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

BID DOCUMENTS

Name of Project : **RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY**

Project Location : **BO. OBRERO, LAPUZ, ILOILO CITY**

Specs No. : **VisP21Z1292Sr** / SO-OPD21-006 (PR2)

Contents :

Design and Development Department

SECTION I

INVITATION TO BID

National Power Corporation
INVITATION TO BID
PUBLIC BIDDING – BCS 2022-0215

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
S3-BLD22-007, S3-BLD22-008 / PB220407-HG00097 (PB2) Supply and Delivery of Various Mechanical Spare Parts for Dale Perkins and FG Wilson Gensets for Balut DPP • *Mode of Award: Per Package*	Supply and Delivery of Diesel Generating Sets or Mechanical and/or Electrical Parts / Components / Equipment for Diesel Generating Sets	28 April 2022 9:30 A.M	10 May 2022 9:30 A.M	Total ₱ 3,594,100.00 / ₱ 5,000.00
Package 1: 163kW Dale Perkins (Model: 2006-TG1) for Balut DPP				₱ 1,156,500.00 / ₱ 5,000.00
Package 2: 160kW FG Wilson (Model: 1606A-E93TAG4) for Balut DPP				₱ 2,437,600.00 / ₱ 5,000.00
S3-NAQ22-001 / PB220408-HG0099 (PB2) Suppy and Delivery of Mechanical Spare Parts for 2 x 260 kW and 2 x 163 kW Dale Perkins Generator Set Engine of Senator Ninoy Aquino DPP	Supply and Delivery of Diesel Generating Sets or Mechanical and/or Electrical Parts / Components / Equipment for Diesel Generating Sets	28 April 2022 9:30 A.M	10 May 2022 9:30 A.M	₱ 2,852,800.00 / ₱ 5,000.00
SO-OPD22-006 / PB220408-AD00098 (PB2) Renovation of NPC Office and Staff House at Bo. Obrero, Iloilo City • PCAB License: License Category of at least **"Category D – General Building"** and registration classification of at least **"Small B – Building and Industrial Plant"**	Construction or renovation of at least one (1) storey building structure	28 April 2022 9:30 A.M	10 May 2022 9:30 A.M	₱ 22,988,000.00 / ₱ 25,000.00
Venue: Kañao Function Room, NPC Bldg. Diliman, Quezon City				

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

PR No/s. / PB Ref No/s.	Delivery Period / Contract Duration	Relevant Period of SLCC reckoned from the date of submission & receipt of bids
S3-BLD22-007 S3-BLD22-008	Sixty (60) Calendar Days	Ten (10) Years
S3-NAQ22-001	Sixty (60) Calendar Days	Ten (10) Years
SO-OPD22-006	One Hundred Eighty (180) 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 Full Face Shield / 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, Diliman, Quezon City and/or via online platform to be announced by NPC. Bids will be opened in the presence of the bidders' representatives who choose to attend the activity.

10. The National Power Corporation reserves the right to reject any and all bids, declare a failure of bidding, or not award the contract at any time prior to contract award in accordance with Sections 35.6 and 41 of the 2016 revised IRR of R.A. No. 9184, without thereby incurring any liability to the affected bidder or bidders.

11. For further information, please refer to:

Bids and Contracts Services Division,
Logistics Department

BIR Road cor. Quezon Avenue
Diliman, Quezon City
Tel Nos.: 8924-5211 and 8921-3541 local 5361/5239
Fax No.: 8922-1622
Email: bcsd@napocor.gov.ph / bcsd_napocor@yahoo.com

12. You may visit the following websites:

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

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

SECTION II

INSTRUCTIONS TO BIDDERS

SECTION II - INSTRUCTIONS TO BIDDERS

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SECTION II - INSTRUCTIONS TO BIDDERS

1. Scope of Bid

NPC invites Bids for the **RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY** , with Project Identification Number **VisP21Z1292Sr.**

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

2. Funding Information

The GOP through the source of funding as indicated below for CY 2021 in the amount of **TWENTY TWO MILLION NINE HUNDRED EIGHTY EIGHT THOUSAND PESOS (₱ 22,988,000.00).** The source of funding is the proposed Corporate Operating Budget of the National Power Corporation (NPC).

3. Bidding Requirements

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

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

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

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

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

5. Eligible Bidders

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

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

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

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

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

6. Origin of Associated Goods

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

7. Subcontracts

7.1. The Bidder may subcontract portions of the Project to the extent allowed by the Procuring Entity as stated herein, but in no case more than fifty percent (50%) of the Project.

7.1. The Bidder must submit together with its Bid the documentary requirements of the subcontractor(s) complying with the eligibility criteria stated in **ITB** Clause 5 in accordance with Section 23.4 of the 2016 revised IRR of RA No. 9184 pursuant to Section 23.1 thereof.

7.2. Subcontracting of any portion of the Project does not relieve the Contractor of any liability or obligation under the Contract. The Supplier will be responsible for the acts, defaults, and negligence of any subcontractor, its agents, servants, or workmen as fully as if these were the Contractor's own acts, defaults, or negligence, or those of its agents, servants, or workmen.

8. Pre-Bid Conference

The Procuring Entity will hold a pre-bid conference for this Project on the specified date and time and either at its physical address and/or through videoconferencing/webcasting) as indicated in paragraph 6 of the **IB.**

9. Clarification and Amendment of Bidding Documents

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

10. Documents Comprising the Bid: Eligibility and Technical Components

10.1. The first envelope shall contain the eligibility and technical documents of the Bid as specified in **Form NPCSF-INFR-01 - Checklist of Technical and Financial Documents, Section VIII - Bidding Forms.**

10.2. If the eligibility requirements or statements, the bids, and all other documents for submission to the BAC are in foreign language other than English, it must be accompanied by a translation in English, which shall be authenticated by

the appropriate Philippine foreign service establishment, post, or the equivalent office having jurisdiction over the foreign bidder's affairs in the Philippines. For Contracting Parties to the Apostille Convention, only the translated documents shall be authenticated through an apostille pursuant to GPPB Resolution No. 13-2019 dated 23 May 2019. The English translation shall govern, for purposes of interpretation of the bid.

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

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

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

11. Documents Comprising the Bid: Financial Component

11.1. The second bid envelope shall contain the financial documents for the Bid as specified in **Form NPCSF-INFR-01 - Checklist of Technical and Financial Documents, Section VIII - Bidding Forms.**

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

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

12. Alternative Bids

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

13. Bid Prices

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

14. Bid and Payment Currencies

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

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

15. Bid Security

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

15.2. The Bid and bid security shall be valid until **One Hundred Twenty (120) calendar days** from the date of opening of bids. Any bid not accompanied by an acceptable bid security shall be rejected by the Procuring Entity as non-responsive.

16. Sealing and Marking of Bids

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

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

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

17. Deadline for Submission of Bids

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

18. Opening and Preliminary Examination of Bids

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

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

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

19. Detailed Evaluation and Comparison of Bids

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

19.2. If the Project allows partial bids, all Bids and combinations of Bids as indicated in the **BDS** shall be received by the same deadline and opened and evaluated simultaneously so as to determine the Bid or combination of Bids offering the lowest calculated cost to the Procuring Entity. Bid Security as required by **ITB** Clause 15 shall be submitted for each contract (lot) separately.

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

20. Post Qualification

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

21. Signing of the Contract

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

SECTION III

BID DATA SHEET

SECTION III - BID DATA SHEET

ITB Clause	
5.2	For this purpose, contracts similar to the Project refer to contracts which have the same major categories of work, which shall be projects involving construction or renovation of at least one (1) storey building structure. 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 for reasons attributable to the Bidder.
7.1	Only a maximum of fifty percent (50%) of the Works may be subcontracted. All Subcontractors must be approved by NPC.
10.1	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: 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. 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.
	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: 1. Contract/Purchase Order 2. Owner's Certificate of Final Acceptance issued by the project owner other than the contractor or a final rating of at least Satisfactory in the Constructors Performance Evaluation System (CPES). In case of contracts with the private sector, an equivalent document (Ex. Official Receipt or Sales Invoice) shall be submitted.
10.3	The required License issued by the Philippine Contractors Accreditation Board (PCAB): License Category of at least **"CATEGORY D – GENERAL BUILDING"** and registration classification of at least **"SMALL B – BUILDING & INDUSTRIAL PLANT"**

10.4	The list of key personnel shall include the following minimum requirements: **a. One (1) Project Engineer** Registered Civil Engineer who had supervised at least a project similar in nature as to the type and cost of the proposed project within the last 10 years. Must have at least 3 years professional experience as Civil Engineer on similar project. **b. One (1) Materials Engineer** Registered Civil Engineer with valid accreditation from the Department of Public Works and Highways (DPWH) as Materials Engineer I **c. One (1) Safety Officer 2** Construction Safety Officer who has completed at least forty (40) hours of Construction Safety and Health Training (COSH) from Occupational Safety and Health Center (OSHC) or Safety Training Organizations (STOs) accredited by the Department of Labor and Employment (DOLE) Valid Professional Regulations Commission (PRC) license for professional personnel, Construction Safety and Health Training Certificate from OSHC/STOs accredited by DOLE for the Safety Officer, certificate of accreditation including ID card issued by DPWH for Materials Engineer, shall be submitted and included as an attachment in the Standard Form NPCSF-INFR-09: List of Key Personnel Proposed to be Assign to the Contract. 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.
10.5	The list of construction equipment (owned or leased) shall include the following minimum requirements: 1. Service Vehicle - 1 unit 2. Dump Truck - 1 unit
10.6	Bidders shall also submit the following requirements in their first envelope, Eligibility and Technical Component of their bid: 1. Duly signed and completely filled-out Technical Data Sheets (Section VI – Part II TDS); Manufacturer's brochures, manuals and other supporting documents of equipment, materials, hardware and tools proposed by the bidders must comply with the technical specifications of such equipment, materials, hardware and tools. It shall be a ground for disqualification if the submitted brochures, manuals and other supporting documents are determined not complying with the specifications during technical evaluation and post-qualification process. Equipment, materials, hardware and tools proposed by the winning bidder to be supplied, which were evaluated to be complying with the technical specifications, shall not be replaced and must be the same items to be delivered/installed/used during the contract implementation. Any proposed changes/replacement of said items may be allowed on meritorious reasons subject to validation and prior approval by NPC. 2. Complete eligibility documents of the proposed sub-contractor, if any

10.7	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.
12	No further instructions
15.1	The bid security shall be in the form of a Bid Securing Declaration or any of the following forms and amounts: 1. The amount of not less than *2% of ABC*, if bid security is in cash, cashier's/manager's check, bank draft/guarantee or irrevocable letter of credit; 2. The amount of not less than *5% of ABC* if bid security is in Surety Bond.
19.2	Partial Bid is not allowed
20	a. Contract/Purchase Order and/or Notice of Award for the contracts stated in the List of all Ongoing Government & Private Contracts Including Contracts Awarded but not yet Started (NPCSF-INFR-02); b. Certification coming from the project owner/client that the performance is satisfactory as of the bidding date for all ongoing contracts stated in form NPCSF-INFR-02. c. The licenses and permits relevant to the Project and the corresponding law requiring it as specified in the Technical Specifications, if any.
21	The following documents shall form part of the contract: 1. Notice to Proceed 2. Construction schedule and S-curve 3. Manpower Schedule 4. Construction Methods 5. Equipment Utilization Schedule 6. Construction safety and health program of the contractor duly approved by the Bureau of Working Condition (BWC) of the Department of Labor and Employment (DOLE) or proof of submission to BWC 7. PERT/CPM.

SECTION IV

GENERAL CONDITIONS OF CONTRACT

SECTION IV – GENERAL CONDITIONS OF CONTRACT

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SECTION IV – GENERAL CONDITIONS OF CONTRACT

1. Scope of Contract

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

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

2. Sectional Completion of Works

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

3. Possession of Site

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

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

4. The Contractor's Obligations

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

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

5. Performance Security

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

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

6. Site Investigation Reports

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

7. Warranty

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

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

8. Liability of the Contractor

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

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

9. Termination for Other Causes

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

10. Dayworks

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

11. Program of Work

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

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

12. Instructions, Inspections and Audits

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

13. Advance Payment

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

14. Progress Payments

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

15. Operating and Maintenance Manuals

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

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

SECTION V

SPECIAL CONDITIONS OF CONTRACT

SECTION V – SPECIAL CONDITIONS OF CONTRACT

GCC Clause	
2	Sectional completion is not specified.
4	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: a. The Contractor shall conduct the Works with due regard to safety and health in accordance with its Construction Safety and Health Program (CSHP) duly approved by the Department of Labor & Employment (DOLE) and in compliance with the DOLE Department Order No. 13 – The Guidelines Governing Occupational Safety and Health in the Construction Industry. 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: 1. Suspend the work until the Contractor complies with the approved CSHP with the condition that the work resumption will not incur additional cost to the Corporation; 2. Suspend payment of the portion of work under question; 3. Correct the situation by employing 3rd party and charge all expenses incurred to the Contractor's collectibles/securities; and 4. Report the condition to the Bureau of Working Conditions of the DOLE for their appropriate action. 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. 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. 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. 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 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. 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. 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.
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	1. The following must be indicated in the performance bond to be posted by the Contractor: i. Company Name ii. Correct amount of the Bond iii. Contract/Purchase Order Reference Number iv. Purpose of the Bond: "To guarantee the faithful performance of the Principal's obligation to undertake *(Contract/Purchase Order Description)* in accordance with the terms and conditions of *(Contract No. & Schedule/Purchase Order No.)* entered into by the parties." 2. The bond shall remain valid and effective until the duration of the contract *(should be specific date reckoned from the contract effectivity)* plus sixty (60) days after NPC's acceptance of the last delivery/final acceptance of the project. 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 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. 4. Other required conditions in addition to the standard policy terms issued by the Bonding Company:

	i. The bond is a penal bond, callable on demand and the entire amount thereof shall be forfeited in favor of the Obligee upon default of the Principal without the need to prove or to show grounds or reasons for demand for the sum specified therein; ii. The amount claimed by the Obligee under this bond shall be paid in full and shall never be subject to any adjustment by the Surety; iii. In case of claim, the Surety shall pay such claim within sixty (60) days from receipt by the Surety of the Obligee's notice of claim/demand letter notwithstanding any objection thereto by the Principal.
6	No site investigation report.
7.2	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. 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. In case of other structures, such as Bailey and wooden bridges, shallow wells, spring developments, and other similar structures: Two (2) years.
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	The period between Program of Work updates is Thirty (30) calendar days. The amount to be withheld for late submission of an updated Program of Work is One percent (1%) of contract amount.
12	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. CPES ratings shall be used for the following purposes: a) eligibility screening/post-qualification; b) awarding of contracts; c) project monitoring & control; d) issuance of Certificate of Completion; and in adopting measures to further improve performance of contractors in the prosecution of government projects. Qualified Constructors Performance Evaluators (CPE) shall conduct project evaluation as follows:

	(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. (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.
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

GW - (GENERAL WORKS)

SECTION VI - TECHNICAL SPECIFICATIONS

GW – GENERAL WORKS

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GW – GENERAL WORKS

GW-1.0 PROJECT HIGHLIGHTS

GW-1.1 General

This section covers the general technical requirements for furnishing all supervision, labor, materials, supplies, tools and equipment in accordance with specifications contained herein and as shown on the accompanying drawings to complete the **RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILO-ILO CITY.**

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

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

GW-1.2 Project Location

The project is located at Bo. Obrero, Lapuz, Ilo-ilo City.

GW-1.3 Scope of Work

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

a. Mobilization and establishment of Contractor's complete construction camp and other facilities;

b. Structural excavation and backfilling works for all concrete footings, wall footings and columns;

c. Complete construction of all structural components (i.e. footings, columns, beams, walls, etc.), including fabrication, installation/erection and pre-painting of metal/steel structures;

d. Furnishing and application of all architectural finishes for walls, ceilings, roofs and floors, including installation of doors and windows;

e. Construction/Installation of water supply system, sanitary and plumbing fixtures;

f. Construction/Installation of sewerage system and drainage appurtenances;

g. Supply, delivery and installation of all mechanical components, air-conditioning system and Fire Protection System;

h. Supply, delivery and installation of electrical, electronics and telecommunication wires, fixtures and devices;

i. Construction of roads, sidewalks and walkways.

j. All other works necessary to complete the project;

k. Demobilization, including clearing of site and demolition of Contractor's camp facilities.

GW-1.4 Contract Period

The Contractor shall complete the works as herein specified within One Hundred Eighty (180) calendar days. The contract period is inclusive of Seven (7) unworkable days considered unfavorable for the execution of the works. The total contract duration shall be reckoned from the date of contract effectivity as specified in the **Notice to Proceed.**

GW-1.5 Contractor's Classification

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

The Contractor must have undertaken similar contracts and/or projects involving renovation/construction of at least One (1) storey building structure.

GW-1.6 Minimum Required Personnel

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

a) One (1) Project Engineer

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

b) One (1) Materials Engineer

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

c) One (1) Safety Officer 2

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

Valid Professional Regulations Commission (PRC) license for professional personnel. Construction Safety and Health Training Certificate from OSHC/STOs accredited by DOLE for the Safety Officer, certificate of

accreditation including ID card issued by DPWH for Materials Engineer, shall be submitted and included as an attachment in the Standard Form NPCSF-INFR-09 List of Key Personnel Proposed to be Assign to the Contract.

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

GW-1.7 Minimum Required Construction Equipment

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

a. Service Vehicle - 1 unit
b. Dump Truck - 1 unit

GW-2.0 GENERAL REQUIREMENTS

GW-2.1 Language and System of Measurement

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

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

GW-2.2 Correspondence

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

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

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

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

GW-2.3 Contractor's Organization and Personnel

GW-2.3.1 Organization

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

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

GW-2.3.2 Personnel/Key Positions

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

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

GW-2.4 Planning and Scheduling

GW-2.4.1 General

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

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

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

GW-2.4.2 Format and Presentation

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

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

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

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

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

GW-2.4.3 Progress Monitoring Principle and System

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

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

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

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

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

GW-2.4.4 Meetings

A. Progress Review Meetings

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

B. Interface Meetings

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

C. Design Review Meetings

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

D. Other Meetings

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

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

E. Call for Meetings

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

F. Minutes of Meetings

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

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

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

GW-2.4.5 Reports

A. Monthly Reports

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

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

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

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

B. Project Control Close-out Reports

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

(a) Final as-is Contract Detail Schedule;
(b) Final as-is cost report; and

(c) Final as-is Contract amendment (if any) and Variation Order register, if any.

GW-2.5 Documents to be Prepared by the Contractor

GW-2.5.1 General

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

GW-2.5.2 Detailed Drawings and Specifications

Whenever required in the Contract, the Contractor shall submit corresponding detailed fabrication drawings and applicable specifications of structural and/or material assemblies (i.e., steel connections, concrete to steel connections, etc.).

GW-2.5.3 Critical Path Network and Time Bar Diagram

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

GW-2.5.4 Catalogue Cuts, Illustrations, Etc.

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

GW-2.5.5 Final / As-Built Drawings

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

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

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

GW-2.5.6 Presentation/Submission of Documents

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

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

(a) Metric units shall be used in all documents, correspondence, technical schedules and drawings.

(b) All drawings and copies thereof shall be submitted in five (5) sets, on A-3 size white paper and with black print unless otherwise agreed upon.

(c) All drawings and similar documents shall be provided with clear space (approximately 80 mm x 50 mm) above the title block for NPC's stamping of **"Approved"** or **"Approved with Corrections Indicated"** or **"Returned for Correction"** that are defined as follows:

- **"Approved"** or **"A"** mark authorizes the Contractor to proceed with the Work as indicated

- **"Approved with Corrections Indicated"** or **"AWCI"** mark authorizes the Contractor to proceed with the Work with due consideration of the notes and/or comments/corrections indicated therein and re-submit the drawings, specifications or designs for subsequent approval

- **"Returned for Correction"** or **"RFC"** mark requires the Contractor to make the corrections indicated and re-submit the corresponding drawings, specifications or designs for approval before commencing the Work indicated.

(d) All other documents shall be similarly submitted in five (5) sets and in book bound form (or securely fastened).

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

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

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

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

been approved. The Contractor, however, is referred to the provision stated above regarding NPC approval of Contractor's drawings.

GW-3.0 MATERIALS AND EQUIPMENT

GW-3.1 General

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

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

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

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

GW-3.2 Codes and Standards

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

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

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

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

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

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

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

GW-3.3 Test of Materials

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

GW-3.4 Tropical Serviceability

GW-3.4.1 General

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

GW-3.4.2 Metals

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

GW-3.5 Workmanship

Workmanship shall be of first-class quality and in accordance with the best modern engineering practice for construction of all civil works structures

and the manufacture, assembly, test and commissioning of equipment and other components, notwithstanding any omissions from the specifications and drawings. To ensure quality workmanship, only technicians and competent workers, skilled in their respective trades, shall be employed.

GW-4.0 DESIGN AND CONSTRUCTION CONDITIONS

GW-4.1 Acknowledgement to Site Conditions

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

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

GW-4.2 Site Conditions

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

Elevation above sea level	: 0 to 500 m
Ambient temperature	: 25 – 40°C
Barometric pressure	: 760 mm Hg
% Relative humidity	: up to 100%
Design for seismic loads	: Seismic zone factor 0.4
Maximum wind velocity	: 240 km/hr

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

GW-4.3 Earthquake and Wind Design Requirements

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

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

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

It is evident from the design response spectra that the degree of response varies markedly with the period of vibration. It is essential, therefore, that

all structures and equipment which has modes of vibration or components with a natural period longer than 0.1 seconds be identified.

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

The structures and equipment under this contract shall meet the requirements for a basic wind speed of not less than 240 km/hr gust, unless otherwise specifically indicated in relevant sections of the specifications.

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

GW-4.4 Sound Control

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

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

GW-5.0 DRAWINGS

GW-5.1 Drawings Contained in the Tender Document

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

Discrepancies between the drawings and actual field conditions, or between drawings and specifications, shall be immediately brought to the attention of NPC for proper resolution. All works with apparent discrepancies shall not be started without NPC's formal approval.

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

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

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

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

GW-5.2 Contractor/Manufacturer Drawings

GW-5.2.1 General

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

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

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

Approvals by NPC shall in no way relieve the Contractor from entire responsibility for the engineering, design, workmanship, material and all other liabilities under the Contract.
NPC reserves the right to reproduce any drawings or prints received from the Contractor as may be necessary regardless of any notice or marks appearing on the drawings or the prints prohibiting such action. All drawings shall preferably be in computer-aided design (CAD) format. All other computer-generated documents shall be compatible to Microsoft Office.

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

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

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

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

All approved drawings shall form part of the Contract.

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

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

GW-5.2.2 As-Built Drawings

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

The Contractor shall furnish prints of these drawings, which shall be kept in the Contractor's field office for use only as a record set. At the end of every month, all entries, changes or revisions made in the drawings by the Contractor shall be checked and approved by NPC.
The complete, duly checked and approved "As-Built" drawings shall be submitted by the Contractor within thirty (30) calendar days from the completion of the contract or prior to the issuance of the certificate of completion, on four (4) prints and one (1) set of write-once recordable CD's. Such CD's shall be suitable for CD ROM/WRITE drive of computer system.

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

GW-5.2.3 Processing of Drawings

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

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

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

the same in five (5) copies each for final approval. Every revision shall be shown by number, date and subject in a revision block.

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

GW-5.2.4 Documents for NPC's Records

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

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

GW-6.0 INSPECTION AND TESTS

GW-6.1 General

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

The Contractor shall submit to NPC for approval, a complete test program for all his supplied materials/equipment and workmanship covered by the contract. Likewise, five (5) copies of test procedures shall be submitted for approval at least forty-five (45) days prior to the conduct of actual test of equipment.
NPC and/or his duly authorized representatives shall witness all applicable tests detailed in the relevant sections. NPC shall be notified by the Contractor thirty (30) days in advance of all test programs and schedule to be conducted requiring the presence of NPC.

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

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

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

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

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

GW-6.2 Inspection/Tests at Contractor's Premises

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

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

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

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

If NPC opted not to witness the Factory Tests, NPC will issue a Certificate of Waiver of Tests Witnessing/Inspection for the equipment and materials. In such case, the Contractor shall proceed with the Factory Tests in accordance with the requirement of the specification and the manufacturer's test specification as approved by NPC.

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

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

GW-6.3 Tests Failures

If any equipment or materials supplied by the Contractor fails to pass any test, the Contractor shall make the necessary corrections or alterations for defects or order equipment/component replacement, as maybe appropriate. Any and all expenses due to additional tests or re-tests made

on that regard, i.e. failure to meet the acceptance criteria and other requirements of the specification, shall be borne by the Contractor.

GW-6.4 Test Reports/Certificates

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

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

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

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

GW-7.0 QUALITY ASSURANCE REQUIREMENTS

GW-7.1 General

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

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

GW-7.2 Quality Assurance Program

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

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

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

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

GW-7.3 Quality Plan

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

GW-7.4 Records

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

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

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

GW-7.5 Reporting and Corrective Action

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

GW-8.0 CERTIFICATE OF COMPLETION AND ACCEPTANCE

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

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

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

GW-9.0 GUARANTEE

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

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

SECTION VI

TECHNICAL SPECIFICATIONS

AW - (ARCHITECTURAL WORKS)

SECTION VI – TECHNICAL SPECIFICATIONS

AW – 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, tinsmithing, plumbing, painting, landscaping and masonry work, etc. notwithstanding any omission from these Specifications or drawings.

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

AW-1.2 Submission of Samples

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

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

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

AW-1.3 Substitution of Materials

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

In case of approved substitution of an inferior kind of material, a reduction in the contract price equal to the difference in cost of the two kinds of materials shall be made. Market prices at the provincial capital or at a commercial center agreed upon by the NPC Representative and the Contractor on the

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

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

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

AW-1.4 Certification of Materials

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

AW-1.5 Other works which even if not 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 4.48MPa average of the fine specimens.

Mortar Proportions

a) Cement mortar for laying concrete hollow blocks shall consist of one (1) part Portland cement, one-fourth (1/4) part lime and three (3) parts sand. Only sufficient water to make a workable mix will be permitted.

1) Masonry grout for filling cells of concrete blocks shall consist of one (1) Portland cement, one-fourth (1/4) part lime, three (3) parts sand to which three (3) pea gravel is added by volume. Mortar materials shall be accurately measured by volume and thoroughly mixed until evenly distributed throughout the batch mechanical mix. The actual mixing time shall not be less than two minutes.

2) Intersecting hollow blocks walls and partitions shall be bonded by overlapping units on alternative course or by the use of 6.3mm (1/4") diameter ties at 610mm (24") O. C. every second course (maximum) anchored in filled cells.

b) Concrete lintel beams shall extend 305mm (12") beyond both sides of the opening and reinforced with four 12.7mm (1/2") bars placed over and below window openings.

1) Concrete studs, reinforced with one 12.7mm (1/2") diameter bar, shall be placed at both sides of all window and door openings.

2) All horizontal reinforcement shall be tied to vertical reinforcement.

3) Reinforcement shall be as specified in Section "Structural Steel".

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

Lime shall be made with pulverized and quicklime or with hydrated lime.

Sand shall be clean, washed and free from deleterious substances.

Water for mixing shall be clean and potable.

AW-2.3 Installation

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

by 609mm (24") long dowels. Embedding of anchor bolts, expansion shields, conduits, etc. shall be done as the erection progresses.

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

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

AW-2.4 Concrete Lintel

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

AW-2.5 Testing of CHB

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

AW-2.6 Measurement and Payment

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

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

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

AW-3.0 PRE-CAST CONCRETE LOUVERS (NOT USED)

AW-3.1 General

The work to be done under this section include the furnishing of materials tools and equipment and performing labor required to complete the pre-cast concrete louvers as shown on the drawings or as specified.

All accessories shall be in accordance with the applicable provisions in section AW *23.0 Finishing Hardware.*
The Contractor shall furnish and install pre-cast concrete louvers as shown in with the applicable drawings and specification and manufacturer's standards.

AW-3.2 Samples

Samples of pre-cast concrete louvers shall be submitted by the Contractor to the NPC for approval before fabrication commences.

AW-3.3 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-3.4 Materials

1. Pre-cast Concrete Louver

   a) Warehouse Area and Engine Room – 0.25x0.25m pre-cast concrete louver window.

   b) Pre-cast concrete louvers shall be products of reputable, national known manufacturers approved by the Contracting Office.

AW-3.5 Installations

a) Louvers shall be accurately fitted to its frame and hardware.

b) Allowance shall be given for painter's finish.

c) All louvers shall operate freely and with all hardware properly adjusted and functioning.

d) Louvers shall be installed complete with finishing hardware, etc.

e) Louvers shall be installed in strict accordance with the accepted manufacturers' standards, set plumb, properly aligned and securely anchored.

AW-3.6 Measurement and Payment

Measurement and payment for pre-cast concrete louvers will be based on the area installed and accepted by the NPC. Payment will be made at the corresponding contract unit price per area 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-4.0 PLASTERED PLAIN CEMENT FINISH

AW-4.1 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-4.2 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-4.3 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-4.4 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-5.0 VITRIFIED TILE AND NATURAL STONE (NOT USED)

AW-5.1 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-5.2 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-5.3 Samples

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

AW-5.4 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-5.5 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-5.6 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-5.7 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-6.0 VINYL QUARTZ TILES (NOT USED)

AW-6.1 General

The work to be done under this section shall consist of furnishing all labor, materials, equipment, tools and the satisfactory performance of all work necessary to complete vinyl quartz tile work shown and indicated in the drawings or herein specified.

AW-6.2 Materials

Vinyl Quartz Tiles shall be 300mm x 300mm (12" x 12") and 3mm thick. Tiles shall have a smooth surface, containing no sand or grit and shall be free from the lumps and unmixed coloring pigments. Materials shall consist of only the highest grade laboratory approved uPVC resin, plasticizer and stabilizers, pigments and quartz filler, which is used to insure abrasion resistance and dimensional stability.

Tiles must be equal or better than "British Standard 3250" in terms of squareness, gauge, stability, abrasion and indentation resistance. It must be fire-resistant.

Adhesive shall be water-resistant type and recommended by the tile manufacturer to be the best suited for tropical installation and for use with the particular type of floor. Adhesive shall be applied in accordance with the adhesive manufacturer's printed instructions unless directed otherwise by the NPC Representative.

Plastic emulsion (seal polish) shall be best suited for the particular type of floor as recommended by the tile manufacturer.

Metal edge strips shall be provided at all exposed edges of vinyl quartz tiles. Metal strips shall be extruded aluminum or brass, butt type and beveled at exposed edges. Top surface metal strips shall be finished flush with the tiles. Strips shall be secured at the ends and between at about 200mm apart with screws. Where two different floor finishes meet on the same level of the surface, the vinyl tile shall be provided with a metal edge strip. Brass metal strip edge nosing shall be provided between vinyl tile floor finish and ceramic tile floor finish.

AW-6.3 Sample

Samples must be submitted to the NPC Representative for approval as to color and quality.

AW-6.4 Installation

All concrete floors must be checked for even level and finish. All cracks, holes, depression, etc. must be filled or leveled with suitable fillers. They must also be free from dirt, dust, wax, oil, grease, or foreign matter that may affect properties of adhesive.

Preparation – Concrete sub-floors to receive the tile shall be clean, thoroughly dry, smooth, firm and sound; and they shall be free from oil, dirt, curing compounds, or other deleterious materials. Sub-floors shall be swept, vacuumed and damp-mopped when necessary to remove dust and oil. It shall be scrubbed with a strong detergent solution, thoroughly rinsed, and spot primed, when necessary to remove oil or grease stains. All edges shall be ground smooth and all holes and cracks less than 1.6mm shall be filled with an approved plastic emulsion. Large holes and depressions, if any, shall be filled and treated with underlayment mortar troweled on to smooth surface and shall be completely dried before the application of adhesive.

Tile-laying Design – Floor covering shall be applied in patterns selected by the NPC Representative for each area. Joint lines shall be parallel to wall lines. Where line patterns of tiles run perpendicular to lines of other tiles, they shall be laid truly at right angles. Tiles shall be neatly cut as required to form neat edges around permanent fixtures, built-in furniture and cabinets, pipes and other items attached to the floor or wall.

