



REPUBLIC OF THE PHILIPPINES
NATIONAL POWER CORPORATION
(Pambansang Korporasyon sa Elektrisidad)

BID DOCUMENTS

**Name of Project : REPAIR AND REHABILITATION OF
POWERHOUSE, OFFICE BUILDING AND
ASSOCIATED STRUCTURES OF MARINAWA
DIESEL POWER PLANT**

Project Location : Marinawa, Bato, Catanduanes

Specs Number : LuzP21Z1207Sr

PR Number : S1-MR22-002

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Design and Development Department



SECTION I

INVITATION TO BID



National Power Corporation

INVITATION TO BID

PUBLIC BIDDING – BCS 2022-0399

1. The NATIONAL POWER CORPORATION (NPC), through its approved Corporate Budget of CY 2022 intends to apply the sum of **(Please see schedule below)** being the Approved Budget for the Contract (ABC) to payments under the contract. Bids received in excess of the ABC shall be automatically rejected at Bid opening.

PR Nos./PB Ref No. & Description	Similar Contracts	Pre-bid Conference	Bid Submission / Opening	ABC/ Amt. of Bid Docs
S1-RDP22-003 / PB220516-AD (PB2) Supply, Delivery and Installation of 20FT Two Storey Collapsible / Containerized Bunker for Rapu-Rapu DPP, Brgy. Poblacion, Rapu-Rapu Island, Albay	Supply, delivery and installation of collapsible, containerized house/office or staff room	24 June 2022 9:30 A.M	07 July 2022 9:30 A.M	P 1,501,000.00 / P 5,000.00
S1-MRN22-002 / PB220707-AD00238 Repair and Rehabilitation of Powerhouse, Office Building and Associated Structures of Marinawa Diesel Power Plant, Marinawa, Bato, Catnauan • PCAB License: License Category of at least "Category D – General Building" and registration classification of at least "Small B – Building and Industrial Plant"	Construction of industrial building, warehouse, stadium or storage building	24 June 2022 9:30 A.M	07 July 2022 9:30 A.M	P 6,386,000.00 / P 10,000.00
S1-MGP22-003 / PB220707-AD00239 Construction of 10kL Rainwater Collector and Office/Staff House at Mangsee DPP, Mangsee, Balabac, Palawan • PCAB License: License Category of at least "Category D – General Building" and registration classification of at least "Small B – Building and Industrial Plant"	Construction of industrial building, office, residential, storage or commercial building	24 June 2022 9:30 A.M	07 July 2022 9:30 A.M	P 1,403,000.00 / P 5,000.00

Venue: Kaňao Function Room, NPC Bldg. Dillman, Quezon City

2. The NPC now invites bids for Items listed above. Delivery of the Goods is required (**see table below**) specified in the Technical Specifications. Bidders should have completed, within (**see table below**) from the date of submission and receipt of bids, a contract similar to the Project. The description of an eligible bidder is contained in the Bidding Documents, particularly, in Section II. (Instruction to Bidders).

PR No/s. / PB Ref No/s.	Delivery Period / Contract Duration	Relevant Period of SLCC reckoned from the date of submission & receipt of bids
S1-RDP22-003	Sixty (60) Calendar Days	Five (5) Years
S1-MRN22-002	One Hundred Eighty (180) Calendar Days	-
S1-MGP22-003	Ninety (90) Calendar Days	-

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.

Bidding is restricted to Filipino citizens/sole proprietorships, partnerships, or organizations with at least sixty percent (60%) interest or outstanding capital stock belonging to citizens of the Philippines, and to citizens or organizations of a country the laws or regulations of which grant similar rights or privileges to Filipino citizens, pursuant to RA 5183.

4. Prospective Bidders may obtain further information from National Power Corporation, Bids and Contracts Services Division and inspect the Bidding Documents at the address given below during office hours (8:00AM to 5:00PM), Monday to Friday.
5. A complete set of Bidding Documents may be acquired by interested Bidders from the given address and website(s) and upon payment of the applicable fee for the Bidding Documents, pursuant to the latest Guidelines issued by the GPPB. Bidding fee may be refunded in accordance with the guidelines based on the grounds provided under Section 41 of R.A. 9184 and its Revised IRR.
6. The National Power Corporation will hold Pre-Bid Conference (**see table above**) and/or through video conferencing or webcasting which shall be open to prospective bidders.

Only registered bidder/s shall be allowed to participate for the conduct of virtual pre-bid conference. **Unregistered bidders** may attend the Pre-Bid Conference at the Kañao Room, NPC subject to the following:

- a. Only a maximum of two (2) representatives from each bidder / company shall be allowed to participate during the virtual pre-bid conference.
 - b. A "No Face mask / No Entry" policy shall be implemented in the NPC premises. Face mask shall be 3-ply surgical or KN95 mask type.
 - c. The requirements herein stated including the medium of submission shall be subject to GPPB Resolution No. 09-2020 dated 07 May 2020
 - d. The Guidelines on the Implementation of Early Procurement Activities (EPA) shall be subject to GPPB Circular No. 06-2019 dated 17 July 2019
7. Bids must be duly received by the BAC Secretariat through (i) manual submission at the office address indicated below; (ii) online or electronic submission before the specified time stated in the table above for opening of bids. 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 Kafiao Function Room, NPC Head Office, Diliman, Quezon City and/or via online platform to be announced by NPC. Bids will be opened in the presence of the bidders' representatives who choose to attend the activity.
10. The National Power Corporation 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 41 of the 2016 revised IRR of R.A. No. 9184, without thereby incurring any liability to the affected bidder or bidders.
11. For further information, please refer to:

**Bids and Contracts Services Division,
Logistics Department**

BIR Road cor. Quezon Avenue

Diliman, Quezon City

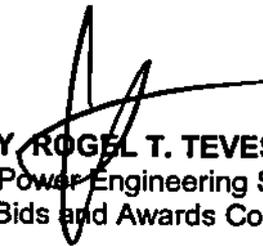
Tel Nos.: 8924-5211 and 8921-3541 local 5239

Fax No.: 8922-1622

Email: bcsd@napocor.gov.ph / bcsd_napocor@yahoo.com

12. You may visit the following websites:

For downloading of Bidding Documents: <https://www.napocor.gov.ph/bcsd/bids.php>


ATTY. ROGEL T. TEVES
Vice President, Power Engineering Services and
Chairman, Bids and Awards Committee

SECTION II

**INSTRUCTIONS TO
BIDDERS**

SECTION II - INSTRUCTIONS TO BIDDERS

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SECTION II - INSTRUCTIONS TO BIDDERS

1. Scope of Bid

NPC invites Bids for the **REPAIR AND REHABILITATION OF POWERHOUSE, OFFICE BUILDING AND ASSOCIATED STRUCTURES OF MARINAWA DIESEL POWER PLANT**, with Project Identification Number **LuzP21Z1207Sr**.

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

2. Funding Information

The GOP through the source of funding as indicated below for CY 2021 in the amount of **SIX MILLION THREE HUNDRED EIGHTY SIX THOUSAND PESOS (P 6,386,000.00)**. The source of funding is the proposed Corporate Operating Budget of the National Power Corporation (NPC).

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 Bidder may subcontract portions of the Project to the extent allowed by the Procuring Entity as stated herein, but in no case more than fifty percent (50%) of the Project.
- 7.1. The Bidder must submit together with its Bid the documentary requirements of the subcontractor(s) complying with the eligibility criteria stated in **ITB** Clause 5 in accordance with Section 23.4 of the 2016 revised IRR of RA No. 9184 pursuant to Section 23.1 thereof.
- 7.2. Subcontracting of any portion of the Project does not relieve the Contractor of any liability or obligation under the Contract. The Supplier will be responsible for the acts, defaults, and negligence of any subcontractor, its agents, servants, or workmen as fully as if these were the Contractor's own acts, defaults, or negligence, or those of its agents, servants, or workmen.

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 and/or through videoconferencing/webcasting} 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 **Form NPCSF-INFR-01 - Checklist of Technical and Financial Documents, Section VIII - Bidding Forms.**
- 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 **Form NPCSF-INFR-01 - Checklist of Technical and Financial Documents, Section VIII - Bidding Forms.**
- 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 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 15 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

SECTION III - BID DATA SHEET

ITB Clause	
5.2	<p>For this purpose, contracts similar to the Project refer to contracts which have the same major categories of work, which shall be projects involving construction of industrial building, warehouse, stadium or storage building.</p> <p>The Single Largest Completed Contract (SLCC) as declared by the bidder shall be verified and validated to ascertain such completed contract. Hence, bidders must ensure access to sites of such projects/equipment to NPC representatives for verification and validation purposes during post-qualification process.</p> <p>It shall be a ground for disqualification, if verification and validation cannot be conducted for reasons attributable to the Bidder.</p>
7.1	<p>Only a maximum of fifty percent (50%) of the Works may be subcontracted. All Subcontractors must be approved by NPC.</p>
10.1	<p>The list of on-going contracts (Form No. NPCSF-INFR-02) shall be supported by the following documents for each on-going contract to be submitted during Post-Qualification:</p> <ol style="list-style-type: none"> 1. Contract/Purchase Order and/or Notice of Award 2. Certification coming from the project owner/client that the performance is satisfactory as of the bidding date. <p>The bidder shall declare in this form all his on-going government and private contracts including contracts where the bidder (either as individual or as a Joint Venture) is a partner in a Joint Venture agreement other than his current joint venture where he is a partner. Non declaration will be a ground for disqualification of bid.</p>
	<p>The Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid (Form No. NPCSF-INFR-03) shall be supported by the following documents to be submitted during Bid Opening:</p> <ol style="list-style-type: none"> 1. Contract/Purchase Order 2. Owner's Certificate of Final Acceptance issued by the project owner other than the contractor or a final rating of at least Satisfactory in the Constructors Performance Evaluation System (CPES). In case of contracts with the private sector, an equivalent document (Ex. Official Receipt or Sales Invoice) shall be submitted.
10.3	<p>The required License issued by the Philippine Contractors Accreditation Board (PCAB): License Category of at least "CATEGORY D – GENERAL BUILDING" and registration classification of at least "SMALL B – BUILDING & INDUSTRIAL PLANT"</p>

<p>10.4</p>	<p>The list of key personnel shall include the following minimum requirements:</p> <p>a. One (1) Project Engineer</p> <p>Registered Civil Engineer who had supervised at least a project similar in nature as to the type and cost of the proposed project within the last 10 years. Must have at least 3 years professional experience as Civil Engineer on similar project.</p> <p>b. One (1) Materials Engineer</p> <p>Registered Civil Engineer with valid accreditation from the Department of Public Works and Highways (DPWH) as Materials Engineer I</p> <p>c. One (1) Safety Officer 2</p> <p>Construction Safety Officer who has completed at least forty (40) hours of Construction Safety and Health Training (COSH) from Occupational Safety and Health Center (OSHC) or Safety Training Organizations (STOs) accredited by the Department of Labor and Employment (DOLE)</p> <p>Valid Professional Regulations Commission (PRC) license for professional personnel, Construction Safety and Health Training Certificate from OSHC/STOs accredited by DOLE for the Safety Officer, certificate of accreditation including ID card issued by DPWH for Materials Engineer, shall be submitted and included as an attachment in the Standard Form NPCSF-INFR-09: List of Key Personnel Proposed to be Assign to the Contract.</p> <p>The above key personnel must either be employed by the Bidder or contracted by the Bidder to be employed for the contract to be bid.</p>															
<p>10.5</p>	<p>The list of construction equipment (owned or leased) shall include the following minimum requirements:</p> <table border="0"> <tr> <td>a. Welding Machine (300 Amp)</td> <td>-</td> <td>1 unit</td> </tr> <tr> <td>b. Bar cutter (25mm Ø capable)</td> <td>-</td> <td>1 unit</td> </tr> <tr> <td>c. Concrete Mixer (1 - bagger)</td> <td>-</td> <td>1 unit</td> </tr> <tr> <td>d. Cargo Truck</td> <td>-</td> <td>1 unit</td> </tr> <tr> <td>e. Service Vehicle</td> <td>-</td> <td>1 unit</td> </tr> </table>	a. Welding Machine (300 Amp)	-	1 unit	b. Bar cutter (25mm Ø capable)	-	1 unit	c. Concrete Mixer (1 - bagger)	-	1 unit	d. Cargo Truck	-	1 unit	e. Service Vehicle	-	1 unit
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c. Concrete Mixer (1 - bagger)	-	1 unit														
d. Cargo Truck	-	1 unit														
e. Service Vehicle	-	1 unit														
<p>10.6</p>	<p>Bidders shall also submit the following requirements in their first envelope, Eligibility and Technical Component of their bid:</p> <p>1. Complete eligibility documents of the proposed sub-contractor, if any</p>															
<p>10.7</p>	<p>The prospective bidders shall declare its Joint Venture partner during the purchase of bid/tender documents. Any single bidder/s who already procured/secured the bidding documents but want to avail the Joint Venture Agreement (JVA) shall inform the EAC in writing prior to the bid opening for records and documentation purposes. Failure to do so shall be a ground for disqualification/non-acceptance of its bid.</p>															
<p>12</p>	<p>No further instructions</p>															

15.1	<p>The bid security shall be in the form of a Bid Securing Declaration or any of the following forms and amounts:</p> <ol style="list-style-type: none"> 1. The amount of not less than 2% of ABC, if bid security is in cash, cashier's/manager's check, bank draft/guarantee or irrevocable letter of credit; 2. The amount of not less than 5% of ABC if bid security is in Surety Bond.
19.2	<p>Partial Bid is not allowed</p>
20	<ol style="list-style-type: none"> a. Contract/Purchase Order and/or Notice of Award for the contracts stated in the List of all Ongoing Government & Private Contracts Including Contracts Awarded but not yet Started (NPCSF-INFR-02); b. Certification coming from the project owner/client that the performance is satisfactory as of the bidding date for all ongoing contracts stated in form NPCSF-INFR-02. c. The licenses and permits relevant to the Project and the corresponding law requiring it as specified in the Technical Specifications, if any.
21	<p>The following documents shall form part of the contract:</p> <ol style="list-style-type: none"> 1. Notice to Proceed 2. Construction schedule and S-curve 3. Manpower Schedule 4. Construction Methods 5. Equipment Utilization Schedule 6. Construction safety and health program of the contractor duly approved by the Bureau of Working Condition (BWC) of the Department of Labor and Employment (DOLE) or proof of submission to BWC 7. PERT/CPM.

SECTION IV

**GENERAL CONDITIONS
OF CONTRACT**

SECTION IV – GENERAL CONDITIONS OF CONTRACT

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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**

SECTION V – SPECIAL CONDITIONS OF CONTRACT

GCC Clause	
2	Sectional completion is not specified.
4	<p>It shall also be the obligation and responsibility of the Contractor to carry out the Works properly and in accordance with this Contract, including but not limited to the following conditions:</p> <p>a. The Contractor shall conduct the Works with due regard to safety and health in accordance with its Construction Safety and Health Program (CSHP) duly approved by the Department of Labor & Employment (DOLE) and in compliance with the DOLE Department Order No. 13 – The Guidelines Governing Occupational Safety and Health in the Construction Industry.</p> <p>Failure to comply with the approved CSHP will be considered as non-compliance with the Contract and shall result to the imposition of Section 19, Violation and Penalties of the DOLE Department Order No. 13 and any appropriate sanctions such as, but not limited to:</p> <ol style="list-style-type: none"> 1. Suspend the work until the Contractor complies with the approved CSHP with the condition that the work resumption will not incur additional cost to the Corporation; 2. Suspend payment of the portion of work under question; 3. Correct the situation by employing 3rd party and charge all expenses incurred to the Contractor's collectibles/securities; and 4. Report the condition to the Bureau of Working Conditions of the DOLE for their appropriate action. <p>b. The Contractor shall be responsible for the strict compliance with the provision of the Philippine Laws affecting labor and operation of Work under the contract and shall be responsible for the payment of all indemnities arising out of any labor accident which may occur in the execution of the Works and for which he may be responsible under Republic Act 3428, as amended, known as the Workmen's Compensation Law.</p> <p>c. The Contractor is obliged to exercise due care so as not to endanger life and property in the vicinity of the Works where he operates in connection with this Contract. He shall be liable for all damages incurred in any manner by acts of negligence of his own, or his agents, employees, or workmen.</p> <p>d. It is the responsibility of the Contractor for the strict compliance with the requirements of the Philippine Clean Air Act of 1999 (R.A. 8749) and Philippine Clean Water Act of 2004 (R.A. 9275). The Contractor shall be liable for any damages/destructions to the environment including penalties that will be imposed by the Department of Environment and Natural Resources (DENR) arising from non-compliance of the requirements thereof.</p>

	<p>e. The Contractor shall be responsible for the strict compliance with the requirements of the Environmental Compliance Certificate (ECC) issued for this project (if any) and DENR Administrative Order No. 26. He shall be liable for any damages/destructions to the environment including penalties that will be imposed by the DENR arising from non-compliance thereof, in any manner by his acts or negligence, or by his agents, employees, or workmen in the execution of the Works. The Contractor may employ a Pollution Control Officer accredited with the DENR for the duration of the project, if so required by the DENR Administrative Order No. 26</p> <p>f. It shall be the Contractor's responsibility for the correctness, accuracy and quality of works. NPC's approval does not relieve his contractual obligation and responsibility under this contract.</p> <p>g. Payment of all forms of taxes, such as value added tax (VAT) including municipal licenses and permits, and others that may be imposed by the Philippine Government or any of its agencies and political subdivisions in connection with the Contract shall be for the account of the Contractor.</p> <p>h. In general, the Contractor is totally responsible for the execution of the Works and therefore, takes upon himself all the technical, legal and economic risks and all obligations which could arise therefrom or connected therewith. The overall responsibility of the Contractor includes the responsibility for actions or omissions of his own personnel as well as the personnel of the sub-contractors.</p>
<p>4.1</p>	<p>NPC shall give access to the Site for the Contractor to commence and proceed with the works on the start date. The access to the site referred herein shall not be exclusive to the Contractor but only to enable him to execute the Work.</p>
<p>5</p>	<p>1. The following must be indicated in the performance bond to be posted by the Contractor:</p> <ul style="list-style-type: none"> i. Company Name ii. Correct amount of the Bond iii. Contract/Purchase Order Reference Number iv. Purpose of the Bond: "To guarantee the faithful performance of the Principal's obligation to undertake <u>(Contract/Purchase Order Description)</u> in accordance with the terms and conditions of <u>(Contract No. & Schedule/Purchase Order No.)</u> entered into by the parties." <p>2. The bond shall remain valid and effective until the duration of the contract <u>(should be specific date reckoned from the contract effectivity)</u> plus sixty (60) days after NPC's acceptance of the last delivery/final acceptance of the project.</p> <p>3. In case of surety bond, any extension of the contract duration or delivery period granted to the CONTRACTOR shall be considered as given, and any modification of the contract shall be considered as authorized, as if with the expressed consent of the surety, provided</p>

	<p>that such extension or modifications falls within the effective period of the said surety bond. However, in the event that the extension of the contract duration or delivery schedule would be beyond the effective period of the surety bond first posted, it shall be the sole obligation of the CONTRACTOR to post an acceptable Performance Security within ten (10) calendar days after the contract duration/delivery period extension has been granted by NPC.</p> <p>4. Other required conditions in addition to the standard policy terms issued by the Bonding Company:</p> <ul style="list-style-type: none"> i. The bond is a penal bond, callable on demand and the entire amount thereof shall be forfeited in favor of the Obligee upon default of the Principal without the need to prove or to show grounds or reasons for demand for the sum specified therein; ii. The amount claimed by the Obligee under this bond shall be paid in full and shall never be subject to any adjustment by the Surety; iii. In case of claim, the Surety shall pay such claim within sixty (60) days from receipt by the Surety of the Obligee's notice of claim/demand letter notwithstanding any objection thereto by the Principal.
6	No site investigation report.
7.2	<p>In case of permanent structures, such as buildings of types 4 and 5 as classified under the National Building Code of the Philippines and other structures made of steel, iron, or concrete which comply with relevant structural codes (e.g., DPWH Standard Specifications), such as, but not limited to, steel/concrete bridges, flyovers, aircraft movement areas, ports, dams, tunnels, filtration and treatment plants, sewerage systems, power plants, transmission and communication towers, railway system, and other similar permanent structures: Fifteen (15) years.</p> <p>In case of semi-permanent structures, such as buildings of types 1, 2, and 3 as classified under the National Building Code of the Philippines, concrete/asphalt roads, concrete river control, drainage, irrigation lined canals, river landing, deep wells, rock causeway, pedestrian overpass, and other similar semi-permanent structures: Five (5) years.</p> <p>In case of other structures, such as Bailey and wooden bridges, shallow wells, spring developments, and other similar structures: Two (2) years.</p>
10	No dayworks are applicable to the contract.
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/Letter of Acceptance.
11.2	<p>The period between Program of Work updates is Thirty (30) calendar days.</p> <p>The amount to be withheld for late submission of an updated Program of Work is One percent (1%) of contract amount.</p>

12	<p>During contract implementation, the Procuring Entity shall conduct Constructors Performance Evaluation in accordance with Section 12, Annex E of the Revised Implementing Rules and Regulation of R.A. 9184 using the NPC Constructors Performance Evaluation System (CPES) Guidelines.</p> <p>CPES ratings shall be used for the following purposes: a) eligibility screening/post-qualification; b) awarding of contracts; c) project monitoring & control; d) issuance of Certificate of Completion; and in adopting measures to further improve performance of contractors in the prosecution of government projects.</p> <p>Qualified Constructors Performance Evaluators (CPE) shall conduct project evaluation as follows:</p> <p>(a) During Construction - Except for those projects with a duration of 90 calendar days and below which may be subjected to at least one (1) visit, all projects shall be subjected to a minimum of two (2) evaluations to be performed by the CPE. The number of evaluations beyond the prescribed minimum shall be determined by the CPES-Implementing Unit based on the size, nature and complexity of the project and shall be subject to approval by the proper authorities within the agency. The first evaluation shall be performed when the project is at least thirty percent (30%) physically complete or as maybe required by the CPES-IU using the S-curve or other appropriate means to determine whether there is substantial work completed for evaluation.</p> <p>(b) Upon Completion - only one evaluation shall be performed by the CPE right after the Project Implementation Group reports one hundred percent (100%) completion of the project.</p>
13	The maximum amount of advance payment is fifteen percent (15%) of the Contract Price and paid in lump sum.
14	No further instructions.
15.1	The date by which "as built" drawings and operating and maintenance manuals are required is within thirty (30) calendar days after completion of contract.
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 percent (5%) of contract amount.

SECTION VI

TECHNICAL SPECIFICATIONS

SECTION VI

TECHNICAL

SPECIFICATIONS

FOR

GENERAL WORKS

PART 1 - TECHNICAL SPECIFICATIONS

GW – GENERAL WORKS

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PART 1 - TECHNICAL SPECIFICATIONS

GW – GENERAL WORKS

GW-1.0 PROJECT HIGHLIGHTS

GW-1.1 General

This section covers the general technical requirements for furnishing all supervision, labor, materials, supplies, tools and equipment in accordance with specifications contained herein and as shown on the accompanying drawings to complete the **REPAIR AND REHABILITATION OF POWERHOUSE, OFFICE BUILDING AND ASSOCIATED STRUCTURES OF MARINAWA DIESEL POWER PLANT.**

The Contractor shall accept full responsibility for its work in the performance qualifications, specifications, documentation, reports, fabrication, corrosion protection, cleaning, shop testing, preparation for shipment, field testing, warranty provisions and compliance with the applicable codes and standards and the requirements of this specification.

The Contractor shall strictly observe the general requirements of this specification in conjunction with the specific requirements specified in the relevant specifications.

GW-1.2 Project Location

The project is located at Barangay Marinawa, Bato, Catanduanes

GW-1.3 Scope of Work

The works and services to be performed under this Contract shall essentially consist of, but not limited to the following:

- a. Mobilization/establishment of Contractor's complete construction camp and other facilities;
- b. Demolition/Dismantling of corroded and dilapidated existing roofing and siding materials;
- c. All Architectural Works
 1. Concrete and Masonry Works, including surface preparation; Ceiling Works including hardware's and accessories; Fenestration Works including accessories and painting works; All carpentry and joinery works.
 2. Supply and installation of pre-fabricated roofing and siding sheets; repainting of gate; and
 3. All other works and services required to complete the project.

d. All Civil Works

1. Moving-in including furnishing, superintendence, construction, operation and maintenance of general construction facilities and moving-out thereof after completion and acceptance;
2. Complete construction of all structural components (i.e. columns, beams, walls, slabs, etc.) including fabrication, installation/erection and pre painting of metal/steel structures;
3. Repair and rehabilitation of gate; and
4. All other works and services including those are not specifically detailed herein but are required to fully complete the project.

e. Electrical Works

1. Supply, Installation and Test of Complete Lighting and Power System.

f. Mechanical Works

1. One (1) Unit of Inverter-Split Type Wall Mounted Air Conditioner of 26,500kJ/hr minimum cooling capacity for Conference Room, complete with controls (infrared remote) and other necessary accessories as described in the technical specification;
2. Six (6) units of Centrifugal Roof Ventilator, 20,000 m³/hr minimum capacity for Powerhouse, complete with its mounting accessories and control; and
3. All other works and services required to complete the project:

GW-1.4 Contract Period

The Contractor shall complete the works as herein specified within One Hundred Eighty (180) calendar days. The contract period is inclusive of twelve (12) unworkable days considered unfavorable for the execution of the works. The total contract duration shall be reckoned from the date of contract effectivity as specified in the **Notice to Proceed**.

GW-1.5 Contractor's Classification

The Contractor must have a valid Philippine Contractors Accreditation Board (PCAB) license of at least **"CATEGORY D – GENERAL BUILDING"** and registration classification of at least **"SMALL B – BUILDING & INDUSTRIAL PLANT"**.

The Contractor must have undertaken similar contracts and/or projects that involving construction of industrial building, warehouse, stadium or storage building.



GW-1.6 Minimum Required Personnel

For the duration of the contract, the Contractor shall have the following minimum required personnel assigned to the project:

a. One (1) Project Engineer

Registered Civil Engineer who had supervised at least a project similar in nature as to the type and cost of the proposed project within the last 10 years. Must have at least 3 years professional experience as Civil Engineer on similar project.

b. One (1) Materials Engineer

Registered Civil Engineer with valid accreditation from the Department of Public Works and Highways (DPWH) as Materials Engineer I.

c. One (1) Safety Officer 2

Construction Safety Officer who has completed at least forty (40) hours of Construction Safety and Health Training (COSH) from Occupational Safety and Health Center (OSHC) or Safety Training Organizations (STOs) accredited by the Department of Labor and Employment (DOLE).

Valid Professional Regulations Commission (PRC) license for professional personnel. Construction Safety and Health Training Certificate from OSHC/STOs accredited by DOLE for the Safety Officer, certificate of accreditation including ID card issued by DPWH Materials Engineer, shall be submitted and included as an attachment in the Standard Form NPCSF-INFR-09 List of Key Personnel Proposed to be Assign to the Contract.

The above key personnel must either be employed by the Bidder or contracted by the Bidder to be employed for the contract to be bid.

GW-1.7 Minimum Required Construction Equipment

The list of construction equipment (owned or leased) shall include the following:

- | | |
|--------------------------------------|----------|
| a. Welding Machine (300 Amp) | - 1 unit |
| b. Bar cutter (25 mm Φ capable) | - 1 unit |
| c. Concrete Mixer (1-bagger) | - 1 unit |
| d. Cargo Truck | - 1 unit |
| e. Service vehicle | - 1 unit |

GW-2.0 GENERAL REQUIREMENTS**GW-2.1 Language and System of Measurement**

All documentation relative to this Contract shall be in English. Submitted drawings, literature, etc., which are not in English language will be considered as not submitted at all.

Metric units shall be used in all documents, correspondence, technical schedules and drawings. On drawings or printed pamphlets where other units have been used, the metric equivalent shall be marked in addition.

GW-2.2 Correspondence

Actions or responses to all communications pertaining to this Contract shall be addressed to:

The Manager, Project Management Department
National Power Corporation
BIR Road corner Quezon Avenue,
Diliman, Quezon City

The Contractor shall maintain a record of all correspondences that shall be accessible to NPC for information. The Contractor shall forward its correspondences to NPC in one (1) original.

All correspondences between NPC and the Contractor shall be numbered consecutively.

GW-2.3 Contractor's Organization and Personnel**GW-2.3.1 Organization**

The Contractor shall maintain in the project site offices – for management, control and execution of the Contract – its organization and personnel required in GW (1.6) and as named in its proposal. Any changes in the organization and personnel shall be subject to the approval of NPC.

The Contractor shall maintain an up-to-date project organization chart, which shall be submitted to NPC for approval in the event of any changes.

GW-2.3.2 Personnel/Key Positions

Listed in GW (1.6) above comprises the Contractor's key personnel under this Contract. These key positions in the organization charts of the Contractor pertain to individuals assigned to management/supervisory positions, who at any time during the execution of the work can give decision and recommendation on matters pertaining to the proper and early completion of the Works.

The appointment, transfer and replacement of personnel to all key positions shall be subject to NPC's prior approval.



GW-2.4 Planning and Scheduling**GW-2.4.1 General**

The Contractor shall be responsible for planning and scheduling, progress monitoring and reporting of all works and activities defined under this Contract.

Within fifteen (15) days from the effectivity of the Contract, the Contractor shall submit for NPC approval a detailed work schedule using applicable project management tool(s) for monitoring project activity progress, such as a Critical Path Method (CPM) network or Project Evaluation and Review Technique (PERT) diagram.

The detailed work schedule shall show commencement and completion dates of the project's major activities and milestones.

GW-2.4.2 Format and Presentation

The Contractor shall prepare an activity network with the activities listed in early start order and showing the following:

- (a) Activity code
- (b) Activity description
- (c) Duration in days
- (d) Early start and finish dates
- (e) Late start and finish dates

The Contractor shall also prepare a bar chart identifying all activities which cannot be performed without NPC's approval, and the need dates for NPC's decision thereof.

The Contract Schedule submitted shall meet the completion dates in the Construction Schedule and Schedule of Timings and shall clearly demonstrate the manner in which the various phases of the Works shall be completed.

All activities required for execution of the Works shall be carried out in accordance with the sequence and times and completion dates shown on the work schedule or subsequent revisions as approved by NPC.

GW-2.4.3 Progress Monitoring Principle and System

For the duration of the Contract, the Contractor shall monitor progress of the Works, and shall immediately advise NPC in advance of any anticipated delays in schedule, and the reason therefore.

If the Contractor believes it is necessary or advantageous to change the sequence of events shown on the Contract Schedule, he shall submit a proposed revision accompanied by a full explanation of the reasons and ramification of the change to NPC for approval. No change shall be made in the order in which the Works activities are being performed until NPC's approval for the revised Contract Schedule has been obtained.

Actual progress of each activity of the Works shall be updated and compared with the progress indicated on the approved Contract Schedule at least once every month by the Contractor.

After NPC approves the Contractor's detailed Contract Schedule and planned activity completion dates, the Contractor shall update and analyze the Contract Schedule on a monthly basis and submit updates to NPC on or before the 5th day of the following month.

The Contractor shall not change the sequence of activities shown on the approved Contract Schedule without NPC's prior approval.

GW-2.4.4 Meetings

A. Progress Review Meetings

The Contractor shall schedule and hold monthly progress review meetings with NPC to a mutually agreed agenda that shall be held at the Contractor's site offices or preferred venue.

B. Interface Meetings

The Contractor shall attend interface meetings with NPC's other contractors, if any, as arranged by NPC on a monthly, or as needed, basis. The Contractor may also call for such meetings whenever necessary.

C. Design Review Meetings

The Contractor may request for a design review meeting during the processing stage of seeking the approval of NPC to all design drawings to review, clarify and evaluate the design submitted with reference to the tender, the final design and the Contract Specification. The Contractor shall submit a meeting agenda seven (7) days prior to the meeting.

D. Other Meetings

The Contractor shall arrange discipline meetings and other meetings as necessary with sub-contractors, etc. NPC shall be notified in due time of such arrangements and given opportunity to attend.

The Contractor and NPC shall, as required, hold meetings on specific subjects.

E. Call for Meetings

Except for regular scheduled meetings, calls for meetings and agenda shall be sent out by the party calling the meeting to all requested attendees.

F. Minutes of Meetings

Minutes shall be prepared by the Contractor on an agreed form and be issued for NPC's review the next working day after the meeting has taken place. Minutes shall be approved by NPC before copies are distributed to all attending parties.



Matters requiring action shall be assigned the responsible party with dates for completion of such action. Result of action from previous meetings shall be recorded.

Copies of the minutes of meetings from interface meetings and other meetings, as stated above, shall be sent to NPC in six (6) copies.

GW-2.4.5 Reports

A. Monthly Reports

The Contractor, beginning on the second month after Commencement Date, shall submit to NPC a monthly report related to the Works performed during the preceding month. The Contractor shall present the report with diagrams in printed format.

Cut-off date for the report shall be the last Sunday of each month and, thereupon, the monthly report shall be submitted to NPC not later than 12:00 noon of Wednesday after the cut-off date.

The monthly report shall include, but not limited to, the following items:

- (a) Narrative discussion of major accomplishments and any deviations from time schedule, reasons for such deviations, with recommended actions and potential effects;
- (b) The Contract Detail Schedule showing the status at the cut-off date by means of a front line or equivalent;
- (c) A systematic listing and analysis of all significant time critical activities;
- (d) A summary of HSE activities and reported incidents in own and major sub-contractor's activities;
- (e) Report on interface activities; and
- (f) Narrative report on quality management activities.

B. Project Control Close-out Reports

The Contractor shall submit to NPC a project control close-out report within ten (10) days after the issuance of the Completion Certificate, which shall at least contain the following:

- (a) Final as-is Contract Detail Schedule;
- (b) Final as-is cost report; and
- (c) Final as-is Contract amendment (if any) and Variation Order register, if any.

GW-2.5 Documents to be Prepared by the Contractor

GW-2.5.1 General

All documents, calculations, certifications, manuals, drawings, etc. pertaining to the execution of all works that are to be prepared by the Contractor are listed hereunder. The Contractor's attention is drawn to various sections of the Specification, where detailed contents of the required documentation are specified.



GW-2.5.2 Detailed Drawings, Design and Specifications

Whenever required in the Contract, the Contractor shall submit corresponding detailed fabrication drawings and applicable specifications of structural and/or material assemblies (i.e., support structures of various electrical/mechanical equipment, components, etc.) supported by the corresponding design calculations.

The detailed drawings and specification shall include the following:

- As-stake site development plans/layout and/or general assembly drawings, as may be applicable
- Erection/Installation methodology indicating: 1) the various materials, equipment and tools to be used; 2) system and procedures; and 3) testing and commissioning
- Assembly drawings showing: 1) sectional views; 2) mounting details; 3) function of the assemblies; 4) adjustment and operating ranges; 5) concrete pedestals and foundation including bolts and anchorages; 6) field tolerances; 7) all field joints; and 8) methods of lubrication (if required)
- Detailed manufacturing/fabrication drawings showing: 1) detailed dimensions; 2) tolerances; 3) materials; and 4) nameplate diagrams
- When applicable, engineering instructions and detailed specifications for manufacturing, fabrication, painting (including final color scheme), heat treatment, welding, surface treatment and testing.

GW-2.5.3 Design Calculation and Final Design Data

Upon the completion of the preliminary design, the Contractor shall submit the final design data, analysis and calculations (referred to as designs) – all type written and in book bound form, clearly laid out with all the design criteria and standards indicated, for NPC's review and approval.

GW-2.5.4 Critical Path Network and Time Bar Diagram

Immediately upon effectivity of the Contract, NPC and the Contractor shall re-examine the Critical Path Network and Time Bar Diagram submitted with the Bid and determine by mutual agreement the "Agreed Critical Path Network" and "Agreed Time Bar Diagram. The "Agreed Critical Path Network" shall not be revised or modified without the prior approval of NPC or except where the extension of the contract period is approved in accordance with relevant provisions of the Specifications.

GW-2.5.5 Catalogue Cuts, Illustrations, Etc.

Applicable requirements of this paragraph with reference to drawings shall apply equally to catalogue cuts, illustrations, printed specifications, design data, analysis/calculation, and manufacturer's descriptive literature and instructions for all equipment and/or applicable materials furnished to demonstrate fully of their conformance to the requirements and intent of the Contract Documents.



GW-2.5.6 Final / As-Built Drawings

The Contractor shall furnish NPC a complete set of original copies of all drawings as finally approved and built – together with the electronic or soft copies of the said drawings in CDs, DVDs or other media types, and in format acceptable to NPC.

For all approved drawings with no subsequent revisions, the reproducible copies earlier furnished may be considered part of this set.

NPC will not release the final payment and the performance security until the foregoing conditions have been fulfilled.

GW-2.5.7 Presentation/Submission of Documents

The foregoing drawings and documents shall be submitted to NPC for approval.

In submitting the required documents, the Contractor must take into account the following:

- (a) Metric units shall be used in all documents, correspondence, technical schedules and drawings.
- (b) All drawings and copies thereof shall be submitted in five (5) sets, on A-3 size white paper and with black print unless otherwise agreed upon.
- (c) All drawings and similar documents shall be provided with clear space (approximately 80 mm x 50 mm) above the title block for NPC's stamping of **"Approved"** or **"Approved With Corrections Indicated"** or **"Returned for Correction"** that are defined as follows:
 - **"Approved"** or **"A"** mark authorizes the Contractor to proceed with the Work as indicated
 - **"Approved with Corrections Indicated"** or **"AWCI"** mark authorizes the Contractor to proceed with the Work with due consideration of the notes and/or comments/corrections indicated therein and re-submit the drawings, specifications or designs for subsequent approval
 - **"Returned for Correction"** or **"RFC"** mark requires the Contractor to make the corrections indicated and re-submit the corresponding drawings, specifications or designs for approval before commencing the Work indicated.
- (d) All other documents shall be similarly submitted in five (5) sets and in book bound form (or securely fastened).

Approval of the Contractor's drawings and other technical documents shall not be construed as the Contractor's relief of its obligations to meet all the requirements of this specification.



When revised drawings or drawings which have been returned to the Contractor marked **"Approved with Corrections Indicated"** or **"Returned for Correction"** are re-submitted for approval, the revision block shall be completed with the description and date of revision and the appropriate revision letter or numeral which shall be clearly indicated adjacent to the revision or modification which requires approval.

No revision affecting the design shall be made after a drawing has been **"Approved"** without re-submitting the drawings suitably revised for formal approval.

NPC will complete the review and approval of the Contractor's drawings within twenty (20) calendar days from the receipt of the respective documents at NPC's office mandated to act on those submittals. If within the same period, the Contractor has not received any response from NPC to that regard, the Contractor may proceed with the design and manufacture of equipment, materials or assemblies as if the drawings have been approved. The Contractor, however, is referred to the provision stated above regarding NPC approval of Contractor's drawings.

GW-3.0 MATERIALS AND EQUIPMENT

GW-3.1 General

All materials to be furnished by the Contractor shall be new and unused, free from defects and imperfections and best suited for its intended purpose. All materials shall comply with the latest revisions or editions of the specified standards or material specifications.

The equipment and/or materials to be furnished under this specification shall be essentially the current standard products of the respective manufacturer regularly engaged in the production of such equipment and/or materials. It shall be designed and manufactured for maximum safety and reliability in accordance with quality specifications.

Original brochures, catalogs and other related technical data sheets of materials and equipment to be furnished by the Contractor under this contract shall be submitted in prescribed form during the project implementation for NPC's review and approval prior to its fabrication and/or procurement.

Certified mill test reports, as required in the relevant sections of this specification and the governing codes and standards, shall be furnished by the Contractor for NPC's record. Copies of each mill test report shall be submitted to NPC prior to procurement/fabrication of materials under consideration.

GW-3.2 Codes and Standards

All materials, equipment, fabrication, construction, installation, inspection and testing furnished shall conform to the latest specifications and provisions of engineering societies or other internationally accepted standards listed hereunder:



ACI	-	American Concrete Institute
AISC	-	American Institute of Steel Construction
ANSI	-	American National Standard Institute
API	-	American Petroleum Institute
ASME	-	American Society of Mechanical Engineers
ASNT	-	American Society of Non-Destructive Testing
ASTM	-	American Society of Testing Materials
AWS	-	American Welding Society
NPFA	-	National Fire Protection Association
OSHA	-	Occupational Safety Health Act of 1970
SSPC	-	Steel Structures Painting Council

Other standards not mentioned above may be accepted provided that they ensure equal or higher quality; provided; further, that they meet the requirements of existing laws and regulations of the Government of the Republic of the Philippines.

