



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

## **BID DOCUMENTS**

**Name of Project :** CONSTRUCTION OF OFFICE AND STAFFHOUSE  
AT ROXAS SUBSTATION (NPSSTL)

**Location :** ROXAS, PALAWAN

**PR No. :** S1-NPS22-019

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Design and Development Department



## SECTION I

# INVITATION TO BID



# National Power Corporation

## INVITATION TO BID

### PUBLIC BIDDING – BCS 2022-0604

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
<b>S1-NPS22-019 / PB220725-AD00373 (PB2)</b>  Construction of Office and Staff House at Roxas Substation (NPSSTL), Roxas, Palawan  • PCAB License: License Category of at least <b>"Category D – General Building"</b> and registration classification of at least <b>"Small A – Building and Industrial Plant"</b>	Construction of Office, Staffhouse, or Residential Building	13 September 2022 9:30 AM	26 September 2022 9:30 AM	<b>₱ 2,800,000.00 / ₱ 5,000.00</b>
<b>S1-MGP22-003 / PB220707-AD00239 (PB2)</b>  Construction of 10KL Rainwater Collector and Office/Staff House at Mangsee DPP, Mangsee, Balabac, Palawan  • PCAB License: License Category of at least <b>"Category D – General Building"</b> and registration classification of at least <b>"Small B – Building and Industrial Plant"</b>	Construction of Industrial Building, Office, Residential, Storage or Commercial Building	13 September 2022 9:30 AM	26 September 2022 9:30 AM	<b>₱ 1,403,000.00 / ₱ 5,000.00</b>
<b>Venue: Kaňao Function Room, NPC Bldg. Diliman, Quezon City</b>				

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-NPS22-019	Seventy-Five (75) 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 Kañao Function Room, NPC Head Office, Dilliman, 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

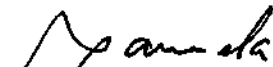
Tel Nos.: 8924-5211 and 8921-3541 local 5611/5504

Fax No.: 8922-1622

Email: [bcsd@napocor.gov.ph](mailto:bcsd@napocor.gov.ph) / [bcsd\\_napocor@yahoo.com](mailto:bcsd_napocor@yahoo.com)

12. You may visit the following websites:

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



**RENE B. BARRUELA**

Vice President, Corporate Affairs Group and  
Chairman, Bids and Awards Committee

## SECTION II

# INSTRUCTION TO BIDDERS



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## SECTION II - INSTRUCTIONS TO BIDDERS

### 1. Scope of Bid

NPC invites Bids for the **CONSTRUCTION OF OFFICE AND STAFFHOUSE AT ROXAS SUBSTATION (NPSSTL)**, with Project Identification Number **PR NO. S1-NPS22-019**.

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 2022 in the amount of specified in the Invitation to Bid. 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 criterion 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 contracts/projects involving construction of office, staffhouse, or residential 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"> <li>1. Contract/Purchase Order and/or Notice of Award</li> <li>2. Certification coming from the project owner/client that the performance is satisfactory as of the bidding date.</li> </ol> <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"> <li>1. Contract/Purchase Order</li> <li>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.</li> </ol>
10.3	<p>The required License issued by the Philippine Contractors Accreditation Board (PCAB); License Category of at least <b>"CATEGORY D – GENERAL BUILDING"</b> and registration classification of at least <b>"SMALL B – BUILDING AND INDUSTRIAL PLANT"</b></p>

10.4	<p>The list of key personnel shall include the following minimum requirements:</p> <p><b>a. One (1) Project/Site Engineer</b></p> <p>Registered Civil Engineer who had supervised at least a project similar in nature as to the type of the proposed project within the last Ten (10) years. Must have at least 3 years professional as Civil Engineer on similar project</p> <p><b>b. One (1) Safety Officer 2</b></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, 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>
10.5	<p>The list of construction equipment (owned or leased) shall include the following minimum requirements:</p> <p>a. Concrete Vibrator - 1 unit</p> <p>b. Concrete Mixer (at least 1 bagger) - 1 unit</p> <p>c. Welding Machine (at least 300A) - 1 unit</p> <p>d. Bar cutter (at least 25mm <math>\phi</math> capable) - 1 unit</p> <p>e. Oxy-Acetylene gas cutter - 1 unit</p>
10.6	<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>
10.7	<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 BAC 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>
12	No further instructions
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> <p>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;</p> <p>2. The amount of not less than 5% of ABC if bid security is in Surety Bond.</p>

19.2	Partial Bid is not allowed. The project is grouped in a single lot and the lot shall not be divided into sub-lots for the purpose of bidding, evaluation, and contract award.
20	<ul style="list-style-type: none"> <li>a. Contract/Purchase Order and/or Notice of Award for the contracts stated in the List of all Ongoing Government &amp; Private Contracts Including Contracts Awarded but not yet Started (NPCSF-INFR-02);</li> <li>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.</li> <li>c. Drawings and documents to be submitted during post-qualification process as specified in the Technical Specifications.</li> <li>d. The licenses and permits relevant to the Project and the corresponding law requiring it as specified in the Technical Specifications, if any.</li> </ul>
21	<p>The following documents shall form part of the contract:</p> <ul style="list-style-type: none"> <li>1. Notice to Proceed</li> <li>2. Construction schedule and S-curve</li> <li>3. Manpower Schedule</li> <li>4. Construction Methods</li> <li>5. Equipment Utilization Schedule</li> <li>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</li> <li>7. PERT/CPM.</li> </ul>



## 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 &amp; 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"> <li>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;</li> <li>2. Suspend payment of the portion of work under question;</li> <li>3. Correct the situation by employing 3<sup>rd</sup> party and charge all expenses incurred to the Contractor's collectibles/securities; and</li> <li>4. Report the condition to the Bureau of Working Conditions of the DOLE for their appropriate action.</li> </ol> <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>
4.1	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.
5	<p>1. The following must be indicated in the performance bond to be posted by the Contractor:</p> <ul style="list-style-type: none"> <li>i. Company Name</li> <li>ii. Correct amount of the Bond</li> <li>iii. Contract/Purchase Order Reference Number</li> <li>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. &amp; Schedule/Purchase Order No.)</u> entered into by the parties."</li> </ul> <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 that such extension or modifications falls within the effective period of the said surety bond. However, in the event that the extension of</p>



	<p>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"> <li>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;</li> <li>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;</li> <li>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.</li> </ul>
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 &amp; 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

## PROJECT HIGHLIGHTS

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**PH-1.0 PROJECT HIGHLIGHTS****PH-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 **CONSTRUCTION OF OFFICE AND STAFFHOUSE**.

The proposed construction of office and staff-house is consisted with reinforced concrete frame with metallic plastic roofing system. Mainly, the purpose of this project is to provide shelter and working area to the personnel. The building include kitchen, living room and 2 bed rooms.

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.

**PH-1.2 Project Location**

The project is located at Roxas Substation, Roxas, Palawan.

**PH-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. Moving-in including furnishing, superintendence, construction, operation and maintenance of general construction facilities and moving-out thereof after completion and acceptance;
- b. Complete construction of the proposed office and staff-house including the corresponding drainage system;
- c. All other works and services required to complete the project.

**PH-1.4 Contract Period**

The Contractor shall complete the works as herein specified within Seventy-Five (75) calendar days. The contract period is inclusive of five (5) 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**.



**PH-1.5 Contractor's Classification**

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

Contractors under Small B must have completed similar contracts involving construction of office and Staff-house.

**PH-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/Site 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) 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, 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.

**PH-1.7 Minimum Required Construction Equipment**

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

- |  |          |
|--|----------|
| a. Concrete Vibrator                         | - 1 unit |
| b. Concrete Mixer (at least 1 bagger)        | - 1 unit |
| c. Welding Machine (at least 300 Amp)        | - 1 unit |
| d. Bar Cutter (at least 25mm $\Phi$ capable) | - 1 unit |
| e. Oxy-acetylene gas cutter                  | - 1 unit |



**SECTION VI**

**TECHNICAL  
SPECIFICATIONS**

**ARCHITECTURAL WORKS**





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## SECTION VI - TECHNICAL SPECIFICATIONS

### 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, finsmithing, 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.



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 specifically 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 3.48MPa 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 VITRIFIED TILE AND NATURAL STONE****AW-4.1 General**

The work to be done under this section shall consist of furnishing all labor, materials and other facilities to complete all tile and natural stone works shown on the drawings and specified herein.

**AW-4.2 Materials**

- Floor tiles shall be vitrified unglazed and glazed ceramic tiles (toilet) using white clay.
- Wall tiles shall be vitrified glazed ceramic tiles using white clay.
- Listel tiles shall be vitrified glazed ceramic tiles.
- Marble countertops, splashboards and floor slabs shall be 20mm, Cebu variety of the best quality conforming to samples approved by the NPC Representative.
- Granite countertops, splashboards and floor slabs shall be non-porous, dark shade color, has a 98% gloss recovery on edge glazing.
- Granite floor tiles shall be non-porous granite dark color as specified in the bill of quantities.

**AW-4.3 Samples**

Sample of various types/kinds of tiles shall be submitted to the NPC Representative.

**AW-4.4 Shop Drawings**

Contractor shall submit shop drawings of works to be done. Details shall show sizes, section joints and other required details for the approval of the NPC Representative.

**AW-4.5 Execution**

All surfaces to receive tiles, shall be structurally sound, plumb level and true, free from dust, grease, calcimine water and other foreign matter.

Wall and floor surfaces with minor variations (1/8" or less) shall be true and smooth with a skim coat of adhesive applied with flat of trowel. Allow to dry before spreading more adhesive for setting the tile.

**AW-4.6 Tile Preparation**

Tiles - may be set dry or pre-soaked depending on grouting methods to be used. Wall tile may be prepared by soaking in clear water for not less than 15 minutes. If pre-soaked method is used, drain excess water on tile before setting.



**Grouting** - After floor on tile have been in place for not less than four hours, all joints shall be grouted and cleaned. Tile which becomes dry after setting shall be soaked at the joints with a wet sponge, or sprayed with water before grouting to prevent cracking of the grouting compound, grout used with floor tile must be kept moist until properly cured.

**Caulking** - At completion of tile work, clean out joints between tile and other built-in fixtures and apply this bead of caulking compound tooled slightly below tile surface.

**Clearing** - Upon completion, clean all tile surfaces with warm water and a good washing compound and stiff brushes as recommended by tile manufacturer.

**Protection** - Before traffic is permitted over finished tile floor, cover floors with building paper. Lay board walkways on floor that are to be continuously used as passageway by workmen. Tile floor areas to be trucked over have suitably constructed continuous plank runaways of required width installed over building paper. Remove cracked, broken or damage tile and replace with new one.

**AW-4.7 Measurement and Payment**

Measurement for payment for **Vitrified Tile and Natural Stones** will be based on what is required on the Bill of Quantities.

**AW-5.0 PLYWOOD CEILING BOARDS**

**AW-5.1 General**

Consist of furnishing of all labor, materials and other facilities for the satisfactory of all work necessary to complete the marine plywood ceiling.

**AW-5.2 Materials**

Thickness of plywood boards shall be as indicated on the drawings, marine, rotary cut, tanguile or dao. Sheets shall be nailed to ceiling nailers/joists at 150mm (6") on center.

**AW-5.3 Sample**

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

**AW-5.4 Wood Framing**

Framing shall be 50mm x 76mm (2" x 3") tanguile ceiling joists at 1200mm o.c.b.w. and 50mm x 50mm (2" x 2") nailing strip at 400mm o.c.b.w. or as indicated on the drawings.

**AW-5.5 Miscellaneous**

Fastener shall be smooth shank, zinc - coated, common wire nails of local manufacture.

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-5.6 Construction**

All rough carpentry work, ground centering, blocking, etc., shall be in accordance with detailed drawings or recognized carpentry standards. The Contractor shall rigidly construct all wood framing true to lines, levels and dimensions. Nails and other anchorage shall be in accordance with good practice.

Miter external molded members and cope internal corners.

No hammer mark or any other unsightly marks shall be made on any exposed wood face.

All lumbers that will come in contact with concrete and masonry shall be coated with asphalt.

**AW-5.7 Protection**

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

**AW-5.8 Measurement and Payment**

Measurement and payment for **Plywood Ceiling Boards** will be based on the area installed and accepted by the Contracting Officer.

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

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

**AW-6.0 SUSPENSION SYSTEM****AW-6.1 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-6.2 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/m<sup>2</sup>). 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-6.3 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-6.4 Measurement and Payment**

Measurement for payment for **Suspension System** will be based on what is required on the Bill of Quantities.

**AW-7.0 ROOFING AND SIDING SHEETS**

**AW-7.1 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-7.2 Materials**

Material for roofing shall be weather, rust free and non-flammable. It shall be corrugated metallic plastic sheet. Thickness shall be determined as specified in the drawing that shall range from 1.0mm to 2.5mm thick. Bended sheets such as flat barge caps, flashings, ridge rolls, capping and moldings that serve as its accessory components shall have the same composition with the roofing and siding sheets of which minimum thickness shall be 1.5mm. Gutters likewise shall have the same material composition with thickness of 2.0mm unless otherwise specified in the drawing.

**AW-7.3 Workmanship**

Roofing and siding sheets shall be securely fastened on steel purlins and channels by hook or stove bolts or self-drilling screws or as required. Fasteners shall be stainless steel and have a maximum distance of 0.30m O.C. along purlins.

Special care shall be given to the joints, lapping, bolting and setting of closers.



**AW-7.4 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.

Measurement and payment for ridge Roll/Flashing and other accessories shall be referred to the Bidding Form.

**AW-8.0 DOWNSPOUTS AND ROOF DRAINS****AW-8.1 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-8.2 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-9.0 MOISTURE VAPOR BARRIER****AW-9.1 General**

The work to be done under this section includes the furnishing of all labor, materials, equipment, and other facilities required to complete all moisture vapor barrier work as shown in the drawings and as specified.

All concrete floor slabs in direct contact with the ground shall be provided with moisture vapor barrier to stop movement of moisture from the ground through capillary action or osmotic pressure.

**AW-9.2 Materials**

- a) Vapor Barrier – Vapor barrier shall be polyethylene sheeting with thickness as recommended by the manufacturers and as approved by the NPC Representative.
- b) Adhesive and/or Tape – Adhesive or tape shall be as recommended by the manufacturers as approved by the NPC Representative.

**AW-9.3 Physical Properties**

- a) Tensile strength (lb/2" width) is 260.
- b) Moisture and vapor transmission (ASTM F. 96, Procedure E) Ungreased gm/sq.m/225 hours is 17. Perms shall be 0.117.
- c) Greased (ASTM D1027) 6M/sq. meter/24hours is 9. Perms shall be 0.20.

**AW-9.4 Application**

Prior to placing the concrete, the hard core fill should be compacted to a smooth even surface, eliminating all sharp projections or irregularities which may puncture the moisture and vapor barrier. It is preferable in most cases to bring the fill to grade with a stiff mix of one part Portland cement and three parts sand so placed as to provide a smooth even surface for installing the membrane, or to blind the hard core with a layer of consolidated sand. The net thickness of consolidated sand above the gravel fill shall not be less than 6.3mm. Cover the entire area with a layer of moisture and vapor barrier extending past the perimeter of the slab and turning up against walls for the depth of the concrete. The moisture and vapor barrier shall be lapped and the exposed edges of polyethylene shall be sealed by either of the sealing set out below. Where pipes and conduits must pass through the barrier, the material should be carefully cross slit so that it fits tightly around the pipe, and then taped to the pipe with pressure sensitive tape.

**Sealing**

- a) Tape Sealing - To obtain an effective seal, moisture and vapor barrier should be lapped 25mm (1") at all joints and sealed with 50 mm (2")



pressure sensitive tape. A 50mm (2") width of polyethylene film is left exposed on both edges for joining and it is important to ensure that both surfaces are free from moisture and dust, and that the tape is in contact with the polyethylene film on both sheets. If necessary, a firm base such as board can be placed under the joint and the tape applied with firm pressure by hand or by mechanical applicator.

- b) **Adhesive Sealing** - Where adhesive sealing to be used, each alternate sheet must be inverted so that the exposed polyethylene strips of the alternate sheets of the barrier face downwards, ensuring that both surfaces are free from moisture and dust. The sheets shall be lapped 50mm (2") to ensure good adhesion and both surfaces shall then be coated with adhesive and the joint made in accordance with the manufacturer's instructions.
- c) **End Joint Sealing** - End joint sealing should be effected by cutting the ends square, forming a continuous single interlocking fold and sealing on both sides with adhesives.

#### **AW-9.5 Vapor Barriers Under Concrete Slab on the Ground Level**

After consolidating the sand bed under concrete floors and edge beams and before placing the reinforcement, the whole of the sand bed shall be covered with a layer of vapor barrier laid in the longest lengths and widest available widths, lapped 25mm at all joints and intersections and sealed with the pressure sensitive tape. A 50mm width of polyethylene film shall be exposed on both edges of the moisture vapor barrier where sealed joints are to be made and the contractor shall ensure that the tape is in contact with a film on both sheets, all in accordance with the manufacturer's instructions. Alternatively, adhesive sealing may be used in which case each alternate sheet shall be inverted, so that the exposed strips of the sheets are in contact. The sheets shall be lapped 50mm and both polyethylene surfaces coated with the contact adhesive and firmly pressed together to form a moisture proof sealed joint. The moisture vapor barrier shall be carried down into trenches, turned up at the side edge and after concrete has set, turned across on top of concrete slab under cavity flashing.

#### **AW-9.6 Measurement and Payment**

Measurement and payment for **Vapor Barrier** shall be based on the area of material installed 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 all incidentals necessary for the completion of this work.





**AW-10.0 GLASS AND GLAZING****AW-10.1 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-10.2 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-10.3 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-10.4 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-11.0 GLAZING SEALANT**

##### **AW-11.1 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-11.2 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 (5.5 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-11.3 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-11.4 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-11.5 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-12.0 WEATHERSTRIPPING****AW-12.1 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-12.2 Samples**

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

**AW-12.3 Materials**

- a) Extruded products shall be of aluminium alloy 6063 T4.
- 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-12.4 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-12.5 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-12.6 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-13.0 JOINERY AND CARPENTRY WORKS****AW-13.1 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-13.2 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, wanes 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-13.3 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-13.4 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-13.5 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-13.6 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-13.7 Measurement and Payment**

Refer to Bill of Quantities for the pertinent items where required.

**AW-14.0 MILLWORK AND CABINET WORK****AW-14.1 General**

The work to be done under this section shall consist of furnishing all labor and materials, and performing all operations temporary and permanent woodworks, finished treatment and building-in of all cabinet type items, complete in every respect, and incidental associated woodwork appurtenances, the application of all finish hardware in connection with finished woodwork in strict accordance with requirements of drawing and is specified herein subject to the terms and conditions of the Contract Documents.

All woodwork required to be furnished and installed in connection with finish treatment of exposed interior surfaces or spaces, that is cut, fitted, built-in and finished structure is hereby subject to the terms and conditions of the Contract Documents.

All finished millwork that is constructed, assembled and provided with surface finish treatments in a shop outside building structure is hereby classified as "Cabinet Work". Reference to "surface finish treatment" including the filling, staining, shellacking or waxing of all cabinet type woodwork unless noted to contrary.

**AW-14.2 Work not Included**

Woodwork and equipment items specifically indicated on drawing as being furnished by the Contractor.





**AW-14.3 Materials and Workmanship**

- a) Lumber and Wood (Rough Carpentry Work) shall, unless approved otherwise, be new lumber, well-seasoned, air-dried, first quality or other specie conforming to requirements thereof of equivalent kind and quality. Wood for blocking, grounds nailing strips, and/or other woodwork incident to carpentry and joinery and/or for use of other trades unless specified otherwise, shall be second quality Apitong or approved equal perfectly sound and free from loose knots, cluster knots to surface knots that would interfere with or preclude the sound attachment thereof and/or securement to other work.
- b) Wood for shelves and shelving in coat closets, supply closets, etc., shall be of K.D. Tanguile suitable for painting and varnishing; as approved by the NPC Representative.
- c) Mill and Cabinet Work  
Specie of wood shall be K.D. Tanguile for all items of finished wood and cabinet work required to have a natural wood finish, unless otherwise specified.

Quality and Workmanship. All wood for interior finished mill and cabinet work shall be thoroughly air-cured, kiln-dried stock, satisfactory to NPC Representative. All materials specified herein shall be product of one mill in so far as practicable. Contractor shall submit for approval the name of subcontractor for mill and cabinet work called for on scale drawings. Only first-class cabinet type workmanship will be admissible an execution of this work, performed by artisans skilled in this trade so as to provide cabinet work of the highest trade, finish and installation as specified and required.

Care shall be exercised by careful screening to avoid strong contrast in color and graining of finished woods for all wood surfaces or trim, paneling, wall facing, etc., so that any one room or wall surface will present a reasonably uniform appearance. All cutting, framing and fitting shall be done as required for accommodation of work of other trades. Use of wood chips, shims or other shrinkable materials for leveling of plumbing will not be permitted in any form. Mortise and tendon joints set in an approved type of water and moisture proof glue with wedges and/or pinned. Shop mitres, 102mm (4") or more to be glued and doweled and/or locked with a metal ring. Mitres less than 102mm (4") shall have concealed spline.

No woodwork shall be installed until such time as plastering is entirely dry.

In so far as practicable, all millwork, panelling etc. assembled in shop shall be back-painted and finished throughout before delivery to building.



Running trim (chair rail), etc. of wood shall have minimum number of splices and in each instance bevelled and jointed over a solid bearing ground.

In addition to machine sanding, all interior trim, panelling and woodwork shall be smoothed by hand using "00" sandpaper to give all woodwork the required smooth surface for exposed finished treatment and free from machine and tool marks, abrasion, raised grain and other undesirable defects. All woodwork shall be fitted to plaster or other finished work in careful manner so as not to injure these surfaces in any way. Where plaster or other work is damaged or disturbed, it shall be restored to its original state and/or make good without cost to the NPC at the Contractor's expense.

