. Years of Experience</th><th>Remarks</th></tr>
<tr><td>Skilled Solar Power Technician</td><td>1</td><td>3 to 5</td><td>With experience in project of similar nature</td></tr>
<tr><td>Laborer/ Assistant</td><td>1</td><td>3 to 5</td><td>With experience in project of similar nature</td></tr>
</table></td></tr>
<tr><td>10.5</td><td>The minimum major equipment requirements are the following:
<table>
<tr><th colspan="4">MINIMUM EQUIPMENT REQUIREMENT</th></tr>
<tr><th>Description</th><th>Owned</th><th>Leased</th><th>Total</th></tr>
<tr><td>Electrical Tools/ Tester</td><td>1</td><td></td><td>1</td></tr>
<tr><td>Welding Machine</td><td>1</td><td></td><td>1</td></tr>
</table></td></tr>
<tr><td>12</td><td>No Value Engineering clause.</td></tr>
<tr><td>15.1</td><td>The bid security shall be in the form of a Bid Securing Declaration or any of the following forms and amounts:
a. The amount of not less than Php16,400.00 [two percent (2%) of ABC], if bid security is in cash, cashier's/manager's check, bank draft/guarantee or irrevocable letter of credit;

b. The amount of not less than Php41,000.00 [five percent (5%) of ABC] if bid security is in Surety Bond.</td></tr>
<tr><td>16</td><td>Each Bidder shall submit one (1) original and three (3) copies of the first and second components of its bid.

In case the bidder bids for two or more lots, they MUST submit individual set of its bid for <u>each lot</u>. (Each set shall compose of one (1) original and three (3) copies of the first and second components of its bid.)</td></tr>
<tr><td>19.2</td><td>Partial bids are not allowed.</td></tr>
</table>

20	Within a non-extendible period of five (5) calendar days from receipt by the Bidder of the notice from the BAC that it submitted the Lowest Calculated Bid, the Bidder shall submit the latest income and business tax returns filed and paid through the BIR Electronic Filing and Payment System (eFPS).
21	Additional contract documents relevant to the Project that may be required by existing laws and/or the Procuring Entity, such as: 1) construction schedule and S-curve; 2) manpower schedule; 3) construction methods; 4) equipment utilization schedule; 5) construction safety and health program approved by the DOLE; and, 6) PERT/CPM. The abovelisted documents *(together with the Contract Agreement Form for the Procurement of Infrastructure Projects and Performance Security)* must be submitted by the Bidder within ten (10) days after receiving the Notice of Award.

Section IV. General Conditions of Contract

1. Scope of Contract

This Contract shall include all such items, although not specifically mentioned, that can be reasonably inferred as being required for its completion as if such items were expressly mentioned herein. All the provisions of RA No. 9184 and its 2016 revised IRR, including the Generic Procurement Manual, and associated issuances, constitute the primary source for the terms and conditions of the Contract, and thus, applicable in contract implementation. Herein clauses shall serve as the secondary source for the terms and conditions of the Contract.

This is without prejudice to Sections 74.1 and 74.2 of the 2016 revised IRR of RA No. 9184 allowing the GPPB to amend the IRR, which shall be applied to all procurement activities, the advertisement, posting, or invitation of which were issued after the effectivity of the said amendment.

2. Sectional Completion of Works

If sectional completion is specified in the **Special Conditions of Contract (SCC)**, references in the Conditions of Contract to the Works, the Completion Date, and the Intended Completion Date shall apply to any Section of the Works (other than references to the Completion Date and Intended Completion Date for the whole of the Works).

3. Possession of Site

3.1 The Procuring Entity shall give possession of all or parts of the Site to the Contractor based on the schedule of delivery indicated in the **SCC,** which corresponds to the execution of the Works. If the Contractor suffers delay or incurs cost from failure on the part of the Procuring Entity to give possession in accordance with the terms of this clause, the Procuring Entity's Representative shall give the Contractor a Contract Time Extension and certify such sum as fair to cover the cost incurred, which sum shall be paid by Procuring Entity.

3.2 If possession of a portion is not given by the above date, the Procuring Entity will be deemed to have delayed the start of the relevant activities. The resulting adjustments in contract time to address such delay may be addressed through contract extension provided under Annex "E" of the 2016 revised IRR of RA No. 9184.

4. The Contractor's Obligations

The Contractor shall employ the key personnel named in the Schedule of Key Personnel indicating their designation, in accordance with **ITB** Clause 10.3 and specified in the **BDS**, to carry out the supervision of the Works.

The Procuring Entity will approve any proposed replacement of key personnel only if their relevant qualifications and abilities are equal to or better than those of the personnel listed in the Schedule.

5. Performance Security

5.1. Within ten (10) calendar days from receipt of the Notice of Award from the Procuring Entity but in no case later than the signing of the contract by both parties, the successful Bidder shall furnish the performance security in any of the forms prescribed in Section 39 of the 2016 revised IRR.

5.2. The Contractor, by entering into the Contract with the Procuring Entity, acknowledges the right of the Procuring Entity to institute action pursuant to RA No. 3688 against any subcontractor be they an individual, firm, partnership, corporation, or association supplying the Contractor with labor, materials and/or equipment for the performance of this Contract.

6. Site Investigation Reports

The Contractor, in preparing the Bid, shall rely on any Site Investigation Reports referred to in the **SCC** supplemented by any information obtained by the Contractor.

7. Warranty

7.1. In case the Contractor fails to undertake the repair works under Section 62.2.2 of the 2016 revised IRR, the Procuring Entity shall forfeit its performance security, subject its property(ies) to attachment or garnishment proceedings, and perpetually disqualify it from participating in any public bidding. All payables of the GOP in his favor shall be offset to recover the costs.

7.2. The warranty against Structural Defects/Failures, except that occasioned-on force majeure, shall cover the period from the date of issuance of the Certificate of Final Acceptance by the Procuring Entity. Specific duration of the warranty is found in the **SCC**.

8. Liability of the Contractor

Subject to additional provisions, if any, set forth in the **SCC**, the Contractor's liability under this Contract shall be as provided by the laws of the Republic of the Philippines.

If the Contractor is a joint venture, all partners to the joint venture shall be jointly and severally liable to the Procuring Entity.

9. Termination for Other Causes

Contract termination shall be initiated in case it is determined *prima facie* by the Procuring Entity that the Contractor has engaged, before, or during the implementation of the contract, in unlawful deeds and behaviors relative to contract acquisition and implementation, such as, but not limited to corrupt, fraudulent, collusive, coercive, and obstructive practices as stated in **ITB** Clause 4.

10. Dayworks

Subject to the guidelines on Variation Order in Annex "E" of the 2016 revised IRR of RA No. 9184, and if applicable as indicated in the **SCC**, the Dayworks rates in the Contractor's Bid shall be used for small additional amounts of work only when the Procuring Entity's Representative has given written instructions in advance for additional work to be paid for in that way.

11. Program of Work

11.1. The Contractor shall submit to the Procuring Entity's Representative for approval the said Program of Work showing the general methods, arrangements, order, and timing for all the activities in the Works. The submissions of the Program of Work are indicated in the **SCC.**

11.2. The Contractor shall submit to the Procuring Entity's Representative for approval an updated Program of Work at intervals no longer than the period stated in the **SCC.** If the Contractor does not submit an updated Program of Work within this period, the Procuring Entity's Representative may withhold the amount stated in the **SCC** from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue Program of Work has been submitted.

12. Instructions, Inspections and Audits

The Contractor shall permit the GOP or the Procuring Entity to inspect the Contractor's accounts and records relating to the performance of the Contractor and to have them audited by auditors of the GOP or the Procuring Entity, as may be required.

13. Advance Payment

The Procuring Entity shall, upon a written request of the Contractor which shall be submitted as a Contract document, make an advance payment to the Contractor in an amount not exceeding fifteen percent (15%) of the total contract price, to be made in lump sum, or at the most two installments according to a schedule specified in the **SCC**, subject to the requirements in Annex "E" of the 2016 revised IRR of RA No. 9184.

14. Progress Payments

The Contractor may submit a request for payment for Work accomplished. Such requests for payment shall be verified and certified by the Procuring Entity's Representative/Project Engineer. Except as otherwise stipulated in the **SCC**, materials and equipment delivered on the site but not completely put in place shall not be included for payment.

15. Operating and Maintenance Manuals

15.1. If required, the Contractor will provide "as built" Drawings and/or operating and maintenance manuals as specified in the **SCC.**

15.2. If the Contractor does not provide the Drawings and/or manuals by the dates stated above, or they do not receive the Procuring Entity's Representative's approval, the Procuring Entity's Representative may withhold the amount stated in the **SCC** from payments due to the Contractor.

Section V. Special Conditions of Contract

Special Conditions of Contract

GCC Clause	
2	*Completion of the works must be within one hundred twenty (120) calendar days after the receipt of Notice to Proceed (NTP).*
4.1	*BFAR-MIMAROPA shall deliver possession of the site to the Contractor, upon the issuance of the Notice to Proceed (NTP).*
6	Not Applicable.
7.2	**Five (5) years.**
10	Dayworks are applicable at the rate shown in the Contractor's original Bid.
11.1	The Contractor shall submit the Program of Work to the Procuring Entity's Representative within *ten (10) calendar days* of delivery of the Notice of Award.
11.2	The amount to be withheld for late submission of an updated Program of Work is ***ten (10%) percent of the allowable 15% advance payment (mobilization fund).***
13	The amount of the advance payment is *[insert amount as percentage of the contract price that shall not exceed 15% of the total contract price and schedule of payment]*.
14	Materials and equipment delivered on the site but not completely put in place shall be included for payment.
15.1	The date by which operating and maintenance manuals are required is *within thirty (30) calendar days upon receipt of the NTP*. The date by which "as built" drawings are required is *prior to release of full payment for the complete "as built" drawings.*
15.2	The amount to be withheld for failing to produce "as built" drawings and/or operating and maintenance manuals by the date required is *five (5%) percent of the contract price*.

Section VI. Specifications

Please see Annex "A" - TECHNICAL SPECIFICATIONS comprised of: PART I - CIVIL WORKS; PART II - ELECTRICAL WORKS; and, PART III - MOBILIZATION/DEMOBILIZATION OF EQUIPMENT.