In the event of any conflict among the above listed or other applicable codes and this Specification, Appendices and Attachments, the Contractor shall refer the conflict to NPC for written resolution. Otherwise, the responsibility shall be on the Contractor to show the suitability of any alternative standards he may wish to use without NPC approval.

In addition to the above codes and standards, the Contractor shall comply with all applicable state and local laws and regulations. The latest edition of each standard shall mean the latest edition available at the date of contract signing.

Other internationally recognized national standards may be accepted, if in the opinion of NPC, such will guarantee a quality not inferior to that guaranteed by the above standards. The list of these alternative standards which the Contractor proposes to adopt must be attached to his Bid for acceptance. In every case, the Contractor must list fully the standards they will conform to for this Contract.

All units, dimensions and calculations shall be in metric system.

GW-3.3 Test of Materials

All materials, parts and/or assemblies, to be used in the Works shall be tested conforming to the specifications and provisions of the approved and applicable standards for testing of materials. Results of the test shall be submitted to provide the means of determining compliance with the applicable specifications. All test or trials shall be made in the presence of NPC or his duly authorized representative unless NPC waived in writing its right to witness such test.

GW-3.4 Tropical Serviceability

GW-3.4.1 General

In choosing materials and their finishes, due regard shall be given to the humid tropical conditions and environment under which the equipment is to work, and the structures are to be built. Some relaxation of the following provisions may be permitted where equipment is hermetically sealed, but it



is preferred that tropical grade materials should be used wherever possible.

GW-3.4.2 Metals

Iron and steel, in general, are to be galvanized or painted, as appropriate or specified. Small iron and steel plate (other than SUS 316 stainless steel) of all instruments and devices, the metal parts or mechanisms are to be treated in an approved manner to prevent corrosion. Other components which are laminated, or which cannot be rust proofed, shall have all the expected parts thoroughly cleaned and heavily enameled, lacquered or compounded.

GW-3.5 Workmanship

Workmanship shall be of first-class quality and in accordance with the best modern engineering practice for construction of all civil works structures and the manufacture, assembly, test and commissioning of equipment and other components, notwithstanding any omissions from the specifications and drawings. To ensure quality workmanship, only technicians and competent workers, skilled in their respective trades, shall be employed.

GW-4.0 DESIGN AND CONSTRUCTION CONDITIONS

GW-4.1 Acknowledgement to Site Conditions

It shall be the responsibility of the Contractor to conduct site inspection to determine the nature, location and extent of the works, the physical site conditions, and the availability/sources of materials and facilities needed to undertake the Work. The Contractor shall thoroughly investigate and familiarize himself with all the conditions prevailing at the site, assessment of existing facilities/installations that may be affected by the works under this contract, the surrounding areas, means of communication and transportation, and all other factors that could potentially hamper the smooth execution of the works under the contract.

Any and/or all expenses arising from the lack of knowledge, familiarity or understanding of the existing site conditions shall be the responsibility of the Contractor and no additional payment to that regard shall be made by NPC.

GW-4.2 Site Conditions

The conditions enumerated below generally apply to the site under consideration in this contract, unless otherwise specifically indicated in relevant section(s) in the technical specification.

Elevation above sea level	: 0 to 500 m
Ambient temperature	: 25 – 40°C
Barometric pressure	: 760 mm Hg
% Relative humidity	: up to 100%
Design for seismic loads	: Seismic zone factor 0.4
Maximum wind velocity	: 270 km/hr



The prevailing atmospheric condition at site is generally warm and humid.

GW-4.3 Earthquake and Wind Design Requirements

The structures and equipment may be subjected to both horizontal and vertical seismically induced acceleration of 0.40 g or more, depending on:

- a) Natural period and mode of vibration;
- b) Damping (inherent or specifically provided);
- c) Manner of failure (ductile or brittle); and
- d) Location (at ground level or at a higher level).

The structures and equipment required under this contract shall meet the seismic design requirement for earthquake conditions.

It is evident from the design response spectra that the degree of response varies markedly with the period of vibration. It is essential, therefore, that all structures and equipment which has modes of vibration or components with a natural period longer than 0.1 seconds be identified.

Provision shall be made for seismic movement by providing seismic movement joints between components that are interconnected and may have different vibratory characteristics. These joints shall be capable of withstanding the sum of the maximum deflection of each component resulting from a design earthquake.

The structures and equipment under this contract shall meet the requirements for a basic wind speed of not less than 270 km/hr gust, unless otherwise specifically indicated in relevant sections of the specifications.

The wind load shall be based on latest edition of NSCP.

GW-4.4 Sound Control

The Contractor shall ensure that the sound levels of equipment covered by this specification, including those equipment and tools to be used during the performance of his works are within the permissible limits for personnel as defined in DOLE's Occupational Safety & Health Standards for Noise and contractual requirements for overall plant noise levels.

If the Contractor expects the maximum sound level of his equipment to exceed 90 dBA at a distance of 1 meter, Contractor shall use acoustical treatment features to achieve the sound control design objectives.

GW-5.0 DRAWINGS

GW-5.1 Drawings Contained in the Tender Document

All drawings referred to in this section shall be the Bid Drawings attached to the Tender Document unless specifically stated otherwise.

Discrepancies between the drawings and actual field conditions, or between drawings and specifications, shall be immediately brought to the



attention of NPC for proper resolution. All works with apparent discrepancies shall not be started without NPC's formal approval.

Anything mentioned in these specifications and not shown on the drawings or shown in the drawings but not mentioned in the specifications but are obviously necessary to complete the works shall be considered and included as if they are both mentioned and shown.

Drawings and the specifications are complimentary to each other and what is called for in one shall be as binding as if called for both.

Bid drawings may be used for planning the work but shall not be used for construction purposes or for furnishing materials, unless authorized or approved by NPC. Bid Drawings, which show the work to be done as definitely and in as much detail as possible, may be used as guide by the Contractor to proceed in the performance of his work.

Drawings which require changes or adjustments to suit with the actual site conditions shall be prepared/submitted by the Contractor for NPC's review and approval.

GW-5.2 Contractor/Manufacturer Drawings

GW-5.2.1 General

Prior to the procurement of all materials, equipment and auxiliaries to be furnished under this contract, the Contractor shall submit for NPC's review, approval, and/or reference, five (5) copies of prints of detailed drawings (i.e. fabrication/assembly drawings of applicable civil structures, outline/arrangement drawings of equipment and its auxiliaries, wiring diagrams, etc.), and/or brochures. NPC shall review, comment or note corrections to be made and return two (2) copies to the Contractor within twenty (20) calendar days from receipt of the drawings and other required documents at appropriate NPC office mandated to act on those submittals. If corrections are required, the Contractor shall make all necessary corrections and re-submit the corrected ones within fourteen (14) calendar days for NPC's review and approval.

Drawings and/or brochures for approval shall be addressed to:

The Manager, Design and Development Department
National Power Corporation
BIR Road corner Quezon Avenue,
Diliman, Quezon City 1100

Approvals by NPC shall in no way relieve the Contractor from entire responsibility for the engineering, design, workmanship, material and all other liabilities under the Contract.

NPC reserves the right to reproduce any drawings or prints received from the Contractor as may be necessary regardless of any notice or marks appearing on the drawings or the prints prohibiting such action. All drawings shall preferably be in computer-aided design (CAD) format. All other computer-generated documents shall be compatible to Microsoft Office.



Prior to its submission, the Contractor shall first submit a list of drawings he proposes to submit for NPC's approval. Only selected drawings in the list, or any drawings as NPC deemed necessary, shall be submitted for approval. The sequence of submission shall be such that information is available for checking each drawing when it is received.

Construction of any particular structure or portion thereof prior to the approval of pertinent drawings shall be at the Contractor's risk; whom shall be responsible for the undue cost arising from subsequent correction to the work already done but needs to be rectified to conform to the revised and approved drawings.

Should an error be found in the approved Contractor's drawings during construction/erection, the correction, including any field change considered necessary, shall be noted on the drawings and re-submitted for approval.

All data and information to be submitted shall be in the English language and all drawings shall be drawn using the metric system as unit of measurement.

All approved drawings shall form part of the Contract.

All drawings submitted by the Contractor or by any Sub-Contractor shall contain (in the lower right-hand corner), in addition to the Contractor's name, the date, drawing scale, drawing title and number, and contract number as given in the Specification.

NPC Standard Specifications for Title Blocks shall be provided to the Contractor during the contract implementation.

GW-5.2.2 As-Built Drawings

The Contractor shall provide and keep up-to-date "As-Built" drawings of all structures constructed. These drawings shall show all changes or revisions from the original drawings, including locations of embedded piping and other concealed items of Works.

The Contractor shall furnish prints of these drawings, which shall be kept in the Contractor's field office for use only as a record set. At the end of every month, all entries, changes or revisions made in the drawings by the Contractor shall be checked and approved by NPC.

The complete, duly checked and approved "As-Built" drawings shall be submitted by the Contractor within thirty (30) calendar days from the completion of the contract or prior to the issuance of the certificate of completion, on four (4) prints and one (1) set of write-once recordable CD's. Such CD's shall be suitable for CD ROMWRITE drive of computer system.

Drawings and schedules shall be preferably submitted in standard A3 size. No separate payment will be made for furnishing of "As Built" drawings. Cost thereof shall be included in the various pay items in the Bill of Quantities.



GW-5.2.3 Processing of Drawings

All drawings to be submitted by the Contractor for NPC's review and approval shall be on A3 size folded to A4 unless mutually agreed otherwise during the implementation stage.

NPC shall review, comment or note corrections to be made and return two (2) copies to the Contractor within twenty (20) calendar days after receipt of the drawings/documents by NPC official(s) authorized to process such documents. If corrections are required, the Contractor shall make all the necessary corrections and re-submit the same within fourteen (14) calendar days for NPC's review and approval.

Five (5) prints with dark lines on a white background shall be furnished to NPC for each drawing submitted for approval. Two (2) copies will be returned to the Contractor either marked "Approved", "Approved with Corrections Indicated (AWCI)", or "Returned for Corrections (RFC)" as defined in GW-2.5.7 (d) above. When prints of drawings are marked AWCI or RFC, the Contractor shall revise/finalize these drawings and re-submit the same in five (5) copies each for final approval. Every revision shall be shown by number, date and subject in a revision block.

If minor revisions are made after a drawing has been approved, the Contractor shall furnish two (2) additional prints, subsequent to each revision. No major revision affecting the design shall be made after a drawing has been marked "Approved" without re-submitting new drawings thereof for re-processing and approval of such revision.

GW-5.2.4 Documents for NPC's Records

The Contractor shall furnish five (5) copies of the following documents for NPC's records:

- a) Material Data, Material Certifications and Test Results/Reports required by governing Codes and Standards; and
- b) Factory Test/Site Test (Performance) Results

GW-6.0 INSPECTION AND TESTS**GW-6.1 General**

The Contractor shall perform at his own expense all tests required to ensure adequacy of material, workmanship and conformance of materials/equipment to the requirements of the specifications and standards.

The Contractor shall submit to NPC for approval, a complete test program for all his supplied materials/equipment and workmanship covered by the contract. Likewise, five (5) copies of test procedures shall be submitted for approval at least forty-five (45) days prior to the conduct of actual test of equipment.

NPC and/or his duly authorized representatives shall witness all applicable tests detailed in the relevant sections. NPC shall be notified by the



Contractor thirty (30) days in advance of all test programs and schedule to be conducted requiring the presence of NPC.

NPC shall still be notified in advance of tests although not requiring the presence of NPC. In such case, the Contractor shall then proceed with the tests and shall submit test reports in five (5) copies to NPC. NPC's acceptance of the work by waiving the inspection of tests and receipt of the Contractor's Certified Test Reports and Inspection and Testing Certificate shall in no way relieve the Contractor of his responsibility in accordance with the requirement of the Specifications.

For inspected or tested goods that fail to conform with the Specification, the Contractor shall either replace or make any alterations necessary to meet the requirements of the Specifications at no costs to NPC.

The Contractor shall provide the required consumables, if any, to be used during the test, unless otherwise specified in the relevant sections of the technical specifications.

During the test and upon written request of the Contractor, NPC may provide personnel to assist the Contractor in the performance of the test under the direction of the Contractor.

NPC or its designated representative shall be entitled to attend the tests and/or inspections conducted on the premises of the Contractor or its Subcontractor(s) provided that NPC shall bear all of its own costs and expenses incurred in connection with such attendance including, but not limited to, all traveling and board and lodging expenses. The Contractor, however, shall extend all reasonable facilities and assistance during the conduct of such test and/or inspection on its premises.

GW-6.2 Inspection/Tests at Contractor's Premises

NPC reserves the right to inspect all shop and assembly work associated with the Works, verify quantities consigned to stores and inspect quality control and assurance records as well as shop and purchase order records. When scheduled, and as often as NPC deems appropriate, progress will be monitored with respect to Key Dates in the Contract Schedule and the sequence of events and activities on the Contractor's Detailed Contract Schedule.

The Contractor shall carry out all tests in accordance with the requirements of the specifications and submitted test procedures duly approved by NPC.

Prior to shipment and final inspection, each material/equipment furnished by the Contractor shall be given the manufacturer's standard factory acceptance test and/or as required in the relevant sections of the technical specifications.

The Contractor shall carry out tests, as may be required by the specified Standards and the Quality Control and Assurance Program, as well as the entire test program approved by NPC.

If NPC opted not to witness the Factory Tests, NPC will issue a Certificate of Waiver of Tests Witnessing/Inspection for the equipment and materials.



In such case, the Contractor shall proceed with the Factory Tests in accordance with the requirement of the specification and the manufacturer's test specification as approved by NPC.

Issuance of the Certificate of Waiver of Tests Witnessing/Inspection for equipment or material required to be witnessed by NPC or its authorized representative(s) however, shall in no way relieve the Contractor of his responsibility to conform with the approved test procedures and the requirements of the Specifications.

The factory test record and dispositions, and any other pertinent supporting data and documents shall form part of a test report to be submitted in accordance with the specification.

GW-6.3 Tests Failures

If any equipment or materials supplied by the Contractor fails to pass any test, the Contractor shall make the necessary corrections or alterations for defects or order equipment/component replacement, as maybe appropriate. Any and all expenses due to additional tests or re-tests made on that regard, i.e. failure to meet the acceptance criteria and other requirements of the specification, shall be borne by the Contractor.

GW-6.4 Test Reports/Certificates

Five (5) certified copies of the reports of all tests and other manufacturer standard tests shall be furnished to NPC within a maximum of fifteen (15) days following the completion of the tests.

Test certificates shall include, in addition to the test results, the following information:

- a) Name/Title of Project and Specs No.;
- b) Material/Equipment data; and
- c) NPC's tag number; and/or equipment serial number.

The Contractor shall bear the cost of furnishing these records and reports.

GW-7.0 QUALITY ASSURANCE REQUIREMENTS

GW-7.1 General

The Contractor shall have a well-organized Quality Management System that is relevant to the Works covered under the contract to ensure that items and services, including subcontracted items and services, will comply with this specification.

Within thirty (30) days of the Effective Date of Contract, the Contractor shall submit five (5) copies of his complete quality control and assurance procedures, and manuals for review by NPC. The manual shall include pro-forma checklists for all requirements of the Contractor's quality control and assurance program and those called for in this Specification.

GW-7.2 Quality Assurance Program

The Contractor shall, for all work covered by the Contract:

- (a) Establish procedures for adequate planning and resourcing of all quality related activities including the preparation of quality plans;
- (b) Establish measures for the identification and control of items through all stages of the Contract. This shall include measures to maintain traceability as identified in agreed quality plans;
- (c) Arrange for the protection of the quality of the product and/or services to include delivery to the specified destination and/or performance of the required services, respectively; and
- (d) Control their measuring and test equipment in accordance with the established procedures for measurements and calibration systems and ensure that such equipment that may be used by subcontractors to verify work is similarly controlled.

Where any site installation and/or test and commissioning work is involved, the Contractor shall prepare contract-specific quality assurance procedures in agreement with NPC prior to commencement of such works.

The Contractor shall ensure that all computer systems and software to be utilized on the project is qualified for the application under consideration and such qualification is documented.

GW-7.3 Quality Plan

The Contractor shall establish and implement quality plans detailing the specific activities, design reviews, operations, control procedures, inspections, testing, approvals and certification requirements as applicable. All procedures, which support the quality plan shall be referenced and distributed to NPC together with the quality plan. Quality plans shall be submitted to NPC for review and approval.

GW-7.4 Records

The Contractor shall generate records as required by the quality assurance system and quality plans. The Contractor shall make available its records including audit reports for NPC's inspection.

All records shall be concisely compiled, indexed and cross-referenced to the project contract number and the relevant subcontract numbers. They shall be clearly identifiable to the individual parts and assemblies to which they refer.

All records generated during the course of the Contract, including those generated as evidence of effective implementation of the quality assurance program of the Contractor and his subcontractors, shall be retained by the Contractor for a minimum period of five (5) years from the date of contract completion. These records shall be made available to NPC on request during the retention period.



GW-7.5 Reporting and Corrective Action

The Contractor's quality assurance program shall provide established procedures for prompt detection and correction of all conditions adversely affecting quality, including failures, malfunctions, incidents, trends, deficiencies, deviations, non-conformances, and defective materials.

GW-8.0 CERTIFICATE OF COMPLETION AND ACCEPTANCE

When all the works and services have been satisfactorily completed as required in the Contract, the Contractor may give notice to this effect to NPC. Such notice shall be deemed to be the basis for NPC to conduct final joint inspection. Certificate of Completion shall be issued within fifteen (15) days after all works have been inspected and found in conformance to the specifications and contract requirements.

The Defects Liability Period of one (1) year for the completed Works shall commence on the date of issue of the Certificate of Completion. During this period, the Contractor shall undertake the repair works, at his own expense, of any damage to the infrastructure on account of the use of materials of inferior quality, within ninety (90) days from the time NPC has issued an order to undertake repair. In case of failure or refusal to comply with this mandate, NPC shall undertake such repair works and shall be entitled to full reimbursement of expenses incurred therein upon demand.

One (1) year after the issuance of Certificate of Completion, provided that there are no defects found and/or pending repair works, NPC shall issue the Certificate of Final Acceptance for the completed Works. Project warranty period shall start upon issuance of final acceptance.

GW-9.0 GUARANTEE

The Contractor shall guarantee that he will repair, and/or replace, at his own expense, equipment and materials against defect in design, materials and workmanship for a period of twelve (12) months after the issuance of the Certificate of Final Acceptance. The Contractor guarantees that when the equipment and/or material are placed in operation and/or use, it will perform in the manner as set forth in the Contract.

The Contractor also guarantees that structural defects/failures shall comply with the provision stipulated in GCC 12.5.



SECTION VI

TECHNICAL

SPECIFICATIONS

FOR

ARCHITECTURAL

WORKS

SECTION VI – TECHNICAL SPECIFICATIONS

AW – ARCHITECTURAL WORK

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TECHNICAL SPECIFICATION

AW- ARCHITECTURAL WORKS

AW-1.0 GENERAL ARCHITECTURAL REQUIREMENTS

AW-1.1 General

The work to be done under this section shall include the furnishing of all labor, materials, equipment, tools, storage and stockyards of the pertinent materials and structural components and other incidentals for all architectural works enumerated hereunder, as shown on the accompanying drawings or as otherwise directed.

The work shall be performed and completed with high quality workmanship, in accordance with generally accepted modern practice in carpentry fenestrations, tinsmithing, plumbing, painting, landscaping and masonry work, etc. notwithstanding any omission from these Specifications or drawings.

Materials and structural parts that the Contractor shall supply and install and which will be incorporated in the structure shall be new and unused. They shall be suitable for their intended purpose and appropriately matched to each other complying with all applicable regulations, quality and dimensions standards. Defective work is not acceptable.

AW-1.2 Submission of Samples

At least one (1) month before the start of any installation or application of materials, the Contractor shall submit samples of materials for all sections for evaluation and approval. No work shall be done until after samples are approved by the NPC Representative in writing. All work must strictly conform to approved samples as to quality, texture, color and finish.

Failure of the Contractor to comply with the preceding stipulation shall not entitle them of any extension of time nor any claim whatsoever for any delay in the work after rectification due to disapproval of work.

To avoid unnecessary delay, it is suggested that the orders and/or purchase of imported or local materials shall be made within sufficient period in order that adequate supply is available at any time when needed.

AW-1.3 Substitution of Materials

The Contractor shall submit a written request for substitution of materials in lieu of those specified when deemed very necessary and urgent. Such request shall indicate the reasons for substitution. No substitute material shall be used without written authorization from the NPC Representative.

In case of approved substitution of an inferior kind of material, a reduction in the contract price equal to the difference in cost of the two kinds of materials shall be made. Market prices at the provincial capital or at a commercial

center agreed upon by the NPC Representative and the Contractor on the date upon which authority for substitution is granted shall be the basis of said price reduction. Price differentials shall be determined and agreed upon immediately by both parties and incorporated in the approved letter of substitution.

The Contractor shall submit written request for substitution at least one (1) month before such materials are actually needed. Such request shall be accompanied by samples to be substituted and corresponding certification.

No price increase will be allowed for a better kind of material.

AW-1.4 Certification of Materials

The Contractor shall submit to the NPC Representative signed certificates from manufacturer or sole distributor of equipment and materials to be furnished and installed by the Contractor, certifying as to the kind, quality, rated capacity, quantity, performance and other descriptions of the equipment and materials delivered under a receipt number and date. No equipment or materials shall be erected, installed or applied such as electrical fixtures and accessories, concrete reinforcing steel, cement, G.I. and C.I. pipes, valves and fittings, plumbing and sanitary fixtures, building materials and finishes, paint and waterproofing, etc., without the required certificates.

AW-1.5 Other works which even if not specially mentioned in the Section and Bill of Quantities shall be included:

- The measurements for the execution and payment of the Works, including provisions of the measuring equipment and the engagement of labor
- Connecting up of water, gas and electricity from the mains of the site indicated by the NPC Representative to the points of use
- Provision of small equipment and tools
- Safeguarding the Works against surface water, which shall normally be reckoned with, and its possible necessary removal
- Protecting the Works from heat, wind and rain
- Protection and safety measures required
- Protecting the executed works and the items handed over the execution of same from damage and theft up to the time of acceptance
- Supplying of the operational materials
- Supplying of consumable stores
- Supplying of fitting dowels
- Supplying of simple type pipe covering, e.g., in the shape of pipe sheathings with corrugated cardboard and the like
- Supplying and fitting of pipe fastening elements, e.g., pipe clips, hangers, etc.
- Installing and dismantling as well as providing all framework and scaffolds

- Making blackouts on concrete
- Chemical preservation of timber
- Instructing the operating and maintenance personnel

NOTE: The above provisions are general for all types of buildings. The Contractor shall be guided accordingly by the applicable provisions in the specifications and what is shown in the drawings for each type.

AW-1.6 Measurement and Payment

Measurement for payment for different items in **Architectural Works** will be based on the areas, lengths, volumes and quantity placed and accepted by the NPC Representative.

Payments for each architectural item will be made at the corresponding contract unit price per square meter, linear meter, cubic meter and number of pieces/sets, for the pertinent items under Architectural Works in the Bill of Quantities.

Payment shall constitute full compensation for all labor, materials, equipment, tools and incidentals necessary for the completion of each work.

AW-2.0 CONCRETE MASONRY WORKS

AW-2.1 General

The work to be done under this section shall include the furnishing of all labor, materials, equipment, tools and other incidentals to complete the work.

Concrete masonry units of the type and thickness indicated shall be provided, and shall be properly coordinated with the work of other trades. The source of supply for material which will affect the appearance of the finished work shall not be changed after the work has started.

Masonry units shall be handled with care to prevent chipping and breakage. Storage piles shall be so located as to avoid being damaged by construction operations and traffic. Cement and lime shall be stored off the ground under watertight cover until ready for use. Damaged materials shall be rejected.

AW-2.2 Materials

Concrete Hollow Blocks shall be of standard manufacture, machine-vibrated, fine and even textured and well-defined edges.

Unless otherwise shown on the drawings, concrete hollow blocks to be used shall conform to the requirements of ASTM Specification C-129-39 Minimum Compressive Strength of not less than 4.48MPa average of the fine specimens.

Mortar Proportions

- a) Cement mortar for laying concrete hollow blocks shall consist of one (1) part Portland cement, one-fourth (1/4) part lime and three (3) parts sand. Only sufficient water to make a workable mix will be permitted.
 - 1) Masonry grout for filling cells of concrete blocks shall consist of one (1) Portland cement, one-fourth (1/4) part lime, three (3) parts sand to which three (3) pea gravel is added by volume. Mortar materials shall be accurately measured by volume and thoroughly mixed until evenly distributed throughout the batch mechanical mix. The actual mixing time shall not be less than two minutes.
 - 2) Intersecting hollow blocks walls and partitions shall be bonded by overlapping units on alternative course or by the use of 6.3mm (1/4") diameter ties at 610mm (24") O. C. every second course (maximum) anchored in filled cells.
- b) Concrete lintel beams shall extend 305mm (12") beyond both sides of the opening and reinforced with four 12.7mm (1/2") bars placed over and below window openings.
 - 1) Concrete studs, reinforced with one 12.7mm (1/2") diameter bar, shall be placed at both sides of all window and door openings.
 - 2) All horizontal reinforcement shall be tied to vertical reinforcement.
 - 3) Reinforcement shall be as specified in Section "Structural Steel".

Cement shall be Portland cement of approved brand conforming to ASTM Specifications C150, Type I.

Lime shall be made with pulverized and quicklime or with hydrated lime.
Sand shall be clean, washed and free from deleterious substances.
Water for mixing shall be clean and potable.

AW-2.3 Installation

Laying of all masonry units shall be plumbed, leveled and accurately spaced. All units shall be wetted before laying. The block should be laid on full mortar bedding and in such a way that no cracks are formed between the blocks and the mortar at the time the blocks are placed. All joints should be filled with mortar at the time it is laid. Any horizontal and vertical CHB wall reinforcements shall be anchored to concrete works by means of 10mm (3/8") by 609mm (24") long dowels. Embedding of anchor bolts, expansion shields, conduits, etc. shall be done as the erection progresses.

Cutting and patching of masonry required to accommodate the work of other trades shall be performed by masonry mechanics.

Finishing of all hollow block wall surfaces to be applied with cement plaster will be cleaned and evenly wet slashed with a wash of neat cement and sand followed by 1:2 cement mortar mix 10mm (3/8") thick which shall be applied with a wooden float.

AW-2.4 Concrete Lintel

Unless otherwise indicated, provide concrete lintels over all openings in concrete unit masonry walls. Lintels shall be cast-in-place and reinforced with longitudinal bars at the bottom, and of sizes as indicated on the plans. Concrete works shall conform to Concrete Works of these Specifications.

AW-2.5 Testing of CHB

Test samples from every 500 units shall be taken at random from the CHB to be used before installation. The testing shall be performed by a laboratory approved by the NPC Representative and the cost thereof shall be charged to the account of the Contractor. Concrete hollow blocks represented by such samples, failing to meet the requirements under the latest edition ASTM 6129-70 shall be rejected.

AW-2.6 Measurement and Payment

Measurement and payment for **Concrete Hollow Blocks** including its reinforcing bars will be based on the area in place and accepted by the NPC Representative.

Payment will be made at the corresponding contract unit price per square meter for the pertinent items under Architectural Works in the Bill of Quantities.

Payment shall constitute full compensation for all labor, materials, equipment, tools and incidentals necessary for the completion of this work.

AW-3.0 PLASTERED PLAIN CEMENT FINISH

AW-3.1 General

The work to be done under this section includes furnishing of all labor, materials, equipment and other facilities and the satisfactory performance of all work necessary to complete all cement plaster finish.

Plaster mixture is applied in layers to masonry and reinforced concrete, surface to interior or exterior walls and ceilings.

AW-3.2 Materials

- a) Portland cement conforming to the latest edition of ASTM Standards C-150
- b) Lime - Slaked quicklime or hydrated lime to make lime putty
- c) Sand - Natural sand, white or light grey, washed and cleaned, strong and free from injurious amount of dust and flaky particles.
- d) Water - Clean and fresh contains no salt, potable and free from sulfur oil and other impurities that may cause discoloration of the finish.

Accessories for plaster work, includes nails, picture, moulds, casings, window stools, bases, etc.

AW-3.3 Application

The total thickness of masonry and plaster shall be 15mm (5/8"). For a three-coat plastering, the scratch coat and brown coat shall be at least 6.3mm (1/4") thick and the hard finish 3.2mm (1/8") thick with a minimum thickness of 1.6mm (1/16") at any point. For a two-coat work the base shall be 12.7mm (1/2") thick and the hard finish the same as for a three-coat work.

The lath for plastering shall be leveled, plumb and well secured to the backing material. The leveling elements installed would include grounds and screeds. For walls, a screed shall be installed at the base of the wall with its top about 102mm (4") above finish floor. The screed is run horizontally, leveled and set at the exact thickness of finished plaster. Around all openings and the intersection with the ceiling grounds are installed.

All anchorage for cabinets, furniture, stair, handrails, electrical outlets, etc., should be installed before plastering is started.

All internal corners should be reinforced by lapping wire lath. Mixture for various coats should be checked to see that proportions are correct.

Installation. For hollow wood doors and frame, uniform application regardless of function completely reversible for R.H. or L.H. doors.

NOTE: All cement plaster finish shall be painted.

AW-3.4 Measurement and Payment

The measurement for payment for all **Plaster Plain Cement Finish** will be based on the area applied and accepted by the NPC Representative.

Payment will be made at the corresponding contract unit price per square meter for the pertinent item under architectural works in the Bill of Quantities. Payment shall constitute full compensation for all labor, material including metal lath, equipment, tools and incidentals necessary for the completion of this work.

AW-4.0 FIBER CEMENT CEILING BOARD**AW-4.1 General**

Consist of furnishing of all, materials and other facilities for the satisfactory of all work necessary to complete the fiber cement ceiling board.

AW-4.2 Materials

Thickness of Fiber cement ceiling board shall be as indicated on the drawings, rotary cut. Sheets shall be riveted to the metal framing/joist at 150mm (6") on center.

AW-4.3 Sample

Samples must be submitted to the Contracting Officer for approval as to quality.

AW-4.4 Metal Framing

Metal furring shall be 0.5mm thick, 19mm x 25mm x 5mm spaced at 400mm O.C.B.W. with 0.5mm thick wall angle and 0.6mm thick carrying channel, including hardware's and accessories or as indicated on the drawings.

AW-4.5 Miscellaneous

Fasteners shall be rust resistance, common riveters of local manufacturer. Glue shall be resorcinol formaldehyde synthetic resin.

Putty shall be of the color to match wood finish where exposed and shall be subject to approval of the Contracting Officer.

AW-4.6 Installation

Fiber cement boards shall be fixed by a qualified installer as recommended by the manufacturer.

AW-4.7 Protection

The Contractor shall be held accountable from the damaged materials caused by negligence mishandling.

AW-4.8 Measurement and Payment

Measurement for payment for **Fiber Cement Ceiling Board** will be based on the area installed and accepted by the NPC Representative.

Payment will be made at the corresponding contract until price per square meter for the pertinent item under Architectural Works in the Bid Schedule.

Payment shall constitute for the labor, materials, equipment, tools and incidentals necessary for the completion of the work.

AW-5.0 SUSPENSION SYSTEM**AW-5.1 General**

The Contractor shall furnish all materials, labor and equipment necessary to install complete suspension system for plaster ceiling, acoustic board, perimeter for light diffuser and necessary anchorage.

The Contractor shall submit to the NPC Representative for approval, samples and shop drawings illustrating fully the construction and methods of installation. Work shall be performed only upon written approval of the samples and drawings by the NPC Representative.

AW-5.2 Materials

Components shall be manufactured from prime quality hot-dipped galvanized steel according to BS 2989 and JIS G3302 Standards with Z18 zero spangle zinc coating (180/m²). The exposed flange is capped with pre-coated metal strip with polyester coating of 20-25 microns dry film thickness.

Main (1-1/4" x 1") and intermediate (1") runners for all suspension system, unless otherwise required, shall be galvanized steel Snap-On T-runners, satin silver color. The runner shall be installed 600mm on centers supported at every 1200mm by wire or steel strap hangers. The grid shall be leveled to within 1/500.

AW-5.3 Workmanship

The installation and workmanship shall be in full accordance with manufacturer's specifications and shall be made by workmen experienced in this kind of work. Acoustical tiles shall be clipped to the ceiling suspension system with galvanized spring clips. Tile shall fit closely to adjoining walled beams, columns, pilasters and cut neatly around all openings in the ceiling.

AW-5.4 Measurement and Payment

Measurement for payment for **Suspension System** will be based on the area in place and accepted by the NPC Representative.

Payment will be made at the corresponding contract unit price per square meter for the pertinent items under Architectural Works in the Bill of Quantities.

Payment shall constitute full compensation for all labor, materials, equipment, tools and incidentals necessary for the completion of this work.

AW-6.0 ROOFING AND SIDING SHEETS**AW-6.1 General**

The Contractor shall furnish all labor, materials, and operations including tools, other implements and accessories for the complete installation of roofing sheets wherever indicated in the drawings.

Installation shall be performed by skilled workmen in accordance with the construction and shop drawings and the manufacturer's standard.

Shop drawings and manufacturer's catalogue showing product standards and technical data will be provided by the Contractor to the NPC Representative for approval.

AW-6.2 Materials

Material for roofing shall be weather, rust free and non-flammable. It shall be 2.0 mm thick Metallic Plastic long span rib type roofing sheets. Thickness shall be determined as specified in the drawing that shall range from 1.0mm to 2.5mm thick.

Bent sheets such as flat barge caps, flashing, ridge rolls, capping and moldings that serve as its accessory components shall have the same composition with the roofing and sidings sheet of which minimum thickness shall be 1.5mm.

Gutters likewise shall have the same material composition with thickness of 2.0 mm unless otherwise specified in the drawings.

AW-6.3 Workmanship

Installation of the roofing shall be done by the manufacturer or his authorized installer in strict accordance with the specification of the manufacturer.

AW-6.4 Measurement and Payment

Measurement and payment for **Roofing and Siding Sheet** will be based on the projected area inspected and accepted by the NPC Representative. No measurement & payment will be made on hidden areas covered by side & end overlaps, the cost for these being included in the projected area.

Payment will be made at the corresponding unit price per square meter for pertinent items under Architectural Works in the Bill of Quantities.

AW-7.0 DOWNSPOUTS AND ROOF DRAINS**AW-7.1 Scope of Works**

a) Downspouts

Downspouts shall be 150 mm diameter unplasticised PVC, or as indicated in the drawings complete with fittings and accessories down to the catch basin and water storage tank.

b) Roof Drain

Roof drain shall be of high grade, strong, stainless. Casting shall be free from blowholes, porosity hard spots, excessive shrinkage, cracks, or other injurious defects shall be smooth and well cleaned both inside and outside and all fin sand roughness removed. Roof drains shall conform to the diameter of downspouts. Roof drains shall be provided at the upper end of all downspouts.

AW-7.2 Measurement and Payment

a) Downspouts

Measurement for payment will be based on the length installed and accepted.

b) Roof Drains

Measurement for payment for Roof Drain will be based on the number of set installed and accepted.

Payment shall constitute full compensation for labor, materials, equipment, tools and incidentals necessary for the completion of the work.

AW-8.0 GLASS AND GLAZING**AW-8.1 General**

The work includes the furnishing of all labor and materials required to complete all glass and glazing as shown on the drawings and/or herein specified. Mirrors shall be provided and installed where indicated in plans.

The Contractor is responsible for the correct sizes and grades of glass to be used. Improperly set glass or glasses which does not meet the requirements of its grade and size will not be accepted. Such glass must be replaced to the satisfaction of the NPC Representative.

The size of glass indicated is approximate only and the actual size shall be determined by measuring the frame to receive the glass. Glazing rabbets shall be rigid true, plumb, square, properly primed, clean, dry and dust free, before glazing work is started.

Each piece of glass shall have the manufacturer's label showing the type, thickness and quality of the glass. Putty and glazing compound shall be delivered to the site in unopened containers, plainly labeled with the manufacturer's name and brand.

AW-8.2 Materials

- a) Glass of all windows, doors, transoms shall be of the best quality of its respective kind and free from internal or surface defects. Thickness of glass shall be as mentioned in the plans. For other qualities and thickness refer to recognized standards.
- b) Mirror. Where required on the drawings for various purposes, public spaces, etc., glass to be selected shall be 6.3mm (1/4") thick, polished plate glass with right of rejection. Silver to be deposited evenly on selected quality polished plate and protected with electro-copper backing, shellac, varnish and paint in an approved standard method.

Each mirror shall bear manufacturer's label guaranteeing quality and compliance with specifications guaranteed for ten (10) years to be free from any defects that impair full and complete reflection or that present on unsightly appearance. Upon receipt of notice from NPC Representative, Contractors shall repair and/or replace without cost to the NPC all defective material and workmanship.

All labor and other incidental materials such as glazing compound, shims, glazing clips, securement devices, felt, etc., not specifically referenced above but required to provide a complete satisfactory and approved installation. Prior to setting of any mirror on masonry or plastered wall surfaces, all such surfaces shall be damp-proofed.

Mirror with frames (in toilet rooms) with kinds, quality and finish as specified complete with "theft proof" frames shall be furnished and installed in all toilet rooms as indicated in the drawings. Mirror shall be 6.3mm (1/4") thick with aluminum or stainless steel frame on a 6.3mm (1/4") thick plywood backing. Space behind walls shall be insulated and damp-proofed. Check "flatness of wall plan" prior to setting. Perimeter for frame shall be set closely against wall surface in all cases. Renew plastering or surface back mirrors and report any irregularities to NPC Representative that will prevent mirror frames fitting closely to wall surface.

Note: Guarantee is required for all mirrors.

AW-8.3 Installation

- a) The glass shall be prevented from all contact with metal or any hard or sharp metals by using resilient shims placed at quarter points.

- b) Resilient sealant shall be used.
- c) Use stops in size permitting a “good grip” on the glass.
- d) Glass shall be installed only in openings that are rigid, plumb and square.
- e) Allow sufficient clearance at edges of glass to compensate for some settlement of the building. Clearance shall be 6.3mm (1/4”) from edge to frame and 3.2mm (1/8”) for face.
- f) Marking, banners, posters and other decor shall not be applied directly to glass surface as these could cause thermal stress.
- g) Removal of putty or glazing compound smears from glass shall be performed by the glazing Contractor during the metal work life. Failure to do so may result in damage to the glass.

AW-8.4 Measurement and Payment

No measurement for payment for **Glass and Glazing** of doors and windows, the relevant cost being included in the contract unit price for the pertinent items for Doors and Windows under Architectural Works in the Bill of Quantities.

AW-9.0 GLAZING SEALANT

AW-9.1 General

The work to be done shall consist of furnishing all labor, materials and other facilities for the satisfactory performance of all work necessary to complete all glazing sealant work as shown on the drawings and specified herein.

AW-9.2 Materials

- a) Silicone Rubber should comply with Federal Specifications for silicone building sealant and Federal Specifications for one (1) component building sealant. Packaging shall be supplied at least in fl. oz. (325 ml) cartridges and two (2) gallons (7.5 liters), bulk pails, net weight. The joint width shall not be less than 3.2mm. (1/8”). The joint depths shall allow a sealant depth of 3.2mm (1/8”) to a maximum of 12.7mm. (1/2”). The silicone sealant bead depth shall be less than the joint width which is about 2.1mm.
- b) Masking Tape. Areas adjacent to joint shall be masked to a sure line. Do not allow masking tape to attach clean surface to which the silicone sealant is to be adhere. Tooling shall be completed in one (1) continuous stroke immediately after sealant application and before a skin forms. Masking shall be removed immediately after tooling.

AW-9.3 Method of Application

Sealant shall be applied in a continuous operation. A positive pressure adequate to properly fill and seal the joints width shall be employed. Tool or strike the building sealant with light pressure to spread the material against the back-up material and the joint surfaces such as aluminum (sealant shall be applied above 40 °F). A tool with a concave profile is recommended to keep the building sealant with the joint. The sealant can be applied at outdoor temperature as low as 35 °F provided that surface is clean and dry. Excess sealant shall be cleaned from non-porous surfaces, before curing, before using a commercial solvent. On porous surfaces, excess sealant shall be allowed to cure and then be removed by abrasion or other mechanical means. The sealant shall not be disturbed for at least 48 hours.

AW-9.4 Guarantee

The Contractor shall guarantee the caulking work to be free from defects of materials and workmanship for a period of ten (10 years).

AW-9.5 Measurement and Payment

No measurement for payment will be made for **Glazing Sealant**, the cost of which shall be included in the contract unit price for the pertinent items where Glazing Sealant is required under Architectural Works in the Bill of Quantities.