- d) Laminated Plastic Plywood or Particle Board. All horizontal surfaces where laminated plastic covered wood are indicated on drawings shall be cigarette-proof grade. Seconds of the laminate shall be used as a "backing veneer" where concealed.
- e) Centring Blocking, Grounds and Furring. Furnished and installed for all above items of woodwork as specified.
- f) Wood Finish Materials. In general, conform to minimum standard requirements for kind, quality, functions and characteristics of local standards specifications as approved for use and specified herein.
  - 1) Stains, if required, shall be those approved by NPC Representative for various types of finishes.
  - 2) Linseed Oil shall be pure, thoroughly settled and either raw or boiled as required.
  - 3) White Lead shall be white carbonate of lead ground in pure linseed oil.
  - 4) Beeswax shall be pure, unadulterated and of the highest quality product of approved manufacturers.

#### **AW-14.4 General Construction, Workmanship, etc.**

General. Provide all rough carpentry required and/or necessary for any construction works, ladders, staging, scaffolds, and the like. Provide the temporary protection for all masonry and other related items during period of construction, including temporary centres, stairs treads, etc.

Grounds, blocking, cants, nailing strips and other rough woodwork shall be provided for sheet metal work, fabric flashing, and interior woodworks required by drawings.



- a) **Cutting, Patching and Fitting.** Perform all cutting and fitting or work of other trades as required to secure work herein specified including that for any plumbing, heating and electrical work and do all required patching after other trades.
- b) **Grounds and Blocking.** All wood grounds, blocking, centres nailing strips, cants, all wood grids for framing, etc., provided as required to secure carpentry, millwork, acoustical and insulation work and of sizes required.

Grounds shall be sized and dressed to proper dimensions. Ground against masonry units shall be secured in place with expansion bolts. Grounds that are not satisfactory shall be taken down and approved grounds reset at Contractor's expense. Grounds shall be provided behind all wood trim in every instance.

- c) **Rough Hardware.** All nails, bolts, screws and any other rough builder's hardware or securement devices required to securely fasten all work in place shall be furnished and installed for any work herein.
- d) **Miscellaneous Millwork**

The foregoing items are only intended to represent the principal items under this section. The Contractor shall include and furnish all items of Carpentry and Millwork. These are generally indicated on the drawings and shop drawings of all items and shall be prepared and submitted for the NPC Representative's approval as previously specified.

- 1) **Shelving.** Generally, 19mm (3/4") plywood with solid stock tongued front edges, all edges, and supported on cleats, of some material secured to walls with expansion bolts in lead sleeves. Where hook strips are required, they shall be of similar materials and as detailed on drawings, with double pronged hooks secured in place by the Contractor.
- 2) **Countertops.** Except where metal countertops are required, 19mm (3/4") laminated plywood with 3.32mm (1/8") standard grade linoleum of approved color, cemented down with approved type of linoleum adhesive. Where metal edging is required, furnished smooth roll edge white metal alloy edging strips secured with oval header non-ferrous screws.
- 3) **Drawers.** Shall have metal slides with roller bearings, particle board or plywood bottoms, solid hard wood boxing, dove-tailed and glued. Drawer fronts of solid stock, of selected birch and/or as detailed otherwise on drawings and dove-tailed to slides and bottoms.
- 4) **Cases and cabinet doors.** Unless scheduled otherwise, or detailed on drawings, hinged doors for cases and cabinets required under work of this section included and provided with suitable and/or appropriate hardware supplied by the



Contractor. Sliding door hardware shall be furnished and installed by the Contractor.

- 5) Miscellaneous interior cabinet work (cases, counters, equipment fixtures, and the like. The work included herein comprises all items of interior wood cabinet works indicated or required by drawings, including all miscellaneous metal supports, located throughout all public spaces where interior woodwork shall be supplied and built. These shall include all the equipment accessories, supports, draw slides, glass and glazing, shelves, counters, drawers, etc. complete in every respect, provided with beeswax finish and ready to operate.

General construction and quality of workmanship and materials is as specified herein. Office racks, interior cases and/or fixtures, supplied by NPC to be fitted into or between "built-in" case works shall be delivered to Cabinet Carpenter Contractor for in NPC and assembled with his work. In all instances, over-all length of such cabinets, cases, fixtures, shall be verified so as to fit in an approved manner when installed and/or assembled without disfigurement or cutting at job site.

Contractor shall thoroughly examine drawings and Schedules of Work and Finishes and shall be responsible for furnishing, installing and the surface treatment/finishing of all wood items.

#### **AW-14.5 Wood Finish Treatment**

The wood finish treatment for all exposed wood surfaces shall conform to the following, except where or when approved otherwise by NPC Representative. Finish treatment in general applies to the finishing of Narra or Tanguile plywood panels. The intent of the surface finish requirements specified hereinafter are to simulate the best grade quality of workmanship and materials in local use, applied by skilled and experienced wood finishers and painters.

All exposed interior woodwork throughout building structure except laminated plastic covered plywood and woodwork specified to be painted shall be carefully prepared to receive the following finish treatments.

##### **Preparation of wood surfaces**

Prior to application of any finish treatment, all wood surfaces shall be thoroughly cleaned of all foreign matter, dirt, oil, grease, cement plaster stains, finger marks, and the like. Should badly disfigured or damaged surfaces be encountered that are unsuitable to receive finish treatment, attention shall be called to NPC Representative before proceeding and await his conclusion.

All exposed surfaces of any woodwork, either mill or cabinet shall be entirely smooth and unblemished when erected.

Smooth thoroughly using a fine grade of waterproof sandpaper. Sand a second time with sandpaper moistened with best quality refined linseed oil.



Where crevices, deep open wood pores and any other defective surfaces are present, that are "re-faceable", they shall be filled with "stopping wax", prepared as follows:

- i) In an iron pot, put one cupful of common shellac, one teaspoonful of powder resin, one piece of base wax the size of half and average size walnut and a teaspoonful of powdered lemon chrome or other coloring matter to match color of wood.
- ii) Heat and stir thoroughly until prepared compound is fully melted and mixed so as to be uniform in texture. Turn portions of melted compound out between two flat boards and roll to form cylindrical sticks while still plastic.
- iii) As previously specified, thoroughly and tightly fill all holes, crevices, open pores in wood and minor defective areas in wood surface by first melting sticks on a hot iron or small benzene lamp, as if it were solder.
- iv) Defective surfaces, where certain type of natural defects occur in wood that do not provide good seats to receive "stopping wax" shall be enlarged and slightly under-cut around edges so as to assure the forming of a solid key when crevice is filled.
- v) To finish surface after stopping, strike off protruding stopping and smooth with glass paper, so as to leave all surface clean, perfectly smooth and ready for final finish treatment.

#### **AW-14.6 Finish Hardware and Show Case Lighting**

These items as they relate to all cabinet work, furnished and installed complete by this Contractor. Finish hardware for cabinet work and show case lighting fixtures shall be of the highest quality product as selected by NPC Representative. Contractor shall examine same, determining before application that items will perform the function and purpose for which they are intended and apply them in an acceptable manner.

When cabinet work shop drawings are submitted for approval by the Contractor, a detailed cabinet hardware schedule will be prepared by the NPC Representative.

#### **AW-14.7 Prime Painting and/or Finishing**

Contractor shall have option of finishing any portion of this work either on site and/or on a shop. All priming and back-painting shall be completed by the Contractor.



**AW-14.8 Refitting and Checking**

Immediately before building is occupied, the Contractor shall examine all doors and other movable part of all case and cabinet work to see that all are in perfect operating condition. Before and after refitting, all edges of doors shall be sealed with approved water resistant materials.

**AW-14.9 Protection of Finish Products / Interior Woodwork, etc.**

The Contractor shall be held responsible and accountable for the explicit protection of all finish cabinet work, interior trim and decorative treatment until Final Inspection and Acceptance. NPC Representative reserves the right to order replacement at no additional cost to contract sum, for any and all work so injured, and/or damaged as to be unsightly after repairing and/or refinishing. Authorization to repair and/or refinish shall not constitute a waiver of NPC Representative's right to require replacement of any item or work if unsatisfactory to him after such repairing and/or refinishing.

**AW-14.10 Measurement and Payment**

Refer to Bill of Quantities for the pertinent items where required.

**AW-15.0 WOOD DOORS****AW-15.1 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-15.2 Samples**

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

**AW-15.3 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-15.4 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-15.5 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-15.6 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-16.0 FINISHING HARDWARE****AW-16.1 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-16.2 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-16.3 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-16.4 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 paint 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.
- b) Lock-sets shall conform to U.S. Federal Specifications.
- c) 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.
- d) 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-16.5 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-16.6 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-17.0 PAINTING AND VARNISHING**

##### **AW-17.1 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-17.2 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 reminded. 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-17.3 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-17.4 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-17.5 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 be 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-17.6 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-17.7 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 print 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-17.8      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 coat-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 in General Technical Requirements.

#### **AW-17.9 Measurement and Payment**

Payment shall be based on what is called for in the Bidding Form.

#### **AW-18.0 CONCRETE FLOOR HARDENER**

##### **AW-18.1 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-18.2 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-18.3 Measurement and Payment**

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

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-19.0 SOIL TREATMENT****AW-19.1 General**

The work to be done under this Section shall include all labor, materials, tools and equipment necessary for soil treatment.

The Contractor shall treat the soil under the building and immediate surroundings to make it impervious and toxic to subterranean termites, often referred to as white ants or "anay" by application of soil poison solutions.

**AW-19.2 Material**

Material to be used shall be a solution commonly used by licensed companies or entities engaged in pest control or pest eradication. Banned solutions must not be applied.

**AW-19.3 Application**

The application of solutions follows the sequence of construction and the following are the order treatment:

- a) Thoroughly saturate every linear meter of excavation for footings and other cement work.
- b) After grading and leveling the soil in the ground and layers of gravel laid preparatory to the pouring of concrete, flood or soak every square floor area.
- c) As soon as the building is constructed, just prior to the landscaping of the lawn and garden, saturate every linear meter perimeter of the building, about three (3) meters wide, with the termite proofing solution.



- d) Treat earth fills thoroughly as they may carry termite colonies. As soon as the fill is packed and leveled, saturate every one square meter area with 4 liters of the termite-proofing solution.

An ordinary watering can (sprinkling can) can be used to saturate or saturate areas with the termite-proofing solution. However, for convenience and thorough and faster application, use a power sprayer with 3 to 5 gallons per minute capacity.

**AW-19.4 Measurement and Payment**

Measurement for payment for Soil Treatment will be based on what is required on the Bill of Quantities.

**AW-20.0 PLUMBING FIXTURES AND FITTINGS**

**AW-20.1 General**

The work covered by this section of the Specifications consists in furnishing all plant, labor, equipment and tools, articles, appliances and materials and in performing all operations in connections with the installation of all plumbing fixtures, fittings and accessories, complete, in strict accord with this section of the Specifications or indicated on the drawings, are included in this work.

**AW-20.2 Make**

The model numbers herein given are intended to illustrate the quality and design of fixtures that will be required. American standard fixtures specified herein and any substitution made to any item of fixtures specified must first be approved by the NPC Representative.

**AW-20.3 Trade Marks**

All plumbing fixtures and fittings must bear the trademarks of the manufacturer.

Maintenance Manual shall be submitted including complete instructions for replacing valve washers and strainers and give manufacturer's recommendations as to cleaning finish fixture surfaces.

Submit samples of valves, faucets, trims and others for approval of the NPC Representative.

**AW-20.4 Fixtures**

- a) Water Closet – as shown in the drawings or as specified in the Bill of Quantities
- b) Lavatory – as shown in the drawings or as specified in the Bill of Quantities



- c) Urinal – as specified in the Bill of Quantities
- d) Double Tub – Stainless steel sink
- e) Bibbs – Nickel Plated Copper or Brass Alloy
- f) Shower Heads – Nickel Plated Copper
- g) Plated clips and 19mm (3/4") caps on wall or as indicated on the drawings.
- h) Floor Drain – Stainless or Brass Alloy
- i) Clean-outs – Brass alloy

**AW-20.5 Installation**

Plumbing fixtures shall be installed free and open in a manner to afford access for cleaning. All brackets, cleat, plates and anchors required to support the fixtures shall be furnished in a rigidly manner. Water closets shall be sat on Boll-Wax.

Installed plumbing fixtures shall be kept clean and in working order for adequate protection so as not be used by anybody until issuance of Certificate of Completion.

All fixtures shall be provided with individual control stop so that each fixture may be separately controlled without affecting any other fixture.

All flush valves shall be equipped with vacuum breaking devices.

**AW-20.6 Toilet Accessories**

- a) Soap Holders – white, vitreous China to match fixtures quality, brand and wainscoting color.
- b) Tissue/Toilet Paper Holder - colored, to follow Water Closet brand and quality. Provide and fit, ready for use, on most convenient side of wall inside each water closet compartment, 750mm (30") above the finish floor.
- c) Urinal and Toilet Partition and Cubicle Doors- Hard wood laminate phenolic boards. Provide polyester coated extruded aluminium framing, non-rusting connection accessories, door hinges and lock sets, toilet paper holder, grab handle and accessory hook, signage.
- d) Towel Holder-stainless
- e) Liquid Soap Dispenser



**AW-20.7 Measurement and Payment**

Measurement and payment for **Plumbing Fixtures** will be based on the number of sets/pieces installed and accepted by the NPC Representative.

Payment will be made at the corresponding contract unit price per set/piece 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.



**SECTION VI**

**TECHNICAL  
SPECIFICATIONS**

**CIVIL WORKS**

**SECTION VI – TECHNICAL SPECIFICATIONS****CW – CIVIL WORKS****TABLE OF CONTENTS**

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## TECHNICAL SPECIFICATIONS

### CW – CIVIL WORKS

#### **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 Contractor's construction equipment, setting up of the Contractor's camp and the disposition of the Contractor's various facilities at the end of the Contract.

##### **CW-1.2 Moving-in**

The 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 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 Contractor's Camp Facilities**

The 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 Contractor deems necessary for maintaining health, peace and order in the camp and work areas. The areas that may be used by the Contractor within the plant site shall be designated by the NPC.

The 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 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 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 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 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 Contractor's operation, the 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 Contractor shall indemnify NPC against all liabilities, claims, damages and/or lawsuits arising thereto.

**CW-1.7 Construction Power**

The 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 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 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 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 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 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 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 Contractor's Construction Facilities. The entire cost thereof shall be included in the various pay items in the Bill of Quantity.

**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 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 Contractor shall be responsible for dewatering foundation areas so that work can be carried out on a suitably dry condition. The 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 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 Quantity 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 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 Contractor's compliance to the foregoing. The entire cost thereof shall be included in the various pay items in the Bill of Quantity.

**CW-4.0 SITE GRADING**

**CW-4.1 Scope**

In accordance with the specifications contained herein and in conformance with the lines, slopes, grades and extent shown on the plans or otherwise directed by the NPC, the Contractor shall furnish all equipment, labor and materials and shall perform the required grading work.

**CW-4.2 Clearing, Grubbing and Miscellaneous Work**

**CW-4.2.1 Clearing and Grubbing**

The Contractor shall perform clearing and grubbing on the project site. The site shall be cleared and grubbed of all trees and brush except particular trees, which may be retained by the NPC for preservation. Particular trees to be left in place shall be protected from scarring and/or other injuries during clearing and grubbing work and other construction operations.

All stumps, roots and brush shall be removed to a depth of thirty (30) cm below original ground surface and disposed of in a place designated by the NPC. Downed timber, which may be ordered saved by the NPC for future use, shall be cut into logs as directed and neatly piled in a place designated by the NPC, otherwise they shall be disposed of same as above.

**CW-4.2.2 Miscellaneous Works**

Where shown on the drawings or if not shown but directed by the NPC, the Contractor shall perform miscellaneous work like demolition, removal, chipping, replacement or transfer of existing structures and other miscellaneous work. All demolished structures shall be disposed of as directed by NPC.

**CW-4.3 Grading****CW-4.3.1 General**

The word "grading" as defined herein means bringing to required grades all areas in accordance with the lines, slopes, elevations and grades shown on the drawings or as directed by the NPC.

**CW-4.3.2 Classification of Materials**

All materials in grading work shall be unclassified regardless of the nature of materials encountered during grading excavation and of materials used in grading fill. It is on the basis of unclassified material that Contractor shall determine his unit bid price for grading excavation and grading fill.

**CW-4.3.3 Stripping**

Fill areas to be brought to grade shall first be stripped of their top soil as directed but in no case less than twenty (20) centimeters in depth and disposed of properly in spoil areas designated by the NPC. Only materials from grading excavation and intended to be used for filling or backfilling purposes shall be stripped of top soil in the same manner as above.

**CW-4.3.4 Excavation and Fill**

Areas required to be brought to grade shall be excavated or filled as the case may be. Grading work shall be carried out in such a manner that the free drainage is maintained at all times and nowhere shall pondage be found in any part of the work.

The NPC may require the modification of slopes and grades according to the conditions actually encountered during excavation, but such change or modification shall not be construed to mean by the Contractor as a basis for additional compensation over and above the contract unit prices.

Any over-excavation performed by the Contractor for any purpose or reason, except as may be ordered by the NPC, shall be at the Contractor's expense and any excess of excavation shall be refilled, where required, with approved materials that shall be furnished, placed and properly compacted at the expense of the Contractor.

Unsuitable materials, as determined by the NPC, which may be encountered below established grade, shall be removed to a depth as directed and accordingly replaced with suitable materials approved by the NPC. The removal and proper disposal of such unsuitable materials shall be paid for at the contract unit price for the item, Grading Excavation, and payment for placing and compacting suitable material be made at the contract unit price for the item, Grading Fill, in the Bill of Quantity.

Fill work shall not be started until the area has been inspected and approved by the NPC after stripping. Grading fill shall be spread and compacted in layers of 15 cm. loose volume and compacted with approved roller weighing not less than 10 tons. Each layer shall be moistened or dried as directed for maximum compaction. No succeeding layer shall be placed thereon unless the preceding layer has been tested for compaction and approved by the NPC.





In the event that construction of concrete footing or other concrete foundations is on fill, the fill shall be compacted efficiently and thoroughly so that when the fill is tested for compaction at the required foundation elevation for the structure, the required bearing capacity is attained but in no case less than 17.24MPa. In no case shall filling and compaction work to be done without the presence of NPC's inspectors. The Contractor shall be held liable for any structural instability or damage that might result in consequence to non-compliance of this requirement. The Contractor shall institute corrective measures to bring the foundation base to a condition or state that will conform to the required bearing capacity; and also to repair and make good any damage on the structure to the satisfaction and at no cost to NPC.

**CW-4.3.5 Slides**

In the event that slides occur along excavated slopes during grading operations or after completion of grading but prior to acceptance of the work, the Contractor shall remove and dispose the slide materials and also to trim the slopes as directed to leave the slopes in a safe and neat condition all at no additional cost to NPC, unless occurrence of such slides is occasioned by causes beyond control of the Contractor. In such event, payment for the satisfactory removal and proper disposal of slide material and finishing and rounding of slopes will be paid for at the equivalent of thirty percent (30%) of the contract unit price per cubic meter for the item Grading Excavation.

**CW-4.3.6 Slip-Outs**

In the event of slip-outs in any part of the grading fill prior to final acceptance of the work, the Contractor shall rebuild such portion of the fill. In the case it is determined that the slip-outs was caused through the fault of the Contractor, the rebuilding of the fill shall be performed by the Contractor at no extra cost to NPC; otherwise, the reconstruction of the fill will be paid for thirty percent (30%) of the contract unit for the item, Grading Fill.

**CW-4.4 Disposal**

All excess materials from grading work (including excess materials in structural excavation and miscellaneous work) shall be disposed of the by the Contractor. The acquisition of the right-of-way for the area of disposal including the access thereto, permits, and other requirements, shall be the responsibility of the Contractor at no cost to NPC. The Contractor shall be held solely liable for any claim by third parties that may arise from improper transport and disposal of excess materials. The cost of acquisition of the above-mentioned right-of-way shall be included in the unit bid price for excavation.

**CW-4.5 Sources of Fill Materials**

When suitable materials from grading excavation are deficient to meet the quantity required for grading fill, additional fill materials shall be obtained from other sources proposed by the Contractor and approved by the NPC. Cost of excavating, hauling, placing and compacting additional materials from borrow sources shall be included in the unit price bid for the item, Grading Fill. Acquisition of right-of-way to these sources shall be the responsibility and account of the Contractor.

**CW-4.6 Environmental Requirements**

All construction activities to be performed by the Contractor shall be in accordance with the restrictions stated in the approved Environmental Clearance Certificate (ECC) and the conditions set forth in Clause 3.0 - Environmental Requirements for Civil Works.

**CW-4.7 Measurement and Payment****CW-4.7.1 Clearing and Grubbing**

Unless otherwise specified in the Bill of Quantity, no separate measurement and payment will be made for Clearing and Grubbing. Corresponding cost hereof shall be included in the unit bid price of relevant item(s) in the Bill of Quantity.

**CW-4.7.2 Miscellaneous Works**

Measurement for payment for miscellaneous work such as demolition, restoration, etc., shall be made on a lot basis unless otherwise specified in the Bill of Quantity. Payment will be made at the contract unit price for the item Miscellaneous Works, which payment shall cover all cost for furnishing labor, equipment and incidentals necessary for demolition and restoration, disposal, and other related works required to complete the item.

**CW-4.7.3 Stripping**

Unless otherwise specified in the Bill of Quantity, no separate measurement and payment will be made for Stripping. Corresponding cost hereof shall be included in the unit bid price of relevant item(s) in the Bill of Quantity.

**CW-4.7.4 Grading Excavation**

Measurement for payment for Grading Excavation shall be based on the number of cubic meters excavated and properly disposed. Volume shall be computed by the average end area method which shall be the volume between the original ground (as determined by survey to be made by representatives of both NPC and the Contractor) and graded surface on the drawings or as established by NPC. To this volume shall be added, for purpose of payment, all authorized excavations below grade.