Section VII. Drawings

Please see Annex "B" for Drawings of the following:

REHABILITATION AND IMPROVEMENT OF SOLAR POWER AND WATER SYSTEMS IN FRESHWATER TECHNOLOGY STATION (FTS)
(Inclusive of materials, equipment and installation services)

Sub-Lot 1: *Supply, delivery and installation of Solar Power System*
Sub-Lot 2: *Supply, delivery and installation of Water Supply System*

Section VIII. Bill of Quantities

REHABILITATION AND IMPROVEMENT OF SOLAR POWER AND WATER SYSTEMS IN FRESHWATER TECHNOLOGY STATION (FTS)

Sub-Lot No.	DESCRIPTION OF WORK	QUANTITY	UNIT OF MEASURE (UOM)	UNIT COST *(Estimated Direct Cost; Value Added Tax; & Mark-ups)*	TOTAL COST
1	**Supply, delivery and installation of Solar Power System** *(inclusive of materials and labor)*				
	Panel Board 405 watts	24	Unit		
	Lithium Battery 10KVA	1	Unit		
	Hybrid Inverter 8KVA	1	Unit		
	Breaker	1	Unit		
	Inclusive of Labor for Installation				
2	**Supply, delivery and installation of Water Supply System** *(inclusive of materials and labor)*				
	Solar water pump 1000 watts	4	Unit		
	Inclusive of Labor for Installation				
TOTAL APPROVED BUDGET FOR THE CONTRACT (ABC)					**Php 820,000.00**
TOTAL BID PRICE					

Section IX. Checklist of Technical and Financial Documents

Checklist of Technical and Financial Documents

I. TECHNICAL COMPONENT ENVELOPE

Class "A" Documents

Legal Documents

☐ (a) Valid PhilGEPS Registration Certificate (Platinum Membership) (all pages) in accordance with Section 8.5.2 of the IRR;

Technical Documents

☐ (b) Statement of the prospective bidder of all its ongoing government and private contracts, including contracts awarded but not yet started, if any, whether similar or not similar in nature and complexity to the contract to be bid; **and**

☐ (c) Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid, except under conditions provided under the rules; **and**

☐ (d) Special PCAB License in case of Joint Ventures **and** registration for the type and cost of the contract to be bid; **and**

☐ (e) Original copy of Bid Security. If in the form of a Surety Bond, submit also a certification issued by the Insurance Commission **or** original copy of Notarized Bid Securing Declaration; **and**

(f) Project Requirements, which shall include the following:

☐ a. Organizational chart for the contract to be bid;

☐ b. List of contractor's key personnel (*e.g.*, Project Manager, Project Engineers, Materials Engineers, and Foremen), to be assigned to the contract to be bid, with their complete qualification and experience data;

☐ c. List of contractor's major equipment units, which are owned, leased, and/or under purchase agreements, supported by proof of ownership or certification of availability of equipment from the equipment lessor/vendor for the duration of the project, as the case may be; **and**

☐ (g) Original duly signed Omnibus Sworn Statement (OSS) **and** if applicable, Original Notarized Secretary's Certificate in case of a corporation, partnership, or cooperative; or Original Special Power of Attorney of all members of the joint venture giving full power and authority to its officer to sign the OSS and do acts to represent the Bidder.

Financial Documents

☐ (h) The prospective bidder's computation of Net Financial Contracting Capacity (NFCC).

Class "B" Documents

☐ (i) If applicable, duly signed joint venture agreement (JVA) in accordance with RA No. 4566 and its IRR in case the joint venture is already in existence **or** duly notarized statements from all the potential joint venture partners stating that they will enter into and abide by the provisions of the JVA in the instance that the bid is successful.

II. FINANCIAL COMPONENT ENVELOPE

☐ (j) Original of duly signed and accomplished Financial Bid Form; **and**

Other documentary requirements under RA No. 9184

☐ (k) Original of duly signed Bid Prices in the Bill of Quantities; **and**

☐ (l) Duly accomplished Detailed Estimates Form, including a summary shee indicating the unit prices of construction materials, labor rates, and equipmen rentals used in coming up with the Bid; **and**

☐ (m) Cash Flow by Quarter.

IMPORTANT REMINDERS

The above checklist is in conformity with the requirements of the bid project; the provisions of the Philippine Bidding Documents; and Republic Act No. 9184 or the Government Procurement Reform Act and its 2016 Implementing Rules and Regulations (IRR).

- ✓ *The bidders are encouraged to consult this checklist in the preparation of their Bid Envelopes. However, this is* ***BY NO MEANS EXCLUSIVE****. Bidders* ***must still familiarize themselves and abide with*** *other bid requirements not otherwise included in the checklist such as, but not limited to those in the TOR, Bid Bulletins, Pertinent GPPB guidelines, rules, etc.*

- ✓ *Bidders are encouraged to consult* ***GPPB Circular No. 04-2020 dated 16 September 2020*** *for the required forms to be submitted and the mandatory provisions of each form, which may be accessed through this link:* ***https://www.gppb.gov.ph/issuances/Circulars/GPPB%20Circular%20No.%2004-2020.pdf***

- ✓ *In case of conflict between the checklist provided herein and the provisions of the bidding documents, the latter shall prevail. In case of conflict between the bidding documents and RA 9184 and its IRR, the latter shall prevail.*

- ✓ *All documents shall be current and updated and any missing document in the above-mentioned Checklist is a ground for outright rejection of the bid.*

- ✓ *All pages of the documents shall be signed / initialed by the bidder or by his / her authorized representative.*

- ✓ *To facilitate the evaluation of the bids, bidders are advised to follow the arrangement in the above-mentioned checklist when placed in an Envelope, with documents tabbed and labeled according to the Dog-Ear Code.*

- ✓ *Bidders are likewise advised to properly place the documents in folders (fastened or bound) before placing the same in the required envelopes to avoid misplacing or disorganizing the documents.*

TECHNICAL SPECIFICATION
PART I - CIVIL WORKS

A. LAYOUT WORK

A.01 Layout and Installation of Markers

The Contractors shall layout the works and shall be solely responsible for the accuracy of such laying-out. The Contractor shall provide, fix and maintain all stakes marks or the like which are necessary for the accurate laying out of the works and shall take all necessary precautions to prevent their removal or disturbances, all as approved by the Owner. The Contractor shall provide suitable range in the water to indicate the face lines of structure.

Laying out of works shall include verification of position of all markers and the supply and installation of any and all other markers which the contractors may require for the proper executions and completion of the work, and shall also include the repositioning of the Owner's marker if such repositioning is deemed necessary by the Contractor and approved by the Owner.

A.02 Construction Survey Requirements

The Contractor shall establish the following:

a. Column/grid reference system of the building
b. Boundary or primary perimeter lines of the building
c. Entrance points of all utilities in the project area
d. Reference mark to control the floor elevation and other finish grades.

A.02 Interior Layout Work

As the work progresses, the contractor shall provide the reference points throughout each interior area, which are necessary to facilitate detailed layout of partitions, doors, windows, equipment foundation, ceilings and other structures.

All layouts, locations and dimensions shall be rechecked and verified in the plans by the contractor before starting any work items of the project.

B. EXCAVATION AND BACKFILLING FOR BUILDINGS

B.01 Scope of Work

The Contractor shall furnish all labor, materials, equipment, plant and other facilities and perform all work necessary to complete the preparation of site, excavation, filling and grading in strict compliance with the applicable drawings and as specified herein.

B.02 Stake and Batter Boards

The Contractor shall stake out the buildings accurately and establish grades, after which the approval of the Owner shall be secured before any excavation work is started.

Basic batter boards and basic reference marks shall be erected at the expense of the Contractor, at such places where they will not be disturbed during construction. Materials shall be stored and work shall be conducted in such manner as to preserve all reference marks set.

The Contractor shall construct two (2) permanent benchmarks of previously known elevations near or within the site of construction for determining any settlement that may occur during the progress of construction.

Elevation reading shall be taken on at least four (4) points in the buildings and other related structures. A permanent record of the weekly reading shall be kept at construction site and monthly report thereof shall be submitted to the Owner unless some unusual reading is observed in which case report shall be made immediately.

B.03 Excavation

Excavation work shall commerce after the fill has thoroughly compacted and attained the required elevation.

The Contractor shall make all necessary excavation for foundations to grade indicated on the Drawings. All trenches shall be excavated at a neat size, leveled to a line at the bottom, which is ready to receive the foundation. The Contractor shall not excavate to a depth below elevations shown on the Drawings. Work that is excavated to a greater depth than required by the drawings and this specification shall be filled with lean concrete (fc' = 13.8 Mpa) at the expense of the Contractor.

No footings shall rest on fill. If the excavations for foundation reveal that footing will rest on fill, excavations shall be carried until the desired stratum is reached for safe bearing. All excavations shall be made with proper allowance made for floor slabs and forms. Bottom of footing and foundations shall be approximately level, clean and clear of loose materials with the lower section true to size.

All excavation for drainage, sewer and water services, and other underground utilities, which are within the property line or scope of work indicated on the Plans, are included.

Sheathing shall be driven below the bottom of excavation deep enough. Where walls or footings are to be poured without forms, trench sides shall be sharp and true.

The Contractor, at all times protects the excavation and trenches from damage due to water. He shall provide pumps and equipment, build enclosures and shall construct and maintain temporary drainage and do all pumping necessary to keep the excavation free of water. Sheet pilling if

needed shall be provided and tightly driven, shored and braced to maintain its position until removed.

B.04 Utilities

When encountered in work or as indicated, protect the existing active sewer, water, gas, electric, other utility services, and structures, when required for proper execution of work, relocate them as directed. If encountered, requiring protection or relocation, request in writing for decision of the Owner. Do not proceed until written instructions are obtained.

B.05 Backfilling, Grading and Compaction

After forms have been removed from footings, beams, foundations, walls, etc., and when the concrete work has attained full designed strength, backfill shall be placed free from waste and objectionable matters. After the backfill has settled, the Contractor shall fill all shallow places to bring the backfill area to grade.

The Contractor shall grade the site within the area indicated in the scope of work.

All filling materials shall be placed in layers not exceeding 150 mm in thickness, each layer being thoroughly wetted and compacted by rolling or tamping. All fills shall have 95% compaction.

The types of filling materials for buildings shall be selected earthfill and the source shall be approve by the Engineer.

C. CONCRETE WORKS

C.01 Scope of Work

The work shall include all labor, materials, equipment, plant and other facilities for the satisfactory performance of all work necessary to complete all concrete and reinforced concrete work shown on the Drawing and specified herein.