AW-10.0 WEATHERSTRIPPING**AW-10.1 General**

The work to be done shall consist of furnishing materials tools and equipment and perform labor required to complete all types of weather-stripping for all exterior doors and doors noted on the drawings to be light-proof, soundproof or dust-proof, install weather stripping in accordance with manufacturer's instructions. Fit tightly at corners to maintain continuity around periphery of doors.

AW-10.2 Samples

Sample of strips of weather-stripping elements shall be submitted.

AW-10.3 Materials

- a) Extruded products shall be of aluminium alloy 6063 T5.
- b) Extruded architectural bronze.
- c) Flexible metal products shall be of (zinc, aluminium/bronze/ stainless steel).
- d) Inserts shall be of vinyl and/or felt.

AW-10.4 Fasteners

All extruded weather-stripping and saddles shall be furnished complete with screws, color-matched to the items.

- a) For fastening to wood, screws shall be of aluminium or bronze.
- b) For fastening to metal, screws shall be of self- tapping plated steel.
- c) For exterior applications to metal, stainless steel self-tapping screws, plated to match the items are recommended.

AW-10.5 Installation

Included products shall be installed level, square and in proper alignment and relationship to work of other trades. Attachments shall be by means of appropriate nails, screws, bolts, and/or anchors of corresponding materials.

AW-10.6 Measurement and Payment

No measurement for payment will be made for **Weather-stripping**, the cost of which shall be included in the contract unit price for the pertinent items for Doors and Windows where weather-stripping is required under Architectural Works in the Bill of Quantities.

AW-11.0 JOINERY AND CARPENTRY WORKS**AW-11.1 General**

These regulations shall apply to all parts of work in which joinery (carpentry for permanent features, i.e. excluding formwork or shuttering, wood scaffolding, etc.) will be used.

All services shall comprise labor, equipment and the supply of the appurtenant materials and structural components including off-loading and storage at the site unless otherwise specified.

All materials and structural components to be supplied, erected or installed by the Contractor, and therefore, ultimately incorporated in the structure shall be new and unused unless otherwise specified. They shall be suitable for their intended purpose and appropriately matched to each other.

All materials and structural components covered by standards shall meet the quality and dimensional requirements thereof.

Early enough before the beginning of fabrication, the dimension of non-standardized structural components shall be checked by Contractor on the structure unless it is established, for instance, in the Specifications or by mutual agreement, that such checking can be dispensed with or will be replaced by the statement of specific dimensions, e.g., in drawings explicitly mentioned.

In particular, the Contractor shall verify that such conditions as the following do not exist:

- undue humidity of the structure
- Inadequate painting of the structural components intended to be installed.
- Lack of possibilities for fixing the structural components and sealing them against the respective part of the structure.

Other works which even if not specifically mentioned in the Bill of Quantities or Schedule of Price shall be included in the Contractual Works.

- Protecting the executed Works and the items handed over execution of same from damage and theft up to the time of acceptance.
- Providing small tackle and tools.
- Supplying consumable stores
- Transporting all materials and structural components, from the storing places at the Site to the points of destinations, and return transport if necessary.
- Removal of all contamination (refuse, building, rubbish and the like) arising from or in connection with the Contractor's work.
- Installing and dismantling as well as providing all false work and scaffolds.
- Making holes in masonry and light weight concrete.
- Supplying and fitting dowels.
- Chemical preservation of timber.

Prior to the start of his operations under this item, the Contractor shall verify that all conditions are suitable for the timely and effective carrying out of his work. Where unsuitable conditions are found, they shall be reported in writing to the NPC Representative and under the NPC Representative's direction immediately corrected.

AW-11.2 Quality of Lumber

Lumber indicated and required for various parts of the work shall be of the best grade available. It must be straight, sound, bright, of nature growth, well - seasoned and conditioned to suit the particular purpose for which it is to be used. The material shall be cleanly sawn, square edged, and free from injurious shakes, splits, warps, waness and knots, soft spots and rot, incipient, decay and all other defects or imperfections impairing its strength, durability or appearance. All structural components shall be made so that when properly

treated and used they will not warp or crack under any circumstances including stresses due to temperature humidity that will have to be expected. Their general conditions on lumber when not mentioned in the succeeding particulars are carried and shall apply.

AW-11.3 Fastening

Joints for cabinet work shall be glued aside from nails or other fastening device required. The type and strength of gluing shall suit the site of installation and intended application (of glues) must not cause any discoloration or other damage. Sealing compounds shall be resistant to atmospheric influences, shall not harden, and shall not be aggressive.

All nails on surfaces exposed to view shall have flush heads. They shall be countersunk. The use of nails with notched heads and screw nails in lieu of wood screws shall not be allowed.

All door frames shall be rabbeted and molded. Frames which are in contact with concrete shall be anchored by means of 102 mm (4") common wire nails spaced not more than 204 mm (8") apart the contact surfaces.

Anchors, connectors, fastenings, and any rough hardware necessary for the completion of the work but is not shown or indicated on the drawings and/or specified shall be provided. Such rough hardware shall be of the size and type to suit the conditions encountered. Bolts, nuts, washers, hangers, straps and other rough hardware is embedded in or in contact with exterior wall of concrete masonry or slab or exposed to weather shall be zinc coated unless otherwise specified. Bolts head and nut bearing on wood shall be provided with standard steel washers.

AW-11.4 Wood Preservatives

All lumbers ultimately in contact with the outside air or permanently with particular humid air or connecting to masonry or concrete e.g. windows and doors, including lining and casing, shall before being inserted be treated on all sides with a suitable wood preservative, in the case of lumber sensitive to blue stain, also with a blue stain preventive agent, unless adequately protected in manufacture already, e.g. wood work items.

The Contractor shall in the choice and use of the wood preservative exercise the care required in the handling of poisonous substances. The wood preservative shall also be compatible with the paint and in interior applications the wood preservative shall be colorless.

If the NPC Representative has not specified the wood preservative to be used, the Contractor may make his own choice of a suitable preservative, subject to the NPC Representative's approval. Before leaving the workshop, the lumber components shall receive a coat of paint.

Lumber surfaces in contact with masonry shall be given two (2) brush coats of bituminous paint before installation.

AW-11.5 Materials

Materials for carpentry works shall conform to the following specifications and shall be used whenever indicated in the plans or noted in the Bill of Quantities:

- a) Kinds of Lumber
 - 1) S4S Yacal, Molave Guijo or approved equal
 - i) Door and window jambs, sills and mullions
 - ii) Any lumber in contact with concrete or masonry, such lumber mentioned above shall be treated with wood preservative treating solution.
 - 2) Apitong or approved equal
 - i) Ceiling frames and hangers
 - ii) Wooden frames and shelves, cabinets and closet
 - 3) Tanguile, Red Lauan or approved equal
 - i) Cabinet and closet framing, kiln-dried with moisture content not more than 10% when tested
 - ii) All mouldings, base boards and wood slats.
 - iii) Vertical and horizontal studs for interior partitions
 - iv) All T & G board, fascia boards, louvers shall be kiln-dried with moisture content not more than 10% when tested.
 - v) Door and window sash frames
 - 4) Kiln-dried Narra
 - i) Mouldings and lattice works and base boards.
 - ii) Wood handrails, door panels and frames with moisture content not more than 10% when treated.
 - iii) All structural lumber to be used for truss members, purlins, cleats, wood plates, girder and rafters shall be as indicated in the Civil Design drawings.

AW-11.6 Shop Drawings

Shop drawings with essential dimensions and details for construction may be required by the NPC Representative in connection with carpentry and joinery work which will be submitted for approval before proceeding with the work.

AW-11.7 Measurement and Payment

Measurement for payment for **Carpentry Works** will be based on the unit of measure specified in the bill of quantities install and accepted by the NPC Representative.

Payment will be made at the corresponding contract unit price per unit of measure specified in the bill of quantities for the pertinent items under Architectural Works.

Payment shall constitute full compensation for all labor, materials, equipment, tools and incidentals necessary for the completion of this work.

AW-12.0 WOOD DOORS**AW-12.1 General**

The work to be done under this section include the furnishing of materials tools and equipment and performing labor required to complete flush type hollow core doors and other wood doors as shown on the drawings or as specified.

Doors shall be thoroughly seasoned, kiln-dried wood and pressure preservative treated. Wood doors shall be products of reputable, nationally known manufacturers approved by the NPC Representative.

All doors shall be of the type and size indicated in the drawings and as specified herein. The top and bottom edges of all wood doors shall be given a coat of water resistant coating after cutting and fittings, and prior to installation.

AW-12.2 Samples

Sample shall be submitted showing the corner sections of wood doors and jambs.

AW-12.3 Workmanship

The Contractor shall take special care in the manufacturing and assembly process of joint work. All joint works shall be done in accordance with accepted practices and shall be accurate and clean so as the joined elements fit perfectly together.

AW-12.4 Materials

Flush Type - Hollow Core Plywood shall be of first class quality marine plywood and the color shall be approved by the NPC Representative.

Framing shall be kiln-dried treated Tanguile for exterior framing and kiln-dried Tanguile for exposed edge framing.

Panel Type Tanguile, KD shall be used for panel doors, stiles and rails; grain and color suitable for natural finish.

Jambs shall be S4S Yakal, common to all doors.

AW-12.5 Installation

- a) Each door shall be accurately cut, trimmed and fitted to its frame and hardware.
- b) Allowance shall be given for painter's finish and possible swelling or shrinkage.
- c) Clearance shall not exceed 3.2mm (1/8") at lock and hanging stiles and at top; and, 6.3mm (1/4") at bottom.
- d) All corners shall be rounded to 0.07mm (1/26") radius. Lock and rail edges shall be slightly bevelled.
- e) The screws for hardware shall not be driven, but merely started by driving and then screwed home.
- f) All doors shall operate freely and with all hardware properly adjusted and functioning.
- g) Doors shall be installed complete with finishing hardware, e.g. doorknob with key, hinges, doorstop, etc.

AW-12.6 Measurement and Payment

Measurement and payment for **Wood Doors** will be based on the number of sets installed and accepted by the NPC Representative.

Payment will be made at the corresponding contract unit price per set for the pertinent item under Architectural Works in the Bill of Quantities.

Payment shall constitute full compensation for all labor, materials, equipment, tools and incidentals necessary for the completion of this work.

No measurement of payment for door jambs, payment being included in set.

AW-13.0 FINISHING HARDWARE**AW-13.1 General**

This section includes furnishing and installing all finishing hardware, complete. The schedules in this section are intended to indicate the various hardware's but are not guaranteed as to quantity. The Contractor shall check the schedule and drawings for count and any item similar location elsewhere in the building.

In order to identify and establish each kind of hardware, genuine American, Japanese & European products shall be used.

AW-13.2 Packaging and Marking

Each item of finishing hardware shall be individually packed and delivered in the manufacturer's original container. Each package or box shall be clearly marked with the manufacturer's name, catalogue number and other markings required for easy identification of the hardware.

A packaging list should be furnished to clearly identify the quantity and type of hardware in every box numbered in accordance with this list.

All hardware shall have the required screws, bolts and fastening necessary for installation packed in the same package with hardware. All packages shall be legibly and adequately labeled indicating the part of the work for which it is intended.

AW-13.3 Qualified Supervision

Materials shall be procured from a source of supply approved by the NPC Representative as competent to correctly evaluate the plans, details, and specifications and be prepared at all times to promptly and satisfactorily service the hardware on the job. This supplier must be an established Contractor for builder's hardware who meets all above requirements and who operates an office in this field.

AW-13.4 Material Specification

- a) Butt Hinges shall conform to U.S. Federal Specifications unless otherwise specified.
 - 1) For doors up to 914mm (3' - 0") wide or less, 90mm x 90mm (3-1/2" x 3-1/2") hinges shall be used.
 - 2) For closet doors, use long span hinges.
 - 3) Where the jamb trim projects to such an extent that the width of the leaf of butt hinges will not allow the door (in normal opening) to clear such trim, butt hinges with leaves of sufficient width shall be provided.
 - 4) Finish and Material

- i) Hinges used for doors to receive point shall be Bonderized and prime coating for painting.
 - ii) Hinges used for doors to receive natural finish shall be wrought steel highly finished, polished and plated.
 - iii) Use only non-ferrous material butt hinges for doors exposed to the weather.
- a) Lock-sets shall conform to U.S. Federal Specifications.
 - b) Hardware Selection and Door Control. To obtain satisfaction and maximum services, consideration should be given to all of the following basic factors:
 - i) Proper lock selection. Depends on expected usage (lock, series, function), climatic conditions.
 - ii) Proper installation. The use of right installation tools is recommended.
 - iii) Proper door control. To protect locks and other hardware items, the use of door closers and other control devices is vital under certain conditions.
 - c) Keying and Key. Locks shall be keyed in sets and sub-sets to provide maximum expansion. All sets shall be grand master keyed, and all entrance locks shall be great-master keyed. Designation shall be by the NPC Representative.

Permanent cylinders with construction inserts are to be assembled with all locksets. Change keys are to be packed in cartons marked "packing list". On completion of the job, the NPC Representative will collect all construction keys, remove the construction inserts from the lock cylinders and distribute the lock change keys as directed. Retain Contractor and construction keys for future key system control.

Construction

- a) Mechanism. Wrought steel zinc plated and dischromated with coil compression springs.
- b) Exposed trim and parts. Wrought brass, bronze, aluminium or stainless.

Installation. For hollow wood doors and frame, uniform application regardless of function completely reversible for R.H. or L.H. doors.

Warranty. Locksets are engineered to meet or exceed applicable government and industry standards for strength, durability and performance. They are fully guaranteed against defects in materials for workmanship.

- Door Closers
- Push/Pull Handles
- Door Stops
- Door Catches

AW-13.5 Installation and Hardware

All hardware shall be installed in a neat, crafts manlike manner following the manufacturer's instruction. Fasteners supplied together with the hardware, shall be used to secure the hardware in place. Wood screws set in expansion shields, shall be used for securing hardware to concrete or masonry surfaces. Through-bolts shall be used where specified or necessary for satisfactory installation. After installation, hardware shall be protected from paint, stains, blemishes and damage until acceptance of the work. All hardware shall be properly adjusted and checked out in the presence of the NPC Representative to see that the hinges, locks, bolts and closers operate properly. Any error in cutting or fitting, or any damage to the adjoining work shall be replaced as directed.

AW-13.6 Measurement and Payment

No measurement for payment will be made for **Hardware**, the cost of which shall be included in the contract unit price for the pertinent items where hardware is required under Architectural Works in the Bill of Quantities.

AW-14.0 PAINTING AND VARNISHING**AW-14.1 General**

The work to be executed under this section shall include the furnishing of all materials, labor, tools and ladders, scaffolding and other facilities necessary for the satisfactory performance of all work necessary to complete all painting and finishing of all surfaces throughout the interior and exterior of the building, except as otherwise specified.

The Contractors, providing the labor, materials or both for this project are specifically referred to the General Contract plans, to the General Conditions of the specifications, to all the Sections of the Specifications and to the various other sub-contract documents which may affect the completion of any sub- contract work. In the absence of a complete agreement between sub-contractors, supply dealers or others affected by the construction of this project, the General Contractor shall be held responsible for the co-ordination of all the work.

The Contractor shall examine all sections of this specification and perform all paintings called for therein.

All wood work in ceiling, partitions, handrails, cabinet work, grill work, mouldings and others as specified by the NPC Representative shall be painted/varnished.

AW-14.2 Inspection of Surfaces

Before starting the work, the Contractor shall inspect all surfaces to be painted. If the surfaces cannot be put in proper condition to receive paint by customary cleaning methods or sanding or sparkling, the Contractor shall notify the NPC Representative in writing. The NPC Representative will cause these defects to be remedied. The commencing of the work by the Contractor indicates his acceptance of the surfaces to be painted and assumes responsibility for the rectification of any unsatisfactory finishing, resulting from his negligence.

AW-14.3 Materials

All paint materials shall meet the requirements of the Philippine National Standard Specifications for Paintings.

Paints shall be brought to the Site in tightly closable, convenient, original containers, if nothing to the contrary is stipulated in the Specifications. The containers shall be marked in a durable manner with the following particulars:

- Maker
- Paint and relevant thinner
- Gross and net weights
- Date of supply by the maker's factory

The openings of the containers shall leave enough room for a stirring appliance.

All containers shall be kept tightly closed until the contents are to be used. Immediately prior to use of the contents and before pouring into smaller containers for working purposes, any skin shall be removed and the contents stirred thoroughly, if necessary with a stirring appliance.

Paints, thinners and filling cements which are not required for immediate use shall be protected against the action of frost and heat.

Only thinners supplied by the makers of the paint or those described by them as suitable shall be used for adjusting paints to working consistency. The instructions of the maker shall be followed in this respect.

Paint and filling cements shall be used in accordance with the maker's instructions.

The Contractor shall obtain from the manufacturer and shall submit to the NPC Representative a paint manufacturer's guarantee for the quality of each painting material and that each coat of paint is compatible with previous and subsequent coats.

Paints which do not have to be prepared by mixing several constituents just prior to use shall be brought to the Site in such a state of readiness that they need only be adjusted to brushing or spraying consistency to meet the

relevant working conditions (e.g., temperature), by adding the particular thinners in accordance with the maker's instructions.

With the exceptions of ready-mixed materials in original containers, all mixing shall be done at the job site. No materials are to be reduced or changed except as specified by the Manufacturer of said materials.

The quality of the paints shall be such that they form no solid sediment and at most a slight skin in unopened original containers within 6 months - calculated from the maker's delivery date. A paint which has formed a solid sediment or more than just a slight skin in the unopened original containers by the time of use or which cannot be processed satisfactorily shall not be used. A sediment shall be regarded as solid if it cannot be dispelled quickly and completely by stirring.

The use of white zinc (lithophones) will not be allowed.

A place will be designated by the NPC Representative for the storage of paint materials and tools. Whenever it may be necessary to change the location of this storage place, the Contractor shall promptly move to the newly designated place. The storage space floor shall be adequately protected from damage and from paint. Paint shall be covered at all times, safeguards taken to prevent fire.

AW-14.4 Colors and Samples

All colors shall be subjected to the approval of the NPC Representative. Tinting of matching colors shall be done under the supervision of the NPC Representative. In all cases, a sample shall be applied on the job and the

NPC Representative must give his approval before work is commenced. If required, three panels, 200 mm x 250 mm (8" x 10") of each color and finish shall be prepared in advance, with the NPC Representative. "Of color selected" shall be understood as all coats specified herein.

AW-14.5 Workmanship

All work shall be done by skilled mechanics with high quality workmanship. All paints shall be evenly applied so as to be free from sags, runs, crawls or other defects. All painting materials shall meet the requirements of stress and shall be in accordance with the relevant standards. All coatings shall be of proper consistency and well brushed out so as to show the minimum of brush marks, except varnish and enamel which shall be uniformly flowed on. All brushes shall be clean and in good condition, with heavy brushes preferred. Light brushes shall not be permitted.

Paint shall be thoroughly stirred so as to keep the pigment evenly in suspension when paint is being applied.

No painting shall be done under conditions that are unsuitable for the production of good results. No oil painting shall be done in damp weather.

Application of succeeding coats shall strictly follow the over-coating times specified by the paint manufacturer. If no specific data are available, all coats

shall be thoroughly dry before painting shall be applied. At least twenty-four (24) hours shall be allowed between coats. Exterior painting under damp/wet conditions is not allowed.

Painting coat as specified are intended to cover the surfaces perfectly, if surfaces are not fully covered, further coat shall be applied to attain the desired evenness of the paint application.

All parts of moldings and ornament shall be left clean and true to details. All finish shall be uniform as to sheen, color and texture, except when glazing is required.

AW-14.6 Protection

The Contractor shall protect the work of all other trades against damage or injury by his employees, or by his materials, tools or utensils used in connection with this contract. Any damage done by him shall be repaired at his own expense, without additional compensation beyond the contract price.

The Contractor shall note that some damage to paint-work during shipment, storage, and building-in and particularly during grouting of the steel lining is unavoidable and the application of all protective treatment shall be programmed accordingly. Care shall be taken to remove salt crystal liable to become deposited during the sea transport and/or storage at seaport by thorough washing with clean fresh water. Before any coat of paint is applied, the surface shall be prepared as hereunder described, so that it is clean and free from all deleterious matter and completely dry.

The Contractor shall be responsible for the complete shop and field coats. Shop coats shall be checked for good quality and where necessary, before proceeding with the painting or coating operations at Site, the Contractor shall clean and repair, including smooth trowel, all shop coats which are defective or damaged.

Protect all parts of the building from paint drops by using clean drop cloths and remove all paint inadvertently placed or dropped on exposed surfaces without damage to same. Close various spaces while painting and exclude dust until finish is dry.

Plumbing systems shall not be used to wash paint brushes or containers.

Temporary or permanent welding shall not be permitted on areas where the welding will damage paint or other protective coatings, unless the areas of coatings which would be damaged thereby are accessible for repairing and inspection. Materials which have been painted shall be handled with care and protected as necessary to preserve the coating in good conditions.

AW-14.7 Paint Application

Materials, which are subject to working instructions, shall be treated according to these instructions, unless stipulated differently by the relevant paint manufacturer:

Paint, gloss and coating may be worked manually or by machines, unless a particular execution has been stipulated in the Specifications.

Paint, gloss and coat shall be bond firmly and be of even surface without scars and strips.

The surface shall be smooth, if not otherwise stipulated in the Specifications, such as finely or coarsely granulated.

Any paint, gloss or coating shall be applied without filling to create a uniform surface or, when gloss is being applied, a flowing surface with the required materials according to instruction manuals, of white or light shade, unless otherwise stated in the Specifications.

Top finish shall be high-gloss, unless otherwise stated in the Specifications.

If flat levels are to be formed, the prime coated surfaces shall be completely being covered with suitable undercoat filler ribbed and smoothed.

Primer protective coating shall be applied on woodwork according to manufacturer's instruction. If several coats are requested, the preceding coat shall need to be dried before applying the subsequent one. This does not apply for wet-on-wet techniques.

Drying periods prescribed by the manufacturer shall be observed, for open surfaces, as well as for edges or irregular surfaces. All edges at doors, windows, skirting, sockets, etc., shall be of sharp and straight line.

New concrete and masonry surfaces must be thoroughly naturalized either by brush or spray with a solution of 2 kg. of zinc sulfate to each gallon of water.

Surfaces so treated shall be tested to ascertain that alkalinity is removed; otherwise a second treatment with the same solution shall be applied. Within 24 hours after drying, all crystals on the surface must be brushed off applying the prime coat.

Metal works shall be kept clean and free from corrosion following installation. Abraded surfaces shall be retouched prior to finish painting, using the same type of paint as prime coat. Galvanized metals shall be weathered or pickled with the approved metal primer in accordance with printed instruction of the manufacturer.

Where components parts of steel or aluminum alloys meet, joints shall be sealed so that no moisture can penetrate between the contact surfaces.

Rivet and bolt heads, protruding corners, sharp section edges and places of difficult access shall be pre-treated.

The paint shall be applied in coats which are as uniform as possible.

The first priming coat shall be applied by brush. Further coats shall be applied by brush if nothing to the contrary is stipulated in the Specifications.

Smaller and specially shaped brushes shall be used for rivet and bolt heads, protruding corners, sharp section edges and places of difficult access.

When applying paints by spray-gun, the object to be sprayed shall not be contaminated by water or oil in the compressed air.

In paint systems involving coats, the various coats of paints shall be distinguishable from each other by their shade.

All coats of paint shall be applied only to clean, dry and non-greasy surfaces. In multi-coat paint systems, the coat last applied shall always be sufficient dry, free from any superficial moisture and from dust and dirt before applying the next text coat; only when using the moist oil type of paints may it be necessary for the previous coat to be hard dry.

The Contractor shall inform the NPC Representative in good time before starting to apply the next coat so that the NPC Representative shall have the opportunity of approving the previous coat.

Painting work shall not be carried out at a temperature below +5 °C and above 50 °C. In addition, painting work shall not be carried out on surface affected by the action of rain, fog and moisture or water of condensation; work started on such surfaces may not be continued until the surfaces to be painted are completely dry.

AW-14.8 Painting Systems

All surfaces which are required by the Finish Schedules or specifications to be painted, or otherwise finished, shall be given coats of paints or varnish as specified herein. Individual directions printed on the label of the approved paint and varnish shall be strictly followed. Paint thinner or linseed oil of the same brand as the paint to be thinned shall be used.

All materials, supplies and articles furnished shall be the standard products of superior quality. All constituent materials shall conform to the applicable provisions of the latest edition of ASTM Specifications.

The following list indicates painting materials of special compositions considered suitable for various parts of the works.

Concrete and Plastered Surface

Any concrete, cement plaster exposed to high humidity 3 coats of a highly weather-resistant synthetic resin-based paint. The first coat shall contain from 5% to 20% thinner as the surface requires.

All concrete (walls, foundations, etc.) backfilled with soil or submerged.

- 1 coat of coal-tar epoxy.
- 2 coats of a mineral-filled water resistant coal-tar epoxy.

Concrete, cement plaster, etc. exposed to oil, surface shall be dry, if possible sandblasted, clean and slightly roughened.

- 1 coat with a plastic-modified hydraulic mortar.

- 2 coats of an oil-resistant synthetic resin based paint.

Concrete exposed to Mechanical and Chemical attack.

- 1 coat of colorless 2- pack epoxy based paint; this shall contain from 10% to 20% thinner as the surface requires.
- 2 coats of 2-pack epoxy-based paint.

Concrete flooring exposed to mechanical wear and oil.

- 3 coats of chlorinated rubber-based paint. The first coat shall contain 15% thinner.

Internal concrete, plastered walls exposed to abrasion.

- 3 coats of an oil-free, synthetic resin-based, dust-binding paint.

Concrete flooring subject to minor mechanical wall.

- 2 coats of an oil-free, synthetic resin-based, dust-binding paint.

Internal plastered ceilings and walls.

- 2 coats of a polyvinyl-acetate dispersion type, non-chalking paint. First coat shall contain up to 30% thinner of clean, fresh water as the surface requires.

Wooden Surfaces

a) Exterior Parts –

b) Surface shall be smoothed down with adhesive; if machine sanding is involved, a sanding is involved, a sanding sealer to bind the fibres shall be applied; the surface shall also be dry and free from dust.

- 1 coat of fungicide and bactericide ingredients after first coat.
- 2 coats of synthetic resin-based lacquer with white active pigments.

c) Interior Parts - Application of varnish on wooden interior walls, partitions, T&G ceiling panelling and closets/cabinets.

All materials, supplies and articles furnished shall be the standard products of a known manufacturer approved by the NPC Representative.

- 1) First Coat. Fill open grained wood with natural wood paste fillers, as is, or mixed with oil-wood stain to obtain desired shade. Apply along the grain within 30 minutes. Let dry overnight and sand lightly.

- 2) Second Coat. Apply any one (1) of the colors of oil-wood stain: oak, walnut, marble, and mahogany. Dry overnight and sand lightly.
- 3) Third Coat. Spray required coats of lacquer sanding sealer. Let dry for 30 minutes and sand to smooth.
- 4) Choice of any of the following topcoats:
 - Clear flat lacquer - for standard flat effect.
 - Clear dead flat lacquer - for complete flat lacquer.
 - Super dead flat lacquer - for complete flat lacquer.
 - Clear gloss lacquer - for standard gloss effect.
 - Water white gloss lacquer - for brilliant crystal clear effect.
 - Versatile spar varnish - for glossy thick coating also applicable for exterior wood surfaces.

When spraying under high humid conditions, add up to ten per cent (10%) by volume of lacquer thinner retarder to prevent blushing of lacquer products.

Steel Surfaces

Details are given General Technical Requirements.

AW-14.9 Measurement and Payment

Measurement of payment for **Painting and Vanishing** will be based on the area applied and accepted by the NPC Representative.

Payment will be made at the corresponding contract unit price per square meter for the pertinent items under Architectural Works in the Bill of Quantities.

Payment shall constitute full compensation for all labor, materials, equipment, tools and incidentals necessary for the completion of this work.

AW-15.0 CONCRETE FLOOR HARDENER

AW-15.1 General

The work under this section shall be undertaken by skilled tradesmen experienced with this kind of work. The work to be done shall consist of furnishing all labor, materials and provision of tools and equipment necessary to complete the application of Floor Hardener.

AW-15.2 Materials

Floor hardener shall be non-metallic a mixture of especially graded mineral aggregates crushed and sieved to produce sharp granules. It should be

extremely hard and must be highly resistant to abrasion, impact, chemical and acid, attack and will not oxidize under any circumstances. It should be non-metallic and must be a mixture of graded Silicon Carbide and Aluminum Oxide Aggregates.

AW-15.3 Measurement and Payment

Measurement and payment for **Concrete Floor Hardener** will be based on the area placed and accepted by the NPC representative.

Payment will be made at the corresponding contract unit price per square meter for the pertinent item under Architectural Works in the Bill of Quantities.

Payment shall constitute full compensation for all labor, materials, equipment, tools and incidentals necessary for the completion of this work.

AW-16.0 WATERPROOFING

AW-16.1 General

The work includes the laying/ installation of waterproofing membrane at the roof deck of the building.

Waterproofing materials shall be delivered to the site in their original sealed containers or packages bearing manufacturer's name and brand designation.

The work shall be performed by the manufacturer's certified applicators and only the best quality of materials and workmanship shall be used in strict accordance with the standard practice for this type of work.

AW-16.2 Materials

The waterproofing material shall be a complete system of bitumen layers supplied by a manufacturer of reputable corporate existence. Waterproofing materials shall be heat resistant preformed reinforced bituminous membrane which has good elongation and recovery characteristic when subjected to expansion and contraction movements.

AW-16.3 Surface Preparation

All concrete or masonry surfaces shall be cured for minimum of seven (7) days. It must be wood-strained, smooth, firm, dry, clean and free from rubbish, loose or foreign materials and imperfections.

Installation of metal fittings and similar works shall be completed before application of waterproofing is done.

Surfaces shall be properly graded to drain water freely into drain lines. Drainage connections shall be set up to permit free flow of water. There shall be provisions for mortar cants in the angle formed by the area. If required, reglets of about 40mm deep and 40mm wide at 250mm above floor finish shall be provided along walls or parapet walls for the waterproofing system.

AW-16.4 Execution of Work

The waterproofing membrane shall be installed according to the manufacturer's instruction. Apply material "patching compound" reinforced with "patching fabric" on cracks and other surface imperfections.

The membrane application shall be commenced from the lowest point when applied on a surface to fall line to ensure weathered overlaps.

After installation of membrane, careful inspection shall be made for accidental damage. Damaged area shall be cleaned and patched with fresh membrane waterproofing (minimum patching material of 152mm x 152mm).

Prior to acceptance of the job, all waterproofed surfaces shall be given a 48-hour flooding and the Contractor shall remedy at once any evidence of leakage. Flooding test shall be done by plugging all drains, building temporary dams at opening so that water will be 25.4mm (1") deep at high point of waterproofing.

Concrete topping to be used shall be 20.70MPa as per ACI specifications and 50mm (2") thick (minimum) excluding the finish and reinforced with welded steel wire fabric as per ASTM A185-73 specifications.

In particular, the Contractor shall verify conditions such as the following do not exist:

- extensive unevenness of the bed
- too rough, too porous, too smooth surfaces
- sharp edges of boarding and ridges
- variation from the horizontal or fall stipulated in the Specifications or dictated by circumstances
- incorrect level of the surface of the bed
- non-rounded corners, edges and channeling
- stress and settlement cracks, holes
- too moist surface
- non-sealing of voids (e.g. in concrete)
- inadequate firmness of the bed
- oily surface
- unsuitable type or portion of penetrating structural members
- lack of parts for connecting structural members which penetrate the waterproofing

AW-16.5 Guarantee

The Contractor shall guaranty that the work specified in this section will be free from defects of materials, workmanship and leakage for a period of five (5) years from the date of final acceptance. This obliges the Contractor to make good the defective work.

AW-16.6 Measurement and Payment

Measurement of payment for **Membrane Waterproofing** will be based on the area applied and accepted by the NPC Representative.

Payment will be made at the corresponding contract unit price per square meter for the pertinent items under Architectural Works in the Bill of Quantities.

Payment shall constitute full compensation for all labor, materials, equipment, tools and incidentals necessary for the completion of this work.

SECTION VI

TECHNICAL

SPECIFICATIONS

FOR

CIVIL WORKS

SECTION VI – TECHNICAL SPECIFICATIONS

CW – CIVILWORKS

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TECHNICAL SPECIFICATIONS

CW – CIVILWORKS

CW-1.0 GENERAL CONSTRUCTION FACILITIES

CW-1.1 Scope

This section covers the construction and/or maintenance of access roads, drainage system and other appurtenant structures, moving-in of the Supplier/Contractor's construction equipment, setting up of the Supplier/Contractor's camp and the disposition of the Supplier/Contractor's various facilities at the end of the Contract.

CW-1.2 Moving-in

The Supplier/Contractor shall bring to the site all his necessary construction equipment and plant and install all stationary construction equipment and plant at location and in the manner approved by the NPC. The Supplier/Contractor shall submit sufficient detailed plans showing the proposed location of such stationary equipment and plant and other pertinent data. No installation of such stationary equipment shall be undertaken unless the corresponding plans have been approved by the NPC.

CW-1.3 Supplier/Contractor's Camp Facilities

The Supplier/Contractor shall provide and grade his camp site, construct his camp, employee housing, warehouse, machine and repair shops, fuel storage tanks and provide such related facilities and sanitary conveniences that the Supplier/Contractor deems necessary for maintaining health, peace and order in the camp and work areas. The areas that may be used by the Supplier/Contractor within the plant site shall be designated by the NPC.

The Supplier/Contractor shall provide, maintain and operate, under competent direction, such camps and facilities as are necessary for the housing, feeding and accommodation of his employees.

CW-1.4 Water Supply

The Supplier/Contractor shall, at his own expense, be responsible for the supply, installation, operation and maintenance of a safe and adequate supply of drinking and domestic water. Whenever there is a possibility of contamination of the water supply for drinking and domestic purposes, chlorination or some other approved methods of sterilization shall be carried out. The installation and maintenance of these services shall be subject to the approval of the NPC.

CW-1.5 Sewerage Disposal and Sanitation

The Supplier/Contractor shall, at his own expense, be responsible for the installation operation and maintenance of an adequate sewerage disposal and sanitation system and shall provide adequate toilet and wash-up facilities for his employees at his camp and in the areas where work is being carried out.

The Supplier/Contractor shall execute the work with due regard to adequate sanitary provisions and applicable codes and shall take all necessary steps to prevent the pollution of water in any spring, river, or other sources of water supply. All toilets or wash-up facilities shall be subject to the prior and continuing approval of the NPC.

CW-1.6 Fire Protection

The Supplier/Contractor shall observe all necessary precautions against fire, shall provide and maintain at his own expense, portable fire-fighting equipment he may deem necessary, and shall comply with all applicable laws of the Philippines relating thereto.

In the event of an uncontrollable fire occurring in the area of the Supplier/Contractor's operation, the Supplier/Contractor shall have to extinguish the fire immediately at his own expense, to the full extent of the manpower and equipment employed under the contract at the time of the fire.

The Supplier/Contractor shall indemnify NPC against all liabilities, claims, damages and/or lawsuits arising thereto.

CW-1.7 Construction Power

The Supplier/Contractor shall be responsible for providing his own electric power supply required for construction and erection/installation. If power is available from NPC and should the Supplier/Contractor elect to utilize the NPC's power supply, he shall make an arrangement with NPC concerned group as to the billing rates and other requirements needed for direct connection to NPC.

CW-1.8 Camp Security

The Supplier/Contractor shall provide his own security force to the extent that he deems necessary for maintaining peace and order in the camp and work areas and to safeguard materials and equipment. Nothing under the provisions of this paragraph shall relieve the Supplier/Contractor from full responsibility for the maintenance of peace and order and protection of life and property in all areas where he operates.

CW-1.9 Construction Material Storage

The Supplier/Contractor is required to put up warehouse(s) with capacities sufficient to store the construction materials required in the work. The warehouse(s) shall be specifically for this contract, notwithstanding his other facilities in the site that may serve the purpose.

CW-1.10 Removal of Camp and Construction Facilities

After the completion of the work covered by the contract and prior to acceptance of the completed work, the entire camp facilities of the Supplier/Contractor, including its water supply system, electric distribution system, quarters, warehouses, shops, dining halls, commissaries, temporary shed and other facilities therein shall be removed by the Supplier/Contractor. The site shall be cleared and cleaned as directed by the NPC.

CW-1.11 Measurement and Payment

No separate measurement and payment will be made for the Supplier/Contractor's Construction Facilities. The entire cost thereof shall be included in the various pay items in the Bill of Quantities.

CW-2.0 CARE OF WATER DURING CONSTRUCTION**CW-2.1 Scope**

In accordance with the specifications contained in this section or otherwise directed, the Supplier/Contractor shall construct and maintain all necessary temporary drainage ditches and other temporary protective works and he shall also furnish, install, maintain and operate necessary pumping equipment and other devices to protect construction operations free from water coming from any source, including rain.

CW-2.2 Drainage and Dewatering

The Supplier/Contractor shall be responsible for dewatering foundation areas so that work can be carried out on a suitably dry condition. The Supplier/Contractor shall construct drainage ditches, holes, culverts, furnish, maintain and operate at his own expense all necessary pumps and other dewatering devices to keep all work areas free from water.

After the work is completed and before it is accepted by the NPC, the Supplier/Contractor shall remove all pumping equipment and shall remove, fill or plug all temporary drainage structures as directed, all at his expense.

CW-2.3 Measurement and Payment

No separate measurement and payment will be made for the Care of Water During Construction operations. The cost of furnishing, constructing, maintaining, operating and removing of temporary drainage structures, pumping system and other dewatering devices necessary to keep construction operations free from water, shall be included in the various pay items in the Bill of Quantities for structures where such care of water is required.

CW-3.0 ENVIRONMENTAL REQUIREMENTS FOR CIVIL WORKS**CW-3.1 Scope**

This section pertains to the environmental and safety provisions, requirements and conditions that shall govern during the execution of all civil works under this project.

CW-3.2 General Conditions

The Supplier/Contractor shall ensure compliance with the applicable environmental and safety regulations, as well as ECC conditions, during installation/construction of this project through the implementation of measures that include, but not limited to, the following:

- a) Designate a Safety Officer and a Pollution Control Officer who shall respectively handle all safety and environmental concerns of the project.
- b) Prepare and submit Construction Safety and Health Plan (CSHP).
- c) Properly manage debris and various waste generated during installation/construction, such as the following:
 - Dispose of demolition and construction debris in a designated or NPC approved disposal area(s);
 - Stockpile (and cover if possible) or haul to the designated and/or pre-developed dump sites (spoil disposal areas) that shall be provided with suitable drainage – equipped with sediment traps, stripped top soil, spoils from quarry/borrow sites and excavated materials;
 - Segregate solid wastes, such as empty cement sacks, scraps of tin or wood, used wires and other domestic garbage, for recycling or storage in NPC-approved temporary storage areas and further disposal to LGU-designated disposal sites.
 - Properly handle, store and dispose-off, through DENR-accredited transporter/treater, hazardous wastes i.e. used oils, paints, thinner, etc.
- d) Limit construction activities that generate excessive noise to daytime works only to prevent nuisance to nearby residents during rest hours.
- e) As far as practicable, undertake site stripping, grading and excavations during dry weather.
- f) Construction/Installation shall be carried-out in a manner where landslides and erosions are minimized.
- g) Avoid unnecessary opening/clearing of areas outside construction sites or destruction of vegetative cover, especially cutting of existing trees; and to re-vegetate disturbed areas.

- h) Implement biological control measures such as maintenance of vegetation buffers (i.e. sodding of grass, planting of creeping vines, herbs, shrubs and trees) to shield streams/rivers from sedimentation; planting of vegetative cover over erodible surfaces; and planting of exposed sloping areas with shallow-rooted species like grasses, herbs or creepers.
- i) Locate fill slopes and spoil heaps away from drainage routes and properly remove/dispose the same as soon as practicable.
- j) Preserve or replace, if practicable, natural drainage patterns (when disturbed by civil works) with appropriate drainage channels.
- k) Convey oil-contaminated wastewater from workshops, garages, or gas filling stations through an oil trap (i.e. improvised oil-water separator) prior to discharge.
- l) Spray water, wherever and whenever necessary, to minimize dust generation.
- m) Provide PPEs and other safety provisions required by DOLE, for its project/site works.
- n) Take all necessary steps to prevent the pollution of groundwater and/or water bodies in the vicinity of the project site.