Adhesive – Recommended adhesives are neoprene, rubber based contact adhesive, rugby-type adhesive. The adhesive shall be applied in a thin film while it is still tacky and spread evenly both on floor and tile, allowing ten (10) minutes drying time prior to installation.

Application of Tiles – Tiles shall be laid cut from midpoint of the long axis of the area to be tiled so that opposite borders will be of equal width. Starting at established guidelines, the approved adhesive shall be spread over and under floor with a fine notched trowel covering approximately 4.0sq.m. per liter and immediately the tiles shall be embedded into the adhesive. Tiles shall be rolled in both directions with a 70kg roller to assure contact of tiles and adhesive and to bring edges of the tiles flush.

All junctions with vertical surfaces, tiles shall be carefully scribed so as to form a neat joint at this point. Tile shall never be placed or laid under pressure.

Cleaning and Waxing - Not earlier than five days after installation, floors shall be washed with an approved cleaning solution and rinsed thoroughly with clean cold water. Vinyl tiles shall be waxed with two coats of water emulsion wax, buffed to an even luster with an approved emulsion.

AW-6.5 Measurement and Payment

Measurement and payment for **Vinyl Quartz Tiles** will be based on the area installed and accepted by the NPC Representative.

AW-7.0 PEBBLE WASHOUT FLOOR FINISH

AW-7.1 General

The work to be done under this section shall consist of furnishing all labor, materials, equipment, plant and other facilities and the satisfactory performance of all work necessary to complete all pebble washouts shown on the drawings and specified herein.

AW-7.2 Materials

a) Portland Cement and Sand shall be used for scratch coat.

b) Pebble size and color shall be determined by the NPC Representative.

c) White Cement. - as approved by the NPC Representative.

AW-7.3 Samples

Samples of washouts in tile form shall be submitted to the NPC Representative. No washout 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 texture, color and finish.

AW-7.4 Application

Before commencement of the work, desired pitch for drainage should be provided in the concrete slab. Concrete must be rough and all loose particle or anything which would prevent bond should be thoroughly cleaned off with water. The concrete surfaces must be kept wet for at least four (4) hours before scratch coat is applied. The required scratch coat of cement mortar in the proportion of one (1) part Portland cement of two (2) sand, by volume, shall not be more than 19mm (3/4") in thickness.

Washout finish shall be applied with pressure to obtain solid adhesion to the concrete which shall not be more than 10mm (3/8") thick, composed of one (1) part Portland or white cement, and three (3) parts pebbles, troweled to a hard, smooth even plain, rodded, and floated to a uniform surface with clean water evenly with a spray machine to wash out all cement on the surface so that the pebble quarts shall be partly exposed, and by means of soft brush and water to remove and wash down the remaining cement paste, leaving the pebble in their natural textures and appearances.

AW-7.5 Cleaning

After all trades have completed their work, wash the surface with clean water and brush thoroughly to produce a clean and sparkling appearance.

AW-7.6 Measurement and Payment

Measurement for payment for **Pebble Washout Finish** 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 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-8.0 ACOUSTIC CEILING BOARD

AW-8.1 General

Acoustic units shall be provided in rooms and spaces where indicated or specified. On areas where suspended ceiling is to be provided, all piping, ducts, electrical and other works that is to be concealed by the ceiling shall be completed, tested, inspected and the proper height and level established, before acoustical work is started. The units shall be applied in any room or

space before completion of all wet works and building humidity is reduced to minimum. Ceiling shall be symmetrically installed as indicated.

Acoustical units shall be delivered to the site in the manufacturer's original unopened containers with the brand name, type, sound reduction and wire absorption grades clearly marked thereon.

AW-8.2 Materials

Acoustic ceiling board shall be 16mm x 600mm x 600mm, non-metallic mineral fiber, fissured finish, on anodized aluminum T-runners.

AW-8.3 Installation

Acoustical board shall be installed true to line and in even plane according to ceiling pattern shown on the drawings.

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

AW-8.4 Measurement and Payment

Measurement for payment for **Acoustic Ceiling Board** will be based on what is required on the Bill of Quantities.

AW-9.0 FIBER CEMENT CEILING BOARD

AW-9.1 General

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

AW-9.2 Materials

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

AW-9.3 Sample

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

AW-9.4 Metal Framing

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

AW-9.5 Miscellaneous

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

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

AW-9.6 Installation

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

AW-9.7 Protection

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

AW-9.8 Measurement and Payment

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

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

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

AW-10.0 SPANFLEX RIB CEILING OR APPROVED EQUAL (NOT USED)

AW-10.1 General

Spanflex Rib Ceiling or approved equal shall be provided in rooms and spaces where indicated or specified. On areas where suspended ceiling is to be provided, all piping, ducts, electrical and other works that is to be concealed by the ceiling shall be completed, tested, inspected and the proper height and level established, before acoustical work is started. The units shall be applied in any room or space before completion of all wet works and building humidity is reduced to minimum. Ceiling shall be symmetrically installed.

Spanflex Rib Ceiling or approved equal shall be delivered to the site in the manufacturer's original unopened containers.

AW-10.2 Materials

Spanflex Rib Ceiling or approved equal (0.6mm thick).

AW-10.3 Installation

Installation of Spanflex Rib Ceiling or approved equal shall be done by the manufacturer or his authorized installer in strict accordance with the specification of the manufacturer.

AW-10.4 Measurement and Payment

Measurement for payment for Spanflex Rib Ceiling or approved equal will be based on what is required on the Bill of Quantities.

AW-11.0 SUSPENSION SYSTEM

AW-11.1 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-11.2 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^2). 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-11.3 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-11.4 Measurement and Payment

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

AW-12.0 ROOFING AND SIDING SHEETS

AW-12.1 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-12.2 Materials

Material for main 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.

Material for entrance roofing canopy shall be 4.5mm thk. Solid Polycarbonate Sheet with low thermal conductivity, hardly flammable – B1 rated and high light transmission with UV protection.

AW-12.3 Workmanship

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

AW-12.4 Measurement and Payment

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

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

AW-13.0 DOWNSPOUTS AND ROOF DRAINS

AW-13.1 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-13.2 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-14.0 MOISTURE VAPOR BARRIER (NOT USED)

AW-14.1 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-14.2 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-14.3 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 25. Perms shall be 0.125.

c) Greased (ASTM D1027) 6M/sq. meter/24hours is 8. Perms shall be 0.27.

AW-14.4 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-14.5 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-14.6 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-15.0 GLASS AND GLAZING (NOT USED)

AW-15.1 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-15.2 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-15.3 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-15.4 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-16.0 GLAZING SEALANT

AW-16.1 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-16.2 Materials

a) Silicone Rubber should comply with Federal Specifications for silicone building sealant and Federal Specifications for one (1) component building sealant. Packaging shall be supplied at least in fl. oz. (325 ml) cartridges and two (2) gallons (7.5 litters), 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-16.3 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 them be removed by abrasion or other mechanical means. The sealant shall not be disturbed for at least 48 hours.

AW-16.4 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-16.5 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-17.0 WEATHERSTRIPPING

AW-17.1 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-17.2 Samples

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

AW-17.3 Materials

a) Extruded products shall be of aluminium alloy 6063 T5.

b) Extruded architectural bronze.

c) Flexible metal products shall be of (zinc, aluminium/bronze/ stainless steel).

d) Inserts shall be of vinyl and/or felt.

AW-17.4 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-17.5 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-17.6 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-18.0 JOINERY AND CARPENTRY WORKS

AW-18.1 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-18.2 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-18.3 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-18.4 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-18.5 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-18.6 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-18.7 Measurement and Payment

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

AW-19.0 MILLWORK AND CABINET WORK

AW-19.1 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-19.2 Work not Included

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

AW-19.3 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-19.4 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-19.5 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-19.6 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-19.7 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-19.8 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-19.9 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-19.10 Measurement and Payment

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

AW-20.0 WOOD DOORS

AW-20.1 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-20.2 Samples

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

AW-20.3 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-20.4 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-20.5 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-20.6 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-21.0 ALUMINUM DOORS AND WINDOWS

AW-21.1 General

The contractor shall furnish and install all aluminum doors and windows in accordance with the applicable drawings specification and manufacture's standards. Samples of aluminum sections shall be submitted by the Contractor to the Contracting Offices for approval before fabrication commences.

AW-21.2 Materials

Aluminum Glass Door

Aluminum glass doors shall be double swing, full glass and floor hinge type complete with transom; hardware and accessories as indicated in the drawings.

Aluminum Glass Windows

Aluminum glass windows shall be a combination of mixed and slide type or as indicated in the drawings.

Color for both doors and windows frames and accessories shall be anodized olive brown, preferably "Analok", "Kalcolor" or approved equal.

Members, sizes, extrusion processes and other characteristics of aluminum shall be referred to "ALUMINUM WORKS" and/or Drawings.

Glass Panels shall be (.006m-0.008mm) thick tinted bronze or as indicated on the drawing.

Aluminum glass doors and windows shall be products of reputable, national known manufacturers approved by the Contracting Officer preferably manufactured by "Hooven Philippines", "Permaline" or approved equal.

AW-21.3 Installation

Doors and windows shall be installed in strict accordance with the accepted manufacturer.

AW-21.4 Measurement and Payment

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

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

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

AW-22.0 METAL DOORS

AW-22.1 General

The work to be done shall consist of furnishing all labor, materials, equipment, tools and other accessories for the complete installation of metal doors as shown on the drawings or as specified.

AW-22.2 Material

Steel doors shall be light-weight metal flush door

- Upper and vertical frame shall be special galvanized steel sheets 1.6mm thick.
- Lower frame (for rest room requirement only) shall be special galvanized steel sheets, 2.3mm thick or stainless steel sheet, 2.0mm thick.
- Rib shall be special galvanized steel sheet 1.6mm thick.
- Insulation shall be asbestos core PD-I, paper core (incombustible) PD-2, paper core, PD-3.
- Door edge shall be stainless sheet, 0.8mm thick.
- Hinge shall be stainless metal, loose pin.
- Height of the door knob with lock shall be 1000mm from the lower edge of the door.
- Anchor mounting position 150mm from both ends; pitch: within 500mm.
- Frame painting shall be anti-corrosive paint, baking finish.
- Door painting shall be standard color and pattern of dressed steel sheet or anti-corrosive paint, baked finish. Wood grain, beige or ivory depending on samples approved by NPC Representative.
- For sizes of door panels refer to Door Schedules and drawings.

AW-22.3 Measurement and Payment

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

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

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

AW-23.0 FINISHING HARDWARE

AW-23.1 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-23.2 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-23.3 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-23.4 Material Specification

a) Butt Hinges shall conform to U.S. Federal Specifications unless otherwise specified.

1) For doors up to 914mm (3' - 0") wide or less, 90mm x 90mm (3-1/2" x 3-1/2") hinges shall be used.

2) For closet doors, use long span hinges.

3) Where the jamb trim projects to such an extent that the width of the leaf of butt hinges will not allow the door (in normal opening) to clear such trim, butt hinges with leaves of sufficient width shall be provided.

4) Finish and Material

i) Hinges used for doors to receive point shall be Bonderized and prime coating for painting.

ii) Hinges used for doors to receive natural finish shall be wrought steel highly finished, polished and plated.

iii) Use only non-ferrous material butt hinges for doors exposed to the weather.

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-23.5 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-23.6 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-24.0 PAINTING AND VARNISHING

AW-24.1 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-24.2 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-24.3 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 use 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 marker'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-24.4 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-24.5 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-24.6 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-24.7 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 meat, 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-24.8 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-24.9 Measurement and Payment

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

AW-25.0 CONCRETE FLOOR HARDENER

AW-25.1 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-25.2 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-25.3 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-26.0 FIBER CEMENT BOARD

AW-26.1 General

The work to be done under this section includes the furnishing of all labor, materials, equipment, tools and other facilities necessary to complete the work.

Boards for walls of the type and thickness indicated shall be properly installed and coordinated with the work of other trades.

AW-26.2 Materials

Fiber cement board for wall shall be of Portland cement, sand, cellulose fiber and water autoclaved, immune to water damage, fire resistant, durable, rot and termite proof.

AW-26.3 Handling and Storage

Boards shall be stacked on edge or laid flat on a smooth surface. Edges and corners shall be protected from chipping. To ensure optimum performance, store sheets under cover and keep dry prior to fixing.

AW-26.4 Installation

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

AW-26.5 Framing

Steel channel shall be used at maximum spacing of 600mm x 600mm O.C. B.W. Six (6) millimeter thick board shall be fixed to
metal frame with 2mm Ø galvanized fiber cement nail.

AW-26.6 Measurement and Payment

Measurement for payment for Fiber Cement Board will be based on what is required on the Bill of Quantities.

AW-27.0 SOIL TREATMENT

AW-27.1 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-27.2 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-27.3 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 litters 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-27.4 Measurement and Payment

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

AW-28.0 PLUMBING FIXTURES AND FITTINGS

AW-28.1 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-28.2 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-28.3 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-28.4 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-28.5 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-28.6 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-28.7 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.

AW-29.0 WATERPROOFING (NOT USED)

AW-29.1 General

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

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

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

AW-29.2 Materials

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

AW-29.3 Surface Preparation

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

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

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

AW-29.4 Execution of Work

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

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

After installation of membrane, careful inspection shall be made for accidental damage. Damaged area shall be cleaned and patched with fresh membrane waterproofing (minimum patching material of 152mm x 152mm).
Prior to acceptance of the job, all waterproofed surfaces shall be given a 48-hour flooding and the Contractor shall remedy at once any evidence of leakage. Flooding test shall be done by plugging all drains, building

temporary dams at opening so that water will be 25.4mm (1") deep at high point of waterproofing.

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

In particular, the Contractor shall verify conditions such as the following do no exist:

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

AW-29.5 Guarantee

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

AW-29.6 Measurement and Payment

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

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

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

SECTION VI

TECHNICAL SPECIFICATIONS

CW - (CIVIL WORKS)

SECTION VI – TECHNICAL SPECIFICATIONS

CW – CIVILWORKS

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TECHNICAL SPECIFICATIONS

CW – CIVILWORKS

CW-1.0 GENERAL CONSTRUCTION FACILITIES

CW-1.1 Scope

This section covers the construction and/or maintenance of access roads, drainage system and other appurtenant structures, moving-in of the 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-4.3.4 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 200 KPa. 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).

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:

Sieve Designation (Square Mesh Sieves)	Percentage by Weight Passing
50.0 mm (2")	100
25.4 mm (1")	55-85
9.5 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 $cm^2$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.

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.

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 that, following the performance of the necessary tests, he gives his approval to the use of all materials involve in making the concrete.

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

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

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

Concrete deemed to be not acceptable using the above criteria maybe rejected unless the 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 latest 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 6mmΦ to 20mmΦ inclusive	D=6d
Bars 25mmΦ and 28mmΦ	D=8d
Bars 32mmΦ 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 takes 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 mmΦ. Splices to be welded shall conform to AWS D1.4; certification of weld ability of the reinforcement by the manufacturer, shall be submitted to the NPC. If the 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:

Splice Type	Grade 40 Min.Lap	But Not Less Than
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 (11/2) 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:

Designation	Size (mm)	Weight (kg/m)
#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 (including all connection details) 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, 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 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 A992 or 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 A325
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 / Field Painting

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

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

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

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

CW-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.

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[1]: 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 CONCRETEWALK / 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 concretewalk 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, grizzliest, 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.

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 concretewalk shall be constructed to the section and dimensions shown on the drawings. The concretewalk 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

concretewalk. 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 cubic meters 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.

CW-10.0 ROADWORKS

CW-10.1 Scope

In accordance with the specifications contained herein and in conformance with the lines, slopes, grades and finished surface shown on the plans or otherwise directed by the NPC, the Contractor shall furnish all plant, labor, equipment and materials; shall perform required grading and shall construct or restore the roadways and/or other paved/gravel surfaced areas as may be required.

CW-10.2 Grading

The word "grading" as defined herein means bringing to the required grade all areas to be paved with concrete or asphalt and other areas required to be graded in accordance with the drawings.

CW-10.3 Sub-Grade Preparation

The sub-grade for the aggregate sub-base and aggregate base shall be prepared by bringing the sub-grade to a firm and unyielding surface by rolling the entire area with an approved roller weighing not less than ten (10) tons. The sub-grade shall be sprinkled, if necessary, to attain satisfactory compaction. All soft yielding material, which will not compact readily when rolled, shall be removed as directed. All holes or depressions shall be filled with suitable material and the whole surface compacted uniformly. In cut sections, the ground below the surface of the sub-grade shall not be plowed or disturbed, except as otherwise directed. When necessary, additional approved material shall be added to bring the sub-grade to the desired elevation and cross section, and the whole shall be rolled until compacted thoroughly.

CW-10.4 Aggregate Sub-Base/Base Course

CW-10.4.1 Aggregate Sub-Base Course

Aggregate sub-base material shall consist of pit run 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, grizzliest, or by handpicking. When necessary to obtain proper uniformity, additional filler shall be blended by mixing on the roadway. The fraction of the aggregate sub-base 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-10.4.2 Aggregate Base Course

Aggregate base course material shall consist of hard, durable fragments of crushed gravel or crushed stone and filler and sand or other finely divided mineral matter. The composite material for the aggregate base 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 requirement shown below. The portion of the material retained in a No. 4 sieve shall be known as filler.

The percentage passing the No. 200 sieve shall not be greater than 2/3 the percentage passing the No. 40 sieve.

The following gradation requirement shall apply to the completed base course:

Sieve Designation (Square Mesh Sieves)	Percentage by Weight Passing
50.8 mm (2")	100
25.4 mm (1")	55-85
9.5 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

The coarse aggregate shall have a percentage of wear of not more than 50% at 500 revolutions as determined by AASHO Method T-96 (Los Angeles Rattler Test).

That portion of the filler passing the No. 40 sieve including blended filler shall be known as "Soil Binder", and shall have a liquid limit of not more than 25 and a plasticity index of not more than 6 as determined by AASHO Method T-89 and T-90, respectively.

Not less than sixty (60) percent by weight of the coarse aggregate shall have at least one (1) fractured face.

If filler, in addition to that naturally present in the aggregate base coarse material, is necessary for meeting the grading requirement or for satisfactory blending of the material, it shall be uniformly blended with the base coarse material at the screening or crushing plant, or on the road. The material for such purpose shall be obtained from sources approved by the NPC, which shall be free from hard lumps and shall not contain more than 15 percent of material retained on the No. 4 sieve.

CW-10.4.3 Construction

Aggregate Sub-Base: The aggregate sub-base material shall be placed on the prepared and approved sub-grade. Depositing and spreading of the material shall be as directed. It shall start at the point farthest from the point of loading, and shall progress continuously without breaks. The materials shall be deposited and spread in a uniform layer and without segregation of size, to such a loose depth of not more than 15 cm each layer, making allowance for any filler to be blended on the road, that when compacted, the layer shall have the required thickness. Spreading shall be from spreader boxes or from moving vehicles, or by placing in a windrow followed by spreading to required depth and width by means of a blade grader.

After the base coarse material has been spread, it shall be bladed to a smooth surface conforming to the cross section shown on the drawings. A grader weighing not less than 3 tons and having a blade of at least 3 meters in length, and a wheelbase of not less than 4.5 meter shall be used for the blading.

When additional filler material is necessary for blending, the material shall be spread in a uniform layer over the loosely spread sub-base layer, in amounts as directed, and shall then be bladed thoroughly into the layer by blade mixing. The entire layer shall be bladed alternately to the center and back to the edges until a uniform mixture is attained. Additions to filler shall be such that the blend of added and original material shall meet grading and quality requirements in all respects.

The Contractor shall schedule his operations to assure completion of spreading within 48 hours after processing. Immediately following the final spreading and smoothing, all materials placed shall be compacted to the full width by rolling with a power roller weighing not less than 10 tons. The rolling shall start longitudinally at the sides and shall progress toward the center, overlapping on successive trips by at least one-half of the width of the roller unit. In confined areas the direction of rolling shall be as ordered by the NPC. Alternate trips of the rollers shall be slightly different in length. The rollers, unless directed otherwise, shall operate at a speed between 3 to 5 kilometers per hour. Rolling shall be accompanied by watering if necessary and as directed.

Crushed Stone Base Course: The manner of placing, spreading, blending, watering and rolling crushed gravel or crushed stone base course material shall be similar to that of the aggregate sub-base.

CW-10.5 Concrete Pavement

CW-10.5.1 Materials

A. Portland Cement

Only Type I Portland Cement shall be used unless otherwise permitted by NPC. Different brands or the same brands from different mills shall not be mixed nor shall they be used alternately unless NPC approves the mix. However, the use of Portland Pozzolan Cement Type IP meeting the AASHTO requirements shall 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 Type IP, shall be adopted.

Cement which, for any reason, has become partially set or that contains lumps of caked cement will be rejected. Cement salvaged from discarded or used bags shall not be used.

Samples of Cement shall be obtained in accordance with the AASHTO procedures.

B. Fine Aggregate

It shall consist of natural sand, stone screenings or other inert materials with similar characteristics or combinations thereof, having hard, strong and durable particles. Fine aggregate from different sources of supply shall not be mixed or stored in the same pile nor used alternately in the same class of concrete without the approval of NPC.It shall not contain more than three (3) mass percent of material passing the 0.075 mm (No. 200 sieve) by washing nor more than one (1) mass percent each of clay lumps or shale. The use of beach sand shall not be allowed without a written approval of NPC.

If the fine aggregate is subjected to five (5) cycles of the sodium sulfate soundness test, the weighted loss shall not exceed 10 mass percent.

The fine aggregate shall be free from injurious amounts of organic impurities. If subjected to the colorimatic test for organic impurities and when a color darker than the standard is produced, it shall be rejected. However, when tested for the effect of organic impurities of strength of mortar, the fine aggregate may be used if the relative strength at 7 and 28 days is not less than 95 mass percent. It shall be well-graded from coarse to fine and shall conform to the following:

Grading Requirement for Fine Aggregates	
Sieve Designation	Mass Percent Passing
9.5 mm (3/8 in)	100
4.75 mm (No. 4)	95 –100
2.36 mm (No. 8)	-
1.18 mm (No. 16)	45 – 80
0.600 mm (No. 30)	-
0.300 mm (No. 50)	5 – 30
0.150 mm (No. 100)	0 – 10

C. Coarse Aggregate

Coarse aggregates shall consist of crushed stone, gravel, blast furnace slag, or other approved inert materials of similar characteristics, or combinations thereof, having hard, strong, durable pieces and free from any adherent coatings.

It shall contain not more than one (1) mass percent of material passing the 0.075 mm (No. 200) sieve, not more than 0.25 mass percent of clay lumps, nor more than 3.5 mass percent of soft fragments.

If the coarse aggregate is subjected to five (5) cycles of the sodium sulfate soundness test, the weighted loss shall not exceed 12 mass percent. It shall have a mass percent of wear not exceeding 40.

If the slag is used, its density shall not be less than 1120 kg/m^3 (70 lb./cu. ft.). The gradation of the coarse aggregate shall conform to the following:

Grading Requirement for Coarse Aggregate				
Sieve Designation		Mass Percent Passing		
Standard mm	Alternate US Standard	Grading A	Grading B	Grading C
75	3 in.	100	-	-
63	2 ½ in.	90 – 100	100	100
50	2 in.	-	90 – 100	95 – 100
37.5	1 ½ in.	25 – 60	35 – 70	-
25	1 in.	-	0 – 15	35 – 70
19	¾ in.	0 – 10	-	-
12.5	½ in.	0 – 5	0 – 5	10 – 30
4.75	No. 4	-	-	0 – 5

Only one grading specification shall be used from any one source.

D. Water

Water to be used in mixing, curing or other designated application shall be reasonably clean and free of oil, salt, acid, alkali, grass or other substances injurious to the finished product. Water which is drinkable may be used without test. Where the source of water is shallow, the intake shall be so enclosed as to exclude silt, mud, grass or other foreign materials.

E. Reinforcing Steel

Dowels and tie bars shall conform to the requirements of AASHTO, except that rail steel shall not be used for tie bars that are to be bent and re-straightened during construction. Tie bars shall be deformed bars. Dowels shall be plain round bars. Before delivery to the site of work, one-half of the length of each dowel shall be painted with one coat of approved lead or tar paint.

The sleeves for dowel bars shall be metal of approved design to cover 50 mm (2 inches), plus or minus 5 mm (1/4 inch) of the dowel with a closed end, and with a suitable stop to hold the end of the sleeve at least 25 mm (1 inch) from the end of the dowel. Sleeves shall be of such design that they do not collapse during construction.

F. Joint Fillers

Poured joint fillers shall be mixed asphalt and mineral or rubber filler.Preformed joint filler be punched to admit the dowels where called for in the Plans. The filler for each joint shall be furnished in a single piece for the full depth and width required for the joint.

G. Admixtures

Air-entraining and chemical admixtures, if specified or permitted, shall conform to the requirements of AASHTO.

Fly Ash, if specified or permitted as a mineral admixture and as 20% partial replacement of Portland Cement in concrete mix shall conform to the ASTMrequirements.

Admixture should be added only to the concrete mix to produce some desired modifications to the properties of concrete where necessary, but not as partial replacement of cement.

H. Curing Materials

Curing materials shall conform to the following requirements as specified:

a) Burlap clothe - AASHTO M 182
b) Liquid membrane forming compounds - AASHTO M 148
c) Sheeting (film) materials - AASHTO M 171

Cotton mats and water-proof paper can be used.

I. Calcium Chloride/Calcium Nitrate

It shall conform to AASHTO, if specified or permitted by NPC, as accelerator.

CW-10.5.2 Storage of Cement and Aggregate

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-10.5.3 Proportioning, Consistency and Strength of Concrete

The Contractor shall prepare the design mix based on the absolute volume method outlined in the American Concrete Institute (ACI) – Recommended Practice for Selecting Proportions for Normal and Heavyweight Concrete.

It is the intent of this Specification to require at least 364 kg of cement per cubic meter of concrete to meet the minimum strength requirements. NPC shall determine, from laboratory tests of the materials to be used, the cement content and the proportions of aggregate and water that will produce workable concrete having a slump of between 40 and 75 mm (1 -1 /2 and 3 inches) if not vibrated or between 10 and 40 mm (1/2 and 1-1/2 inches) if vibrated, and a flexural strength of not less than 3.8 MPa (550 psi) when tested by the third-point method or 4.5 MPa (650 psi) when tested by the mid-point method at fourteen (14) days; or a compressive strength of 24.1 MPa (3500 psi) for cores taken at fourteen (14) days and tested, in accordance with the procedures of AASHTO.

Slump shall be determined using AASHTO procedures.

The concrete mix designer shall consider the use of lean concrete (econocrete) mixtures using local materials or specifically modified

conventional concrete mixes in base course and in the lower course composite, monolithic concrete pavements using a minimum of 75 mm (3 inches) of conventional concrete as the surface course.

The mix design shall be submitted to NPC for approval and shall be accompanied with certified test data from an approved laboratory, demonstrating the adequacy of the mix design.

A change in the source of materials during the progress of work shall necessitate a new design mix.

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 indicated in the drawings and/or Bill of Quantities, concrete strength shall be at least 20.70 MPa.

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.

Preformed Expansion Joint Filler: The preformed expansion joint filler for the concrete pavement shall be 19 mm (3/4") in thickness, non-extruding type, shall conform to the requirement of ASTM D1752-67, "Specifications for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction, Non-extruding and Resilient Non-bituminous Type", Type II.

Slab Reinforcement: All dowel bars except at the expansion joints, shall be deformed steel bars and shall conform to PNS: 49:2002, Grade 275.

Joint Sealer: Concrete joint bituminous sealer for all joints shall conform to ASTM D1850-57, "Specifications for Concrete Joint Sealer, Cold Application Type".

CW-10.5.4 Construction

A. Forms and Form Setting

The concrete pavement shall be constructed one lane at a time. The side forms for the concrete pavement shall be made of shaped steel sections which shall be of sufficient strength when staked down to resist the pressure of the concrete mixer and finishing machine, or finishing tools, without springing. They shall be straight and on a depth equal to the thickness of the pavement at the edge and free from warps or bends at all times. Flexible or curbed forms of proper radius shall be used for curves 30 meters radius or less. The form base shall not less than twenty (20) centimeters wide for forms twenty (20) centimeters or more in height. Flange braces shall extend outward on the base not less than two-thirds (2/3) of the height of the form. The use of wooden side forms may be permitted upon written approval by the NPC, provided the Contractor satisfactorily establishes the fact that the steel

forms cannot be obtained in time to bring the work to completion within the required time.

B. Joints

The ***longitudinal joint*** running at the centerline of the pavement shall be formed in accordance with the section and dimension shown on the drawings. Before concreting the next lane, the longitudinal joint shall be painted with two (2) coats of RC-0 liquid asphalt applied at a temperature of 65° to 35° Fahrenheit. The asphalt should be completely dry before any pouring on the next lane starts.

The ***transverse joints*** consisting of the expansion and contraction joint shall be formed at intervals shown on the plans, a 19 mm (3/4") pre-molded non-extruding expansion filler, as specified, shall be set at all contractions joints when concrete is still soft. This strip shall be removed when concrete has attained its initial set. Care shall be taken in removing the strips to avoid chipping off the edge of the concrete at the joint, such joint shall be provided with dowels of the same length, size and spacing used in expansion joints.

Dowels furnished and placed for this purpose by the Contractor shall be without additional cost to NPC.

C. Dowels

Dowel assembly of the length, size and spacing shown on the drawings shall be provided at longitudinal and expansion joints. Dowel bars shall also be provided at contraction joints of slab on fill. The remaining half of the dowel bars for the expansion joint shall be painted, greased, and wrapped with wax paper before concreting the next monolith.

D. Mixing

Unless given the written approval by NPC, hand mixing of concrete will not be permitted. Machine mixer, if used, shall have a standard mixer of an approved type with a capacity of at least 0.76 m^3. (1 cubic yard) unless specified otherwise by the NPC. Truck mixer, if used, shall be of the revolving drum type, watertight, and so constructed that the concrete can be mixed to insure uniform distribution of materials throughout the mass.

E. Placing

Concrete shall be placed only on aggregate sub-base that has been prepared as herein before prescribed and approved. Concrete shall be deposited in such a manner as to require as little handling as possible, and shall be immediately distributed or spread by shoveling or by other approved methods, to such depth, above grade, that when consolidated and finished, the finished grade of pavement will be attained correctly. Vibrators of approved type with the capacity for the purpose intended shall be used to sufficiently compact the concrete.

F. Finishing

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 machines shall be of the screeding 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 a 3-meter straight edge and any variation of the surface from the desired crown or cross-section shall be properly corrected.

G. Removal of Form

All forms for concrete shall remain in place undisturbed for not less than twenty-four (24) hours after the concrete is placed, after which the forms may be removed. In the removal of forms, care should be taken so as not to break the edges of the pavement. In case portions of the concrete are spalled, they shall be immediately repaired, at the expense of the Contractor, with fresh mortar mixed in the proportion of one (1) part cement to two (2) parts clean sand. Major honeycombed areas will be considered as defective work and shall be removed and replaced at the expense of the Contractor. Any area or section removed shall not be less than 3 meter in length or less than the full width of the lane involved.

H. Curing

As soon as the concrete has sufficiently set, and to prevent the marring of the surface, the pavement shall be covered with burlap or canvass which shall be kept wet with clean water for a period of not less than twenty-four (24) hours. After removing the burlap, the pavement shall be covered immediately with either a layer of earth or sand four (4) centimeters in thickness and shall be kept wet for a period of not less than fourteen (14) days. Ponding of the surface of the pavement shall be kept under water during the same length of time.

I. Opening of Traffic

From the start of curing, the pavement will be closed entirely to traffic until twenty-eight (28) days have elapsed after the concrete was poured.

J. Cleaning and Sealing Joints

After completion of the required curing and before opening the pavement to traffic, all joints shall be thoroughly cleaned of all concrete or aggregate fragments, earth, or other foreign material. Longitudinal, expansion and contraction joints shall be poured with bituminous sealer to the depth shown on the drawings. Only after the joint sealant has thoroughly hardened shall the pavement be opened to traffic.

CW-10.6 Measurement and Payment

CW-10.6.1 Aggregate Sub-Base/Base Course

Measurement for payment for aggregate sub-base and aggregate base course will be based on the number of cubic meters of materials satisfactorily placed and compacted in accordance with the detailed drawings. Pavement in the Bill of Quantities which payment shall include the cost of preparing, cleaning and/or repair of the previously constructed sub-grade; and furnishing, shaping, compacting and finishing the aggregate sub-base or aggregate base course.