Payment will be made at the contract unit price for the item Grading Excavation in the Bill of Quantity, which payment shall constitute full compensation for furnishing of all labor, construction equipment and incidentals necessary excavate, dispose and other related work required to complete the work item.

**CW-4.7.5 Grading Fill**

Measurement for payment for Grading Fill shall be based on the number of cubic meters of the materials placed, graded, compacted and accepted. Volume shall be computed by the average end area method which shall be the volume between the ground surface after stripping and the finished grade surfaces on the drawings or as established by NPC.

Payment will be made at the contract unit price for the item Grading Fill in the Bill of Quantity, which payment shall constitute full compensation for furnishing of all materials, labor, construction equipment and incidentals necessary to complete the work item.

**CW-5.0 STRUCTURAL EXCAVATION, FILL AND BACKFILL**

**CW-5.1 Scope**

In accordance with the specifications contained herein and as shown on the drawings and otherwise directed, the Contractor shall perform all the required structural excavation, fill and backfill for the entire project, including the proper disposal of excess excavated materials.

**CW-5.2 Materials**

**CW-5.2.1 Structural Excavation**

No classification will be made on the materials excavated. The Contractor shall determine his/her unit bid price for structural excavation based on unclassified material regardless of the nature of the materials actually encountered and excavated.

**CW-5.2.2 Structural Fill**

**a. Sand and Gravel Fill**

The material shall be of the same classification as the sand and gravel base consisting of river sand and gravel as approved by the NPC. The composite material shall be free from vegetable matter and lumps or balls of clay, and shall be uniformly graded from coarse to fine in accordance with the grading requirements shown below:

<b><u>Sieve Designation</u></b> <b><u>(Square Mesh Sieves)</u></b>	<b><u>Percentage by</u></b> <b><u>Weight Passing</u></b>
50.0 mm (2")	100
25.4 mm (1")	55-85
10.5 mm (3/8")	35-60
4.76 mm (No. 4)	25-50
2.08 mm (No. 10)	20-40
0.42 mm (No. 40)	8-20
0.074 mm (No. 200)	2-8

**b. Structural Earth Fill**

Structural earth fill shall consist of filling with suitable materials obtained from grading excavation or from borrow areas approved by the NPC.

**CW-5.2.3 Special Foundation, if any**

The NPC shall have the option to use one or both of the following materials for special foundations, whether or not shown on the drawings:



a. **Lean Concrete**

The strength of lean concrete shall be 13.79MPa or as designated by the NPC.

b. **Selected Materials**

Selected materials shall consist of compactable material which, when compacted, shall attain the required bearing capacity. The material could be a combination of earth and rock particles not greater than 8 cm including sandy clay, gravelly clay, or shale, all approved by the NPC.

Bed materials for water pipes and/or drainage culverts shall use sand fills:

**CW-5.2.4 Structural Backfill**

Backfill for Structures Other Than Pipes – Material for backfill shall consist of compactable and approved material taken from grading and structural excavations. Any additional material needed shall be obtained from borrow areas proposed by the Contractor and approved by the NPC.

Backfill for Sewerage and Drainage Pipes – The layer of backfill materials immediately above, up to 60 cm. from the top of pipe, and on the sides of the pipe shall consist of selected material consisting of clay soil and/or other fine materials that are free from stone particles, roots, debris. The upper layer shall consist of compactable materials taken from pipe trench and other structural excavation.

Backfill for Water Supply Pipes – Backfill for water supply pipes shall consist of compactable materials taken from trench excavation and approved by the NPC.

**CW-5.3 Construction**

**CW-5.3.1 Excavation**

a. General

The Contractor shall notify the NPC sufficiently in advance before the beginning of any excavation so that a joint survey for baseline data and cross-sectional measurements can be undertaken on the undisturbed/natural ground surface. All excavation shall be carried out according to the lines, slopes and grades shown on the drawings. In case an increase or decrease in quantities occur as a result of changes made by the NPC to such lines, slopes, and grades, the provisions on Variation Orders under the General Conditions of Contract (GCC) shall apply.

After each excavation is completed or where replacement of unsuitable material below required foundation grade has been undertaken, the Contractor shall notify the NPC so that proper inspection and confirmatory test on the bearing capacity of the foundation material can be made. In no case that concrete, sewer, drainage or water supply pipe can be placed unless a written approval has been issued by the NPC.

Over-excavation performed by the Contractor due to his carelessness shall be filled and properly compacted with the suitable material approved by NPC, at no additional cost to NPC.

b. Structural Excavation, Structure Other Than Pipes

The Contractor shall excavate the foundations to the specified side slopes and depths shown on the drawings, after which the NPC will conduct tests on the underlying material below foundation grade to determine the actual bearing capacity at such depth. If the required bearing capacity is not attained, the NPC shall instruct the Contractor to excavate further down until, in the opinion of the NPC, the bearing capacity is adequate to sustain the applied load on the foundation.

Compliance to such instruction shall not entitle the Contractor for additional compensation over and above the unit prices for excavation regardless of the nature of material excavated. For purposes of measurement, the applicable paylines for the excavation under this condition or situation shall be as shown on the drawings that show the paylines for excavation and special foundation materials.

c. Drainage and Sewerage Pipes and Cable Trench

The width of trench excavation for drainage and sewerage pipes and cable trench shall be as indicated on the drawings. All trench bottoms shall be excavated to the foundation grade indicated, regardless of the foundation material classification.

d. Water Supply Pipes

Trenches for main or feeder lines shall be excavated to the depth of no less than 0.25 meter on open ground and 0.60 meter under roadways and parking areas, both depths measured from the finished grade surface.

Service pipes shall be buried to a depth of at least 0.15 meter below grade line.

**CW-5.3.2 Structural Foundation Fill**

No fill materials shall be placed in any part of the fill foundation unless the foundations have been inspected and approved by the NPC. Fill materials shall be placed and spread in layer covering the entire length and breadth of the section under construction, each layer not to exceed 15 cm. in loose volume thickness and compacted thoroughly to the desired compaction as determined by the NPC. No succeeding layer shall be placed until the previous layer has been tested and approved, as to compaction, by the NPC.

**CW-5.3.3 Special Foundations**

If unsuitable material is encountered or if the foundation material is unsuitable such that the required bearing capacity of the foundation cannot be attained at the required elevation, further excavation shall be performed by the Contractor as stated in CW-5.3.1b.



Excavated materials below foundation grade shall be replaced at the direction of the NPC, either by lean concrete or by selected materials as mentioned in CW-5.2.3.

Selected materials shall be placed in 15-cm layers and compacted until the required bearing capacity is attained.

#### **CW-5.3.4 Backfill**

##### **1. Structures, Other Than Pipes**

Excavated areas around structures for backfilling shall be backfilled with approved materials in horizontal layers, each not exceeding 15cm. (6") in loose volume thickness. Each layer shall either be moistened or dried as directed and thoroughly tamped with tampers having no less than 160 cm<sup>2</sup> of tamping area and weighing not less than 20 kg. The last layer shall be neatly brought up to the level of the adjoining finished grade surface.

In no case shall backfill be placed around concrete structures until after fourteen (14) days from placement of the concrete.

##### **2. Drainage and Sewerage Pipes**

After the pipes have been installed and grouted joints sufficiently cured, but in no case less than seven (7) days allowed for curing as specified in NSCP and the whole pipeline inspected, backfill materials specified herein shall be placed in layers as directed, each layer either dried or moistened as directed and thoroughly tamped. The backfill shall be brought up evenly on both sides of the pipe up to the top of the pipe and finally up to the finished grade surface.

##### **3. Water Supply Pipes**

After the pipeline has been installed and tested it shall be backfilled in layers as directed and compacted to the satisfaction of the NPC.

#### **CW-5.4 Measurement and Payment**

##### **CW-5.4.1 Structural Excavation**

Measurement for payment for structural excavation performed by the Contractor for structures (except drainage, sewerage and water supply pipes, and appurtenances of which cost of excavation and backfill is included in the cost of installed pipe and constructed appurtenances) will be based on the number of cubic meters of materials excavated.

For purpose of payment, all authorized excavation below foundation grade (like in the case of unsuitable materials encountered) shall be included in the measurement.

Payment will be made at the contract unit price for Structural Excavation in the Bill of Quantity, which payment shall constitute full compensation for furnishing all labor and equipment necessary for excavation work and proper disposal of excess material excavated.



**CW-5.4.2 Structural Foundation Fill**

Measurement for payment for Structural Foundation Fill will be based on the number of cubic meters of fill materials placed within the neat lines as shown on the drawings.

Payment will be made at the contract unit price for the item, Sand and Gravel Fill/Base, in the Bill of Quantity, which payment shall constitute full compensation for furnishing, placing and compacting fill materials; labor which include spreading, compacting, etc., equipment and other incidentals necessary to complete the item.

**CW-5.4.3 Special Foundations**

Measurement for payment for lean concrete and/or selected materials placed within the pay lines for excavation will be based on the number of cubic meters in-place and accepted.

Payment will be made at the contract unit price for the corresponding item shown in the Bill of Quantity, which payment shall cover all costs for furnishing all labor, materials, equipment and tools necessary to complete the item.

**CW-5.4.4 Structural Backfill**

Measurement for payment for Structural Backfill (except backfill for drainage and sewerage pipes, appurtenances and other structures of which cost of backfill is included in the cost of installed pipes and appurtenances) will be based on the number of cubic meters of approved materials, backfilled, satisfactorily compacted and accepted. Any backfill material placed outside the pay lines for excavation to replace slides or over-excavation will not be paid.

Payment will be made at the contract unit price for the item, Structural Backfill, in the Bill of Quantity, which payment shall constitute full compensation for furnishing all labor, materials and equipment necessary for backfilling work.

**CW-5.4.5 Trench Excavation and Backfill for Sewerage, Drainage and Water Supply Pipes and Cable Trench**

No separate measurement and payment will be made for trench excavation and backfill for all sewerage, drainage and water supply pipes. Payment for trench excavation and backfill for pipes shall be included in the payment pertaining to pipes as shown in the Bill of Quantity.

**CW-6.0 CONCRETE****CW-6.1 Scope**

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



**CW-6.2 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-6.3 Materials****CW-6.3.1 Cement**

Cement for concrete works shall be furnished by the 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. However, the use of Portland Pozzolan Cement Type IP meeting the AASHTO/ ASTM requirements may be allowed, provided that trial mixes shall be done and that the mixes meeting the concrete strength requirements of the AASHTO/ ASTM provisions, pertaining the use of Portland Pozzolan Cement Type IP, shall be adopted.

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-6.3.2 Reinforcing Steel**

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

**CW-6.3.3 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-6.3.4 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-6.3.5 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-6.4 Storage of Materials**

**CW-6.4.1 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-6.4.2 Reinforcing Steel**

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

**CW-6.5 Concreting**

**CW-6.5.1 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-6.5.2 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 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 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-6.5.3 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-6.5.4 Mixing Concrete**

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

#### **CW-6.5.5 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-6.5.6 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-6.5.7 Removal of Forms**

Formwork shall not be removed without the permission of NPC; where such permission, however, shall not relieve the 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-6.5.8 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-6.5.9 Sampling and Testing of Concrete**

The 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 Contractor's expense.

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

No concreting work on the project will be permitted to be done until NPC signifies in writing the approval of the use of all materials involved in making the concrete, following the satisfactory results of the necessary tests.

As work progresses, test cylinders shall be fabricated from the concrete samples and tested in accordance with ASTM C31 and ASTM C310. 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 strength level of a concrete mixture shall be acceptable if every average of any three consecutive strength tests equals exceeds  $f'_c$ , provided no strength test falls below  $f'_c$  by more than 500psi (3.5MPa) if  $f'_c$  is 5000psi or less; or by more than  $0.10f'_c$  if  $f'_c$  exceeds 5000psi (35MPa)

Concrete deemed to be not acceptable using the above criteria maybe rejected unless the 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-6.5.10 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 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-6.5.11 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-6.6 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 Quantity 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 Quantity. 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-7.0 REINFORCING STEEL**

### **CW-7.1 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-7.2 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-7.2.1 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-7.2.2 Sampling**

The NPC's Representative will sample reinforcement bars at the source of supply or at the point of distribution, and the 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-7.3 Construction Requirement**

#### **CW-7.3.1 Order List for Bent Bars**

Before materials are ordered, the 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 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 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-7.3.2 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 $\Phi$ to 20mm $\Phi$ inclusive	D=6d
Bars 25mm $\Phi$ and 28mm $\Phi$	D=8d
Bars 32mm $\Phi$ 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-7.3.3 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-7.3.4 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-7.3.5 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 mm $\Phi$ . 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 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 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 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-7.4 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 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 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 Quantity which price and payment shall be made in full compensation for furnishing materials, labor, equipment and incidentals necessary to complete this item.

## **CW-8.0      STRUCTURAL STEEL**

### **CW-8.1      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-8.1.1      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 Contractor shall also submit chemical analysis, including tensile strength and hardness tests as required by ASTM A325.

#### **CW-8.1.2 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-8.2 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-8.2.1 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-8.2.2 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-8.2.3 Accessories:**

Welding electrodes and steel structural members shall use:

Rods E70XX electrodes

Non-shrink Grout ASTM C827, non-metallic

### **CW-8.3 Execution**

#### **CW-8.3.1 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-8.3.2 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-8.3.3 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 with high quality workmanship, 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-8.3.4 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 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-8.3.5 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 Testing<sup>1</sup>:** 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-8.4 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 Quantity, which payment shall constitute full compensation for furnishing all labor, materials and equipment necessary to complete the item.

#### **CW-9.0 CONCRETE WALK / SIDEWALK**

##### **CW-9.1 Scope**

In accordance with the plans and these specifications, the Contractor shall furnish all materials; labor, equipment, tools and construct complete the combination concrete walk.

##### **CW-9.2 Materials**

##### **CW-9.2.1 Bedding**

Aggregate bedding material for the concrete walk shall consist of pitrun gravel, talus rock, disintegrated granite, sand, shale, cinders, coral or other similar materials, including additional filler for blending, selected under the direction of the NPC. The maximum dimensions of any particles shall not be greater than two thirds of the required thickness of the layer in which it is to be placed.

Oversized material, if present, shall be removed at the pit by screens, grizzlies, or by handpicking. When necessary to obtain proper uniformity, additional filler shall be blended by mixing on the roadway. The fraction of the aggregate bedding material, including any additional filler passing the No. 40 sieve, shall not be more than two-thirds (2/3) of that passing the No. 40 sieve shall have a liquid limit not greater than 25 and a plasticity index of not more than 6.

##### **CW-9.2.2 Concrete**

Concrete shall be 20.70 MPa or as indicated on the drawings.

##### **CW-9.2.3 Reinforcing Steel**

Reinforcing Steel Bars shall conform to the requirements of PNS 49:2002 for Grade 40 rebar minimum.

<sup>1</sup> Not applicable on non-critical structures/joints and as directed/required by NPC Design Engineer.



**CW-9.3 Construction****CW-9.3.1 Foundation Preparation**

Prior to placing the bedding for the concrete curb, gutter and sidewalk, the foundation shall be prepared by compacting and bringing it to unyielding or firm surface. Compaction shall be attended by either wetting or drying, as the case may be, to attain satisfactory compaction of the foundation.

**CW-9.3.2 Bedding**

The bedding upon which the concrete walk rest, shall be compacted to a firm, even surface.

**CW-9.3.3 Placing Concrete**

Mixing, placing, finishing and curing concrete shall conform to the requirements of ACI Code for Concrete Construction.

The concrete walk shall be constructed to the section and dimensions shown on the drawings. The concrete walk shall be constructed in uniform sections and, unless otherwise directed, each section shall not be more than five (5) meters in length except where shorter sections are required for closure, but no section shall be less than two (2) meters long. The sections shall be separated by sheet templates set perpendicular to the face and top of the concrete walk. The templates shall be approximately 3 mm in thickness, of the same.

**CW-9.4 Measurement and Payment****CW-9.4.1 Concrete**

Measurement for payment will be based on the square meter of sidewalk, completed and accepted. Payment will be made at the contract unit price for the item, sidewalk, in the Bill of Quantity.

**CW-9.4.2 Bedding**

Measurement for payment will be based on the number of cubic meters of bedding materials, placed, compacted and accepted. Payment will be made at the contract unit price for the item, Aggregate Sub-base, in the Bill of Quantity.

SECTION VI

**TECHNICAL  
SPECIFICATIONS**

**ELECTRICAL WORKS**



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## **EW - ELECTRICAL WORKS**

### **EW-1.0 ELECTRICAL SYSTEM**

### **EW-2.0 GENERAL**

This specification covers the technical and associated requirements of complete lighting system for the **Construction of Office and Staff House at Roxas Substation (NPSSTL)**.

### **EW-3.0 SCOPE OF WORK**

The scope of works shall cover but not limited to the Supply, Installation and Test of complete Lighting and Power system.

### **EW-4.0 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-5.0 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-5.1 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-5.2 Lighting and Power Panelboard**

The lighting and power panelboard shall be flush mounted with IP42 rated degree of protection, 2.0mm (steel work) sheet steel gauge metallic housing and tinned copper bus bar.

The main and branch circuit breakers shall be quick-make quick break, thermal magnetic trip, bolt-on type and with rating as required by the connected load.

Nameplate shall be black plastic with engraved white letter.

#### **EW-5.3 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 Type Lighting Fixture with Louvres**

IP20 Recessed Mounted Lighting Fixture with mirror finish aluminum reflector and satin finish aluminum louvres, zinc phosphate steel sheet housing with white powder coat paint finish, ballast-bypass, and high output G13 base LED tube lamp.

**b. Round Ceiling Luminaire**

Round Ceiling Lamp shall be 230V, 60Hz, IP20 rated, 350mm diameter, white steel base, opal glass diffuser and complete with 2x12W E27 base, frosted finish compact LED lamp.

**c. Compact LED Lighting Fixture**

Compact LED Luminaires shall be rated 9W, 230V, 60 Hz operations, cool white, and frosted finish. Lamp holders shall be IP20 surface mounted, E27 Base type.

**EW-5.4 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 3.5mm<sup>2</sup>.

Insulation shall be suitable for wet and dry location, fungi resistant and ultra violet 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-5.4.1 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-5.5 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 checked 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-5.6 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-6.0 MEASUREMENT OF PAYMENT**

#### a) 240V Lighting and Power Panelboard

Measurement of payment for the supply, installation and test of Lighting and Power Panelboard shall be based on the number of sets furnished, installed and tested in accordance with the bid drawing. Payment will be made at the contract unit price for the corresponding item in the Bill of Quantities.

Payment thereof shall constitute the full compensation for furnishing the corresponding item and labor necessary to complete the work including testing.

#### b) Lighting Fixtures/Luminaires

Measurement of payment for the supply, installation and test of lighting fixtures shall be based on the number and type of lighting fixtures including mounting accessories furnished, installed and tested in accordance with the bid drawing. Payment will be made at the contract unit price for each item including mounting accessories in the Bill of Quantities.

Payment thereof shall constitute the full compensation for furnishing all materials and labor necessary to complete the work including testing.

#### c) Outlets and Switches

Measurement of payment for the supply, installation and test of Outlets and Switches shall be based on the number and type furnished, installed and tested in accordance with the bid drawing. Payment will be made at the contract unit price for each outlets and switches in the Bill of Quantities.

Payment thereof shall constitute the full compensation for furnishing the corresponding item and labor necessary to complete the work including testing.

#### d) Conductors

Measurement of payment for the supply, laying and test of Conductors shall be on a lot basis in conformity with the Bid Drawing.

Payment shall be made at the contract lump sum price for the said item in the Bill of Quantities.

Payment thereof shall constitute the full compensation for furnishing the corresponding item and labor necessary to complete the work including testing.

e) Embedded and/or Non-Embedded Conduit, including, Fittings and Accessories

Measurement of payment for the supply and installation of Embedded and/or Non-Embedded Conduits including fittings and accessories shall be on a lot basis in conformity with the Bid Drawing. Payment shall be made at the contract lump sum price for the said item in the Bill of Quantities.

Payment thereof shall constitute the full compensation for furnishing all materials and labor necessary to complete the work including testing.

**SECTION VI**

**TECHNICAL  
SPECIFICATIONS**

**MECHANICAL WORKS**



**SECTION VI – TECHNICAL SPECIFICATIONS****MW - MECHANICAL WORKS****TABLE OF CONTENTS**

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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 Construction of Staff House at Roxas Substation (NPSSTL).

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) lot of Domestic Water Supply System consisting of pipes, valves, hose bibb, pipe fittings, gaskets, flanges, bolts and nuts, pipe supports including the required excavation and backfilling of embedded pipes and other incidentals to complete the domestic water supply piping system;
- b) One (1) unit of Inverter-Window Type Air Conditioner of 14,300 kJ/hr minimum cooling capacity for the Office, complete with its mounting accessories and controls located at Powerhouse area;



- c) Two (2) units Wall Mounted Exhaust Fan, 100 m<sup>3</sup>/hr capacity for the restroom and 150 m<sup>3</sup>/hr capacity for the kitchen, complete with its mounting accessories and control;
- d) Three (3) units of Portable Type Fire Extinguisher, Clean Agent (HCFC or Halotron I Type), 7.1 kg. (15.5 lbs), non-expiry, multi-shots, wall-hung type and PS/ICC and/or BFP approved;
- e) 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 Supplier 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 Supplier under this contract shall be submitted by the Supplier for NPC's review and approval prior to fabrication. Equipment or articles installed or used without such approval shall be at the Supplier'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 DOMESTIC WATER SUPPLY SYSTEM****MW-4.1 General**

This section provides the essential information for the design, supply, installation, construction and test of the Domestic Water Supply System to provide the water requirements of the proposed Construction of Office and Staff House at Roxas Substation (NPSSTL) including all required excavation and backfilling works for the piping system.