CW-3.3 Measurement and Payment

No separate measurement and payment will be made for the Supplier/Contractor's compliance to the foregoing. The entire cost thereof shall be included in the various pay items in the Bill of Quantities.

CW-4.0 CONCRETE

CW-4.1 Scope

In accordance with the specifications contained in this section, the Supplier/Contractor shall furnish all materials, labor, equipment and tools and perform all concreting works in accordance with the drawings, or as otherwise directed.

CW-4.2 Class of Concrete

Class of concrete or strength shall be as indicated on the drawings, which shall conform to the minimum requirement for compressive strength indicated on the provision of NSCP for Concrete and, in no case, shall not be less than 20.7 MPa.

CW-4.3 Materials**CW-4.3.1 Cement**

Cement for concrete works shall be furnished by the Supplier/Contractor and shall conform to the requirements of the latest edition of the Standard Specifications for Portland Cement (ASTMC150).

Unless otherwise specified, cement shall be ordinary Portland Cement. Type I for general construction which concrete is not in contact with soils or ground water and Type II for concrete in contact with soil or ground water.

Changing of brand or type of cement within the same structure will not be permitted unless with prior permission and approval obtained from the NPC.

CW-4.3.2 Reinforcing Steel

The Supplier/Contractor shall furnish all reinforcing steel of the sizes shown on the drawings and in accordance with the herein specifications for reinforcing steel.

CW-4.3.3 Water

Water for use in concrete shall be subject to the approval of the NPC. It shall not be salty and shall be reasonably clear and free from oil, acid, injurious alkali or vegetable matter.

CW-4.3.4 Aggregates

All coarse and fine aggregates shall consist of hard, tough, durable and clean, uncoated particles. All foreign materials and dust shall be removed by processing. Aggregates shall generally be rounded and reasonably free from thin, flat and elongated particles in all sizes and well graded from coarse to fine.

CW-4.3.5 Formwork

Timber, lumber and plywood to be used for falsework and formwork shall be sound and shall comply with the requirements of this specifications. Use forms where a smooth form finish is required. Lumber shall be square-edged or tongue-and-groove boards, free or raised grain, knotholes and the other surfaces defects. Steel when used shall conform to the requirements of the ASTM A36. Steel form surfaces shall not contain irregularities, dents, or sags.

Forms shall be wood, plywood, or steel. Wood forms for surfaces exposed to view in the finished structure and requiring a smooth form finish, shall be plywood. For unexposed surfaces, undressed square-edge lumber may be used. Forms for surfaces requiring special finishes shall be plywood, or shall be lined with plywood, a non-absorptive, hard-pressed fiberboard, absorptive-type lining or other suitable material. Plywood, other than for lining, shall be concrete-form plywood free of raised grain, torn surfaces, worn edges, patches, or other surface defects, which would impair the texture of the concrete surface. Surfaces of steel forms shall be free from irregularities, dents, and sags.

CW-4.4 Storage of Materials**CW-4.4.1 Cement and Aggregates**

All cement shall be stored, immediately upon delivery at the Site, in weatherproof building that will protect the cement from dampness. The floor shall be adequately raised from the ground and in buildings placed in the locations approved by NPC. Provisions for storage shall be ample, and the shipments of cement as received shall be separately stored in such a manner that allows the earliest deliveries to be used first and to provide easy access for identification and inspection of each shipment. Storage buildings shall have capacity for storage of sufficient quantity of cement to allow sampling at least twelve (12) days before the cement is to be used. Bulk cement, if used, shall be transferred to elevated air tight and weatherproof bins. Stored cement shall meet the test requirements at any time after storage when NPC orders retest. At the time of use, all cement shall be free flowing and free of lumps.

Handling and storing of concrete aggregates shall be such that segregation or inclusion of foreign materials is sufficiently prevented. NPC may require that aggregates be stored on separate platforms at satisfactory locations.

In order to secure greater uniformity of concrete mix, NPC may require that the coarse aggregate be separated into two or more sizes. Different sizes of aggregates shall be stored in separate bins or in separate stockpiles and relatively away from each other to prevent the material at the edges of the piles from intermixing.

CW-4.4.2 Reinforcing Steel

Reinforcing steel shall be stored in accordance with the specifications for reinforcing steel.

CW-4.5 Concreting**CW-4.5.1 General**

The written approval of the NPC shall be secured prior to any concreting work. All concrete shall be poured on dry and cleaned surfaces.

CW-4.5.2 Formwork Construction

Forms shall be installed mortar and watertight, true to the dimensions, lines and grades of the structure and with the sufficient strength, rigidity, shape and surface smoothness as to leave the finished works true to the dimensions shown on the drawings or required by NPC and with the surface finish as specified.

The inside surfaces of forms shall be cleaned of all dirt, mortar and foreign material. Forms, which will subsequently be removed, shall be thoroughly coated with a release agent or coating prior to its use. The release agent shall be commercial quality form oil or other approved coating which will permit the ready release of the forms and will not discolor the concrete.

Formwork for concrete placed underwater shall be watertight.

Forms shall be constructed so that the form surface of the concrete does not undulate excessively in any direction. Undulations exceeding either 2 mm or 1/270 of the center distance between studs, joints, form stiffeners, form fasteners, or wales will be considered to be excessive. Should any form of the forming system, even though previously approved for the use, produce a concrete surface with excessive undulations, its use shall be discontinued until modifications, satisfactory to NPC's Representative, have been made. Portions of concrete structures with surface undulations in excess of the limits herein stated may be rejected by the NPC.

Form fasteners consisting of bolts, clamps or other devices shall be used as necessary to prevent spreading of the forms during concrete placement. The use of ties consisting of twisted wire loops to hold the forms in position will not be permitted.

All formworks shall be provided with adequate clean-out openings to permit inspection and easy cleaning after all reinforcement has been placed. Where forms for continuous surfaces are placed in successive units, the forms shall be fitted over the completed surface to obtain accurate alignment of the surface and to prevent leakage of mortar. Panel forms shall be constructed so that they can be removed without damaging the concrete. All exposed joints, edges, and external corners shall be chamfered a minimum of 20 mm unless specified otherwise herein. Forms for heavy girders and similar members shall be constructed with a proper camber.

Coating: Before placing the concrete, the contact surface of forms shall be coated with a non-staining mineral oil or suitable non-staining form coating compound or shall be given two coats of nitrocellulose lacquer, except as specified otherwise. Mineral oil shall not be used on forms for surfaces, which are to be painted. For surfaces not exposed to view in the finished structure, sheathing may be wetted thoroughly with clean water. All excess coating shall be removed by wiping with cloths. Reused forms shall have the contact surfaces cleaned thoroughly. Those that have been coated shall be given an additional application of the coating. Plaster waste molds shall be layered with two coats of the thin shellac or lacquer and coated with soft or thinned non-staining grease.

Tolerance and Variations: The Supplier/Contractor shall set and maintain concrete forms to ensure that, after removal of the forms and prior to patching and finishing, no portion of the concrete work will exceed any of the tolerances specified. Variations in floor levels shall be measured before removal of supporting shores. The Supplier/Contractor shall make the necessary corrective measures for the variations resulting from deflection, or when the latter affects concrete quality or curing. The tolerances specified shall not exceed by any portion of the concrete surfaces; the specified variation for one element of the structure shall be considered unacceptable when it permits another element of the structure to exceed its allowable variations. Except as otherwise specified herein, tolerances shall conform to ACI 347.

CW-4.5.3 Placing Reinforcement

Reinforcing steel and embedded items shall be properly and securely installed prior to the placing of concrete.

In no case shall concreting start without prior inspection and approval by the NPC of the placed reinforcement and other embedded items.

CW-4.5.4 Mixing Concrete

Mixing of concrete shall conform to the requirements of ACI Code for Concrete Construction.

CW-4.5.5 Placing Concrete

Concrete shall be conveyed from mixers to the forms or to the place of deposit as rapidly as possible and by methods that will prevent segregation or loss of ingredients. There shall be no vertical drop greater than 1.5 meters except where suitable equipment like metal pipe or tremie is used. The pipe or tremie shall be kept full of concrete and its end shall be kept buried in the newly placed concrete. Chutes through which concrete is delivered to the structure in a thin, continuously exposed flow will not be permitted except for very limited or isolated sections of the work.

Earth surfaces, upon which concrete shall be placed, shall be cleaned, dry and thoroughly compacted before placing the concrete.

Rock surface, upon which concrete shall be placed, shall be thoroughly cleaned of loose or semi-detached or unsound rock particles. Before placing concrete, all surfaces shall be wetted thoroughly to keep them in a completely moist condition, after which leveling mortar of the same cement ratio as the concrete mix complete contact between concrete and the leveled surface.

CW-4.5.6 Finishing Concrete

After the concrete has been deposited, distributed and vibrated, the concrete shall be struck off and screened by mechanical means approved by the NPC. The finishing machine shall be of the screening and troweling type designed and operated both to strike off and to consolidate. Hand finishing may be employed when suitable finishing machines are not available. Finishing of concrete shall be done, as directed, to the satisfaction of the NPC.

All finished surfaces shall be tested with 3 meters straight edge and any variation of the surface from the desired crown or cross section shall be properly corrected.

CW-4.5.7 Removal of Forms

Formwork shall not be removed without the permission of NPC; where such permission, however, shall not relieve the Supplier/Contractor of its responsibility for the safety of the work. Blocks and bracing shall be removed at the time the forms are removed and in no case shall any portion of the wood forms be left in the concrete.

Falsework removal for continuous structures shall be as directed by NPC but in which case shall be temporarily supported such that the structure is gradually subjected to its working stresses. False work shall not be released in any span until the strength specified hereunder is attained.

When concrete strength tests are to be used as basis for the removal of forms and supports, the compressive strength of concrete must meet the following minimum requirements:

	Min. Time	Min.% Strength
Centering under girders and beams	14 days	80%
Sides of beams and all vertical surfaces	1 day	70%
Floor Slabs	14 days	80%

The site shall be cleared of all debris and refuse resulting from work.

CW-4.5.8 Curing and Protection

Concrete shall be cured for a period of not less than fourteen (14) consecutive days by keeping the surfaces of concrete continuously (not periodically) wet. Where tongue and groove forms were used and left in place of curing, they shall be kept wet at all times prevent opening at the joints and drying out of the concrete.

CW-4.5.9 Sampling and Testing of Concrete

The Supplier/Contractor shall furnish all materials, either separately or mixed, as required by NPC. Selection of materials and the making of test specimens shall be made under the supervision of NPC and delivered to NPC laboratory or any NPC-accredited testing agency at the Supplier/Contractor's expense.

The expense of making and curing all concrete specimens including the materials comprising the concrete specimens shall be borne by the Supplier/Contractor. The cost of shipping and testing the concrete shall likewise be at the expense of the Supplier/Contractor.

No concreting work on the project will be permitted to be done until NPC signifies in writing that, following the performance of the necessary tests, he gives his approval to the use of all materials involve in making the concrete.

As work progresses, test cylinders shall be fabricated from the concrete samples and tested in accordance with ASTM C31 and ASTM C39. At least one set of four (4) cylinders shall be made from each 10 cu.m of the concrete placed of each class. Also at least one set shall be made per day for each class of concrete placed each day.

Two (2) cylinders shall be tested at 28 days for specification compliance and one shall be tested at 7 and 14 days respectively for information. The acceptance test result shall be the average of the strength of the two cylinders tested at 28 days.

The compressive strength of the concrete shall be deemed acceptable if the averages of the three consecutive strength test results is equal to or exceeds the specified strength and no individual test falls below the specified strength by more than 3.50 MPa.

Concrete deemed to be not acceptable using the above criteria maybe rejected unless the Supplier/Contractor can provide evidence, by means of core tests, that the quality of concrete represented by the failed test result is acceptable in place. Three (3) cores shall be taken in accordance with ASTM C42 and soaked for 24 hours prior to testing. Concrete in the area represented by the cores will be deemed acceptable if the average strength of the cores is equal to at least 85% of and no single core is less than 75% of the specified strength.

CW-4.5.10 Tolerances and Repair for Concrete Construction

Concrete structures shall be constructed to the lines shown on the drawings or where so required to suit actual field requirements. Any structure that does not conform to such lines shall be repaired or removed and made anew by the Supplier/Contractor at no additional cost to the Corporation.

Repairs shall be made at surface imperfections due to faulty placing of concrete and cuts on the structures due to the removal of excess concrete on the lines shown on the drawings. Such repairs shall be made immediately after early stripping of the forms, after the imperfections have been identified and the methods of repair appropriately established.

CW-4.5.11 Second Stage Concrete

The second stage of concrete finishing shall be done only after the final installation of all pertinent equipment, anchorages, pipings, conduits and other embedded items as may be required for all electromechanical works.

CW-4.6 Measurement and Payment

Measurement for payment for Concrete, except concreting works that are associated to various construction and/or installation/erection works (i.e. equipment foundation and pedestals, perimeter wall footing and posts, etc.) included in the Bill of Quantities under separate pay item, will be based on the volume of concrete placed and accepted within the neat lines of the structure as shown on the drawings or in accordance with the manner of measurement set forth in the various sections of the Technical Provisions. No deduction will be made for rounded or beveled edges or space occupied by the metal items 10 sq. cm. or less in cross section, embedded in concrete.

Payment will be made at the corresponding contract unit price for the various items of concrete shown in the Bill of Quantities. Payment shall cover all costs for furnishing all labor, materials, including equipment and tools required for concreting work. Payment shall also include non-shrink cementitious grout and epoxy grout inside foundation block out and above engine base plate and care of water.

No separate measurement for payment will be made for formworks of which the cost shall be included in concreting works.

CW-5.0 REINFORCING STEEL**CW-5.1 Description**

This work shall consist of furnishing, fabricating, and placing of steel reinforcement of the type, size, shape and grade required in accordance with these specifications and in conformity with the requirements shown on the Drawings or as directed by the NPC.

CW-5.2 Material Requirement

All material shall conform to the requirements hereinafter given. Certified test reports (mill test or other) shall be submitted to the NPC for all reinforcement steel used. These tests shall show the results of all chemical and physical tests made.

CW-5.2.1 Bar Reinforcement

Reinforcement bars for concrete shall be hot-rolled, weld able, deformed billet-steel bars conforming to the requirements specified in ASTM A615 and PNS 49 unless shown on the Drawings or as required by the NPC. The use of the cold twisted bars is not permitted. Bar reinforcement shall be shipped in standard bundles, tagged and marked in accordance with the Code of Standard Practice of the Concrete Reinforcement Steel Institute.

CW-5.2.2 Sampling

The NPC's Representative will sample reinforcement bars at the source of supply or at the point of distribution, and the Supplier/Contractor shall notify the NPC in sufficient time in advance to permit sampling and testing before shipment is made. Three (3) samples from each size shall be taken at random representing five (5) tons or fraction thereof of each size.

CW-5.3 Construction Requirement**CW-5.3.1 Order List for Bent Bars**

Before materials are ordered, the Supplier/Contractor shall furnish all order lists and bending diagrams for the approval of the NPC. The approval of order lists and bending diagrams by the NPC shall in no way relieve the Supplier/Contractor of responsibility for the correctness of such lists and such lists and diagrams. Any expenses incident to the revisions of materials furnished in accordance with such lists and diagrams to make them comply with the drawings shall be borne by the Supplier/Contractor.

Shop Drawings for Reinforcing Steel (ACI 315): Indicate bending diagrams, assembly diagrams, splicing and laps of bars, shapes, dimensions and details of bar reinforcing, accessories and concrete cover. Do not scale dimensions from structural drawings to determine lengths of reinforcing steel.

CW-5.3.2 Fabrication

Bent bar reinforcement shall be cold bent as shown on the drawings or as required by the NPC. Bars shall be bent around circular pin having the following diameters (D) in relation to the diameter of the bar (d):

Bars 6mm Φ to 20mm Φ inclusive	D=6d
Bars 25mm Φ and 28mm Φ	D=8d
Bars 32mm Φ and greater	D=10d

Bends and hooks in stirrups and lateral ties may be bent to the diameter of the principal bar enclosed therein.

CW-5.3.3 Protection of Material

Steel reinforcement shall be protected at all times from injury. When placed in the work, it shall be free from dirt, detrimental scale, paint, oil or other foreign matter. However, when steel has on its surface easily removable and detrimental rust, loose scale or dust, it shall be cleaned by a satisfactory method, approved by the NPC.

Store reinforcement of the different sizes in racks raised above the ground with accurate identification. Protect reinforcing steel from contaminants such as grease, oil and dirt.

CW-5.3.4 Placing and Fastening Reinforcement & Miscellaneous Material (ACI-301)

All reinforcement bars, stirrups, hanger bars, wire fabric, spirals and other reinforcing materials shall be provided as indicated in the drawing or required by the specification, together with all necessary wire ties, chairs, screws, supports, and other devices necessary to install and secure the reinforcement properly. All reinforcement, when placed, shall be free from rust, scale, oil, grease, clay, and other coatings, and foreign substances that would reduce or destroy the bond. Rusting of reinforcement shall not reduce the effective cross sectional area of the reinforcement to the extent that the strength is reduced beyond specified values. Heavy, thick rust or loose, flaky rust shall be removed by rubbing with burlap or other approved method, prior to placing. Reinforcement that has bends not shown on the project drawings or on approved shop drawings, or is reduced in section by rusting such that its weight is not within permissible ASTM tolerances, shall not be used. All reinforcement shall be supported and wired together to prevent displacement by construction loads or by the placing of concrete. Unless directed otherwise by the NPC, reinforcement shall not be bent after being partially embedded in hardened concrete. Detailing of reinforcing shall conform to ACI 315. Where cover over reinforcing steel is not specified or indicated, it shall be in accordance with ACI 318.

All steel reinforcement shall be accurately placed in position shown on the drawings or as required by the NPC and firmly held there during the placing and setting of the concrete. Bars shall be tied at all intersections except where spacing is less than 30 mm in each direction, when alternate intersections shall be tied. Ties shall fasten on the inside.

Distance from the forms shall be maintained by means of stays, blocks, hangers or other approved supports. Blocks for holding reinforcement from contact with the forms shall be pre-cast mortar blocks of approved shape and dimensions or approved chairs. Layers of bars shall, be separated by pre-cast mortar blocks or by other equally suitable devices. The use of pebbles, pieces of broken stone or brick, metal pipe and wooden blocks or metal chairs shall not be permitted. Unless otherwise shown on the Drawings or required by the NPC, the minimum distance between bars shall be 40mm. Reinforcement in any member shall be placed and then inspected and approved by the NPC before the placing of concrete commences. Bundled bars shall be tied together at not more than 1.80 meters intervals.

Reinforcement shall be placed accurately and secured. It shall be supported by suitable chairs and spaces or by metal hangers. On the ground, and where otherwise subject to corrosion, concrete or other suitable non-corrodible material shall be used for supporting reinforcement. Where the concrete surface will be exposed to the weather in the finished structure or where rust would impair the appearance or finish of the structure, all reinforcement supports, within specified concrete cover, shall be galvanized or made of a suitable non-corrodible material.

All placement or movement of reinforcing steel after placement, to positions other than indicated or specified, shall be subject to the approval of the NPC.

Concrete protection for reinforcement shall be as indicated, or if not indicated, in accordance with ACI 318.

The minimum concrete cover for reinforcement specified in the bid documents shall take precedence over all permissible reinforcement placement variations; nothing in the variations listed below is to be constructed as permitting violation or compromise thereof:

- | | |
|--|------------------|
| a. Height of bottom bars | ±6mm above form |
| b. Lengthwise positioning | ±50mm of bars |
| c. Spacing bars in walls and solid slabs | ±25mm |
| d. Spacing bars in beams and footings | ±6mm |
| e. Height of top bars | ±6mm |
| f. Stirrup spacing: | |
| (1) For any one stirrup | ±25mm |
| (2) For over-all group | ±25mm of stirrup |

Anchors and bolts; including but not limited to those for the machine and equipment bases: frames or edgings, hangers and inserts, door bucks, pipe supports, pipe sleeves, pipe passing through walls, metal ties, conduits, flashing reflects, drains and all other materials in connection with the concrete construction shall, where practicable be placed and secured in position when the concrete is placed. Anchor bolts for machines shall be set to templates, shall be plumbed carefully and checked for location and elevation with an instrument, and shall be held in position rigidly to prevent displacement while concrete is being placed.

CW-5.3.5 Splicing

Splicing of reinforcement shall be in accordance with ACI 318, except as indicated otherwise or modified herein. Where splices in addition to those indicated on the drawings are necessary, they shall be approved by the NPC prior to their use. Splices shall not be made in beams, girders, and slabs at points of maximum stress. Butt Splicing shall preferably be used over lapping for bar sizes larger than 32 mmΦ. Splices to be welded shall conform to AWS D1.4; certification of weld ability of the reinforcement by the manufacturer, shall be submitted to the NPC. If the Supplier/Contractor elects to use butt splicing of reinforcing, he shall submit complete details of the process to be used by the NPC. If the butt splices are used the Supplier/Contractor shall ensure that the splice meets the requirements specified herein by performing at least three splices which shall be submitted for tests to a testing laboratory that has been approved for such testing by the NPC. The cost of these shall be borne by the Supplier/Contractor.

All reinforcement shall be furnished in the full lengths indicated on the Drawings. Splicing of bars, except where shown on the Drawings will not be permitted without the written approval of the NPC. When allowed, splices shall be staggered as far as possible and with a minimum separation of not less than 40 bar diameters. Not more than one-third of the bars may be spliced in the same cross section, except where shown on the Drawings.

Unless otherwise shown on the Drawings, bars shall be lapped a minimum distance of:

<u>Splice Type</u>	<u>Grade 40 Min.Lap</u>	<u>But Not Less Than</u>
Tension	24d	300mm
Compression	20d	300mm

Where d is the diameter of the bar. In lapped splices, the bars shall be placed in contact and wired together. Lapped splices will not be permitted at locations where the concrete section is insufficient to provide a minimum clear distance of one and one-third the maximum size of coarse aggregate between the splice and the nearest adjacent bar. Welding of reinforcing steel shall only be done if detailed on the Drawings or if authorized by the NPC in writing. Spiral reinforcement shall be spliced by lapping at least one and half (1 1/2) turns or by butt-welding unless otherwise shown on the drawings.

CW-5.4 Measurement and Payment

The quantity to be paid for shall be the calculated theoretical number of kilograms of reinforcement steel bars as determined from the net length of the steel shown on the drawings, incorporated in the concrete and accepted. The weight of deformed bars will be computed from the theoretical weight of the same nominal size as shown in the following tabulation:

<u>Designation</u>	<u>Size (mm)</u>	<u>Weight (kg/m)</u>
#2	6	0.222
#3	10	0.616
#4	12	0.888
#5	16	1.579



#6	20	2.468
#8	25	3.854
#9	28	4.833
#10	32	6.313
#11	36	7.991

Clips, ties, separators and other and related materials used for positioning and fastening the reinforcement in place as required by the NPC shall not be included in the weight-calculated payment under this item. If bars are substituted upon the Supplier/Contractor’s request and as a result, more steel is used than specified – only the amount specified shall be included.

When laps are made for splices, other than those shown on the drawings or required by the NPC and for the convenience of the Supplier/Contractor, the extra steel shall not be measured nor paid for.

The accepted quantity shall be paid at the corresponding unit price for the item, Reinforcing Steel as shown in the Bill of Quantities which price and payment shall be made in full compensation for furnishing materials, labor, equipment and incidentals necessary to complete this item.

CW-6.0 STRUCTURAL STEEL

CW-6.1 General

This section covers the fabrication, erection, and shop painting of structural steel in accordance with the AISC “Manual of Steel Construction” referred to herein. In the AISC “Manual of Steel Construction” referred to herein, the Specification for Design, Fabrication, and Erection of Structural Steel for Buildings,” and “Structural Joints using A325 or A490 Bolts” shall be considered a part thereto.

CW-6.1.1 Submittals

Shop Drawings of all structural steel in five (5) copies for approval prior to fabrication of structural steel with complete information necessary for the fabrication and erection of the component parts of the structure including the location, type and size of all bolts and welds, member sizes and lengths, camber & connector details, blocks, copes, and cuts. Include all welds by standard welding symbols.

Erection Plan consists of descriptive data to illustrate the structure steel erection procedure including the sequence of erection and temporary shoring and bracing, and written description of the detailed sequence of all welding, including each welding procedure to be performed.

Certificates of Conformance for the following:

- Bolts, Nuts and Washers
- Welding Electrodes and Rods
- Paint
- Steel



- **Certified Test Reports**

Chemical Analysis and Tensile Strength Test of structural steel in accordance to ASTM A53.

For high strength bolts and nuts, the Supplier/Contractor shall also submit chemical analysis, including tensile strength and hardness tests as required by ASTM A325.

CW-6.1.2 Delivery and Storage

All materials shall be handled, shipped and stored in a manner that will prevent distortion or other damages. Materials shall be stored in a clean and properly drained location and out of contact with the ground. Damaged materials shall be replaced or, when permitted by NPC, may be repaired in an approved manner at no additional cost to NPC.

CW-6.2 Materials

All the materials shall be of the best quality of their kind, well graded and within the allowable distortions. They shall be free from flakes, corrosion, scale of fragments that could reduce the resistance and durability or injure the external appearance.

Except as modified herein, blast clean surfaces in accordance with SSPC SP6. Wash clean surfaces that become contaminated with rust, dirt, oil, grease or other contaminants with solvents until thoroughly clean. Ensure that steel to be embedded in concrete and surfaces when assembled, are free from rust, grease, dirt and other foreign matter.

CW-6.2.1 Steel

Materials shall conform to the respective specifications specified herein. Materials not otherwise specified herein shall conform to the AISC "Manual of Steel Construction".

Structural Steel:	ASTM A36
Steel Pipe:	ASTM A53, Type E or S, Grade B, ASTM A501
Steel W-Shape Piles (Soldier Piles):	ASTM A328

CW-6.2.2 Bolts, Nuts and Washers:

All bolts, nuts and washers shall be of hot-dip galvanized steel, in accordance with the following:

Bolts: ASTM A307, Grade C or ASTM A36 for Anchor Bolts; ASTM A325 for Fastening Bolts

Nuts:

ASTM A563, Grade A, heavy hex style, except nuts less than 38mm may be provided in hex style

Washers:

ANSI B18.22.1, Type B

CW-6.2.3 Accessories:

Welding electrodes and steel structural members shall use:

Rods

E70XX electrodes

Non-shrink Grout

ASTM C827, non-metallic

CW-6.3 Execution

CW-6.3.1 Fabrication

Structural steel fabrication shall be in accordance with the applicable provisions of the Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings as set forth in the AISC "Manual of Steel Construction".

CW-6.3.2 Welding of Structural Steel Work:

All welding works shall be as indicated in the drawings and shall conform to AWS D1.1 - 77 "Structural Welding Code". Unless specified on the drawings, fillet welds shall be a minimum of 5 mm (3/16") and welding electrodes shall be with a tensile strength of 485 MPa.

All welding works shall be executed by the AWS D1.1 qualified welders, welding operators and trackers, whose workmanship shall be subject to the approval of NPC.

CW-6.3.3 Shop Painting

Except as otherwise specified, shop prime surfaces of all structural steel, except steel to be embedded in concrete or mortar. Surfaces to be welded shall not be coated within 12 mm from the specified top of the weld prior to welding. Insure that the surfaces are thoroughly dry and clean when the paint is applied. Do not paint on wet weather except under cover. Do not apply paint to steel, which is at a temperature that will cause blistering or porosity, or will otherwise be detrimental to the life of the paint. Apply paint in a workmanlike manner, and coat all joints and crevices thoroughly. Prior to assembly, paint all surfaces that will be concealed or inaccessible after assembly.

Shop prime coat surfaces as soon as possible after cleaning. Apply one coat of inorganic zinc to a minimum dry film thickness of 100 microns.

- **Field painting:** When the erection work is complete, the heads of field bolts, all welds and any surface from which the shop coat of paint has become worn off or has otherwise become defective, shall be cleaned and thoroughly covered with one coat of shop coat paint. When the paint applied for touching up bolt heads and abraded surfaces has become thoroughly dry, apply two field coats of marine epoxy paint subject to the approval of NPC.

- **Marking:** Prior to erection, members shall be provided with a painted erection mark. In addition, connecting parts assembled in the shop for remaining holes in field connections shall be matched marked with scratch and notch marks. Do not locate erection markings on areas to be welded. Do not locate erection markings in areas that will decrease member strength or cause stress concentrations.

CW-6.3.4 Erection

Except as modified herein, erect steel in accordance with the AISC "Manual of Steel Construction". Where parts cannot be assembled or fitted properly as a result of errors in fabrication or of deformation due to handling or transportation, report such condition immediately to the NPC's Representative and obtain approval there from for the methods of correction for straightening, including members of steel conforming to ASTM A514.

Drain Steel work properly; fill pockets in structures exposed to the weather with an approved waterproof material.

Provide safety belts and lines for workmen aloft on high structures unless safe working platforms or safety nets are provided.

When calibrated wrenches are used for tightening bolts, calibrate them at least one each working day using not less than three typical bolts of each diameter. Do not use impact torque wrenches to tighten anchor bolts set in concrete.

Connections: Connections shall be executed as shown on drawing. In case, connections are not detailed, it shall be designed in accordance with AISC "Manual of Steel Construction". Build connections into the existing work. Punch, sub-punch and ream, or drill bolt holes.

Tolerances: Structural steel shall be furnished and installed to the lines and levels as shown on the drawings.

Any structure that does not conform shall be repaired, removed and/or erected anew by the Supplier/Contractor at no additional cost to NPC. Tolerances on structural steel shall be in accordance with the "Code of Standard Practice" of the AISC "Manual of Steel Construction".

CW-6.3.5 Tests and Inspections

Visual Inspection of Welding: After the welding is completed, hand or power wires brush welds, thoroughly clean them before the inspector makes the check inspection. Inspect welds with magnifiers under strong, adequate light for surface cracking, porosity, and slag inclusions; excessive roughness; unfilled craters; gas pockets; undercuts; overlaps; size and insufficient throat and concavity. Inspect the preparation of groove welds for adequate throat opening and for snug positioning of backup bars.

Non-Destructive Testing¹: In accordance with AWS D1.1 Twenty-five percent (25%) of the total number of joints, as selected by the NPC, shall be tested. If

more than 20 percent of welds contain defects identified by testing, then all welds shall be tested by radiographic or ultrasonic testing, and to be approved by the NPC. When all welds made are required to be tested, magnetic particle testing shall be used only in areas inaccessible to either radiographic or ultrasonic testing. Retest defective areas after repair.

CW-6.4 Measurement and Payment

Measurement for payment for structural steel shall be based on the total kilogram of structural steel placed and accepted.

Payment will be made at the contract unit price for the item Structural Steel in the Bill of Quantities, which payment shall constitute full compensation for furnishing all labor, materials and equipment necessary to complete the item.

SECTION VI

TECHNICAL

SPECIFICATIONS

FOR

MECHANICAL WORKS

PART 1 - TECHNICAL SPECIFICATIONS

MW - MECHANICAL WORKS

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MW - MECHANICAL WORKS

MW-1.0 GENERAL

The work to be done under this section shall include the furnishing of all labor, materials, equipment, tools and other incidentals for all mechanical works enumerated hereunder or as shown on the accompanying drawings and installation manuals or as otherwise directed by NPC.

The work shall be performed and completed with high quality workmanship, in accordance with generally accepted modern practice in installation/erection works of Mechanical Equipment for the Repair and Rehabilitation of Powerhouse, Office Building and Associated Structures of Marinawa Diesel Power Plant.

All equipment and materials which the Contractor shall supply and install shall be new and unused. They shall be suitable for their intended purpose and shall comply with all applicable regulations, quality and dimension standards.

The Contractor shall closely coordinate with other disciplines to avoid interference with other works specified in the relevant sections of this specification.

MW-2.0 SCOPE OF WORK

It is not the intent of this specification to specify all technical requirements or to set forth those requirements covered by applicable codes and standards. The Contractor shall furnish high quality work, materials and equipment meeting the requirements of this specification and industry standards.

The Contractor shall also be responsible to assess and determine all and every work and service although not specifically detailed but are deemed required to fully complete the work and smooth execution of the project. Relative costs of any additional works or materials which the Contractor deemed required or necessary to complete the works shall be included in the bid proposal.

The work to be done under this section shall comprise the furnishing of all labor, tools, equipment, supply of appurtenant materials and other incidentals including installation/erection and test of all mechanical works enumerated hereunder in accordance with the Specifications contained herein and as shown in the drawings or otherwise directed by the NPC, which shall consist of but not limited to the following:

- a) One (1) unit of Inverter-Split Type Wall Mounted Air Conditioner of 26,500 kJ/hr minimum cooling capacity for Conference Room, complete with controls (infrared remote) and other necessary accessories as described in the technical specifications;
- b) Six (6) units of Centrifugal Roof Ventilator, 20,000 m³/hr minimum capacity for Powerhouse, complete with its mounting accessories and control; and
- c) All other works and services required to complete the project.



MW-3.0 MATERIALS AND EQUIPMENT**MW-3.1 General**

All materials, equipment, devices and accessories shall be new and unused, free from all defects and imperfections, and best suited for the purpose intended. Materials used in the manufacture and installation of all equipment to be furnished shall be of the required quality used in commercial products of reputable manufacturers. All equipment or substitute materials to be used shall conform to the latest specifications and provisions of approved standards of engineering societies or other equivalent standards approved by NPC.

All materials, parts and assemblies to be used shall be tested conforming to the latest specifications and provisions of approved Standards of Testing Materials. Results of the test shall be made to provide means of determining compliance with the applicable specifications. When requested, all tests or trials shall be made in the presence of NPC's duly authorized representative.

If the equipment fails to meet the guaranteed performance as determined by the test, the Contractor shall promptly make the necessary modifications at no cost to NPC.

Brochures, catalogs and other related technical data of materials and equipment to be supplied by the Contractor under this contract shall be submitted by the Contractor for NPC's review and approval prior to fabrication. Equipment or articles installed or used without such approval shall be at the Contractor's risk of subsequent rejections.

MW-3.2 Applicable Codes and Standards

The design, materials, equipment, manufacturing, construction, installation, and testing of all works under this contract shall be in strict accordance with the latest edition of all applicable codes and standards, national and local laws, codes and regulations, statutes and ordinances.

The latest edition of each standard shall mean the latest edition available at the date of contract signing.

All units, dimensions and calculations shall be in metric system.

MW-3.3 Test of Materials

All materials, parts and assemblies to be used shall be tested conforming to the latest specifications and provisions of approved Standards of Testing Materials. Results of the test shall be made to provide means of determining compliance with the applicable specifications. When requested, all tests or trials shall be made in the presence of NPC's duly authorized representative.



If the equipment fails to meet the guaranteed performance as determined by the test, the Contractor shall promptly make the necessary modifications at no cost to NPC.

MW-3.4 Submittals

The Contractor shall submit the technical specifications/data and brochures/catalogs of all equipment and materials to be supplied for NPC's review and approval prior to purchase and/or implementation including other necessary documents as required or specified in the relevant sections of this specification. Equipment or materials installed or used without such approval shall be at the Contractor's risk of subsequent rejections.

MW-4.0 AIRCONDITIONING AND VENTILATION SYSTEM

MW-4.1 General

This section provides the essential information for the Air Conditioning and Ventilation System equipment to be supplied, installed and tested by the Contractor.

All air-conditioning equipment and Ventilation System shall preferably have one Brand name and shall be the standard product of a reputable A/C manufacturer. In case other brand of A/C and Ventilation equipment are to be used to meet with the specific requirements in the bid document, catalogues and other supporting documents shall be submitted for NPC's review and approval.

Power supply for the ventilation and air-conditioning equipment shall be 230V, single phase, 60 hz.

Refrigerant to be used shall be environment-friendly.

All necessary transformers and electrical materials shall be included in the Contractor's supply if power ratings provided are other than the one's specified above.

MW-4.2 Design Conditions

a) Outdoor Conditions:

Dry Bulb Temperature	:	35°C
Wet Bulb Temperature	:	27°C
Relative Humidity	:	80% to 100%

b) Indoor Conditions (for air-conditioned areas):

Dry Bulb Temperature	:	24°C ± 3°C
Relative Humidity	:	50% ± 5%

c) Area to be air-conditioned shall be:

c.1) Conference Room



d) Area to be ventilated shall be:

d.1) Powerhouse - 20 air changes per hour

MW-4.3 Schedule of Equipment

a) Air-Conditioning Unit

Location	Quantity	Cooling Load/Unit	Type
a.1) Conference Room	One (1) unit	26,500 kJ/hr	Inverter Split Type (Wall Mounted)

b) Ventilation Unit

Location	Quantity	Rating/Unit	Type
b.1) Powerhouse	Six (6) units	20,000 m ³ /hr	Centrifugal Roof Ventilator

MW-4.4 Air-Conditioning System

MW-4.4.1 Scope of Works

The Work called for in this specification includes the design, furnishing, delivering, installing and testing of split type air conditioner (inverter type) including refrigerant pipes and mounting brackets and concrete pads to provide a fully ventilated and air conditioned rooms. The work shall include other accessories even though not specifically mentioned in this specification but are necessary to obtain a complete set for the safe and reliable operation of the system as a whole.

All installation works shall include provision of opening on concrete walls, boring through walls, construction of concrete foundations for outdoor units as required, structural supports for indoor and outdoor units, layout of insulated refrigerant piping, piping supports including excavation and backfilling for embedded refrigerant piping as required, cables/wiring and other necessary accessories to complete the system.

All electrical materials such as circuit breakers, automatic controls, including all power and control wires, supervision, electrical outlets, fittings and conduits for interlocking the operation of the indoor units and outdoor units shall be included and provided by the Contractor including complete system of automatic temperature controls.



All air conditioning units (split type) to be supplied and installed shall have the following features/accessories but not limited to:

- With Remote Controller and Holder
- With automatic and manual swing louver control
- With control switch
- Cool Mode
- Fan Mode
- Automatic Mode

The type and quantity of air conditioning equipment to be supplied shall be as specified in Clause 4.3 (Schedule of Equipment) or shown on the drawings.

MW-4.4.2 Split Type Air-Conditioning Systems

MW-4.4.2.1 Fan Coil Unit (Indoor Unit)

The fan coil units shall be factory-built, factory-tested, and installed in accordance with the manufacturer's recommendations. The unit shall be complete with motor/blower assembly, evaporator coil, low voltage components, frame, cabinet, cleanable air filters, condensate drain, etc.

Unit casing shall be fabricated of heavy-gauge galvanized steel or other approved corrosion-resistant materials reinforced with steel angle framework and shall be insulated with fiberglass or other approved insulated materials for excellent thermal and acoustic insulation.

The centrifugal blower wheels shall be statically and dynamically balanced for smooth and quiet operation. Fan housing and motors shall be designed to minimize vibration inside the unit. Fan and motor bearings shall be easily accessible for maintenance and lubrication.

The evaporator coil shall be factory tested under pressure for leaks and completely dehydrated under vacuum.

Refrigerant control shall utilize thermostatic expansion valve.

Air filters shall be cleanable and removable type.

Condensate drain pan shall be of heavy gauge galvanized steel or other approved corrosion-resistant material. Condensate from FCU shall be drained to the nearest drain line using Polyvinyl Chloride (PVC) material of approved class piping or other approved corrosive-resistant material.

The cooling system shall be provided with safety devices to protect the system against damage from unusual operating conditions.

The Contractor shall provide other accessories such as discharge grilles, return grilles, etc.

Types of indoor units (wall mounted) shall be as specified in the schedule of equipment or shown on the drawings.

MW-4.4.2.2 Condensing Unit (Outdoor Unit)

The condensing units shall be weatherproof, factory-built, tested and installed in accordance with manufacturer's recommendations. The unit shall be air-cooled type, complete with compressor/motor, condenser coils, condenser fan/motor, safety devices, controls, etc.

The unit casing shall be weatherproof constructed of heavy gauge galvanized steel topped with two (2) coats of baked enamel for durability and protection against corrosion or other approved corrosive-resistant material.

Condenser fans shall be direct-driven dynamically balanced propeller type. Fans/motors shall be designed to minimize vibration inside the unit. Fan and motor bearings shall be easily accessible for maintenance and lubrication.

Type of compressor depends on the capacity of the system (see schedule of equipment) or manufacturer's standard. Safety devices shall be provided to protect the system against damage from unusual operating conditions.

MW-4.4.2.3 Refrigerant and Piping System

The Contractor shall design, furnish and install the refrigerant piping from fan coil unit to the condensing unit. Exact location of equipment and piping route shall be coordinated with NPC prior to installation.

Refrigerant to be used shall be environment-friendly.

Refrigerant piping shall be seamless hard drawn copper preferably single piping connection from the indoor unit to the outdoor unit for simple installation.