C.02 Concrete and Reinforced Concrete

All concrete and reinforced concrete work shall be done in accordance with the *DPWH Standard Specifications for Highways and Bridges revised 1988 and the current American Concrete Institute "BUILDING CODE REQUIREMENTS FOR THE REINFORCED CONCRETE (ACI 318 – 76)".*

C.03 Concrete Materials

Portland Cement shall be Type I and shall conform to "Specification for Portland cement (ASTM – C – 150-76a)".

Concrete aggregates shall be well-graded particles of gravel or crushed rock conforming to the *"Specification for Concrete Aggregates (ASTM C33 – 74a)".*

The maximum size of the aggregates shall not be larger than 1/5 of the narrowest dimension between forms nor larger than 3/4 of the minimum clear spacing between reinforcing bars nor larger than 25 mm in diameter.

Larger diameters of aggregates may be allowed in massive concreting with written permissions from the Owner.

Water used in mixing concrete shall be clean and free from injurious amount of oil, acid, alkali, salt, organic matter or other deleterious substances.

All reinforcing bars used shall be deformed and shall be free from rust, oil, defects, grease or kinks.

All reinforcing steel bars shall conform to the *PHILIPPINE STANDARD GRADE DSB 275.*

C.04 Forms

The Contractor shall provide forms that will produce correctly aligned concrete. Plastering in general shall not be allowed so that extra care shall be exercised by the Contractor in choice of fitting, and rigid supporting of the forms. Plywood, metal or surfaced lumber forms shall be used for all exposed concrete works.

Column forms shall check for plumpness before concrete is poured. Handholds shall be provided in column forms at lowest points of per lifts to render this space accessible for cleaning.

Forms and shoring shall not be removed until the concrete is adequately set and strong enough to withstand anticipated loading, and in no case less than seven (7) days after pouring.

All girders, beams, centering shall be crowned at least 25 mm in all direction from every eight (8) meters span. However, chambers for all cantilevers shall be as indicated in Plans or obtained from the Owner.

C.05 Storage of Materials

Cement shall be stored immediately upon arrival at the site in substantial, weatherproof bodegas, with a floor raised from the ground sufficiently high to be free from dampness.

Aggregates shall be stored in such a manner as to avoid the inclusion of other/foreign materials.

Reinforcing bars shall be placed in racks raised above the ground and protected from moisture and vegetation.

C.06 Samples and Testing

Testing except as otherwise specified herein shall be performed by an approved testing agency as proposed by the Contractor and approved by the Owner at no additional cost to the Owner.

Cement: Sampled either at the mill or at the site of the work and tested by an approved independent commercial or national testing laboratory at no additional cost to the Owner. Certified copies of laboratory test reports shall be furnished for each lot of cement and shall include all test data results and certificates that the sampling and testing cement shall be used until notice has been given by the Owner that the test results are satisfactory. Cement that has been stored, other than in bins at the mills, for more than four (4) months after delivery to the site shall be retest before use. Cement delivered at the site and later found under the test to be unsuitable shall not be incorporated into the permanent works.

Aggregates: Tested as prescribed in ASTM C 33.

Reinforcement: Certified copies of mill certificates of tests shall accompany deliveries of steel bar reinforcement. If requested by the Owner, additional testing of the materials shall be made at the Contractor expense.

Concrete Test: Provide for test purposes three sets of test specimens taken under the instructions of the Owner from each 50 cu. m. or fraction thereof of each class of concrete placed. At least one set of test specimens shall provided for each Class of concrete placed in each 8-hour shift. Each shall consist of two specimens, and shall be made from separate batch. *Samples shall be secured in conformity with ASTM C 172. Test specimens shall be made, cured and packed for shipment in accordance with ASTM C 31.* Cylinders will be tested by and at the expense of the Contractor in accordance with the ASTM C 39. Test specimens will be evaluated separately by the Owner for meeting strength level requirements for each cylinder with CONCRETE QUALITY of ACI 318. The standard age of test shall be 28 days, however 7 days tests may be allowed, with the permission of the Owner provided that the relation between the 7 day and the 28 day strengths on the concrete is established by tests for the materials and proportions used. When samples fail to conform to the requirements for strength, the Owner shall have the right to order a change in the proportions of the concrete mix for the remaining portions of the work at no additional cost to the Owner.

C.07 Proportioning of Concrete Work

Trial design batches and testing to meet requirements of the "**Class A**" concrete mixture specified shall be the responsibility of the Contractor. The design mix shall be of consistencies specified herein after in ***PART I. C – CONCRETE WORKS***/Test for slump, unit weight, and air content shall be performed in the field under the presence of the Owner.

Concrete Proportioning: Samples of approved aggregate shall be obtained in accordance with the requirements of ASTM D 75. Samples of materials other than aggregate shall be representative of those proposed for the project and shall be accompanied by the manufacturer's test reports indicating compliance with applicable specified requirements. Trial mixes shall have

proportions, consistencies, and air content suitable for the work. Trial mix shall be designed for maximum permitted slump and air content. The temperature of concrete in each trial batch shall be reported. For concrete in each water-cement ratio, at least three test cylinders for each test age shall be made and cured in accordance with ASTM C 39. From these test results, a curve shall be plotted showing the relationship between water-cement.

C.08 Strength Requirement

All concrete, unless otherwise indicated, shall develop a minimum 28 - day cylinder strength of 20.70 MPa.

The Contractor shall submit mix design obtained from at least three standard cylinder samples made in accordance with Section 5.4 of the NSCB, 1991, for the strength required stating the proposed slump and the proportional weights of cement, aggregates and water. The mixes shall be approved by preliminary tests fourteen (14) days before concreting and shall show the required strength. No substitutions shall be made in the materials or mix without additional tests to show that the quality for concrete is satisfactory.

Slump: Tests shall be made in conformity with ASTM C 143, and unless otherwise specified by the Owner slump shall be within the following limits:

Structural Element	*Slump of Vibrated Concrete*	
	Minimum	*Maximum*
Concrete Wall, Column and girder, beam, 25 cm maximum thickness	50 mm	70 mm
	50 mm	70 mm
All other concrete	50 mm	100 mm

C.09 Joints

No reinforcement, corner protection angles or other fixed metal items shall be run continuous through joints containing expansion – joint filler, through crack - control joints in slabs on grade and vertical surfaces.

Pre – molded Expansion Joint Filler

Joints with Joint Sealant: At expansion joints in concrete slabs to be exposed, and at the other joints indicated to receive joint sealant, pre–molded expansion joint filler strips shall be installed at the proper level below the elevation with a slightly tapered, dressed and wood strip temporarily secured to the top thereof to form a groove, when surface dry, shall be cleaned of foreign matter, loosed particles, and concrete protrusions, there filled approximately flush with joint sealant so as to be slightly concave after drying.

Finish of Concrete at Joints*:* Edges of exposed concrete slabs along expansion joints shall be nearly finished with slightly rounded edging tools.

Construction Joints: Unless otherwise specified herein, all construction joints shall be subject for approval of the Owner. Concrete shall be placed continuously to form a monolithic construction. Fresh concrete may be placed against adjoining units, provided the set concrete is sufficiently hard not to be

injured thereby. Joints not indicated shall be made and located in a manner not to impair strength and appearance of the structure.

Placement of concrete shall be at such rate that surfaces of concrete not carried to joint levels will not have attained initial set before additional concrete is placed thereon. Lifts shall terminate at such levels as indicated or as to conform to structural requirements as directed. If horizontal construction joints are required, a strip of 25 mm square – edge lumber, leveled to facilitate removal shall be taken to the inside the forms at the construction joint. Concrete shall be placed to a point 25 mm above the underside of the strip. The strip shall be removed (1) one hour after the concrete has been placed, any irregularities in the joint lines shall be leveled off with a wood float, and all laitance removed. Prior to placing additional concrete, horizontal constructed joints shall be prepared as specified in *BONDING*.

Crack control joints in slabs on grade are specified in ***Part I. C – CONCRETE WORKS/SLABS ON GRADE.***

C.10 Placing Concrete

Concrete shall be transport from mixer to the place of final deposit in a continuous manner, as rapidly as practicable without segregation or loss of ingredient until the approved unit of work is completed. Placing will not be permitted when the sun, heat, wind or limitations of facilities furnished by the Contractor, prevent proper finishing and curing of the concrete. Concrete shall be placed in the forms, as closed as possible in the final position, in uniform approximately horizontal layers not over 300 mm deep. Forms splashed with concrete of form coating shall be cleaned in advance of placing subsequent lifts. Concrete shall not be allowed to drop freely more than 10 m in unexposed work not more than 1.0 m in exposed work; where greater drops are required, tremie or other approved means shall be employed. The discharge of the tremies shall be controlled so that the concrete may be effectively compacted into horizontal layers no more than 300 mm thick, and spacing o the tremies shall be such that segregation does not occur. Concrete to receive other construction shall be screeded to the proper level to avoid excessive skimming or grouting. Conduits and pipes shall not be embedded in concrete unless specifically indicated or as directed by the Owner.

Time Interval Between Mixing and Placing: Concrete mixed in stationary mixers and transported by non-agitating equipment shall be placed in the forms within 45 minutes from the time ingredients are charge into the mixing drum. Concrete transported in truck mixers or truck agitator shall be delivered to the site of work discharge in the forms within 45 minutes from the time that the ingredients are discharge into the mixing drum. Concrete shall be placed in the forms within 45 minutes after discharge from the mixer at the jobsite.

Earth – foundation Placement: Leveling concrete for concrete foundations, exterior slabs and exterior foundations receiving equipment or machinery shall be placed upon undisturbed surfaces conforming to ***Part I. B – EXCAVATION AND BACKFILLING FOR BUILDINGS***. The surfaces shall be clean, free from mud and water. The concrete foundations maybe placed over the leveling concrete surfaces.