CW-10.6.2 Concrete Pavement

Measurement for payment of concrete pavement will be based on the number of cubic meters of pavement constructed and accepted. Payment will be made at the contract unit price for the relevant item in the Bill of Quantities, which payment cover all cost of furnishing all materials including forms, joint bituminous sealer and non-bituminous preformed joint filler, dowels, labor, equipment and tools necessary to complete the item.

CW-11.0 DRAINAGE SYSTEM AND APPURTENANT STRUCTURES (NOT USED)

CW-11.1 Scope

In accordance with the specifications contained herein, the Contractor shall furnish all materials, labor, equipment and tools, perform all required excavation and backfill, install all pipes and construct canals and ditches, as the case may be, where indicated on the drawings or where directed conforming with the lines and grades as established in the field by the NPC. The Contractor shall also construct or install, where required, appurtenant structures like street inlet, street inlet-catch basin combination, manhole, catch basin for downspouts, catch basin for intersecting perforated PVC pipes, septic tank, drainage outlets, etc. as well as joints and connections as may be required to complete the system.

CW-11.2 Materials

CW-11.2.1 Reinforced Concrete Drainage Pipes

Reinforced concrete drainage pipes shall meet the design and test requirements for Class II Reinforced Concrete Pipes in accordance with ASTM C76-68 and ASTM C497-67.

One (1) pipe length shall be taken at random representing a group of fifty (50) pipes or fraction thereof of the same size and shall be submitted for test. Any group represented by corresponding test specimens that do not meet the strength and other requirements shall not be used in the work.

CW-11.2.2 PVC Pipes

Polyvinyl Chloride (PVC) Pipes shall be unplasticized conforming to ISO4435 or equivalent. Details/scheme of perforation shall be as indicated in the bid drawing or as directed by NPC.

CW-11.2.3 Bedding Material

A. For Stable Soil and Rock Foundation

Bedding material for sewerage and drainage pipes in a stable soil and rock foundation, as determined by NPC, shall consist of sand or natural sandy soil in which all the materials passes a 9.5 mm (3/8") sieve but not more than 10% passes a 0.074 mm (No. 200) sieve.

B. For Unstable Foundation

Bedding for sewerage and drainage pipes in soft and unstable foundation as determined by the NPC, shall consist of 13.79MPa concrete cradle in conformity with the dimensions shown on the drawings, or as determined by the NPC.

C. Foundation under Roadways and Parking Areas

Bedding for sewerage and drainage pipes crossing under roadways and parking areas with pipe cover (excluding concrete or asphalt pavement) of 60.9 cm (2 ft.) or less shall consist of 13.79MPa concrete cradle in conformity with the dimensions shown on the drawings, or as determined by the NPC.

CW-11.3 Construction

CW-11.3.1 Appurtenant Structures

Appurtenant structures like street inlet, street inlet-catch basin combination, manhole, catch basin for downspouts, catch basin for intersecting perforated PVC pipes, septic tank, drainage outlets, etc. shall be constructed at locations indicated on the plans or at the other convenient locations designated by the NPC. All appurtenant structures shall be of 20.7 MPa concrete unless otherwise shown on the drawings.

CW-11.4 Pipe Installation

CW-11.4.1 General

Before any drain pipe is installed, the sand or concrete bedding shall have been prepared and approved in accordance with the grade, shape, and dimensions shown on the drawings, or as directed by the NPC. No pipe over 45.7 cm (18") in diameter shall be laid on concrete bedding until seven (7) days have been elapsed after placing the concrete bedding. Pipes under 45.7 cm (18") in diameter may be laid after five (5) days elapsed after placing the concrete bedding.

All drain pipes shall be laid carefully, hubs upgraded, ends fully and closely jointed, and true to the lines and grades given. Succeeding pipe shall be jointed to the previously laid pipe, correct in alignment and grade. Any pipe, which has been damaged during installation or before acceptance of the work, shall be replaced and laid by the Contractor at his expense.

CW-11.4.2 Non-Reinforced and Reinforced Concrete Drainage Pipes

Whenever possible, concrete pipes shall be handled and installed with the aid of mechanical equipment and not just rolled or pushed into the trench from the bank. For small pipes, rope slings may be placed at both ends of the pipes and the rope slowly paved out until the pipe rests on the trench bed. Proper and careful handling and laying should be observed at all times to prevent unnecessary structural damage to the pipe, especially at the pipe ends.

For pipes on sand bedding, before joining the next pipe length to the last pipe already laid, the bottom of the trench shall be excavated to the shape, size and location of the collar below the joint. The next pipe section shall then be securely attached to the previously laid pipe seeing to it the correct alignment and grade is always attained. Same procedures shall be observed for the remaining pipes.

All pipe joints shall be filled with stiff mortar composed of one (1) part cement and two (2) parts clean sand and enough water. The inside part of the joint shall be plastered properly to bring the inside surfaces of jointed pipe ends flush even. Sufficient mortar shall be placed on the outside surface of joint to form a bead around the joint. Plastering work shall be as directed and approved by the NPC. After initial set, the mortar on the outside surface shall be protected from air and sunlight with a cover thoroughly wetted earth or burlap. Curing of the joint shall be done for a period of at least seven (7) days within which no backfill shall be placed on the installed pipeline.

CW-11.5 Measurement and Payment

CW-11.5.1 Concrete Drainage Pipes and PVC Pipes

Non-reinforced and reinforced concrete drain pipes, and perforated PVC pipes in place and accepted will be measured by the linear meter along the centerline of the pipeline.

The quantities measured as provided above, completely installed and accepted, will be paid at the contract unit price for each size and kind of pipe shown in the bill of quantity. Payment shall constitute full compensation for furnishing all labor, material, equipment and tools for fabricating, hauling, installing and jointing of pipes. Payment shall also include the cost of attendant excavation, bedding and backfilling.

CW-11.5.3 Appurtenant Structures

Measurement for payment of appurtenant structures like street inlet, street inlet-catch basin combination, manhole, catch basin for downspouts, catch

basin for intersecting perforated PVC pipes, septic tank, drainage outlets, etc. will be based on the number of structures constructed/installed and accepted.

The Contractor will be paid at the contract unit price for the pertinent item for each appurtenant structure shown in the bill of quantity. Such payment shall cover all costs for furnishing all equipment, labor, materials and tools necessary to complete the construction of the aforementioned appurtenant structures. Payment also includes the cost of attendant excavation and backfill, furnishing, scheduling, cutting, bending and placing of reinforcing steel.

CW-11.5.4 Bedding

Measurement for payment for sand or natural sandy soil bedding and concrete cradle will be based on the number of cubic meters of materials placed and accepted.

Payment will be made at the corresponding contract unit price for the item. Sand Bedding for Pipes, and item, Concrete Cradle for Pipes, in the bill of quantity, which payment shall constitute full compensation for furnishing all labor, materials, equipment and tools necessary to complete the items.

SECTION VI

TECHNICAL SPECIFICATIONS

EW - (ELECTRICAL WORKS)

TECHNICAL SPECIFICATION

EW - ELECTRICAL WORKS

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TECHNICAL SPECIFICATION

EW - ELECTRICAL WORKS

EW-1.0 GENERAL

This section covers the technical and associated requirements for the **Renovation of NPC Office and Staffhouse at Bo. Obrero, Iloilo City.**

All electrical equipment shall be installed in accordance with the relevant sections of this specification. The Contractor shall submit all related drawings and document deemed necessary, prior to the execution of the work, subject to the approval of NPC.

The works shall be performed and completed in a satisfactory manner in accordance with generally accepted modern engineering practice.

EW-2.0 SCOPE OF WORK

The scope of electrical work covers the furnishing of all labor, materials, equipment, tools and other necessary incidentals required which shall essentially consist of all electrical equipment and materials enumerated herein:

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

2. Supply, Installation and Test of Complete Structured Cabling System.

EW-3.0 STANDARD OF MATERIALS

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

1. American National Standards Institute (ANSI)

2. Institute of Electrical and Electronic Engineers (IEEE)

3. Underwriter's Laboratory (UL)

4. National Electrical Manufacturer's Association (NEMA)

5. National Electrical Code (NEC)

6. Philippine Electrical Code (PEC)

7. Philippine Electronics Code (PEC)

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

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

EW-4.0 LIGHTING AND POWER SYSTEM

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

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

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

EW-4.1 Technical Requirements and Characteristics

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

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

EW-4.2 Lighting and Power Panelboard

The lighting and power panelboard shall be flush mounted rated at 240V, 60Hz, operating on a three-phase system.

Main circuit breaker shall be molded case type with instantaneous magnetic trip and thermal over-current trip coordinated with up-stream feeder circuit breaker.

Branch circuit breaker shall be quick-make, quick-break, thermal magnetic and trip indicating type with rating as required by connected load.

Panelboard Nameplate shall be black plastic with engraved white letter. All branch circuits, especially for ACU's, motors, heaters, etc., shall be labeled to easily identify and locate the connected loads during maintenance.

EW-4.3 Lighting Fixtures, Luminaires and Accessories

Lighting Fixtures

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

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

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

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

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

Lighting Luminaires

a. LED Tube Type Lighting Fixture with Louvers

IP20 Recessed Mounted Type Louvered Lighting Fixture, with Mirror Finish Aluminum Reflector, 2 X 18 Watts Cool White High Output Ballast-Bypass Type Led Lamp Tube Luminaires.

b. Round Ceiling Luminaire

IP20 Round Ceiling Luminaire, Surface Mounted, 350mm Diameter, White Steel Base, White Opal Glass Diffuser and Complete with 2 X 18 Watts, E27 Base, Frosted Finish Compact Led Lamp.

c. LED Tube Type Lighting Fixture with Diffusers

IP54 Surface Mounted Lighting Fixture with 3mm thick prismatic diffuser and gasket, 1200mm x 300mm zinc phosphate steel sheet housing with white powder coat paint finish, and complete with high output, 2 x 20W daylight LED tube lamp.

d. Wall Mounted Lighting Fixture

IP44 Wall Mounted Lighting Fixture, Steel Base, White Satinated Glass Diffuser with 1 X 12 Watts Day Light Compact Led Lamp.

e. LED Tube Type Lighting Fixture - Open Type Luminaire

IP20 Open Type Luminaire, With Zinc Phosphated Die-Formed Steel Sheet Base and White Powder Coat Paint Finish Complete with 1 X 9 Watts Led Tube Lamp.

f. Recessed Mounted Vertical Profile Downlight

IP44 Recessed Mounted Vertical Profile Downlight with Aluminum Reflector and Powder Coated Rim Fitted with Vertically Placed E27 Base 1 x 12 Watts, Compact LED Lamp.

g. Surface Mounted Vertical Profile Downlight

IP20 Surface Mounted Vertical Profile Downlight with Aluminum Reflector and Powder Coated Rim Fitted with Vertically Placed E27 Base 1 X 9 Watts Compact Led Lamp.

h. Emergency Lighting Fixture

The Contractor shall supply and install the automatic stand-alone emergency lamp with self-contained battery unit as specified herein.

When the AC main supply is interrupted, the lamps shall be automatically switched ON with a time delay of 1 second to the battery-powered operation. Lamps shall be switched OFF when the batteries are discharged at the low-level voltage (below 7.5V). The charging system of both maximum-constant voltage and constant current shall be able to recharge the completely discharged batteries to their full capacity within 20 hours or less. The charging system shall cut-off automatically and instantaneously upon reaching fully charged state.

Under normal supply, the charging system shall ensure and maintain the batteries in a fully charged state ready to supply power and shall be equipped with a reliable protective device to protect the batteries against overload and short circuit.

Batteries shall be of long life, maintenance free, sealed lead acid type. The batteries shall have sufficient capacity to operate the lamps at full luminous efficiency for up to 3 hours after failure of the main supply.

Rated input voltage of the automatic stand-alone emergency lamps shall be 230 VAC, 1-phase, 60 Hz.

i. Exit Lights

IP30 LED Emergency Exit Sign Light shall be Non-Maintained, Low Heat, Low Maintenance and Low Volt Cut-off preventing battery over discharge. It shall be complete with High Temperature Nickel Cadmium Battery, IC Controlled Dual-Rate Charger, Fire Retardant Molded Acrylic Diffuser and Electro Galvanized Steel with Epoxy Powder Coated Fittings.

j. Wall Mounted Outdoor Lighting Fixture

IP65 Up Down Wall Mounted Lighting Fixture, with Toughened Glass, and Die-Cast Aluminum and with Vertically Placed E27 Base 2 x 9 Watts Compact LED Lamp.

EW-4.4 Conductors

Conductors shall be stranded annealed copper conductor suitable for continuous temperature of 90°C when used in wet or dry location and 75°C when exposed to oil or coolant. The minimum size of conductor to be used shall be 3.5mm^2.

Insulation shall be suitable for wet and dry location, fungi resistant and ultraviolet stable.
All conductors shall be moisture and heat resistant, flame retardant polyvinyl chloride insulation, chemical and abrasion resistant nylon sheath.

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

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

EW-4.4.1 Conductor Installation

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

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

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

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

EW-4.5 Conduit

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

During installation, due precaution shall be taken to protect the conduit and threads from mechanical injury. The ends of the conduit shall be sealed in an approved manner. Conduit runs shall be sealed using 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, coloured red-orange, schedule 40.

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

EW-4.6 Junction / Utility and Pull Boxes

Junction / Utility Boxes

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

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

Pull Boxes

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

EW-5.0 STRUCTURED CABLING SYSTEM

This specification covers the technical and associated requirements for the supply, installation and test of the fiber structured cabling system as required including cables, fittings, supporting racks, brackets, etc.

Included in the scope is the supply and embedment of concrete inserts for supporting cable conduits if used on walls and provision of openings and recesses in walls and floor concrete inserts.

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

All materials to be supplied shall be new and in accordance with the governing standards.

EW-5.1 Technical Requirements and Characteristics

The Contractor shall ensure that all equipment supplies function correctly and safely.

The characteristics and ratings of the equipment and devices given in the applicable sections are not necessarily the standards of any manufacturer, but they are the minimum requirements that must be satisfied by the Contractor.

The construction must be as standard as possible in order to reduce to a minimum the spare parts and to make the maintenance and replacement operation easy. All similar parts must be interchangeable.

EW-5.2 Telephone Terminal Cabinet

The telephone terminal cabinet with terminal blocks shall be flush mounted.

Terminal blocks to be installed for the cabinets shall be "punched-down" to the quick connect interface type blocks.

Cabinet name plates shall be black plastic with engraved white letters.

EW-5.3 Private Automatic Branch Exchange (PABX)

The PABX shall be a core telephony server of advanced design and construction using modern electronic switching system based on the required multiplex switching network.

The process shall operate under the control of a program stored in a Programmable Read Only Memory (PROM) and consist of a set of integrated modules, forming a complete telephony solution for an enterprise.

The equipment shall be compact and modular. The equipment shall provide easily accessible test points to permit the connection of testing and measuring equipment.

It shall be designed to operate with real time, multi-tasking, multi-processor operating systems. It shall perform call controls, call-signaling, media transcoding and conversion functions. All call routing parameters can be stored.

It shall have the scalability and flexibility architecture that supports the provision of multiple servers and multiple gateways systems, rather than having a singular network for every location. This ensures accommodation of any dialing plan-local, and/or network.

It should be compatible and equipped with functionalities that will seamlessly integrate with the dialing plan and calling policies.

And it shall support a specified number of telephone switching management.

EW-5.4 Distribution Frame/Data Cabinet

The Contractor shall provide a standardized frame or enclosure for mounting the equipment hardware. The rack shall be provided with front and back door with spring lock, detachable side panel and lock. Status of the system shall be readable through shatterproof glass or plastic windows.

The mounting rack shall be capable to provide ease of access for the standard telecommunication practices. Adjustable square holed mounting rail with cage nuts and bolts shall be provided and the shortest possible connectivity link routes shall be striven for.

The mounting rack shall be a standard powder coated finish and black. Racks shall include vertical cable managers mounted on the channels with removable covers that can handle large quantities of cables and patch cords.

EW-5.5 Network Distribution Switch

The network distribution switches to be supplied in the work shall be new, of high quality, free from all defects and of proven acceptability for the purpose intended that acts like a distribution switch that will handle the aggregate traffic if there will be too many end-devices for several locations.

Unless otherwise specified, materials shall conform to the latest applicable standard issued and provides ports for the transferring and routing of information.

It must be complete with software, accessories, and connectors for seamless integration with the NPC's data communication equipment and future new equipment. It shall also have SFP and stacking capabilities.

The Contractor shall be responsible for taking reference to its accessibility, means of transportation, cabling, configuration, end to end testing and commissioning of all installed equipment and components to conform to the network topology.

EW-5.6 Patch Panel and Patch Cords

The patch panels and patch cords to be provided shall be a cross connect section that will convert communication media from analog-to-digital and vice versa. It shall avoid messy connections for loaded unshielded voice and data patch panels with color universal labels on the network. It shall also aid for ease of maintenance and increase in the life span of the data communication equipment since the switch will not be accessed directly whenever there are faults. It shall have fixed connections with the panel.

Patch panels and patch cords shall have Category 6A electrical performance. It shall be made of black anodized aluminum or steel 48-port in one rack space configuration, T568A/T568B universally wiring support configuration, with usable bandwidth transmission performance integrated grounding support.

Patch cords are cross connection wire and shall meet or exceed the same category rating of connecting hardware. It shall be assembled with RH45 plugs to enable high levels of performance and 100% transmission tested. It shall be utilized stranded for optimal transmission performance to eliminate Alien Crosstalk with round low smoke zero halogen jacket.

EW-5.7 Structured Cabling System Distribution

The distribution shall be enclosed in uPVC conduits and configurable, i.e. adapts modifications without any assistance. The distribution within the buildings will permit a highly available organization of all the applications.

It shall be wired separately installed from power outlets on the conduits to be provided. It shall further be suitably protected on both ends to prevent damage to cables and/or equipment as well as to avoid possible electrical shocks.

The Contractor shall perform at his own expense all the inspection to ensure the adequacy of design, materials, satisfactory, and conformance of the supplied equipment to the requirements of the specifications and standards.

EW-5.7.1 Installation Requirements

The Contractor shall carry out all the installation works as directed by NPC, by furnishing all labor, materials, equipment, and all other supplies necessary to complete the Installation works in accordance with the specification and as per industry standards.

The Contractor shall provide complete details of proper handling and storage, installation, print out testing, performance guarantees, etc. to be submitted for NPC's review and approval.

All components and associated accessories for the structured cabling system shall be assembled, installed, tested and commissioned in accordance with the manufacturer's drawings and instruction manual.

Materials and equipment shall be handled with care at all times to prevent damage and defects during handling, transportation, assembly, installation and any damage and defects shall be repaired, replaced or otherwise make good by the Contractor to the satisfaction of and no cost to NPC.

The Contractor shall ensure that the equipment and materials are installed in accordance with manufacturer's standards/recommendations, check hardware configuration, perform adjustments necessary to place the system in trouble free operation. Instruct the operating personnel in the proper operation and maintenance of the equipment, testing instruments and software furnished, perform hardware troubleshooting and/or installation.

Assembly, installation, interfacing, test and commissioning of the system shall be carried out by skilled and qualified personnel. An experienced engineer/service technician, as a minimum, is required for this task.

EW-5.8 Unshielded Twisted Pair Cables

The cables shall be twisted pairs with high immunity to cross talk and electromagnetic interference for voice connectivity distribution of the building.

Insulation shall be suitable for wet and dry location, fungi resistant and ultraviolet stable. All cables shall be moisture and heat resistant, flame retardant polyvinyl chloride insulation, chemical and abrasion resistant nylon sheath. The conductor specification shall meet ASTM specification, and requirements of PEC.

The Contractor shall submit catalogues and/or brochures showing details of insulation of cables to be supplied.

EW-5.8.1 Cable Installation

The cable pulled through conduits shall be supported in an approved manner 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 to only by means of approved grips and the end portion of the cables, which has been marked or deformed by the grip, shall be cut-off by the Contractor.

Prior to installation of conduits shall be thoroughly cleaned to prevent damage to cables during installation.

After cables have been installed, it shall be tested for continuity and insulation resistance and shall be tagged with respective wire number.

EW-5.9 Conduits, Data and Telephone Outlets

Conduits

All conduits shall be embedded and concealed, while pull boxes, outlets w/ connectors and fittings required for the system installation including all necessary hardware and accessories 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 conduits and threads from mechanical injury. The ends of the conduit shall be sealed in an approved manner. Conduit runs shall be sealed using caps and discs or plugs. The seals shall be maintained, except during inspection and tests, until the cables are pulled in. Conduit shall be checked to be free from obstructions by pulling a wooden mandrel of appropriate size through the conduit.

Conduits running under 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 the pull boxes, fittings and equipment enclosures shall be made watertight.

Conduits installed outdoors running on walls or underground shall be buried to a minimum of 0.5m.

Metallic Conduits (If specified)

Rigid metallic conduits shall be hot-dipped galvanized. The inside of the conduit shall have stove enameled coating to prevent erosion and assure smooth wire pulling.

Metal fittings and cover shall have the same property and finish as that of the metallic conduits.

Rigid metal expansion joints, where required, shall be of standard manufactured product, of watertight construction, equipped with approved means to provide electrical continuity of the conduit runs, zinc-coated, and so designed as to prevent damage to the cables. They shall permit a small amount of transverse movement as well as the longitudinal movement.

Non-Metallic Conduits

Where non-metallic conduits can be used by NPC, it shall be made of unplasticized 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.

Data and Telephone Outlets

Data and telephone outlets shall be wired separately for lighting and power outlets. Data and telephone outlets shall be based on the number and type furnished, installed and tested in accordance with the bid drawing.

EW-5.10 Grounding System

All equipment to be used shall be properly grounded in accordance with the latest electrical and electronics industry standards.

EW-6.0 MEASUREMENT OF PAYMENT

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

SECTION VI

TECHNICAL SPECIFICATIONS

MW - (MECHANICAL WORKS)

PART I– TECHNICAL SPECIFICATIONS

MW – MECHANICAL WORKS

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 for **Renovation of NPC Office and Staff House at Bo. Obrero, Iloilo City.**

All materials and equipment to be supplied by the Contractor under this Contract shall be new and unused, free from defects and imperfections and best suited for the purpose intended.

All equipment, materials, parts 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 materials and components to be supplied shall essentially be the standard products of the manufacturer as best meets the conditions of sound engineering economy of manufacture and procurement.

Brochures, catalogs and other related technical data of materials and equipment to be supplied by the Contractor under this contract shall be submitted by the Contractor for NPC's review and approval prior to fabrication.

Any and/or all expenses arising through the lack of knowledge or understanding regarding the existing conditions of the site shall be the responsibility of the Contractor and no additional payment thereof shall be made by NPC.

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 conduct actual inspection at both sites and thoroughly investigate and familiarize himself with all the conditions at site, make assessment on the physical conditions and configurations of the existing building equipment and auxiliaries to be transferred, determine the required quantity of materials and equipment to be supplied/utilized during the project execution, determine possible sources of materials and equipment to be supplied/utilized, and verify the actual scope of works and relative costs. Any and/or all expenses arising through the lack of knowledge or understanding regarding the existing conditions of the site shall be the responsibility of the Contractor and no additional payment thereof shall be made by NPC.

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 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. Domestic Water System complete with valves, pipe fittings, piping works, pipe supports excavation and backfilling and other incidentals to complete the piping system including pipe disinfection which includes but not limited to;

   a.1 Replacement of old water distribution lines/pipes;
   a.2 Replacement of old water pump complete with controls and other accessories including spare parts for one (1) year operation and construction of pump house; and
   a.3 Water meter

b. Air-conditioning (AC) and Ventilation System complete with its necessary controls, mounting accessories and other appurtenances which includes but not limited to;

   a.1 Inverter-Split-Type Wall Mounted AC;
   a.2 Inverter-Split-Type Floor Mounted AC;
   a.3 Inverter-Window Type AC; and
   a.4 Wall and Ceiling Mounted Exhaust Fans

c. Fire Fighting System complete fire with piping materials; valves; fittings and appurtenances which includes but not limited to.

   a.1 Fire Detection and Alarm System; and
   a.2 Potable Fire Extinguisher

d. All other works and services including those are not specifically detailed herein but are required to fully complete the project.

MW-3.0 MATERIALS AND EQUIPMENT

MW-3.1 General

All materials, equipment, devices and accessories to be supplied under this contract shall be new and unused, free from 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 and materials shall conform to the latest specifications and provisions of approved standards of engineering societies or other equivalent standards approved by NPC.

The work shall be performed and completed in a high quality workmanship, in accordance with generally modern accepted practice in the fabrication, assembly, installation and test of all equipment and materials supplied by the Contractor, notwithstanding any omission from these Specifications or drawings.

Defect and damages to the equipment resulting from faulty installation works shall be repaired and/or replaced by the Contractor at no cost to the NPC.

MW-3.2 Applicable Code 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 Equipment Foundation

All equipment shall be installed in accordance with the manufacturer's recommendations and applicable codes and standards. Requirements for concrete foundations where the equipment are to be mounted shall be referred to the relevant Civil Works Specifications.

The Contractor shall be responsible for the correct positioning and leveling of the equipment and auxiliaries, and any checking made by the NPC during the course of the work shall not relieve the Contractor from his responsibility. During installation works, electro-mechanical equipment shall be carefully lifted or glided on the foundation by using only approved methods and equipment, and in a manner that will prevent damage to the equipment and foundation. The equipment shall be positioned on a location as shown on the drawings and shall be leveled and checked true to grade and alignment before final grouting. The Contractor shall strictly adhere to the installation procedures/manuals provided by Manufacturers of the equipment.

Prior to equipment mounting and grouting, the surface area and blackouts of concrete foundation shall be cleaned of all dirt by any approved means. Chipping of concrete surface to the required thickness shall be done by any approved methods without damaging the concrete structure as a whole.

The pouring of concrete to secure in place any equipment on its concrete foundation shall not be made until the NPC has verified the correct location of the foundation. Should incorrect positioning be ascertained after the concrete pouring, the Contractor shall make the correction at his own expense.

The concrete foundation surfaces shall be free of any loose materials, oil, water or any other contaminants that would prevent the grout from bonding. The concrete shall be chipped to expose a minimum aggregate so as to remove all laitance and provide a rough surface for bonding. The exposed surface shall be blown with compressed air free of oil to remove dust.

All materials, equipment, devices and accessories to be supplied under this contract 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 and equipment to be used shall conform to the latest specifications and provisions of approved standards of engineering societies or other equivalent standards approved by NPC.

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

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

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

MW-3.5 Piping System

MW-3.5.1 Polypropylene (PPR) Pipe

Domestic water supply and distribution piping shall generally be constructed from Polypropylene (PPR) pipe, conforming to ISO, DIN standard and/or approved equivalent with a rating of 20 bars PN, unless otherwise shown on the drawing.

MW-3.5.2 Pipe Installation

All water piping shall generally be installed underground.

The Contractor shall install the piping system in a thorough manner and with good workmanship, in accordance with the drawings and specifications or as directed 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 acceptance 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 end 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.

Pipe sleeves shall be provided for pipe which penetrates platforms, floors, roofs and partitions. Proper flashing shall be provided to ensure tightness and water-proofing, where required.

After installation, pipe insides shall be washed thoroughly using high pressure cleaning pump. Water for washing must be clean enough not to damage the equipment.

All existing facilities which are 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.

The Contractor shall strictly observe the safety requirements/regulations of NPC during the performance of the work.

Prior to the start of all piping works, the Contractor shall coordinate with NPC personnel at site to avoid interference with the existing installations or other structures. In case interference occurs, NPC will decide which work is to be relocated.

MW-4.0 DOMESTIC WATER SYSTEM

MW-4.1 General

This section provides the essential information for the design, supply, installation, construction and test of the complete Domestic Water Supply System to provide the water requirements of the New NPC Office including the required excavation and backfilling of pipe trenches.

The work covers the interconnection with the existing water supply line (50 mm Ø to be verified by Contractor during site inspection). Prior to interconnection works, proper coordination with the NPC/SPUG-Visayas Management shall be made by the Contractor to minimize water interruptions.

The work shall include, but not limited to the following:

a. One (1) set of Centrifugal Pump, capable of delivering 10.0 M3/H @ 30 m TDH, complete with necessary control, control panel, power and control/instrumentation cables and its accessories including spare parts for 1 year operation, discharge piping and interconnection works with the existing elevated water tank and construction of pump house; and

b. One (1) lot of New Domestic Water Distribution Piping System complete with valves, pipe fittings, piping works, pipe supports excavation and backfilling and other incidentals to complete the piping system including pipe disinfection;

MW-4.2 Centrifugal Pump

The scope of work shall cover the supply, delivery, installation and test of one (1) unit of Centrifugal Pump, single or multi-stage, horizontal shaft type with a capacity not less than 10.0 m^3/hr @ 30 psi discharge pressure complete with flanges, bolts, nuts and other accessories necessary for the safe and reliable operation of the domestic water supply system. The pump shall be installed at location as shown on the drawing. The supply shall include but not limited to the following:

a. One (1) unit of 32 mm Ø Gate Valve @ suction;

b. One (1) unit of 25 mm Ø Gate Valve @ discharge;

c. One (1) unit of 25mm Ø Check Valve @ discharge;

d. One (1) unit of Pressure Gauge, 100mm Ø dial gauge, bourbon tube type, 0 - 3 kg/cm2 scale range, equipped with isolation valve;

e. One (1) unit of Strainers Y-type with cast iron or PPR body material and flanged or screwed ends. Screen elements shall be of stainless steel construction with minimum of 40-mesh size.

f. One (1) lot of standard spare parts as recommended by the manufacturer for one (1) year operation and as specified in the technical specifications.

g. One (1) lot of piping materials complete with pipe fittings, pipe supports and other accessories;

h. One (1) lot of 4-level switches (high/low level alarm to be installed inside the existing elevated concrete water tank)) for automatic pump control complete with power, control and instrumentation cables;

i. One (1) lot of concrete foundation for the pump; and

j. Functional test of the pump and control panel.

MW-4.2.1 Materials and Construction

The pump casing shall be made of heavy duty cast iron, bronze or stainless steel impeller, stainless steel shaft sleeve and mechanical seal arrangement. Shaft shall be of high-grade carbon steel or stainless steel designed for maximum load-carrying capability

The pump casing shall be split type for ease of maintenance such that the impeller and shaft are capable of being withdrawn without disturbing any of the main pipe work and valves carrying the pumped fluid.

The horizontal pump shall be mounted with its driving motor on a common bedplate of rigid construction. The bed plate shall be complete with drip tray fitted with a conveniently located drain plug.

Pump shall be directly coupled to the electric motor which complies with the latest NEMA standards.

The motor shall be operated on 230V, single phase, 60 hz suitable for continuous and intermittent operation. The motor shall be equipped with built-in overload protection and automatic reset to assure safe motor operation under normal field conditions.

Motor shall be provided with suitable electrical control and complete protective devices. The control relays of the motor starter shall be contained in the steel metal enclosures or control panel installed under the building stair.

MW-4.2.2 Power Cable

Power supply and control cables shall be included in the supply. Power supply shall be sourced from the facility Main Power Panel Board and terminated in the pump's local control panel installed in the pump house. The cables shall be sized suitably for the proper pump operation conforming to the requirements specified in the relevant Electrical Specifications.

MW-4.2.3 Controls

Motor shall be provided with suitable electrical controls and complete protective devices. The control equipment shall be of switch actuated control type. The control relays shall be contained in the steel metal enclosures/control panel of the motor starter. The pump controls shall be designed such that it can be operated either automatically in conjunction with a level switch in the water storage tank or manually through a manual-local control push buttons provided at the pump's local control panel installed in the pump house.

The control for the two water pumps shall be designed such that when one running pump trips, the non-running pump shall start automatically. Control switch to start and stop the pump shall be done in the local panel installed within the pumphouse. Sufficient status indications and alarm signal is initiated upon loss of pump operation. Pump operation shall be as follows:

a.	Water storage tank level high	:	Pump stops
b.	Water storage tank level high high	:	Annunciate high level alarm and simultaneously trips the running pump
c.	Water storage tank level low	:	Pump starts
d.	Water storage tank level low low	:	Annunciate low level alarm and simultaneously triggers the standby pump to start

The local control panel shall include pump starter, circuit breaker, motor overload protection, pump control relay, internal 230-240volt control transformer for supplying power to the instruments and control system, start/stop push buttons with indicating lights, power supply indicating light, level alarms, failure or trouble alarm and other components required for the proper operation of the pump. The change-over switch for AUTO-LOCAL operation shall be provided in the local control panel.