All parts in contact with copper piping shall be copper plated. Hangers and supports for all piping shall be selected as applicable to suit actual condition of the existing structures.

All suction piping to compressor shall be insulated with pre-sized fiberglass insulation covered with aluminum vapor barrier or other approved insulation per manufacturer's standard. Insulation should be installed on clean and dry surfaces. All insulation shall be continuous through walls, ceilings and sleeves.

MW-4.5 Ventilation Units**MW-4.5.1 General**

The Contractor shall furnish, deliver, install and test the ventilation system equipment complete with all the necessary appurtenances for its efficient operation. The scope of supply shall include all mounting supports and fixing materials required to complete the installation and ready for operation.



The unit shall be properly sized to conform to the required air changes per hour at free air for this particular application but in no case be less than those specified elsewhere in this specification. It shall be designed to continuously or intermittently operate on a 230 V, single phase, 60 Hz power supply, otherwise specified.

MW-4.5.2 Centrifugal Roof Ventilator

Centrifugal roof ventilator shall be provided at the area as specified in the schedule of equipment.

Each unit shall be properly sized to conform with the required air changes per hour at free air for this particular application but in no case be less than those specified elsewhere in this specification. It shall be of direct driven type, downblast and corrosion resistant to operate on a 230 V, single phase, 60 Hz.

MW-4.6 Installation and Painting

The Air-Conditioning and Ventilation Units shall be installed as indicated in the drawings or as directed by NPC. After installation, all exposed and unfinished surfaces shall be thoroughly cleaned and washed possibly by chemical of all rust, oil and other foreign matters and shall be repainted in accordance with the manufacturer's standard or as approved by NPC.

Likewise, all surfaces and supports shall be thoroughly cleaned of rust, oil and other foreign matters and shall be painted with epoxy primer and two (2) coats of finish paint.

Painted surfaces of all equipment which are damaged during transport and installation shall be repaired or touched-up as necessary to prevent rusting, corrosion, etc. until the final finish painting application is made.

MW-4.7 Equipment Marking and Labeling

All equipment and devices to be supplied by the Contractor under this contract shall be provided with a corrosion-resistant nameplate with clearly legible writing of approved size and pattern and shall be permanently attached at an easily visible place. It shall provide all necessary information or brief technical description under which the equipment has been designed to operate and shall include the following: manufacturer's name; type of equipment; serial number; year of manufacture; weight and other relevant information in compliance with applicable standards.

All items of equipment, valves, piping, and instruments are to be provided with labels bearing the Tag Number. The inscriptions are to be approved by NPC.

All labels and nameplates shall be of engraved stainless steel or equivalent non-corrodible material.

Tag Numbers for instruments and other devices shall also be provided as necessary and practicable.

Appropriate labels shall also be provided for equipment and devices mounted on control boards, relay cabinets, desks, and other places as required for proper identification, as well as for operational, functional, and safety reasons.

The labeling, size of label plates, and their location shall be subject to approval by NPC. A sample label-plate (with indication of material used) with lettering shall be submitted for this purpose. The inscription shall be printed or stenciled but in any case, water-proof, oil-proof and wear-resistant.

Each equipment, wherever necessary, shall be provided with cautionary and warning plates and signs.

Nameplates, labels, and warning plates shall be in English.

The nameplates and labels shall be protected during erection especially during painting. Damaged or illegible labels or nameplates shall be replaced by new ones.

No separate payment shall be made by NPC for nameplates and labels. Corresponding costs thereof shall be included by the Contractor in the bid price for each equipment to be furnished under the Contract.

MW-4.8 Spare Parts and Tools

The Contractor shall supply the standard spare parts for one (1) year operation as recommended by the equipment manufacturer. Spare parts required during the warranty period shall be supplied by the Contractor at no Cost to NPC.

Special tools for normal operation and maintenance and are not usually available in a standard machine shop or retailing store shall also be provided as recommended by the manufacturer.

MW-4.9 Acceptance Test

Prior to acceptance of the Works, the equipment shall be tested in the presence of NPC to determine whether the requirements of the specifications have been met. Any defects found that are inherent in the equipment shall be remedied at the expense of the Contractor.

MW-4.10 Submittal

Prior to purchase and implementation of the works, the Contractor shall prepare and submit five (5) copies of the following drawings/documents for review/approval of NPC:

- a) Dimensional layout drawings of mechanical equipment and associated devices.
- b) Manufacturer's catalog sheets, marked as necessary, to indicate materials or equipment being furnished including instruments for control system;

- c) Complete control schematic and wiring diagrams for all equipment to be furnished;
- d) List of recommended Spare Parts and Special Tools; and
- e) Operation and Maintenance Manuals.

MW-5.0 DRAWINGS

Prior to procurement of all materials, equipment and auxiliaries to be supplied by the Contractor under this contract, the Contractor shall submit for NPC's review, approval, and/or reference, five (5) copies of prints of technical specifications/data and/or brochures/catalogues. NPC shall review, comment or note corrections to be made and return two (2) copies to the Contractor within twenty (20) calendar days after receipt of the drawing. If corrections are required, the Contractor shall make all necessary corrections and re-submit such within fourteen (14) calendar days for NPC's review and approval.

Prints marked "Approved" or "Approved with Corrections Indicated" authorize the Contractor to proceed with the procurement of materials or equipment or construction/fabrication of the work shown on the drawings, with corrections, if any, indicated thereon. When prints of drawings are marked "Approved with Corrections Indicated" or "Returned for Corrections", the Contractor shall finalize the drawings and re-submit same in five (5) copies each for final approval. Every revision shall be shown by number, date and subject in a revision block.

Drawings approved by NPC shall in no way relieve the Contractor from entire responsibility for engineering, design, workmanship, material and all other liabilities under the Contract.

NPC reserves the right to reproduce any drawings or prints received from the Contractor as may be required despite any notice prohibiting the same appearing on the drawing or the print.

The Contractor shall submit construction and detailed drawings as may deemed necessary, as-built drawings and other documents for NPC's review, approval, information and reference as specified in the relevant specifications.

Any supply of materials/equipment or construction of any particular structure or portion thereof prior to the approval of drawings pertinent thereto shall be at the Contractor's risk. The Contractor shall be responsible for any extra cost that may arise in correcting the work already done to conform with the drawings as revised and approved.

Should an error be found in the Contractor's drawings during construction/erection, the correction including any field change considered necessary shall be noted on the drawings and shall be resubmitted for approval.



All data and information to be submitted shall be in the English language and all drawings shall be drawn using the metric system as unit of measurement.

The Contractor shall address all communications pertaining to Contractor's Drawings or otherwise agreed to:

The Manager, Design and Development Department
National Power Corporation
BIR Road corner Quezon Avenue,
Diliman, Quezon City 1100

All drawings and documents to be submitted by the Contractor for NPC's review and approval shall be on A4 size or A3 size folded to A4.

MW-6.0 GUARANTEE

The Contractor shall guarantee the replacement of the supplied equipment or components at his own expense against defect in design, workmanship and materials for a period of twelve (12) months after the equipment has been installed, tested and accepted. However, the warranty coverage for the compressor of the air-conditioning units shall be five (5) years. The Contractor guarantees that the equipment will perform in the manner as set forth in the equipment's manual and the Contract.

The Contractor shall submit a Warranty Certificate effective from the date of acceptance by NPC.

After the lapse of the warranty period, provided that there are no defects found and/or pending repair works, NPC shall release the warranty security/certificate.

MW-7.0 MEASUREMENT OF PAYMENT

Measurement for payment for all works shall be based on the bid price of each item as shown in the Bill of Quantities. The cost shall cover all works required and described in the pertinent provisions of the specifications.

Measurement for payment for pipes shall be based on the bid price of actual length of pipe installed as shown in the Bill of Quantities. The cost shall cover all works required including excavation, sand bedding, backfilling, testing, painting and other works and services described in the pertinent provisions of the specifications.

SECTION VI

TECHNICAL

SPECIFICATIONS

FOR

ELECTRICAL WORKS

SECTION VI – TECHNICAL SPECIFICATIONS

EW – ELECTRICAL WORKS

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SECTION VI – TECHNICAL SPECIFICATIONS

EW - ELECTRICAL WORKS

EW-1.0 GENERAL

This specification covers the technical and associated requirements of complete lighting system for the **Repair and Rehabilitation of Powerhouse, Office Building and Associated Structures of Marinawa Diesel Power Plant.**

EW-2.0 SCOPE OF WORK

The scope of works shall cover but not limited to the Replacement of Lighting Fixtures including Power Conductors and Supply, Installation and Test of Safety Breaker with Outlet for Air-Conditioning Unit.

The work shall also include all the other works and services which are not indicated on the technical specifications that are necessary for the complete and reliable operation of the system shall hereby provide by the Contractor.

EW-3.0 STANDARD OF MATERIALS

All materials to be used in the work shall be new, of high quality, free from all defects and of proven acceptability for the purpose of intended. Unless otherwise specified, materials shall conform to the latest applicable standard issued by the following authorities:

1. American National Standards Institute (ANSI)
2. Institute of Electrical and Electronic Engineers (IEEE)
3. Underwriter's Laboratory (UL)
4. National Electrical Manufacturer's Association (NEMA)
5. National Electrical Code (NEC)
6. Philippine Electrical Code (PEC)

Other recognized national standards maybe accepted if, in the opinion of NPC representatives, such will guarantee a quality not inferior to that guaranteed by the above standards.

In case of conflicting requirements between authorities cited above and those specified, such disagreement shall be resolved by representative of which his decision shall be final.

EW-4.0 LIGHTING SYSTEM

The lighting system covered by this specification includes lighting fixtures and associated conduits, conductors, fittings, etc.

The devices/materials furnished shall be in accordance with, but not limited to, the latest issues of the Applicable Codes and Standards, including all addenda, in effect at time of purchase order unless otherwise stated in this specification.

All materials and parts which are not specifically mentioned herein but are necessary for the proper installation and safe operation of the lighting system shall be identified by the Contractor and shall be furnished at no additional cost to NPC.

EW-4.1 Technical Requirements and Characteristics

Circuits shall be wired separately for lighting and outlets. Lighting fixtures shall be controlled and switched locally approximately as shown on the drawings.

Replacement of fixture bulbs or tubes shall be possible without disconnecting any part of the power supply and risk of touching live parts of the installation.

EW-4.2 Lighting and Power Panelboard

The existing Lighting and Power Panelboard shall be flush mounted rated at 240V, 60Hz.

Safety Circuit Breaker to be supplied in the Air-Conditioning Unit shall be molded case type with instantaneous magnetic trip and thermal overcurrent trip.

Panelboard Nameplate shall be black plastic with engraved white letter.

EW-4.3 Lighting Fixtures, Luminaires and Accessories**Lighting Fixtures**

All lighting fixtures when installed shall be free of leaks, warps, dents and other irregularities.

The hangers and brackets of all kinds for safety and proper installation of lighting fixtures shall be furnished and installed by the Contractor at his own expense.

The housing of lighting fixture shall be fabricated of steel sheet, corrosion resistant, good ventilation and easy installation.

All lighting fixtures, samples and catalogues shall be submitted for NPC's review and approval prior to the order. No lighting fixtures shall be installed without approval of NPC.

Lighting fixtures shall be wired with approved fixture wire, 90°C insulation. Each fixture shall be wired to a single point with an adequate slack for proper connection. All lighting fixtures shall be protected from damage during installation. Any broken lighting fixtures, receptacles, stems and the like, shall be replaced with new parts, at no cost to NPC.

Lighting Luminaires

a. LED Tube Lighting Fixture

IP54 Flush Mounted Lighting Fixture with 3mm thick prismatic diffuser and gasket, 1200mm x 300mm zinc phosphate steel sheet housing with white powder coat paint finish, and complete with high output, 2x18W daylight LED tube lamp.

b. Compact LED Lighting Fixture

Compact LED Lighting Fixtures shall be rated 230VAC, 60 Hz operations, cool white and frosted finish. Lamp holders shall be for E27 base surface mounted type.

c. LED Open Type Lighting Fixture

IP20 Open Type Luminaire shall be Zinc Phosphate and Die-Formed Steel Sheet Base, White Powder Coat paint finish and complete with 240V, 60Hz, with 18W Cool White and frosted finish compact LED lamp.

EW-4.4 Conductors

Conductors shall be stranded annealed copper conductor suitable for continuous temperature of 90°C when used in wet or dry location and 75°C when exposed to oil or coolant. The minimum size of conductor to be used shall be 3.5mm².

Insulation shall be suitable for wet and dry location, fungi resistant and ultraviolet stable.

All conductors shall be moisture and heat resistant, flame retardant polyvinyl chloride insulation, chemical and abrasion resistant nylon sheath.

The conductor specification shall meet ASTM specification, PNS 35, UL standard 83 and requirements of PEC.

The contractor shall submit catalogues and/or brochures showing details of insulation and ampacity ratings of all types of conductors to be supplied for approval of NPC.

EW-4.4.1 Conductor Installation

Conductors pulled through conduits shall be supported in an approved manner so as to avoid damage to the insulation. Grease or oily substances shall not be used to facilitate the passage of the conductor in conduits.

The pull shall be applied only by means of approved grips and the end portion, which has been marked or deformed by the grip, shall be cut-off by the Contractor.

All cable runs shall be continuous and all termination shall be at the terminal boards, equipment, etc. No splices are allowed in conduit or cable tray.

Prior to installation of conductors, conduits and cable trays shall be thoroughly cleaned to prevent damage to conductors during installation. After conductors have been installed, it shall be tested for continuity and insulation resistance and shall be tagged with respective conductor number.

EW-4.5 Conduit

All embedded and concealed in ceiling conduits, boxes and fitting required for the power and control conductors including all necessary hardware and accessories such as screws, bolts, concrete inserts, clamps, locknuts, couplings shall be furnished by the Contractor. The required quantities of various items of conduits and associated materials shall be furnished in accordance with the installation requirements.

During installation, due precaution shall be taken to protect the conduit and threads from mechanical injury. The ends of the conduit shall be sealed in an approved manner. Conduit runs shall be sealed by the use of caps and discs or plugs. The seals shall be maintained, except during inspection and tests, until the conductor is pulled in. Conduit shall be check to be free from obstructions by pulling a wooden mandrel of appropriate size through the conduit.

Conduits running in floors and terminating at equipment mounted on concrete bases shall be brought up to the equipment within the concrete bases, wherever possible.

All joints between lengths of conduits and threaded connection to boxes, fittings and equipment enclosures shall be made watertight.

Conduits installed outdoors running underground shall be buried to a minimum of 0.6 m.

Non-Metallic Conduits

Non-metallic conduit shall be made of un-plasticized polyvinyl chloride (uPVC) smooth walled inside and outside, colored red-orange, schedule 40.

The uPVC conduits shall be non-corrosive and weatherproof, resistant to the attacks of acids and alkalis and must have a self-extinguishing property hence shall not support combustion. It shall resist corrosion, rust and scale.

EW-4.6 Junction / Utility and Pull Boxes

Junction / Utility Boxes

All junction/utility boxes for concealed work shall be of hot dip galvanized steel or un-plasticized polyvinyl Chloride. All wall boxes on exposed work shall be of aluminum blasted cast iron.

Utility boxes shall be firmly anchored in place and where required provided with fixture supports. The Contractor shall provide special supports for recessed lighting fixtures, etc. Suitable expansion screws shall be used for securing boxes to solid masonry and approved type toggles for securing to hollow masonry units.

Pull Boxes

Pull boxes shall be installed at all necessary points, to prevent damage to the insulation or other damage that might result from pulling resistance or for other reasons related to improper installation. All pull boxes shall be made of galvanized sheet steel not less than 2mm or unplasticized polyvinyl chloride. Where pull boxes are used in connection with exposed conduits, plain covers attached to the pull box with a suitable number of countersunk flathead machine screws may be used.

EW-5.0 MEASUREMENT OF PAYMENT

Measurement of payment for all electrical works shall be based on the bid price of each item as shown in the Bill of Quantities – Electrical Works, Section VII of the Bid Document. The cost of each item shall cover all works required and described in the pertinent provisions of the specifications.

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BILL OF QUANTITIES

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AW – (ARCHITECTURAL WORKS)

SECTION VII - BILL OF QUANTITIES

LuzP21Z1207Sr

ARCHITECTURAL WORKS
MARINAWA DIESEL POWER PLANT

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount (In Figures)
I POWERHOUSE							
A. ROOFING SYSTEM AND BUILDING BLANKETS							
1.	Demolition/Removal of Roofing Sheets (including gutter, uPVC downspout, large caps, sidings, fascia boards and flashings)	Dismantle & Dispose	Refer to NPC TS & Drawing	lot.	1.00	(P _____)	(P _____)
2.	Roofing and Sidings: 2.0mm thick Metallic Plastic long span rib type roofing sheets including stainless steel fasteners, sealants and 2.0 mm thick Metallic plastic end flashing	Furnish and Install	Refer to NPC TS & Drawing	sq.m.	1,388.00	(P _____)	(P _____)
3.	Gutter: 2.0mm thick Metallic Plastic gutter including fasteners sealants, hardware and accessories	Furnish and Install	Refer to NPC TS & Drawing	l.m.	157.00	(P _____)	(P _____)
4.	Ridge Roll: 2.0mm thick Metallic plastic ridge roll including fasteners, sealants, hardware and accessories	Furnish and Install	Refer to NPC TS & Drawing	l.m.	50.00	(P _____)	(P _____)
5.	Facia Board: 1/2' x 12' x 12' Fiber Cement board including steel frame hardware and accessories	Furnish and Install	Refer to NPC TS & Drawing	l.m.	179.00	(P _____)	(P _____)
6.	Downspout: 4" Ø uPVC pipe series 1000 downspout including joint fittings solvents and brackets	Furnish and Install	Refer to NPC TS & Drawing	l.m.	163.00	(P _____)	(P _____)
7.	Roof Drain: Removable stainless wire basket strainer	Furnish and Install	Refer to NPC TS & Drawing	pc.	41.00	(P _____)	(P _____)

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MARINAWA DIESEL POWER PLANT

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount (In Figures)
B FENESTRATION							
1.	Windows: W -1 (900mm x 3650mm) Glass and Aluminum Awning Window, 6mm thick clear glass on anodized aluminum frame	Furnish and Install	Refer to NPC TS & Drawing	set	18.00	_____ (P _____)	_____ (P _____)
II CONFERENCE ROOM (PENTHOUSE)							
A. WALL SYSTEM AND FINISHES							
1.	150m thick (6") CHB Parapet Wall including mortars and reinforcing bars	Furnish and Lay	Refer to NPC TS & Drawing	sq.m.	20.69	_____ (P _____)	_____ (P _____)
2.	Plastering. Plain cement plaster wall finish (Exterior face including parapet wall)	Furnish and Apply	Refer to NPC TS & Drawing	sq.m.	92.00	_____ (P _____)	_____ (P _____)
B. ROOFING SYSTEM AND BUILDING BLANKETS							
1.	Roofings: 2.0mm thick Metallic Plastic rib type roofing sheets including stainless steel fasteners, sealants, and 2.0 mm thick Metallic plastic wall flashing	Furnish and Install	Refer to NPC TS & Drawing	sq.m.	30.00	_____ (P _____)	_____ (P _____)
2.	Gutter: 2.0mm thick Metallic Plastic gutter including fasteners sealants, hardware and accessories	Furnish and Install	Refer to NPC TS & Drawing	l.m.	9.00	_____ (P _____)	_____ (P _____)
3.	Facia Board: 1/2' x 12" x 12' Fiber Cement board including steel frame hardware and accessories	Furnish and Install	Refer to NPC TS & Drawing	l.m.	9.00	_____ (P _____)	_____ (P _____)
4.	Downspout: 4" Ø uPVC pipe series 1000 downspout including joint fittings solvents and brackets	Furnish and Install	Refer to NPC TS & Drawing	l.m.	10.00	_____ (P _____)	_____ (P _____)

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MARINAWA DIESEL POWER PLANT

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount (In Figures)
5.	Roof Drain: Removable stainless wire basket strainer	Furnish and Install	Refer to NPC TS & Drawing	pc.	4.00	_____ (P. _____)	_____ (P. _____)
C. FENESTRATION							
1.	D-1 (800mm X 2100mm) Flush type wooden door, marine plywood both sdes, 2'x5' hard wood jamb, including 3 pairs heavy duty loose pin hinges, fixed louver intake, door knob/ lockset weather proof and painting	Furnish and Install	Refer to NPC TS & Drawing	pc.	1.00	_____ (P. _____)	_____ (P. _____)
D. CEILING SYSTEM							
1.	6mm thk. fiber cement board on 0.5mm thk. metal furring spaced at 0.40 o.c.b.w. 0.5mm thk wall angle and 0.6mm thk. Carrying channel, including hardwares and accessories	Furnish and Install	Refer to NPC TS & Drawing	sq.m.	29.00	_____ (P. _____)	_____ (P. _____)
E. PAINTING							
1.	All Concrete Surfaces (interior and exterior including surface preparation)	Furnish and Apply	Refer to NPC TS & Drawing	sq.m.	87.00	_____ (P. _____)	_____ (P. _____)
III GUARDHOUSE							
A. FENESTRATION							
1.	D-1 (800mm X 2100mm) Flush type wooden door, marine plywood both sdes, 2'x5' hard wood jamb, including 3 pairs heavy duty loose pin hinges, fixed louver intake, door knob/ lockset weather proof and painting	Furnish and Apply	Refer to NPC TS & Drawing	pc.	1.00	_____ (P. _____)	_____ (P. _____)

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ARCHITECTURAL WORKS
MARINAWA DIESEL POWER PLANT

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price In Pesos (Words and Figures)	Total Amount (In Figures)
B. PAINTING							
1.	All Concrete Surfaces	Furnish and Apply	Refer to NPC TS & Drawing	sq.m.	70.00	_____ (P _____)	_____ (P _____)
2.	All Steel Surfaces (including surface preparation)	Furnish and Apply	Refer to NPC TS & Drawing	sq.m.	2.79	_____ (P _____)	_____ (P _____)
IV ENTRANCE GATE							
A. PAINTING							
1.	All Steel Surfaces	Furnish and Apply	Refer to NPC TS & Drawing	sq.m.	25.30	_____ (P _____)	_____ (P _____)
V GARAGE							
A. ROOFING SYSTEM AND BUILDING BLANKETS							
1.	Removal of Dilapidated Corrugated Roofings & Facia Board	Remove and Dispose	Refer to NPC TS & Drawing	lot.	1.00	_____ (P _____)	_____ (P _____)
2.	Roofing Sheets: 0.5mm base metal thickness pre-painted span corrugated-type roofing sheets including stainless steel fasteners and sealants and barge cap flashing	Furnish and Install	Refer to NPC TS & Drawing	sq.m.	57.00	_____ (P _____)	_____ (P _____)
3.	Facia Board: 1/2" x 12" x 12' Fiber Cement board including steel frame hardware and accessories	Furnish and Install	Refer to NPC TS & Drawing	lm.	33.00	_____ (P _____)	_____ (P _____)
4.	Ridge Roll: 0.5mm base metal thickness pre-painted ridge roll including fasteners, sealants, hardware and accessories	Furnish and Install	Refer to NPC TS & Drawing	lm.	11.00	_____ (P _____)	_____ (P _____)

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MARINAWA DIESEL POWER PLANT

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount (In Figures)
B. PAINTING							
1.	All Steel Surfaces (including surface preparation)	Furnish and Apply	Refer to NPC TS & Drawing	sq.m.	9.40	_____ (P _____)	_____ (P _____)
VI WASTE MATERIAL MANAGEMENT FACILITY							
A. ROOFING SYSTEM							
1.	Roofing Sheets: 0.5mm base metal thickness pre-painted long span corrugated-type roofing sheets including stainless steel fasteners, sealants and barge cap flashings	Furnish and Install	Refer to NPC TS & Drawing	sq.m.	75.86	_____ (P _____)	_____ (P _____)
2.	Ridge Roll: 0.5mm base metal thickness pre-painted ridge roll including fasteners, sealants, hardware and accessories	Furnish and Install	Refer to NPC TS & Drawing	lm.	14.60	_____ (P _____)	_____ (P _____)
3.	Facia Board: 1/2" x 12" x 12' Fiber Cement board including steel frame hardware and accessories	Furnish and Install	Refer to NPC TS & Drawing	lm.	34.38	_____ (P _____)	_____ (P _____)
SUB-TOTAL AMOUNT OF BID (ARCHITECTURAL WORKS)						_____	_____
MARINAWA DPP						_____ (P _____)	_____ (P _____)

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SECTION VII

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CW – (CIVIL WORKS)

SECTION VII - BILL OF QUANTITIES

CIVIL WORKS
MARINAWA DIESEL POWER PLANT

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount (In Figures)
CW-1.0 POWERHOUSE							
CW-1.1	Demolition Works (Corroded and damaged steel purlins including cross braces etc.)	Dismantel & Dispose	Refer to NPC TS & Drawing	lot.	1.00	_____ (P _____)	_____ (P _____)
CW-1.2	Purlins (200x75x25x4mm) including stiffener and cleats	Furnish, Fabricate & Install	Refer to NPC TS & Drawing	l.m.	75.00	_____ (P _____)	_____ (P _____)
CW-1.3	Sag Rods (12mm Ø plain round bar)	Furnish and Install	Refer to NPC TS & Drawing	l.m.	22.00	_____ (P _____)	_____ (P _____)
CW-1.4	Cross Bracing w/ Turnbuckle	Furnish and Install	Refer to NPC TS & Drawing	l.m.	50.00	_____ (P _____)	_____ (P _____)
CW-2.0 CONFERENCE ROOM							
CW-2.1	Removal/Demolition of damaged existing conc. parapet	Demolish and Dispose	Refer to NPC TS & Drawing	sq.m.	2.60	_____ (P _____)	_____ (P _____)
CW-2.2	Structural Steel (A36) (Roof Trusses including 6mm gusset plate)	Furnish, Fabricate and Install	Refer to NPC TS & Drawing	kgs.	608.66	_____ (P _____)	_____ (P _____)
CW-2.3	Purlins 100x50x15x2 including stiffeners and cleats	Furnish and Install	Refer to NPC TS & Drawing	l.m.	53.00	_____ (P _____)	_____ (P _____)
CW-2.4	Sag Rods (10 mm Ø plain round bar)	Furnish and Install	Refer to NPC TS & Drawing	l.m.	18.00	_____ (P _____)	_____ (P _____)
CW-2.5	Base Plate (150x150x12mm including expansion bolts)	Furnish, Fabricate and Install	Refer to NPC TS & Drawing	pc.	20.00	_____ (P _____)	_____ (P _____)

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MARINAWA DIESEL POWER PLANT

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount (In Figures)
CW-3.0 GUARD HOUSE							
CW-3.1	Demolition/Removal of Existing Roof Trusses	Remove & Dispose and dispose	Refer to NPC TS & Drawing	lot.	1.00	_____ (P _____)	_____ (P _____)
CW-3.2	Concrete (20.70 Mpa)	Furnish & Place	Refer to NPC TS & Drawing	cu.m	3.75	_____ (P _____)	_____ (P _____)
CW-3.3	Reinforcing Steel Bars (Gr. 275)	Furnish, Schedule, Cut, Bend & Install	Refer to NPC TS & Drawing	kgs.	105.00	_____ (P _____)	_____ (P _____)
CW-4.0 ENTRANCE GATE							
CW-4.1	Repair of Entrance Gate (including damaged foot bolt, square bars, NPC logo)	Remove, Furnish & Install	Refer to NPC TS & Drawing	lot.	1.00	_____ (P _____)	_____ (P _____)
CW-5.0 WASTE MATERIAL MANAGEMENT FACILITY							
CW-5.1	Purlins 65x30x15x2.5 including 30x30x3 cleats	Furnish, fabricate & Install	Refer to NPC TS & Drawing	l.m.	132.00	_____ (P _____)	_____ (P _____)
SUB-TOTAL AMOUNT OF BID (CIVIL WORKS) MARINAWA DPP						_____ (P _____)	_____ (P _____)

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SECTION VII

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MW– (MECHANICAL WORKS)

MECHANICAL WORKS

Item No.	Description of Work or Materials	Work to be Done	Ref. Clause	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount
1.0	AIR CONDITIONING & VENTILATION SYSTEM		MW-4.0				
1.1	Air-conditioning System						
1.1.1	Air conditioning units for Conference Room, 26,500 kJ/hr minimum cooling capacity, inverter split-type, wall mounted, inverter-type, complete with necessary mounting accessories and controls (infrared remote) and other necessary accessories as described in the technical specifications.	Supply, Install and Test		Set	1	_____ (P _____) P _____	
1.2	Ventilating System						
1.2.1	Centrifugal Roof Ventilator for Powerhouse, 20,000m ³ /h, 230V, 1-phase, 60Hz, roof mounted, downblast, direct driven, complete with mounting accessories and controls	Supply, Install and Test		Sets	6	_____ (P _____) P _____	
2.0	LABELS OR TAGGING		MW-4.7				
2.1	Tagging or Labels for Equipment	Supply & Installation		Lot	1	_____ (P _____) P _____	
3.0	PAINTING		MW-4.6				
3.1	Painting for equipment supports including touch-up for factory painted equipment and accessories as described in the technical specifications	Supply & Apply		Lot	1	_____ (P _____) P _____	
TOTAL MECHANICAL WORKS						_____ (P _____) P _____	

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SECTION VII

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EW – (ELECTRICAL WORKS)



SECTION VII - BILL OF QUANTITIES

ELECTRICAL WORKS
MARINAWA DIESEL POWER PLANT

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price In Pesos (Words and Figures)	Total Amount (In Figures)
1.0 Replacement of Lighting Fixtures							
a.	Fixture Type A LED Tube Type Lighting Fixture w/ Louvres 1200mmx600mm zinc phosphated steel sheet housing with mirror finish aluminum reflector, satin finish aluminum louvres and 2x16W LED Tube Lamp	Furnish, Install and Test	EW-TS, TDS & Bid Dwg.	sets	3	_____ (P_____)	_____ (P_____)
b.	Fixture Type B 1 x 9W Cool White, Classic Globe Shape, Frosted finish, E27 Base, Compact LED Lamp	Furnish, Install and Test	EW-TS, TDS & Bid Dwg.	sets	3	_____ (P_____)	_____ (P_____)
c.	Fixture Type C IP20 open type luminaire, with Zinc Phosphated Die-formed Steel Sheet Base and White Powder Coat Paint Finish Complete with 1 X 18W LED tube lamp.	Furnish, Install and Test	EW-TS, TDS & Bid Dwg.	sets	2	_____ (P_____)	_____ (P_____)
2.0 Outlets and Switches Including Plate Cover, Flush-mounted, Grounding Type							
a.	Convenience Outlet, Duplex with Cover, 16 A, 240 V, 1-phase	Furnish, Install and Test	EW-TS, TDS & Bid Dwg.	sets	4	_____ (P_____)	_____ (P_____)
b.	Single Pole Wall Switch, 10 A, 240 V	Furnish, Install and Test	EW-TS, TDS & Bid Dwg.	sets	3	_____ (P_____)	_____ (P_____)
c.	Duplex Wall Switch, 10 A, 240 V	Furnish, Install and Test	EW-TS, TDS & Bid Dwg.	set	1	_____ (P_____)	_____ (P_____)

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ELECTRICAL WORKS
MARINAWA DIESEL POWER PLANT

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount (In Figures)
d.	50AF/30AT, 2-Pole MCCB Safety Circuit Breaker with box for split type ACU	Furnish and Install and Test	EW-TS, TDS & Bid Dwg.	set	1	_____ (P_____)	_____ (P_____)
e.	Boxes, Fittings, and Accessories	Furnish and Install and Test	EW-TS, TDS & Bid Dwg.	lot	1	_____ (P_____)	_____ (P_____)
3.0	Cables (THHN/THWN-2)			lot	1		
a.	5.5 mm ² , 600 V, Heat Resistant Thermoplastic, (THHN/THWN-2), Copper Conductor	Furnish, Lay and Test	EW-TS, TDS & Bid Dwg.			_____ (P_____)	_____ (P_____)
b.	3.5 mm ² , 600 V, Heat Resistant Thermoplastic, (THHN/THWN-2), Copper Conductor	Furnish, Lay and Test	EW-TS, TDS & Bid Dwg.			_____ (P_____)	_____ (P_____)
4.0	Electrical Conduit Including Locknuts & Boxes			lot	1		
a.	20 mmØ uPVC	Furnish and Install and Test	EW-TS, TDS & Bid Dwg.			_____ (P_____)	_____ (P_____)
b.	Boxes, Locknuts, Elbows, and other Fittings	Furnish and Install and Test	EW-TS, TDS & Bid Dwg.			_____ (P_____)	_____ (P_____)
5.0	Dismantling of all Existing Lighting Fixture, Convenience Outlet, Cables and Conduits in Conference Room, Garage & Guard House					_____ (P_____)	_____ (P_____)
SUB-TOTAL AMOUNT OF BID (ELECTRICAL WORKS)						_____ (P_____)	_____ (P_____)
MARINAWA DPP						_____ (P_____)	_____ (P_____)

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SECTION VIII

BIDDING FORMS

SECTION VIII – BIDDING FORMS

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- NPCSF-INFR-13 - Bid Letter
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- NPCSF-INFR-15 - Summary Sheets of Materials Prices, Labor Rates and Equipment Rental Rates

Standard Form No: NPCSF-INFR-01

Checklist of Technical & Financial Envelope Requirements for Bidders

A. THE 1ST ENVELOPE (TECHNICAL COMPONENT) SHALL CONTAIN THE FOLLOWING:

1. ELIGIBILITY DOCUMENTS

a. (CLASS A)

➤ Any of the following:

- PhilGEPS Certificate of Registration and Membership under Platinum Category in accordance with Section 8.5.2 of the IRR;

OR:

- The following updated and valid Class "A" eligibility documents enumerated under "Annex A" of the Platinum Membership:

- Registration Certificate from the Securities and Exchange Commission (SEC) for corporations, Department of Trade and Industry (DTI) for sole proprietorship, or Cooperative Development Authority (CDA) for cooperatives;
- Mayor's/Business permit issued by the city or municipality where the principal place of business of the prospective bidder is located, or the equivalent document for Exclusive Economic Zones or Areas.

In cases of recently expired Mayor's/Business permits, it shall be accepted together with the official receipt as proof that the bidder has applied for renewal within the period prescribed by the concerned local government unit, provided that the renewed permit shall be submitted as a post qualification requirement in accordance with Section 34.2 of the Revised IRR of RA 9184.

- The prospective bidder's audited financial statements, showing, among others, the prospective bidder's total and current assets and liabilities, stamped "received" by the BIR or its duly accredited and authorized institutions, for the preceding calendar year which should not be earlier than two (2) years from the date of bid submission.
- Tax clearance per Executive Order 398, Series of 2005, as finally reviewed and approved by the BIR;
- Valid Philippine Contractors Accreditation Board (PCAB) license and registration for the type and cost of the contract for this Project or Special PCAB License in case of Joint Ventures.

OR:

- A combination thereof.

➤ Statement of all its ongoing government and private contracts if any, whether similar or not similar in nature and complexity to the contract to be bid (NPCSF-INFR-02)

➤ The Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid, and whose value, adjusted to current prices using the Philippine Statistics Authority (PSA) consumer price index, must be at least 50% of the ABC (NPCSF-INFR-03) complete with the following supporting documents:

- Contract
- Owner's Certificate of Final Acceptance issued by the project owner other than the contractor or a final rating of at least Satisfactory in the Constructors Performance Evaluation System (CPES). In case of contracts with the private sector, an equivalent document (Ex. Official Receipt or Sales Invoice) shall be submitted

Standard Form No: NPCSF-INFR-01
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(The Single Largest Completed Contract (SLCC) as declared by the bidder shall be verified and validated to ascertain such completed contract. Hence, bidders must ensure access to sites of such projects/equipment to NPC representatives for verification and validation purposes during post-qualification process.

It shall be a ground for disqualification, if verification and validation cannot be conducted due to inaccessibility of the site for whatever reason or fault of the bidder.)

- Special PCAB License in case of Joint Ventures
- Duly signed computation of its Net Financial Contracting Capacity (NFCC) at least equal to the ABC (NPCSF-INFR-04);

b. (CLASS B)

- Valid Joint Venture Agreement, if applicable (NPCSF-INFR-05)

2. Technical Documents

- Bid Security, any one of the following:
 - Bid Securing Declaration (NPCSF-INFR-06c)
 - OR
 - Cash or Cashier's/Manager's check issued by a Universal or Commercial Bank – 2% of ABC;
 - OR
 - Bank draft/guarantee or irrevocable letter of credit issued by a Universal or Commercial Bank: (NPCSF-INFR-06a) - 2% of ABC;
 - OR
 - Surety Bond callable upon demand issued by a reputable surety or insurance company (NPCSF-INFR-06b) - 5% of ABC, with
 - Certification from the Insurance Commission as authorized company to issue surety
- Duly signed, completely filled-out and notarized Omnibus Sworn statement (Revised) (NPCSF-INFR-07), complete with the following attachments:
 - For Sole Proprietorship:
 - Special Power of Attorney
 - For Partnership/Corporation/Cooperative/Joint Venture:
 - Document showing proof of authorization (e.g., duly notarized Secretary's Certificate, Board/Partnership Resolution, or Special Power of Attorney, whichever is applicable)
- Organization Chart for the project (NPCSF-INFR-08)
- Duly Signed List of Contractor's Key Personnel (based on the minimum key personnel) with complete supporting documents (NPCSF-INFR-09, 10a, 10b & 11)
- Duly Signed List of Contractor's Equipment (owned, leased or under purchase agreement (NPCSF-INFR-12), with
 - Proof of ownership and/or certificate of availability issued by Equipment Lessors
- Complete eligibility documents of proposed sub-contractor, if applicable

Standard Form No: NPCSF-INFR-01
Page 3 of 3

B. THE 2ND ENVELOPE (FINANCIAL COMPONENT) SHALL CONTAIN THE FOLLOWING:

- Duly signed Bid Letter indicating the total bid amount in accordance with the prescribed form (NPCSF-INFR-13)
- Duly signed and completely filled-out Bill of Quantities (Section VII) indicating the unit and total prices per item and the total amount in the prescribed Bill of Quantities form.
- Duly Signed Detailed Estimates for each items of work showing the computations in arriving at each item's unit prices used in coming up with the bid (NPCSF-INFR-14)
- Summary sheets indicating the direct unit prices of construction materials, labor rates and equipment rental rates used in coming up with the bid (NPCSF-INFR-15)

CONDITIONS:

1. *Each Bidder shall submit one copy of the first and second components of its Bid. NPC 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.*
2. *A Bidder not submitting bid for reason that his cost estimate is higher than the ABC, is required to submit his letter of non-participation/regret supported by corresponding detailed estimates. Failure to submit the two (2) documents shall be understood as acts that tend to defeat the purpose of public bidding without valid reason as stated under Section 69.1.(i) of the revised IRR of R.A. 9184.*

Standard Form Number: NPCSF-INFR-03

The Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid

Business Name : _____
Business Address : _____

Name of Contract	a. Owner's Name b. Address c. Telephone Nos.	Nature of Work	Contractor's Role		a.Amount at Award b.Amount at Completion c. Duration	a. Date Awarded b. Contract Effectivity c. Date Completed
			Description	%		

- Notes: 1. The bidder must state only one (1) Single Largest Completed Contract (SLCC) similar to the contract to be bid.
2. Supporting documents such as Contract/Purchase Order and any of the following: Owner's Certificate of Final Acceptance issued by the project owner other than the contractor; or A final rating of at least Satisfactory in the Constructors Performance Evaluation System (CPES); or Official Receipt (O.R); or Sales Invoice for the contract stated above shall be submitted during Bid Opening.

Submitted by _____
(Printed Name & Signature)
Designation : _____
Date : _____

Standard Form Number: NPCSF-INFR-04

NET FINANCIAL CONTRACTING CAPACITY (NFCC)

A. Summary of the Bidder's/Contractor's assets and liabilities on the basis of the income tax return and audited financial statement for the immediately preceding calendar year are:

		Year 20__
1.	Total Assets	
2.	Current Assets	
3.	Total Liabilities	
4.	Current Liabilities	
5.	Net Worth (1-3)	
6.	Net Working Capital (2-4)	

B. The Net Financial Contracting Capacity (NFCC) based on the above data is computed as follows:

NFCC = [(Current assets minus current liabilities) x 15] minus the value of all outstanding or uncompleted portions of the projects under ongoing contracts, including awarded contracts yet to be started coinciding with the contract for this Project.

NFCC = P _____

Herewith attached is certified true copy of the audited financial statement, stamped "RECEIVED" by the BIR or BIR authorized collecting agent for the immediately preceding calendar year.