**MW-4.2 Domestic Water Supply Piping System****MW-4.2.1 Scope of Work**

The Contractor shall supply, install and test the Domestic Water Supply and Distribution Piping System including piping supports, fittings, all required excavation and backfill of pipe trenches.

The work shall include the installation of valves, valve boxes if necessary, gauges and other accessories to complete and make ready for safe and reliable operation of the system, but not limited to the following:

- a) One (1) unit of 20 mm Ø Gate Valve @ at the tapping point (existing domestic water supply) of Roxas Substation;
- b) Two (2) units of 20 mm Ø Hose Bibb;
- c) One (1) lot of domestic water piping, pipe fittings and other necessary accessories.



**MW-4.2.2 Pipe, Fittings and Accessories**

Domestic water piping shall be constructed from Unplasticized Polyvinyl Chloride (uPVC) pipe schedule 80 or class 150, conforming to ASTM D-1784 or approved equivalent.

Unplasticized PVC pipe connection joints 80 mm (3") Ø and above shall be joined by rubber ring or solvent cement type connection. Smaller sizes shall be of solvent cement type connection.

Flanged connections may be used for connecting to flanged surfaces and shall be of the same material with the connected pipe with a rating of class 150 or ANSI 150. Flanged joints may use flat gaskets with serrated flange faces or O-rings with corresponding grooves. Gaskets and O-rings shall not be fabricated from plasticized PVC.

Union joints shall not be used with pipe diameters of more than 63 mm O.D. (2"). Joints between metal pipes and PVC pipes should be flanged type using a PVC flange on the PVC pipe and full face gasket.

Flange bolts shall be hexagonal head machine bolts with heavy semi-finished head nuts having dimensions in accordance with ANSI B18.2.

PVC pipe installed aboveground shall be properly supported to avoid pipe sagging. Pipe covering made of steel or metal shall be provided in case there is high risk of damaging the pipe during normal operation and maintenance.

All trench excavation and backfill works shall be done in accordance with pertinent provisions specified in the Civil Works Specifications.

**MW-4.2.3 Valves and Accessories**

All gate and globe valves, 65mm and above shall be of OS & Y with rising stem, solid wedge type disc for gate valves and plug type disc for globe valves, bolted, bonnet, bolted gland and have flanged ends with the following materials of components:

- |                     |   |                        |
|---------------------|---|------------------------|
| a) Body & bonnet    | - | Cast iron              |
| b) Stem             | - | Bronze or brass        |
| c) Seat ring & seat | - | Bronze or bronze faced |
| d) Wedge or disc    | - | Bronze or bronze faced |

Gate and globe valves, 50mm and smaller shall be made of bronze material, rising stem, union bonnet, inside screw, solid wedge or plug type disc, and screwed ends. Valves installed in valve boxes shall have flanged ends for easy replacement or if valves with screwed ends are used, appropriate unions shall be installed.

Valves of all sizes shall have a rating of not less than Class 150.

Garden hose connection valves or hose bibbs shall be of bronze material, 20mm size and outfitted with male thread hose connections.

Strainers, if required, shall be of Y-type with cast iron or PVC body material and flanged or screwed ends. Screen elements shall be of stainless steel construction with minimum of 40-mesh size.

#### **MW-4.3 Installation**

The Contractor shall install the piping system in a thorough manner and with good workmanship in accordance with the construction drawings and specification or as directed by NPC. No installation work for underground pipe shall commence unless trench excavation has been approved by NPC.

All pipes, fittings, valves and appurtenances shall be free from dirt or other foreign matters before laying. In the installation of the pipes, care shall be taken to prevent the pipes from becoming clogged during the progress of the work. Should any pipe become either partially or wholly clogged before final completion of the work, it shall be cleaned out by the Contractor in a manner satisfactory to NPC or shall be replaced by and at the expense of the Contractor. Open ends shall be temporarily plugged, otherwise suitably closed when necessary.

Special care shall be taken in carrying out the installation of joints, branches, valves and other fittings.

All piping works shall be coordinated with any other work at site and with existing installation so that interference between piping and other structural features will be avoided. In case interferences occur, NPC will decide which work is to be relocated.

Where pipeline are laid, the trench shall be provided with a cushion pad of at least 100 mm sand and sandy soil bedding materials.

Embedded water supply pipes in open areas shall be laid not less than 300mm from the ground surface to the bottom of pipe.

All pipeline excavation shall be backfilled up to the level of the finished grade surface in layers of 150 mm and thoroughly compacted. Backfill materials shall be compactable soil taken from trench excavation and approved by NPC. Trench excavation and backfilling works shall be done in accordance with the pertinent provisions of the Civil Works Technical Specifications.

PVC pipe installed aboveground shall be properly supported to avoid pipe sagging. Pipe covering made of steel or metal shall be provided in case there is high risk of damaging the pipe during normal operation and maintenance.

All existing facilities affected and damaged during the installation of piping shall be replaced and/or restored to its original appearance by the Contractor at his own expense.

Transportation, storage and erection shall be in strict accordance with manufacturer's recommendations. Erection shall be such as to prevent stress in the piping.

All trench excavation and backfill works shall be done in accordance with pertinent provisions specified in the Civil Works Specifications.



**MW-4.4 Testing and Cleaning**

The piping system shall be hydrostatically tested at a pressure 1.5 times the design pressure or maximum working pressure of the system for a period of not less than 30 minutes. Test may be applied to whole assembly of the entire piping system. During the test, valves shall be opened and closed.

Before starting the test procedure, the piping shall be flushed and cleaned thoroughly. When filling the line with water, all air shall be removed.

There shall be no leakage or whatsoever from the piping, fittings and connections for each assembly tested while the system is under test pressure for a period of not less than the specified time or the total time to inspect all portions of the water line under test, whichever is longer.

Any leakage or defect disclosed by the test prior to the acceptance shall be corrected and repaired by the Contractor at his own expense and to the satisfaction of NPC.

Before any tests are made, the Contractor shall notify NPC so that such test may be witnessed by NPC or his duly authorized representative. All expenses incurred during the test shall be borne by the Contractor.

If applicable, test shall also include visual check on welded parts of the modified tapping points during actual operation of each system to ensure that no leakage is observed on the welded joints.

The water piping system shall be disinfected after testing and before being put into use. Before disinfections, the piping should be drained, flushed, re-drained and refilled. In refilling, care must be taken to avoid entraining or entrapping air in the piping. The Contractor may use any of the methods of disinfections as recommended by the American Water Works Association (AWWA) or any of the following kinds of treatment:

- a) Chlorine Gas-Water Mixture;
- b) Calcium-Hypochlorite or equal; or
- c) Dry Calcium Hypochlorite or Chlorinated Lime and Water Mixture.

Retention period shall be at least 24 hours and shall produce not less than 10 ppm at extreme end of the lines at the end of the retention period. After flushing, residual chlorine must be reduced to less than 1 ppm.

The Contractor shall submit the following for review and/or approval by NPC:

- a) Test procedures prior to test; and
- b) Test and inspection reports.

**MW-5.0 AIRCONDITIONING AND VENTILATION SYSTEM****MW-5.1 General**

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

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 Supplier's supply if power ratings provided are other than the one's specified above.

**MW-5.2 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: Office****d) Area to be ventilated shall be:**

d.1) Rest Room	-	10 changes per hour
d.2) Kitchen	-	20 changes per hour

**MW-5.3 Schedule of Equipment****a) Air-Conditioning Unit**

Location	Quantity	Cooling Load/Unit	Type
a.1) Office	One (1) set	14,300 kJ/hr	Inverter Window Type



**b) Ventilation Unit**

Location	Quantity	Rating/Unit	Type
b.1) Restroom	One (1) set	100 m <sup>3</sup> /hr	Wall Mounted Exhaust Fan
b.2) Kitchen	One (1) set	150 m <sup>3</sup> /hr	Wall Mounted Exhaust Fan

**MW-5.4 Air-Conditioning System****MW-5.4.1 Scope of Works**

The Work called for in this specification includes the design, furnishing, delivering, installing and testing of window type air conditioner (inverter type) to provide a fully ventilated and air conditioned room. 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 electrical materials such as circuit breakers, automatic controls, including all power and control wires, supervision, electrical outlets and fittings shall be included and provided by the Supplier including complete system of automatic temperature controls.

The type and quantity of air conditioning equipment to be supplied shall be as specified in Clause 5.3 (Schedule of Equipment) or shown on the drawings.

All air conditioning units (window 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

**MW-5.4.2 Window Type Air-Conditioning System**

The Window Type Air Conditioning Unit shall be supplied and installed on the area specified in the schedule of equipment or shown on the drawings.

The units shall be wall mounted room air conditioner and shall be provided with a room thermostat and sensing element which detect changes in room temperature and adjust it to desired cooling by automatic actuation of the compressor. Compressor shall be provided with thermal overload device that automatically shuts off the compressor during overheating.

Fan motor shall be permanently lubricated. The unit shall operate on a 230 V AC, single phase and 60 Hz power supply.



Mounting brackets which are properly fixed on the wall or structure shall be provided to support the suspended portion of the air conditioner unit. Weather seals shall be provided on the area between the air conditioner and wall opening.

Provision of wall opening for the installation of the window type air conditioning units shall be closely coordinated with the civil works.

## **MW-5.5 Ventilation Units**

### **MW-5.5.1 General**

The Supplier 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-5.5.2 Wall Mounted Exhaust Fans**

Thru-the-wall propeller exhaust fans 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. Unit installed/mounted on the wall and directly discharges exhaust outside the building shall be provided with automatic shutter. It shall be of the direct driven type and corrosion resistant to operate on a 230 V, single phase, 60 Hz.

## **MW-5.6 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-5.7 Spare Parts and Tools**

The Supplier 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 Supplier 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-5.8 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 Supplier.

**MW-5.9 Submittal**

Prior to purchase and implementation of the works, the Supplier 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-6.0 FIRE FIGHTING SYSTEM****MW-6.1 General**

This section provides the essential information for the design, manufacture, fabrication, supply, installation, delivery to site and test of the specified Fire Fighting System.

All equipment and materials necessary for the complete installation shall be furnished complete, even though not necessarily mentioned in this specification but are necessary for the safe and reliable operation of the Fire Fighting System.



All the Fire Fighting System equipment shall be supplied by the Supplier complete with their corresponding technical brochures written in English that would in the aid installation, operation and maintenance of the equipment.

The Fire Fighting System shall be designed, installed and tested in accordance with the requirements of National Fire Protection Association (NFPA) Standards.

The Supplier shall design, furnish, install and test all the equipment specified below.

## **MW-6.2      Portable Fire Extinguisher**

### **MW-6.2.1      Scope of work**

The Supplier shall supply the specified number of PS/ICC and/or BFP approved Portable Type Fire Extinguishers complete and ready for operation and shall be installed at their corresponding place of use as specified below and shown on the drawings.

- a) Three (3) units of Portable Type Fire Extinguisher, Clean Agent (HCFC or Halotron I Type), 7.1 kg. (15.5lbs), non-expiry, multi-shots, wall-hung type and PS/ICC and/or BFP approved.

### **MW-6.2.2      Fire Extinguisher**

Fire extinguisher shall be Philippine Standard/Import Commodity Clearance and/or Bureau of Fire Protection Approved and of rechargeable cylinder with five (5) years guarantee against leak. Each fire extinguisher cylinder shall be complete with release valve, dial gauge indicator, appropriate length of hose with nozzle and locking pin.

The 7.1 kg (15.5 lbs.) capacity wall-hung type fire extinguishers shall be complete with carrying handle and wall-mounting bracket.

Portable fire extinguishers shall be suitable for the protection against class ABC fires using Clean Agent (HydroChloroFluoroCarbon or Halotron I Type) that is environmentally safe and leaves no residue.

The fire extinguishers shall be check-weighted at interval of six (6) months from the date of delivery for a period on one (1) year and if found to be undercharged (unless used by an NPC personnel) shall be filled and recharged by the Supplier at no expenses to NPC.

### **MW-6.2.3      Submittal**

The Supplier shall submit the type and model of the fire extinguishers for the approval of NPC prior to purchase.

**MW-7.0****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  
Agham Road corner Quezon Avenue,  
Diliman, Quezon City 1104



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-8.0      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-9.0      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 VII

# **BILL OF QUANTITIES ARCHITECTURAL WORKS**

## SECTION VII - BILL OF QUANTITIES

## ARCHITECTURAL WORKS

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	
<b>I OPERATOR'S QUARTER AND OFFICE</b>							
<b>AW (ARCHITECTURAL WORKS)</b>							
<b>AW-1 WALL SYSTEM AND FINISHES</b>							
AW-1.1	150mm thick (6") CHB Wall including mortars and reinforcing bars.	furnish and lay	Refer to NPC TS & Drawing	sq.m.	83	_____ (P _____)	P _____
AW-1.2	100mm thick (4") CHB Wall including mortars and reinforcing bars.	furnish and lay	Refer to NPC TS & Drawing	sq.m.	64	_____ (P _____)	P _____
AW-1.3	Plain cement plaster wall finish	furnish and apply	Refer to NPC TS & Drawing	sq.m.	267	_____ (P _____)	P _____
AW-1.4	Vitrified glazed wall tiles 200mm x 200mm including bonding materials for kitchen counter and toilet walls	furnish and install	Refer to NPC TS & Drawing	sq.m.	11	_____ (P _____)	P _____

Name of Firm

Name and Signature of Authorized Representative

Designation



## SECTION VII - BILL OF QUANTITIES

## ARCHITECTURAL WORKS

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	
<b>AW-2 FLOOR FINISHES</b>							
AW-2.1	Vitrified unglazed floor tiles 200mm x 200mm including bonding materials for toilet floor	furnish and install	Refer to NPC TS & Drawing	sq.m.	3	_____ (P _____)	P _____
AW-2.2	Red cement plaster floor finish	furnish and apply	Refer to NPC TS & Drawing	sq.m.	60	_____ (P _____)	P _____
<b>AW-3 ROOFING SYSTEM</b>							
AW-3.1	Roofings: 2.0mm thk Metallic Plastic long span corrugated roofing sheet, including stainless steel fasteners sealants and 2.0mm thk. Metallic plastic end flashing.	furnish and install	Refer to NPC TS & Drawing	sq.m.	105	_____ (P _____)	P _____
AW-3.2	Gutter: 2.0mm thick Metallic Plastic Gutter including fasteners, sealants, hardware and accessories	furnish and install	Refer to NPC TS & Drawing	l.m.	24	_____ (P _____)	P _____
AW-3.3	Ridge Roll: 2.0mm thick Metallic Plastic Ridge Roll including fasteners, sealant, hardware and accessories	furnish and install	Refer to NPC TS & Drawing	l.m.	12	_____ (P _____)	P _____

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## SECTION VII - BILL OF QUANTITIES

## ARCHITECTURAL WORKS

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	
AW-3.4	Facia Board: 1/2" x 12" Fiber cement board including steel frame hardware and accessories	furnish and install	Refer to NPC TS & Drawing	l.m.	42	_____ (P _____)	P _____
AW-3.5	Downspout: 4" Ø uPVC pipe series 1000 downspout including joint fittings, solvents and brackets	furnish and install	Refer to NPC TS & Drawing	l.m.	40	_____ (P _____)	P _____
AW-3.6	Roof Drain: Removable stainless wire basket strainer	furnish and install	Refer to NPC TS & Drawing	pcs	8	_____ (P _____)	P _____
<b>AW-4 CEILING SYSTEM</b>							
AW-4.1	6mm thick marine plywood on standard metal furring spaced @ 0.40 O.C.B.W. and metal hangers spaced 0.80 O.C.B.W.	furnish and install	Refer to NPC TS & Drawing	sq.m.	98	_____ (P _____)	P _____
<b>AW-5 FENESTRATION</b>							
AW-5.1	Doors:						
a.	D - 1 (800mm x 2100mm) Wooden Panel Door, 2" x 5" hard wood jamb, including heavy duty loose pin hinges, door knob/lockset weather proof and painting	furnish and install	Refer to NPC TS & Drawing	set	2	_____ (P _____)	P _____

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## SECTION VII - BILL OF QUANTITIES

## ARCHITECTURAL WORKS

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	
b.	D - 2 (800mm x 2100mm) Flush Type Wooden Door Marine Plywood both sides, 2" x 5" hard wood jamb, including heavy duty loose pin hinges, door knob/lockset weather proof and painting	furnish and install	Refer to NPC TS & Drawing	set	2	_____	_____
						(P _____)	P _____
c.	D - 3 (600mm x 2100mm) Flush Type Wooden Door Marine Plywood both sides, 2" x 5" hard wood jamb, including heavy duty loose pin hinges, door knob/lockset weather proof and painting	furnish and install	Refer to NPC TS & Drawing	set	1	_____	_____
						(P _____)	P _____
AW-5.2 Windows:							
a.	W - 1 (1.80 x 1.20m) Glass jalousie window 6mm thk. Clear glass on anodized aluminum frame	furnish and install	Refer to NPC TS & Drawing	set	6	_____	_____
						(P _____)	P _____
b.	W - 2 (1.20m x 1.20m) Glass jalousie window 6mm thk. Clear glass on anodized aluminum frame	furnish and install	Refer to NPC TS & Drawing	set	2	_____	_____
						(P _____)	P _____
c.	W - 3 (1.20 x 1.00m) Glass jalousie window 6mm thk. Clear glass on anodized aluminum frame	furnish and install	Refer to NPC TS & Drawing	set	1	_____	_____
						(P _____)	P _____

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## SECTION VII - BILL OF QUANTITIES

**ARCHITECTURAL WORKS**

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	
d.	W - 4 (0.60m x 0.60m) Glass jalousie window 6mm thk. Clear glass on anodized aluminum frame	furnish and install	Refer to NPC TS & Drawing	set	1	_____ (P _____)	P _____
<b>AW-6 PLUMBING SYSTEM</b>							
a.	Water closet, white	furnish and install	Refer to NPC TS & Drawing	set	1	_____ (P _____)	P _____
b.	Lavatory: Wall mounted with pedestal, colored,	furnish and install	Refer to NPC TS & Drawing	set	1	_____ (P _____)	P _____
c.	Soap holder, white	furnish and install	Refer to NPC TS & Drawing	pc	1	_____ (P _____)	P _____
d.	Toilet paper holder	furnish and install	Refer to NPC TS & Drawing	pc	1	_____ (P _____)	P _____
e.	Towel holder	furnish and install	Refer to NPC TS & Drawing	pc	1	_____ (P _____)	P _____
f.	Floor drain stainless 100mm x 100mm	furnish and install	Refer to NPC TS & Drawing	pc	1	_____ (P _____)	P _____

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## SECTION VII - BILL OF QUANTITIES

## ARCHITECTURAL WORKS

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	
g.	Kitchen sink, single tub stainless steel elongated, including faucet and p-trap fittings	furnish and install	Refer to NPC TS & Drawing	set	1	_____	_____
						_____ (P _____)	P _____
<b>AW-7 PAINTING</b>							
a.	All Concrete Surfaces	furnish and apply	Refer to NPC TS & Drawing	sq. m.	267	_____	_____
						_____ (P _____)	P _____
b.	All Wooden Surfaces	furnish and apply	Refer to NPC TS & Drawing	sq. m.	99	_____	_____
						_____ (P _____)	P _____
<b>AW-8 MISCELLANEOUS</b>							
a.	Soil poisoning; authorized anti-termite liquid concentrate	furnish and apply	Refer to NPC TS & Drawing	sq.m	60	_____	_____
						_____ (P _____)	P _____
<b>TOTAL AMOUNT OF BID</b>						_____	_____
						_____ (P _____)	P _____

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## SECTION VII

# BILL OF QUANTITIES

## SECTION VII

# **BILL OF QUANTITIES CIVIL WORKS**

## SECTION VII - BILL OF QUANTITIES

**CIVIL WORKS**

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	
<b>CW-1 SITE DEVELOPMENT</b>							
CW-1.1	Grading fill	furnish, place, spread & compact	Refer to NPC TS & Drawing	cu.m	60	_____ (P _____)	P _____
CW-1.2	Stripping	Excavate, stockpile and dispose	Refer to NPC TS & Drawing	cu.m	17	_____ (P _____)	P _____
CW-1.3	Concrete Walk	furnish and place	Refer to NPC TS & Drawing	sq.m	10	_____ (P _____)	P _____
<b>CW-2 CONSTRUCTION OF OPERATOR'S QUARTER AND OFFICE</b>							
CW-2.1	Structural Excavation	excavate, stockpile and dispose	Refer to NPC TS & Drawing	cu.m.	17	_____ (P _____)	P _____
CW-2.2	Structural Backfill	furnish, place, level and compact	Refer to NPC TS & Drawing	cu.m.	9	_____ (P _____)	P _____
CW-2.3	Structural Fill	furnish, place, spread & compact	Refer to NPC TS & Drawing	cu.m	14	_____ (P _____)	P _____
CW-2.4	Sand and Gravel Bedding	furnish, spread and level	Refer to NPC TS & Drawing	cu.m.	1	_____ (P _____)	P _____

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## SECTION VII - BILL OF QUANTITIES

**CIVIL WORKS**

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	
CW-2.5	Concrete (20.7 MPa)	furnish and place	Refer to NPC TS & Drawing	cu.m.	12	_____	
						_____ (P _____)	P _____
CW-2.6	Reinforcing Steel Bars ( Gr. 275)	furnish, cut, bend schedule and install	Refer to NPC TS & Drawing	kgs.	920	_____	
						_____ (P _____)	P _____
CW-2.7	Steel Truss (A36) (using 50x50x6mm angle bars)	furnish, fabricate and install	Refer to NPC TS & Drawing	kgs.	650	_____	
						_____ (P _____)	P _____
CW-2.8	Steel Purlins (using 100x50x15x2mm)	furnish and install	Refer to NPC TS & Drawing	kgs.	650	_____	
						_____ (P _____)	P _____
<b>CW-3.0 DRAINAGE APPURTENANCE</b>							
CW-3.1	Septic Tank	furnish and install	Refer to NPC TS & Drawing	lot	1	_____	
						_____ (P _____)	P _____
CW-3.2	150 mm Ø uPVC Pipe	furnish and install	Refer to NPC TS & Drawing	l.m.	40	_____	
						_____ (P _____)	P _____
CW-3.3	Catch Basin	furnish and install	Refer to NPC TS & Drawing	pcs	8	_____	
						_____ (P _____)	P _____
<b>TOTAL AMOUNT OF BID</b>						_____	
						_____ (P _____)	P _____