MW-4.2.4 Pump House

The Contractor shall construct a new pump house which will house the Centrifugal Pump in accordance with the attached Civil Work drawings. The pump house shall be provided with lighting and other amenities to conform to the requirements specified in the relevant Electrical and Civil Works Technical Specifications and drawings.

MW-4.2.5 Testing

The pump and motor shall be subjected to factory tests to determine its conformance with the requirements of the specifications and approved test procedures which shall include but not limited to the following:

a. Pressure hydrostatic proof of the casing to 1.5 times the maximum pressure for 30 minutes;

b. Report of the characteristic curves such as Head vs. Flow and Efficiency vs. Flow, etc.; and

c. Other tests as required by applicable codes and standards.

MW-4.2.6 Spare Parts and Tools

The Supplier shall supply and submit list of recommended spare parts for one (1) years operation with corresponding cost which shall include the following:

a. One (1) set of bearing metal for pump and motor; and

b. One (1) set of bushing, wearing rings, packing and gaskets

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

MW-4.2.6 Submittals

The following documents shall be submitted by the Contractor for NPC's review and approval.

a. Technical data, specifications and catalogues;

b. Outline, assembly and installation drawings showing all the dimensions;

c. Operation and maintenance manuals; and Complete test reports.

MW-4.3 Pipe, Pipe Fittings and Accessories

Domestic water supply and distribution piping shall generally be constructed from Polypropylene (PPR) pipe, conforming to ISO, DIN standard and/or approved equivalent Domestic water supply and distribution piping shall generally be constructed from Polypropylene (PPR) pipe, conforming to ISO, DIN standard and/or approved equivalent with a rating of 20 bars PN, unless otherwise shown on the drawing.

Polypropylene pipe connection joints shall be by heat fusion in accordance with the manufacturer's recommendation.

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 as minimum.

Flanged joints may use flat gaskets with serrated flange faces or 0-rings with corresponding grooves. Gaskets and 0-rings shall not be fabricated from polypropylene material.

Union joints shall not be used with pipe diameters of more than 63 mm O.D. (2"), except otherwise commercially available per manufacturer's standard. Joints between metal pipes and PPR pipes should be flanged type using a PPR flange on the PPR pipe and full face gasket.

Domestic water piping to be installed within the area of the existing elevated water tank and pump shall be constructed from ASTM A53, Grade A, Schedule 40, seamless and hot-dip galvanized. All steel piping 65mm Ø and above shall be constructed with flanged joints or butt welded joints and fittings. Pipes 50mm Ø below shall be connected with threaded joints.

MW-4.4 Valves and Accessories

All gate and globe valves, 65mm and over 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 valves 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 shall be of bronze material, 20mm size and outfitted with male thread hose connections.

Check valves shall be of a swing disc type, cast iron material, flanged/screw type, Class 150.

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

MW-4.5 Water Meter and Accessories

Water meters and accessories to be supplied by the Contractor shall conform to the requirements specified in this specification.

The Contractor shall provide water meter and accessories which are suitable for the operating conditions of the systems in which they are to be used, and shall be responsible for the pressure and temperature ratings of the selected

components or as specified in relevant sections of this specifications. The selected components shall meet the requirements of trouble free and safe operation under maximum load, part load and transient conditions.

The diameter of water meter ends shall be the same as the diameter of the connecting pipe.

Water meters shall be at accessible location for easy maintenance and isolation to respective household connections.

All water meter shall be installed above ground and provided with respective concrete pad to prevent growing of grass under the water meter as shown on the drawings.

MW-4.6 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.

The domestic water system piping shall generally be laid underground. All trenches shall be provided with a cushion pad of at least 100mm sand and sandy soil bedding materials. All pipeline excavations shall be backfilled up to the level of the finished grade surface in layers of 150 and each layer shall be thoroughly compacted. Backfill materials shall be compatible soil taken from trench excavation and approved by NPC.

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

All pipes that cross roadways shall be provided with pipe sleeve made of steel material or RCP pipe to protect the pipe from various loads imposed by vehicles and shall extend 600mm beyond shoulder of each pavement side. Embedded water supply pipes in open areas shall be laid not less than 300mm from the ground surface to the bottom of pipe.

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 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.

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

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.

MW-4.7 Testing

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.

Before any test is made, the Contractor shall notify NPC in advance so that such test may be witnessed. All expenses that may be incurred during the tests shall be borne by the Contractor.

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

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

Tests may be applied to sections or the entire system. The test shall be made between valves and sections of not more than 305m (1000 ft) in accordance with the American Water Works Association (AWWA).

There shall be no leakage whatsoever from the pipes, fittings and connections for each section tested while the system is under the test pressure for the period of not less than thirty (30) minutes of the total time to inspect all portions of the waterline under test, whichever is longer.

During the test, valves shall be opened and closed. Any leakage or any defect disclosed by the tests prior to the acceptance shall be corrected and repaired by the Contractor at his own expense to the satisfaction of NPC.

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-4.8 Disinfecting of the Domestic Water Piping System

The domestic water piping system shall be disinfected after testing and before being put into use. Before disinfection, piping should be drained, flushed, re-drained and refilled. In refilling, care must be taken to avoid entraining or entrapping air in the pipe. The Contractor may use any of the methods of disinfection 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.

MW-4.9 Submittal

The following documents shall be submitted by the Contractor for NPC's review and approval prior to procurement and installation.

a. Complete data, specifications and catalogues;
b. Outline and assembly drawings;
c. Test procedures;
d. Field test reports; and
e. Operation and Maintenance Manuals.

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 Contractor.

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

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

Refrigerant to be used shall be environmental friendly.

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

MW-5.2 Design Conditions

MW-5.2.1 Outdoor Conditions

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

MW-5.2.2 Indoor Conditions (Air-Conditioned Areas)

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

MW-5.2.3 Indoor Conditions (Air-Conditioned Areas)

Staff House	:	Four (4) Bedrooms
Administration Area	:	Nine (9) Rooms/Areas

MW-5.2.4 Areas to be Ventilated @ 10 Air Changes per hour

Staff House	:	Two (2) Bedrooms
Administration Office	:	Nine (9) Rooms/Areas

MW-5.3 Schedule of Equipment

MW-5.3.1 Air-Conditioning Units

Location	No. of Unit/s	Cooling Capacity/Unit	Type
a.1 Staff House			
▪ Bedroom 1	One (1)	18,750 kJ/hr	Inverter-Window Type
▪ Bedroom 2	One (1)	18,750 kJ/hr	
▪ Bedroom 3	One (1)	18,750 kJ/hr	
▪ Bedroom 4	One (1)	18,750 kJ/hr	
a.2 Administration/Office			
▪ Canteen	Two (2)	29,520 kJ/hr	Inverter-Split Type Wall Mounted
▪ Cashier	One (1)	10,500 kJ/hr	
▪ Lobby	One(1)	25,290 kJ/hr	
▪ IT Office	Two (2)	9,000 kJ/hr	
▪ Security	One 1)	9,000 kJ/hr	
▪ Manager	One (1)	21,900 kJ/hr	
▪ Conference	One (1)	25,290 kJ/hr	Inverter-Window Type
▪ Office area	Five (5)	25,290 kJ/hr	Inverter-Split Type Floor Mounted
▪ Clinic	One(1)	10,500 kJ/hr	Inverter-Split Type Wall Mounted
Total	**19**		

MW-5.3.2 Ventilation Units

Location	No. of Unit/s	Flow Rate	Type of Exhaust Fan
b.1 Staff House			
▪ Bedroom No. 2 (CR)	One(1)	100 m³/hr	Ceiling Mounted
▪ Bedroom No. 4 (CR)	One(1)	100 m³/hr	
▪ Kitchen Area	One(1)	2130 m³/hr	Wall Mounted
▪ Common CR- He/She	Two (2)	330 m³/hr	Ceiling Mounted
b.2 Admin/Office			
▪ Common CR- He/She	Two (2)	330 m³/hr	Ceiling Mounted
▪ Kitchen CR	One(1)	790 m³/hr	
▪ Manager CR	One(1)	150 m³/hr	
▪ Clinic CR	One(1)	85 m³/hr	
Total	**Ten (10)**		

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 Inverter-Split Type Air Conditioners (Wall/Floor Mounted) including refrigerant pipes and mounting brackets and concrete pads to provide a fully ventilated and air conditioned rooms. The work shall include other accessories even though not specifically mentioned in this specification but are necessary to obtain a complete set for the safe and reliable operation of the system as a whole.

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

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

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

a. With Remote Controller and Holder
b. With automatic and manual swing louver control
c. With control switch
d. Cool Mode
e. Fan Mode
f. Automatic Mode

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.

MW-5.4.2 Split-Inverter Type Air-conditioning Systems

MW-5.4.2.1 Fan Coil Unit (Indoor Unit)

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

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

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

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

Refrigerant control shall utilize thermostatic expansion valve.

Air filters shall be cleanable and removable type.

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

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

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

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

MW-5.4.2.2 Condensing Unit (Outdoor Unit)

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

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

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

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

MW-5.4.2.3 Refrigerant and Piping System

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

Refrigerant to be used shall be environment friendly.

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

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

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

MW-5.5 Ventilation Units

MW-5.5.1 General

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

MW-5.5.2 Ceiling Mounted Exhaust Fans

Ceiling type exhaust fans shall be provided at the area as specified in the schedule of equipment.

Discharged air from Ceiling type exhaust fans shall be directed outside the building through flexible hoses or ducts complete with accessories. Fans on ceiling shall be provided with grilles or louvers both on the inlet and outlet opening. Outlet flanges installed vertically shall be provided with gravity shutters. Exhaust air shall not be discharged within the enclosed ceiling particularly those installed in the kitchen and toilet.

MW-5.5.3 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 Unit and Exhaust Fans 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 which are damaged during 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 Equipment Marking and Labeling

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

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

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

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

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

The labeling, size of label plates, and their location shall be subject to approval by NPC. A sample label-plate (with indication of material used) with

lettering shall be submitted for this purpose. The inscription shall be printed or stenciled but in any case, water-proof, oil-proof and wear-resistant.

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

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

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

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

MW-5.8 Spare Parts and Tools

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

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

MW-5.9 Acceptance Test

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

MW-5.10 Submittals

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

a) Dimensional layout drawings of mechanical equipment and associated devices.

b) Manufacturer's catalog sheets, marked as necessary, to indicate materials or equipment being furnished including instruments for control system;

c) Complete control schematic and wiring diagrams for all equipment to be furnished;

d) List of recommended Spare Parts and Special Tools; and

e) Operation and Maintenance Manuals.

MW-6.1 General

This section provides the essential information for the design, manufacture, fabrication, supply, installation, delivery to site, testing and commissioning 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 Contractor complete with their corresponding technical brochures written in English that would aid in the 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.

All material and equipment which are not specifically mentioned herein but are necessary for the proper installation and operation of the fire detection and alarm system shall be furnished at no additional cost to NPC.

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

MW-6.2 Fire Detection and Alarm System

MW-6.2.1 General

This section covers the design, supply, delivery, installation, test and commissioning of the fire detection and alarm system, complete in every respect and suitable for reliable and satisfactory operation in accordance with NFPA 70 and NFPA 72, latest edition.

The equipment 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 material and equipment which are not specifically mentioned herein but are necessary for the proper installation and operation of the fire detection & alarm system shall be furnished at no additional cost to NPC.
The fire alarm system shall provide a reliable and fault free early warning system in the event of fire.

The fire alarm system shall provide the means for early detection of fire, provide audible alarm and visual annunciation. Plug-in units using electronic modules must be used.

The alarm signal receiving units must be so designed such that by the use of a standardized alarm unit socket, any of the following types of detectors may be used with equal facility of any of the fire alarm circuits:

The alarm signal receiving units must be so designed such that by the use of a standardized alarm unit socket, any of the following types of detectors may be used with equal facility of any of the fire alarm circuits:

a. Photoelectric detector for the detection of visible smoke formation and burning gas; and

b. Thermal heat detector for detecting a rate of rise in temperature

Power supply for the fire alarm system must come from the 240 V AC of adequate capacity, which shall be electrically supervised. Transfer from normal to emergency power or restoration to normal power shall be fully automatic and shall not cause transmission of false alarm.

MW-6.2.2 Scope of Work

The Scope of Work shall comprise a complete functioning system including the following:

a) One (1) Main Fire Alarm Control Panel (MFACP) complete with modules, Automatic Voltage Regulator (AVR), chargers and battery, trouble/fault audible alarm with flashing light which shall be installed as shown on the drawings and other appurtenances;

b) One (1) Local Fire Alarm Control Panel complete with accessories;

c) One (1) lot of Heat Detectors;

d) One (1) lot of Photoelectric Smoke Detectors;

e) One (1) lot of Manual Pull Station Alarm Lines;

f) One (1) lot of Alarm bells; and

g) One (1) lot of Wiring and Accessories.

h) Training of NPC personnel in the operation and trouble shooting of the system including supply and turnover of manufacturer's software needed in programming the MFACP setting including other digital components that require exclusive programs from the Manufacturer with free update throughout the operating life of the MFACP.

MW-6.2.3 Main Fire Alarm Control Panel (MFACP)

The Main Fire Alarm Control Panel shall be provided to supervise and monitor all fire protection and detection systems including LFACP's and capable of operating addressable and non-addressable initiating devices (detectors and pull stations). The MFACP shall be located inside the Entrance Lobby.

The MFACP shall be of UL listed and/or FM approved, suitable for wall mounting and have NEMA 4 enclosure designed to operate on 220 VAC, 60 hertz, 1-phase.

The detection system shall remain 100% operational and capable of responding to an alarm condition while in the routine maintenance mode. Addressable detection devices shall be individually identified by the system, and any quantity of addressable detection devices shall be in alarm at any time up to the total number connected to the system.

Supervision of system hardware and software, wiring and detection devices shall be provided in the control system. Failure of system hardware or wiring shall be indicated by type and location of the alpha-numeric annunciator. The

system shall provide fail-safe operation, i.e., incoming alarms shall automatically override all other modes of operation, and the panel shall automatically return to normal operating mode for any operator initiated mode.

Ground fault detection shall be provided for all initiating and audible circuits. Lamp test capability shall be provided to test all visual panel indicators and associated hardware. The MFACP shall be equipped with a silence before reset feature, designed to prevent accidental system reset during an alarm condition.

The system alarm lamp shall flash upon receipt of any alarm condition. Acknowledgment of the alarm by operation of the silence switch shall silence the audible alarm and cause the trouble lamp to light steadily. Receipt of subsequent alarm shall cause the audible devices to resound and the alarm lamp to flash.

The system trouble lamp shall flash and trouble audible alarm shall sound upon the occurrence of any trouble condition. Acknowledgment of the trouble condition by operation of the silence switch shall silence the audible alarm and cause the trouble lamp to light steadily. Receipt of subsequent troubles shall cause the trouble horn to resound and the trouble lamp to flash.

Individual input and output device addressability shall be performed on the same pair of wires with no special wiring sequence shall be required on addressable device circuits, and unlimited number of wiring branches shall be permitted with no loss of supervision. The system shall be capable of having all addressable devices in alarm simultaneously.

Light emitting diodes (LED's) shall be included to indicate (green) system power, (yellow) trouble, and (red) alarm; trouble and alarm shall also be annunciated on an alpha numeric display which will give zone number, device number and location plus diagnosis of trouble. An audible device shall sound within the control for alarm or trouble. This device shall have two (2) distinct sounds, and shall be silenceable by the acknowledge/silence switch. Alarms shall override any trouble condition.

The control power supply shall be capable of powering detectors and audible/visual signal circuits. All system expansion modules shall interconnect through a card edge connector and shall require no inter-module wiring.

The control shall allow for expansion and shall also be configurable without system interwiring.

New unacknowledged alarms and troubles shall be distinctively displayed on both the visual display and the printer and differentiated from previous alarm and troubles.

No alarm or trouble indication shall be resettable until it has been acknowledged. It shall not be possible to reset the system until all alarms have been acknowledged.

A fire alarm bell of audible rating shall be furnished and installed by the Contractor on the MFACP and shall be of NEMA 4 operating on 24 V DC.

The following color coding shall be used for indicating lamps on the MFACP and the LFACP:

a) Green : System Normal
b) Red : Fire
c) Amber : Trouble

The following visual "fire" alarms shall be provided for each type of the system:

a. System Normal
b. "Fire Alarm"
c. System Activated

A continuous supervisory system shall be provided for each detection, actuation, alarm and signaling circuit. The supervisory system shall be designed to actuate an audible trouble alarm distinct from the fire alarm and an amber light to appear on the occurrence of any of the following:

a. Loss of electrical integrity in any detection unit
b. Loss of electrical integrity in any actuation unit
c. Loss of electrical integrity in any alarm and signaling circuit
d. Loss of AC power or power supply
e. Short circuits, open circuits
f. Ground Faults

The system shall be capable of:

a. Counting the number of addressable detectors within a "Zone" or "System" which are in alarm.
b. Differentiating among types of addressable detectors such as smoke detectors, manual stations and heat detectors.

It shall be provided with back-up battery and battery charger of adequate ampere rating complete with charge/float-charge monitoring, protection and metering devices. The battery system must be capable of powering the system for not less than 24 hours in the "powerless condition." Transfer to the secondary power supply shall be done automatically.

MW-6.2.4 Local Fire Alarm Control Panel (LFACP)

Local Fire Alarm Control Panel shall be provided to supervise automatic wet pipe sprinkler system (future), detection system zones, status of fire pumps and capable of operating addressable and non-addressable initiating devices (detectors and pull stations). The LFACP shall be located at appropriate area as shown on the drawings.

The LFACP shall be UL listed and/or FM approved and shall be suitable for surface mounting, have NEMA 4 enclosure and designed to operate on 220

VAC, 60 hertz, 1-phase. All internal devices shall be factory wired to terminal blocks located on the interior of the panels.

Battery backup shall be provided for the LFACP. The backup system shall include a battery charger and shall be designed such that, upon main power failure, backup power automatically supplies the system with no delay or interruption of any kind. The battery system must be capable of powering the system for not less than 24 hours in the "power loss" trouble condition. At the end of this time, the battery system shall be capable of operating the entire system in full alarm condition for a period of not less than 10 minutes. The "battery system in use" annunciator light shall be lit to indicate that the system is operating on battery power.

The LFACP shall include contacts for local audible and visual annunciation of the fire alarm and trouble signals as required by each fire protection system being monitored. Visual annunciation of alarm and trouble signals shall be integral with the cabinet.

The LFACP shall be furnished with permanently attached nameplates which indicate the appropriate system and/or zone designation and identify the equipment served.

The LFACP shall include contacts for remote annunciation each of alarm or trouble conditions via data communication lines to Main Fire Alarm Control Panel (MFACP). The alarm and trouble conditions annunciated remotely by these controls shall include the conditions as listed in this section.

Indicating lights and switches shall be furnished on the local panels for each alarm condition. Each light shall be clearly labeled. All devices mounted on the panel shall have nameplates with white lettering on the black background. (All system status is indicated by approximately80 character LCD display. Switches are of key-member type).

Fire alarm bells or horns for the panels shall be NEMA 4 rated and shall operate on 24 volts DC. A separate fire alarm bell or trouble horn shall be furnished and installed by the Contractor for each panel. The minimum sound output for the fire alarm bells or horn shall exceed 90 dBA at 10 feet from the device.

An acknowledge push button shall be provided on each LFACP to silence audible annunciation of fire and trouble alarms. The circuit for this push button shall permit audible annunciation of additional incoming alarms. This push button shall test sound the audible device when in the depressed position and all alarm conditions shave been cleared.

The color coding shall be used for indicating lamps on the LFACP shall be the same as on the MFACP (All system status events are indicated preferably by 80 character LCD display).

Provisions shall be made to show that each condition of alarm has been restored to normal.

The following visual "fire" alarms as applicable shall be provided for Automatic Fire Sprinkler system (future) each fire exits for every floor of Dormitory Independent Detection Systems and Manual Pull Station:

a. System Normal
b. "Fire" Alarm
c. System Activated

A continuous supervisory system shall be provided for each detection, actuation, alarm and signaling circuit similar to the MFACP.

The following visual "trouble" alarms shall be provided on the LFACP for each type of system: Circuit Trouble indicating lights may be combined into a single common system trouble indicating light: (All system status events are indicated by approximately80 character LCD display).

System Type	Trouble Alarm
a. Wet Pipe Sprinkler System (Future)	• Water Flow Circuit Trouble • High/Low Water Pressure • Bell/Strobe/Circuit Trouble
b. Independent Detection System	Detection System Circuit Trouble
c. Manual Pull Station	Manual Pull Station Circuit Trouble

MW-6.2.5 Storage Batteries and Battery Charger

Back-up batteries for MFACP and LFACP of lead-acid type with adequate ampere-hour rating shall be provided to operate the system under supervisory condition for at least 24 hours. At the end of this time, it shall still be capable of operating the entire system with all audible/visual signals devices under alarm conditions for a period of not less than 30 minutes. Reliable separation cells shall be provided to prevent contact between terminals of adjacent cells and between battery terminals and other metal parts. Batteries shall be located preferably inside each of the control panel or if it cannot be accommodated shall be installed at the appropriate location to be designated by NPC personnel.

Back-up battery and battery charger shall have adequate ampere rating complete with charge/float-charge monitoring, protection and metering devices. The battery system must be capable of powering the system for not less than 24 hours in the "powerless condition." Transfer to the secondary power supply shall be done automatically.

Battery chargers that can completely provide an automatic high/low charging rate and shall be capable of recovery of the batteries from full discharge to full charge in 6 hours or less. Ammeter for recording rate of charge and voltmeter to indicate the state of battery charge including the necessary protections shall be provided. Red pilot light to indicate when batteries are manually placed on a high rate of charge shall be provided as part of the unit assembly if a high rate switch is provided. The power supply for the charger at 220 VAC could be sourced from the low voltage distribution board of the building or as directed by NPC. The charger shall be located preferably in the control panel or if it can not be accommodated shall be installed at the same location of the storage batteries or as designated by NPC representative.

MW-6.2.6 Heat Detectors

The heat detectors to be supplied shall be UL listed and/or FM approved designed to provide high quality and reliability. It shall be designed to meet

the performance requirement of an industrial alarm system. It shall contain a unique dual transistor sensing circuit to provide both maximum performance and solid state reliability.

The heat detector shall be addressable thermal fire detector of fixed temperature type. Detector shall be twist/lock design and shall be directly interchangeable with smoke detectors and other compatible plug-in detectors. Detectors shall continuously be supervised from MFACP.

MW-6.2.7 Photoelectric Smoke Detectors

The Contractor shall supply smoke detectors of photoelectric type. The smoke detectors shall be addressable and shall operate using a light source, a light beam collimating system and a photoelectric sensor. They shall be directly interchangeable with other comparable plug-in detectors. Detectors shall be UL listed and/or FM approved and shall operate from a nominal 24V DC source from MFACP and shall be continuously supervised from the MFACP. The type of detector shall be as shown on the bid drawings.

The smoke detectors shall be designed to sense both visible and invisible products of combustion. They shall incorporate advanced solid-state, low-voltage circuitry featuring a Surface Mount Technology. The 360 degree smoke entry characteristic permits maximum smoke response from any direction. To assure that the detector is functioning, a pulsing LED allows for visual supervision of the detector. Under alarm condition, the LED lights continuously at full brilliance.

MW-6.2.8 Manual Fire Alarm Stations

Manual fire alarm stations shall be addressable manual station and shall be operated by pulling down on the lever. When operated, the lever shall remain down with the alarm contacts closed until the station is reset. The manual station shall be reset by opening the front and resetting the switch. The station shall close only after the switch is reset. It shall not be possible to open the station without special tools or keys. The manual station shall be tested by opening the station and operating the toggle switch. Stations shall flush or surface mounted and shall be UL listed and/or FM Approved. Stations shall be red with the word "FIRE" in raised lettering. The manual fire alarm stations shall be electrically supervised from the MFACP.

MW-6.2.9 Alarm Bells

Bells shall be of the vibrating type suitable for use in an electrically supervised circuit and shall be watertight/weatherproof type. The gongs shall be made of selected alloy steel to give loud, resonant tones necessary in fire alarm system. Alarm bells shall be 200mm in diameter and of the underdome type with heavy-duty mechanism. Bells shall produce a sound output rating of at least ninety decibels (90 dB) at 3 meters from the device. The alarm bells shall be UL listed and/or FM approved and shall be electrically supervised by the MFACP and capable of parallel operation.

MW-6.2.10 Installation Requirements

The Contractor shall install the fire alarm system in accordance with the applicable requirements of NFPA 72A, 72B, 72D and 72E. Materials and equipment to be furnished under this specification shall be essentially the current design products of one manufacturer regularly engaged in the production of such equipment and shall be listed under the Underwriter's Laboratories, Inc. (UL) or approved by Associated Factory Manual Laboratories (FM) or its approved equivalent.

a. Wiring

The scope of work shall include the supply and installation of all interconnecting raceways and wiring, including associated supports for interfacing all his supplied equipment and devices.

Electrical installation of fire detection and alarm system shall be in accordance with NFPA 70 and 72 and all applicable local codes and regulations.

All wiring shall be fully segregated from other wiring system and run in dedicated raceways. Indoor cables shall run in Electrical Metallic Tubing conduits and outdoors in Rigid Galvanized Conduits. Cables shall be XLPE insulated with Thermoset Jacket. PVC insulation shall not be used.

Wire for 220 volts circuit shall be 3.5mm^2 minimum. All voltage wiring shall be color coded in conduit or electrical metallic tubing. All circuit conductors shall be identified within each enclosure where a top, splice or termination is made. Conductor identification shall be by plastic coated self-sticking printed markers or by heat-shrink type sleeves. The markers shall be attached in a manner that will not permit accidental detachment. Control circuit terminations shall be properly identified. No "T" wiring or pigtail connectors shall be permitted.

b. Grounding

All terminals requiring grounding connection shall be grounded to the building grounding system or as per manufacturer's recommended standard.

MW-6.2.11 Submittal

The Contractor shall submit the following documents for review and approval prior to the purchase, installation and implementation of the works:

a. Design layout drawings of all fire alarm equipment, electrical power supply panels, wiring counts, and conduit runs from the control panel to all associated equipment;
b. Schematic diagram of fire alarm circuit;
c. Brochures and catalogues containing guaranteed technical data; and
d. Design computation of the proposed system, as required.

MW-6.2.12 Testing

MW-6.2.12.1 General

Firefighting system components shall be given requisite factory tests as necessary to determine that the work and materials are free from defects and ensure that system design and construction meet the requirements of this specification.

The Fire Alarm and Detection System shall be tested for acceptance in accordance with requirements of NFPA 14, NFPA 15, and NFPA 20 respectively.

Test procedure for testing and commissioning of the fire alarm and detection system shall be prepared by the Contractor/Manufacturer in accordance with NFPA 72 which shall be submitted to NPC for review and approval. The Contractor/Manufacturer shall be responsible for the performance of the test, demonstrating the function of the system and verifying the correct operation of all systems components, circuits, and programming.

MW-6.2.12.2 Fire Detection, Alarm and Control System

The fire detection and alarm system shall be tested in accordance with NFPA 72 and the test procedure submitted by the Contractor and approved by NPC.

The Contractor shall demonstrate all input and output functions of the system and verify the correct operation of all systems components, circuits and programming which shall include but not limited to the following:

a. System wiring to demonstrate correct system response and subsequent operation;

b. System audible and visible alarms including system indications; and

c. System power capabilities including back-up battery and charger.

Testing shall include verification that the releasing circuits and components energized or actuated by the fire alarm system are electrically supervised and operate as intended on alarm.

Suppression systems and releasing components shall be returned to their functional operating condition upon completion of system testing.

MW-6.2.12.3 Test Failures

If any equipment or component fails to pass any test, NPC may, at his own judgment, direct the Contractor to make any necessary corrections or alterations for defects or order equipment/component replacement, as maybe deemed appropriate. Any and all expenses due to additional tests or retests made necessary by failure of Contractor's supplied equipment/component, i.e. failure to meet the guarantees and other requirements of the specification, shall be borne by the Contractor.

MW-6.2.13 Spare Parts

The Contractor shall supply the standard and recommended spare parts for use during the warranty period including spare parts specified in this section.

Any parts found to be incorrect or damaged during testing and commissioning shall be replaced by the Contractor at his own cost.

The spare parts shall be supplied complete with markings showing the description or code numbers and the name of the equipment or device to which the parts are a component therein.

All spare parts shall be delivered into storage areas designated by NPC and the delivery will be deemed complete when the packages have been opened by Contractor, their contents checked by NPC and articles protected and replaced by Contractor to the satisfaction of such representatives or assembled into units at NPC's option and stored as directed by NPC. Damaged or incorrect item shall be replaced by the Contractor at his own cost.

All bidders are required to submit in their proposal the detailed list of spare parts to be supplied with its corresponding costs. This list is preliminary and subject to changes in order to conform to the final design without any additional cost. The final list of spare parts shall be submitted to NPC for approval not later than one (1) month prior to delivery of equipment.

Contractor shall indicate the expected life of the parts requiring replacement and the minimum recommended inventory of the spare parts for installation, start-up, continuous operation and maintenance. Contractor shall state whether the recommended spare part is a stock item or a special item, and shall furnish name and location of the nearest supplier, and approximate lead time required for delivery of materials.

MW-6.3 Portable Fire Extinguishers

MW-6.3.1 Scope of Work

The Contractor shall supply the specified number of Philippine Standard/International Code Council (ICC) or Philippine Bureau Fire Protection (PBFP) listed and/or 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) Twenty three (23) units of Portable Type Fire Extinguisher, Clean Agent (HCFC or Halotron I Type), 7.1 kg. (15.5 lbs), wall-hung type and PS/ICC or PBFP approved;

Location	No. of Unit
Staff House	5
Administration/Office	18
Total	23

MW-6.3.2 Technical Requirements

Fire extinguishers shall be PS/ICC or PBFP 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-weighed at interval of six (6) months from the date of delivery for a period of one (1) year and if found to be undercharged (unless used by an NPC personnel) shall be filled and recharged by the Contractor at no expense to NPC.

MW-6.3.3 Painting

Painting of Fire Fighting Equipment and applicable piping shall be in accordance with the Manufacturer's recommended practice. Final color to be used for all firefighting equipment shall be Munsell No. 7.5 R 4/14 or manufacturer's standard.

Painting of Fire Fighting Equipment and applicable piping shall be in accordance with Manufacturer's standard or as directed by NPC. Equipment with final painting have already been applied at the shop but have been damaged during transport and/or installation works, shall require touch-up painting.

MW-6.3.4 Submittals

The Contractor shall submit catalogues and brochures specifying the type and model of the fire extinguishers for the approval of NPC prior to purchase.

MW-7.0 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 and humidifier 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-8.0 MEASUREMENT OF PAYMENT

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

Measurement of 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.

PART II – TECHNICAL DATA SHEETS

MW – MECHANICAL WORKS

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PART II – TECHNICAL DATA SHEETS

MW – MECHANICAL WORKS

DOCUMENTS TO BE SUBMITTED DURING THE BID OPENING

NOTES

1. The Bidder shall complete this technical data sheet/documents and submit the filled-up forms during the project implementation (during contract stage). The Bidder shall use additional sheets as necessary for any other additional information following to the format shown herein or by reproducing the same.

2. The data required are technical features and characteristics of the Equipment to be provided by the bidder. Bidder's proposal shall at least be equal or superior to the requirements specified by NPC. The data provided shall be used as basis for evaluation of brochures, drawings and other documents to be submitted for review and approval during the project implementation.