Conveying Concrete by Chute, Conveyor or Pump: Concrete may be conveyed by chute, conveyor, or pump if approved in writing. In requesting approval, the Contractor shall submit his entire plan of operation for time of discharge of concrete from the mixer to final placement in the forms, and the steps to be taken to prevent the formation of cold joints, in case the transporting of concrete by chute, conveyor or pump is disrupted. Conveyor and pump shall be capable of expeditiously placing concrete at the rate most advantageous to good workmanship. Approval will not be given for chutes or conveyors requiring changes in the concrete materials or design mix for efficient operation.

a. **Chutes and Conveyors:** Chutes shall be of steel or steel line wood, rounded in cross section rigid in construction, and protected from over flow. Conveyors shall be designed and operated and chute section shall be set, to assure a uniform flow of concrete from mixer to final place of deposit without segregation of ingredients, loss of mortar, or change in slump. The discharge portion of each chute or conveyor shall be provided with a device to prevent segregation. The chute and conveyor shall be thoroughly cleaned before and after each run. Waste material and flushing water shall be discharge outside the forms. When using tilted chutes, the inclination should not be flatter than one (1) vertical and two (2) horizontal. From the outlet/mouth of the chute to the concrete surface, the maximum allowable height shall be 1.50 m.

b. Pumps shall be operated and maintained so that a continuous stream of concrete is delivered into the forms without air pocket, segregation of change in slump. When pumping is completed, concrete remaining in the pipeline shall be ejected, wasted without contamination of concrete already.

c. After each operation, equipment shall be thoroughly cleaned and the flushing water shall be splashed outside the forms.

d. ***Placing Concrete Reinforcement:*** Where congestion of the steel or other conditions will make placing or compaction of concrete difficult, a layer of mortar shall be first deposited in forms to a depth of approximately 25 cm. Mortar proportions shall be the same as the concrete minus the coarse aggregate.

C.11 Compaction

Immediately after placing, each layer of concrete shall be compacted by internal concrete vibrators supplemented by handspading, rodding and tamping. Tapping or other external vibration of forms will not be permitted unless specifically approved by the Owner. Vibrators shall not be used to transport concrete inside forms. Internals vibrators submerged in concrete

shall maintain a speed of not less than 7,000 impulses per minute. The vibrating equipment at all times shall be adequate in number of units and power to properly consolidate all concrete.

Spare units shall be on hand as necessary to insure such adequacy. Duration of vibrating equipment shall be limited to time necessary to produce satisfactory consolidation without causing objectionable segregation. The vibrators shall not be inserted into lower courses that have begun to set.

Vibrators shall be applied at uniformity spaced points not further apart that the visible effectiveness of the machine.

C.12 Bonding

Bonding/depositing new concrete on or against concrete that has set; The surfaces of the set concrete shall be thoroughly cleaned so as to expose the coarse aggregate and be free of laitance, coatings, foreign matter and loose particles. Forms shall be retightened. The cleaned surfaces shall be moistened, but shall be without free flowing water when concrete is placed.

C.13 Slabs on Grade

Capillary water barrier or surged shall conform to ***PART I. B – EXCAVATION AND BACKFILLING FOR BUILDINGS.***

Concrete shall be compacted, screeded to grade, and prepared for the specified finish. Concrete shall be placed continuously so that each unit of operation will be monolithic in construction. Concrete shall be placed in alternate check board pattern terminating at crack-control joints or construction joints or may be placed in alternative paving lanes as limited by expansion, and contraction joints. Crack-control joints shall be expansion, contraction, or construction joints. Joints not shown shall be lifted at column centerlines and at intermediate intervals so that such panel is shall not be more than 55 sq.m. . Panels shall be approximately square with dimensioning of one side not more than 7.5 m. Forms shall remain in place for at least 12 hours after complete placement.

Construction joints may be formed by the insertion of hard pressed fiberboard strips inserted in the plastic concrete or may be cut with an approved concrete sawing machine, after the concrete has set. Unless otherwise indicated or directed the joints shall be 3 mm wide and depth equal to approximately 1/4 of the slab thickness of the maximum size of the coarse aggregate whichever is greater.

C.14 Finishes of Concrete

Within 12 hours after forms are removed, surface defects shall be remedied as specified herein. Fine and loose material shall be removed. Honeycomb, aggregate pockets, voids over 13 mm in diameter, and holes left by the rods or bolts shall be cut out to solid concrete, reamed, thoroughly wetted, brush-coated with neat cement rout, and filled with mortar. Mortar shall be a stiff mix of 1 part portland cement to not more than 2 parts fine aggregates passing the no. 16 mesh sieve, and minimum amount of water. The color of the mortar

shall match the adjoining concrete color. Mortar shall be thoroughly compacted in place.

Holes passing through walls shall be completely filled from the inside face by forcing mortar through to the outside face. Holes, which do not pass entirely through wall, shall be packed full.

Patchwork shall be finished to match adjoining surfaces in texture and color. Patchworks shall be damping cured for 72 hours. Ambient temperature shall not be less than 10 degrees C. Dusting of finish surfaces with dry material or adding water to concrete surfaces will not be permitted.

C.15 Concrete Finished for Slabs

Slabs Receiving Concrete Paving: After concrete is placed and consolidated, slab shall be screed or struck off and no further finish is required.

Smooth Finish: Required only when specified; screed concrete and floats to required level with no coarse aggregate visible. After surface moisture has disappeared and laitance has been removed the surface shall be finished by float and steel trowel.

Broom Finish: Required for paving, stairs and landings; the concrete shall be screed and floated to required finish level with no coarse aggregate visible. After the surface moisture has disappeared and laitance ahs been removed, surface shall be float finished to an even, smooth finish. The floated surfaces shall be broom with a fiber bristle brush in a direction transverse to the direction of the main traffic.

Tolerance: Smooth and broom finished surfaces shall be true to plane with no deviation in excess of 3 mm in any direction when tested with a 3.0 m. straight edge.

C.16 Finishes of Concrete other than Floor Slabs

Within 12 hours after forms are removed, surfaced defects shall be remedied as specified herein. Honeycomb, aggregate, pockets, voids over 12 mm in diameter, and holes left by the rods or bolts shall be cut out to, reamed and thoroughly wetted, brush coated with next cement grout and filed with mortar.

Mortar shall be a stiff mix of 1 part portland cement and not more than 2 parts fine aggregates passing the no. 16 mesh sieve. Minimum amount of water using white portland cement for all or part of the cement so that when dry, the color of the mortar shall be thoroughly compacted in place. Holes passing entirely through walls shall be completely filled from the inside face by forcing mortar through the wall shall be packed full. Patchwork shall be damp cured for 72 hours protruding portions of bar supports shall be ground flush with concrete surfaces that will be exposed, painted or plastered directly.

Smooth Finish: After the above operations have been completed, smooth finish shall be given to interior and exterior concrete surfaces that are to be painted or exposed to view. Smooth finished shall consist of thoroughly

wetting and then brush-coating the surfaces with cement grout composed by volume of 1 part fine aggregate passing the no. 30 mesh sieve and mix with water to the consistency of thick mixes, so that the final color of grout when dry, will be approximately the same as the color of the surrounding concrete. Grout shall be cork or wood-floated to fill all pits and air bubbles; visible grout film. The grout shall be kept damp by means of fog spray during the setting period. The finish of any area shall be completed in the same day and the limits of a finished area shall be made at natural breaks in the finished surface.

Rough Slab Finish: Slabs to receive full and mortar setting beds shall be screeded with straightedges to bring the surface to the required finish plane with no aggregate visible.

Broom Finish shall be given to exterior surfaces except concrete stairs treads, entrances, and landings for buildings. The concrete shall be screeded and floated to the required finish level with no coarse aggregate visible. After the surface moisture has disappeared and laitance has been removed, surfaces shall be still troweled to an even, smooth finish. The trawled surfaces shall be broomed with a fiber bristle brush in a direction transverse to that of the main traffic.

C.17 Curing

Concrete shall be protected against moisture loss, rapid temperature change, mechanical injury from rain or flowing water, for a minimum period of 7 days.

Concrete shall be maintained in a moist condition at temperature above 10 degrees C throughout the specified curing period and until remedied work started under ***Part I. C – CONCRETE WORKS/FINISHES OF CONCRETE***. Curing activities shall be started as soon as free water has disappeared from the surface of the concrete after placing and finishing. Form under surfaces shall be moist cured with forms in place for the full curing period or, if other removes forms prior to the end of the curing period approved means. Curing shall be accomplished by any of the following methods of combination thereof, as approved.

Water: Water used in curing shall be reasonably cleaned and free of oil, salt, acid, alkali, or other substances injurious to the concrete. Drinking water may be used for curing test.

Moist Curing: Uniformed surfaces shall be covered with burlap or mats, wetted before placing and over-lap at least 150 mm. Burlap or mats shall be kept continually wet and in intimate contract with the surface. If the forms are removed before the end of the curing period, curing shall be continued on uniformed surfaces, using suitable materials.

D. CONCRETE WATER PROOFING

D.01 Scope of Work

This item shall consist of furnishing all water proofing materials, labor, tools, equipment and other facilities and undertaking the proper work required as shown on the plan and in accordance with this specification and as directed by the Engineer.

D.02 Material Requirements

Liquid water proofing materials shall be Multi-high Quality Water Proofing Film (Castle Brand or equivalent materials) applied in liquid form and shall be approved by the Engineer.

Integral water proofing shall be in accordance with the approved manufacture's recommended amount/ratio of admixture for cement.

D.03 Construction Requirements

D.03.1 Submittals

The Contractor shall submit for approval of the Engineer the manufacturer's recommended method of water proof installation/construction.

D.03.2 Surface Preparation

Concrete surface to be applied with water proofing shall be structurally sound, clean and free of dirt, loose mortar particles, paints, oil, protective coats, etc.

All defects shall be properly corrected and carefully formed to provide smooth surface that is free of marks and properly cured prior to application works.

Inside corners where vertical and horizontal structure meet shall be provided with cants measuring 50 mm. or rounded at corners a minimum of 50 mm. radius.

Concrete slabs shall be properly graded to drain rainwater. Provide a minimum pitch of 1 on 100 to satisfactorily drain rainwater freely into the drainage lines, gutters and downspout.

Drainage connections and weep holes shall be set to permit the free flow of water.

Any expansion and contraction joint shall be cleaned, primed, fitted with a backing rod and caulked with sealant.
Provide reglets of about 40 mm. deep by 40 mm. wide and 250 mm. above floor along walls or parapets for the termination of the membrane.

Prepared surface shall be cured and kept wet by sprinkling with water at regular intervals for a period of at least three days and allow surface to actually set within seven (7) days.

Ensure that the prepared surface has completely set and all defects repaired.

D.03.3 Application Procedure

Prior to application of multi-high quality water proofing film, concrete surfaces should be sound and cured without the use of curing compound. Apply a coat neutralizer to remove oil, dirt and other contaminants.

Apply a primer coat of Cement and Mortar Intensifier (Castle Brand, PME 901) or equivalent (coating of the manufacturer at the rate of 25 square meter per gallon over the surface area to be applied by brush or roller brush (Make mix of PME 901 and 150% of water perfectly).