Submitted by:

Name of Bidder/Contractor

Signature of Authorized Representative

Date : _____

Standard Form Number: NPCSF-INFR-05

JOINT VENTURE AGREEMENT

KNOW ALL MEN BY THESE PRESENTS:

That this JOINT VENTURE AGREEMENT is entered into by and between:
_____, of legal age, (*civil status*) _____, authorized representative of
_____ and a resident of _____.

- and -

_____, of legal age, (*civil status*) _____, authorized representative of
_____ a resident of _____.

That both parties agree to join together their capital, manpower, equipment, and other resources and efforts to enable the Joint Venture to participate in the Bidding and Undertaking of the hereunder stated Contract of the **National Power Corporation**.

NAME OF PROJECT

CONTRACT AMOUNT

That the capital contribution of each member firm:

NAME OF FIRM	CAPITAL CONTRIBUTION
1.	P
2.	P

That both parties agree to be jointly and severally liable for their participation in the Bidding and Undertaking of the said contract.

That both parties agree that _____ and/or _____ shall be the Official Representative/s of the Joint Venture, and are granted full power and authority to do, execute and perform any and all acts necessary and/or to represent the Joint Venture in the Bidding and Undertaking of the said contract, as fully and effectively and the Joint Venture may do and if personally present with full power of substitution and revocation.

That this Joint Venture Agreement shall remain in effect only for the above stated Contract until terminated by both parties.

Name & Signature of Authorized Representative

Official Designation

Name of Firm

Name & Signature of Authorized Representative

Official Designation

Name of Firm

Witnesses

1. _____ 2. _____

[Jurat]

[Format shall be based on the latest Rules on Notarial Practice]

Standard Form Number: NPCSF-INFR-06a

FORM OF BID SECURITY (BANK GUARANTEE)

WHEREAS, (Name of Bidder) (hereinafter called "the Bidder") has submitted his bid dated (Date) for the [name of project] (hereinafter called "the Bid").

KNOW ALL MEN by these presents that We (Name of Bank) of (Name of Country) having our registered office at _____ (hereinafter called "the Bank" are bound unto National Power Corporation (hereinafter called "the Entity") in the sum of [amount in words & figures as prescribed in the bidding documents] for which payment well and truly to be made to the said Entity the Bank binds himself, his successors and assigns by these presents.

SEALED with the Common Seal of the said Bank this _____ day of _____ 20____.

THE CONDITIONS of this obligation are that:

- 1) If the Bidder withdraws his Bid during the period of bid validity specified in the Bidding Documents; or
- 2) If the Bidder does not accept the correction of arithmetical errors of his bid price in accordance with the Instructions to Bidder; or
- 3) If the Bidder, having determined as the LCB, fails or refuses to submit the required tax clearance, latest income and business tax returns and PhilGEPs registration certificate within the prescribed period; or
- 4) If the Bidder having been notified of the acceptance of his bid and award of contract to him by the Entity during the period of bid validity:
 - a) fails or refuses to execute the Contract; or
 - b) fails or refuses to submit the required valid JVA, if applicable; or
 - c) fails or refuses to furnish the Performance Security in accordance with the Instructions to Bidders;

we undertake to pay to the Entity up to the above amount upon receipt of his first written demand, without the Entity having to substantiate its demand, provided that in his demand the Entity will note that the amount claimed by it is due to the occurrence of any one or combination of the four (4) conditions stated above.

The Guarantee will remain in force up to 120 days after the opening of bids or as it may be extended by the Entity, notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this Guarantee should reach the Bank not later than the above date.

DATE _____ SIGNATURE OF THE BANK _____

WITNESS _____ SEAL _____

(Signature, Name and Address)

Standard Form Number: NPCSF-INFR-06b

FORM OF BID SECURITY (SURETY BOND)

BOND NO.: _____ DATE BOND EXECUTED: _____

By this bond, We (Name of Bidder) _____ (hereinafter called "the Principal") and (Name of Surety) _____ of (Name of Country of Surety) _____, authorized to transact business in the Philippines (hereinafter called "the Surety") are held and firmly bound unto National Power Corporation (hereinafter called "the Employer") as Obligee, in the sum of (amount in words & figures as prescribed in the bidding documents), callable on demand, for the payment of which sum, well and truly to be made, we, the said Principal and Surety bind ourselves, our successors and assigns, jointly and severally, firmly by these presents.

SEALED with our seals and dated this _____ day of _____ 20 _____

WHEREAS, the Principal has submitted a written Bid to the Employer dated the _____ day of _____ 20 _____, for the _____ (hereinafter called "the Bid").

NOW, THEREFORE, the conditions of this obligation are:

- 1) if the Bidder withdraws his Bid during the period of bid validity specified in the Bidding Documents; or
- 2) if the Bidder does not accept the correction of arithmetical errors of his bid price in accordance with the Instructions to Bidder; or
- 3) if the Bidder, having determined as the LCB, fails or refuses to submit the required tax clearance, latest income and business tax returns and PhilGEPs registration certificate within the prescribed period; or
- 4) if the Bidder having been notified of the acceptance of his bid and award of contract to him by the Entity during the period of bid validity:
 - d) falls or refuses to execute the Contract; or
 - e) fails or refuses to submit the required valid JVA, if applicable; or
 - f) fails or refuses to furnish the Performance Security in accordance with the Instructions to Bidders;

then this obligation shall remain in full force and effect, otherwise it shall be null and void.

PROVIDED HOWEVER, that the Surety shall not be:

- a) liable for a greater sum than the specified penalty of this bond, nor
- b) liable for a greater sum than the difference between the amount of the said Principal's Bid and the amount of the Bid that is accepted by the Employer.

Standard Form Number: NPCSF-INFR-06b
Page 2 of 2

This Surety executing this instrument hereby agrees that its obligation shall be valid for 120 calendar days after the deadline for submission of Bids as such deadline is stated in the Instructions to Bidders or as it may be extended by the Employer, notice of which extension(s) to the Surety is hereby waived.

PRINCIPAL _____ SURETY _____

SIGNATURE(S) _____ SIGNATURES(S) _____

NAME(S) AND TITLE(S) _____ NAME(S) _____

SEAL _____ SEAL _____

Standard Form No: NPCSF-INFR-06c

REPUBLIC OF THE PHILIPPINES)
CITY OF _____) S.S.

BID-SECURING DECLARATION
REPAIR AND REHABILITATION OF POWERHOUSE, OFFICE BUILDING AND
ASSOCIATED STRUCTURES OF MARINAWA DIESEL POWER PLANT
(LuzP21Z1207Sr)

To: **National Power Corporation**
BIR Road cor. Quezon Ave.
Diliman, Quezon City

I/We¹, the undersigned, declare that:

1. I/We understand that, according to your conditions, bids must be supported by a Bid Security, which may be in the form of a Bid-Securing Declaration.
2. I/We accept that: (a) I/we will be automatically disqualified from bidding for any contract with any procuring entity for a period of two (2) years upon receipt of your Blacklisting Order; and, (b) I/we will pay the applicable fine provided under Section 6 of the Guidelines on the Use of Bid Securing Declaration, within fifteen (15) days from receipt of the written demand by the Procuring Entity for the commission of acts resulting to the enforcement of the Bid Securing Declaration under Sections 23.1 (b), 34.2, 40.1 and 69.1, except 69.1 (f) of the IRR of R.A. 9184; without prejudice to other legal action the government may undertake.
3. I/We understand that this Bid-Securing Declaration shall cease to be valid on the following circumstances:
 - (a) Upon expiration of the bid validity period, or any extension thereof pursuant to your request;
 - (b) I am/we are declared ineligible or post-disqualified upon receipt of your notice to such effect, and (i) I/we failed to timely file a request for reconsideration or (ii) I/we filed a waiver to avail of said right;
 - (c) I am/we are declared as the bidder with the Lowest Calculated and Responsive Bid, and I/we have furnished the performance security and signed the Contract.

IN WITNESS WHEREOF, I/we have hereunto set my hand this ____ day of ____
20____ at _____, Philippines.

[Name and Signature of Bidder's Representative/
Authorized Signatory] [Signatory's legal capacity]
Affiant

[Jurat]
[Format shall be based on the latest Rules on Notarial Practice]

¹ Select one and delete the other. Adopt same instruction for similar terms throughout the document.

Standard Form No: NPCSF-INFR-07

Omnibus Sworn Statement (Revised)

REPUBLIC OF THE PHILIPPINES)
CITY/MUNICIPALITY OF _____) S.S.

AFFIDAVIT

I, [Name of Affiant], of legal age, [Civil Status], [Nationality], and residing at [Address of Affiant], after having been duly sworn in accordance with law, do hereby depose and state that:

1. *[Select one, delete the other:]*

[If a sole proprietorship:] I am the sole proprietor or authorized representative of [Name of Bidder] with office address at [address of Bidder];

[If a partnership, corporation, cooperative, or joint venture:] I am the duly authorized and designated representative of [Name of Bidder] with office address at [address of Bidder];

2. *[Select one, delete the other:]*

[If a sole proprietorship:] As the owner and sole proprietor, or authorized representative of [Name of Bidder], I have full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for [Name of the Project] of the [Name of the Procuring Entity], as shown in the attached duly notarized Special Power of Attorney;

[If a partnership, corporation, cooperative, or joint venture:] I am granted full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for [Name of the Project] of the [Name of the Procuring Entity], as shown in the attached [state title of attached document showing proof of authorization (e.g., duly notarized Secretary's Certificate, Board/Partnership Resolution, or Special Power of Attorney, whichever is applicable)];

3. [Name of Bidder] is not "blacklisted" or barred from bidding by the Government of the Philippines or any of its agencies, offices, corporations, or Local Government Units, foreign government/foreign or international financing institution whose blacklisting rules have been recognized by the Government Procurement Policy Board, by itself or by relation, membership, association, affiliation, or controlling interest with another blacklisted person or entity as defined and provided for in the Uniform Guidelines on Blacklisting;

4. Each of the documents submitted in satisfaction of the bidding requirements is an authentic copy of the original, complete, and all statements and information provided therein are true and correct;

5. [Name of Bidder] is authorizing the Head of the Procuring Entity or its duly authorized representative(s) to verify all the documents submitted;

6. *[Select one, delete the rest:]*

[If a sole proprietorship:] The owner or sole proprietor is not related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

[If a partnership or cooperative:] None of the officers and members of [Name of Bidder] is related to the Head of the Procuring Entity, members of the Bids and Awards Committee

(BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

[If a corporation or joint venture:] None of the officers, directors, and controlling stockholders of *[Name of Bidder]* is related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

7. *[Name of Bidder]* complies with existing labor laws and standards; and
8. *[Name of Bidder]* is aware of and has undertaken the responsibilities as a Bidder in compliance with the Philippine Bidding Documents, which includes:
 - a. Carefully examining all of the Bidding Documents;
 - b. Acknowledging all conditions, local or otherwise, affecting the Implementation of the Contract;
 - c. Making an estimate of the facilities available and needed for the contract to be bid, if any; and
 - d. Inquiring or securing Supplemental/Bid Bulletin(s) issued for the *[Name of the Project]*.
9. *[Name of Bidder]* did not give or pay directly or indirectly, any commission, amount, fee, or any form of consideration, pecuniary or otherwise, to any person or official, personnel or representative of the government in relation to any procurement project or activity.
10. In case advance payment was made or given, failure to perform or deliver any of the obligations and undertakings in the contract shall be sufficient grounds to constitute criminal liability for Swindling (Estafa) or the commission of fraud with unfaithfulness or abuse of confidence through misappropriating or converting any payment received by a person or entity under an obligation involving the duty to deliver certain goods or services, to the prejudice of the public and the government of the Philippines pursuant to Article 315 of Act No. 3815 s. 1930, as amended, or the Revised Penal Code.

IN WITNESS WHEREOF, I have hereunto set my hand this ___ day of ___, 20__ at _____, Philippines.

[Insert NAME OF BIDDER OR ITS AUTHORIZED REPRESENTATIVE]
[Insert signatory's legal capacity]
Affiant

Jurat
[Format shall be based on the latest Rules on Notarial Practice]

Standard Form Number: NPCSF-INFR-08

CONTRACTOR'S ORGANIZATIONAL CHART FOR THE CONTRACT

Submit Copy of the Organizational Chart that the Contractor intends to use to execute the Contract if awarded to him. Indicate in the chart the names of the Project Manager, Project Engineer, Foreman and other Key Engineering Personnel.

Attach the required Proposed Organizational Chart for the Contract as stated above

NOTES:

1. *This organization chart should represent the "Contractor's Organization" required for the Project, and not the organizational chart of the entire firm.*
2. *Each such nominated engineer/key personnel shall comply with and submit duly accomplished forms NPCSF-INFR-10a, NPCSF-INFR-10b and NPCSF-INFR-11.*
3. *All these are required to be in the Technical Envelope of the Bidder.*

Standard Form Number: NPCSF-INFR-09

LIST OF KEY PERSONNEL PROPOSED TO BE ASSIGNED TO THE CONTRACT
(Based on the Minimum Key Personnel Required in the Bidding Documents)

Business Name: _____
Business: _____

	DESIGNATION				
1 Name					
2 Address					
3 Date of Birth					
4 Employed Since					
5 Experience					
6 Previous Employment					
7 Education					
8 PRC License					

Required Attachments:

1. Certificate of Employment, Bio Data and Construction Safety and Health Training Certificate of the Safety Officer
2. Certificate of Employment, Bio Data and valid PRC License of the (professional) personnel
3. Certificate of Employment, Bio Data and accreditation from DPWH as Materials Engineer for the Materials Engineer

Submitted by: _____
(Printed Name & Signature)

Designation: _____
Date: _____

One of the requirements from the bidder to be included in its Technical Envelope is a list of contractor's key personnel (based on the minimum key personnel required in the bidding documents) to be assigned to the contract to be bid, with their complete qualification and experience data (including the key personnel's signed written commitment to work for the project once awarded the contract).

Standard Form Number: NPCSF-INFR-10a

**KEY PERSONNEL'S CERTIFICATE OF EMPLOYMENT
(PROFESSIONAL PERSONNEL)**

Issuance Date

THE PRESIDENT

National Power Corporation
BIR Road cor. Quezon Ave.
Diliman, Quezon City

Dear Sir:

I am (Name of Nominee) a Licensed _____ Engineer with Professional License No. _____ issued on (date of issuance) at (place of issuance).

I hereby certify that (Name of Bidder) has engaged my services as (Designation) for the (Name of Project), if awarded to it.

As (Designation), I supervised the following completed projects similar to the contract under bidding:

NAME OF PROJECT	OWNER	COST	DATE COMPLETED
_____	_____	_____	_____

At present, I am supervising the following projects:

NAME OF PROJECT	OWNER	COST	DATE COMPLETED
_____	_____	_____	_____

In case of my separation for any reason whatsoever from the above-mentioned Contractor, I shall notify the National Power Corporation at least twenty one (21) days before the effective date of my separation.

As (Designation), I know I will have to stay in the job site all the time to supervise and manage the Contract works to the best of my ability, and aware that I am authorized to handle only one (1) contract at a time.

I do not allow the use of my name for the purpose of enabling the above-mentioned Contractor to qualify for the Contract without any firm commitment on my part to assume the post of (Designation) therefor, if the contract is awarded to him since I understand that to do so will be a sufficient ground for my disqualification as (Designation) in any future National Power Corporation bidding or employment with any Contractor doing business with the National Power Corporation.

(Name and Signature)
AFFIANT

[Jurat]

[Format shall be based on the latest Rules on Notarial Practice]

One of the requirements from the bidder to be included in its Technical Envelope is a list of contractor's key personnel (viz. Project Manager, Project Engineer, Construction Safety Officer, Foremen, etc), to be assigned to the contract to be bid, with their complete qualification and experience data (including the key personnel's signed written commitment to work for the project once awarded the contract).

Standard Form Number: NPCSF-INFR-10b

**KEY PERSONNEL'S CERTIFICATE OF EMPLOYMENT
(CONSTRUCTION SAFETY AND HEALTH OFFICER)**

Issuance Date

THE PRESIDENT
National Power Corporation
BIR Road cor. Quezon Ave.
Diliman, Quezon City

Dear Sir:

I am (Name of Nominee) an Construction Safety & Health Officer with Certificate No. _____ issued on (date of issuance) at (place of issuance).

I hereby certify that (Name of Bidder) has engaged my services as Construction Safety & Health Officer for the (Name of Project), if awarded to it.

I am the Construction Safety & Health Officer of the following completed projects similar to the contract under bidding:

NAME OF PROJECT	OWNER	COST	DATE COMPLETED
_____	_____	_____	_____
_____	_____	_____	_____

At present, I am the Construction Safety & Health Officer of the following projects:

NAME OF PROJECT	OWNER	COST	DATE COMPLETED
_____	_____	_____	_____
_____	_____	_____	_____

In case of my separation for any reason whatsoever from the above-mentioned Contractor, I shall notify the National Power Corporation at least twenty one (21) days before the effective date of my separation.

As Construction Safety & Health Officer, I know I will have to stay in the job site all the time and aware that I am authorized to handle only one (1) contract at a time.

I do not allow the use of my name for the purpose of enabling the above-mentioned Contractor to qualify for the Contract without any firm commitment on my part to assume the post of Construction Safety & Health Officer, if the contract is awarded to him since I understand that to do so will be a sufficient ground for my disqualification as Construction Safety & Health Officer in any future National Power Corporation bidding or employment with any Contractor doing business with the National Power Corporation.

(Name and Signature)
AFFIANT

[Jurat]

[Format shall be based on the latest Rules on Notarial Practice]

One of the requirements from the bidder to be included in its Technical Envelope is a list of contractor's key personnel (viz. Project Manager, Project Engineer, Construction Safety Officer, Foremen, etc), to be assigned to the contract to be bid, with their complete qualification and experience data (including the key personnel's signed written commitment to work for the project once awarded the contract).

Standard Form Number: NPCSF-INFR-11

**KEY PERSONNEL
(FORMAT OF BIO-DATA)**

Give the detailed information of the following personnel who are scheduled to be assigned as full-time field staff for the project. Fill up a form for each person.

- 1. Name : _____
- 2. Date of Birth : _____
- 3. Nationality : _____
- 4. Education and Degrees : _____
- 5. Specialty : _____
- 6. Registration : _____
- 7. Length of Service with the Firm : _____ Year from _____ (months) _____ (year)
To _____ (months) _____ (year)
- 8. Years of Experience : _____
- 9. If Item 7 is less than ten (10) years, give name and length of service with previous employers for a ten (10)-year period (attached additional sheet/s), if necessary:

Name and Address of Employer

Length of Service

_____	_____ year(s) from	_____ to
_____	_____ year(s) from	_____ to
_____	_____ year(s) from	_____ to

10. Experience:

This should cover the past ten (10) years of experience. (Attached as many pages as necessary to show involvement of personnel in projects using the format below).

One of the requirements from the bidder to be included in its Technical Envelope is a list of contractor's key personnel (viz. Project Manager, Project Engineer, Construction Safety Officer, Foremen, etc), to be assigned to the contract to be bid, with their complete qualification and experience data (including the key personnel's signed written commitment to work for the project once awarded the contract).

Standard Form Number: NPCSF-INFR-11
Page 2 of 2

- 1. Name : _____
- 2. Name and Address of Owner : _____
- 3. Name and Address of the
Owner's Engineer
(Consultant) : _____
- 4. Indicate the Features of Project
(particulars of the project
components and any other particular
interest connected with the project): _____
- 5. Contract Amount Expressed in
Philippine Currency : _____
- 6. Position : _____
- 7. Structures for which the employee
was responsible : _____
- 8. Assignment Period : from _____ (months) _____ (years)
: to _____ (months) _____ (years)

Name and Signature of Employee

It is hereby certified that the above personnel can be assigned to this project, if the contract is awarded to our company.

(Place and Date)

(The Authorized Representative)

One of the requirements from the bidder to be included in its Technical Envelope is a list of contractor's key personnel (viz. Project Manager, Project Engineer, Construction Safety Officer, Foremen, etc), to be assigned to the contract to be bid, with their complete qualification and experience data (including the key personnel's signed written commitment to work for the project once awarded the contract).

Standard Form Number: NPCSF-INFR-12

LIST OF EQUIPMENT, OWNED OR LEASED AND/OR UNDER PURCHASE AGREEMENTS
(Based on the Minimum Equipment Required in the Bidding Documents)

Business Name: _____
 Business: _____

Description	Model/Year	Capacity / Performance / Size	Plate No.	Motor No. / Body No.	Location	Condition	Proof of Ownership / Lessor or Vendor
A. Owned							
i.							
ii.							
iii.							
iv.							
v.							
B. Leased							
i.							
ii.							
iii.							
iv.							
v.							
C. Under Purchase Agreements							
i.							
ii.							
iii.							
iv.							
v.							

Submitted by: _____
 (Printed Name & Signature)

Designation: _____

Date: _____

One of the requirements from the bidder to be included in its Technical Envelope is the list of its equipment units pledged for the contract to be bid, based on minimum equipment required in the bidding docs. which are owned (supported by proof/s of ownership), leased, and/or under purchase agreements (with corresponding engine numbers, chassis numbers and/or serial numbers), supported by certification of availability of equipment from the equipment lessor/vendor for the duration of the project

Standard Form No. : NPCSF-INFR-13

BID LETTER

Date: _____

To: **THE PRESIDENT**
National Power Corporation
BIR Road cor. Quezon Ave.
Diliman, Quezon City

We, the undersigned, declare that:

- (a) We have examined and have no reservation to the Bidding Documents, including Addenda, for the Contract **REPAIR AND REHABILITATION OF POWERHOUSE, OFFICE BUILDING AND ASSOCIATED STRUCTURES OF MARINAWA DIESEL POWER PLANT (LuzP21Z1207Sr)**.
- (b) We offer to execute the Works for this Contract in accordance with the Bid Documents, Technical Specifications, General and Special Conditions of Contract accompanying this Bid;

The total price of our Bid, excluding any discounts offered below is: insert information _____;

The discounts offered and the methodology for their application are: insert information _____;

- (c) Our Bid shall be valid for a period of insert number _____ days from the date fixed for the Bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
- (d) If our Bid is accepted, we commit to obtain a Performance Security in the amount of insert percentage amount _____ percent of the Contract Price for the due performance of the Contract;
- (e) Our firm, including any subcontractors or suppliers for any part of the Contract, have nationalities from the following eligible countries: insert information _____;
- (f) We are not participating, as Bidders, in more than one Bid in this bidding process, other than alternative offers in accordance with the Bidding Documents;
- (g) Our firm, its affiliates or subsidiaries, including any subcontractors or suppliers for any part of the Contract, has not been declared ineligible by the Funding Source;
- (h) We understand that this Bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal Contract is prepared and executed; and
- (i) We understand that you are not bound to accept the Lowest Calculated Bid or any other Bid that you may receive.

- (j) We likewise certify/confirm that the undersigned, is the duly authorized representative of the bidder, and granted full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for the **REPAIR AND REHABILITATION OF POWERHOUSE, OFFICE BUILDING AND ASSOCIATED STRUCTURES OF MARINAWA DIESEL POWER PLANT (LuzP21Z1207Sr)** of the National Power Corporation.

- (k) We acknowledge that failure to sign each and every page of this Bid Letter, including the Bill of Quantities, shall be a ground for the rejection of our bid.

Name: _____

In the capacity of: _____

Signed: _____

Duly authorized to sign the Bid for and on behalf of: _____

Date: _____

Standard Form No. : NPCSF-INFR-15

SUMMARY SHEETS OF MATERIALS PRICES, LABOR RATES AND EQUIPMENT RENTAL RATES

Name of Bidder : _____

I. Unit Prices of Materials

Materials Description	Unit	Unit Price
1.		
2.		
3.		
4.		
5.		
6.		
7.		

II. Manpower Hourly Rates

Designation	Rate/Hr.
1.	
2.	
3.	
4.	
5.	
6.	
7.	

III. Equipment Hourly Rental Rates

Equipment Description	Rental Rate/Hr.
1.	
2.	
3.	
4.	
5.	
6.	
7.	

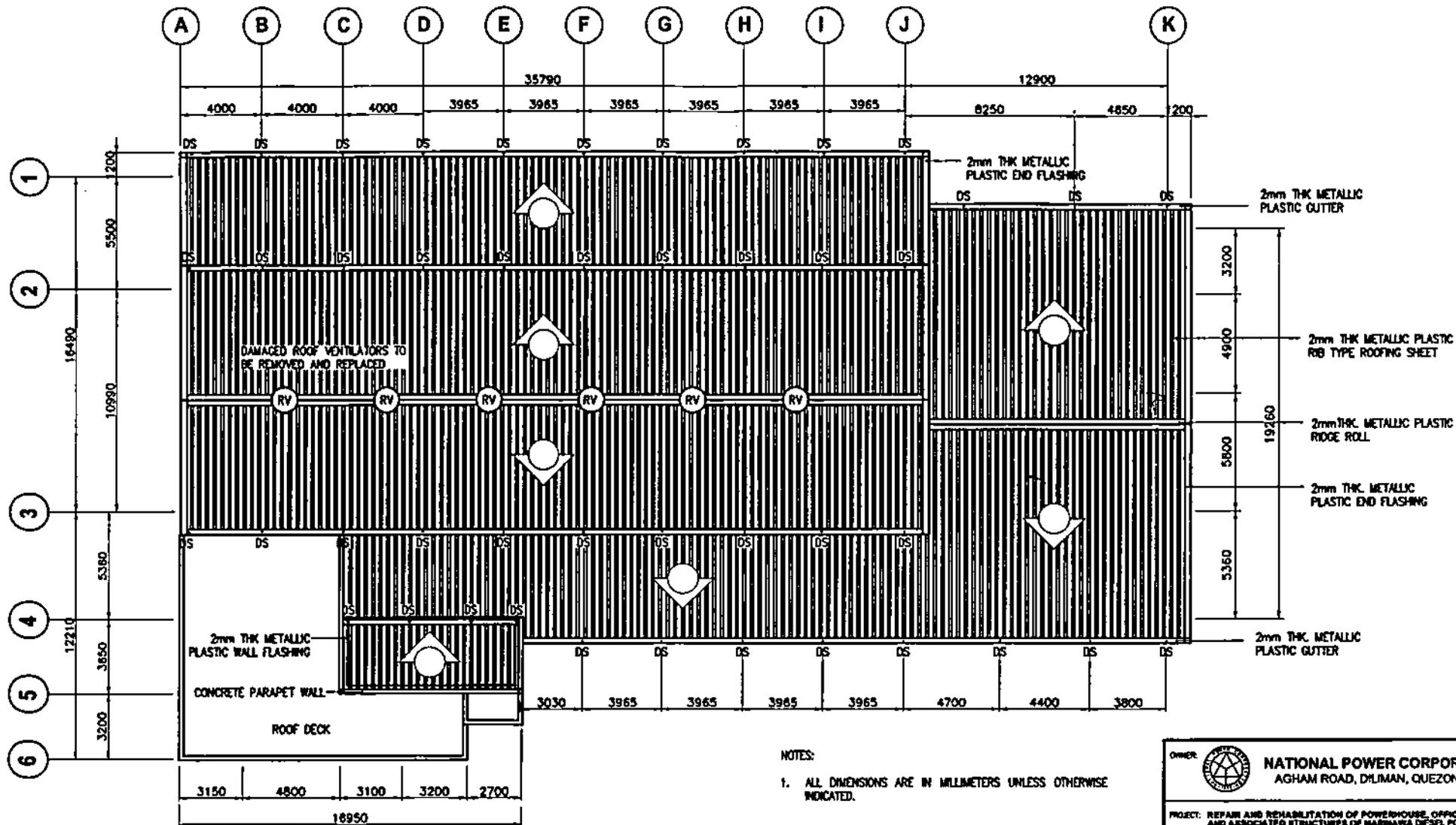
Name, Signature of Authorized Representative

Designation

SECTION IX – BID DRAWINGS**AW – ARCHITECTURAL WORKS**

DRAWING NO.	TITLE
MWAP-BDA-17.001	Roof Plan (POWERHOUSE)
MWAP-BDA-17.002	Roof Plan (GUARDHOUSE AND CONFERENCE ROOM)
MWAP-BDA-17.003	Floor Plan (GARAGE, CONFERENCE ROOM & GUARDHOUSE)
MWAP-BDA-17.004	Conference Room (ELEVATIONS)
MWAP-BDA-17.005	Elevation and Framing Plan (WASTE MATERIAL MANAGEMENT FACILITY)
MWAP-BDA-17.006	Existing Garage (ELEVATIONS)
MWAP-BDA-17.007	Guardhouse (ELEVATIONS)
MWAP-BDA-17.008	Schedule of Doors and Windows (ELEVATIONS)





NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.

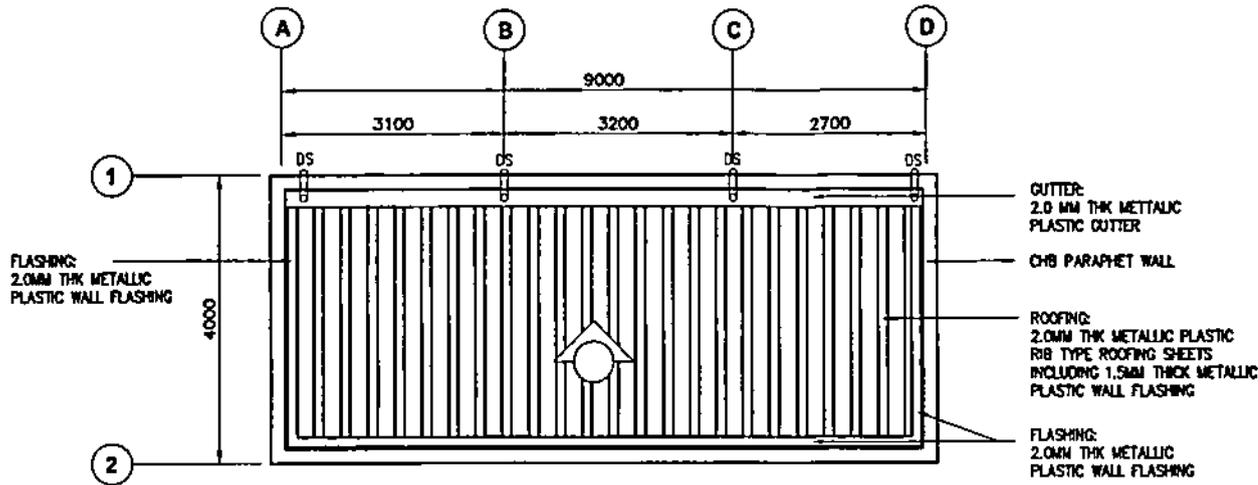
LEGEND:

- DS - DOWNSPOUT
- RV - ROOF VENTILATORS

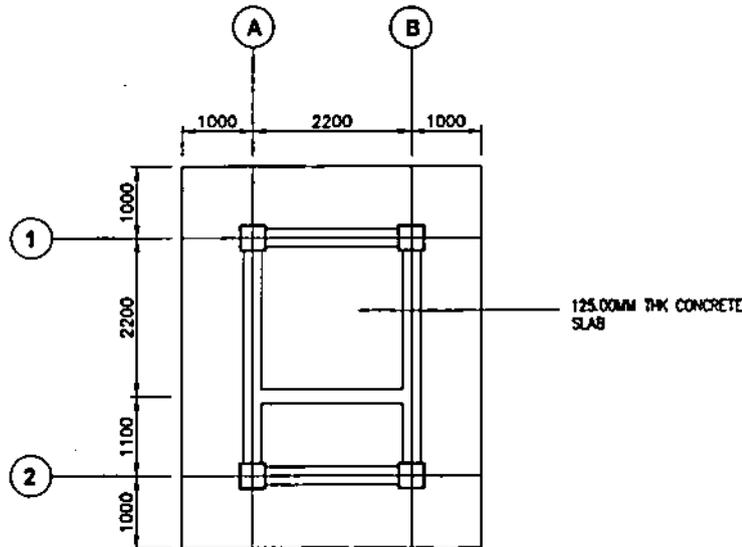
ROOF PLAN
 MWAP-80A-17.001 SCALE 1:200

NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY																																			
PROJECT: REPAIR AND REHABILITATION OF POWERHOUSE, OFFICE BUILDING AND ASSOCIATED STRUCTURES OF MARINA DIESEL POWER PLANT LOCATION: MARINA DIESEL, CANTONMENT																																			
TITLE ROOF PLAN (POWERHOUSE)																																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>DESIGNED</th> <th>BY</th> <th>CHKD</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <th>DRAWN</th> <td> </td> <td> </td> <td> </td> </tr> <tr> <th>REVIEWED</th> <td> </td> <td> </td> <td> </td> </tr> <tr> <th>CHECKED BY</th> <td> </td> <td> </td> <td> </td> </tr> <tr> <th>ELEC.</th> <td> </td> <td> </td> <td> </td> </tr> <tr> <th>MECH.</th> <td> </td> <td> </td> <td> </td> </tr> </table>	DESIGNED	BY	CHKD	DATE					DRAWN				REVIEWED				CHECKED BY				ELEC.				MECH.				<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">SUBMITTED:</td> <td style="text-align: left;"> R. R. VILLANUEVA PRINCIPAL ARCHITECT, C.E.O. </td> </tr> <tr> <td style="text-align: right;">RECOMMENDED:</td> <td style="text-align: left;"> J. JORVINA MANAGER, C.E.O. </td> </tr> <tr> <td style="text-align: right;">APPROVED:</td> <td style="text-align: left;"> G. B. MAGPOC, JR. MANAGER, D.O. </td> </tr> </table>	SUBMITTED:	 R. R. VILLANUEVA PRINCIPAL ARCHITECT, C.E.O.	RECOMMENDED:	 J. JORVINA MANAGER, C.E.O.	APPROVED:	 G. B. MAGPOC, JR. MANAGER, D.O.
DESIGNED	BY	CHKD	DATE																																
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CHECKED BY																																			
ELEC.																																			
MECH.																																			
SUBMITTED:	 R. R. VILLANUEVA PRINCIPAL ARCHITECT, C.E.O.																																		
RECOMMENDED:	 J. JORVINA MANAGER, C.E.O.																																		
APPROVED:	 G. B. MAGPOC, JR. MANAGER, D.O.																																		
DWG. NO. MWAP-80A-17.001 SPEC. NO. LmdP21212079																																			
BID DRAWING																																			

REV.	DATE	NATURE OF REVISION	BY	CHKD.	RECD.	APPD.



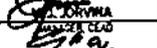
ROOF PLAN @ CONFERENCE ROOM
MWAP-BDA-17.002 SCALE 1:75

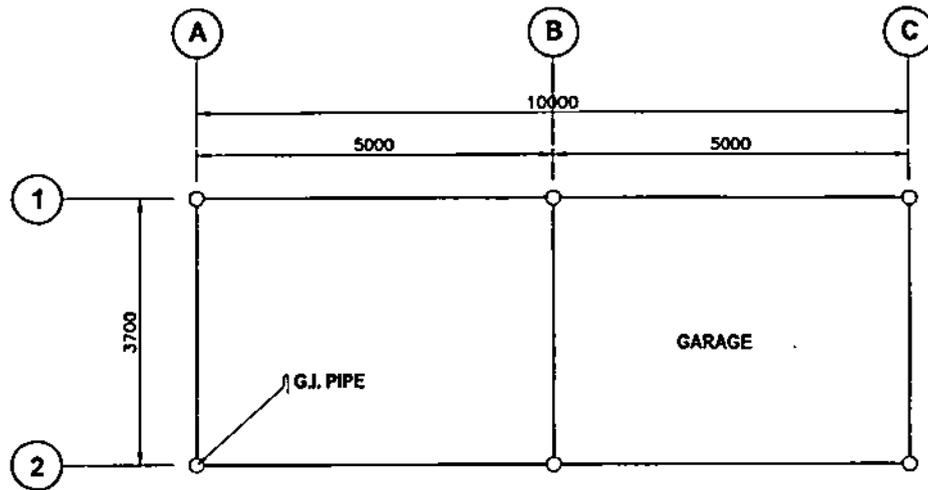


ROOF PLAN @ GUARDHOUSE
MWAP-BDA-17.002 SCALE 1:75

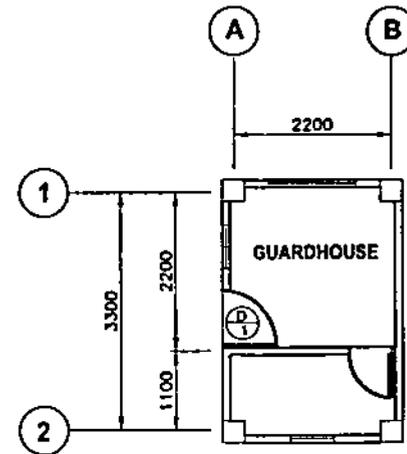
NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
2. MINIMUM COMPRESSIVE STRENGTH OF CONCRETE SHALL BE $f_c=20.70$ MPa AT 28 DAYS PERIOD.
3. ALL ASPECTS OF CONSTRUCTION AND DETAILING OF REINFORCEMENTS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE ACI CODE.

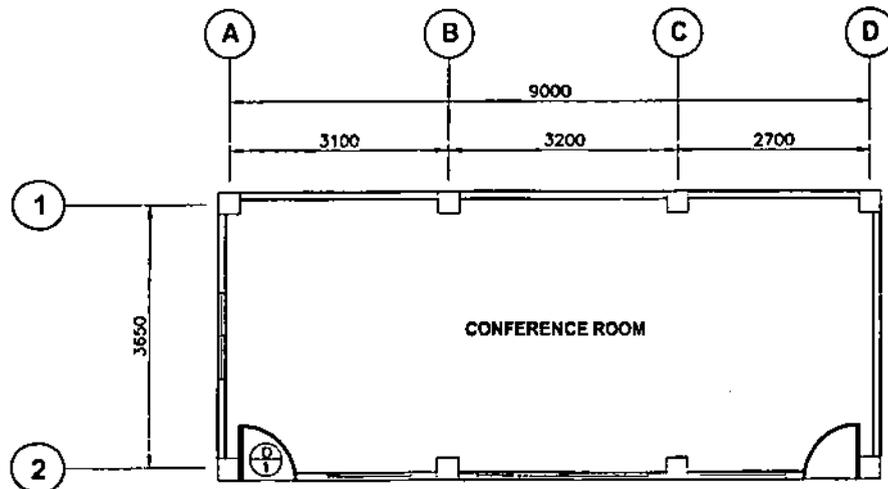
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PROJECT: REPAIR AND REHABILITATION OF POWERHOUSE, OFFICE BUILDING AND ASSOCIATED STRUCTURES OF MARINA DIESEL POWER PLANT											
LOCATION: MARINA, BATO, CATAKUNANES											
TITLE: ROOF PLAN (GUARDHOUSE AND CONFERENCE ROOM)											
DESIGNED	BY	CHKD	DATE	SUBMITTED:							
DRAWN	Draw			BY:	R. R. R. VILLANUEVA ARCHITECT & CEAD						
REVIEWED	PRINCIPAL ENGR. / ARCHT.			RECOMMENDED:							
CHECKED				APPROVED:	G. B. MASPOS, JR. MANAGER, CEAD						
ELEC.				MECH.	MANAGER, MECH.						
DWG. NO. MWAP-BDA-17.002		SPECS. NO. Lu2P21Z120754									
REV.		DATE	NATURE OF REVISION	BY	CHKD	RECD.	APPR.	SCALE: AS SHOWN	BID DRAWING		REV. 0



FLOOR PLAN
MWAP-BDA-17.003 SCALE 1:75



FLOOR PLAN
MWAP-BDC-17.003 SCALE 1:75



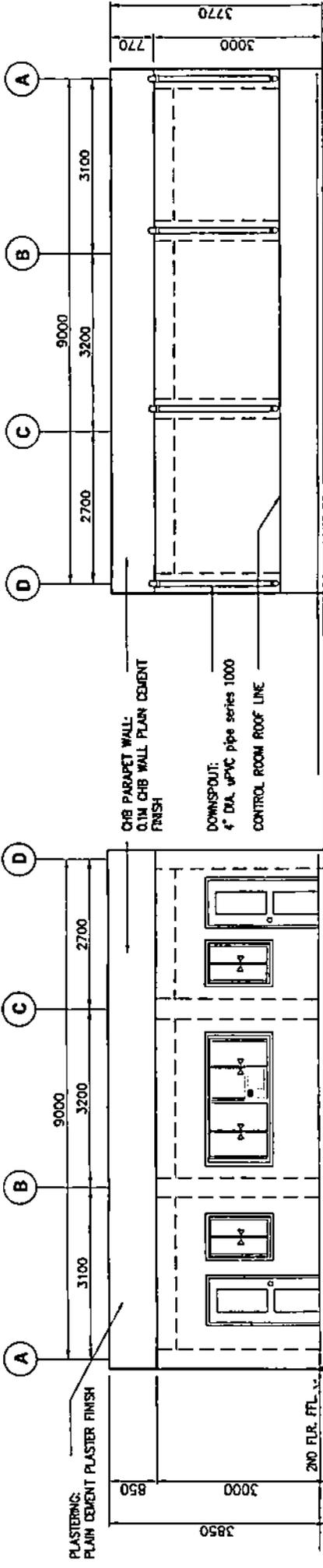
FLOOR PLAN
MWAP-BDA-17.003 SCALE 1:75

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.