3. All data and information shall be in English language.

Name of Firm	Name & Signature of Representative	Designation

I. EQUIPMENT DATA

ITEM	DESCRIPTION	UNIT	NPC REQUIREMENT	CONTRACTOR'S DATA
MW-1.0	**DOMESTIC WATER SUPPLY SYSTEM**			
MW-1.1	**Centrifugal Pump**			
MW-1.1.1	Pump			
	▪ Manufacturer		By Contractor	
	▪ Place of Manufacture		By Contractor	
	▪ Type		Centrifugal, Horizontal	
	▪ Capacity	m^3/h	10.0 minimum	
	▪ Discharge Pressure	psi	30	
	▪ Efficiency	%	By Contractor	
	▪ Power Required	hp	≤ 1.5 (2hp)	
	▪ NPSH Required	m	By Contractor	
	▪ Material:			
	- Casing		Cast Iron	
	- Impeller		Cast Bronze	
	- Shaft		Stainless steel	
	- Shaft Sleeve		Bronze	
MW-1.1.2	Motor			
	▪ Manufacturer		By Contractor	
	▪ Place of Manufacture		By Contractor	
	▪ Type and Protection		By Contractor	
	▪ Insulation Class		By Contractor	
	▪ Electrical Ratings	v/Ø/h	230/1/60	
	▪ Power Output	kW	≤ 1.5 (2hp)	
	▪ Current at Rated Voltage		By Contractor	
	- Full Load	a	By Contractor	
	- Locked Rotor	a	By Contractor	
MW-1.1.3	Quantity		One (1)	
MW-1.1.4	Speed	rpm	By Contractor	
MW-1.1.5	Approving Authority		UL/FM	
MW-1.1.4	Controllers and other accessories/ components		Outdoor Type Controller - (With start-stop push button, circuit breaker, control relays, magnetic contactor, under/ overvoltage protection relay, phase failure protection relay, high and low liquid level, alarm relay, auto-manual selector switch, voltage and current meter, indicating lights, etc.), power and instrumentation cables NEMA 3 enclosure with anti-corrosion paint.	

Name of Firm | Name & Signature of Representative | Designation

ITEM	DESCRIPTION	UNITS	NPC REQUIREMENT	CONTRACTOR'S DATA
MW-1.0	**DOMESTIC WATER SUPPLY SYSTEM *(Continuation)***			
MW-1.2	**Water Meter**			
	▪ Manufacturer		By Contractor	
	▪ Place of Manufacture		By Contractor	
	▪ Model/Type		By Contractor	
	▪ Quantity	pcs	1	
	▪ Flow Rate	m^3/hr	10	
	▪ Size (End Connections)		1½"	
	▪ Accuracy		Conform to ISO 4064 Class B Standard	
	▪ Display Range	m^3	0.1 to 9999	
	▪ Operating Pressure		MAP 16	
	▪ Water Temperature	°C	50 (maximum)	
	▪ Dimension		By Contractor	
	▪ Weight	kg.	By Contractor	
	▪ Installation		Horizontal	
	▪ Type of Construction:		Water meter shall be/have: - Uni-Directional - Mechanical Transmission - Screw Type Brass Body - Wet Dial - Vacuum Sealed - Anti-Magnetic Protection - High Quality Mineral Glass Inspection Window - Fitted with Rotating Lid	

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ITEM	DESCRIPTION	UNIT	NPC REQUIREMENT	CONTRACTOR'S DATA
MW-2.0	**AIR CONDITIONING SYSTEM**			
MW-2.1	**Inverter-Split Type Wall Mounted**			
MW-2.1.1	**Cooling Capacity (Minimum)**	**kJ/h**	**29,520**	
	▪ Manufacturer		By Contractor	
	▪ Model		By Contractor	
	▪ Quantity		Two (2)	
	▪ Electrical Ratings	v/Ø/hz	240/1/ 60	
	▪ Dimensions (W X L X H): Indoor Unit	mm	By Contractor	
	▪ Dimensions W X L X H): Indoor Unit	mm	By Contractor	
	▪ Weight (Indoor and Outdoor Units)	kg	By Contractor	
	▪ Refrigerant type		By Contractor	
	▪ Total Power Consumption (Indoor and Outdoor Units)	kW	By Contractor	
	▪ Control System (With Remote Control Unit)		Included	
MW-2.1.2	**Cooling Capacity (Minimum)**	**kJ/h**	**25,290**	
	▪ Manufacturer		By Contractor	
	▪ Model		By Contractor	
	▪ Quantity		One (1)	
	▪ Electrical Ratings	v/Ø/hz	240/1/ 60	
	▪ Dimensions (W X L X H): Indoor Unit	mm	By Contractor	
	▪ Dimensions W X L X H): Indoor Unit	mm	By Contractor	
	▪ Weight (Indoor and Outdoor Units)	kg	By Contractor	
	▪ Refrigerant type		By Contractor	
	▪ Total Power Consumption (Indoor and Outdoor Units)	kW	By Contractor	
	▪ Control System (With Remote Control Unit)		Included	
MW-2.1.3	**Cooling Capacity (Minimum)**	**kJ/h**	**21,900**	
	▪ Manufacturer		By Contractor	
	▪ Model		By Contractor	
	▪ Quantity		One (1)	
	▪ Electrical Ratings	v/Ø/hz	240/1/ 60	
	▪ Dimensions (W X L X H): Indoor Unit	mm	By Contractor	
	▪ Dimensions W X L X H): Indoor Unit	mm	By Contractor	
	▪ Weight (Indoor and Outdoor Units)	kg	By Contractor	
	▪ Refrigerant type		By Contractor	
	▪ Total Power Consumption (Indoor and Outdoor Units)	kW	By Contractor	
	▪ Control System (With Remote Control Unit)		Included	

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ITEM	DESCRIPTION	UNIT	NPC REQUIREMENT	CONTRACTOR'S DATA
MW-2.1.4	**Cooling Capacity**	kJ/h	10,500	
	▪ Manufacturer		By Contractor	
	▪ Model		By Contractor	
	▪ Quantity		Two (2)	
	▪ Electrical Ratings	v/Ø/hz	240/1/ 60	
	▪ Dimensions (W X L X H): Indoor Unit	mm	By Contractor	
	▪ Dimensions W X L X H): Indoor Unit	mm	By Contractor	
	▪ Weight (Indoor and Outdoor Units)	kg	By Contractor	
	▪ Refrigerant type		By Contractor	
	▪ Total Power Consumption (Indoor and Outdoor Units)	kW	By Contractor	
	▪ Control System (with Remote Control Unit)		Included	
MW-2.1.5	**Cooling Capacity (Minimum)**	kJ/h	9,000	
	▪ Manufacturer		By Contractor	
	▪ Model		By Contractor	
	▪ Quantity		Three (3)	
	▪ Electrical Ratings	v/Ø/hz	240/1/ 60	
	▪ Dimensions (W X L X H): Indoor Unit	mm	By Contractor	
	▪ Dimensions W X L X H): Indoor Unit	mm	By Contractor	
	▪ Weight (Indoor and Outdoor Units)	kg	By Contractor	
	▪ Refrigerant type		By Contractor	
	▪ Total Power Consumption (Indoor and Outdoor Units)	kW	By Contractor	
	▪ Control System (With Remote Control Unit)		Included	
MW-2.2	**Inverter-Split Type Floor Mounted**			
MW-2.2.1	**Cooling Capacity (Minimum)**	kJ/h	25,290	
	▪ Manufacturer		By Contractor	
	▪ Model		By Contractor	
	▪ Quantity		Five (5)	
	▪ Electrical Ratings	v/Ø/hz	240/1/ 60	
	▪ Dimensions (W X L X H): Indoor Unit	mm	By Contractor	
	▪ Dimensions W X L X H): Indoor Unit	mm	By Contractor	
	▪ Weight (Indoor and Outdoor Units)	kg	By Contractor	
	▪ Refrigerant Type		By Contractor	
	▪ Total Power Consumption (Indoor and Outdoor Units)	kW	By Contractor	
	▪ Control System (With Remote Control Unit)		Included	

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ITEM	DESCRIPTION	UNIT	NPC REQUIREMENT	CONTRACTOR'S DATA
MW-2.30	**Inverter-Window Type**			
MW-2.3.1	**Cooling Capacity (Minimum)**	**kJ/h**	**25,290**	
	▪ Manufacturer		By Contractor	
	▪ Model		By Contractor	
	▪ Quantity		One (1)	
	▪ Electrical Ratings	v/Ø/hz	240/1/ 60	
	▪ Dimensions (W X L X H)	mm	By Contractor	
	▪ Weight	kg	By Contractor	
	▪ Refrigerant type		By Contractor	
	▪ Total Power Consumption	kW	By Contractor	
	▪ Control System (With Remote Control Unit)		Included	
MW-2.3.2	**Cooling Capacity (Minimum)**	**kJ/h**	**18,750**	
	▪ Manufacturer		By Contractor	
	▪ Model		By Contractor	
	▪ Quantity		Four (4)	
	▪ Electrical Ratings	V/Ø/Hz	240/1/ 60	
	▪ Dimensions (W X L X H)	mm	By Contractor	
	▪ Weight	kg	By Contractor	
	▪ Refrigerant type		By Contractor	
	▪ Total Power Consumption	kW	By Contractor	
	▪ Control System (With Remote Control Unit)		Included	
MW-3.0	**VENTILATION SYSTEM/EXHAUST FAN (PROPELLER TYPE)**			
MW-3.1	**Wall Mounted**			
MW-3.1.1	**Air Flow (Minimum)**	**m^3/h**	**2130**	
	▪ Manufacturer		By Contractor	
	▪ Model		By Contractor	
	▪ Quantity		One (1)	
	▪ Electrical Ratings	v/Ø/hz	220/1/60	
	▪ Power Consumption	kW	By Contractor	
MW-3.1.2	**Air Flow (Minimum)**	**m^3/h**	**100**	
	▪ Manufacturer		By Contractor	
	▪ Model		By Contractor	
	▪ Quantity		Two (2)	
	▪ Electrical Ratings	v/Ø/hz	220/1/60	
	▪ Power Consumption	kW	By Contractor	

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ITEM	DESCRIPTION	UNIT	NPC REQUIREMENT	CONTRACTOR'S DATA
MW-3.2	**Ceiling Mounted**			
MW-3.2.1	**Air Flow (Minimum)**	**m^3/h**	**790**	
	▪ Manufacturer		By Contractor	
	▪ Model		By Contractor	
	▪ Quantity		One (1)	
	▪ Electrical Ratings	v/Ø/hz	220/1/60	
	▪ Power Consumption	kW	By Contractor	
MW-3.2.1	**Air Flow (Minimum)**	**m^3/h**	**330**	
	▪ Manufacturer		By Contractor	
	▪ Model		By Contractor	
	▪ Quantity		Four (4)	
	▪ Electrical Ratings	v/Ø/hz	220/1/60	
	▪ Power Consumption	kW	By Contractor	
MW-3.2.2	**Air Flow (Minimum)**	**m^3/h**	**150**	
	▪ Manufacturer		By Contractor	
	▪ Model		By Contractor	
	▪ Quantity		One (1)	
	▪ Electrical Ratings	v/Ø/hz	220/1/60	
	▪ Power Consumption	kW	By Contractor	
MW-3.2.3	**Air Flow (Minimum)**	**m^3/h**	**85**	
	▪ Manufacturer		By Contractor	
	▪ Model		By Contractor	
	▪ Quantity		One (1)	
	▪ Electrical Ratings	v/Ø/hz	220/1/60	
	▪ Power Consumption	kW	By Contractor	
MW-4.0	**FIRE FIGHTING SYSTEM**			
MW-4.1	**Fire Detection and Alarm System**			
	▪ Manufacturer		By Contractor	
	▪ Place of Manufacture		By Contractor	
	▪ Main Fire Control Panel (MFCP)	set	1	
	▪ MFCP Dimensions (W X L X H)	mm	By Contractor	
	▪ Weight	kg	By Contractor	
	▪ Local Fire Control Panel (LFCP)	set	2	
	▪ LFCP Dimensions (W X L X H)	mm	By Contractor	
	▪ Approving Authority		UL/FM	
MW-4.2	**Portable Fire Extinguishers**			
	▪ Manufacturer		By Contractor	
	▪ Type		HCFC or Halotron I, Wall Hung	
	▪ Quantity	sets	18	
	▪ Capacity	kg	7.1	
	▪ Approving Authority		PS/ICC or PBFP	

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SECTION VII

BILL OF QUANTITIES

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AW - (ARCHITECTURAL WORKS)

ARCHITECTURAL WORKS

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount (In Figures)
AW-1.0	**DEMOLITION WORKS**						
	a. Demolition of Interior Walls	demolish & dispose	Refer to NPC TS & Drawing	sq.m	**346**	_____ _____(P_____)	_____(P_____)
	b. Removal of Floor Tiles	demolish & dispose	Refer to NPC TS & Drawing	sq.m.	**565**	_____ _____(P_____)	_____(P_____)
	c. Removal of Doors and Windows	demolish & dispose	Refer to NPC TS & Drawing	sq.m.	**69**	_____ _____(P_____)	_____(P_____)
AW-2.0	**WALL SYSTEM AND FINISHES**						
	a. 150mm thick (6") CHB wall including mortar grout and reinforcing steel bars	furnish & lay	Refer to NPC TS & Drawing	sq.m.	**146**	_____ _____(P_____)	_____(P_____)
	b. 100mm thick (4") CHB wall including mortar grout and reinforcing steel bars	furnish & lay	Refer to NPC TS & Drawing	sq.m.	**178**	_____ _____(P_____)	_____(P_____)
	c. Plastering: Plain cement plaster wall finish	furnish & apply	Refer to NPC TS & Drawing	sq.m.	**492**	_____ _____(P_____)	_____(P_____)
	d. Wainscoting: 200mm x 300mm x 6mm thick ceramic glazed wall tiles, colored, including bonding materials. (toilet)	furnish & install	Refer to NPC TS & Drawing	sq.m.	**265**	_____ _____(P_____)	_____(P_____)
	e. Dry Wall Partition: 6mm thk cement fiber board on 50mm x 75mm x 0.6mm stud & runners including hardwares & accessories	furnish & install	Refer to NPC TS & Drawing	sq.m.	**119**	_____ _____(P_____)	_____(P_____)
AW-3.0	**FLOOR FINISHES**						
	a. Ceramic glazed floor tiles 300mm x 300mm x 6mm thick colored including bonding materials.	furnish & install	Refer to NPC TS & Drawing	sq.m.	**482**	_____ _____(P_____)	_____(P_____)
	b. Ceramic unglazed floor tiles 200mm x 200mm x 6mm thick colored including bonding materials. (toilet only)	furnish & install	Refer to NPC TS & Drawing	sq.m.	**53**	_____ _____(P_____)	_____(P_____)

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Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount (In Figures)
	c. Granite floor tiles, 600mm x 600mm x 18mm thick non-porous granite dark color	furnish & install	Refer to NPC TS & Drawing	sq.m.	38	_____ _____(P_____)	_____(P_____)
	d. Plain cement plaster floor finish with floor hardener light traffic density	furnish & apply	Refer to NPC TS & Drawing	sq.m.	91	_____ _____(P_____)	_____(P_____)
	e. Pebble washout floor finish #10 Black and white Pebbles	furnish & apply	Refer to NPC TS & Drawing	sq.m.	73	_____ _____(P_____)	_____(P_____)
AW-4.0	**ROOFING SYSTEM AND BUILDING BLANKETS**						
	a. Roofing Sheets: 2.0mm thk Metallic Plastic long span corrugated roofing sheet including stainless steel fasteners and sealants	furnish & install	Refer to NPC TS & Drawing	sq.m.	753	_____ _____(P_____)	_____(P_____)
	b. Ridge Roll: 2.0mm thk Metallic Plastic Ridge Roll including fasteners, sealants, hardware and accessories.	furnish & install	Refer to NPC TS & Drawing	li.m.	108	_____ _____(P_____)	_____(P_____)
	c. Gutter: 2.0mm thk Metallic Plastic Gutter including fasteners, sealants, hardware and accessories.	furnish & install	Refer to NPC TS & Drawing	li.m.	145	_____ _____(P_____)	_____(P_____)
	d. Valley Gutter: 2.0mm thk Metallic Plastic Valley Gutter including fasteners, sealants, hardware and accessories.	furnish & install	Refer to NPC TS & Drawing	li.m.	29	_____ _____(P_____)	_____(P_____)
	e. Facia Board: 1/2" x 12" x 8' Fiber cement board including steel frame hardware and accessories	furnish & install	Refer to NPC TS & Drawing	li.m.	145	_____ _____(P_____)	_____(P_____)
	f. Downspout: 4" Ø uPVC pipe series 1000 downspout including joint fittings, solvents and brackets	furnish & install	Refer to NPC TS & Drawing	li.m.	128	_____ _____(P_____)	_____(P_____)

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Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount (In Figures)
	g. Roofdrain: Removable stainless wire basket strainer	furnish & install	Refer to NPC TS & Drawing	pcs	37	_____ _____(P_____)	_____(P_____)
	h. Thermal Insulation: 10mm thick polyethelene with aluminum foil on both faces, above purlins.	furnish & install	Refer to NPC TS & Drawing	sq.m.	712	_____ _____(P_____)	_____(P_____)
	i. Main Entrance Canopy Roofing: 4.5mm thk. Solid Polycarbonate roofing sheet including stainless steel fasteners, sealants and accessories.	furnish & install	Refer to NPC TS & Drawing	sq.m.	13	_____ _____(P_____)	_____(P_____)
AW-5.0	**CEILING SYSTEM**						
	a. 6mm thk. Fiber cement board on 0.5mm thk metal furring spaced at 0.4 o.c.b.w. and metal hangers at 0.8m o.c.b.w. including hardwares & accessories	furnish & install	Refer to NPC TS & Drawing	sq.m.	712	_____ _____(P_____)	_____(P_____)
AW-6.0	**FENESTRATION**						
AW-6.1	**Doors**						
	a. D-1 (4700mm x 2150mm) Glass and aluminum swing door, 8mm thk. Tempered Tinted Glass Bronze, One Whole Piece Panel, Alum. Frame Analok Finish, 50x100mm on Fixed Frame, Heavy Duty Mechanism	furnish & install	Refer to NPC TS & Drawing	set	1	_____ _____(P_____)	_____(P_____)
	b. D-2 (1700mm x 2150mm) Glass and aluminum swing door, 8mm thk. Tempered Tinted Glass Bronze, One Whole Piece Panel, Alum. Frame Analok Finish, with transom window, 50x100mm on Fixed Frame, Heavy Duty Mechanism	furnish & install	Refer to NPC TS & Drawing	set	2	_____ _____(P_____)	_____(P_____)

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Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount (in Figures)
	c. D-3 (800mm x 2100mm) Panel type Wood Door, 2"x5" Hard Wood Jamb, 3 pcs of Heavy Duty Loose Pin Hinges, One set Door Knob, Weatherproof, Glazed Lacquer Paint finish on Door and Jamb	furnish & install	Refer to NPC TS & Drawing	sets	11	_____ _____(P_____)	_____(P_____)
	d. D-4 (800mm x 2100mm) Flush type Wood Door, Marine Ply Wood on both sides, 2"x5" Hard Wood Jamb, 3 pcs of Heavy Duty Loose Pin Hinges, One set Door Knob, Weatherproof, Glazed Lacquer Paint finish on Door and Jamb	furnish & install	Refer to NPC TS & Drawing	sets	10	_____ _____(P_____)	_____(P_____)
	e. D-5 (600mm x 2100mm) Flush type Wood Door, Marine Ply Wood on both sides, 2"x5" Hard Wood Jamb, 3 pcs of Heavy Duty Loose Pin Hinges, One set Door Knob, Weatherproof, Glazed Lacquer Paint finish on Door and Jamb, with fixed louver	furnish & install	Refer to NPC TS & Drawing	sets	9	_____ _____(P_____)	_____(P_____)
	f. D-6 (1000mm x 2100mm) Flush type Wood Door, Marine Ply Wood on both sides, 2"x5" Hard Wood Jamb, 3 pcs of Heavy Duty Loose Pin Hinges, One set Door Knob, Weatherproof, Glazed Lacquer Paint finish on Door and Jamb, with fixed louver	furnish & install	Refer to NPC TS & Drawing	set	1	_____ _____(P_____)	_____(P_____)
AW-6.2	**Windows**						
	a. W-1 (1500mmx1200mm) glass and alum. sliding window 6mm thk. tempered tinted glass bronze, alum. frame analok finish, 50x100mm framing	furnish & install	Refer to NPC TS & Drawing	sets	22	_____ _____(P_____)	_____(P_____)
	b. W-2 (1500mmx1200mm) glass and alum. fixed window 8mm thk. tempered tinted glass bronze, alum. frame analok finish 50x100mm framing	furnish & install	Refer to NPC TS & Drawing	sets	5	_____ _____(P_____)	_____(P_____)
	c. W-3 (1000mmx500mm) glass and alum. awning window 6mm thk. tempered tinted glass bronze, alum. frame analok finish 50x100mm framing	furnish & install	Refer to NPC TS & Drawing	sets	8	_____ _____(P_____)	_____(P_____)

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Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount (In Figures)
	d. W-4 (1000mmx1200mm) glass and alum. fixed window 6mm thk. tempered tinted glass bronze, alum. frame anatok finish 50x100mm framing	furnish & install	Refer to NPC TS & Drawing	sets	1	_____ _____(P_____)	_____(P_____)
AW-7.0	**PLUMBING SYSTEM**						
	a. Fixtures including fittings soil and waste pipes Water Closet with bidet spray colored, 680 x 378mm elongated, including nickel plated fittings and bidet spray.	furnish & install	Refer to NPC TS & Drawing	sets	11	_____ _____(P_____)	_____(P_____)
	b. Urinal: Flush type, colored, 305mm x 470mm x 680mm elongated, including nickel plated fittings.	furnish & install	Refer to NPC TS & Drawing	sets	5	_____ _____(P_____)	_____(P_____)
	c. Lavatory: Oval, colored, under-the counter, including nickel plated long spout fittings, 400mm x 540mm.	furnish & install	Refer to NPC TS & Drawing	sets	8	_____ _____(P_____)	_____(P_____)
	d. Lavatory: Wall mounted with pedestal, colored, 400mm x 540mm including nickel plated long spout fittings.	furnish & install	Refer to NPC TS & Drawing	sets	5	_____ _____(P_____)	_____(P_____)
	e. Soap Dispenser: Wall mounted squezzed liquid sputtering, plastic casing, heavy duty.	furnish & install	Refer to NPC TS & Drawing	pcs	7	_____ _____(P_____)	_____(P_____)
	f. Soap holder, white	furnish & install	Refer to NPC TS & Drawing	pcs	4	_____ _____(P_____)	_____(P_____)
	g. Toilet paper holder, stainless	furnish & install	Refer to NPC TS & Drawing	pcs	11	_____ _____(P_____)	_____(P_____)
	h. Towel holder stainless	furnish & install	Refer to NPC TS & Drawing	pc	4	_____ _____(P_____)	_____(P_____)
	I. Shower valve and head, including nickel plated fittings	furnish & install	Refer to NPC TS & Drawing	set	4	_____ _____(P_____)	_____(P_____)

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Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount (In Figures)
	j. Floor drain stainless 100mm x100mm	furnish & install	Refer to NPC TS & Drawing	pcs.	15	_____ _____(P_____)	_____(P_____)
	k. Kitchen sink, double tub stainless steel elongated, including gooseneck faucet and nickel plated fittings	furnish & install	Refer to NPC TS & Drawing	set	1	_____ _____(P_____)	_____(P_____)
	l. Urinal Partition, Toilet Partition and Cubicle Doors : Hard wood laninate phenolic boards, including polyester coated extruded aluminum framing, non-rusting connection accessories, door hinges and lock sets, toilet paper holder, grab handle, and accessory hook, signage. (8 cubicles partitions, 3 urinal partitions and 8 Cubicle Doors)	furnish & install	Refer to NPC TS & Drawing	lot	1	_____ _____(P_____)	_____(P_____)
	m. 50mm dia. uPVC pipe for sanitary system (including joint fittings)	furnish & install	Refer to NPC TS & Drawing	l.m.	200	_____ _____(P_____)	_____(P_____)
	n. 75mm dia. uPVC pipe for sanitary system (including joint fittings)	furnish & install	Refer to NPC TS & Drawing	l.m.	100	_____ _____(P_____)	_____(P_____)
	o. 100mm dia. uPVC pipe for sanitary system (including joint fittings)	furnish & install	Refer to NPC TS & Drawing	l.m.	12	_____ _____(P_____)	_____(P_____)
AW-8.0	**PAINTING**						
	a. Exterior Concrete Surfaces 1-coat of primer solvent based acrylic paint 2-coats of top coat solvent based acrylic glazing including surface preparation	furnish & apply	Refer to NPC TS & Drawing	sq.m.	398	_____ _____(P_____)	_____(P_____)
	b. Interior Concrete Surfaces 1-coat of water based acrylic paint primer 2-coats of water based acrylic top coat including surface preparation	furnish & apply	Refer to NPC TS & Drawing	sq.m.	411	_____ _____(P_____)	_____(P_____)

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Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount (In Figures)
	c. Fiber Cement Board Surfaces 1-coat of water based acrylic paint primer 2-coats of water based acrylic top coat including surface preparation	furnish & apply	Refer to NPC TS & Drawing	sq.m.	831	_____ _____(P_____)	_____(P_____)
AW-9.0	**COUNTERS AND CABINETS**						
	a. Men's Toilet Counter top, 20 x 600 x 1800mm natural granite stone, non-porous, glazed ball nose with 2 block outs for under the counter lavatory with fittings.	furnish & install	Refer to NPC TS & Drawing	pcs	2	_____ _____(P_____)	_____(P_____)
	b. Women's Toilet Counter top, 20 x 600 x 2200mm natural granite stone, non-porous, glazed ball nose with 2 block outs for under the counter lavatory with fittings.	furnish & install	Refer to NPC TS & Drawing	pcs	2	_____ _____(P_____)	_____(P_____)
	c. Men's Toilet Counter Splash board, 20 x 150 x 2400mm natural granite stone, non-porous, glazed round metered corner	furnish & install	Refer to NPC TS & Drawing	pcs	2	_____ _____(P_____)	_____(P_____)
	d. Women's Toilet Counter Splash board, 20 x 150 x 2800mm natural granite stone, non-porous, glazed round metered corner	furnish & install	Refer to NPC TS & Drawing	pcs	2	_____ _____(P_____)	_____(P_____)
	e. Men's Toilet Counter Support Facia, 20 x 150 x 2400mm natural granite stone, non-porous, glazed round metered corner	furnish & install	Refer to NPC TS & Drawing	pcs	2	_____ _____(P_____)	_____(P_____)
	f. Women's Toilet Counter Support Facia, 20 x 150 x 2800mm natural granite stone, non-porous, glazed round metered corner	furnish & install	Refer to NPC TS & Drawing	pcs	2	_____ _____(P_____)	_____(P_____)

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Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount (In Figures)
AW-10.0	**MISCELLANEOUS**						
	a. Ceramic glazed tiles, 300mm x 300mm x 6mm thk colored including bonding materials (counter top for pantry, food display, office kitchen and employees quarter kitchen)	furnish & install	Refer to NPC TS & Drawing	sq.m.	12	_____ _____(P_____)	_____(P_____)
	b. Ramp Handrails & Railings: Handrail-3"ø high nickel content stainless steel pipe, and railings-2"ø high nickel content stainless steel pipe including anchoring, flange, fastening, welding and buffing (for concrete ramp at clinic area)	furnish & install	Refer to NPC TS & Drawing	l.m.	17	_____ _____(P_____)	_____(P_____)
	c. Stair Brass Nosing: Extruded brass metal 2" wide nominal dimension	furnish & lay	Refer to NPC TS & Drawing	l.m.	17	_____ _____(P_____)	_____(P_____)
	d. Steel Tubular Lattice Wall Façade 25mm x 50mm x 2.0mm thk Tubular steel including painting	furnish & lay	Refer to NPC TS & Drawing	lot	1	_____ _____(P_____)	_____(P_____)
	SUB-TOTAL AMOUNT OF BID (ARCHITECTURAL WORKS)					_____ _____(P_____)	_____(P_____)

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SECTION VII

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CW - (CIVIL WORKS)

CIVIL WORKS

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount (In Figures)
CW-1.0	**SITE DEVELOPMENT**						
CW-1.1	**Demolition**						
	a. Demolition of Existing Flag Pole	demolish & dispose	Refer to NPC TS & Drawing	lot	1	_____ _____(P_____)	_____(P_____)
CW-1.2	**Concrete Pavement, Curb, Gutter, Sidewalk and Parking**						
	a. Aggregate Sub-Base 100mm thick for pavement, curb&gutter, concretewalk/sidewalk and parking (including grading works)	excavate, furnish spread & compact	Refer to NPC TS & Drawing	cu.m	88	_____ _____(P_____)	_____(P_____)
	b. Concrete Pavement (20.70 Mpa) 150mm thick (including reinforcement)	furnish & place	Refer to NPC TS & Drawing	cu.m	68	_____ _____(P_____)	_____(P_____)
	c. Concrete curb & gutter (20.70 Mpa) (including reinforcement)	furnish & place	Refer to NPC TS & Drawing	cu.m	10	_____ _____(P_____)	_____(P_____)
	d. Concrete walk / side walk & Ramp (20.7 MPa) 100mm thick (including reinforcement)	furnish & place	Refer to NPC TS & Drawing	cu.m	12	_____ _____(P_____)	_____(P_____)
	e. Concrete Pavement for Parking (20.7 MPa) 150mm thick (including reinforcement)	furnish & place	Refer to NPC TS & Drawing	cu.m	45	_____ _____(P_____)	_____(P_____)
CW-1.3	**Flag Pole Construction**						
	a. Flag Pole - 25' (including GI Pipe, cleats, pulley, painting and foundation)	furnish and construct	Refer to NPC TS & Drawing	lot	1	_____ _____(P_____)	_____(P_____)

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CIVIL WORKS

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount (In Figures)
CW-2.0	**Renovation Works**						
CW-2.1	**Construction of Footing, Column and Beams**						
	a. Demolition/Excavation Works (for wall footing only)	demolish, excavate stockpile & dispose	Refer to NPC TS & Drawing	cu.m.	7	_____ _____(P_____)	_____(P_____)
	b. Structural Excavation	excavate stockpile & dispose	Refer to NPC TS & Drawing	cu.m.	14	_____ _____(P_____)	_____(P_____)
	c. Structural Backfilling	backfill spread & compact	Refer to NPC TS & Drawing	cu.m.	9	_____ _____(P_____)	_____(P_____)
	d. Sand and Gravel Bedding	furnish spread & compact	Refer to NPC TS & Drawing	cu.m.	17	_____ _____(P_____)	_____(P_____)
	e. 20.7MPa Concrete	furnish, place & vibrate	Refer to NPC TS & Drawing	cu.m.	20	_____ _____(P_____)	_____(P_____)
	f. RSB Grade 40	furnish, cut, bend, schedule & install	Refer to NPC TS & Drawing	kg	1,835	_____ _____(P_____)	_____(P_____)
CW-2.2	**Steel Roof Structure**						
	a. Demolition of Wood Roof Truss	demolish & dispose	Refer to NPC TS & Drawing	lot	1	_____ _____(P_____)	_____(P_____)
	b. Steel Tusses, Purlins, cleats, sag rods & crossbrace (including gusset plate sand E60XX welds) - A36 steel	furnish/fabricate & construct	Refer to NPC TS & Drawing	kg	15,070	_____ _____(P_____)	_____(P_____)
	b. Steel Connections (A36 steel plates, A325 bolts and E60XX welds)	furnish/fabricate & construct	Refer to NPC TS & Drawing	kg	566	_____ _____(P_____)	_____(P_____)
	SUB-TOTAL AMOUNT OF BID (CIVIL WORKS)					_____ _____(P_____)	_____(P_____)

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SECTION VII

BILL OF QUANTITIES

EW - (ELECTRICAL WORKS)