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## SECTION VII

# **BILL OF QUANTITIES ELECTRICAL WORKS**

## SECTION VII - BILL OF QUANTITIES

## ELECTRICAL WORKS

Item No.	Description of Work or Materials	Work to Be Done	Ref.	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount
<b>1.0</b>	<b>LIGHTING AND POWER PANELBOARD</b>						
a.	100AF/60AT, 3-Pole Main MCB with branch circuits of: 3 - 30AT, 2-Pole MCB 2 - 20AT, 2-Pole MCB 1 - 15AT, 2-Pole MCB	Furnish, Install and Test		set	1	_____ (P _____) P _____	
<b>2.0</b>	<b>LIGHTING FIXTURES</b>						
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		sets	2	_____ (P _____) P _____	
b.	Fixture Type B 2x12W Round Ceiling Luminaire Steel Base, Opal Glass Diffuser and 2x12W E27 Base Compact LED Lamp	Furnish, Install and Test		sets	4	_____ (P _____) P _____	
c.	Fixture Type C 9W Compact LED Lamp Classic Globe Shape, Frosted Finish, and complete with E27 Base Type Lamp Holder	Furnish, Install and Test		sets	2	_____ (P _____) P _____	
<b>3.0</b>	<b>OUTLETS AND SWITCHES INCLUDING PLATE COVER FLUSH-MOUNTED, GROUNDING TYPE</b>						
a.	Convenience Outlet, 16A, 250V	Furnish, Install and Test		sets	11	_____ (P _____) P _____	

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## SECTION VII - BILL OF QUANTITIES

## ELECTRICAL WORKS

Item No.	Description of Work or Materials	Work to Be Done	Ref.	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount
b.	50AF/30AT Safety Circuit Breaker with Built-in Universal Convenience Outlet	Furnish, Install and Test		sets	3	(P ) P	
c.	Single Receptacle Convenience Outlet, 16A, 250V for Exhaust Fan	Furnish, Install and Test		sets	2	(P ) P	
d.	Single Pole Wall Switch, 10A, 250 V	Furnish, Install and Test		sets	5	(P ) P	
e.	Duplex Pole Wall Switch, 10A, 250 V	Furnish, Install and Test		sets	1	(P ) P	
f.	Boxes, Fittings, and Accessories	Furnish and Install		lot	1	(P ) P	
<b>4.0</b>	<b>INSULATED COPPER CONDUCTORS INCLUDING TERMINAL LUGS, CONNECTORS, CABLE TIES, IDENTIFICATION TAGS, ETC.</b>	Furnish, Lay and Test		lot	1	(P ) P	
a.	14 mm <sup>2</sup> , 600 V, Heat Resistant Thermoplastic, (THWN), Copper Conductor						
b.	8.0 mm <sup>2</sup> , 600 V, Heat Resistant Thermoplastic, (THWN), Copper Conductor						
c.	5.5 mm <sup>2</sup> , 600 V, Heat Resistant Thermoplastic, (THWN), Copper Conductor						

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## SECTION VII - BILL OF QUANTITIES

## ELECTRICAL WORKS

Item No.	Description of Work or Materials	Work to Be Done	Ref.	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount
d.	3.5 mm <sup>2</sup> , 600 V, Heat Resistant Thermoplastic, (THWN), Copper Conductor						
5.0	<b>EMBEDDED AND/OR NON-EMBEDDED CONDUITS INCLUDING BOXES, LOCKNUTS, ELBOWS, BOLTS AND OTHER FITTINGS</b>	Furnish and Lay		lot	1	_____ (P _____) P _____	
a.	20 mmØ uPVC						
b.	25 mmØ uPVC						
c.	Service Entrance Cap for 25mmØ u PVC						

## SUB-TOTAL AMOUNT OF BID (ELECTRICAL WORKS)

\_\_\_\_\_ (P \_\_\_\_\_) P \_\_\_\_\_

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## SECTION VII

# **BILL OF QUANTITIES MECHANICAL WORKS**

## PART VII - BILL OF QUANTITIES

## MECHANICAL WORKS

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	
<b>MW-1.0</b>	<b>DOMESTIC WATER SUPPLY PIPING SYSTEM</b>		<b>MW-4.0</b>				
<b>MW-1.1</b>	Gate Valve, 20 mm Ø, rising stem, cast bronze, screwed ends, Class 150	Supply, Install and Test		set	1	_____ (P _____)	P _____
<b>MW-1.2</b>	Water Pipe, 25 mm O.D. (3/4" N.D.), uPVC pipe, sch. 80 or class 150, and its associated fittings, pipe supports and other accessories	Supply, Excavate, Install, Backfill, Test & Disinfection		lm	90	_____ )	P _____
<b>MW-1.3</b>	Water Pipe, 20 mm O.D. (1/2" N.D.), uPVC pipe, sch. 80 or class 150, and its associated fittings, pipe supports and other accessories	Supply, Excavate, Install, Backfill, Test & Disinfection		lm	12	_____ )	P _____
<b>MW-1.4</b>	Hose bibb, 20 mm Ø, bronze body, screwed ends, Class 150	Supply, Install and Test		set	2	_____ )	P _____
<b>MW-2.0</b>	<b>AIR CONDITIONING &amp; VENTILATION SYSTEM</b>		<b>MW-5.0</b>				
<b>MW-2.1</b>	<b>Air-Conditioning System</b>						
<b>MW-2.1.1</b>	Air conditioning unit for Office, 14,300 kJ/h minimum cooling capacity, window type, inverter-type, complete with necessary mounting accessories and controls (infrared remote) and other necessary accessories as	Supply, Install and Test		set	1	_____ )	P _____
<b>MW-2.2</b>	<b>Ventilation System</b>						
<b>MW-2.2.1</b>	Exhaust fan for Restroom, 100 m3/h wall mounted, propeller type, direct driven, complete with automatic shutter, mounting accessories and controls	Supply, Install and Test		set	1	_____ )	P _____

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## PART VII - BILL OF QUANTITIES

**MECHANICAL WORKS**

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	
<b>MW-2.2</b>	<b>Ventilation System (Cont'd...)</b>						
<b>MW-2.2.2</b>	Exhaust fan for Kitchen, 150 m3/h wall mounted, propeller type, direct driven, complete with automatic shutter, mounting accessories and controls	Supply, Install and Test		set	1	_____	
						_____ )	P _____
<b>MW-3.0</b>	<b>FIRE FIGHTING SYSTEM</b>		<b>MW-6.0</b>				
<b>MW-3.1</b>	Portable Fire Extinguishers, HCFC or Halotron I, 7.1 kg. (15.5 lbs.), non-expiry, multi shots, wall hung type with bracket and mounting accessories, PS/ICC and/ or BFP approved	Supply and Install		units	3	_____	
						_____ )	P _____
<b>TOTAL MECHANICAL WORKS</b>						_____	
						_____ )	P _____

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# SECTION VIII

## BIDDING FORMS

**SECTION VIII – BIDDING FORMS****TABLE OF CONTENTS**

NPCSF-INFR-01	-	Checklist of Technical and Financial Envelope Requirements for Bidders
NPCSF-INFR-02	-	List of all Ongoing Government & Private Construction Contracts Including Contracts Awarded but not yet Started
NPCSF-INFR-03	-	Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid
NPCSF-INFR-04	-	Computation of Net Financial Contracting Capacity (NFCC)
NPCSF-INFR-05	-	Joint Venture Agreement
NPCSF-INFR-06a	-	Form of Bid Security : Bank Guarantee
NPCSF-INFR-06b	-	Form of Bid Security : Surety Bond
NPCSF-INFR-06c	-	Bid Securing Declaration Form
NPCSF-INFR-07	-	Omnibus Sworn Statement (Revised)
NPCSF-INFR-08	-	Contractor's Organizational Chart for the Project
NPCSF-INFR-09	-	List of Key Personnel Proposed to be Assigned to the Project
NPCSF-INFR-10a	-	Key Personnel's Certificate of Employment (Professional Personnel)
NPCSF-INFR-10b	-	Key Personnel's Certificate of Employment (Construction Safety and Health Officer)
NPCSF-INFR-11	-	Key Personnel's Bio-Data
NPCSF-INFR-12	-	List of Equipment, Owned or Leased and/or under Purchase Agreement, Pledged to the Proposed Project
NPCSF-INFR-13	-	Bid Letter
NPCSF-INFR-14	-	Detailed Cost Estimate Form
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 1<sup>ST</sup> 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  
Page 2 of 3

*(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 2<sup>ND</sup> 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-02

**List of All Ongoing Government and Private Contracts Including Contract Awarded But Not Yet Started**

Business Name : \_\_\_\_\_

Business Address : \_\_\_\_\_

Name of Contract/Location/ Project Cost	a. Owner's Name b. Address c. Telephone Nos.	Nature of Work	Contractor's Role		a. Date Awarded b. Date Started c. Date of Completion or Estimated Completion Time	Value of Outstanding Works
			Description	%		
<u>Government</u>						
<u>Private</u>						
					Total Cost	

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.

Note : This statement shall be supported with the following documents for all the contract(s) stated above which shall be submitted during Post-qualification:

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.

Submitted by : \_\_\_\_\_

(Printed Name &amp; Signature)

Designation : \_\_\_\_\_

Date : \_\_\_\_\_

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*

\_\_\_\_\_  
*Name & Signature of Authorized Representative*

\_\_\_\_\_  
*Official Designation*

\_\_\_\_\_  
*Official Designation*

\_\_\_\_\_  
*Name of Firm*

\_\_\_\_\_  
*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) fails 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) \_\_\_\_\_ SIGNATURE(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**  
**CONSTRUCTION OF OFFICE AND STAFFHOUSE AT ROXAS SUBSTATION (NPSSTL)**  
**(PR NO. S1-NPS22-019)**

To: **National Power Corporation**  
BIR Road cor. Quezon Ave.  
Diliman, Quezon City

I/We<sup>1</sup>, 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]

<sup>1</sup> 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

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).

Standard Form Number: NPCSF-INFR-11

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).

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
<b>A. Owned</b>							
i.							
ii.							
iii.							
iv.							
v.							
<b>B. Leased</b>							
i.							
ii.							
iii.							
iv.							
v.							
<b>C. Under Purchase Agreements</b>							
i.							
ii.							
iii.							
iv.							
v.							

Submitted by: \_\_\_\_\_

(Printed Name &amp; 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 **CONSTRUCTION OF OFFICE AND STAFFHOUSE AT ROXAS SUBSTATION (NPSSTL) (PR NO. S1-NPS22-019)**.
- (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 **CONSTRUCTION OF OFFICE AND STAFFHOUSE AT ROXAS SUBSTATION (NPSSTL) (PR NO. S1-NPS22-019)** 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: \_\_\_\_\_



**DETAILED COST ESTIMATE FORM**

**Name of Bidder :** \_\_\_\_\_

[illegible]

---

**Designation**

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

## SECTION IX

# BID DRAWINGS

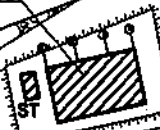
# CIVIL WORKS

**SECTION IX – BID/REFERENCE DRAWINGS  
CW – CIVIL WORKS**

<b><u>DRAWING NO.</u></b>	<b><u>TITLE</u></b>
CSRS-BDC-13.001	SITE DEVELOPMENT PLAN
CSRS-BDC-13.002	FOUNDATION AND ROOF FRAMING PLAN
CSRS-BDC-13.003	DETAILS OF C1-F1, WF-1, WF-2 AND CONCRETE WALK
CSRS-BDC-13.004	ROOF AND LINTEL BEAM DETAILS
CSRS-BDC-13.005	ROOF TRUSS DETAILS
CSRS-BDC-13.006	DRAINAGE PLAN
CSRS-BDC-13.007	SEPTIC TANK (PLAN, SECTION & DETAILS)



PROPOSED  
STAFFHOUSE



PARKING  
SPACE

ACCESS ROAD

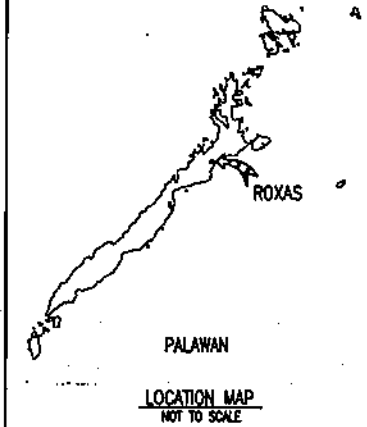
ACCESS ROAD

GATE

GUARD  
HOUSE

EXISTING CONCRETE ROAD

GATE



### NOTE:


1. LOCATIONS MAY BE MODIFIED TO SUIT ACTUAL FIELD CONDITIONS.

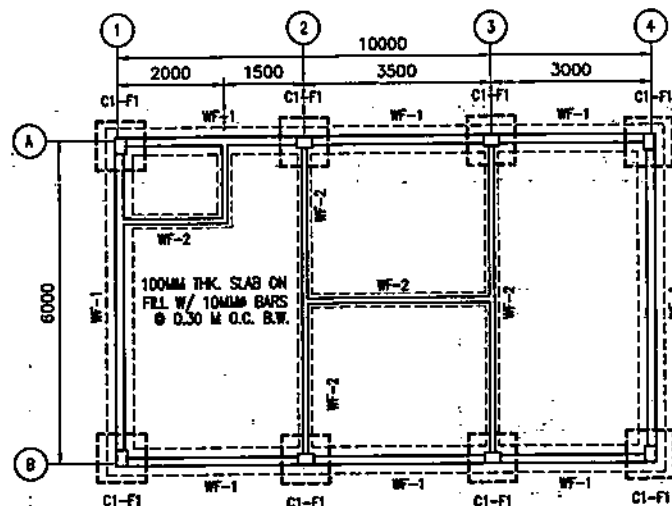
### LEGEND:

▨ - PROPOSED STRUCTURES.

||||| - GRADING FILL

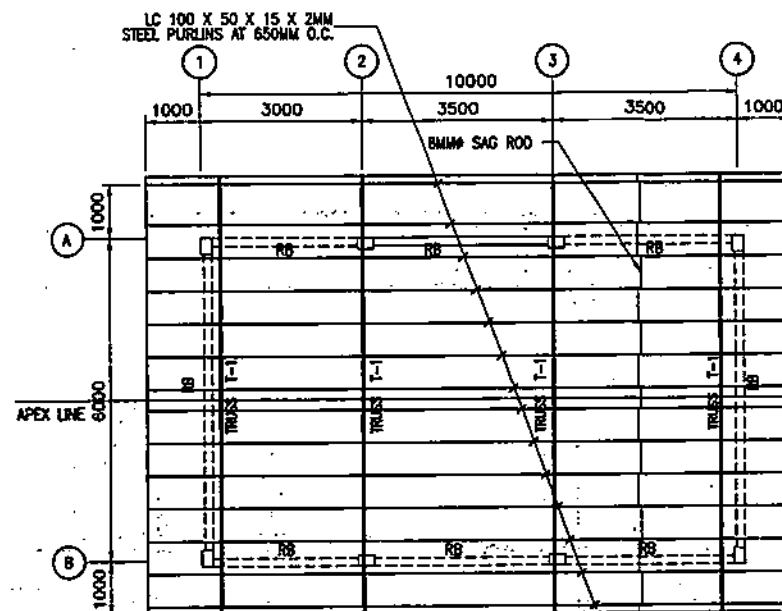
ST - SEPTIC TANK

OWNER:		 <b>NATIONAL POWER CORPORATION</b> AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT:		CONSTRUCTION OF OFFICE AND STAFFHOUSE AT ROXAS SUBSTATION (NPSSTL)	
LOCATION:		ROXAS, PALAWAN	
TITLE: <b>SITE DEVELOPMENT PLAN</b>			
DESIGNED	BY	CHKD	DATE
DRAWN			
REVIEWED	PRINCIPAL ENGINEER / ARCHT.		SUBMITTED: <b>H. L. MENDOZA</b> Manager DDO
CHECKED BY			RECOMMENDED: <b>A. C. ESPINOSA</b> Manager DDO
ELEC.			APPROVED: <b>N. G. SCHUMACHER</b> Manager DDO
MEDL.			
DWS. NO. <b>CSRS-BDC-13.001</b>		PR. NO. <b>S1-NPS22-019</b>	
REV. DATE		NATURE OF REVISION	
BY	CHKD.	REC'D.	AP'D.
SCALE: 1:500		<b>BID DRAWING</b>	
		REV. 0	



**FOUNDATION PLAN**

SCALE 1:100




**ROOF FRAMING PLAN**

SCALE 1:100

**NOTES:**

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.

OWNER:				<b>NATIONAL POWER CORPORATION</b> AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT:		CONSTRUCTION OF OFFICE AND STAFFHOUSE AT ROKAS SUBSTATION (NPSSTL)			
LOCATION:		ROKAS, PALAWAN			
TITLE:		<b>FOUNDATION &amp; ROOF FRAMING PLAN</b>			
DESIGNED	BY	CHKD	DATE	SUBMITTER:	H. L. MENDOZA Principal Engineer, Archt.
DRAWN				RECOMMENDED:	A. C. ESPERITU Manager, DDO
REVIEWED	PRINCIPAL ENGR. / ARCHT.			APPROVED:	N. G. SOMOSERRA Manager, DDO
CHECKED					
ELC.					
MECH.					
DWG. NO.		CSRS-BDC-13.002		PR. NO. S1-NPS22-019	
REV.		DATE		NATURE OF REVISION	
BY		CHKD.		RECD.	
APPD.					
SCALE: AS SHOWN		<b>BID DRAWING</b>		REV. 0	



## DETAILS OF C1-F1



SCALE 1:20



SCALE 1:20



SCALE 1:20

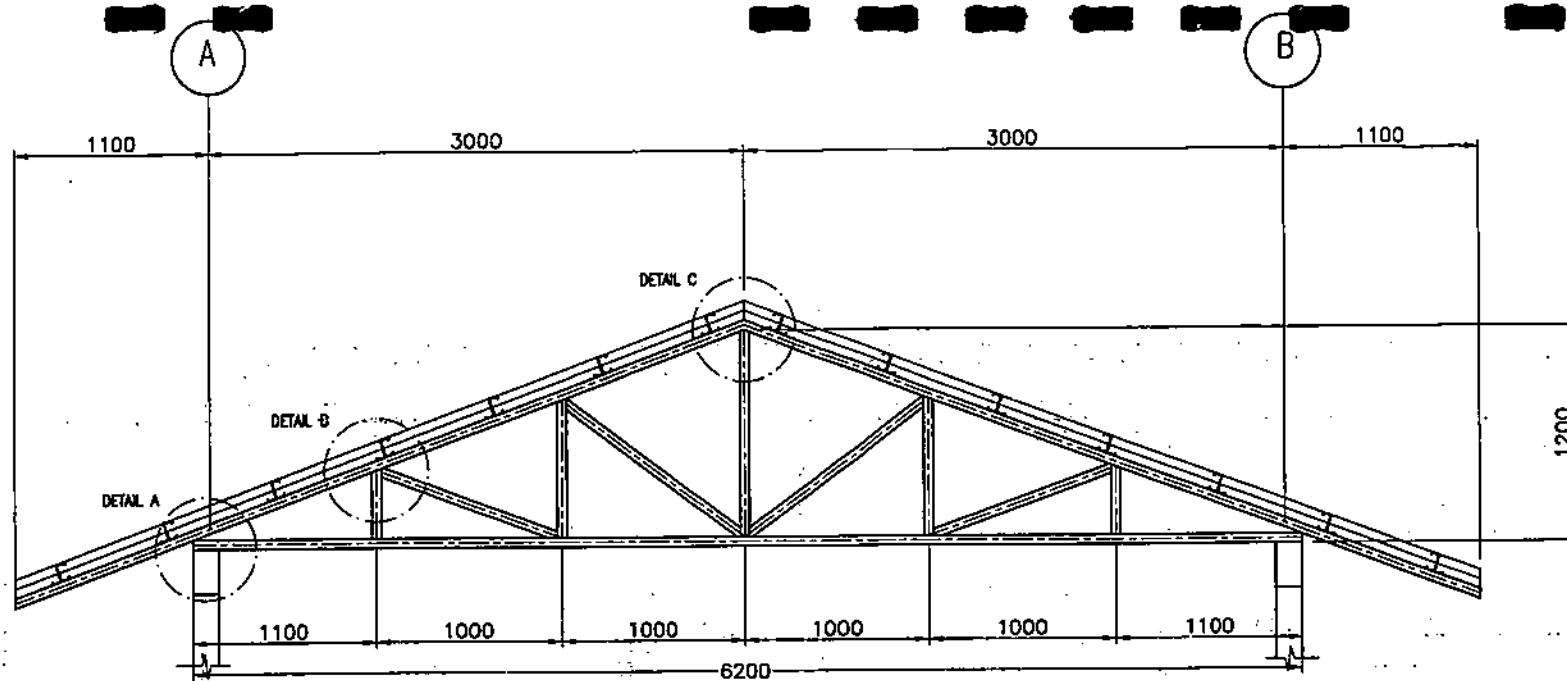
**NOTES:**

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.