The prime coat shall be allowed to dry in 40 to 60 minutes, before applying the main water proofing materials.

Apply three (3) coats of Multi-high Quality Water Proofing Film (Castle Brand, PME 202) or equivalent by using brush or roller at the rate of three (3) to four (4) square meters per gallon for three (3) coats at a film dry thickness of 1.0 mm. to 1.2 mm.

Water proofing application/procedure shall conform to manufacturer's specification.

D.03.4 Flood Testing

Flood test for duration of 24 hours shall be undertaken upon completion of water proofing installation to determine any leakage or defect on the materials and/or workmanship.

The actual flood testing shall be conducted together with the Owner's Engineer to ensure authenticity of test.

E. CEMENT AND MASONRY

E.01 Scope of Work

The work under this section shall include all labor, materials, equipment, plant and other facilities and the satisfactory performance of all work necessary to complete all cement and masonry work shown on the Drawings and as specified herein.

Unless otherwise indicated on the Drawings, or specified herein; all materials or work under this section shall be subject to provision under ***Part I. C – CONCRETE WORKS***.

E.02 Mortar

Cement mortar shall be one (1) part portland cement and three (3) parts of sand by volume.

Re-tampering is not permitted. No mortar that has stood for more than one (1) hour shall be used. Works shall not be permitted on mortar that has reached its initial set.

E.03 Concrete Hollow Blocks

Concrete hollow blocks shall have a minimum compressive strength of 350 psi. computed from the average of five (5) units based on the average gross area and a minimum of 300 psi. for individual unit. Samples shall be taken at random for every batch/delivery of at least 2,000 pieces and upon the discretion of the Engineer.

E.04 Laying of Concrete Hollow Blocks

Do not wet blocks before using. Blocks must be dry when laid.

The first row of blocks must be thoroughly anchored to concrete walls, columns or slabs. Courses shall be laid straight and uniform with regular running bond and vertical faces truly vertical and set true to line. Each block shall be adjusted to its position in the wall while the mortar is still soft and plastic enough to ensure good bond. The position of the block shall never be shifted after the mortar has stiffened. No re-alignment of a block shall be attempted after a higher or following course has been laid.

All horizontal and vertical reinforcing bars shall be anchored 20 diameters into the concrete walls, columns and slabs.

Dowel bars properly spaced are placed into walls, columns or slabs during pouring and hooked to the vertical bar, leaving bar diameter exposed to splice with the reinforcing bars of the hollow block walls during construction.

All units shall be laid with mortar composed of one (1) part portland cement and three (3) parts of sand. Unless otherwise specified or detailed on the drawings, horizontal and vertical joints shall be 10 mm thick with full mortar coverage on the face shells and on the web surrounding the cells to be filled.

Reinforcing bars shall have a lap of 40 bar diameters. All horizontal reinforcement must be tied to the vertical reinforcement at their intersection.

After each days work, uncompleted wall shall be covered with waterproof materials to keep the inside of the blocks dry in case of rain.

E.05 Plain Cement Plaster Finish

All concrete columns, beams, roof beams, exposed concrete hollow block walls and floor surfaces to be applied with plain cement finish shall be clean and evenly wet, slushed with a wash or neat cement and followed by cement mortar 5mm thick which shall be applied with a wooden float to leave the surface straight, true, smooth, plumb and even, and all corner angles and all

intersections shall be straight, true and rounded slighted. The use of an approved bond fluid is suggested.

E.06 Vitrified Tiles

E.06.1 Description

This item shall consist of furnishing all vitrified tiles and cementitious material, tools and equipment including labor required in undertaking the proper installation of walls and floor tiles as shown on the Plans and in accordance with this Specification.

E.06.2 Material Requirement

Glazed tiles and trims shall have an impervious face of vitrified materials fused onto the color scheme approved by the Owner.

Walls to be finished with glazed tile wainscoting or elsewhere indicated as shown on Drawings, shall be chipped off, cleaned thoroughly with a wire brush, wetted with clean water and then pointed up solid with 1:2 cement mortar before applying the tile wainscoting.

Unglazed tiles shall be hard dense tile of homogeneous composition, The materials used in the body, the method of manufacture and the thermal treatment determine its color and characteristics.

Vitrified unglazed floor tiles shall be applied in the areas shown in the Plan. Floor tiles installation shall not be started in spaces requiring wall tile until the wall has been installed.

Floor and wall tiles and their accessories shall be first quality free from lamination, serrated edges, chipped-off corners and other imperfections affecting their quality, appearance and strength. Tiles shall conform to samples approved by the Owner.

Floor and wall tiles shall be of locally manufacture's brand, **EURO TILES** or equivalent.

Samples of all floor and wall tiles shall be submitted to the Owner for approval as to color, texture and quality.

F. CARPENTRY WORKS

F.01 Scope of Work

The scope of work shall consist of furnishing all tools, labor, equipment, and materials, unless otherwise specified to complete all carpentry and joinery works shown on the Drawings and specified herein.

F.02 General Provisions

Lumber shall be approved quality of the respective kinds required for the various parts of the work, well seasoned, thoroughly dry and free from large, loose or unsound knots, sap shakes or other imperfections impairing its strength, durability or appearance.

Framing lumber shall be of the rough dimensions unless otherwise shown on the Drawings.

All exposed woodwork shall be smoothly dressed and sandpapered.

ANY LUMBER equally good for the purpose intended may be substituted for the kinds specified, subject to the approval of the Owner. Provided, however, that in the substitution of the cheaper kind of lumber that specified, a reduction in the contract price equal to the difference in the cost of the cost of the two kinds of lumber will be made.

Note:

All painting works shall conform to the provision of ***Part I. I – PAINTING.***

F.03 Fastenings

Fastenings shall be common nails, glue as specified, flat-head wood screws (F.H.W.S), round-head wood screws (R.H.W.S), bolts or lag screws where specified or called for shall be used.

Conceal fastening as much as possible, or if not possible, locate them in inconspicuous places. Where nailing is permitted through woodwork smooth-finished face, conceal nail heads.

F.04 Protection and Storage

Lumber shall be protected and kept under cover both in transit and all at the job site, and shall be carefully piled off the ground and be insured of proper drainage, ventilation, and protection from the weather. Surface of wood framework, and other wood members coming in contact with or embedded in concrete shall be painted with two (2) coats of hot applied asphalt.

The Contractor shall protect all finished wood work and millwork from injury after it has been set in place until the completion and final acceptance of work.

Temporary Supports: Make or provide wood centering or other necessary supports for openings in masonry walls accurately, strongly and well braced and secured in position until masonry has set thoroughly.

F.05 Wooden Materials

Unless otherwise shown on the drawings, the Contractor shall use the following lumber in accordance with the schedule below:

a. Apitong/Tanguile(common grade) for ceiling joist, hangers and nailers.

b. 6mm Marine Plywood for ceiling board.

c. Coco Lumber for scaffoldings, shoring and bracing only.

G. DOORS

G.01 Scope of Work

The work under this Section shall include all labor, materials, hardware, painting, equipment, and other facilities and the satisfactory performance of all work necessary to complete all doors shown on the Drawings and as specified herein.

G.02 Doors

All lumbers for doors and all woodwork of similar nature shall be kiln dried (KD) with not more than fourteen percent (14%) moisture content. All doors shall be done in accordance with full sized details which will be furnished, hereafter to the contractor. Door shall have one and three fourth (1 ¾) inch finished thickness.

All doors shall be guaranteed against warping, twisting or cracking for a period of twelve (12) months from the date of final acceptance of the finished building. This obligates the Contractor to make good such defects or replace entirely any and all such defective doors.

All doors for shall be panel type complete with jambs and accessories, kiln dried (KD) and shall be provided with loose pin hinges 3 ½" x 3 ½", door lockset *"Schlage" bra*nd.

H. WINDOWS

H.01 Scope of Work

The work under this Section shall include all labor, materials, hardware, equipment, and other facilities and the satisfactory performance of all work necessary to complete all aluminum framed glass windows shown on the Drawings and as specified herein.

H.02 Materials Requirements (Powder Coated Aluminum Framed Annealed Glass Windows)

- Frame and panel members shall be fabricated from extruded aluminum sections true to details with clean, straight, sharply defined profiles and free from defects impairing strength of durability. Extruded aluminum sections shall conform to the specifications requirements as defined in ASTM B211.

- Screw, nuts, 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 devices shall be closely match to the extruded aluminum section and adaptable to the type and method of opening.

- Weather strips shall be provided with good quality

- All Aluminum Framed Windows shall be provided with brown aluminum screen assembly, sliding type complete with accessories.

- For Aluminum Framed Glass Windows use 6mm thick glass

H.03 Construction Requirements

- For all assembly and fabrication works and cut ends shall be true and accurately jointed, free of burrs and rough edges. Cut-out recesses, mortising, grinding operation for hardware shall be accurately made and properly reinforced when necessary.

- Installation procedure:

  Main frame shall consist of head sill and jamb stiles specifically designed and machined to inter fit and be joined at corners with self-threading screw.

  Sliding window shall be provided with nylon sheave. Sliding panel shall be suspended with concealed roller overhead tracks with bottom guide pitch outward and slotted to complete drainage. The sliding panels shall be provided with interior handles. The locking devices shall be spring loaded extruded latch that automatically engages special frame hips.
  All joints between metal surfaces and masonry shall be properly caulked.

H.04 Protection

- All Aluminum parts and glasses shall be protected adequately to ensure against damage during transit and construction phase.

I. PAINTING

I.01 Scope of work

The work under this Section shall include all labor, materials, equipment, plant and other facilities and the satisfactory performance of all work necessary to complete all field painting and as specified herein.

I.02 General

Color schemes for the painting of the whole building, complete both inside and outside shall be furnished by the Architect to the Contractor upon request. Color scheme samples required by these Specifications shall be submitted by the Contractor to the Owner for approval. Expenses for sample of color schemes shall be at Contractor's expense.

All exposed work shall be protected while the building is being painted. Any dirt, smears, etc., shall be removed by the Contractor to the satisfaction of the Owner.

I.03 Material

All paint materials shall meet the requirements of the standard specifications of the *Standardization Committee* on supplies and shall be in accordance with latest *Classification Class "A" of the Institute of Science, Manila, Philippines*, and shall be delivered on the work in the original containers, with labels intact and seals unbroken.