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
1.0	**LIGHTING AND POWER PANELBOARD**						
a.	Main Distribution Panelboard 600AF/400AT, 3-Pole Main MCCB with branch circuits of: 1 - 30AT, 3-Pole MCCB 1 - 90AT, 3-Pole MCCB 1 - 125AT, 3-Pole MCCB 1 - 175AT, 3-Pole MCCB 1 - 20AT, 2-Pole Fire Alarm Circuit Breaker	Furnish, Install and Test	EW-TS, BD	set	1	_____ _____ (P_____) P	_____
b.	Lighting Panelboard 50AF/30AT, 3-Pole Main MCCB with branch circuits of: 12 - 15AT, 2-Pole MCB	Furnish, Install and Test	EW-TS, BD	set	1	_____ _____ (P_____) P	_____
c.	Power Panelboard 200AF/125AT, 3-Pole Main MCCB with branch circuits of: 15 - 20AT, 2-Pole MCB 2 - 45AT, 2-Pole MCB	Furnish, Install and Test	EW-TS, BD	set	1	_____ _____ (P_____) P	_____
d.	Water Heater Panelboard 100AF/90AT, 3-Pole Main MCCB with branch circuits of: 4 - 25AT, 2-Pole MCB	Furnish, Install and Test	EW-TS, BD	set	1	_____ _____ (P_____) P	_____
e.	ACU Panelboard 200AF/175AT, 3-Pole Main MCCB with branch circuits of: 4 - 20AT, 2-Pole MCB 2 - 25AT, 2-Pole MCB 5 - 30AT, 2-Pole MCB 8 - 40AT, 2-Pole MCB	Furnish, Install and Test	EW-TS, BD	set	1	_____ _____ (P_____) P	_____

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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
2.0	**LIGHTING FIXTURES**						
a.	Fixture Type A Recessed Mounted Type Louvered Lighting Fixture, with Mirror Finish Aluminum Reflector, 2 X 18 Watts Cool White High Output Ballast- Bypass Type Led Lamp Tube Luminaires	Furnish, Install and Test	EW-TS, BD	sets	59	_____ (P_____) P	_____
b.	Fixture Type B Round Ceiling Luminaire, Surface Mounted, 350mm Diameter, White Steel Base, White Opal Glass Diffuser and Complete With 2 X 18 Watts, E27 Base, Frosted Finish Compact Led Lamp	Furnish, Install and Test	EW-TS, BD	sets	10	_____ (P_____) P	_____
c.	Fixture Type C Flushed Mounted Type Lighting Fixture, 1200mmx300mm with 3mm Thick Prismatic Diffuser, Zinc Phosphated Steel Sheet Housing, 2 X 18 Watts, High Output Led Tube Lamp	Furnish, Install and Test	EW-TS, BD	sets	4	_____ (P_____) P	_____
d.	Fixture Type D Wall Mounted Lighting Fixture, Steel Base, White Satinated Glass Diffuser with 1 X 12 Watts Day Light Compact Led Lamp	Furnish, Install and Test	EW-TS, BD	sets	2	_____ (P_____) P	_____
e.	Fixture Type E Open Type Luminaire, With Zinc Phosphated Die-Formed Steel Sheet Base and White Powder Coat Paint Finish Complete with 1 X 9 Watts Led Tube Lamp	Furnish, Install and Test	EW-TS, BD	sets	13	_____ (P_____) P	_____

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Item No.	Description of Work or Materials	Work to Be Done	Ref.	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount
f.	Fixture Type F Recessed Mounted Vertical Profile Downlight with Aluminum Reflector and Powder Coated Rim Fitted with Vertically Placed E27 Base 1 X 12 Watts Compact Led Lamp	Furnish, Install and Test	EW-TS, BD	sets	58	_____ (P_____)	P _____
g.	Fixture Type G Surface Mounted Vertical Profile Downlight with Aluminum Reflector and Powder Coated Rim Fitted with Vertically Placed E27 Base 1 X 9 Watts Compact Led Lamp	Furnish, Install and Test	EW-TS, BD	sets	18	_____ (P_____)	P _____
h.	Fixture Type H Wall Mounted Led Emergency Exit Sign Light, 2 Watts	Furnish, Install and Test	EW-TS, BD	set	1	_____ (P_____)	P _____
i.	Fixture Type I Portable Emergency Lighting Fixture, 2 X 2 Watts Led Warm White with Built-In Sealed Lead Acid Battery, Charging Time < 20 Hrs, Usage Time <= 4 Hrs	Furnish, Install and Test	EW-TS, BD	sets	10	_____ (P_____)	P _____
j.	Fixture Type J Up Down Wall Mounted Lighting Fixture, with Toughened Glass, and Die-Cast Aluminum and Vertically Place E27 Base 2 x 9 Watts Compact LED Lamp	Furnish, Install and Test	EW-TS, BD	sets	14	_____ (P_____)	P _____
3.0	**OUTLETS AND SWITCHES INCLUDING PLATE COVER FLUSH-MOUNTED, GROUNDING TYPE**						
a.	Single Pole Convenience Outlet, 16A, 250V Grounding Type for Refrigerator	Furnish, Install and Test	EW-TS, BD	set	1	_____ (P_____)	P _____

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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.	Single Pole Convenience Outlet , 16A, 250V for Exhaust Fan	Furnish, Install and Test	EW-TS, BD	sets	11	_____ (P_____)	P _____
e.	Single Pole Convenience Outlet, 16A, 250V for for Emergency Lighting Fixture	Furnish, Install and Test	EW-TS, BD	sets	10	_____ (P_____)	P _____
f.	Double Pole Convenience Outlet, 16A, 250V Grounding Type	Furnish, Install and Test	EW-TS, BD	sets	60	_____ (P_____)	P _____
g.	Floor Mounted Double Pole Convenience Outlet, 16A, 250V Grounding Type	Furnish, Install and Test	EW-TS, BD	sets	22	_____ (P_____)	P _____
h.	Weatherproof Double Pole Convenience Outlet, 16A, 250V Grounding Type	Furnish, Install and Test	EW-TS, BD	sets	7	_____ (P_____)	P _____
i.	Range Outlet, 50 A, 250 V Grounding Type	Furnish, Install and Test	EW-TS, BD	sets	2	_____ (P_____)	P _____
j.	Ground Fault Circuit Interrupter (GFCI) Outlet Single Receptacle, 20 A, 230 V, 1-phase	Furnish, Install and Test	EW-TS, BD	sets	4	_____ (P_____)	P _____
k.	Universal Outlet, 20 A, 230 V for 1.0 hp Split Type ACU	Furnish, Install and Test	EW-TS, BD	sets	4	_____ (P_____)	P _____
l.	50AF/25AT, 2-Pole MCB with Built-in Universal Outlet for 1.5 hp Split Type ACU	Furnish, Install and Test	EW-TS, BD	sets	2	_____ (P_____)	P _____
m.	50AF/30AT, 2-Pole MCB with Built-in Universal Outlet for 2.0 hp Split Type or Window Type ACU	Furnish, Install and Test	EW-TS, BD	sets	5	_____ (P_____)	P _____
n.	50AF/40AT, 2-Pole MCB with Built-in Universal Outlet for 2.5 hp Split Type ACU	Furnish, Install and Test	EW-TS, BD	sets	8	_____ (P_____)	P _____

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Item No.	Description of Work or Materials	Work to Be Done	Ref.	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount
o.	Single Pole Wall Switch, 10A, 250 V	Furnish, Install and Test	EW-TS, BD	sets	19	_____ (P_____)	P _____
p.	Double Pole Wall Switch, 10A, 250 V	Furnish, Install and Test	EW-TS, BD	sets	14	_____ (P_____)	P _____
q.	Triple Pole Wall Switch, 10A, 250 V	Furnish, Install and Test	EW-TS, BD	sets	5	_____ (P_____)	P _____
r.	Three Way Wall Switch, 10A, 250 V	Furnish, Install and Test	EW-TS, BD	sets	10	_____ (P_____)	P _____
s.	Four Way Wall Switch, 10A, 250 V	Furnish, Install and Test	EW-TS, BD	sets	2	_____ (P_____)	P _____
t.	Boxes, Fittings, and Accessories	Furnish and Install	EW-TS,	lot	1	_____ (P_____)	P _____
4.0	**INSULATED COPPER CONDUCTORS INCLUDING TERMINAL LUGS, CONNECTORS, CABLE TIES, IDENTIFICATION TAGS, ETC.**						
a.	325 mm^2, 600 V, Heat Resistant Thermoplastic, (THWN), Copper Conductor	Furnish, Lay and Test	EW-TS, BD	lot	1	_____ (P_____)	P _____
b.	80 mm^2, 600 V, Heat Resistant Thermoplastic, (THWN), Copper Conductor	Furnish, Lay and Test	EW-TS, BD	lot	1	_____ (P_____)	P _____
c.	50 mm^2, 600 V, Heat Resistant Thermoplastic, (THWN), Copper Conductor	Furnish, Lay and Test	EW-TS, BD	lot	1	_____ (P_____)	P _____

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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.	30 mm^2, 600 V, Heat Resistant Thermoplastic, (THWN), Copper Conductor	Furnish, Lay and Test	EW-TS, BD	lot	1	_____ (P_____)	P _____
e.	14 mm^2, 600 V, Heat Resistant Thermoplastic, (THWN), Copper Conductor	Furnish, Lay and Test	EW-TS, BD	lot	1	_____ (P_____)	P _____
f.	8.0 mm^2, 600 V, Heat Resistant Thermoplastic, (THWN), Copper Conductor	Furnish, Lay and Test	EW-TS, BD	lot	1	_____ (P_____)	P _____
g.	5.5 mm^2, 600 V, Heat Resistant Thermoplastic, (THWN), Copper Conductor	Furnish, Lay and Test	EW-TS, BD	lot	1	_____ (P_____)	P _____
h.	3.5 mm^2, 600 V, Heat Resistant Thermoplastic, (THWN), Copper Conductor	Furnish, Lay and Test	EW-TS, BD	lot	1	_____ (P_____)	P _____
5.0	**EMBEDDED AND/OR NON-EMBEDDED CONDUITS INCLUDING BOXES, LOCKNUTS, ELBOWS, BOLTS AND OTHER FITTINGS**						
a.	20 mmØ uPVC	Furnish and Lay	EW-TS, BD	lot	1	_____ (P_____)	P _____
b.	25 mmØ uPVC	Furnish and Lay	EW-TS, BD	lot	1	_____ (P_____)	P _____
c.	32 mmØ uPVC	Furnish and Lay	EW-TS, BD	lot	1	_____ (P_____)	P _____
d.	40 mmØ uPVC	Furnish and Lay	EW-TS, BD	lot	1	_____ (P_____)	P _____

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Item No.	Description of Work or Materials	Work to Be Done	Ref.	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount
	e. 65 mmØ uPVC	Furnish and Lay	EW-TS, BD	lot	1	_____ (P_____)	P _____
	f. 90 mmØ uPVC	Furnish and Lay	EW-TS, BD	lot	1	_____ (P_____)	P _____
	g. Service Entrance Cap for 90mmØ uPVC	Furnish and Lay	EW-TS	set	1	_____ (P_____)	P _____
EW-6.0	**GROUNDING MATERIALS**						
	a. Ground Rod, Copper Bonded, 16mmØ x 3000 mm with Ground Clamp	Furnish, Install	EW-TS, BD	set	1	_____ (P_____)	P _____
	b. 50mm^2, 600V, Bare Stranded Copper Conductor	Furnish, Install	EW-TS, BD	lot	1	_____ (P_____)	P _____
	c. Grounding Accessories such as Cable Lugs, etc.	Furnish, Install	EW-TS,	lot	1	_____ (P_____)	P _____
EW-7.0	**STRUCTURED CABLING**						
	a. Flush-mounted data and telephone outlets w/ connectors	Furnish, Install and Test	EW-TS, BD	sets	39	_____ (P_____)	P _____
	b. Telephone Terminal Cabinet w/ terminal blocks	Furnish, Install and Test	EW-TS, BD	set	1	_____ (P_____)	P _____
	c. Distribution Frame/Data Cabinet with telecommunication racks, H:12U, W:0.6m, D:0.6m	Furnish, Install and Test	EW-TS, BD	set	1	_____ (P_____)	P _____

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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.	Private Automatic Branch Exchange (PABX): supports 48-ports of telephone switching w/ software & licenses	Furnish, Install and Test	EW-TS, BD	set	1	_____ (P_____)	P _____
e.	Gigabit PoE Network Distibution Switches: Supports at least 48-ports Ethernet management	Furnish, Install and Test	EW-TS, BD	set	1	_____ (P_____)	P _____
f.	Cat6 Patch Panel: Supports 48-ports of loaded unshielded voice patch panel w/ color coded universal labels	Furnish, Install and Test	EW-TS, BD	sets	2	_____ (P_____)	P _____
g.	Patch Cords: Copper, 1M	Furnish, Install and Test	EW-TS, BD	pcs	39	_____ (P_____)	P _____
h.	Cat6 25-pairs telephone wire line cable	Furnish, Lay and Test	EW-TS, BD	lot	1	_____ (P_____)	P _____
i.	Cat6 data cabling LAN cable	Furnish, Lay and Test	EW-TS, BD	lot	1	_____ (P_____)	P _____
j.	32mmø uPVC conduit	Furnish and Install	EW-TS, BD	lot	1	_____ (P_____)	P _____
k.	Boxes, locknuts, elbows, bolts and other fittings	Furnish and Install	EW-TS	lot	1	_____ (P_____)	P _____

SUB-TOTAL AMOUNT OF BID (ELECTRICAL WORKS) _____ (P_____) P _____

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SECTION VII

BILL OF QUANTITIES

MW - (MECHANICAL WORKS)

MECHANICAL 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
1.0	**DOMESTIC WATER SYSTEM**		MW-4.0				
1.1	**Centrifugal Pump:** 10.0 m^3/h minimum capacity at 30psi discharge head, 230V, 1phase, 60hz with power cable, instruments & controls, control panel, and other accessories as described in the technical specifications.	Supply, Install and Test		set	1	_____ (₱ _____)	₱ _____
1.1.2	Spare Parts for centrifugal pump for one (1) year operation or during the warranty period per manufacturer's recommendation and as specified in the technical specifications which shall include: a . One (1) set of bearing metal for pump and motor; and b. One (1) set of bushing, wearing rings, packing and gaskets	Supply and delivery		set	1	_____ (₱ _____)	₱ _____
1.2	Domestic water pipe, fittings, supports, valves and other accessories including required excavation and backfilling works; test and disfection as described in the technical specifications and shown on the bid drawings.	Supply, Excavate, Install, Backfill, Test & Disinfection					
1.2.1	Water Pipe,40 mm O.D. (1 1/2" N.D.), PP-R pipe, PN 20 pressure class, and its associated fittings, pipe supports and other accessories	Supply, Excavate, Install, Backfill, Test & Disinfection		lm	24	_____ (₱ _____)	₱ _____
1.2.2	Water Pipe, 32 mm O.D. (1 1/4" N.D.), PP-R pipe, PN 20 pressure class, and its associated fittings, pipe supports and other accessories	Supply, Excavate, Install, Backfill, Test & Disinfection		lm	24	_____ (₱ _____)	₱ _____
1.2.3	Water Pipe, 25 mm O.D. (1" N.D.), PP-R pipe, PN 20 pressure class, and its associated fittings, pipe supports and other accessories	Supply, Excavate, Install, Backfill, Test & Disinfection		lm	102	_____ (₱ _____)	₱ _____
1.2.4	Water Pipe, 20 mm O.D. (3/4" N.D.), PP-R pipe, PN 20 pressure class, and its associated fittings, pipe supports and other accessories	Supply, Excavate, Install, Backfill, Test & Disinfection		lm	24	_____ (₱ _____)	₱ _____
1.2.5	Water Pipe, 15 mm O.D. (1/2" N.D.), PP-R pipe, PN 20 pressure class, and its associated fittings, pipe supports and other accessories	Supply, Excavate, Install, Backfill, Test & Disinfection		lm	12	_____ (₱ _____)	₱ _____
1.2.6	Gate Valve, 40 mm Ø, rising stem, cast bronze, screwed ends, Class 150	Supply, Install and Test		set	4	_____ (₱ _____)	₱ _____

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Item No.	Description of Work or Materials	Work to be Done	Ref.	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount
1.2.7	Gate Valve, 32mm Ø, rising stem, cast bronze, screwed ends, Class 150	Supply, Install and Test		set	3	_____ (₱ _____)	₱ _____
1.2.8	Check Valve, 25mmØ, Swing type, cast bronze, screwed ends, Class 150	Supply, Install and Test		set	1	_____ (₱ _____)	₱ _____
1.2.9	Gate Valve, 20 mm Ø, cast bronze, rising stem, screwed ends, Class 150	Supply, Install and Test		set	1	_____ (₱ _____)	₱ _____
1.2.10	Pressure Gauge, 100mm Ø dial gauge, bourbon tube type, 0 - 3 kg/cm2 scale range, equipped with isolation valve	Supply, Install and Test		sets	1	_____ (₱ _____)	₱ _____
1.2.11	Strainers, Y-type with cast iron or PPR body material and flanged or screwed ends. Screen elements shall be of stainless steel construction with minimum of 40-mesh size.	Supply, Install and Test		set	1	_____ (₱ _____)	₱ _____
1.2.12	Water Meter (40 mm Ø), heavy duty brass or bronze body screwed ends connection and complete with accessories.	Supply, Install & Test		set	1	_____ (₱ _____)	₱ _____
1.2.13	High/low level switch (4-level points) to be installed inside the existing elevated concrete water tank) for automatic pump operation complete with power, control and instrumentation cables;	Supply, Install & Test		set	1	_____ (₱ _____)	₱ _____
1.2.14	Disinfection of existing concrete elevated tank	Supply, perform, and Test		lot	1	_____ (₱ _____)	₱ _____
2.0	**AIR CONDITIONING & VENTILATION SYSTEM**		MW-5.0				
2.1	**Air-conditioning System**						
2.1.1	Air conditioning units for Bedrooms (1, 2, 3 & 4), 18,750 kJ/h minimum cooling capacity, Inverter- window type, wall mounted complete with controls (infrared remote) and necessary requirements as described in the technical mounting accessories and other specifications	Supply, Install and Test		sets	4	_____ (₱ _____)	₱ _____
2.1.2	Air conditioning units for Working Area, 29,520 kJ/h minimum cooling capacity, inverter split type, wall mounted complete with controls (infrared remote) and mounting accessories and other requirements as described in the technical specifications	Supply, Install and Test		sets	2	_____ (₱ _____)	₱ _____

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Item No.	Description of Work or Materials	Work to be Done	Ref.	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount
2.1.3	Air conditioning units for Working Area, 25,290 kJ/h minimum cooling capacity, inverter split type, floor mounted complete with controls (infrared remote) and mounting accessories and other requirements as described in the technical specifications	Supply, Install and Test		sets	5	_____ (₱ _____)	₱ _____
2.1.4	Air conditioning units for Working Area, 25,290 kJ/h minimum cooling capacity, inverter split type, wall mounted complete with controls (infrared remote) and mounting accessories and other requirements as described in the technical specifications	Supply, Install and Test		set	1	_____ (₱ _____)	₱ _____
2.1.5	Air conditioning units for Working Area, 25,290 kJ/h minimum cooling capacity, inverter window type complete with controls (infrared remote) and mounting accessories and other requirements as described in the technical specifications	Supply, Install and Test		set	1	_____ (₱ _____)	₱ _____
2.1.6	Air conditioning units for Working Area, 21,900 kJ/h minimum cooling capacity, inverter split type, wall mounted complete with controls (infrared remote) and mounting accessories and other requirements as described in the technical specifications	Supply, Install and Test		set	1	_____ (₱ _____)	₱ _____
2.1.7	Air conditioning units for Working Area, 10,500 kJ/h minimum cooling capacity, inverter split type, wall mounted complete with controls (infrared remote) and mounting accessories and other requirements as described in the technical specifications	Supply, Install and Test		set	2	_____ (₱ _____)	₱ _____
2.1.8	Air conditioning units for Working Area, 9,000 kJ/h minimum cooling capacity, inverter split type, wall mounted complete with controls (infrared remote) and mounting accessories and other requirements as described in the technical specifications	Supply, Install and Test		set	3	_____ (₱ _____)	₱ _____
2.1.9	Supply the standard spare parts for one (1) year operation as recommended by the equipment manufacturer.	Supply and delivery		set	1	_____ (₱ _____)	₱ _____
2.2	**Ventilating System**						
2.2.1	Exhaust fan for Comfort Room 85 m^3/h ceiling mounted, propeller type, direct driven,complete with grills/louvers, flexible hose or ducts, mounting accessories and controls	Supply, Install and Test		sets	1	_____ (₱ _____)	₱ _____
2.2.2	Exhaust fan for Comfort Room 100 m^3/h ceiling mounted, propeller type, direct driven,complete with grills/louvers, flexible hose or ducts, mounting accessories and controls	Supply, Install and Test		sets	2	_____ (₱ _____)	₱ _____

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Item No.	Description of Work or Materials	Work to be Done	Ref.	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount
2.2.3	Exhaust fan for Comfort Room 150 m^3/h ceiling mounted, propeller type, direct driven,complete with grills/louvers, flexible hose or ducts, mounting accessories and controls	Supply, Install and Test		sets	1	_____ (₱ _____)	₱ _____
2.2.4	Exhaust fan for Comfort Room 330 m^3/h ceiling mounted, propeller type, direct driven,complete with grills/louvers, flexible hose or ducts, mounting accessories and controls	Supply, Install and Test		sets	4	_____ (₱ _____)	₱ _____
2.2.5	Exhaust fan for Comfort Room 790 m^3/h ceiling mounted, propeller type, direct driven,complete with grills/louvers, flexible hose or ducts, mounting accessories and controls	Supply, Install and Test		sets	1	_____ (₱ _____)	₱ _____
2.2.6	Exhaust fan for Comfort Room 2130 m^3/h wall mounted, propeller type, direct driven,complete with grills/louvers, flexible hose or ducts, mounting accessories and controls	Supply, Install and Test		sets	1	_____ (₱ _____)	₱ _____
2.2.7	Supply the standard spare parts for one (1) year operation as recommended by the equipment manufacturer.	Supply and delivery and Test		lot	1	_____ (₱ _____)	₱ _____
3.0	**FIRE FIGHTING SYSTEM**		MW-7.0				
3.1	**Fire Detection and Alarm System** Fire alarm and detection system complete with control panels (each with storage battery and charger), smoke and heat detectors, bells and horns with flashing light, manual pull stations and other appurtenances and services as described in the shown on the drawings consisting of but not limited to technical specifications and/or the following:	Design, Supply, Install, Test and Conduct O&M Training		lot	1	_____ (₱ _____)	₱ _____
3.1.1	One (1) set of Main Fire Alarm Control Panel (MFCP), UL/FM approved capable of operating addressable and non-addressable devices						
3.1.2	One (1) set of Local Fire Alarm Control Panel (LFCP), UL /FM approved capable of operating addressable and non-addressable devices						
3.1.3	Three (3)units of Heat Detector, fixed temperature, UL/FM approved, addressable type						
3.1.4	Twenty Three (23) units of Smoke Detector, photoelectric type, UL/FM approved, addressable & Non-addressable type						

_____
Name of Firm

_____
Name and Signature of Authorized Representative

_____
Designation

MECHANICAL 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
3.1.5	Five (5) units of Manual Pull Station, UL listed and/or FM approved, addressable						
3.1.6	Seven (7) units of 200mm Ø Bell with flashing light and one (1) unit of Horn with flashing light, outdoor type, both are UL listed and/or FM approved						
3.1.7	One (1) lot of Wirings, Groundings, Conduits, Fittings and accessories						
3.1.8	One (1) lot of Recommended Spare Parts during the warranty period						
3.1.9	One (1) lot of other equipment/accessories per Manufacturer's standard design or per applicable standard requirements						
3.3	**Fire Extinguisher System**						
3.3.1	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, UL/FM approved	Supply and Install		units	18	_____ (₱ _____)	₱ _____
4.0	**MISCELLANEOUS WORKS**						
4.1	Tagging and/or Labels for Equipment, Valves, Piping, Instruments and its fixing accessories as described in the bid documents or shown on the drawings.	Conduct/Perform		lot	1	_____ (₱ _____)	₱ _____
4.2	Painting of Existing Elevated Concrete Tank , Equipment and Piping, Air Conditioning & Ventilation Equipment & Supports its associated valves, fittings, supports and other accessoriesas described in the technical specifications or shown on the drawings	Conduct/Perform		lot	1	_____ (₱ _____)	₱ _____

_____
Name of Firm

_____
Name and Signature of Authorized Representative

_____
Designation

SECTION VIII

BIDDING FORMS

SECTION VIII – BIDDING FORMS

TABLE OF CONTENTS

Standard Form No: NPCSF-INFR-01

Checklist of Technical & Financial Envelope Requirements for Bidders

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

1. ELIGIBILITY DOCUMENTS

a. (CLASS A)

➢ Any of the following:

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

OR:

- The following updated and valid Class "A" eligibility documents enumerated under "Annex A" of the Platinum Membership:
  - Registration Certificate from the Securities and Exchange Commission (SEC) for corporations, Department of Trade and Industry (DTI) for sole proprietorship, or Cooperative Development Authority (CDA) for cooperatives;
  - Mayor's/Business permit issued by the city or municipality where the principal place of business of the prospective bidder is located, or the equivalent document for Exclusive Economic Zones or Areas.

    In cases of recently expired Mayor's/Business permits, it shall be accepted together with the official receipt as proof that the bidder has applied for renewal within the period prescribed by the concerned local government unit, provided that the renewed permit shall be submitted as a post qualification requirement in accordance with Section 34.2 of the Revised IRR of RA 9184.
  - The prospective bidder's audited financial statements, showing, among others, the prospective bidder's total and current assets and liabilities, stamped "received" by the BIR or its duly accredited and authorized institutions, for the preceding calendar year which should not be earlier than two (2) years from the date of bid submission.
  - Tax clearance per Executive Order 398, Series of 2005, as finally reviewed and approved by the BIR;
  - Valid Philippine Contractors Accreditation Board (PCAB) license and registration for the type and cost of the contract for this Project or Special PCAB License in case of Joint Ventures.

OR:

- A combination thereof.

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

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

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

(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
- Omnibus Sworn statement using any of the following form:
  - *NPCSF-INFR-07a* - for Sole Proprietorship;

    OR
  - *NPCSF-INFR-07b* - for Partnership/Corporation/Cooperative/Joint Venture with the following supporting documents:
    - In the case of corporations, board/partnership resolution or secretary's certificate, granting full powers to the authorized signatory;
    - For Joint-Venture, a resolution, duly signed by all the joint-venture partners granting full powers to the authorized signatory
- 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

- Duly signed and completely filled-out Technical Data Sheets (Section VI – Part II TDS)
- Complete eligibility documents of proposed sub-contractor, if applicable

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

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

CONDITIONS:

1. *Each Bidder shall submit one copy of the first and second components of its Bid. NPC may request additional hard copies and/or electronic copies of the Bid. However, failure of the Bidders to comply with the said request shall not be a ground for disqualification.*
2. *For Joint Venture, each partner of a joint venture agreement shall submit the document required in **ITB** Clause 12.1(a)(i). Submission of other documents required under **ITB** Clauses 12.1 by any of the joint venture partners constitutes compliance.*
3. *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	%		
Government						
Private						
					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 & 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* Sale 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.	₱
2.	₱

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. _____

If the bidder is a joint venture, one of the requirements is the submission of a valid joint venture agreement.

Standard Form Number: NPCSF-INFR-05
Page 2 of 2

ACKNOWLEDGMENT

BEFORE ME, a Notary Public for and in _____, Philippines, this _____day of _____, 200__, personally appeared _____, authorized representative, of _____ with Community Tax Certificate No._____, issued at _____, on _____, AND _____ authorized representative, of _____ with Community Tax Certificate No._____, issued at _____, on _____ known to me to be the same person who executed the foregoing instrument consisting of two (2) pages, including the page whereon the acknowledgements are written, all pages signed by both parties and their instrumental witnesses and they acknowledged before me that the same are their free and voluntary acts and deeds and that of the Corporations they represents.

WITNESS MY HAND AND NOTARIAL SEAL, at the place and on the date first above written.

Notary Public
Until 31 December 20_____
PTR No. _____
Issued at:_____
Issued on:_____
TIN No. _____

Doc. No. _____
Page No. _____
Book No. _____
Series of _____.

If the bidder is a joint venture, one of the requirements is the submission of a valid joint venture agreement.

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 that the difference between the amount of the said Principal's Bid and the amount of the Bid that is accepted by the Employer.

Standard Form Number: NPCSF-INFR-06b
Page 2 of 2

This Surety executing this instrument hereby agrees that its obligation shall be valid for 120 calendar days after the deadline for submission of Bids as such deadline is stated in the Instructions to Bidders or as it may be extended by the Employer, notice of which extension(s) to the Surety is hereby waived.

PRINCIPAL _____	SURETY _____
SIGNATURE(S) _____	SIGNATURES(S) _____
NAME(S) AND TITLE(S) _____	NAME(S) _____
SEAL _____	SEAL _____

Standard Form No: NPCSF-INFR-06c

REPUBLIC OF THE PHILIPPINES)
CITY OF _____) S.S.

BID-SECURING DECLARATION
RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY
VisP21Z1292Sr

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

I/We[1], 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.

---

[1] *Select one and delete the other. Adopt same instruction for similar terms throughout the document.*

Standard Form Number: NPCSF-INFR-06c
Page 2 of 2

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

SUBSCRIBED AND SWORN to before me this _____ day of _____ 20____ at _____, Philippines. *Affiant/s is/are* personally known to me and *was/were* identified by me through competent evidence of identity as defined in the 2004 Rules on Notarial Practice (A.M. No. 02-8-13-SC). Affiant exhibited to me *his/her [insert type of government identification card used]*, with *his/her* photograph and signature appearing thereon, with no. _____ and *his/her* Community Tax Certificate No. _____ issued on _____ at _____.

Witness my hand and seal this _____ day of _____, 20___.

NAME OF NOTARY PUBLIC
Serial No. of Commission _____
Notary Public for _____ until _____
Roll of Attorneys No. _____
PTR No. __, *[date issued], [place issued]*
IBP No. __, *[date issued], [place issued]*

Doc. No. ___
Page No. ___
Book No. ___
Series of ____.

Standard Form No: NPCSF-INFR-07b

OMNIBUS SWORN STATEMENT
(PARTNERSHIP/CORP/COOP/JV)

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. I am the duly authorized and designated representative of *[Name of Bidder]*____ with office address at *[address of Bidder]*____;

2. I am granted full power and authority to do, execute and perform any and all acts necessary and/or to represent the *[Name of Bidder]*____ in the bidding as shown in the attached *[state title of attached document showing proof of authorization (e.g., duly notarized Special Power of Attorney, Board/Partnership Resolution, or Secretary's Certificate, 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. 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 with the eligibility requirements under **ITB** Clause 5 of the bidding documents;

8. *[Name of Bidder]*_____ will accept corrections made to our bid to consider computational errors, omissions and other bid modifications, which shall be calculated in monetary terms to determine the calculated prices;

9. *[Name of Bidder]*_____is free and clear of all tax liabilities to the government;

10. *[Name of Bidder]*_____is aware of and has undertaken the following responsibilities as a Bidder:

    a) Carefully examined and accepted all of the Terms and Conditions of the Bidding Documents;

This omnibus statement is a requirement in the Technical Envelope. The following additional requirements shall also be submitted: In the case of corporation/partnership/JV, duly notarized Special Power of Attorney, Board/Partnership Resolution, or Secretary's Certificate, whichever is applicable.

Standard Form Number: NPCSF-INFR-07b
Page 2 of 2

b) Conducted site inspection and acknowledged all conditions, local or otherwise, affecting the implementation of the Contract;

c) Made an estimate of the facilities available and needed for the contract to be bid, if any;

d) Inquired or secured Supplemental/Bid Bulletin(s) issued for the *[Name of the Project]*___; and

11. *[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.

12. 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.

_____
Name and Signature of
Bidder's Representative/Authorized Signatory

ACKNOWLEDGMENT

REPUBLIC OF THE PHILIPPINES)
QUEZON CITY)SS.

BEFORE ME, a Notary Public for and in Quezon City, Philippines, this _____ day of _____, 20_____, personally appeared:

NAME	CTC NO.	ISSUED AT/ON
_____	_____	_____

known to me and known to be the same person who executed the foregoing instrument consisting of _____ ( ) pages, including the page whereon the acknowledgments is written and acknowledged before me that the same is his free and voluntary act and deed and that of the Corporation he represents.

WITNESS MY HAND AND NOTARIAL SEAL, at the place and on the date first above written.

Notary Public
Until 31 December 20____
PTR No._____
Issued at:_____
Issued on:_____
TIN No. _____

Doc. No. _____
Page No. _____
Book No. _____
Series of _____.