OWNER:		<b>NATIONAL POWER CORPORATION</b> AGHAM ROAD, DILIMAN, QUEZON CITY			
PROJECT:		<b>CONSTRUCTION OF OFFICE AND STAFFHOUSE AT ROXAS SUBSTATION (NPSSTL)</b>			
LOCATION:		<b>ROXAS, PALAWAN</b>			
TITLE:		<b>DETAILS OF C1-F1, WF-1, WF-2 AND CONCRETE WALK</b>			
DESIGNED	BY	CHD	DATE	SUBMITTED: <b>H. L. KENDOZA</b> <i>(Signature)</i> Principal Engineer, C&E RECOMMENDED: <b>A. C. ESPINOSA</b> <i>(Signature)</i> Manager, C&E APPROVED: <b>N. G. SOLARUNA</b> <i>(Signature)</i> Manager, C&E	
DRAWN					
REVIEWED	PRINCIPAL ENGR. / ARCHT.				
CHECKED					
ELUC.					
MECH.					
DWG. NO. <b>CSRS-BDC-13.003</b>				PR. NO. <b>S1-NPS-02-19</b>	
SCALE: AS SHOWN				BID DRAWING	
				REV. 0	





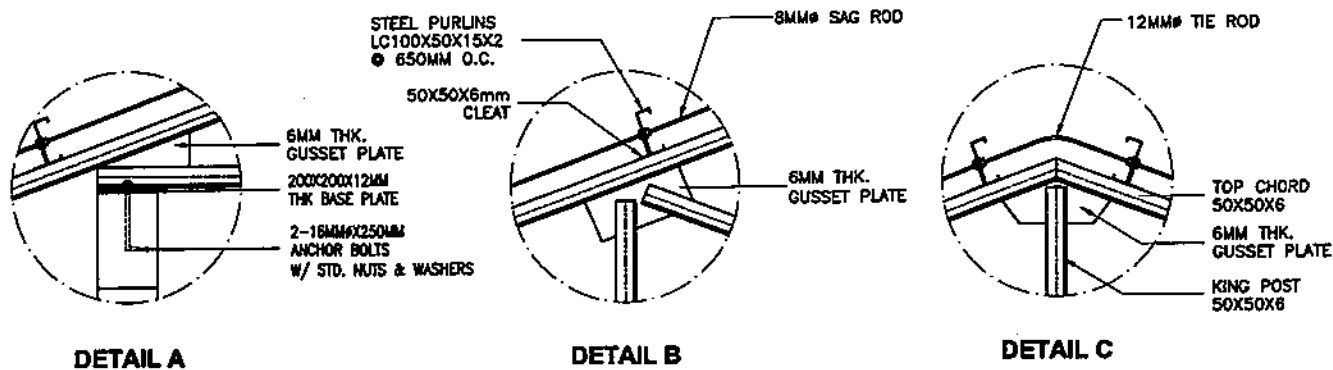


TOP CHORD = 50x50x6mm ANGLE BARS  
 BOTTOM CHORD = 50x50x6mm ANGLE BARS  
 WEB MEMBERS = 40x40x6mm ANGLE BARS  
 PROVIDE 6MM THK GUSSET PLATES FOR ALL STRUCTURAL STEEL JOINTS

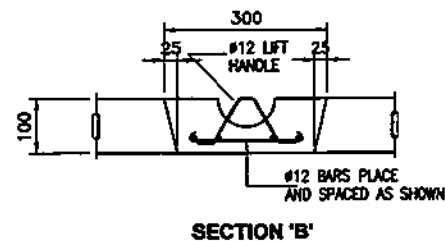
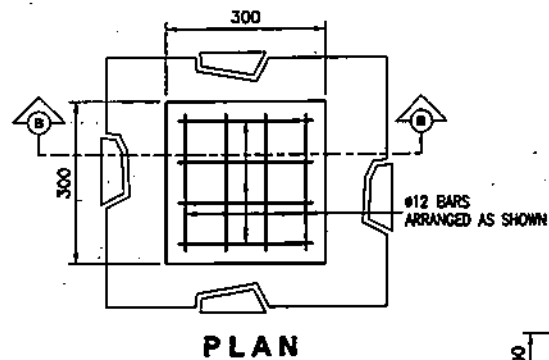
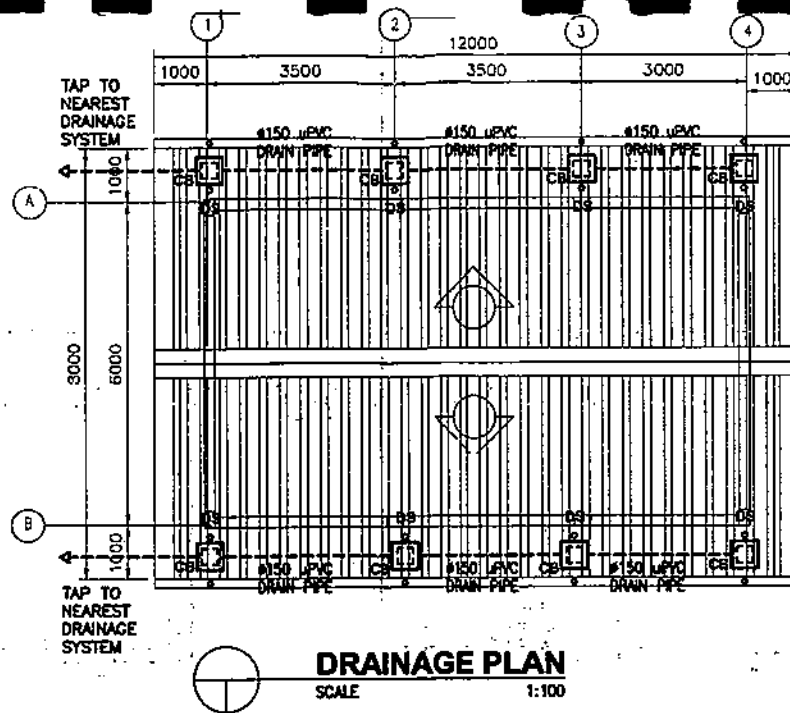
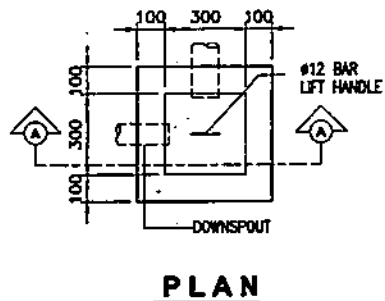
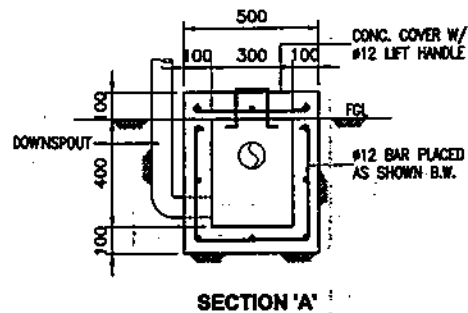
**TRUSS DETAIL**  
 SCALE 1:30

#### NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.



OWNER:		<b>NATIONAL POWER CORPORATION</b> AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT:		CONSTRUCTION OF OFFICE AND STAFFHOUSE AT ROXAS SUBSTATION (NPSSTL)	
LOCATION:		ROXAS, PALAWAN	
TITLE:		<b>ROOF TRUSS DETAILS</b>	
DESIGNED	BY	CHKD	DATE
DRAWN			
REVIEWED	PRINCIPAL ENGR. / ARCHT.		SUBMITTED: H. L. MENDOZA
CIVIL/ARCHT			RECOMMENDED: A. C. ESPARITUA
ELEC.			APPROVED: H. G. MENDOZA
MECH.			Manager, O&S
DWG. NO. CSRS-BDC-13.005		PR. NO. S1-NPS22-019	
SCALE: AS SHOWN		BID DRAWING	
REV. 0		REV. 0	




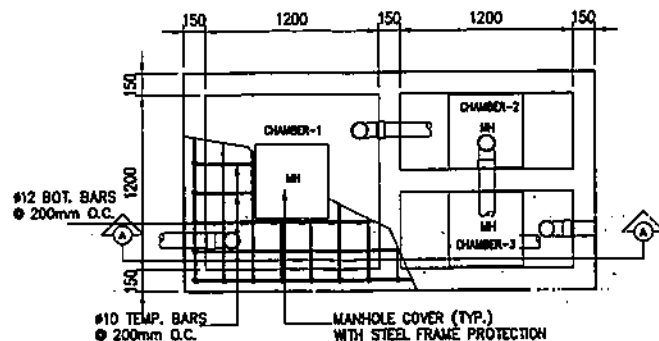
#### LEGENDS:

1. DS ——— DOWNSPOUT
2. CB ——— CATCH BASIN

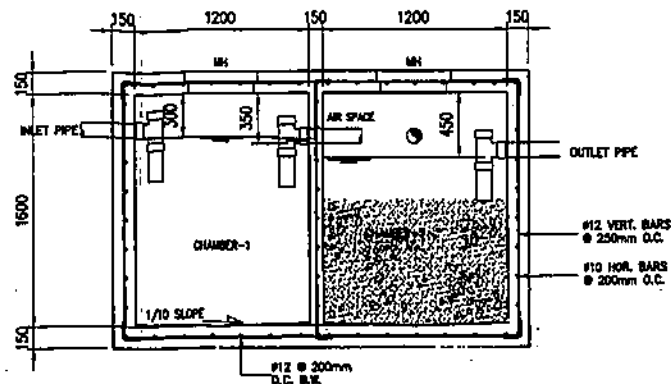
#### NOTES:

1. ALL ASPECTS OF CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE PROVISIONS OF THE LATEST APPLICABLE CODE OR EDITION OF THE NATIONAL PLUMBING CODE/LOCAL REQUIREMENTS AND SUBDIVISION RULES AND REGULATIONS.
2. ALL INDIVIDUAL BRANCHES TO FIXTURE OR GROUP FIXTURE SHALL BE PROVIDED WITH AIR CAP, CAPPED CHAMBER OR CAPPED VERTICAL EXTENSIONS.
3. ALL CLEAN OUT SHALL BE FLUSHED MOUNTED AND PROVIDED WITH POLISHED COVER. DO NOT INSTALL FLOOR CLEANOUT AT LINE ON GRADE AND SERVICE AREA NOT SUBJECT TO TRAFFIC.
4. PROVIDE GATE VALVES TO ALL WATER SUPPLY LINES TO FIXTURES.
5. THE PLUMBING LAYOUTS ARE ONLY DIAGRAMMATIC PIPES, CLEANOUT, CHECK VALVES SHALL BE LOCATED INSIDE BATHROOMS AND SERVICE AREA CONCEALED AS MUCH AS POSSIBLE.
6. ALL CAST IRON PIPES, POLYVINYL CHLORIDE (PVC), GALVANIZED IRON (GI) SHALL BE OF APPROVED QUALITY.
7. PROVIDE VENT PIPES AND VENT STACK THRU ROOF AS REQUIRED.
8. THE MINIMUM SLOPE OF SEWER SHALL BE TWO PERCENT (2%) AND FOR DRAIN LINES SHALL BE ONE PERCENT (1%).

OWNER:				NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT:		CONSTRUCTION OF OFFICE AND STAFFHOUSE AT ROXAS SUBSTATION (NPSSTL)			
LOCATION:		ROXAS, PALAWAN			
TITLE:		DRAINAGE PLAN			
DESIGNED	BY	CHKD	DATE	SUBMITTED:	H. L. MENDOZA Project Engineer
DRAWN				RECOMMENDED:	A. C. ESPINOSA Project Engineer
REVIEWED	PRINCIPAL ENGR./ARCHT.			APPROVED:	N. G. SERRANO Manager, O&S
CHALKED					
ELEC.					
MECH.					
DWG. NO.		CSRS-BDC-13.006		PR. NO. S1-NPS22-019	
SCALE:		AS SHOWN		BID DRAWING	
REV.		DATE		NATURE OF REVISION	
BY		CHKD		RECD	
APPR.					

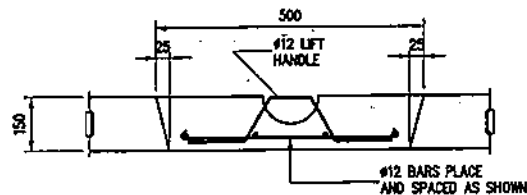


**PLAN**

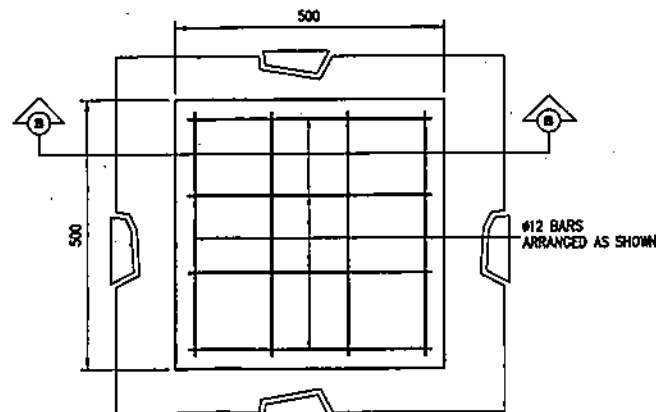


**SECTION 'A'**

**SEPTIC TANK**  
SCALE 1:30



**SECTION B-B**



**PLAN**

**MANHOLE COVER**  
SCALE 1:10

**NOTES:**

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED IN THE DRAWING.
2. USE 17.30MPa CONCRETE FOR ALL DRAINAGE APPURTENANT STRUCTURES UNLESS OTHERWISE INDICATED.
3. REINFORCING STEEL BARS SHALL CONFORM TO THE REQUIREMENTS OF THE PNS FOR DEFORMED STEEL BARS GRADE 275.
4. POLYVINYL CHLORIDE (PVC) PIPE SHALL BE UNPLASTICIZED CONFORMING TO ISO4435 OR EQUIVALENT.

OWNER:		NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT:		CONSTRUCTION OF OFFICE AND STAFFHOUSE AT ROXAS SUBSTATION (NPSSTL)	
LOCATION:		ROXAS, PALAWAN	
TITLE:		SEPTIC TANK (PLAN, SECTION & DETAILS)	
DESIGNED	BY	CHKD	DATE
DRAWN			
REVIEWED	PRINCIPAL ENGR./ARCHT.	RECOMMENDED	
CHECKED		APPROVED	
ELEC.			
MECH.			
DRWG. NO. CSRS-BDC-13.007		PR. NO. S1-NPS22-019	
REV. DATE		NATURE OF REVISION	
BY		CHKD. RECD. APD.	
SCALE: AS SHOWN		BID DRAWING	
REV. 0			

## SECTION IX

# BID DRAWINGS ARCHITECTURAL WORKS

**SECTION IX – BID/REFERENCE DRAWINGS  
AW – ARCHITECTURAL WORKS****DRAWING NO.****TITLE**

CSRS-BDA-13.001

FLOOR PLAN AND ROOF PLAN

CSRS-BDC-13.002

SECTIONS AND ELEVATIONS

CSRS-BDC-13.003

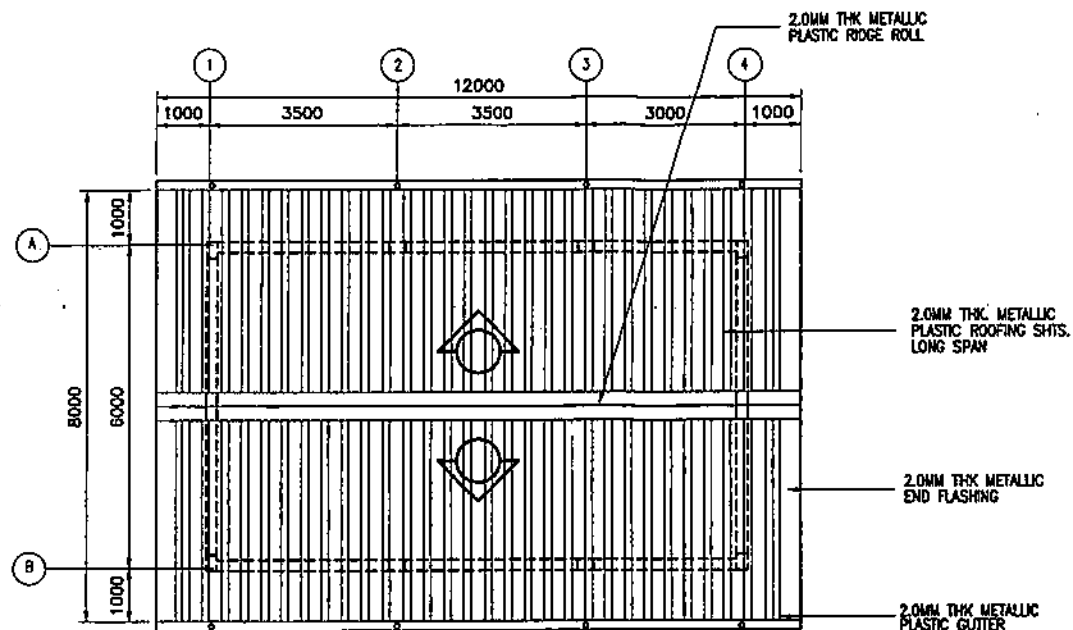
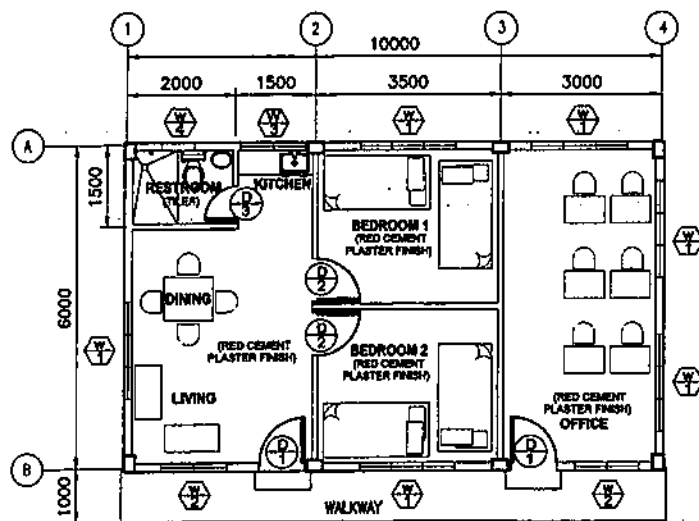
SCHEDULE OF DOORS AND WINDOWS

CSRS-BDC-13.004

WATER LINE DRAWING

CSRS-BDC-13.005

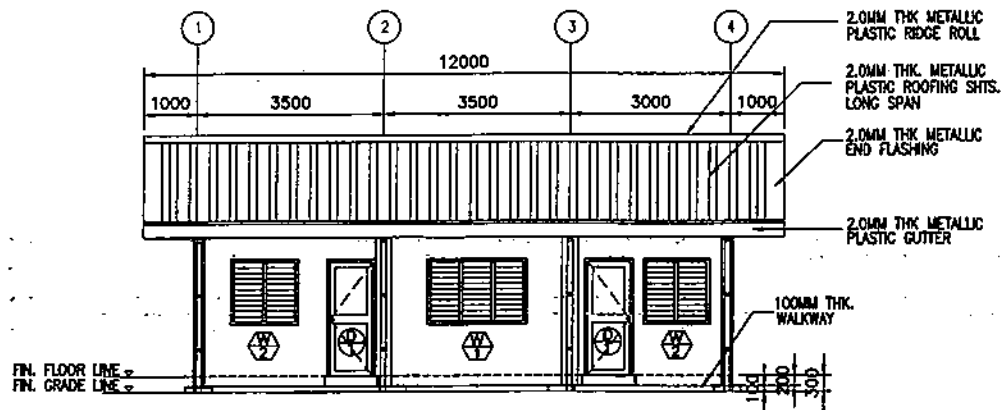
REFLECTED CEILING PLAN



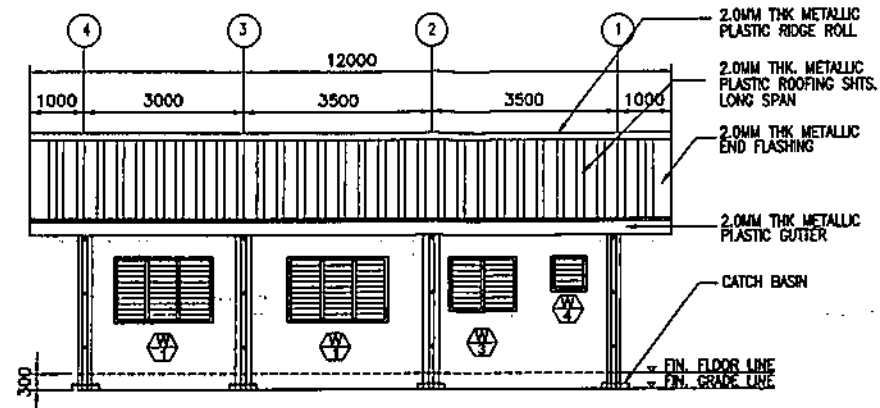
#### NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
2. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION. THE NPC SHALL BE NOTIFIED OF ANY DISCREPANCIES OR INCONSISTENCIES.
3. DIMENSION SHALL TAKE PRECEDENCE OVER SCALED DRAWINGS.