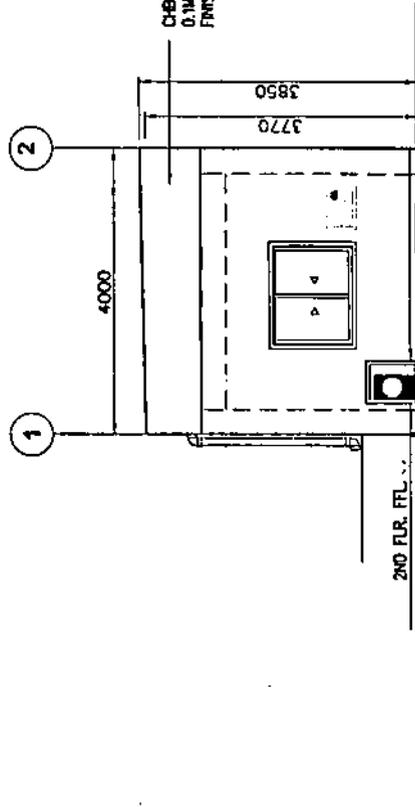
OWNER:		 NATIONAL POWER CORPORATION AGHAM ROAD, DILMAN, QUEZON CITY	
PROJECT: REPAIR AND RENOVATION OF POWERHOUSE, OFFICE BUILDING AND ASSOCIATED STRUCTURES OF MARIKINA DIESEL POWER PLANT			
LOCATION: MARIKINA, BAYO, CANTARLANES			
TITLE: FLOOR PLAN (GARAGE, CONFERENCE ROOM & GUARDHOUSE)			
DESIGNED	BY	CHKD	DATE
DRAWN	BY		
REVIEWED	PRINCIPAL ENGR. / ARCHT.		RECOMMENDED
CHECKED			
ELEC.			APPROVED
MECH.			
DWG. NO. MWAP-BDA-17.003		SPECS. NO. LUP21212075f	
REV. DATE		NATURE OF REVISION	
BY	CHKD	REC'D	APP'D
SCALE: AS SHOWN		BID DRAWING	
			REV. 8

REV.	DATE	NATURE OF REVISION	BY	CHKD	REC'D	APP'D

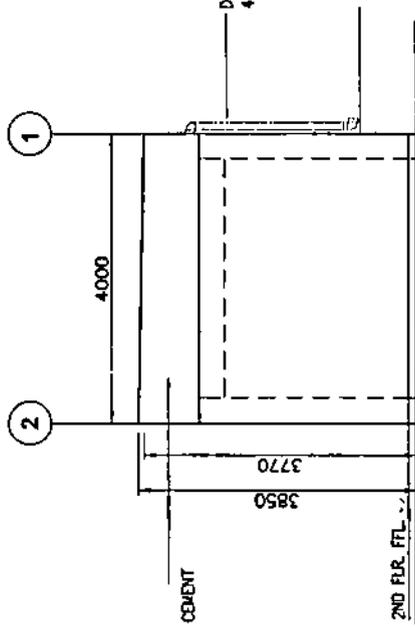


FRONT ELEVATION
 MWAP-BDA-17.004 SCALE 1:75

REAR ELEVATION
 MWAP-BDA-17.004 SCALE 1:75



LEFT SIDE ELEVATION
 MWAP-BDA-17.004 SCALE 1:75



RIGHT SIDE ELEVATION
 MWAP-BDA-17.004 SCALE 1:75

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.



NATIONAL POWER CORPORATION
 AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: REPAIR AND RECONSTRUCTION OF POWERHOUSE OFFICE BUILDING AND ASSOCIATED STRUCTURES OF MANAWA DESER POWER PLANT
LOCATION: MANAWA INTD. DAMBINES

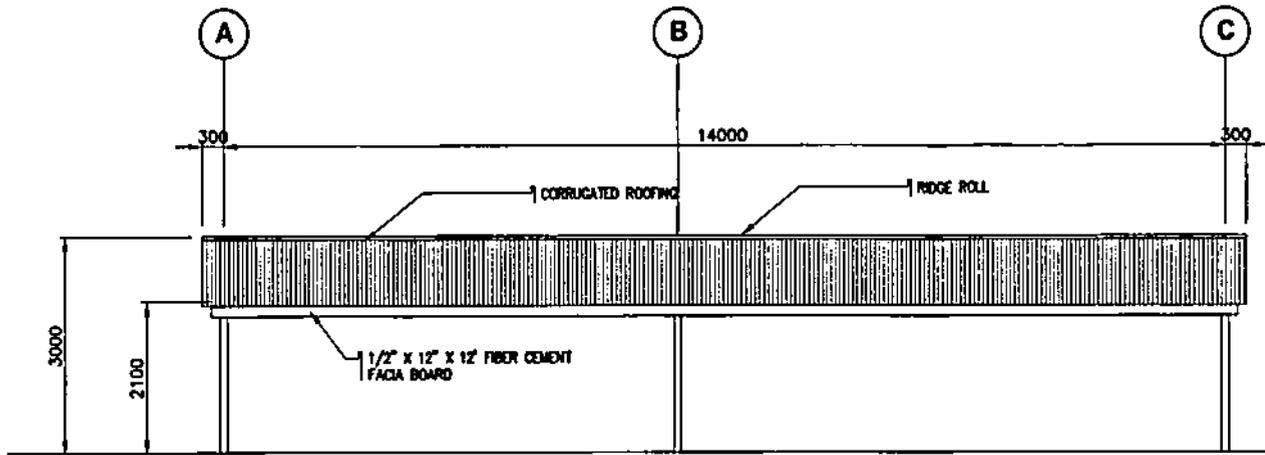
DESIGNED		BY	CHKD	DATE	SUBMITTED	
DESIGNED	BY	CHKD	DATE	DATE	BY	DATE
REVIEWED	BY	CHKD	DATE	DATE	BY	DATE
APPROVED	BY	CHKD	DATE	DATE	BY	DATE
MECH.	BY	CHKD	DATE	DATE	BY	DATE

DWG NO: MWAP-BDA-17.004
SPCS NO: LUP2121207S
SCALE: AS SHOWN
TITLE: CONFERENCE ROOM (ELEVATIONS)

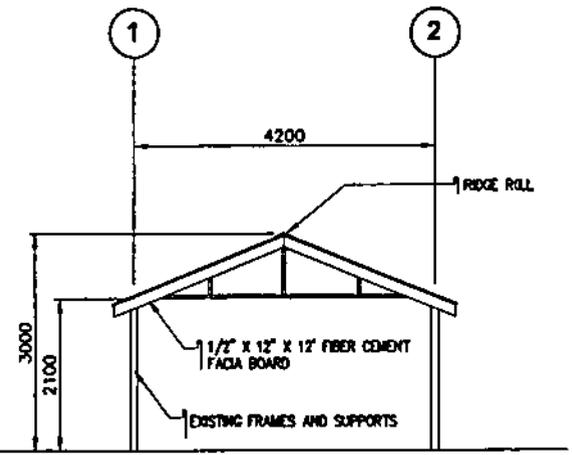
BID DRAWING

REV. 8

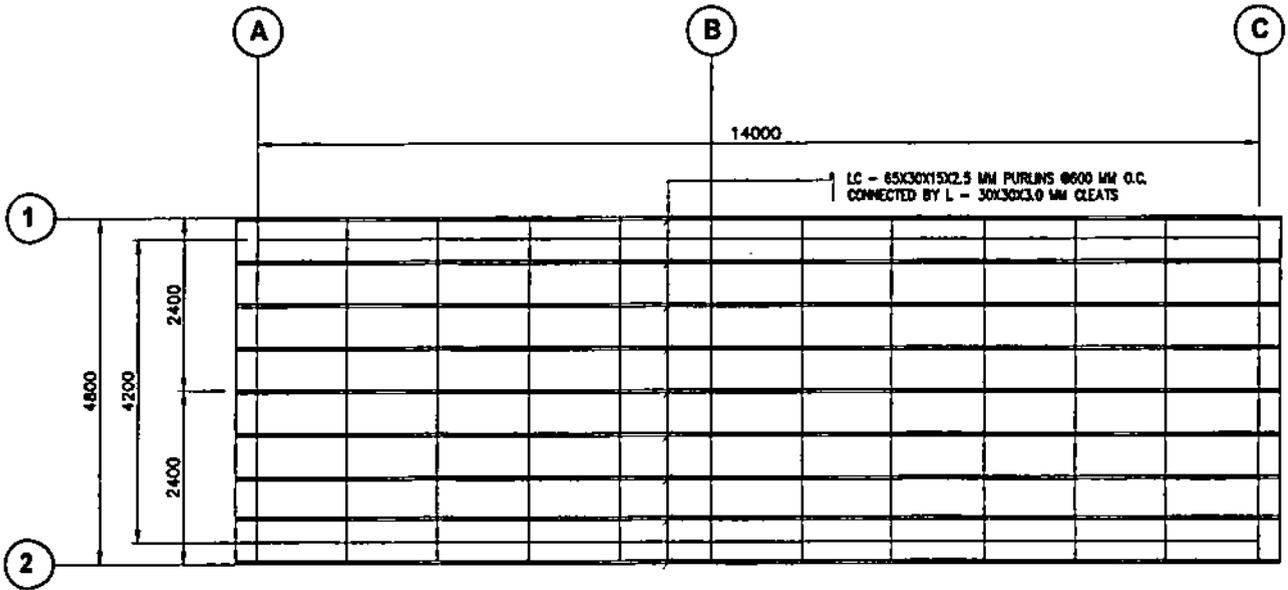
LUP2121207S



SIDE ELEVATION
 MWAP-BDA-17.005 SCALE 1:75



FRONT AND REAR ELEVATION
 MWAP-BDA-17.005 SCALE 1:75



FRAMING PLAN
 MWAP-BDA-17.005 SCALE 1:75

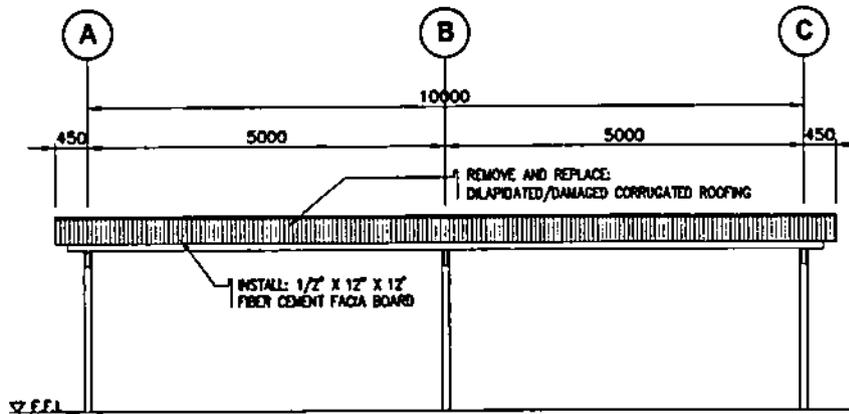
NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.

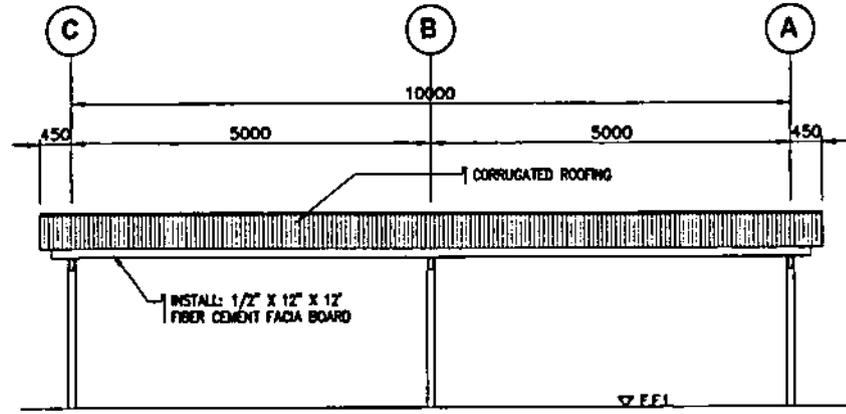
 NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT: REPAIR AND REHABILITATION OF POWERHOUSE, OFFICE BUILDING AND ASSOCIATED STRUCTURES OF BAMBAYNA DIESEL POWER PLANT LOCATION: BAMBAYNA, BATO, CITANDUNEZ	
TITLE: ELEVATIONS AND FRAMING PLAN (WASTE MATERIAL MANAGEMENT FACILITY)	
DESIGNED: DRAWN: REVIEWED: CHECKED: ELEC: MECH:	BY: CHD: DATE: SUBMITTED: RECOMMENDED: APPROVED:
DWG. NO. MWAP-BDA-17.005 SPEC. NO. L22P21Z12075r	
BID DRAWING	

REV.	DATE	NATURE OF REVISION	BY	CHD.	REC'D.	APPL.

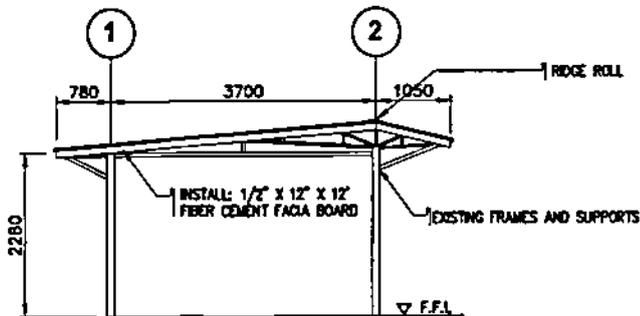
SCALE: AS SHOWN



FRONT ELEVATION
MWAP-BDA-17.006 SCALE 1:75



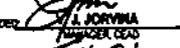
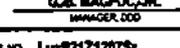
REAR ELEVATION
MWAP-BDA-17.006 SCALE 1:75



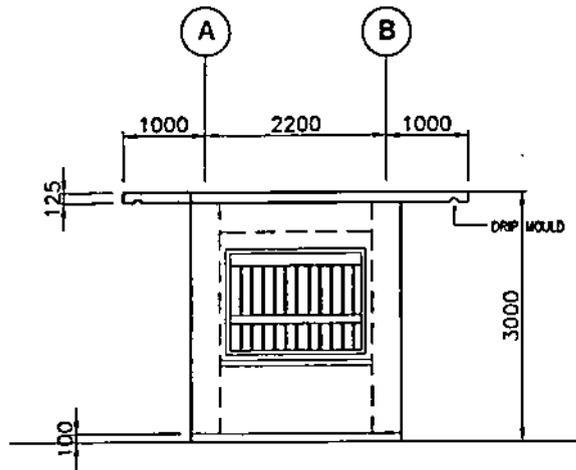
SIDE ELEVATION
MWAP-BDA-17.006 SCALE 1:75

NOTES:

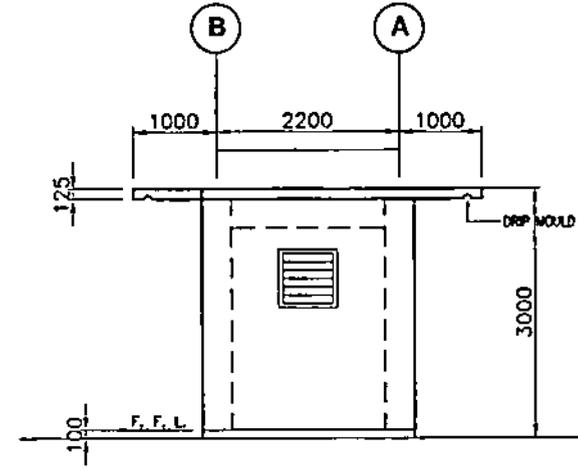
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.

OWNER:				NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT: REPAIR AND REHABILITATION OF POWERHOUSE, OFFICE BUILDING AND ASSOCIATED STRUCTURES OF MARAWA DIESEL POWER PLANT					
LOCATION: MARAWA, BAYO, CANTALUNES					
TITLE: EXISTING GARAGE (ELEVATIONS)					
DESIGNED	BY	CHKD	DATE	SUBMITTED:	
DRAWN	ENR			RECOMMENDED:	
REVIEWED	PRINCIPAL ENGR. / ARCHT.			APPROVED:	
CHECKED					MANAGER, O&D
MECH.					
DWG. NO. MWAP-BDA-17.006			SPECS. NO. LUZP21212075		
SCALE: AS SHOWN			BID DRAWING		REV. 0

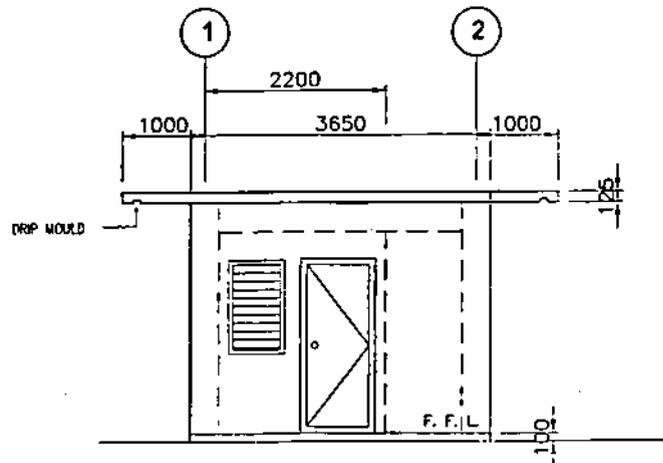
REV.	DATE	NATURE OF REVISION	BY	CHKD.	RECD.	APPD.



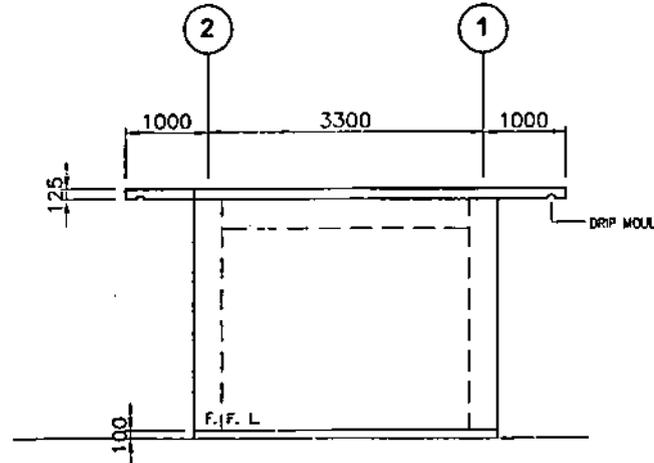
FRONT ELEVATION
MWAP-BDA-17.007 SCALE 1:65



REAR ELEVATION
MWAP-BDA-174.007 SCALE 1:65



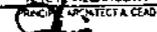
RIGHT SIDE ELEVATION
MWAP-BDA-17.007 SCALE 1:65



LEFT SIDE ELEVATION
MWAP-BDA-17.007 SCALE 1:65

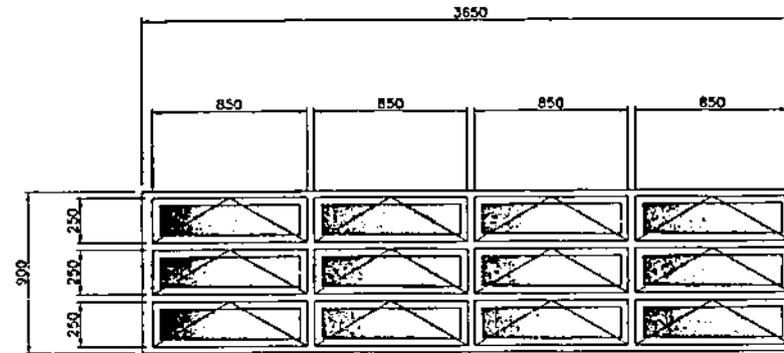
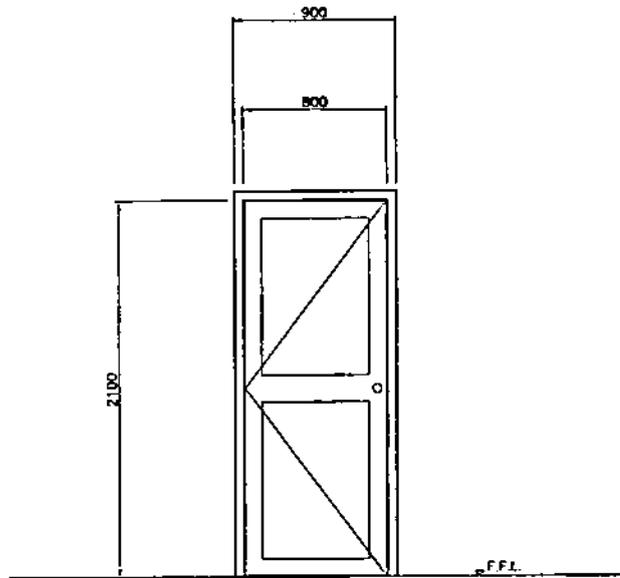
NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.

OWNER:				NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT: REPAIR AND REHABILITATION OF POWERHOUSE, OFFICE BUILDING AND ASSOCIATED STRUCTURES OF MARBANA DIESEL POWER PLANT					
LOCATION: MARBANA BATO, CATANDUANES					
TITLE: GUARDHOUSE (ELEVATIONS)					
DESIGNED	BY	CHKD	DATE	SUBMITTED	
DRAWN	BY			RECOMMENDED	
REVIEWED	PRINCIPAL ENGR. (APPROV.)			APPROVED	
CHECKED					G. B. MAGDOC, JR. MANAGER (07)
DATE					
DWG. NO. MWAP-BDA-17.007				SPECS. NO. LUZP212120754	
SCALE: AS SHOWN				BID DRAWING	
REV.	DATE	NATURE OF REVISION	BY	CHKD.	RECD.

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.



- : FLUSH TYPE WOOD DOOR
- : MARINE PLYWOOD BOTH SIDES
- : 2 x 5 HARD WOOD JAMB
- : 3 PIECES OF HEAVY DUTY LOOSE PIN HINGES
- : ONE SET DOOR KNOB, WEATHERPROOF
- : GLAZED LACQUER PAINT FINISH ON DOOR AND JAMB

(FOR CONFERENCE ROOM & GUARD HOUSE)



- : GLASS AND ALUM. AWNING WINDOW
- : 6 MM THICK CLEAR GLASS ONE WHOLE PIECE PANEL
- : HEAVY GAGE EXTRUDED 50 X 100MM ANODIZED ALUMINUM FRAME
- : HEAVY DUTY MECHANISM (FOR POWERHOUSE)

SCHEDULE OF DOORS AND WINDOWS

MWAP-BDA-17.008 SCALE

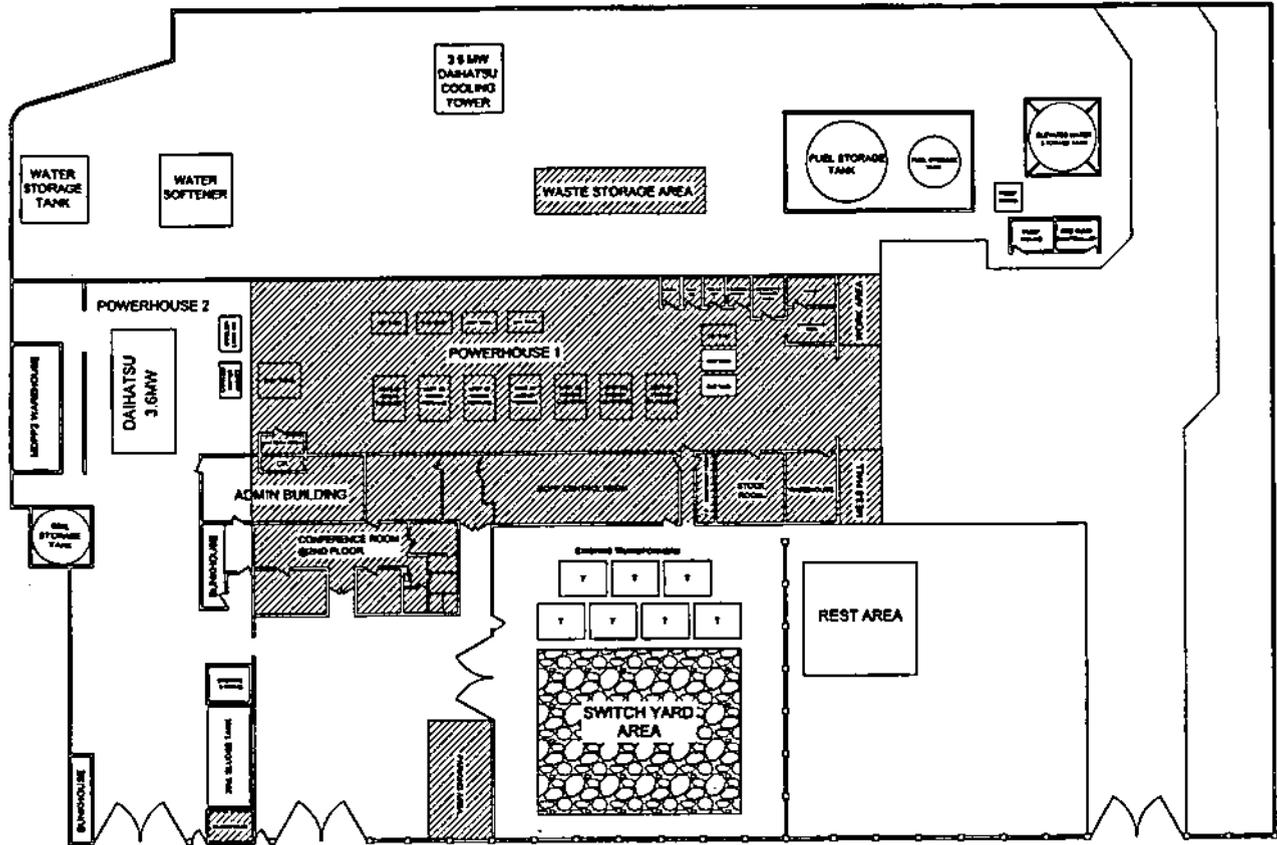
1:30

OWNER		 NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT: REPAIR AND REHABILITATION OF POWERHOUSE, OFFICE BUILDING AND ASSOCIATED STRUCTURES OF MARINAWA DIESEL POWER PLANT			
LOCATION: MARINAWA SATO, CATANDUANES			
TITLE: SCHEDULE OF DOORS AND WINDOWS			
DESIGNED	BY	CHKD	DATE
DRAWN	BY		
REVIEWED	PRINCIPAL ENGR./ARCHT.	RECOMMENDED	
CIVIL/ARCHT		APPROVED	
ELEC.			
MECH.			
DWG NO: MWAP-BDA-17.008		SPEC NO: LUP-212130754	
SCALE: AS SHOWN		BID DRAWING	
REV. DATE		NATURE OF REVISION	
BY	CHKD	RECD.	APPD.
		REV. 0	

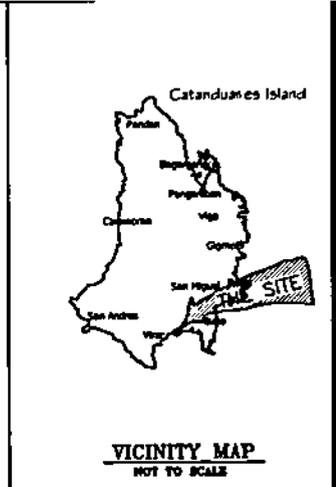
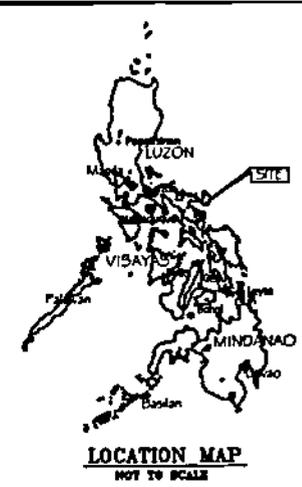
SECTION IX – BID DRAWINGS**CW – CIVIL WORKS**

DRAWING NO.	TITLE
MWAP-BDC-17.001	Site Development Plan
MWAP-BDC-17.002	Typical Beam and Slab Details (GUARDHOUSE)
MWAP-BDC-17.003	Truss and Connection Details (CONFERENCE ROOM)
MWAP-BDC-17.004	Roof Framing Plan (CONFERENCE ROOM AND GUARDHOUSE)
MWAP-BDC-17.005	Typical Steel Truss Details (POWERHOUSE)
MWAP-BDC-17.006	Entrance Gate (DETAILS)






SITE DEVELOPMENT PLAN
 MWAP-EDC-17.001 SCALE NTS



NOTES:

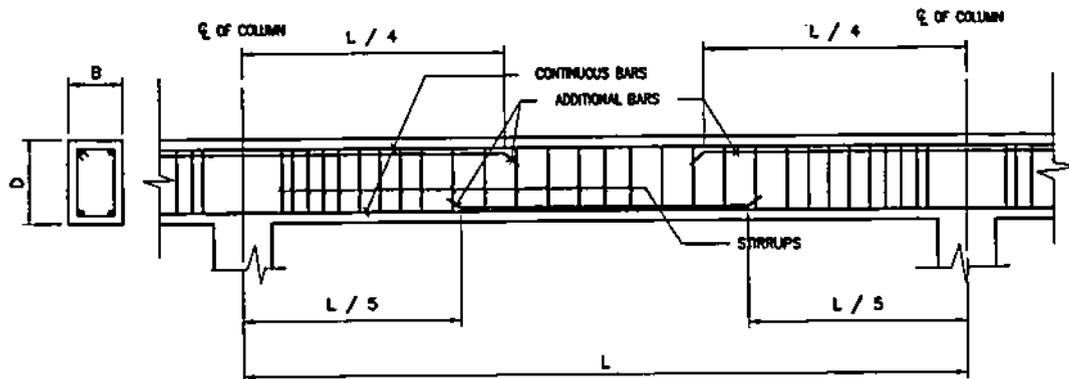
1. THIS DRAWING IS FOR BIDDING PURPOSE ONLY.
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
3. BROCHURES AND SAMPLES OF THE REQUIRED ROOFING MATERIALS SHALL BE SUBMITTED TO NPC FOR APPROVAL PRIOR TO INSTALLATION.

LEGENDS:

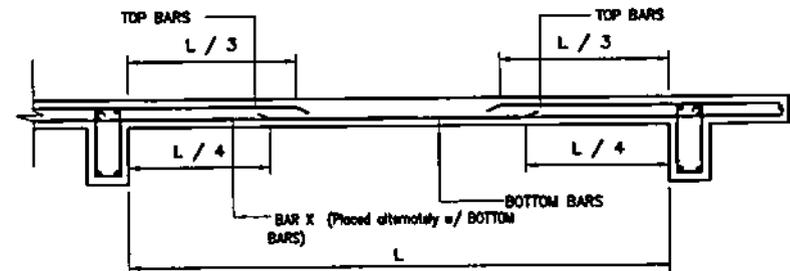
-  - LOCATION OF FACILITIES TO BE REPAIRED AND REHABILITATED
-  - EXISTING EQUIPMENT/STRUCTURES

 NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY																																
PROJECT: REPAIR AND REHABILITATION OF POWERHOUSE, OFFICE BUILDING AND ASSOCIATED STRUCTURES OF MARINA DIESEL POWER PLANT LOCATOR: MARINA, BATO, CATANDUANES																																
TITLE: SITE DEVELOPMENT PLAN																																
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>DESIGNED</th> <th>BY</th> <th>CHKD</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <th>DRAWN</th> <td> </td> <td> </td> <td> </td> </tr> <tr> <th>REVIEWED</th> <td> </td> <td> </td> <td> </td> </tr> <tr> <th>OVERSIGHT</th> <td> </td> <td> </td> <td> </td> </tr> <tr> <th>ELEC.</th> <td> </td> <td> </td> <td> </td> </tr> <tr> <th>MECH.</th> <td> </td> <td> </td> <td> </td> </tr> </table>	DESIGNED	BY	CHKD	DATE					DRAWN				REVIEWED				OVERSIGHT				ELEC.				MECH.				<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td> SUBMITTER:  H. L. MENDOZA <small>PRINCIPAL ENGINEER / CEO</small> </td> </tr> <tr> <td> RECOMMENDED:  J. JORVINA <small>MANAGER / CEO</small> </td> </tr> <tr> <td> APPROVED:  G. B. MAGPOC, JR. <small>MANAGER / CEO</small> </td> </tr> </table>	SUBMITTER:  H. L. MENDOZA <small>PRINCIPAL ENGINEER / CEO</small>	RECOMMENDED:  J. JORVINA <small>MANAGER / CEO</small>	APPROVED:  G. B. MAGPOC, JR. <small>MANAGER / CEO</small>
DESIGNED	BY	CHKD	DATE																													
DRAWN																																
REVIEWED																																
OVERSIGHT																																
ELEC.																																
MECH.																																
SUBMITTER:  H. L. MENDOZA <small>PRINCIPAL ENGINEER / CEO</small>																																
RECOMMENDED:  J. JORVINA <small>MANAGER / CEO</small>																																
APPROVED:  G. B. MAGPOC, JR. <small>MANAGER / CEO</small>																																
DWG. NO. MWAP-EDC-17.001 SPECS. NO. LuzP2122757																																
SCALE: NTS BID DRAWING REV. 0																																

REV.	DATE	NATURE OF REVISION	BY	CHKD.	RECD.	APPD.



TYPICAL BEAM DETAILS
MWAP-BDC-17.002 SCALE 1:100



TYPICAL ROOF SLAB DETAILS
MWAP-BDC-17.002 SCALE 1:100

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETER UNLESS OTHERWISE INDICATED.

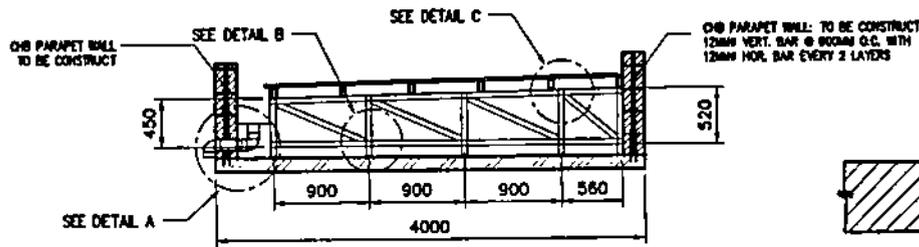
MARK	BEAM DIMENSIONS B x D (MM)	CONTINUOUS BARS		ADDITIONAL BARS			STIRRUPS
		TOP	BOTTOM	L.S.	M.S.	R.S.	
B-1	250 x 350	2-12 mm dia.	2-12 mm dia.	1-12 mm dia.	1-12 mm dia.	1-12 mm dia.	10 mm dia. stirrups spaced @ 1-50 mm, 3-100 mm, 4-125 mm, rest @ 150 o.c. from support to midspan

SCHEDULE OF BEAMS
MWAP-BDC-17.002 SCALE 1:100

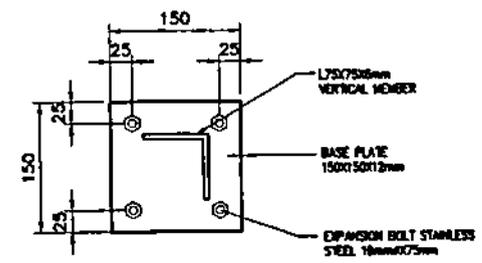
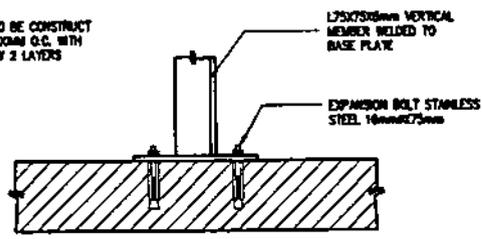
SLAB DESIGNATION	THICKNESS, T (mm)	SPACING OF 10 MM DIA. REINFORCEMENTS (mm)				
		TOP BARS		BOTTOM BARS		BAR X (continuous bars)
		SHORT SPAN	LONG SPAN	SHORT SPAN	LONG SPAN	
S-1	125	250	250	500	500	500
S-2	125	250 (throughout)	250 (throughout)	500	500	500
S-3	125	250 (throughout)	250 (throughout)	500	500	500

SCHEDULE OF ROOF SLAB
MWAP-BDC-17.002 SCALE 1:100

OWNER:		NATIONAL POWER CORPORATION AGHAM ROAD, DILMAN, QUEZON CITY	
PROJECT: REPAIR AND REHABILITATION OF POWERHOUSE, OFFICE BUILDING AND ASSOCIATED STRUCTURES OF MARAPATA DIESEL POWER PLANT			
LOCATION: MARAPATA, BATO, CANTORONES			
TITLE: TYPICAL BEAM AND SLAB DETAILS (GUARDHOUSE)			
DESIGNED	BY	CHKD	DATE
DRAWN	CHKD		
REVIEWED	PRINCIPAL ENGR./ ARCHT.	RECOMMENDED	
CHECKED		APPROVED	
ELEC.			
MECH.			
DWG. NO. MWAP-BDC-17.002		SPECS. NO. LDCP21212973r	
SCALE: AS SHOWN		BID DRAWING	
REV.	DATE	NATURE OF REVISION	BY
			CHKD.
			RECD.
			APPL.
			REV. 0

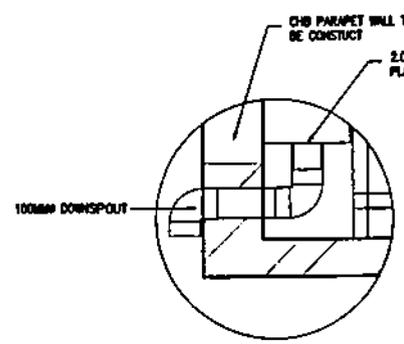


TOP CHORD = 75x75x6mm ANGLE BARS
 BOTTOM CHORD = 75x75x6mm ANGLE BARS
 WEB MEMBERS = 50x50x6mm ANGLE BARS
 PROVIDE 8MM THK GUSSET PLATES FOR ALL STRUCTURAL STEEL JOINTS

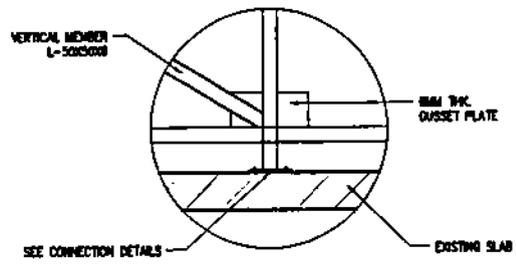


CONNECTION DETAILS
 MWAP-BDC-17.003 SCALE 1:100

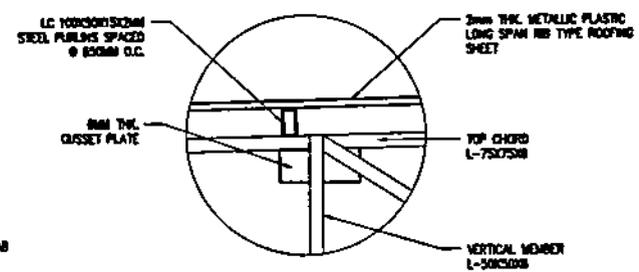
TRUSS DETAILS
 MWAP-BDC-17.003 SCALE 1:100



DETAIL "A"
 MWAP-BDC-17.003 SCALE NTS



DETAIL "B"
 MWAP-BDC-17.003 SCALE NTS



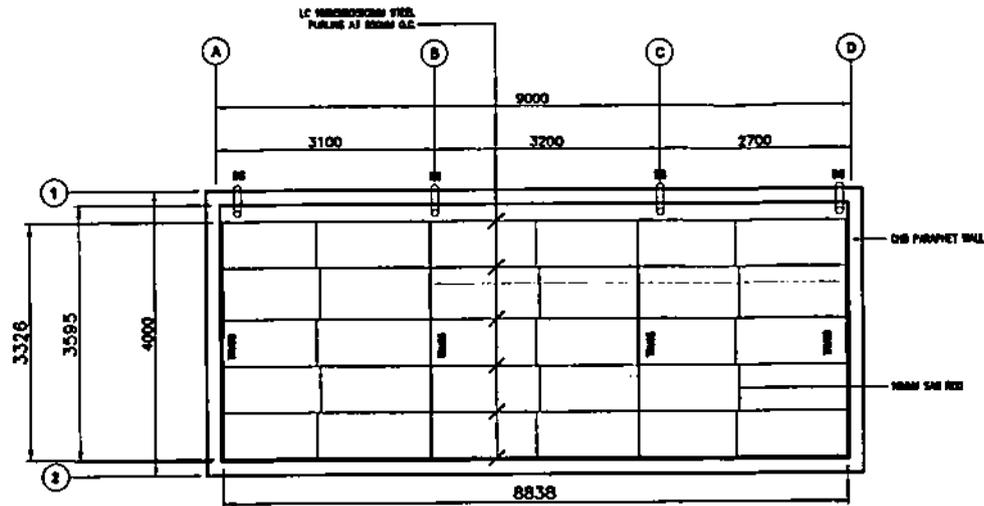
DETAIL "C"
 MWAP-BDC-17.003 SCALE NTS

NOTES:

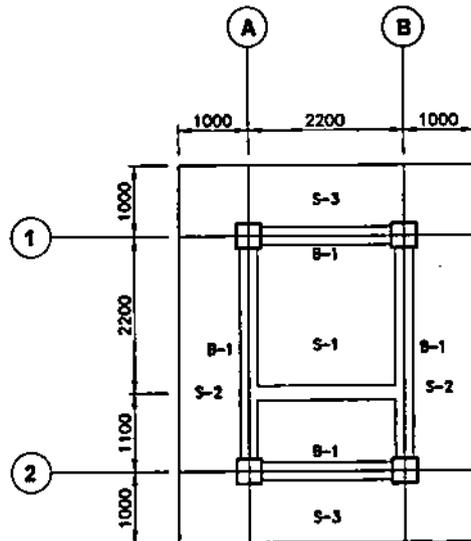
1. ALL DIMENSIONS ARE IN MILLIMETER UNLESS OTHERWISE INDICATED.
2. ALL STEEL SHALL CONFORM TO ASTM A36 STEEL AND TO BE FABRICATED AND ERECTED IN ACCORDANCE WITH NPC SPECS.
3. WELDING SHALL CONFORM TO E80 SERIES OF SPECIFICATIONS FOR MILD STEEL ARC WELDING ELECTRODES.
4. ALL CONNECTION DETAILS SHOWN ARE CONCEPTUAL DESIGN AND OF CONNECTION DETAILS IS THE RESPONSIBILITY OF THE CONTRACTOR.
5. ALL STRUCTURAL STEEL MEMBERS SHALL BE APPLIED WITH RED LEAD PRIMER OR ANY EQUIVALENT BRAND (2 COATS)
6. ALL CONNECTION DETAILS SHOWN ARE CONCEPTUAL DESIGN AND IS THE RESPONSIBILITY OF THE CONTRACTOR.