This omnibus statement is a requirement in the Technical Envelope. The following additional requirements shall also be submitted: In the case of corporation/partnership/JV, duly notarized Special Power of Attorney, Board/Partnership Resolution, or Secretary's Certificate, whichever is applicable.

Standard Form No: NPCSF-INFR-07a

OMNIBUS SWORN STATEMENT
(SOLE PROPRIETORSHIP)

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. I am the sole proprietor of *[Name of Bidder]*____ with office address at *[address of Bidder]*____;

2. As the owner and sole proprietor of *[Name of Bidder]*____, I have full power and authority to do, execute and perform any and all acts necessary to represent it in the bidding for _____*[name of project]*____of the **National Power Corporation.**

3. 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;

4. *[Name of Bidder]*____ is authorizing the President of NPC or its duly authorized representative(s) to verify all the documents submitted;

5. I am 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;

6. *[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;

7. *[Name of Bidder]*_____ complies with existing labor laws and standards and with the eligibility requirements under **ITB** Clause 5 of the bidding documents;

8. *[Name of Bidder]*_____ will accept corrections made to our bid to consider computational errors, omissions and other bid modifications, which shall be calculated in monetary terms to determine the calculated prices;

9. *[Name of Bidder]*_____is free and clear of all tax liabilities to the government;

10. *[Name of Bidder]*_____is aware of and has undertaken the following responsibilities as a Bidder:

    a) Carefully examined and accepted all of the Terms and Conditions of the Bidding Documents;

    b) Conducted site inspection and acknowledged all conditions, local or otherwise, affecting the implementation of the Contract;

This omnibus statement is a requirement in the Technical Envelope. The following additional requirements shall also be submitted: In the case of corporation/partnership/JV, duly notarized Special Power of Attorney, Board/Partnership Resolution, or Secretary's Certificate, whichever is applicable.

c) Made an estimate of the facilities available and needed for the contract to be bid, if any;

a) Inquired or secured Supplemental/Bid Bulletin(s) issued for the *[Name of the Project]*___; and

11. *[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.

12. 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.

_____
Name and Signature of
Bidder's Representative/Authorized Signatory

ACKNOWLEDGMENT

REPUBLIC OF THE PHILIPPINES)
QUEZON CITY)SS.

BEFORE ME, a Notary Public for and in Quezon City, Philippines, this _____ day of _____, 20_____, personally appeared:

NAME	CTC NO.	ISSUED AT/ON
_____	_____	_____

known to me and known to be the same person who executed the foregoing instrument consisting of _____ ( ) pages, including the page whereon the acknowledgments is written and acknowledged before me that the same is his free and voluntary act and deed and that of the Corporation he represents.

WITNESS MY HAND AND NOTARIAL SEAL, at the place and on the date first above written.

Notary Public
Until 31 December 20____
PTR No._____
Issued at:_____
Issued on:_____
TIN No. _____

Doc. No. _____
Page No. _____
Book No. _____
Series of _____.

This omnibus statement is a requirement in the Technical Envelope. The following additional requirements shall also be submitted: In the case of corporation/partnership/JV, duly notarized Special Power of Attorney, Board/Partnership Resolution, or Secretary's Certificate, whichever is applicable.

Standard Form Number: NPCSF-INFR-08

CONTRACTOR'S ORGANIZATIONAL CHART FOR THE CONTRACT

Submit Copy of the Organizational Chart that the Contractor intends to use to execute the Contract if awarded to him. Indicate in the chart the names of the Project Manager, Project Engineer, Foreman and other Key Engineering Personnel.

Attach the required Proposed Organizational Chart for the Contract as stated above

NOTES:

1. *This organization chart should represent the "Contractor's Organization" required for the Project, and not the organizational chart of the entire firm.*
2. *Each such nominated engineer/key personnel shall comply with and submit duly accomplished forms NPCSF-INFR-10a, NPCSF-INFR-10b and NPCSF-INFR-11.*
3. *All these are required to be in the Technical Envelope of the Bidder.*

Standard Form Number: NPCSF-INFR-09

LIST OF KEY PERSONNEL PROPOSED TO BE ASSIGNED TO THE CONTRACT

(Based on the Minimum Key Personnel Required in the Bidding Documents)

Business Name: _____

Business: _____

_____

		DESIGNATION				
1	Name					
2	Address					
3	Date of Birth					
4	Employed Since					
5	Experience					
6	Previous Employment					
7	Education					
8	PRC License					

Required Attachments:

1. *Certificate of Employment, Bio Data and Construction Safety and Health Training Certificate of the Safety Officer*
2. *Certificate of Employment, Bio Data and valid PRC License of the (professional) personnel*
3. *Certificate of Employment, Bio Data and accreditation from DPWH as Materials Engineer for the Materials Engineer*

Submitted by: _____

(Printed Name & Signature)

Designation: _____

Date: _____

One of the requirements from the bidder to be included in its Technical Envelope is a list of contractor's key personnel (based on the minimum key personnel required in the bidding documents) to be assigned to the contract to be bid, with their complete qualification and experience data (including the key personnel's signed written commitment to work for the project once awarded the contract).

Standard Form Number: NPCSF-INFR-10a

KEY PERSONNEL'S CERTIFICATE OF EMPLOYMENT
(PROFESSIONAL PERSONNEL)

_____
Issuance Date

THE PRESIDENT
National Power Corporation
BIR Road cor. Quezon Ave.
Diliman, Quezon City

Dear Sir:

I am *(Name of Nominee)*_____ a Licensed _____ Engineer with Professional License No. _____ issued on *(date of issuance)*_____ at *(place of issuance)*_____.

I hereby certify that *(Name of Bidder)*_____ has engaged my services as *(Designation)*_____ for the *(Name of Project)*_____, if awarded to it.

As *(Designation)*_____, I supervised the following completed projects similar to the contract under bidding:

NAME OF PROJECT	OWNER	COST	DATE COMPLETED

At present, I am supervising the following projects:

NAME OF PROJECT	OWNER	COST	DATE COMPLETED

In case of my separation for any reason whatsoever from the above-mentioned Contractor, I shall notify the National Power Corporation at least twenty one (21) days before the effective date of my separation.

As *(Designation)*_____, I know I will have to stay in the job site all the time to supervise and manage the Contract works to the best of my ability, and aware that I am authorized to handle only one (1) contract at a time.

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-10a
Page 2 of 2

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

REPUBLIC OF THE PHILIPPINES)
CITY OF _____) S.S.

SUBSCRIBED AND SWORN TO before me this _____, day of _____ 200__, affiant exhibiting to me his/her Community Tax Certificate No. _____ issued on _____ at _____, Philippines.

Notary Public
Until 31 December 20____
PTR No._____
Issued at:_____
Issued on:_____
TIN No. _____

Doc. No. _____
Page No. _____
Book No. _____
Series of _____.

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.

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
Page 2 of 2

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

REPUBLIC OF THE PHILIPPINES)
CITY OF _____) S.S.

SUBSCRIBED AND SWORN TO before me this _____, day of _____ 200__, affiant exhibiting to me his/her Community Tax Certificate No. _____ issued on _____ at _____, Philippines.

Notary Public
Until 31 December 20____
PTR No._____
Issued at:_____
Issued on:_____
TIN No. _____

Doc. No. _____
Page No. _____
Book No. _____
Series of _____.

One of the requirements from the bidder to be included in its Technical Envelope is a list of contractor's key personnel (viz. Project Manager, Project Engineer, Construction Safety Officer, Foremen, etc), to be assigned to the contract to be bid, with their complete qualification and experience data (including the key personnel's signed written commitment to work for the project once awarded the contract).

Standard Form Number: NPCSF-INFR-11

KEY PERSONNEL
(FORMAT OF BIO-DATA)

Give the detailed information of the following personnel who are scheduled to be assigned as full-time field staff for the project. Fill up a form for each person.

1. Name :_____
2. Date of Birth :_____
3. Nationality :_____
4. Education and Degrees :_____
5. Specialty :_____
6. Registration :_____
7. Length of Service with the Firm :_____ Year from ____(months) _____ (year)
   To ____(months) _____ (year)
8. Years of Experience :_____
9. If Item 7 is less than ten (10) years, give name and length of service with previous employers for a ten (10)-year period (attached additional sheet/s), if necessary:

Name and Address of Employer	Length of Service
_____	_____ year(s) from _____ to _____
_____	_____ year(s) from _____ to _____
_____	_____ year(s) from _____ to _____

10. Experience:

    This should cover the past ten (10) years of experience. (Attached as many pages as necessary to show involvement of personnel in projects using the format below).

One of the requirements from the bidder to be included in its Technical Envelope is a list of contractor's key personnel (viz. Project Manager, Project Engineer, Construction Safety Officer, Foremen, etc), to be assigned to the contract to be bid, with their complete qualification and experience data (including the key personnel's signed written commitment to work for the project once awarded the contract).

Standard Form Number: NPCSF-INFR-11
Page 2 of 2

1. Name : _____

2. Name and Address of Owner : _____

3. Name and Address of the Owner's Engineer (Consultant) : _____

4. Indicate the Features of Project (particulars of the project components and any other particular interest connected with the project): _____

5. Contract Amount Expressed in Philippine Currency : _____

6. Position : _____

7. Structures for which the employee was responsible : _____

8. Assignment Period : from _____ (months) _____ (years)
: to _____ (months) _____ (years)

_____
Name and Signature of Employee

It is hereby certified that the above personnel can be assigned to this project, if the contract is awarded to our company.

_____ _____
(Place and Date) (The Authorized Representative)

One of the requirements from the bidder to be included in its Technical Envelope is a list of contractor's key personnel (viz. Project Manager, Project Engineer, Construction Safety Officer, Foremen, etc), to be assigned to the contract to be bid, with their complete qualification and experience data (including the key personnel's signed written commitment to work for the project once awarded the contract).

Standard Form Number: NPCSF-INFR-12

LIST OF EQUIPMENT, OWNED OR LEASED AND/OR UNDER PURCHASE AGREEMENTS

(Based on the Minimum Equipment Required in the Bidding Documents)

Business Name: _____

Business: _____

_____

Description	Model/Year	Capacity / Performance / Size	Plate No.	Motor No. / Body No.	Location	Condition	Proof of Ownership / Lessor or Vendor
A. Owned							
i.							
ii.							
iii.							
iv.							
v.							
B. Leased							
i.							
ii.							
iii.							
iv.							
v.							
C. Under Purchase Agreements							
i.							
ii.							
iii.							
iv.							
v.							

Submitted by: _____

(Printed Name & Signature)

Designation: _____

Date: _____

One of the requirements from the bidder to be included in its Technical Envelope is the list of its equipment units pledged for the contract to be bid, based on minimum equipment required in the bidding docs. which are owned (supported by proof/s of ownership), leased, and/or under purchase agreements (with corresponding engine numbers, chassis numbers and/or serial numbers), supported by certification of availability of equipment from the equipment lessor/vendor for the duration of the project

Standard Form No. : NPCSF-INFR-13

BID LETTER

Date: _____

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

We, the undersigned, declare that:

(a) We have examined and have no reservation to the Bidding Documents, including Addenda, for the Contract **RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY (VisP21Z1292Sr).**

(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 **RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY (VisP21Z1292Sr)** of the National Power Corporation.

(k) We acknowledge that failure to sign each and every page of this Bid Letter, including the Bill of Quantities, shall be a ground for the rejection of our bid.

Name: _____

In the capacity of: _____

Signed: _____

Duly authorized to sign the Bid for and on behalf of: _____

Date: _____

Standard Form No. : NPCSF-INFR-14

DETAILED COST ESTIMATE FORM

Name of Bidder : _____

Item No.	Item Description	Unit of Measure	Direct Cost			Mark-Up		VAT	Unit Cost	Total Price
			Materials	Labor	Equipment	OCM	Profit			

_____ Name, Signature of Authorized Representative

_____ 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

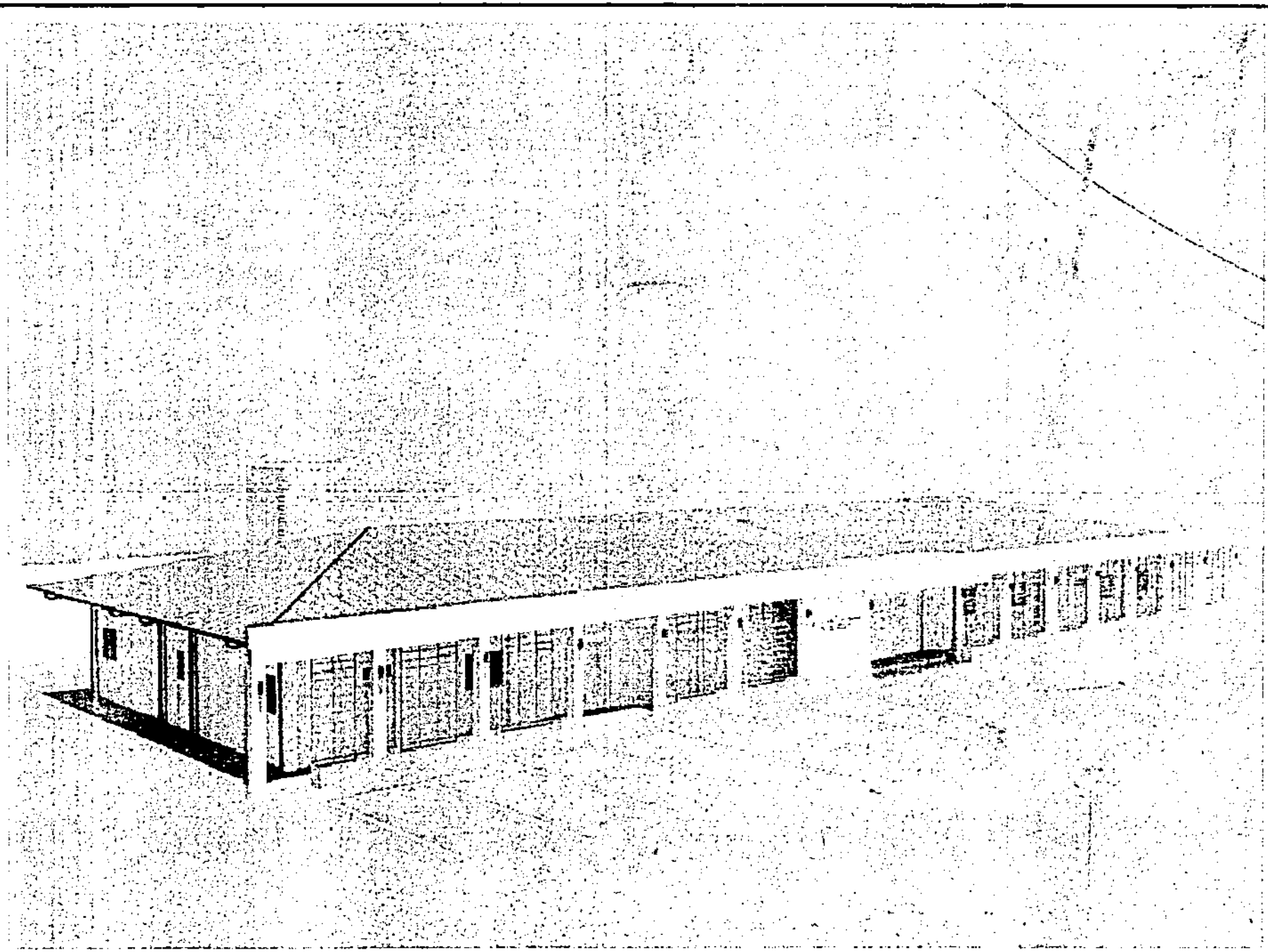
BID DRAWINGS

AW - (ARCHITECTURAL WORKS)

SECTION IX - BID DRAWINGS

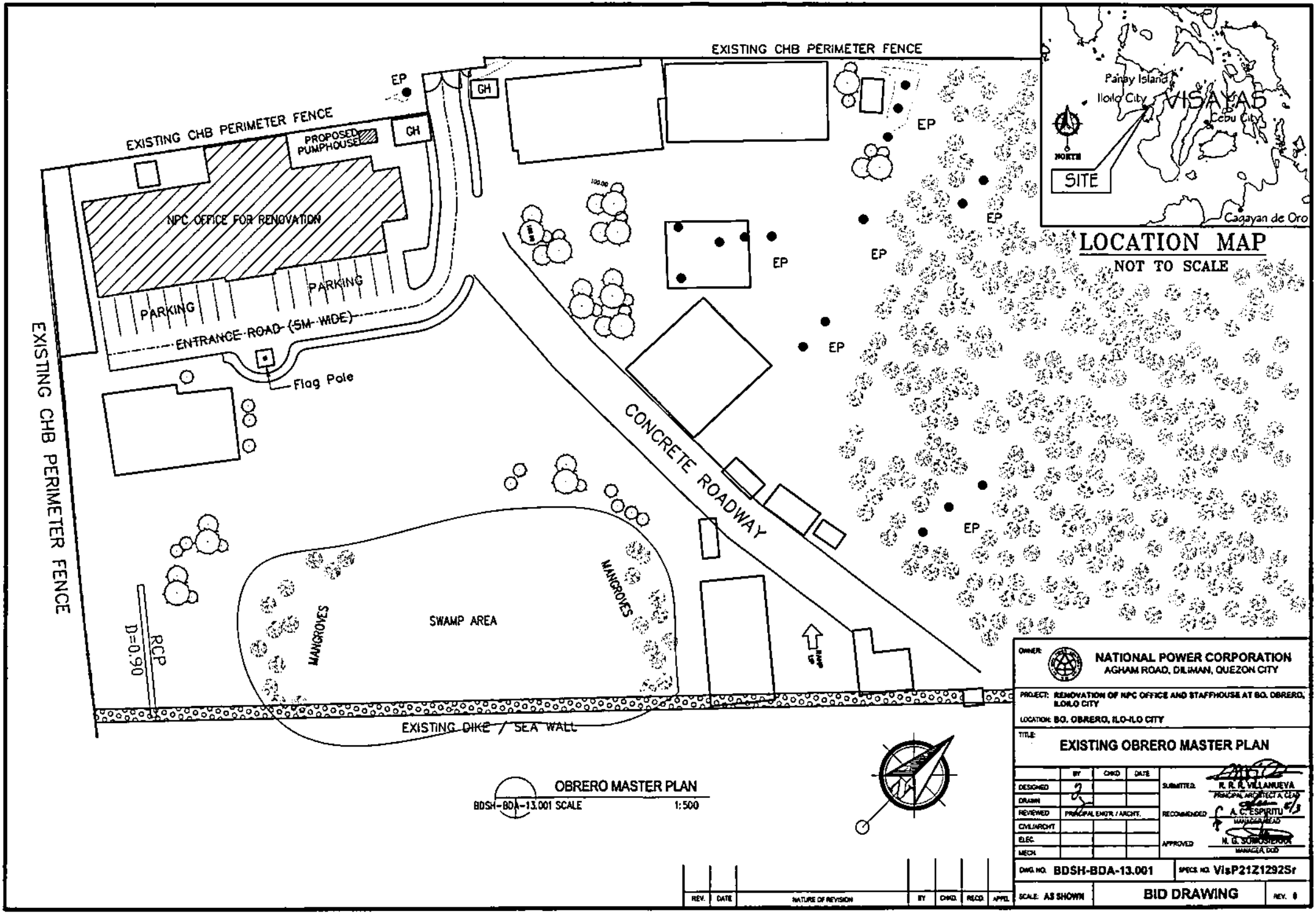
AW - ARCHITECTURAL WORKS

DRAWING NO.	TITLE
BDSH-BDA-13.001	EXISTING OBRERO MASTER PLAN
BDSH-BDA-13.002	NPC OFFICE EXISTING FLOOR PLAN
BDSH -BDA-13.003	NPC OFFICE PROPOSED FLOOR PLAN
BDSH -BDA-13.004	ELEVATIONS (FRONT AND REAR)
BDSH -BDA-13.005	ELEVATIONS AND SECTIONS (LEFT, RIGHT AND SECTION THRU A)
BDSH -BDA-13.006	REFLECTED CEILING PLAN
BDSH -BDA-13.007	ROOF PLAN
BDSH -BDA-13.008	SCHEDULE OF DOORS AND WINDOWS



PERSPECTIVE VIEW

SCALE NTS



OBRERO MASTER PLAN
BDSH-BDA-13.001 SCALE 1:500

LOCATION MAP
NOT TO SCALE

OWNER: NATIONAL POWER CORPORATION
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY

LOCATION: BO. OBRERO, ILO-ILO CITY

TITLE: EXISTING OBRERO MASTER PLAN

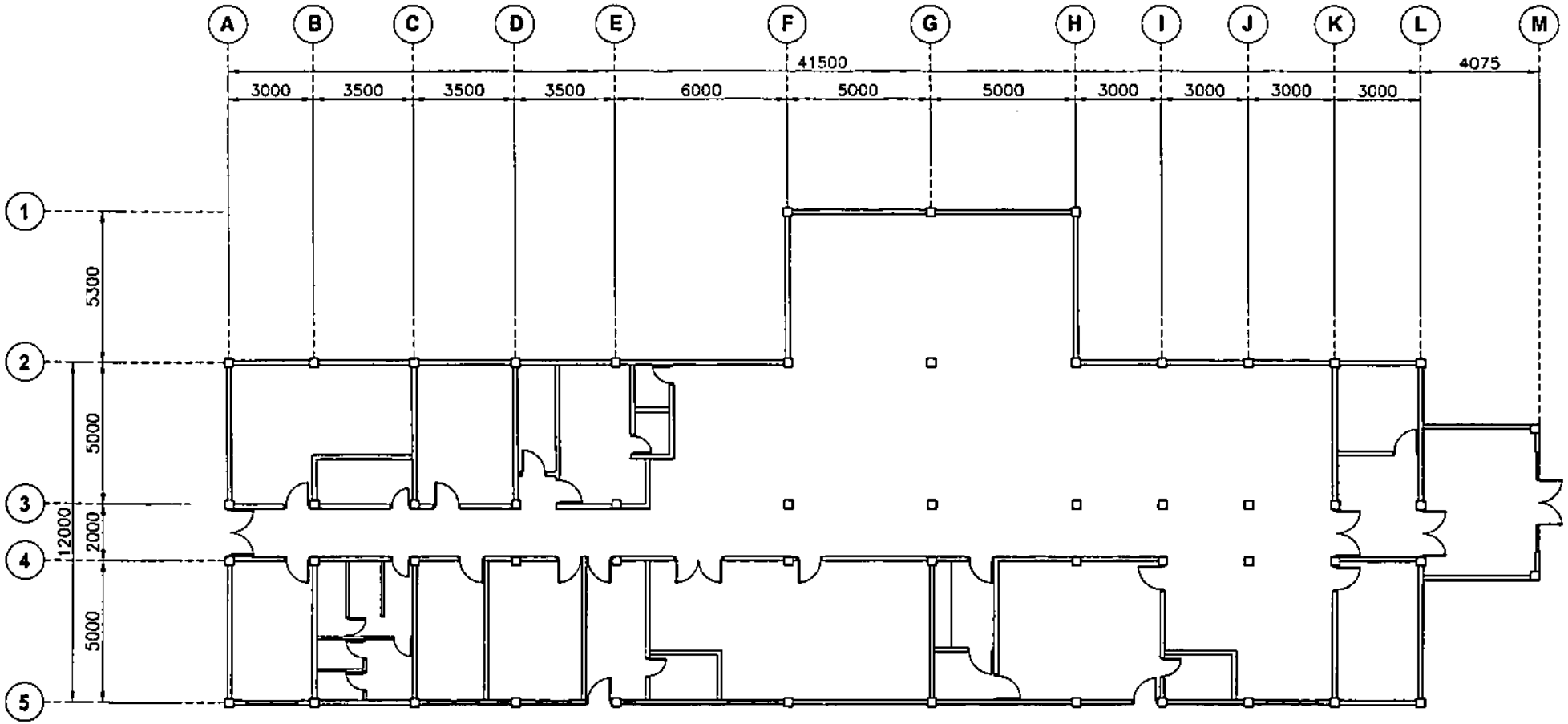
	BY	CHKD	DATE
DESIGNED			
DRAWN			
REVIEWED	PRINCIPAL ENGR. / ARCHT.		
CIVIL/ARCHT			
ELEC			
MECH			

SUBMITTED: R. R. R. VILLANUEVA, PRINCIPAL ARCHITECT A, CEA
RECOMMENDED: A. C. ESPIRITU, MANAGER, HEAD
APPROVED: N. G. SORIANO, MANAGER, DOD

DWG. NO. BDSH-BDA-13.001 SPECS. NO. VisP21Z1292Sr

SCALE: AS SHOWN BID DRAWING REV. 0

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



EXISTING NGCP OFFICE FLOOR PLAN

BDSH-BDA-13.002 SCALE 1:150

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

OWNER: NATIONAL POWER CORPORATION
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY

LOCATION: BO. OBRERO, ILO-ILO CITY

TITLE:

NPC OFFICE EXISTING FLOOR PLAN

	BY	CHKD	DATE
DESIGNED			
DRAWN			
REVIEWED	PRINCIPAL ENGR. / ARCHT.		
CIVIL/ARCHT			
ELEC.			
MECH.			

SUBMITTED: R. R. R. VILLANUEVA, PRINCIPAL ARCHITECT A, OGD

RECOMMENDED: A. C. ESPIRITU, MANAGER, OGD

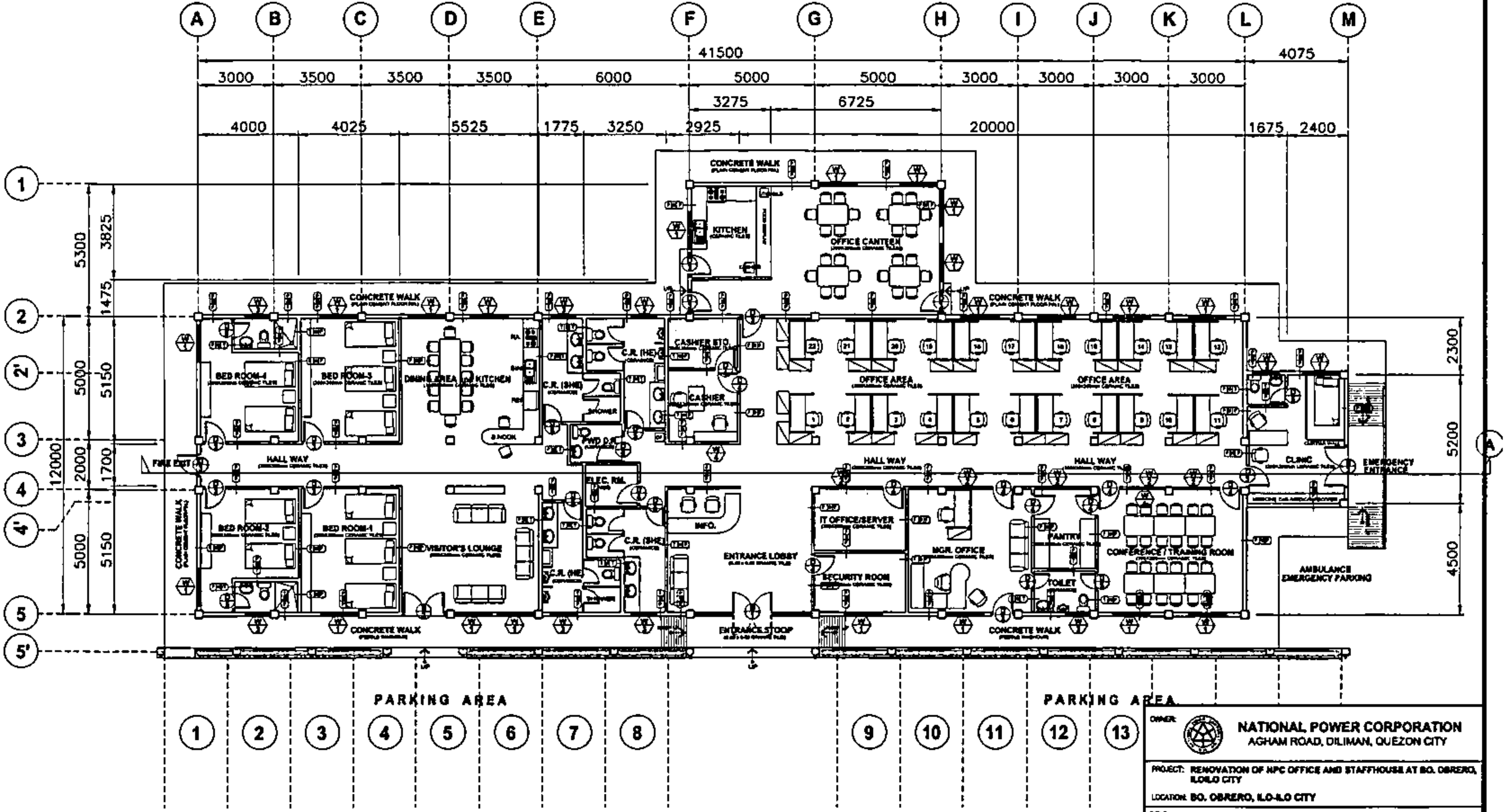
APPROVED: MANAGER, OGD

DWG. NO. BDSH-BDA-13.002 SPECS. NO. VIsP21Z1292Sr

SCALE: AS SHOWN

BID DRAWING

REV. 0



PROPOSED FLOOR PLAN

BDSH-BDA-13.003 SCALE 1:150

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

OWNER: **NATIONAL POWER CORPORATION**
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY

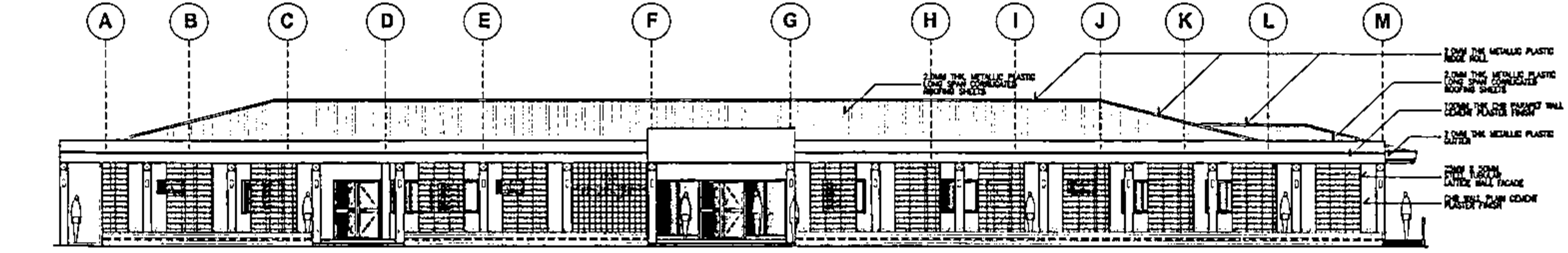
LOCATION: BO. OBRERO, ILO-ILO CITY

TITLE: **NPC OFFICE PROPOSED FLOOR PLAN**

	BY	CHKD	DATE		
DESIGNED				SUBMITTED:	R. R. R. VILLANUEVA PRINCIPAL ARCHITECT A. CEAD
DRAWN					
REVIEWED	PRINCIPAL ENG'R / ARCHT.			RECOMMENDED:	A. C. ESPIRITU MANAGER, CEAD
CIVIL/ARCHT					
ELEC.				APPROVED:	MANAGER, DDD
MECH.					