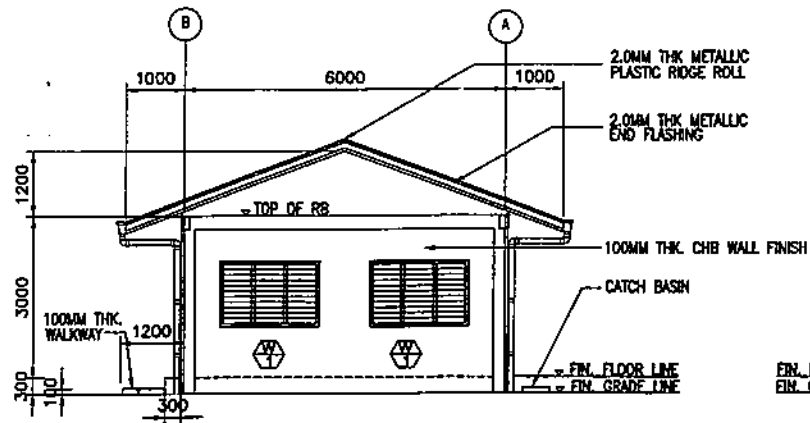
OWNER:		<b>NATIONAL POWER CORPORATION</b> AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT:		CONSTRUCTION OF OFFICE AND STAFFHOUSE AT ROXAS SUBSTATION (NPSSTL)	
LOCATION:		ROXAS, PALAWAN	
TITLE:		FLOOR PLAN AND ROOF PLAN	
DESIGNED	BY	CHKD	DATE
DRAWN			
REVIEWED	PRINCIPAL ENGR. / ARCHT.	RECOMMENDED	
CIVIL/ARCHT			
ELEC.			
Mech.			
SUBMITTED:		R. R. R. VILANUEVA PROJECT ENGINEER	
APPROVED:		A. C. ESPRITO MANAGER	
DWG. NO.		PR. NO.	
CSRS-BDA-13.001		S1-NPS22-019	
SCALE: AS SHOWN		BID DRAWING	
REV. DATE		REV. 8	



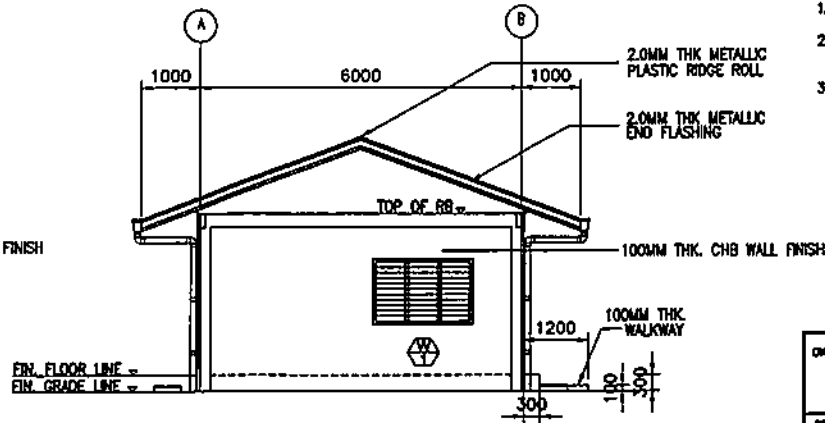
**FRONT ELEVATION**  
SCALE 1:100



**REAR ELEVATION**  
SCALE 1:100




**RIGHT ELEVATION**  
SCALE 1:100



**LEFT ELEVATION**  
SCALE 1:100

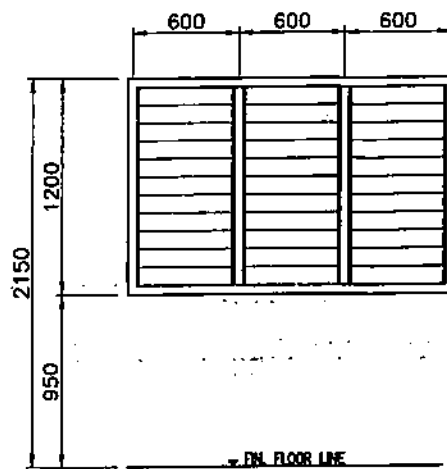
**NOTES:**

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
2. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION. THE NPC SHALL BE NOTIFIED OF ANY DISCREPANCIES OR INCONSISTENCIES.
3. DIMENSION SHALL TAKE PRECEDENCE OVER SCALED DRAWINGS.

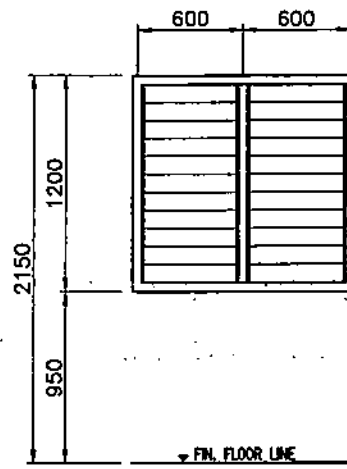
OWNER:  <b>NATIONAL POWER CORPORATION</b> AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT: <b>CONSTRUCTION OF OFFICE AND STAFFHOUSE AT ROXAS SUBSTATION (NPSSTL)</b>	
LOCATION: <b>ROXAS, PALAWAN</b>	
TITLE: <b>SECTIONS AND ELEVATIONS</b>	
DESIGNED BY	DATE
DRAWN BY	DATE
REVIEWED BY	DATE
CHECKED BY	DATE
ELC. BY	DATE
MECH. BY	DATE
SUBMITTED BY: <b>R. R. R. VILLANUEVA</b>	RECOMMENDED BY: <b>A. C. ESPINOSA</b>
APPROVED BY: <b>N. G. BERNABE</b>	DATE: <b>10/10/2010</b>
DWG. NO. <b>CSRS-BDA-13.002</b>	PR. NO. <b>S1-NPS22-019</b>
SCALE: <b>AS SHOWN</b>	
<b>BID DRAWING</b>	
REV. 0	

REV.	DATE	NATURE OF REVISION	BY	CHKD.	RECD.	APPD.

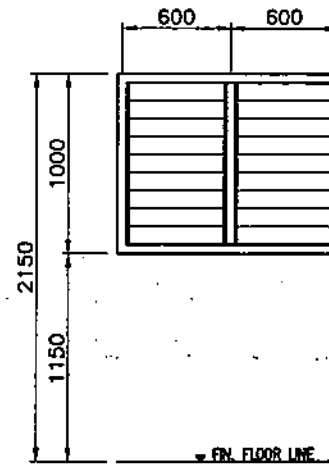




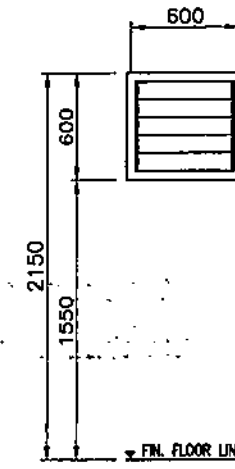
- W1
- : GLASS JALOUSIE WINDOW
  - : 6MM THK. FROSTED GLASS BLADES
  - : HEAVY DUTY ALUMINUM FRAME WITH MECHANISM



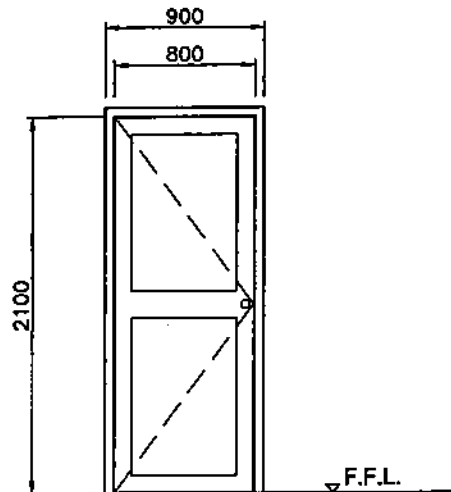
- W2
- : GLASS JALOUSIE WINDOW
  - : 6MM THK. FROSTED GLASS BLADES
  - : HEAVY DUTY ALUMINUM FRAME WITH MECHANISM



- W3
- : GLASS JALOUSIE WINDOW
  - : 6MM THK. FROSTED GLASS BLADES
  - : HEAVY DUTY ALUMINUM FRAME WITH MECHANISM

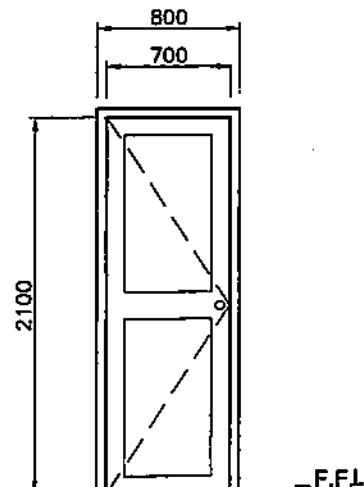


- W4
- : GLASS JALOUSIE WINDOW
  - : 6MM THK. FROSTED GLASS BLADES
  - : HEAVY DUTY ALUMINUM FRAME WITH MECHANISM



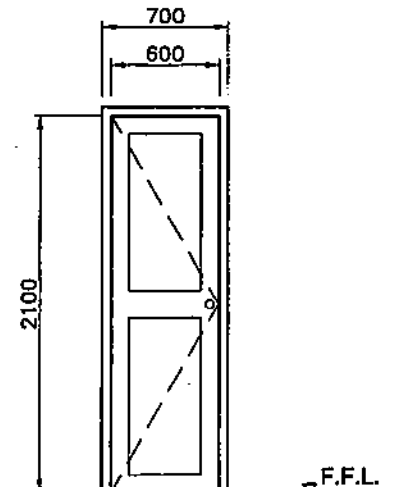
SWING DOOR:

- D1
- : PANEL TYPE WOOD DOOR
  - : 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



SWING DOOR:

- D2
- : 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




SWING DOOR:

- D3
- : 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

#### NOTES:

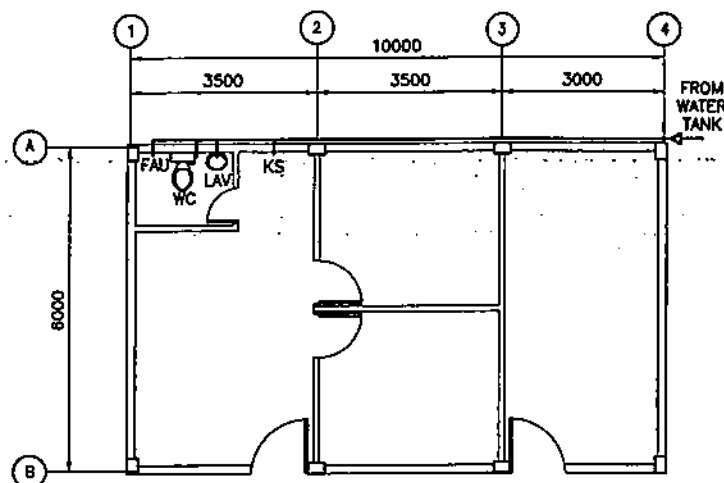
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
2. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION. THE NPC SHALL BE NOTIFIED OF ANY DISCREPANCIES OR INCONSISTENCIES.
3. DIMENSION SHALL TAKE PRECEDENCE OVER SCALED DRAWINGS.

OWNER:				<b>NATIONAL POWER CORPORATION</b> AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT:		CONSTRUCTION OF OFFICE AND STAFFHOUSE AT ROXAS SUBSTATION (NPSSTL)			
LOCATION:		ROXAS, PALAWAN			
TITLE: <b>SCHEDULE OF DOORS AND WINDOWS</b>					
DESIGNED	BY	CHKD	DATE	SUBMITTED:	<i>R. R. R. VILLANUEVA</i>
DRAWN				RECOMMENDED:	<i>A. C. ESPINOSA</i>
REVIEWED	PRINCIPAL ENGR./ARCHT.			APPROVED:	<i>N. G. BOWEN</i>
CIVIL/ARCHT					
ELEC					
MECH					

DWG. NO. **CSRS-BDA-13.003** M.N.O. **S1-NPS22-019**

SCALE: AS SHOWN **BID DRAWING** REV. 0

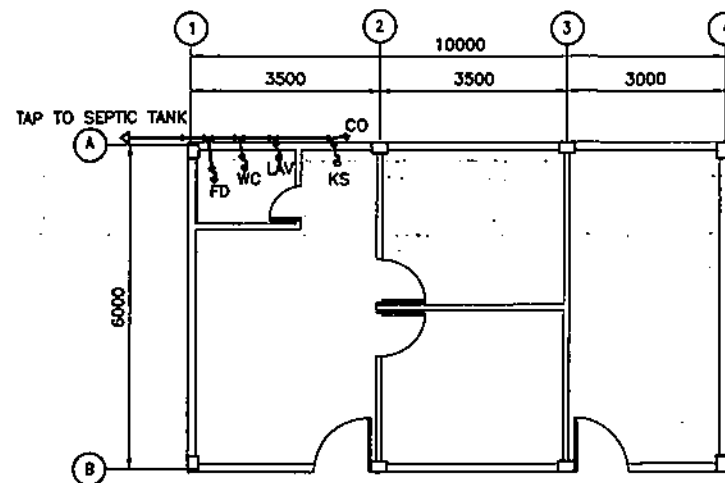
REV.	DATE	NATURE OF REVISION	BY	CHKD.	RECD.	APPR.



**WATER LINE DRAWING**

SCALE

1:100



**PLUMBING DRAWING**

SCALE


1:100

#### NOTES:

1. ALL ASPECTS OF CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE PROVISIONS OF THE LATEST APPLICABLE CODE OR EDITION OF THE NATIONAL PLUMBING CODE, LOCAL REQUIREMENTS AND SUBDIVISION RULES AND REGULATIONS.
2. ALL INDIVIDUAL BRANCHES TO FIXTURE OR GROUP FIXTURE SHALL BE PROVIDED WITH AIR CAP, CAPPED CHAMBER OR CAPPED VERTICAL EXTENSIONS.
3. ALL CLEAN OUT SHALL BE FLUSHED MOUNTED AND PROVIDED WITH POLISHED COVER. DO NOT INSTALL FLOOR CLEANOUT AT LINE ON GRADE AND SERVICE AREA NOT SUBJECT TO TRAFFIC.
4. PROVIDE GATE VALVES TO ALL WATER SUPPLY LINES TO FIXTURES.
5. THE PLUMBING LAYOUTS ARE ONLY DIAGRAMMATIC PIPES, CLEANOUT, CHECK VALVES SHALL BE LOCATED INSIDE BATHROOMS AND SERVICE AREA CONCEALED AS MUCH AS POSSIBLE.
6. ALL CAST IRON PIPES, POLYVINYL CHLORIDE (PVC), GALVANIZED IRON (G.I.) SHALL BE OF APPROVED QUALITY.
7. PROVIDE VENT PIPES AND VENT STACK THRU ROOF AS REQUIRED.
8. THE MINIMUM SLOPE OF SEWER SHALL BE TWO PERCENT (2%) AND FOR DRAIN LINES SHALL BE ONE PERCENT (1%).

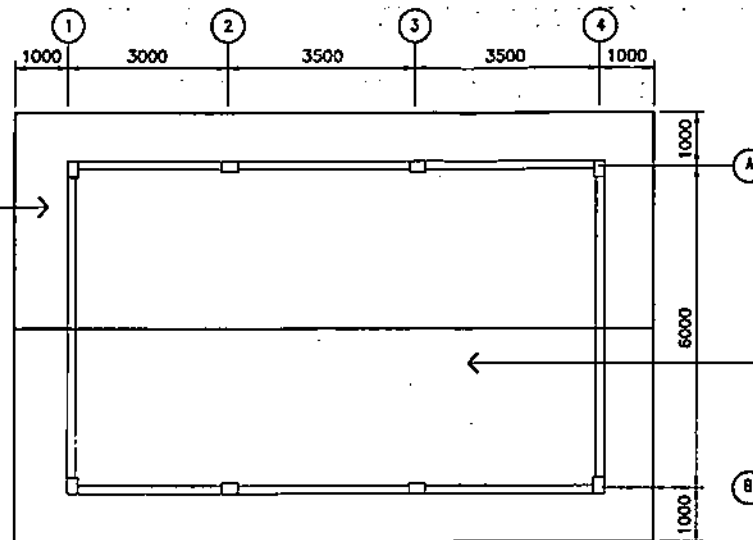
#### LEGEND:

1. FD ----- FLOOR DRAIN
2. WC ----- WATER CLOSET
3. LAV ----- LAVATORY
4. CO ----- CLEAN OUT
5. FAU ----- FAUCET
6. KS ----- KITCHEN SINK

OWNER:		 <b>NATIONAL POWER CORPORATION</b> AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT:		CONSTRUCTION OF OFFICE AND STAFFHOUSE AT ROXAS SUBSTATION (NPSSTL)	
LOCATION:		ROXAS, PALAWAN	
TITLE:		<b>WATER LINE DRAWING</b>	
DESIGNED	BY	CHKD	DATE
DRAWN			
REVIEWED	PRINCIPAL ENGR./ARCHT.		SUBMITTED: <b>R. R. R. VILLANUEVA</b> Principal Engr./Arch.
CIVIL/ARCHT			RECOMMENDED: <b>A. C. ESPINOSA</b> Manager, E&C
ELEC.			APPROVED: <b>N. C. SORIANO</b> Manager, E&C
MECH.			
DWG. NO. <b>CSRS-BDA-13.004</b>		PRJ. NO. <b>S1-NPS22-019</b>	
SCALE: AS SHOWN		<b>BID DRAWING</b>	
REV. 0			

REV.	DATE	NATURE OF REVISION	BY	CHKD.	RECD.	APPR.

ROOF EAVES:  
6MM THICK MARINE PLYWOOD ON STANDARD  
METAL FURRING SPACED @ 0.40 O.C.B.W.  
AND METAL HANGERS SPACED 0.80 O.C.B.W



6MM THICK MARINE PLYWOOD ON STANDARD  
METAL FURRING SPACED @ 0.40 O.C.B.W.  
AND METAL HANGERS SPACED 0.80 O.C.B.W




# REFLECTED CEILING PLAN

SCALE

1:100

## NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
2. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION. THE NPC SHALL BE NOTIFIED OF ANY DISCREPANCIES OR INCONSISTENCIES.
3. DIMENSION SHALL TAKE PRECEDENCE OVER SCALED DRAWINGS.

OWNER:		 <b>NATIONAL POWER CORPORATION</b> AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT:		CONSTRUCTION OF OFFICE AND STAFFHOUSE AT ROXAS SUBSTATION (NPSSTL)	
LOCATION:		ROXAS, PALAWAN	
TITLE:		<b>REFLECTED CEILING PLAN</b>	
DESIGNED	BY	CHKD	DATE
DRAWN			
REVIEWED	PRINCIPAL/ENGR./ARCHT.		SUBMITTED: <b>R. R. R. VILLANUEVA</b> Project Engineer
CIVIL/ARCHT			RECOMMENDED: <b>A. C. ESPRITO</b> Manager, E&C
ELEC.			APPROVED: <b>N. G. SORIANO</b> Manager, E&C
MECH.			
DWG. NO. <b>CSRS-BDA-13.005</b>		PIN NO. <b>S1-NPS22-019</b>	
SCALE: AS SHOWN		<b>BID DRAWING</b>	

REV.	DATE	NATURE OF REVISION	BY	CHKD.	RECD.	APPD.

## SECTION IX

# BID DRAWINGS ELECTRICAL WORKS

**SECTION IX – BID DRAWINGS****EW - ELECTRICAL WORKS****DRAWING NO.****TITLE**

SHRS-BDE-17.001

GENERAL NOTES & DETAILS OF LIGHTING  
FIXTURES

SHRS-BDE-17.002

LIGHTING LAYOUT

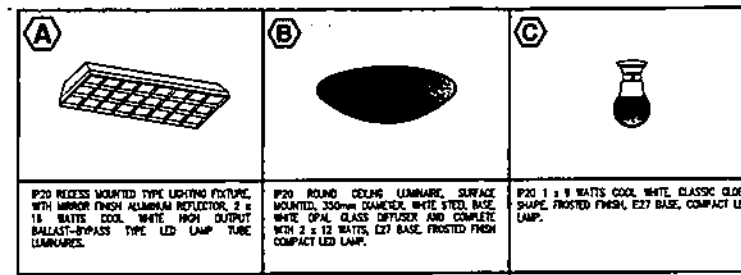
SHRS-BDE-17.003

POWER LAYOUT

SHRS-BDE-17.004

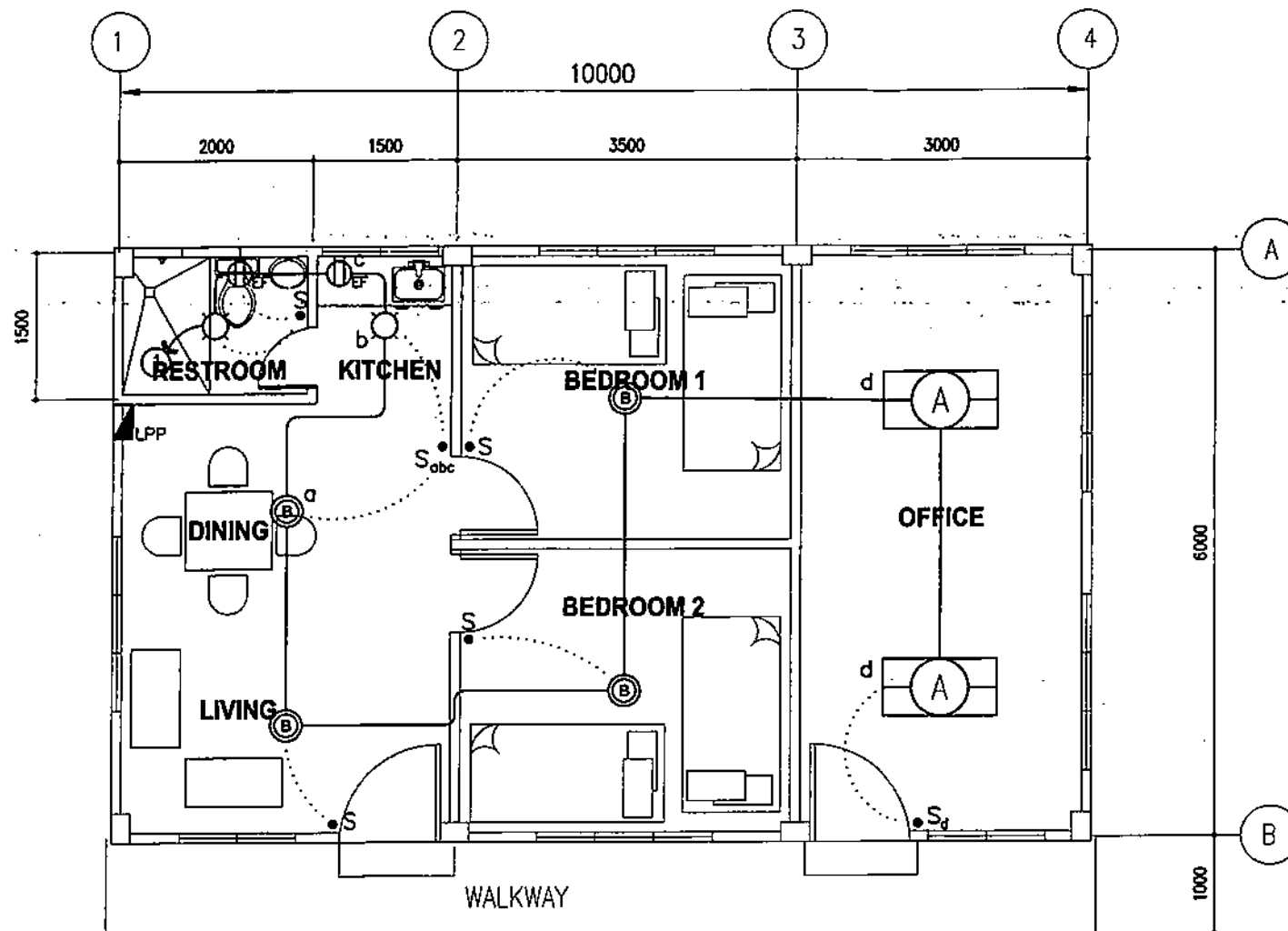
SCHEDULE OF LOADS &amp; RISER DIAGRAM

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, TWO (2) WIRE SYSTEM TO BE PROVIDED BY THE END-USER.
3. SERVICE ENTRANCE SHALL BE IN UNPLASTICIZED POLYVINYL CHLORIDE (uPVC) WITH THWN WIRES.
4. 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.
5. ALL SWITCHES AND CONVENIENCE OUTLETS SHALL BE FLUSH-MOUNTED. SWITCHES SHALL BE 1.37 METERS ABOVE THE FINISHED FLOOR, WHILE CONVENIENCE OUTLET SHALL BE MOUNTED 0.30 METERS ABOVE THE FINISHED FLOOR AND 0.15 METERS ABOVE WORKING TABLE.
6. OUTLETS FOR EMERGENCY LIGHTING FIXTURE, EXHAUST FAN SHALL BE FLUSH-MOUNTED, 2.0 M ABOVE THE FINISHED FLOOR.
7. CONDUIT RUNS ARE INDICATIVE ONLY. THE ACTUAL RUNS SHALL BE DETERMINED IN THE FIELD.
8. 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.
9. ALL ELECTRICAL MATERIALS TO BE USED IN THE INSTALLATION SHALL BE NEW, STANDARD AND APPROVED TYPE AS TO LOCATION, TYPES AND PURPOSE.
10. MINIMUM SIZE OF CONDUCTOR TO BE USED SHALL BE 3.5 mm<sup>2</sup> THWN IN 20 mm<sup>ø</sup> uPVC, SCH.40 CONDUIT UNLESS OTHERWISE SPECIFIED IN THE PLAN.
11. ELECTRICAL WORKS SHALL BE DONE UNDER THE DIRECT SUPERVISION OF A DULY LICENSED ELECTRICAL ENGINEER.