Dutch Boy paint or Boysen Paint shall be used on all surfaces to be painted and certificate of origin and quality shall be submitted to the Owner for inspection and approval before using any of the paint materials.

The use of ready mixed paint may be allowed in this project, provided, however, that such paint is in accordance with the standard Specification No. 13 of the Philippine Government and that ready mixed paints shall be those listed under "Good Substitutes" only.

Tinting colors for latex shall be the highest grade obtainable. Tinting colors for oil paint shall be color in oil ground in pure linseed oil. Color shall be non fading. Color pigments shall be used to produce the exact shades of paint which shall conform to the approved color scheme of the building. Except as otherwise noted, color of priming coat shall be white.

All materials to be used in the work shall be stored in a place to be designated by the Owner, and such place shall be kept neat and clean at all times. Any damage on this place and its surroundings shall be rectified. All precautions to avoid danger of fire must be observed by removing oily rags, waste, etc., from the building at the end of daily work.

I.04 Inspection and Preparation of Surface

The Contractor shall inspect all surfaces to be painted and all defects shall be remedied before starting work.

No work shall be started unless the Contractor shall have made certain as to the dryness of surface. Tests shall be made, in the presence of the Owner, to verify dryness of surface to be painted.

Before painting is started, all spaces shall be broom clean and all dust, dirt, plaster, grease and other extraneous matter that would affect the finish work shall be removed.

I.05 Workmanship

All painting work shall be done in workmanlike manner by skilled house painters only.

All materials shall be evenly applied on, so as to form a film of uniform thickness, free from sags, runs, crawl, or other defects. The use of a heavy brush (nylon brushes for oil paints) is required and they shall always be clean and in good condition. Light brushes shall not be permitted. Paint shall be thoroughly stirred so as to keep the pigment evenly in suspension while paint is being applied.

In general and unless otherwise specified, and/or instructed by the Owner or due to actual conditions on the job, not less than 3 days time shall elapse between application of succeeding coats.

Each coat of paint shall be allowed to dry thoroughly and inspected for approval before the succeeding coat is applied. No painting shall be done in damp weather. No work shall be done under conditions that are unsuitable for the production of good results. No painting shall be done while plastering is in process or is drying.

Except where otherwise noted or specified, all paints shall be applied in three (3) coats (priming, body and finish). Each coat shall be brush applied (except as otherwise noted), spread evenly and in full covering body.

Surfaces which cannot be satisfactory finished on the number of coats specified shall have such additional coats, or such preparatory coats and subsequent coats as may be required to produce satisfactory finished work.

Spray gun application shall be used where indicated in color scheme schedule.

Before any painting is started, the Contractor shall furnish the Owner the paint manufacturer's detailed painting recommendation as to surface preparations and applications plus relevant information regarding the use of the paint.

I.06 Concrete and Masonry Surfaces

Surface Preparation

For New Surfaces: Scrapes off loose cement, chalk, dust and other surface deposits. Treat the surface with Dutch Boy 61-135 Acri-Free Concentrate. Mix one (1) liter Acri-Free Concentrate with ten (10) liters of water. Apply by brush and make sure that the alkaline surfaces are completely neutralized. In case of doubt, test the surface with red litmus paper. If it turns blue, then the second neutralization will be necessary. Let dry thoroughly. Do not rinse.

For areas affected by high alkalinity, apply one coat of Dutch Boy Concentrate Sealer. Allow to dry at least four (4) hours before applying succeeding coats.

Application

Apply Dutch Boy Flat Nalcrete as primers. Thin with water if necessary. First coat may be tinted with Dutch Boy Acrytint to the desired color of topcoat. Dry for at least 2-4 hours.

Repair minor surface imperfection with suitable putty. Dry for 24 hours, sand then spot coat with top coat color.

Apply two (2) coats Dutch Boy Gloss Nalcrete for interior/exterior. Tint with Dutch Boy Acrytint to the desired color.

I.07 Wood Preservative

Apply two (2) coats of wood preservatives for all wood surfaces such as jambs, ceiling joist and roof framing members.

I.08 Protection and Cleaning

Protection

a. Lighting fixtures shall be loosened and removed from contact with surfaces covered and protected, and reset upon completion.

b. Remove all electric plates, surface hardware, etc., before painting, protected and replace when completed.

c. The Contractor at his own expense shall make all undue damage to any part or parts of present structure caused by the Contractor, during the execution of the work good.

The Contractor shall, upon completion of work remove all paint, where it has been spilled, splashed, or splattered on the surface, remove all surplus materials, scaffolds, etc., so as to leave premises in perfect condition, acceptable to the Owner.
Finished surfaces shall be solid, even colors; and finished texture free from drops, runs, lumps, brush marks, discoloration and other defects. Before final inspection, any work that has become damaged or discolored shall be touched up or refinished in a satisfactory manner.

All other items or work to painted and not specified herein, but necessary to complete the work shall be painted with appropriate first quality paint and suited to the service and nature of the surface and material in accordance with these Specifications.

J. WELDING AND METAL WORKS

J.01 Scope of WorkThis section covers the furnishing of all work, equipment, materials labor and supervision required to complete the items in full compliance with the Drawing and this Specifications.

J.02 Material Provisions

All welding works shall conform to the "AWS CODE FOR ARC AND GAS WELDING IN BUILDING" and as herein specified or any other welding standards approved by the Owner's Engineer's.

All metal works shall be done in accordance with all related publications of American Institute of Steel Construction (AISC), American Society of Testing Materials (ASTM) and American Welding Society (AWS).

Use only welding equipment, electrodes welding wire and fluxes capable of producing satisfactory when used in a qualified welding procedure.

The Contractor shall be responsible for all errors of detailing for correct fitting of the structural members.

J.03 Storage of Materials

The materials shall be stored out of contact with the ground and in a manner and location that will minimize contamination and deterioration.

J.04 Materials

All materials shall be new stock, free from surface imperfections and shall conform to the applicable ASTM Specifications and equivalent standards.

J.05 Shop Connections

As detailed in the drawing or as approved by the Owner's Engineer.

J.06 Field Connections

Provide welded connections as shown in the drawing or as approved by the Owner's Engineer's.

K. PLUMBING WORKS

K.01 General

a. The Contractor shall provide all items, articles, materials, operations, or methods listed, mentioned, or schedule on the drawings and/or herein specified, including all labor, materials, equipment and incidentals necessary and required for their completion.

b. All fittings, connections, piping, hidden or embedded in concrete shall be subject to inspection by the Owner before covering.

c. The drawings and these Specifications as 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 shall be furnished and installed by the Contractor without additional cost to the Owner. All dimensional locations of fixture, floor drains, risers and pipe chases shall be verified on the architectural drawings and manufacturer's catalogue.

d. Intent – It is not intended that the drawings shall shoe every pipe, fitting, valve and appliance. 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 plumbing trade and to the satisfaction of the Owner.

K.02 Work Included

a. Work included under this Section shall consist of furnishing all labor, tools, equipment, appliances and materials necessary for complete installation testing and operation of the plumbing system in accordance with these Specifications and all applicable drawings in the contract.

b. Inside potable water distribution and supply pipes to fixtures and hose bibs/faucets. The Contractor shall furnish all piping materials and accessories of all water supply line located inside the building structures.

c. Sanitary sewers from the building and their connections to the point of discharge including septic vault as shown in the plans.

d. Drainage system for the entire building of the point of discharge including pipes, drainage canals, screening tank and catch basin.

e. Soil, waste and vent pipe system within the building

f. Plumbing fixtures, trims and accessories.

g. Furnishing of water meter, gate valves, check valves and related accessories.

h. Hydrostatic testing and reliability testing.

K.03 Materials

a. All materials to be used shall conform with the standards below. Use of material shall further be governed by other requirements imposed on other sections of these Specifications.

For Water Pipes

Blue uPVC Potable Water Pipes and Fittings shall conform with ASTM and ISO Standards with nominal pressure of 230 psi., Pipe fittings as per manufacturer's specification.

For Sewer Lines

Orange uPVC Sanitary Pipe (for 100mm Diameter and below) uPVC Pipe shall conform with ASTM 2729. Pipes and fittings are specified with integral push on bell complete with elastomeric neoprene O-ring gasket on one end and plain leveled on the other end.

Orange Gravity Sewer Pipe (for above 100mm Diameter)

uPVC Pipe shall conform with the Standard Specification of ISO R-161/ISO 4435, SDR-41 Jointing method shall be solvent cement jointing/rubber ring on joint. Pipe fittings shall be as per manufacturer's specifications.

Alternative Materials – Use of materials not specified in these Specifications may be allowed provided such alternative has been approved by the Owner and provided further that tests, if required, shall be done by an approved agency in accordance with generally accepted standards.

Identification of Materials – each length of pipe, fittings, traps, fixtures and devices used in the plumbing system shall have cast, stamped or indelibly marked on it, the manufacturer's trademark or name, the weight, type and classes of product when required by the standards mentioned above.

K.04 Make of Fixtures

Unless otherwise indicated, water closet (tank type), lavatory (under the counter type and wall hung type) including soap and tissue holders shall be American Standard brand or equivalent compete with accessories.

Urinals shall be done as shown on the plan, American Standard brand or equivalent. Push valve type.

Lavatory, faucet shall be knob type, American Standard brand or equivalent.

Faucets shall be stainless, U.S. made.

K.05 Soil, Water, Drain and Vent Pipes (For Sanitary Sewer Lines)

Underground soil, waste pipes and fittings shall be uPVC Sanitary Pipe, Orange or Brown.

All main vent stacks shall be extended to full size to end above the roofline except where otherwise specifically indicated.

Vent pipes in roof spaces shall run as close as possible to underside of roof, with horizontal piping pitched down to stacks without forming traps. Vertical vent pipes maybe connected into one main vent riser above the highest vented fixtures.

Where end or circuit vent pipe from any fixtures or line of fixtures is connected to a vent line serving other fixtures, the connections shall be at least 1,200 mm above the floor on which the fixtures are located, to prevent the use of any vent line as waste pipe, unless indicated otherwise.

Horizontal waste lines receiving the discharge from two or more fixtures shall be provided with end vents, unless separate venting of fixture is noted.

Rough in for pipes and fixtures shall be carried along the building construction. Correctly located opening of proper sizes shall be provided where required in the walls and floor for the passage of pipes. All items to be embedded in concrete shall be thoroughly cleaned and free from all rust scale and paint.

K.06 Cleanout, Plugs, Test and Traps

Cleanouts shall be the same size as the pipe but cleanouts larger than 100 mm shall not be required.