OWNER: NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT: REPAIR AND REHABILITATION OF POWERHOUSE, OFFICE BUILDING AND ASSOCIATED STRUCTURES OF MARINA DIESEL POWER PLANT	
LOCATION: MARINA, BAY, CANTONMENT	
TITLE: TRUSS AND CONNECTION DETAILS (CONFERENCE ROOM)	
DESIGNED BY: CHD DATE:	SUBMITTED BY: <i>H. L. ENDOZA</i> PRINCIPAL ENGINEER / CHD
DRAWN BY: CHD	RECOMMENDED BY: <i>J. JORVINA</i> MANAGER / CHD
REVIEWED BY: PRINCIPAL ENGR. / ARCHT.	APPROVED BY: <i>[Signature]</i> MANAGER / CHD
CHLAINOYT	
ELEC.	
MECH.	
DWG. NO. MWAP-BDC-17.003	SPECS. NO. LuzP21Z12073r
SCALE: AS SHOWN	BID DRAWING

REV.	DATE	NATURE OF REVISION	BY	CHKD.	RECD.	APPD.



ROOF FRAMING PLAN @ CONFERENCE ROOM
 MWAP-80C-17.004 SCALE 1:75



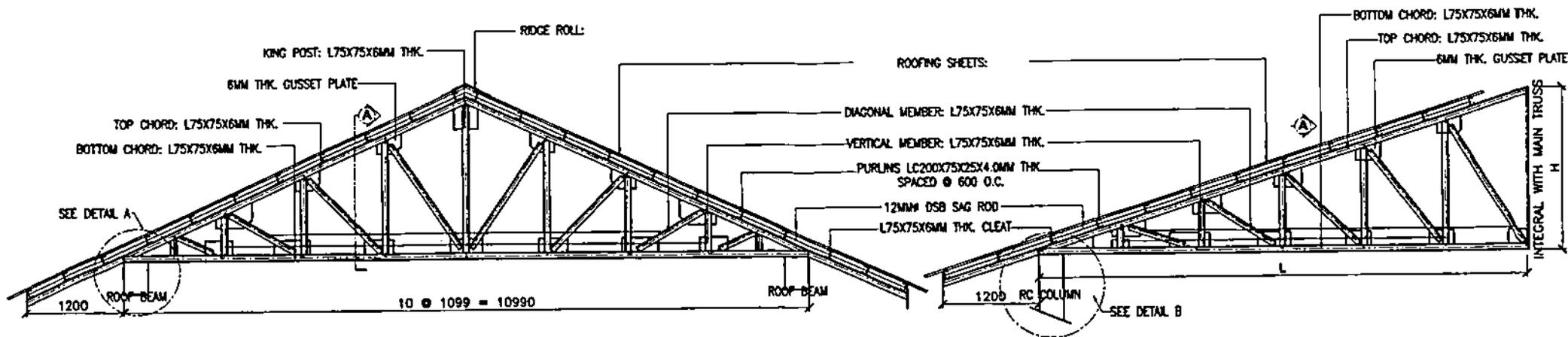
ROOF FRAMING PLAN @ GUARDHOUSE
 MWAP-80C-17.004 SCALE 1:75

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
2. ALL STEEL SHALL CONFORM TO ASTM A36 STEEL AND TO BE FABRICATED AND ERECTED IN ACCORDANCE WITH NPC SPECS.
3. WELDING SHALL CONFORM TO E80 SERIES OF SPECIFICATIONS FOR MILD STEEL ARC WELDING ELECTRODES.
4. ALL CONNECTION DETAILS SHOWN ARE CONCEPTUAL DESIGN AND OF CONNECTION DETAILS IS THE RESPONSIBILITY OF THE CONTRACTOR.
5. ALL STRUCTURAL STEEL MEMBERS SHALL BE APPLIED WITH RED LEAD PRIMER OR ANY EQUIVALENT BRAND (2 COATS).
6. ALL CONNECTION DETAILS SHOWN ARE CONCEPTUAL DESIGN AND IS THE RESPONSIBILITY OF THE CONTRACTOR.

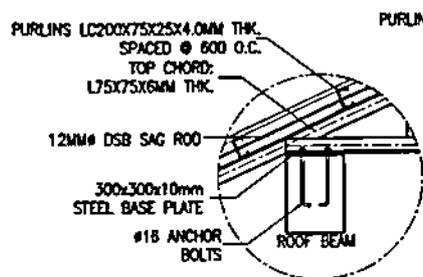
OWNER:		 NATIONAL POWER CORPORATION AGHAM ROAD, DILMAN, QUEZON CITY	
PROJECT: REPAIR AND REHABILITATION OF POWERHOUSE, OFFICE BUILDING AND ASSOCIATED STRUCTURES OF MARINA DIESEL POWER PLANT			
LOCATION: MARINA, BAY, CATAWUNES			
TITLE: ROOF FRAMING PLAN (GUARDHOUSE AND CONFERENCE ROOM)			
DESIGNED	BY	CHKD	DATE
DRAWN	DWDR		
REVIEWED	PRINCIPAL ENGR. / ARCHT.	RECOMMENDED	
CHKD/NOTY		APPROVED	
ELEC.			
MECA			
DWG. NO. MWAP-80C-17.004		SPEC. NO. LUP21212873r	
SCALE: AS SHOWN		BID DRAWING REV. 0	

REV.	DATE	NATURE OF REVISION	BY	CHKD.	RECD.	APPR.

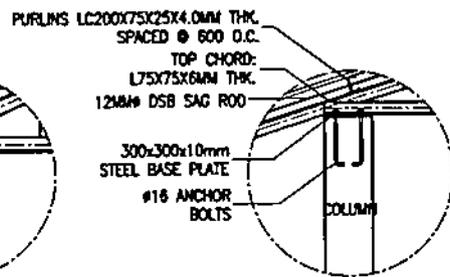


STEEL TRUSS DETAILS
 MWAP-BDC-17.005 SCALE NTS

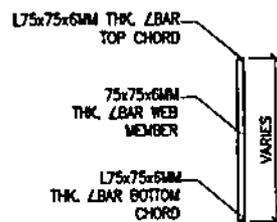
STEEL HALF-TRUSS DETAILS (HT)
 MWAP-BDC-17.005 SCALE 1:50



DETAIL-A
 SCALE 1/4"

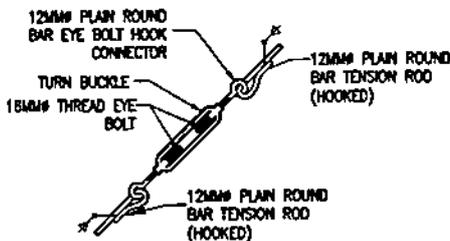


DETAIL-B
 SCALE 1/4"

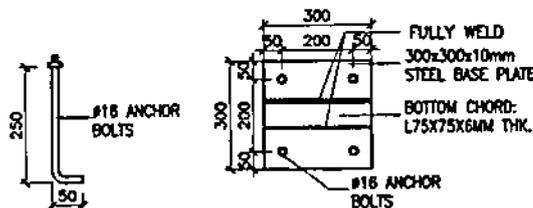


SECTION-A
 SCALE 1/4"

- NOTES:**
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
 2. USE STRUCTURAL GRADE STEEL SHAPES, BARS AND PLATES CONFORMING TO ASTM A36.
 3. WELDING SHALL CONFORM TO E70 SERIES OF SPECIFICATIONS FOR MILD STEEL ARC WELDING ELECTRODES ASTM A233, LATEST EDITION.
 4. ALL ASPECTS OF CONSTRUCTION AND DETAILING SHALL BE IN ACCORDANCE WITH THE PROVISIONS OF ACI CODE.
 5. ALL STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE AISC SPECIFICATIONS AND CODE OF STANDARD PRACTICE.
 6. USE 6MM THK GUSSET PLATE.



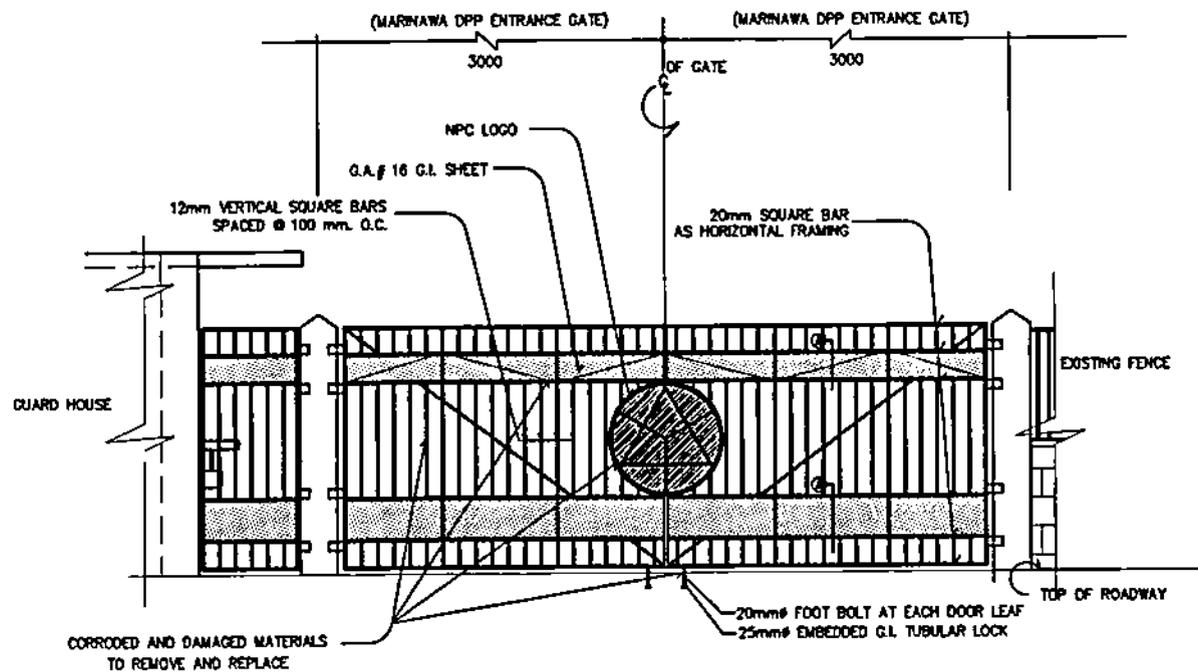
TURNED BUCKLE DETAIL
 MWAP-BDC-17.005 SCALE NTS



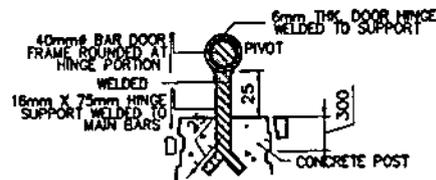
ANCHOR BOLTS LAYOUT
 MWAP-BDC-17.005 SCALE NTS

OWNER:		 NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT:		REPAIR AND REHABILITATION OF POWERHOUSE, OFFICE BUILDING AND ASSOCIATED STRUCTURES OF MARBANA DIESEL POWER PLANT	
LOCATION:		MARBANA, BATO, CITANUNGAN	
TITLE:		TYPICAL STEEL TRUSS DETAILS (POWERHOUSE)	
DESIGNED	BY	CHKD	DATE
DRAWN	DUBB		
REVIEWED	PRINCIPAL ENGR./ARCHT.	RECOMMENDED	
CIVIL/ARCHT			
ELEC.		APPROVED	
MECH.			
DWG NO. MWAP-BDC-17.005		SPEC NO. L12P21212073r	
SCALE: AS SHOWN		BID DRAWING	

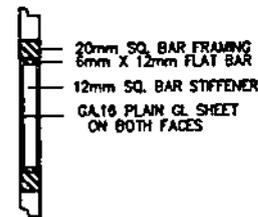
REV.	DATE	NATURE OF REVISION	BY	CHKD	RECD	APPL



ENTRANCE GATE
MWAP-BDC-17.006 SCALE NTS



GATE HINGES
MWAP-BDC-17.006 SCALE NTS



SECTION "A"
MWAP-BDC-17.006 SCALE NTS

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
2. ALL REINFORCING BARS SHALL CONFORM TO THE LATEST REQUIREMENTS OF PHILIPPINE NATIONAL STANDARD FOR DEFORMED STEEL BARS GRADE 275.
3. ALL STEEL SHALL CONFORM TO ASTM A36 STEEL TO BE FABRICATED AND ERECTED IN ACCORDANCE WITH NPC SPECIFICATIONS.
4. WELDING SHALL CONFORM TO E60 SERIES OF THE SPECIFICATIONS FOR MILD STEEL ARC WELDING ELECTRODES.
5. ALL STRUCTURAL STEEL MEMBERS SHALL BE APPLIED WITH RED LEAD PRIMER OR ANY EQUIVALENT BRAND (2 COATS)
6. ALL CONNECTION DETAILS SHOWN IS THE RESPONSIBILITY OF THE CONTRACTOR.

OWNER:		 NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT: REPAIR AND REHABILITATION OF POWERHOUSE, OFFICE BUILDING AND ASSOCIATED STRUCTURES OF MARNAWA DIESEL POWER PLANT			
LOCATION: MARNAWA, BAYO, CATANDUANES			
TITLE:		ENTRANCE GATE (DETAILS)	
DESIGNED	BY	CHKD	DATE
DRAWN	DNM		
REVIEWED	PRINCIPAL ENGR. I. ARCHT.		RECOMMENDED
CHKD/INCHG			
ELEC.			
MECH.			
DWG NO. MWAP-BDC-17.006		SPEC. NO. L12P21Z12075r	
SCALE: AS SHOWN		BID DRAWING REV. 9	

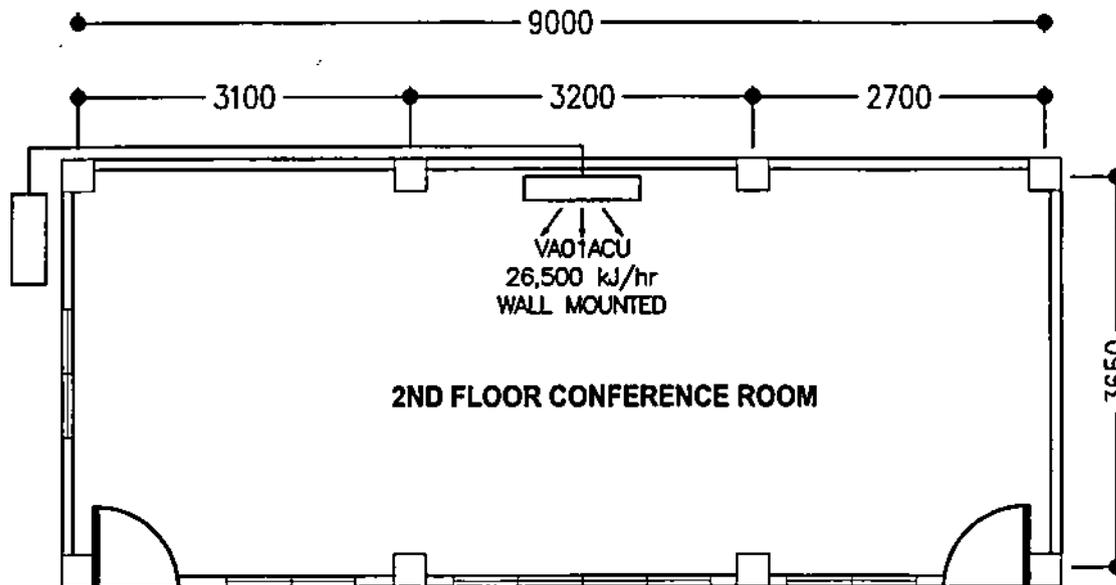
REV.	DATE	NATURE OF REVISION	BY	CHKD	RECD.	APPD.

SECTION IX – BID DRAWINGS

MW- MECHANICAL WORKS

DRAWING NO.	TITLE
MWAP-BDM-17.001	Air Conditioning System (2 nd FLOOR CONFERENCE ROOM)
MWAP-BDM-17.002	Ventilation System (POWERHOUSE)





NOTES:

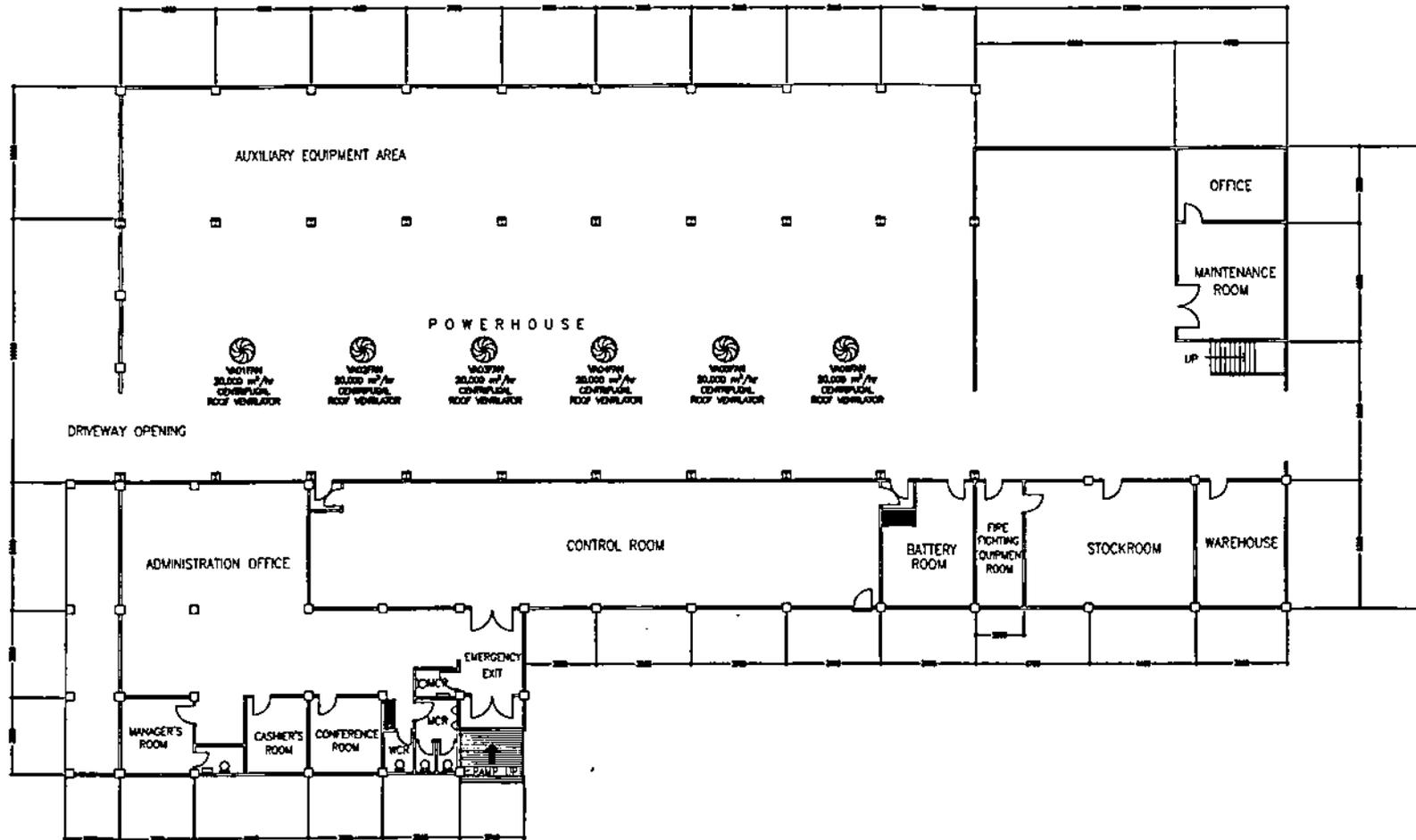
1. THIS DRAWING IS FOR BIDDING PURPOSES ONLY.
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
3. EQUIPMENT TO BE FURNISHED SHALL BE DESIGNED & CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE SPECIFICATIONS & SHALL FIT INTO THE SPACE AVAILABLE WITH PROPER REGARD TO ACCESSIBILITY, PASSAGEWAY, HANDLING AND STRUCTURE LIMITATIONS.
4. ALL WORKS SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE TECHNICAL SPECIFICATIONS.
5. ALL AIRCONDITIONING EQUIPMENT BROCHURES/ CATALOGUES SHALL BE SUBMITTED BY THE CONTRACTOR FOR NPC'S REVIEW AND APPROVAL, PRIOR TO PROCUREMENT/ INSTALLATION.
6. ALL PIPES, CABLES, FITTINGS, AND ANGLE SUPPORTS SHALL BE INSTALLED FOR THE EFFICIENT AND PROPER OPERATION OF THE AIRCONDITIONING SYSTEM.
7. FINAL DETAILS AND ADJUSTMENT SHALL BE DONE IN THE FIELD BY THE CONTRACTOR DURING INSTALLATION TO SUIT ACTUAL SITE CONDITIONS. ALL WORKS SHALL BE EXECUTED IN CLOSE COORDINATION WITH ALL TRADES.

LEGEND:

 - SPLIT INVERTER TYPE AIR CONDITIONING UNIT

OWNER:				NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT REPAIR AND REHABILITATION OF POWERHOUSE, OFFICE BUILDING AND ASSOCIATED STRUCTURES OF MARINAWA DIESEL POWER PLANT LOCATION: MARINAWA, BATO, CATANDUANES					
TITLE: AIR CONDITIONING SYSTEM (2ND FLOOR CONFERENCE ROOM)					
DESIGNED	BY	CHKD	DATE	SUBMITTED: <i>R. M. CRUZAWAN</i>	
DRAWN	LACK			RECOMMENDED: <i>A. N. RODRIGUEZ</i>	
REVIEWED	PRINCIPAL ENGR. / ARCHT.			APPROVED: <i>G. B. MAGPOC, JR.</i>	
CHARACHT				MECH. <i>DOO</i>	
ELEC.					
MECH.					
DWG. NO. MWAP-BDM-17.001				SPEC. NO. LuzP21Z1207Sf	

REV.	DATE	NATURE OF REVISION	BY	CHKD	RECD	APPL



- NOTES:**
1. THIS DRAWING IS FOR BIDDING PURPOSES ONLY.
 2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
 3. EQUIPMENT TO BE FURNISHED SHALL BE DESIGNED & CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE SPECIFICATIONS & SHALL FIT INTO THE SPACE AVAILABLE WITH PROPER REGARD TO ACCESSIBILITY, PASSAGEWAY, HANDLING AND STRUCTURE LIMITATIONS.
 4. ALL WORKS SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE TECHNICAL SPECIFICATIONS.
 5. ALL ROOF VENTILATOR EQUIPMENT BROCHURES/CATALOGUES SHALL BE SUBMITTED BY THE CONTRACTOR FOR NPC'S REVIEW AND APPROVAL, PRIOR TO PROCUREMENT/ INSTALLATION.
 6. FINAL DETAILS AND ADJUSTMENT SHALL BE DONE IN THE FIELD BY THE CONTRACTOR DURING INSTALLATION TO SUIT ACTUAL SITE CONDITIONS. ALL WORKS SHALL BE EXECUTED IN CLOSE COORDINATION WITH ALL TRADES.

LEGEND:
 - CENTRIFUGAL ROOF VENTILATOR

OWNER:		 NATIONAL POWER CORPORATION AGHAM ROAD, DELIMAN, QUEZON CITY	
PROJECT: REPAIR AND RENABILITATION OF POWERHOUSE, OFFICE BUILDING AND ASSOCIATED STRUCTURES OF MARINAWA DIESEL POWER PLANT LOCATION: MARINAWA, BATO, CATANQUANES			
TITLE:		VENTILATION SYSTEM (POWERHOUSE)	
DESIGNED	BY	CHKD	DATE
DRAWN	LACR		
REVIEWED	PRINCIPAL ENGR. / ARCHT.		
ENCL. ARCHT.			
ELEC.			
MESAL			
SUBMITTED:		R. M. CASAWAN	
RECOMMENDED:		A. N. RODRIGUEZ Manager, E&C	
APPROVED:		G. B. MAGPOC, JR. Manager, D&O	
DWG. NO. MWAP-BDM-17.002		SPCS. NO. LUZP21Z1207Sr	
SCALE: 1:200		BID DRAWING	

REV.	DATE	NATURE OF REVISION	BY	CHKD.	RECD.	APPD.

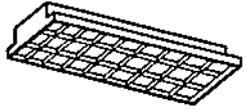
SECTION IX – BID DRAWINGS**EW – ELECTRICAL WORKS**

DRAWING NO.	TITLE
MWAP-BDE-17.001	Details of Lighting Fixtures (CONFERENCE ROOM, GARAGE & GUARDHOUSE)
MWAP-BDE-17.002	Lighting Layout (CONFERENCE ROOM, GARAGE & GUARDHOUSE)
MWAP-BDE-17.003	Power Layout (CONFERENCE ROOM, GARAGE & GUARDHOUSE)



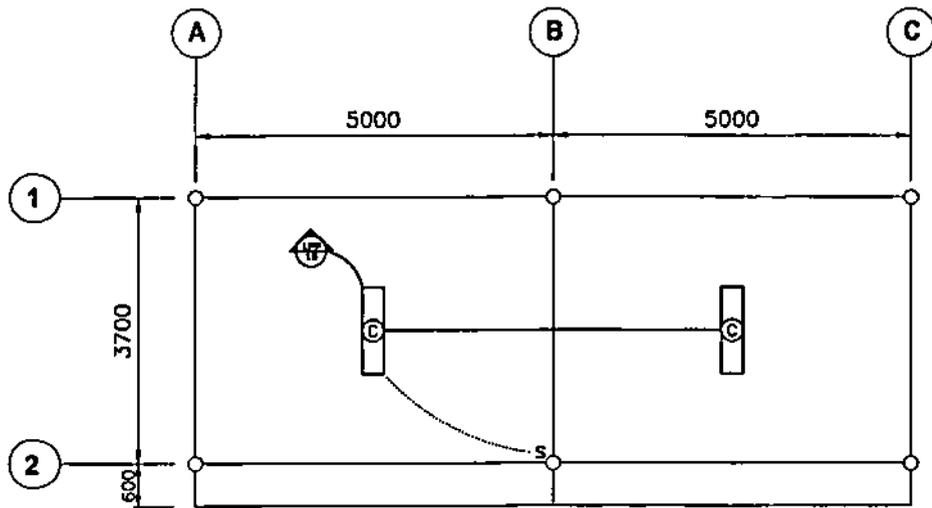
GENERAL NOTES:

1. ALL WORKS SHALL BE DONE IN ACCORDANCE WITH THE LATEST PROVISIONS OF THE PHILIPPINE ELECTRICAL CODE, LAWS AND ORDINANCES OF THE LOCAL CODE ENFORCING AUTHORITIES.
2. POWER SUPPLY SHALL BE SINGLE PHASE, 240 VOLTS, 60 HERTZ, THREE (3) WIRE SYSTEM TO BE PROVIDED BY THE END-USER.
3. METHOD OF WIRING SHALL BE IN uPVC WITH PROPER FITTINGS, DEVICES, BOXES AND SUPPORTS, WORK SHALL BE AS PER PLAN AND SPECIFICATIONS AS TO LOCATION, TYPE AND USE.
4. ALL SWITCHES AND CONVENIENCE OUTLETS SHALL BE FLUSH-MOUNTED 1.37 METERS AND 0.30 METER RESPECTIVELY ABOVE THE FINISHED FLOOR.
5. CONDUIT RUNS ARE INDICATIVE ONLY. THE ACTUAL RUNS SHALL BE DETERMINED IN THE FIELD.
6. WIRES, BOXES, ELECTRICAL AS WELL AS NON-ELECTRICAL MATERIALS NOT INCLUDED IN THE PLANS AND SPECIFICATION BUT NECESSARY TO COMPLETE THE JOB SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
7. ALL ELECTRICAL MATERIALS TO BE USED IN THE INSTALLATION SHALL BE NEW, STANDARD AND APPROVED TYPE AS TO LOCATION, TYPES AND PURPOSE.
8. MINIMUM SIZE OF CONDUCTOR TO BE USED SHALL BE 3.5 mm² THWN IN 20 mm ϕ uPVC, SCH.40 CONDUIT UNLESS OTHERWISE SPECIFIED IN THE PLAN.
9. ELECTRICAL WORKS SHALL BE DONE UNDER THE DIRECT SUPERVISION OF A DULY LICENSED ELECTRICAL ENGINEER.
10. ALL LIGHTING AND POWER CIRCUIT SHALL BE CONNECTED TO EXISTING LIGHT AND POWER PANELBOARD.
11. AIR CONDITIONING UNIT SAFETY CIRCUIT BREAKER SHALL BE CONNECTED TO EXISTING AIR CONDITIONING PANELBOARD.

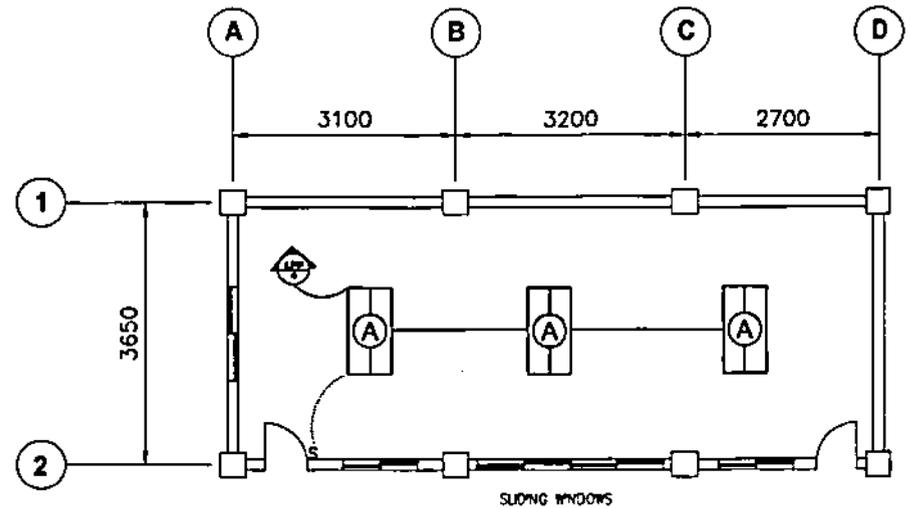
<p>A INDOOR</p> 	<p>B</p> 
<p>LED LIGHTING FIXTURE, WITH MIRROR FINISHED ALUMINUM REFLECTORS, RECESS TYPE WITH 3 x 18 W LAMP HIGH OUTPUT LED LAMP TUBE LUMINAIRE. APPLICABLE AREA: CONTROL AND STATION AUXILIARY ROOMS, OFFICE AND FOYER</p>	<p>1 x 9 WATTS COOL WHITE, CLASSIC GLOBE SHAPE, FROSTED FINISH, E27 BASE, COMPACT LED LAMP APPLICABLE AREAS: GUARDHOUSE, TOILET, PUMPHOUSE</p>
<p>C</p> 	
<p>IP20 OPEN TYPE LUMINAIRE WITH ZINC PHOSPHATED DIE-FORMED STEEL SHEET BASE AND WHITE POWDER COAT PAINT FINISH COMPLETE WITH 1 x 18 WATTS LED TUBE LAMP. APPLICABLE AREA: GARAGE</p>	

DETAILS OF LIGHTING FIXTURES

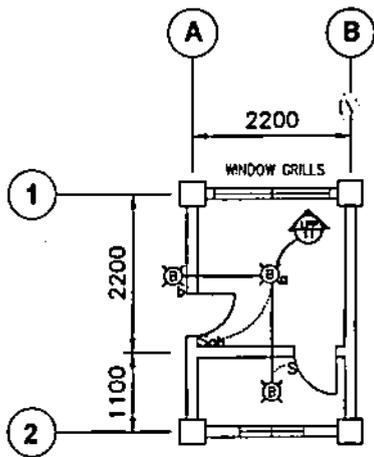
OWNER:				NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT: REPAIR AND RENOVATION OF POWERHOUSE, OFFICE BUILDING AND ASSOCIATED STRUCTURES OF MARINAHA DIESEL POWER PLANT					
LOCATION: MARINAHA, BATO, CATANDUANES					
TITLE: GUARDHOUSE, GARAGE & CONFERENCE ROOM					
DESIGNED	BY	CHKD	DATE	SUBMITTED	<i>[Signature]</i> S. M. ACUÑA MANAGER EECO
DRAWN	GW			RECOMMENDED	A. S. CANDELARIA II MANAGER EECO
REVIEWED	PRINCIPAL ENGR. / ARCHT.			APPROVED	<i>[Signature]</i> G. B. MAGPOC, JR. MANAGER, EEO
CYCLING/CHY					
ELEC.					
MECH.					
DWG. NO. MWAP-8DE-17.001			SPECS. NO. LuzP21Z1207Sp		
REV.	DATE	NATURE OF REVISION	BY	CHKD	RECD
SCALE: NTS		BID DRAWING		REV. 1	



FLOOR PLAN @ GARAGE
1:75



FLOOR PLAN @ CONFERENCE ROOM
1:75



FLOOR PLAN @ GUARDHOUSE
1:75

LEGENDS:

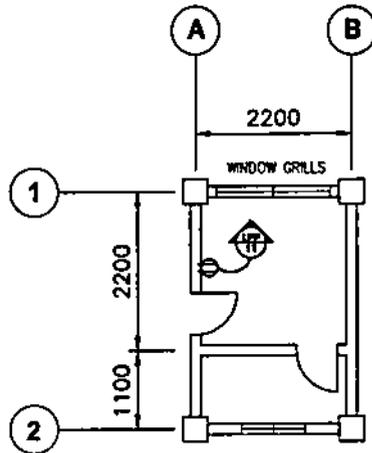
- FIXTURE TYPE A
- FIXTURE TYPE B
- FIXTURE TYPE C
- S - SINGLE POLE SWITCH
- Sub - DUPLEX POLE WALL SWITCH
(LETTER INDICATES LAMP(S) TO BE CONTROLLED)
- - CIRCUIT RUNNING ON THE CEILING
- - CONTROL CIRCUIT
- ① - CIRCUIT HOMERUN

NOTES:

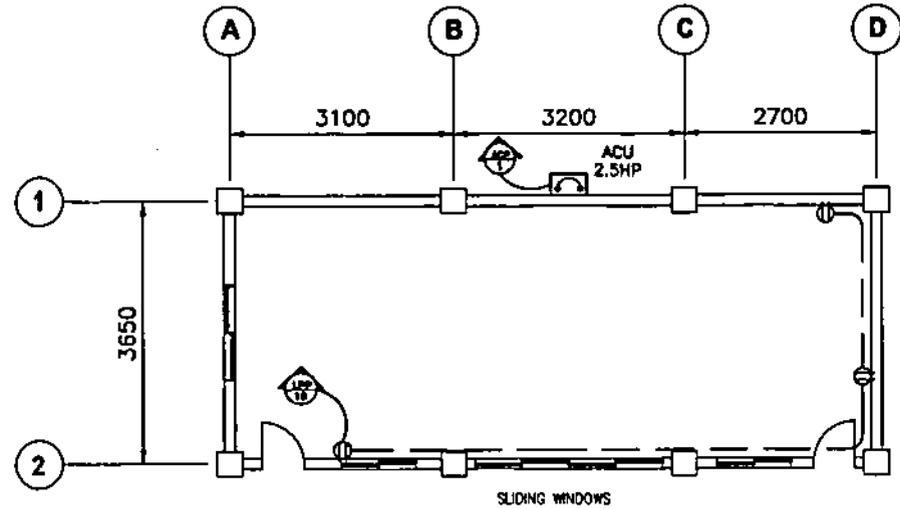
1. ALL WORKS SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE TECHNICAL SPECIFICATIONS.

OWNER:		NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT: REPAIR AND REHABILITATION OF POWERHOUSE, OFFICE BUILDING AND ASSOCIATED STRUCTURES OF MARBANA DIESEL POWER PLANT			
LOCATION: MARBANA, BATO, CATAOQUANES			
TITLE: LIGHTING LAYOUT (CONFERENCE ROOM, GARAGE & GUARDHOUSE)			
DESIGNED	BY	CHKD	DATE
DRAWN	GM		
REVIEWED	PRINCIPAL ENGR. / ARCHT.		RECOMMENDED
CHARLHIGHT			MANAGER, E&C
ELEC.			APPROVED:
MECH.			MANAGER, DOO
DWG. NO. SWAP-BDE-17.002		SPEC. NO. LUPP2121275r	
SCALE: AS SHOWN		BID DRAWING	

REV.	DATE	NATURE OF REVISION	BY	CHKD.	RECD.	APVD.



FLOOR PLAN @ GUARDHOUSE
1:75



FLOOR PLAN @ CONFERENCE ROOM
1:75

NOTES:

1. ALL WORKS SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE TECHNICAL SPECIFICATIONS.

LEGENDS:

- CONVENIENCE OUTLETS
- ACU 2.5HP - ACU SPLIT-TYPE CIRCUIT BREAKER
- CIRCUIT RUNNING UNDERGROUND
- CIRCUIT HOMERUN

OWNER:  NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT: REPAIR AND REHABILITATION OF POWERHOUSE, OFFICE BUILDING AND ASSOCIATED STRUCTURES OF MARIKINA DIESEL POWER PLANT	
LOCATION: MARIKINA, BAYO, CALABUZONES	
TITLE: POWER LAYOUT (CONFERENCE ROOM, GARAGE & GUARDHOUSE)	
DESIGNED BY: <i>[Signature]</i>	SUBMITTED: <i>[Signature]</i>
DRAWN BY: <i>[Signature]</i>	RECOMMENDED BY: <i>[Signature]</i>
REVIEWED BY: PRINCIPAL ENGR./ARCHT.	APPROVED BY: <i>[Signature]</i>
CHIEF ARCHT. ELEC.	MANAGER ELEC.
MECH.	MANAGER MECH.
DWG. NO. MWAP-BDE-17.003	SPECS. NO. L12P21212075r
SCALE: AS SHOWN	BID DRAWING

REV.	DATE	NATURE OF REVISION	BY	CHKD.	RECD.	APPO.