## DETAILS OF LIGHTING FIXTURES

OWNER:		<b>NATIONAL POWER CORPORATION</b> AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT:		<b>CONSTRUCTION OF OFFICE AND STAFFHOUSE AT ROXAS SUBSTATION (NPSSTL)</b>	
LOCATION:		<b>ROXAS, PALAWAN</b>	
TITLE:		<b>GENERAL NOTES AND DETAILS LIGHTING FIXTURES</b>	
DESIGNED	BY	CHKD	DATE
DRAWN			
REVIEWED	PRINCIPAL ENGR./ARCHT.		
CHECKED			
ELEC.			
MECH.			
SUBMITTED:		<u>B. M. AGUILA</u> Principal Engineer	
RECOMMENDED:		<u>C. Z. CAUGOD, JR.</u> Manager, EED	
APPROVED:		<u>N. G. SOMOSIERRA</u> Manager, DDO	
DWG. NO.		PR. NO.	
<b>CSRS-BDE-13.001</b>		<b>S1-NPS22-019</b>	
SCALE: N.T.S.		<b>BID DRAWING</b>	
REV. 0			



# **LEGEND:**

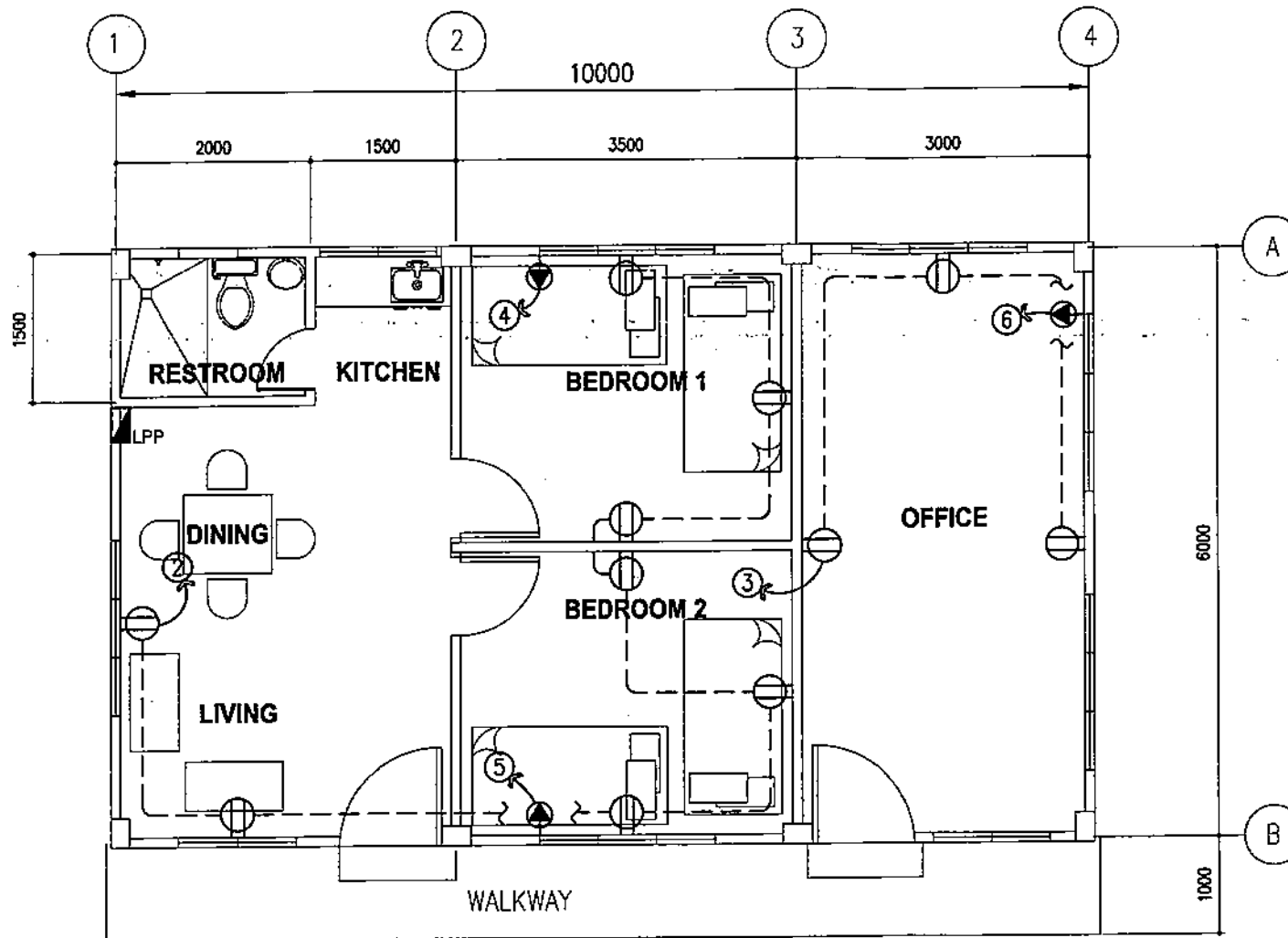
- 2x10W LIGHTING FIXTURE TYPE A
- 2x12W LIGHTING FIXTURE TYPE B
- 9W LIGHTING FIXTURE TYPE C
- SINGLE POLE WALL SWITCH (letter denotes fixture to be controlled)
- DUPLEX WALL SWITCH (letter denotes fixture to be controlled)
- 200W, DUPLEX CONVENIENCE OUTLET
- 100W, EXHAUST FAN OUTLET
- LIGHTING AND POWER PANELBOARD
- CIRCUIT HOMERUN
- CIRCUIT RUNNING ON CEILING
- CONTROL CIRCUIT

**OFFICE/STAFF HOUSE LIGHTING LAYOUT**

SCALE 1:50

OWNER:		<b>NATIONAL POWER CORPORATION</b> AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT:		CONSTRUCTION OF OFFICE AND STAFFHOUSE AT ROXAS SUBSTATION (NPSSTL)	
LOCATION:		ROXAS, PALAWAN	
TITLE:		LIGHTING LAYOUT	
DESIGNED	BY	CHKD	DATE
DRAWN			
REVIEWED	PRINCIPAL ENGR./ARCHT.		SUBMITTED:
CHLARCHT			RECOMMENDED:
ELEC			APPROVED:
MECH			
DWG. NO. CSRS-BDE-13.002		PR. NO. S1-NPS22-019	
SCALE: AS SHOWN		BID DRAWING	
REV. 0			

REV.	DATE	NATURE OF REVISION	BY	CHKD.	RECD.	APPD.



# LEGEND:

- 200VA, DUPLEX CONVENIENCE OUTLET
- CIRCUIT BREAKER W/ UNIVERSAL OUTLET
- LIGHTING AND POWER PANELBOARD
- CIRCUIT HOMERUN
- CIRCUIT RUNNING ON GROUND

**OFFICE/OFFICE HOUSE POWER LAYOUT**

SCALE 1:50

OWNER:		NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT:		CONSTRUCTION OF OFFICE AND STAFFHOUSE AT ROXAS SUBSTATION (NPSSTL)	
LOCATION:		ROXAS, PALAWAN	
TITLE:		POWER LAYOUT	
DESIGNED	BY	CHKD	DATE
DRAWN			
REVIEWED	PRINCIPAL ENGR./ARCHT.		RECOMMENDED:
CHECKED			
ELEC.			APPROVED:
MECH.			
DWG. NO. CSRS-BDE-13.003		PR. NO. S1-NPS22-019	
SCALE: AS SHOWN		BID DRAWING	
REV. 0		REV. 0	

REV.	DATE	NATURE OF REVISION	BY	CHKD.	RECD.	APPD.

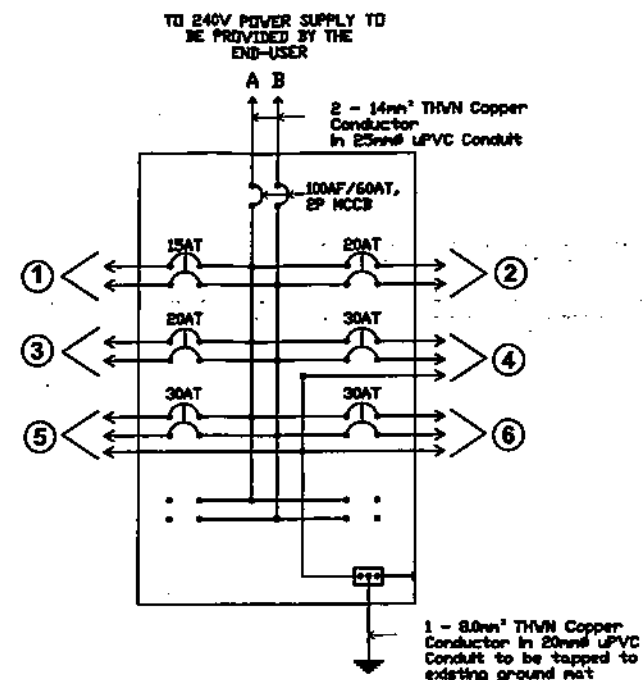


CKT NO.	DESCRIPTION	VA	VOLTS	AMPS	SIZES		
					BREAKER	WIRE	CONDUIT
1	2 - 2x16V LIGHTING FIXTURE TYPE A	422	230	1.83	15AT	2 - 3.5mm <sup>2</sup> THVN	20mm <sup>2</sup> uPVC
	4 - 2x12V LIGHTING FIXTURE TYPE B						
	2 - 9W LIGHTING FIXTURE TYPE B						
	2 - 100VA EXHAUST FAN OUTLET						
2	8 - 200VA CONVENIENCE OUTLET	1600	230	6.96	20AT	2 - 3.5mm <sup>2</sup> THVN	20mm <sup>2</sup> uPVC
3	3 - 200VA CONVENIENCE OUTLET	600	230	2.61	20AT	2 - 3.5mm <sup>2</sup> THVN	20mm <sup>2</sup> uPVC
4	1 - 2HP AIR CONDITIONING UNIT (FUTURE)	2760	230	12.00	30AT	3 - 5.5mm <sup>2</sup> THVN	20mm <sup>2</sup> uPVC
5	1 - 2HP AIR CONDITIONING UNIT (FUTURE)	2760	230	12.00	30AT	3 - 5.5mm <sup>2</sup> THVN	20mm <sup>2</sup> uPVC
6	1 - 2HP AIR CONDITIONING UNIT (FUTURE)	2760	230	12.00	30AT	3 - 5.5mm <sup>2</sup> THVN	20mm <sup>2</sup> uPVC
7	SPACE						
8	SPACE						
	TOTAL	10902	230	47.40			

PROVIDE: 100AF / 60AT, 2P MCB  
WITH BRANCH CIRCUIT OF:  
3 - 30AT, 2p, MCB  
2 - 20AT, 2p, MCB  
1 - 15AT, 2p, MCB

PROVIDE: 2 - 14 mm<sup>2</sup> THHN/THWN-2 Copper Conductor  
in 25mm<sup>2</sup> uPVC Conduit

**SCHDULE OF LOADS**  
SCALE NTS



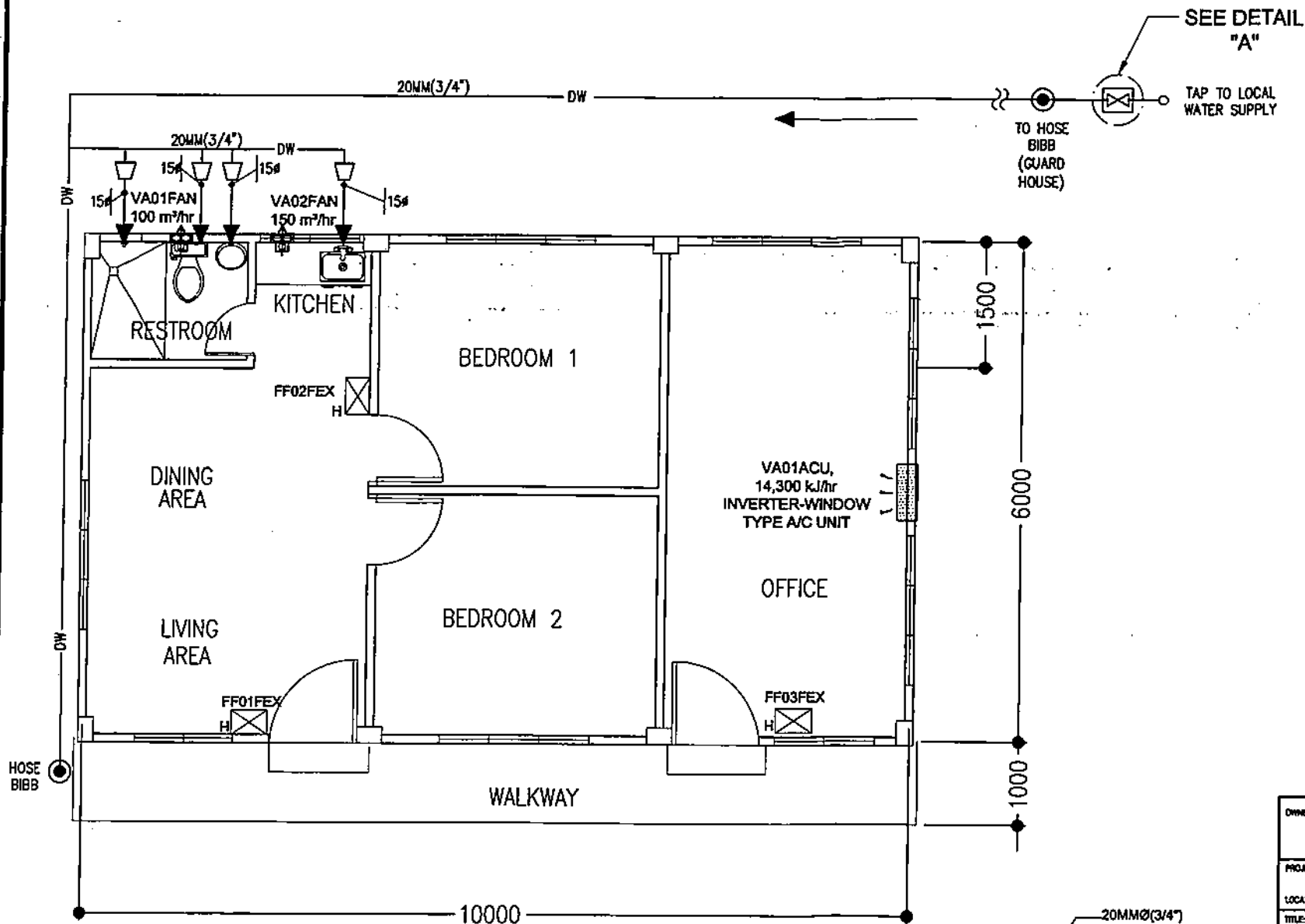
**RISER DIAGRAM**  
SCALE NTS

OWNER:		NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT:		CONSTRUCTION OF OFFICE AND STAFFHOUSE AT ROXAS SUBSTATION (NPSSTL)	
LOCATION:		ROXAS, PALAWAN	
TITLE:		SCHEDULE OF LOADS & RISER DIAGRAM	
DESIGNED	BY	CHKD	DATE
DRAWN			
REVIEWED	PRINCIPAL ENGR./ARCHT.	RECOMMENDED:	C. Z. C. LUGOD, JR. ENGR. III
CIVIL/ARCHT		APPROVED:	N. O. SANCHEZ ENGR. III
ELEC			
MECH			
DWG. NO. CSRS-BDE-13.004		PR. NO. S1-NPS22-019	
REV. DATE		NATURE OF REVISION	
BY	CHKD	RECD	APPD
SCALE: AS SHOWN		BID DRAWING	
		REV. 0	

SECTION IX

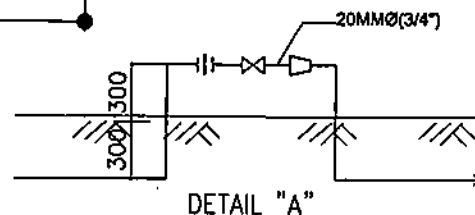
**BID DRAWINGS**

**MECHANICAL WORKS**



# LEGEND:

- PORTABLE FIRE EXTINGUISHER (7.1KG HCFC OR HALOTRON I)
- DOMESTIC WATER LINE
- UNION
- HOSE BIBB
- REDUCER
- WALL MOUNTED EXHAUST FAN
- INVERTER-WINDOW TYPE AIRCON
- GATE VALVE (NORMALLY OPEN)
- ISOLATION VALVE



REV.	DATE	NATURE OF REVISION	BY	CHKD.	RECD.	APPL.

## NOTES:

- THIS DRAWING IS FOR BIDDING PURPOSES ONLY.
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
- 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.
- ALL WORKS SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE TECHNICAL SPECIFICATIONS.
- PIPING SHALL BE EMBEDDED NOT LESS THAN 300MM FROM THE GROUND SURFACE TO THE BOTTOM OF PIPE.
- FOR PIPES THAT CROSSES ROADWAYS, PIPE SLEEVE OF STEEL MATERIAL SHALL BE PROVIDED.
- ALL PIPES, VALVES, VALVE BOXES, FITTINGS, AND PIPE SUPPORTS SHALL BE INSTALLED FOR THE EFFICIENT AND PROPER OPERATION OF THE SYSTEM.
- ALL PIPES AND VALVES' BROCHURES/CATALOGUES SHALL BE SUBMITTED BY THE CONTRACTOR, FOR NPC'S REVIEW AND APPROVAL, PRIOR TO PROCUREMENT/INSTALLATION.
- 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.
- ALL PVC/PE PIPE DIMENSIONS SHOWN ARE IN NOMINAL DIAMETER (MM) WITH THE FOLLOWING EQUIVALENT:

65MM (2 1/2")	= 75MM O.D. (OUTSIDE DIA.)
50MM (2")	= 63MM O.D.
40MM (1 1/2")	= 50MM O.D.
32MM (1 1/4")	= 40MM O.D.
25MM (1")	= 32MM O.D.
20MM (3/4")	= 25MM O.D.
15MM (1/2")	= 20MM O.D.

OWNER:		NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT: CONSTRUCTION OF OFFICE AND STAFF HOUSE AT ROXAS SUBSTATION (NPSSTL)			
LOCATION: ROXAS, PALAWAN			
TITLE: <b>OFFICE/ STAFF HOUSE</b> (AIRCONDITIONING, VENTILATION, FIRE FIGHTING AND DOMESTIC WATER PIPING LAYOUT)			
DESIGNED: JPL	CHKD: APR 2022	SUBMITTED: R.M. CADSAWAN	  R.C. SYLOSINABA Manager, OOO
DRAWN: JPL	APR 2022	RECOMMENDED: R.A. TAYLOR	
REVIEWED: PRINCIPAL ENGR. / ARCHT.		APPROVED: R.C. SYLOSINABA	
CIVIL/ARCHT.			
ELEC.			
MECH.			
DWG. NO. CSRS-BDM-13.001		PR. NO. S1-NPS22-019	
SCALE: 1:50		BID DRAWING	
REV. 0			