Every plumbing fixtures or equipment requiring connection to the sanitary drainage system shall be equipped with a trap. Each trap shall be placed as near the fixture as possible. No fixture shall be double-trapped.

K.07 Valves and Faucets for Building

Valves shall be KITZ or equivalent and shall be provided on all supplied fixtures as specified.

All valves shall be gate valves, check valves and ball valves unless otherwise specified or noted on the drawings.

Valves up to and including 50 mm dia. shall be brass with threaded ends, rough bodies and finished trimmings.

Faucets shall be U.S. made, chrome plated.

K.08 Fixtures and Equipment Supports and Fastenings

Stub-outs for sanitary lines, and vents shall be 300 mm above the floor line, and properly capped or else installed ready to receive the fixtures. The entire comfort room shall be properly tiled and finished, complete with doors and windows.

All fixtures shall be supported and fastened in a safe and in satisfactory manner.

Bolts and nuts shall be horizontal and exposed. Bolts, nuts, cap nuts and screw shall be chromium plated and provided with chromium plated brass washer.

K.09 Drains and Floor Sinks

Floor drains and floor sinks shall be made of high-grade, strong tough and even grained metals.

K.10 Cleaning

All exposed metal surfaces shall be rid of grease, dirt or other foreign materials.

All plumbing fixtures shall be properly protected from use and drainage during the construction period. At the end of the work and prior to approval, the fixture shall be cleaned as per manufacturer's recommendations to the satisfaction of the Owner.

All pipes, valves and fittings shall be cleaned of grease and sludge, which may have accumulated. The Contractor shall repair any stoppage or discoloration or other damage to parts of the building, its finished or furnishing due to the system without additional cost to the Owner.

K.11 Defective Work

If inspection or test show any defect, such defect work or matter shall be replaced by the Contractor and inspection and tests repeated until satisfactory to the Owner.

K.12 Septic Vault/Tank

Dimensions and locations are indicated in the plan, cement plaster for all inner linings.

Construction shall conform to Sanitary and Plumbing Code of the Philippines.

Septic vault/tank and holding tank outlets shall be connected to the nearest drainage system.

The work shall conform to the applicable provision of ***PART I. C – CONCRETE WORKS AND PART I. D – CEMENT AND MASONRY WORKS***.

K.13 Galvanized Pipes and Fittings

Galvanized steel pipe shall conform to the requirements of "AST M – 120", and shall be Schedule 40. Fittings for galvanized pipe shall be galvanized malleable iron.

K.14 Water Meter

Water meter must be “ARAD” or Asahi brand, or approved equivalent, screw type brass bodied with operating pressure conforming to standard specifications of MWSS or LWUA.

The Contractor shall submit certification of calibration issued by authorized government water utility agencies prior to acceptance of the required equipment.

K.15 Testing Requirements

Pressure testing of the piping system shall be performed as work progresses to detect leaks especially at the pipe joints. Testing shall be done prior to backfilling. Testing shall be made only after all the pipes are properly anchored. Test pressures and procedures as approved by the Engineer.

Pump test shall also be performed to check its performance under actual operating condition. This is done after the installation works so that the whole system including its controls shall be subjected to demonstration test to prove that they operate and function satisfactorily.

All pipes, fittings, valves, joints and couplings found to be defective or cracked during the test should be removed and replaced by the Contractor at his own expense.

TECHNICAL SPECIFICATIONS
PART - II ELECTRICAL WORKS

A. GENERAL

GENERAL REQUIREMENTS contain requirements essential to these specifications and apply whether or not individually referred to under this section.

B. SCOPE OF WORK

The work shall consist of the supply of labor, materials, equipment and other facilities necessary to complete the Electrical Works

All works herein shall comply with the pertinent provisions of the latest edition of the Philippine Electrical Code and is hereby made part of the Contract.

Compliance with the provisions herein shall be Contractor's responsibility to provide as part of the Contract Work and without separate payment therefore.

Expenses for the power connection/tapping from the existing local Electric Cooperative including electric meter deposit, billing deposit, drop wires and other accessories necessary for the energization, of the project shall be provided by the LGU of Lubang.

C. PRINCIPAL MATERIALS AND EQUIPMENT TO BE FURNISHED BY THE CONTRACTOR

	MATERIAL	SPECIFICATION
1.	Offices, Bedroom and Stairway	Recessed Type Flourescent Lighting Fixtures w/ Mirrorized Aluminum Reflectors and Louvers (1x40W)
2.	Comfort Rooms and Hallways	150 mm diameter recessed mounted downlight lighting fixture complete with aluminum reflector, glass cover and 18 watts CFL lamp.
3.	Switches	5A/230 volts, National Brand
4.	Wires	Sizes as specified in the plans, Philflex, American Wire or Columbia Brand.

5. Panelboards as specified in the plan.

D. EXECUTION AND INSTALLATION WORKS

The work under this contract shall be done in accordance with the provision of the latest edition of the Philippine Electrical Code, the Rules and Regulations of the Bureau of Labor and Standards and in compliance with the requirements of the local utility company. Nothing contained in these Specifications or shown in the drawing shall be construed as to conflict with national and local ordinance or laws governing the installation of electrical works and all such laws and ordinances are hereby made part of these specifications. The contractor is required to meet the requirement thereof.

D.01 Guarantee

The Contractor shall guarantee that the electrical system are free from all grounds and from all defective workmanship and will remain so for a period of one year from the date of acceptance of the work. The Contractor at his owns expense shall remedy any defects, appearing within the aforesaid period.

E. WORKMANSHIP

The work throughout shall be executed in the best and most thorough manner under the direction of and to the satisfaction of the PFDA who will interpret the meaning of the Drawings and Specifications and shall have power to reject any work and materials that in his judgment are not in full accordance therewith.

E.01 Standard of Materials

All materials shall be new and shall conform to the standards of Underwriter's Laboratories, Inc., IEEE, NEMA and Philippine Standard Agency (PSA) for every case where such a standard has been established for the particular type of materials in questions.

All materials on all systems shall comply with the specifications, and all material, which is not specified, shall be of the best of their respective kind.

E.02 Ground Test

The entire installation shall be free from improper grounds and from short circuits. Test shall be made in the presence of the PFDA. Each panel shall be tested with mains connected to the feeder and branches, and all switches closed all fixtures in place and permanently connected, lamps removed or omitted from the sockets and all switches closed. Each individual power feeder shall be tested

with the power equipment connected for proper and intended operation. In no case shall the resistance be less than that allowed by the Regulations for Electrical Equipment of Buildings. Failure shall be corrected in a manner satisfactory to the PFDA.

E.03 Performance Test

It shall be the responsibility of the Contractor to test all system of the entire electrical installation for proper operational condition. This condition shall apply to the power and lighting installation as well as low voltage and alarm control, signal and communication systems. Where sequence operation is required, the Contractor shall test for proper sequence of the entire electrical installation for satisfactory working condition as approved by the PFDA.

E.04 Completion Requirements

Remove waste and debris resulting from this work, as work progresses and upon completion.

Service and adjust moving or mechanical parts for smooth, quiet and proper operating condition.

Touch-up abraded or damaged prime paintings or galvanizing and leave clean and ready for finishing work required.

E.05 Trade/Brand Names

Trade/Brand names of equipment are intended only to show the degree of standardization on which the design of the particular work is based and also to avoid ambiguous description of the equipment. The indication of the trade/brand names therefore shall in no way be considered to limit the acceptability of other products of equal or better performances, functions, reliability and durability.

F. LIGHTING SYSTEM

The lighting system shall be complete in every aspect, all as indicated in the plans.

If anything has been omitted in any item of work or material usually furnished which are necessary for the completion of the lighting system work as outline hereunder, then such item must be and hereby included in this section of the work.

Each lighting outlet shall have standard deep 100 mm. Octagonal or square box for each ceiling and bracket fixture installation. Each box shall finish flush against concrete and plaster walls or ceiling, except for exposed work.

The Contractor shall provide and install all lighting fixtures of the size and type as indicated in the drawings. All fixtures shall be wired and installed completely including all lamps and/or tubes, transformers, ballast, supports, canopies, globes, and other parts

and devices necessary for the complete installation and operation.

F.01 Relamping

The Contractor shall furnish and install all lamps for the entire lighting fixture installations and shall replace all broken or burned out lamps up to the time that the owner takes final acceptance of the work.

F.02 Switches

Wall switches shall be rated at 5 amperes, 230 volts, one-way or three-way as required. The type of switch shall be tumbler or snap-on as required, National brand. Where switches are installed surface mounted, they shall be installed in type FS conduit fittings and provided with surface mounting covers.

Switches shall not arc during switching operations.

Wall switches shall be mounted 1400 mm. from finish floor.

F.03 Receptacles

Receptacles outlets shall be for flush mounting, duplex rated at 15 Amperes, 230-volt connection, National Brand or equivalent. Type and color of receptacle outlet plates shall be as selected by the Engineer and appropriate samples of outlet and plates shall be submitted prior to purchase of device.

Weatherproof shall be National brand. Wall receptacles shall be mounted 300 mm from floor finish unless otherwise indicated in the plan.

F.04 Outlet and Switch Boxes

At all outlets or whatever kind for all systems, there shall be provided suitable outlet boxes or other fittings specially designed to receive the type of devices to be mounted thereon.

All outlet boxes shall be uPVC.

Boxes installed in damp or wet locations shall be specifically approved for the purpose and shall be so placed and constructed as to prevent moisture from entering or accumulating within the box.

In walls or ceiling constructed of wood, concrete of other similar materials, boxes and covers shall be flush with finished surfaces. Number of wires and devices contained in the box shall be in accordance with the code. Where necessary flush square outlet boxes shall be fitted with extension rings or raised cover plates.

Boxes shall be securely and rigidly fastened to surface upon which they are mounted or embedded in concrete or masonry, and shall be supported from a

structural member of building either directly or by using substantial and approved metal braces.

Standard outlet boxes shall be of the octagonal, square or rectangular shapes and only deep types no less than 54 mm. depth shall be used for all installations.

G. PULLBOXES AND WIRE GUTTERS

Pull boxes and wire gutters for the pulling or concealment of wires or cables shall be provided where indicated and also where required though not indicated. It shall be made of steel sheets, thickness not less than gauge 16, galvanized and painted with anti-rust primer.

Pull boxes shall be provided on all conduit runs exceeding 30 meters between outlets, and shall be sufficiently set by bolts braces and fasteners. In large pull boxes, cables shall be tied or racked in an approved manner.

H. CONDUITS

All conduits shall be unplasticized Polyvinyl Chloride (uPVC), schedule 40, and uniformed wall thickness. It shall be compression and impact resistant, non-corrosive, weatherproof as manufactured by Emerald, Neltex or its approved equal. The material shall not support combustion and shall not deteriorate when exposed to sunlight, rain and other elements.

H.01 Installation of Conduit System

Conduits shall be installed and supported in a rigid and satisfactory manner.
No conduits shall be used in any system smaller than 15 mm. (1/2 inch.) diameter trade size, nor shall have more than four quarter bends in any one run between outlets and/or fittings. When necessary pull boxes shall be provided as directed by the Engineer.

All cut ends of conduit shall be reamed to remove rough edges. Where a conduit enters a box or fitting, bushing shall be provided to protect wire from abrasion, unless design of box or fitting is such as to afford equivalent protection.

Raceways shall be installed at right angles or parallel to building lines. Conduit shall be firmly fastened within 0.3 m. of each outlet box fitting or cabinet by means of standard clamps and intermediately spaced no more than 1.0 meter. All clamps, bolts, straps, etc. shall be galvanized and painted metal.

Support and braces may be welded to structural steel with the specific approval of the Engineer. When running over concrete surfaces, the screws shall be held in place by expansion sleeves.

I. WIRES AND CABLES

600 Volt grade wire shall be copper, hard drawn and annealed and shall be of 98% conductivity.

Wire or cable for lighting and power systems shall be plastic insulated type TW, THW, or THHN as noted on plans or as specified. All wires 8.0 sq. mm. and larger shall be stranded unless noted on plans.

No wire smaller than 2.0 sq. mm. shall be used except where otherwise specified. Control leads for motors shall be types THW, unless otherwise indicated.

All wires shall be color coded (Black, Red, Yellow, Green) and shall be as manufactured by Phelps Dodge, Philflex, Columbia or its approved equal.

Ungrounded conductors shall have distinct insulation color from grounded and grounding wires. Grounding wires and cables shall be colored green or white or as approved by the Engineer.

I.01 Cable Connectors

The connection of conductors from sizes 8 sq. mm. and larger shall be made with copper, solderless, pressure type connectors. Connection shall be done without damaging the individual cable strands. Connectors shall be provided insulators or fish paperboard separators.

I.02 Installation of Wire and Cables

Conductors or cable shall not be installed in conduits, raceway until such systems has been completed, nor it be installed until the inside of conduit has been cleaned.

The Contractor shall exercise due care to prevent damage to conductors, insulation or sheathing when pulling wires and cables.

All feeder cables installed shall be continuous from origin to panel or equipment terminations without running splices in Hand Hole or pull box except where taps and splices are approved by the Engineer using suitable connectors.

Wires and cables for power and lighting shall be in separate conduit from any wires or cables for communication and signal systems.

Where cable passes through building exterior walls and underground identification tags of non-corrosive materials shall be stamped on each end and every route.

Wires and cables inside panelboards and control boxes shall be binded by means of plastic straps in a neat and orderly manner.

J. LIGHTING PANELBOARD

Panelboard shall be as specified in the approved plans.

All protective devices shall meet NEMA and Underwriter Laboratories Inc. specifications. In multiple circuit breakers, all poles shall be interrupted simultaneously during fault conditions.

All busbars and current carrying parts shall be high conductivity copper and shall have current density not more than 1.5 amperes per sg.m. of cross sectional area and shall be heavier where required for mechanical strength. Supply with non-ferrous or galvanized bolts, nuts, washers and other required attachment devices.

Each and every panel shall be provided on the inside of the door, with directory frame protected by a transparent plastic window, containing typed card indicating the member and designation of the circuits.

All panels shall have grounding bus or lugs with pressure type terminals of sufficient quantity and size and so located inside as to permit easy termination of cables.

K. CIRCUIT BREAKERS

Circuit breakers shall consist of quick-make, quick break operating mechanism, thermal magnetic trip unit on each pole and enclosed in a molded phenolic case. The thermal magnetic trip unit shall provide time delay overload protection in case of overload and instantaneous trip for short circuit condition in any one pole.

Rating of circuit breaker shall be suitable for each service application and shall be specified as to rated voltage, current, type, frame, size and frequency as manufactured by Westinghouse.

Enclosure of individual circuit breakers or knife switches shall be general purpose NEMA type 1 or rain tight NEMA type 3R or as required according to the specific duty called for.

L. INSPECTION TEST

The Contractor in the presence of the owner's representative shall conduct inspection and tests. These tests shall be for the normal operation of the entire electrical system of the project. The decision made by the owner's representative for correction on any item of work, alteration of incorrect installation, or replacement of defective materials, or any other defects as found by him shall be final and must be complied with by the Contractor within forty-eight (48) hours after receipt of the official written communication before final acceptance can be made.

M. TEMPORARY LIGHT AND POWER

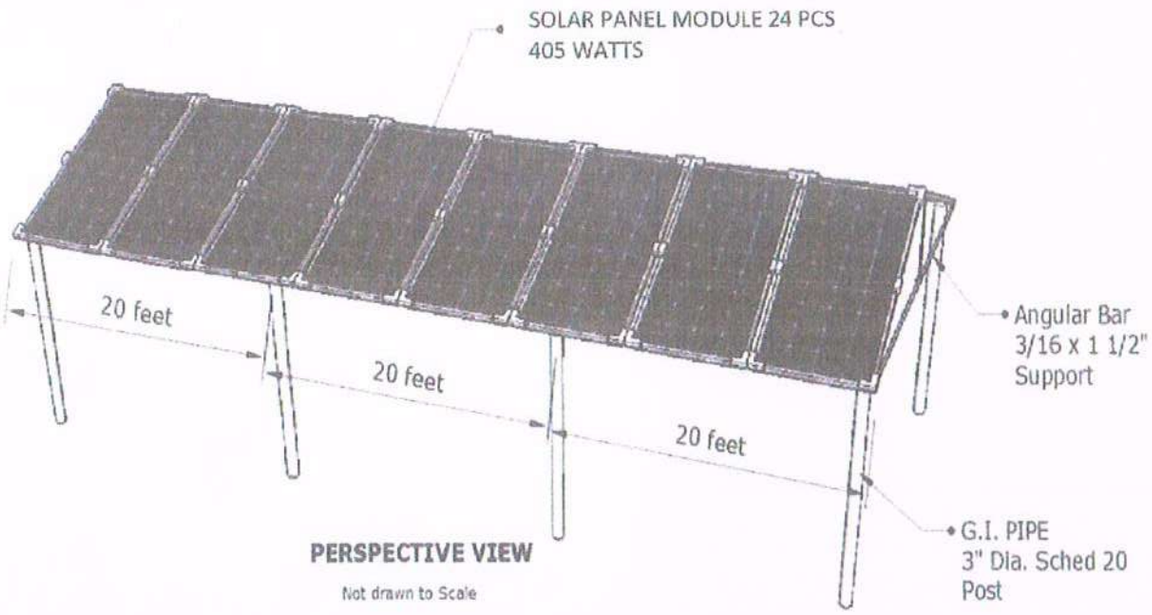
The Contractor shall provide, install and maintain adequate incoming service transformer, light feeders, branch circuits, outlets, lamps and fixtures, as required for performance of the work by all trades engaged in the construction of the building structures and installation.

PROGRAM OF WORK
PART III – MOBILIZATION/DEMOBILIZATION OF EQUIPMENT

A. SCOPE OF WORK

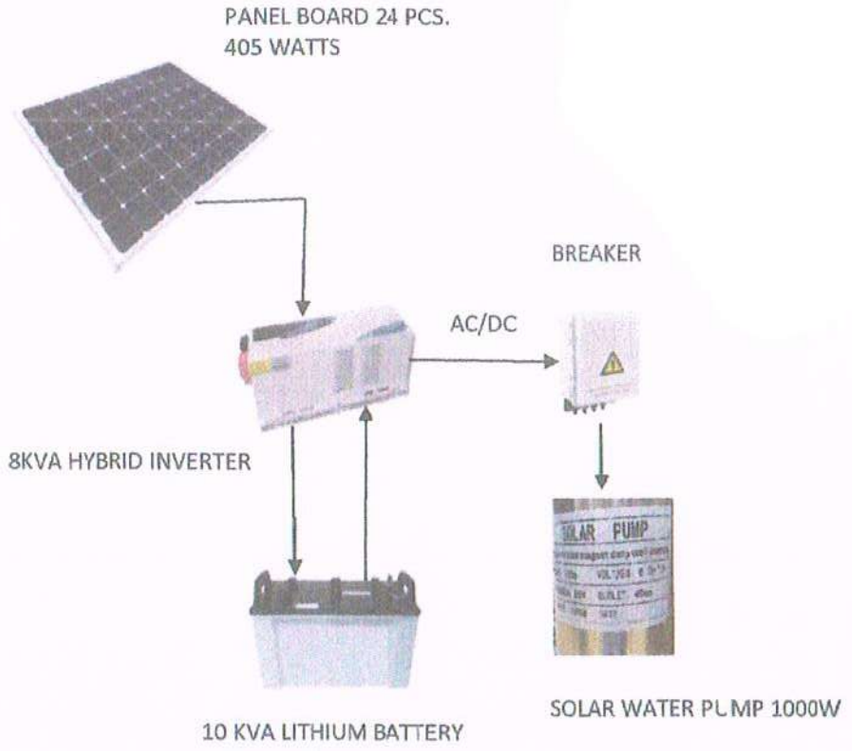
A.01 The contractor shall mobilized and demobilized all equipment necessary to complete the work of the project.

A.02 Mobilization and demobilization shall be treated as a separate item. It shall be computed based on the cost of transportation of equipment of the contractor to complete the project.



PERSPECTIVE VIEW

Not drawn to Scale



PANEL SYSTEM CONNECTION

BUREAU OF FISHERIES AND AQUATIC RESOURCES	PROJECT TITLE/ LOCATION: **REHABILITATION OF SOLAR PANEL** BRACKISHWATER RESEARCH STATION BARCENAGA, NAUJAN	Prepared by: **Mercilyn V. Hj Rebuan** OIC - BFRS	Recommending Approval: **Roberto R. Abrera** OIC - Assistant Regional Director	APPROVED BY: **ELIZER S. SALILIG, MFT** Regional Director BFAR MIMAROPA