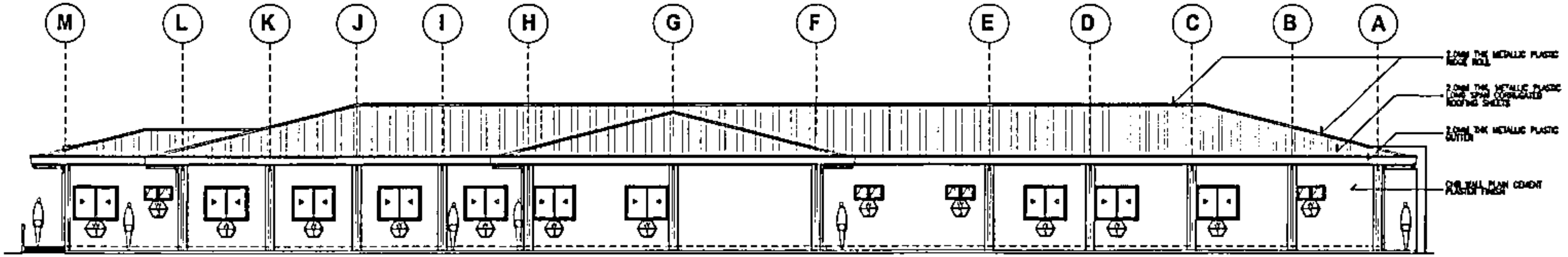
DWG. NO. BDSH-BDA-13.003 | SPEC'L NO. VisP21Z1292Sr

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



FRONT ELEVATION

BDSH-BDA-13.004 SCALE 1:150



REAR ELEVATION

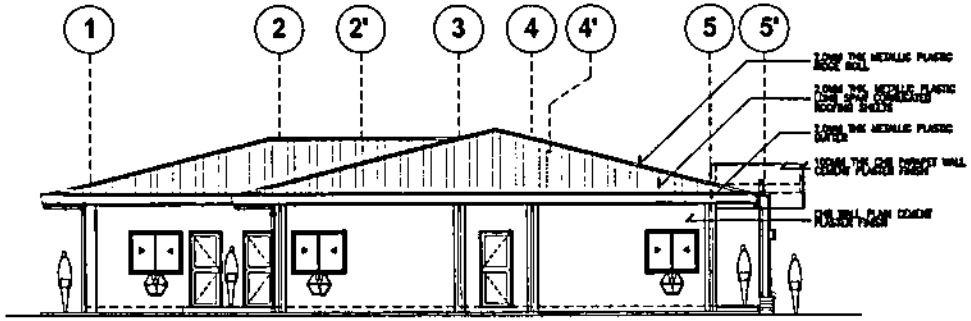
BDSH-BDA-13.004 SCALE 1:150

OWNER:	**NATIONAL POWER CORPORATION** AGHAM ROAD, DILIMAN, QUEZON CITY		
PROJECT:	RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY		
LOCATION:	BO. OBRERO, ILO-ILO CITY		
TITLE:	**ELEVATIONS (FRONT AND REAR)**		

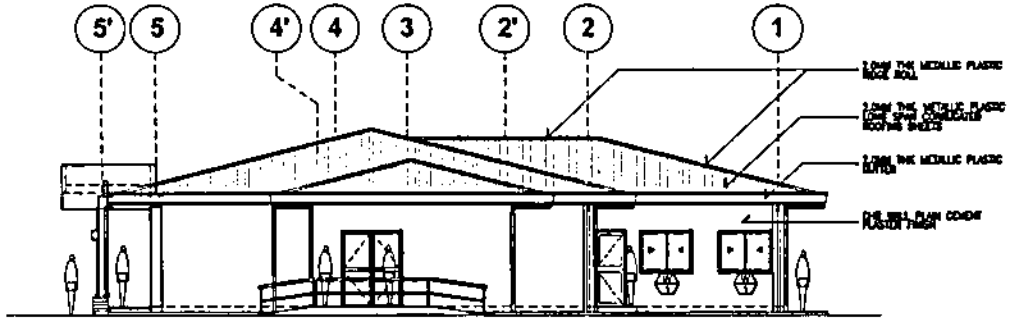
	BY	CHKD	DATE		
DESIGNED				SUBMITTED:	R. R. R. VILLANUEVA PRINCIPAL ARCHITECT A, CEAD
DRAWN					
REVIEWED	PRINCIPAL ENGR. / ARCHT.			RECOMMENDED:	A. C. ESPIRITU MANAGER, CEAD
CIVIL/ARCH'T					
ELEC.				APPROVED:	N. G. [illegible] MANAGER, DOD
MECH.					

DWG NO. BDSH-BDA-13.004	SPECS. NO. VIsP21Z1292Sr
SCALE: AS SHOWN	**BID DRAWING** — REV. 1

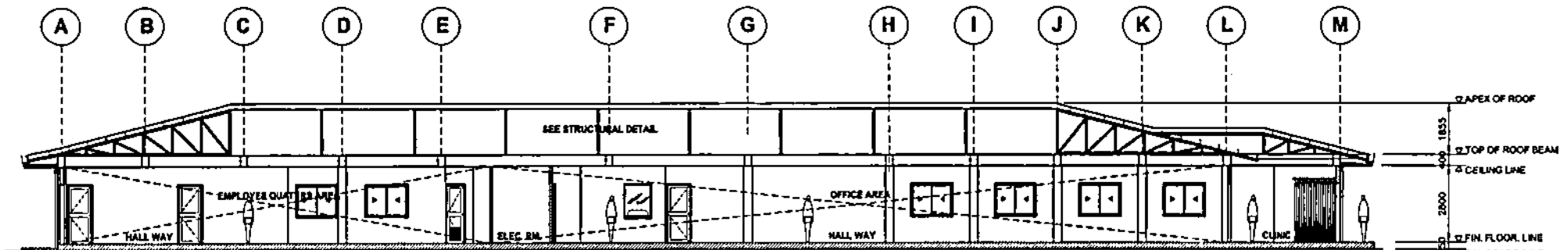
REV.	DATE	NATURE OF REVISION	BY	CHKD.	RECD.	APPD.



LEFT SIDE ELEVATION
BDSH-BDA-13.005 SCALE 1:150



RIGHT SIDE ELEVATION
BDSH-BDA-13.005 SCALE 1:150



SECTION THRU 'A'
BDSH-BDA-13.005 SCALE 1:150

OWNER: NATIONAL POWER CORPORATION
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY

LOCATION: BO. OBRERO, ILO-ILO CITY

TITLE: ELEVATIONS AND SECTION (LEFT, RIGHT AND SECTION THRU 'A')

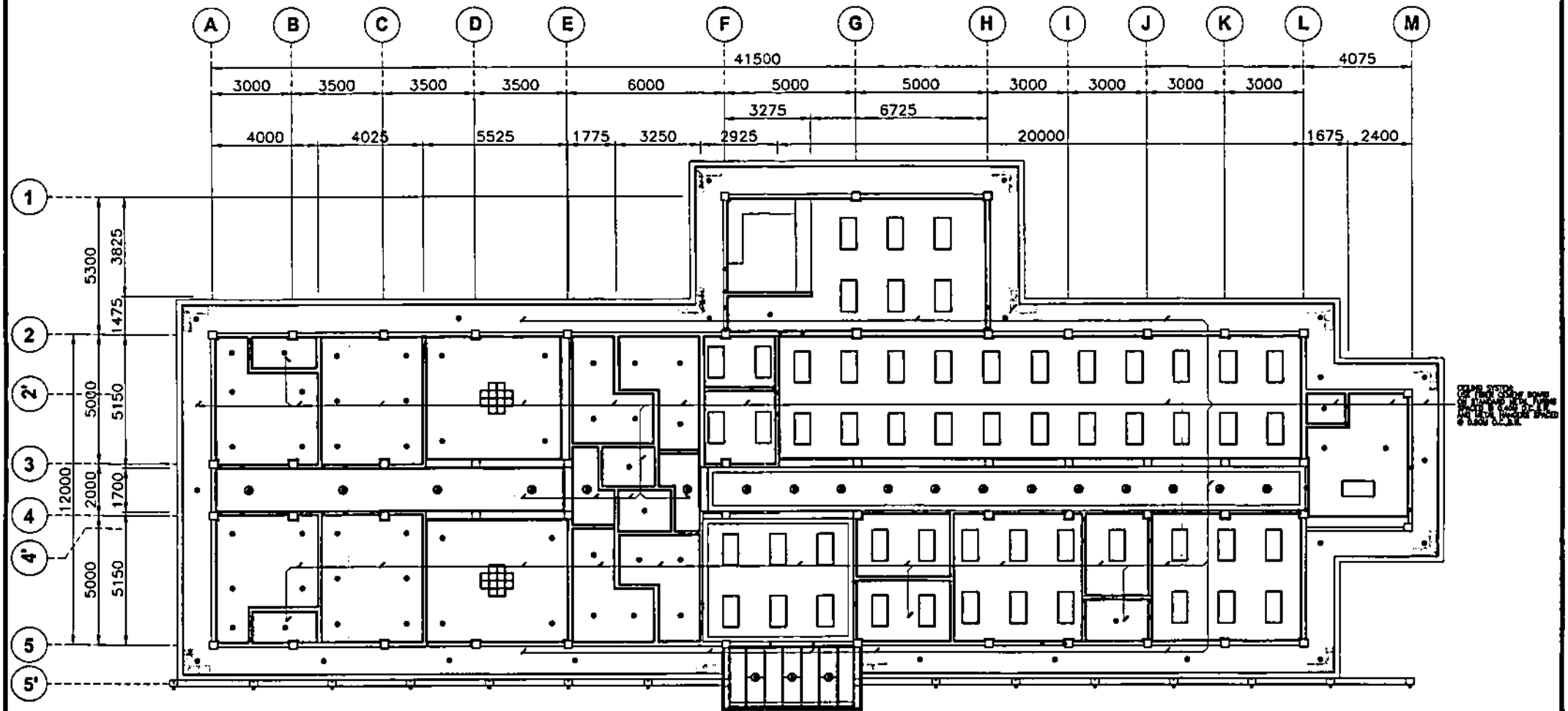
	BY	CHKD	DATE
DESIGNED			
DRAWN			
REVIEWED	PRINCIPAL ENGR. / ARCHT.		
CIVIL/ARCHT			
ELEC.			
MECH.			

SUBMITTED: R. R. R. VILLANUEVA, PRINCIPAL ARCHITECT A, CEAD
RECOMMENDED: A. C. ESPIRITU, MANAGER, CEAD
APPROVED: M. G. GO, MANAGER, DDD

DWG NO. BDSH-BDA-13.005 SPECS NO. VIsP21Z1292Sr

SCALE: AS SHOWN BID DRAWING REV. 0

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



REFLECTED CEILING PLAN

BDSH-BDA-13.006 SCALE 1:150

OWNER: NATIONAL POWER CORPORATION
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY

LOCATION: BO. OBRERO, ILO-ILO CITY

TITLE: REFLECTED CEILING PLAN

	BY	CHKD	DATE
DESIGNED			
DRAWN			
REVIEWED	PRINCIPAL ENGR. / ARCHT.		
CIVIL/ARCHT			
ELEC.			
MECH.			

SUBMITTED: R. R. R. VILLANUEVA, PRINCIPAL ARCHITECT A, CEAD

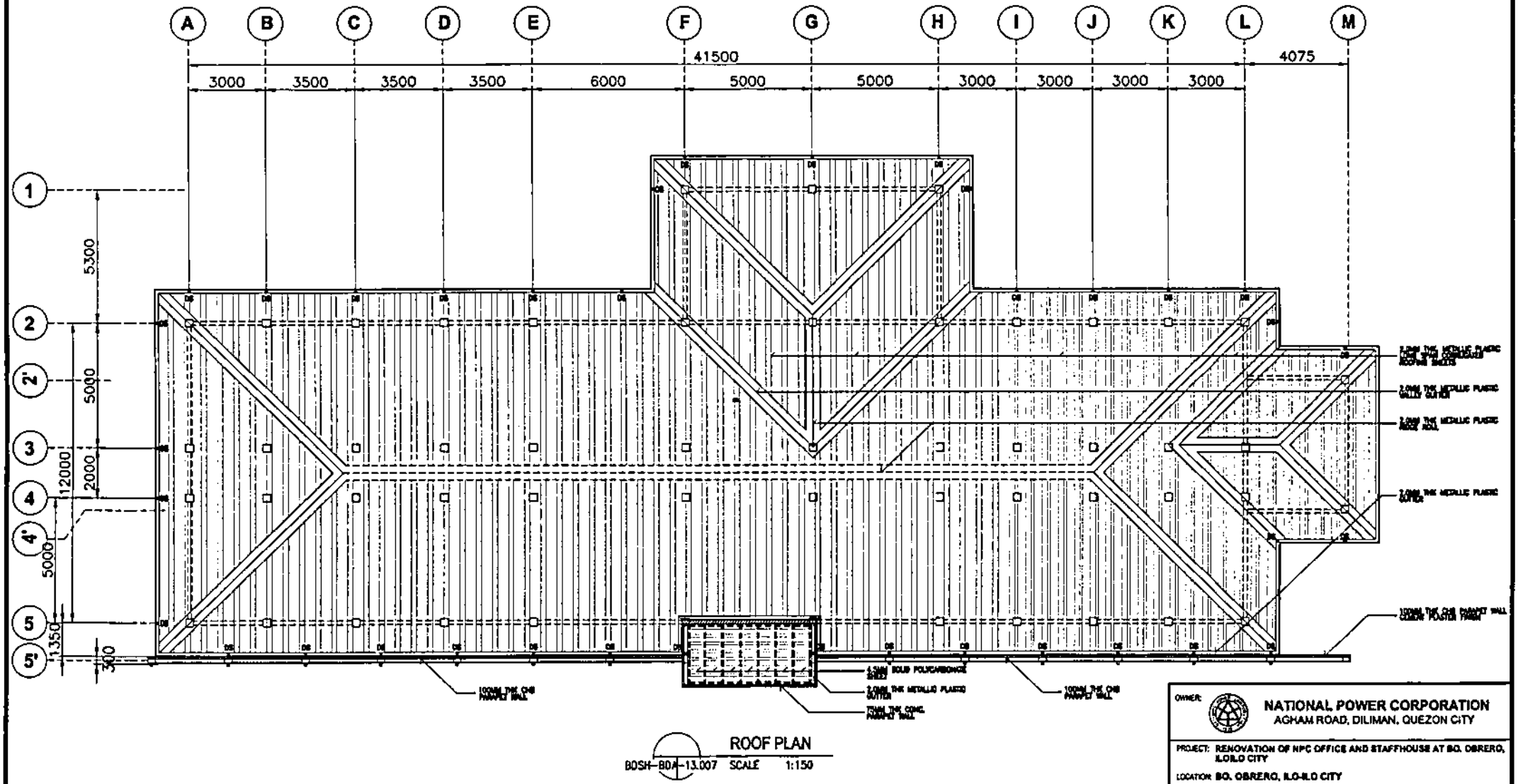
RECOMMENDED: A. C. ESPIRITU, MANAGER, CEAD

APPROVED: R. G. S[illegible], MANAGER, DOD

DWG. NO. BDSH-BDA-13.006 SPECS NO. VisP21Z1292Sr

SCALE: AS SHOWN BID DRAWING REV. 0

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



ROOF PLAN

BDSH-BDA-13.007 SCALE 1:150

OWNER: NATIONAL POWER CORPORATION
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY

LOCATION: BO. OBRERO, ILO-ILO CITY

TITLE: ROOF PLAN

	BY	CHKD	DATE
DESIGNED			
DRAWN			
REVIEWED	PRINCIPAL ENGR. / ARCHT.		
CMU/ARCHT			
ELEC.			
MECH.			

SUBMITTED: R. R. R. VILLANUEVA, PRINCIPAL ARCHITECT A, CEAD

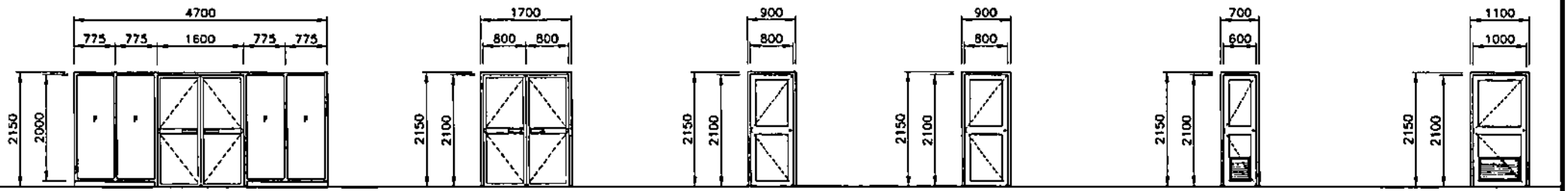
RECOMMENDED: A. C. ESPIRITU, MANAGER, CEAD

APPROVED: MANAGER, DDD

DWG. NO. BDSH-BDA-13.007 SPEC. NO. VisP21Z1292Sr

SCALE: AS SHOWN BID DRAWING REV. 0

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



D1

- GLASS AND ALUM. SWING DOOR
- 6mm THK. TEMPERED TINTED GLASS BRONZE, ONE WHOLE PIECE PANEL
- ALUMINUM FRAME ANALOK FINISH
- 50x100mm DR FIXED FRAME
- HEAVY DUTY MECHANISM

D2

- GLASS AND ALUM. SWING DOOR
- 6mm THK. TEMPERED TINTED GLASS BRONZE, ONE WHOLE PIECE PANEL
- ALUMINUM FRAME ANALOK FINISH
- 50x100mm DR FIXED FRAME
- HEAVY DUTY MECHANISM

D3

- PANEL TYPE WOOD DOOR
- 2x6" HARD WOOD JAMB
- 3 PIECES OF HEAVY DUTY LOOSE PIN HINGES
- ONE SET DOOR KNOB, WEATHERPROOF
- GLAZED LACQUER PAINT FINISH ON DOOR AND JAMB

D4

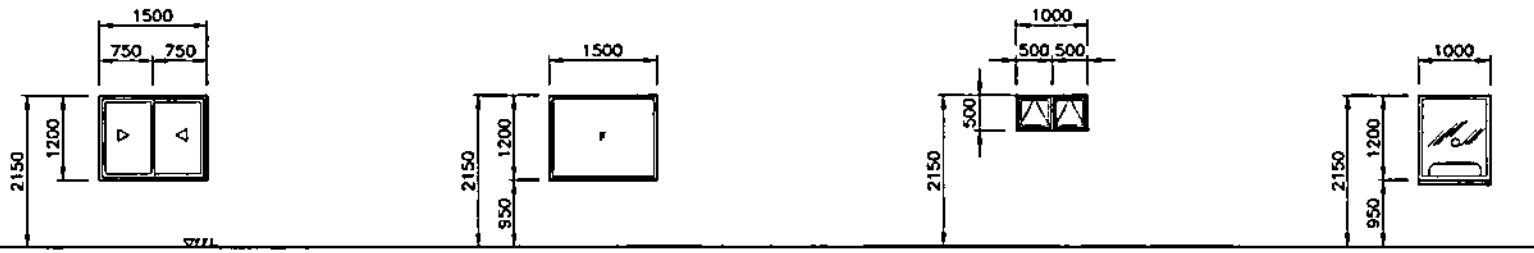
- FLUSH TYPE WOOD DOOR
- MARINE PLYWOOD BOTH SIDES
- 2x6" HARD WOOD JAMB
- 3 PIECES OF HEAVY DUTY LOOSE PIN HINGES
- ONE SET DOOR KNOB, WEATHERPROOF
- GLAZED LACQUER PAINT FINISH ON DOOR AND JAMB

D5

- FLUSH TYPE WOOD DOOR
- MARINE PLYWOOD BOTH SIDES
- 2x6" HARD WOOD JAMB
- 3 PIECES OF HEAVY DUTY LOOSE PIN HINGES
- ONE SET DOOR KNOB, WEATHERPROOF
- GLAZED LACQUER PAINT FINISH ON DOOR AND JAMB
- FIXED LOUVER INTAKE

D6

- FLUSH TYPE WOOD DOOR
- MARINE PLYWOOD BOTH SIDES
- 2x6" HARD WOOD JAMB
- 3 PIECES OF HEAVY DUTY LOOSE PIN HINGES
- ONE SET DOOR KNOB, WEATHERPROOF
- GLAZED LACQUER PAINT FINISH ON DOOR AND JAMB
- FIXED LOUVER INTAKE



W1

- GLASS AND ALUM. SLIDING WINDOW
- 6mm THK. TEMPERED TINTED GLASS BRONZE
- ALUMINUM FRAME ANALOK FINISH
- 50x100mm FRAMING
- HEAVY DUTY MECHANISM

W2

- GLASS AND ALUM. FIXED WINDOW
- 6mm THK. TEMPERED TINTED GLASS BRONZE
- ALUMINUM FRAME ANALOK FINISH
- 50x100mm FRAMING

W3

- GLASS AND ALUM. AWNING WINDOW
- 6mm THK. TEMPERED TINTED GLASS BRONZE
- ALUMINUM FRAME ANALOK FINISH
- 50x100mm FRAMING
- HEAVY DUTY MECHANISM

W4

- GLASS AND ALUM. FIXED WINDOW
- 6mm THK. TEMPERED TINTED GLASS BRONZE
- ALUMINUM FRAME ANALOK FINISH
- 50x100mm FRAMING

SCHEDULE OF DOORS AND WINDOWS

BDSH-BDA-13.008 SCALE 1:150

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

OWNER: NATIONAL POWER CORPORATION
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY

LOCATION: BO. OBRERO, ILO-ILO CITY

TITLE: SCHEDULE OF DOORS AND WINDOWS

	BY	CHKD	DATE
DESIGNED			
DRAWN			
REVIEWED	PRINCIPAL ENGR. / ARCHT.		
CIVIL/ARCHT			
ELEC.			
MECH.			

SUBMITTED: PETE R. VILLANUEVA, PRINCIPAL ARCHITECT A, CEAD

RECOMMENDED: A. C. ESPIRITU, MANAGER, CEAD

APPROVED: [illegible], MANAGER, DDO

DWG NO. BDSH-BDA-13.008 SPECS NO. VIsP21Z1292Sr

SCALE: AS SHOWN BID DRAWING REV. 0

SECTION IX

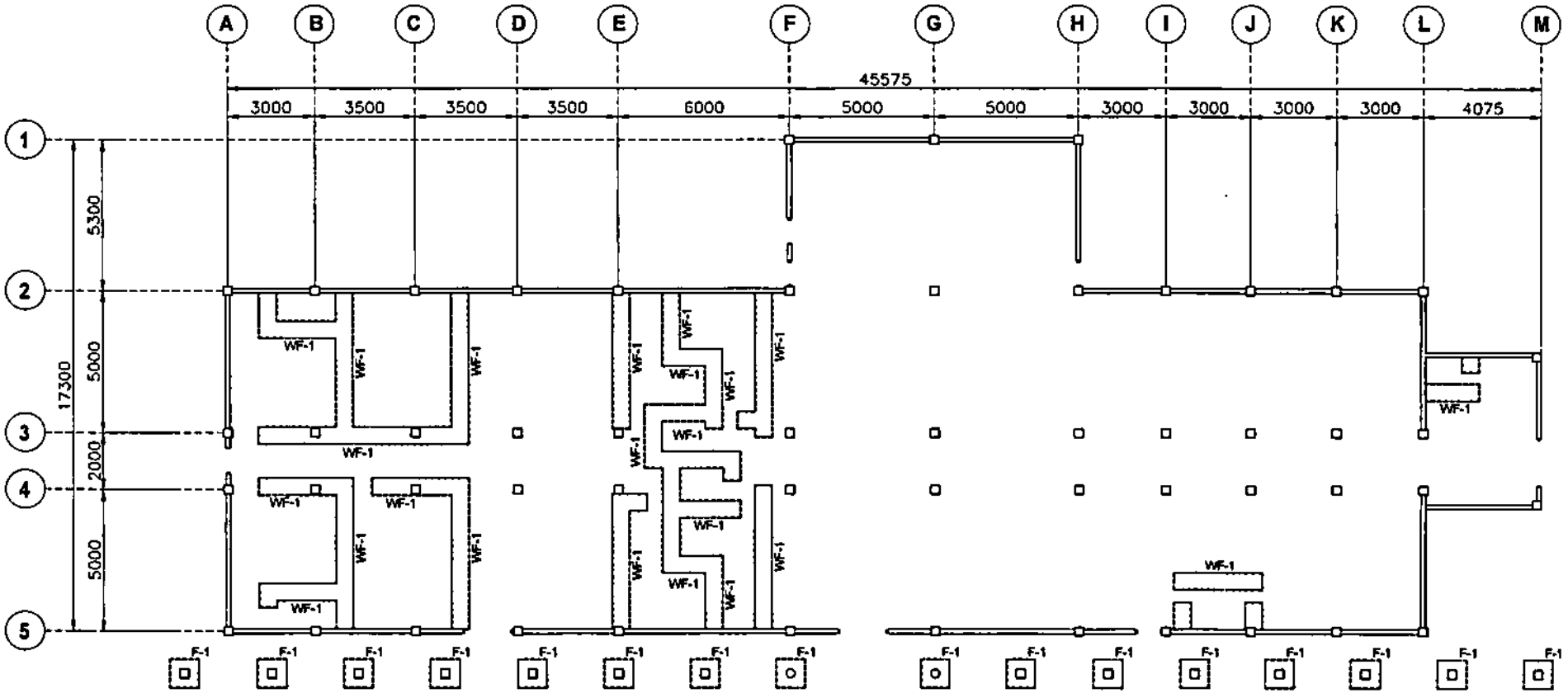
BID DRAWINGS

CW - (CIVIL WORKS)

SECTION IX - BID DRAWINGS

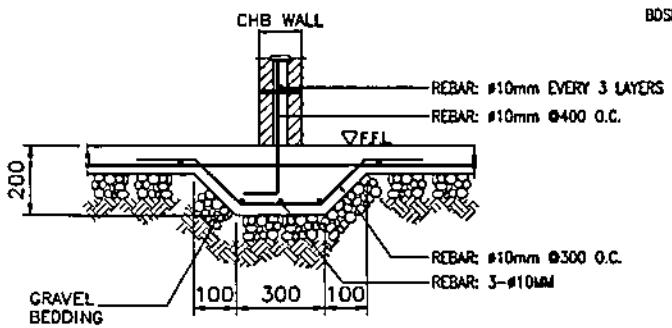
CW - CIVIL WORKS

DRAWING NO.	TITLE
BDSH-BDC-13.001	WALL FOOTING FOUNDATION
BDSH-BDC-13.002	ROOF FRAMING PLAN
BDSH -BDC-13.003	TRUSS DETAILS
BDSH -BDC-13.004	HALF TRUSS DETAILS
BDSH -BDC-13.005	PURLINS CROSSBRACE AND TRUSS (CONNECTION DETAILS)
BDSH -BDC-13.006	ROADWAY (ROAD PLAN AND SECTION)
BDSH -BDC-13.007	ROADWAY (TYPICAL DETAILS)
BDSH -BDC-13.008	TYPICAL FLAGPOLE AND PERIMETER LIGHTING (PLAN, SECTIONS AND DETAILS)



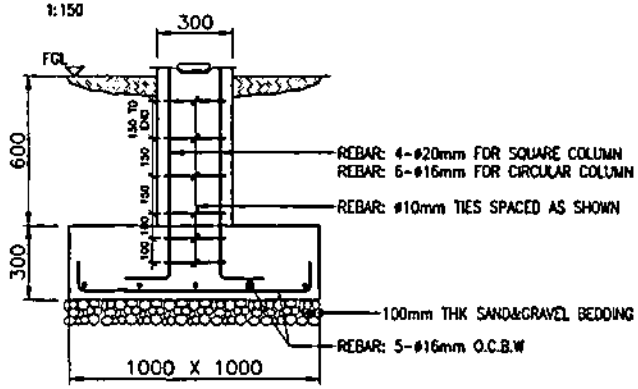
FOUNDATION PLAN

BDSH-BDC-13.001 SCALE 1:150



WALL FOOTING (WF-1) DETAILS

BDSH-BDC-13.001 SCALE NTS



FOOTING (F-1) & COLUMN DETAILS

BDSH-BDC-13.001 SCALE NTS

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

OWNER: NATIONAL POWER CORPORATION
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY

LOCATION: BO. OBRERO, ILO-ILO CITY

TITLE: WALL FOOTING FOUNDATION

	BY	CHKD	DATE
DESIGNED			
DRAWN			
REVIEWED	PRINCIPAL ENGR. / ARCHT.		
CIVIL/ARCHT			
ELEC.			
MECH.			

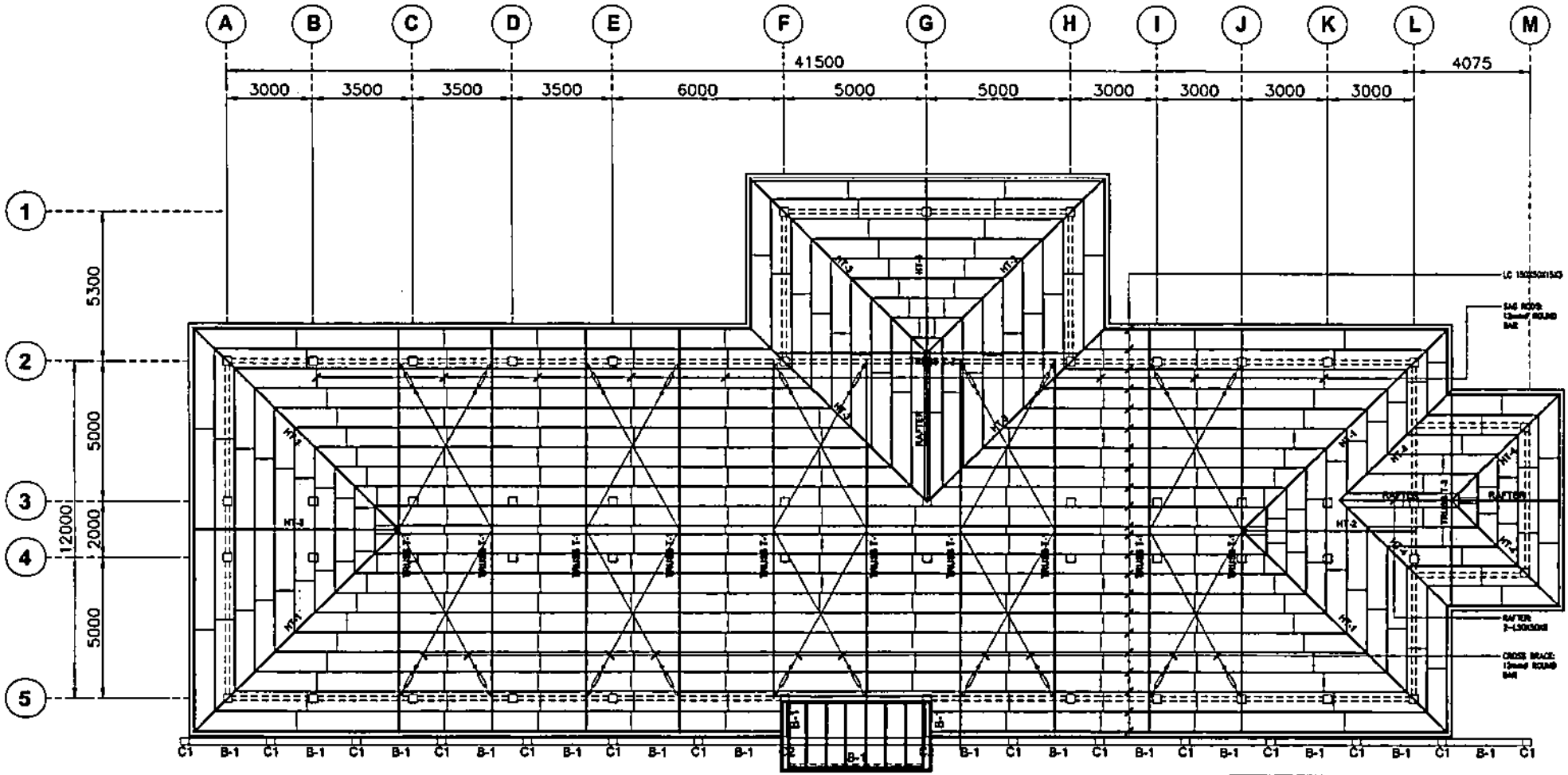
SUBMITTED: H. C. MENDOZA, PRINCIPAL ENGINEER A / CHIEF

RECOMMENDED: A. C. ESPIRITU, MANAGER, DEAD

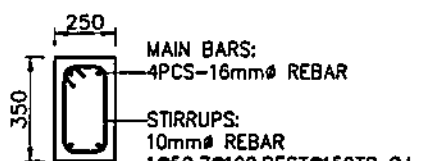
APPROVED: MANAGER, DDD

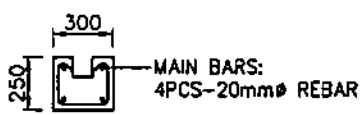
DWG. NO. BDSH-BDC-13.001 SPECS. NO. VisP21Z1292Sr

SCALE: AS SHOWN BID DRAWING REV. 0



ROOF FRAMING PLAN
BDSH-BDC-13.002 SCALE 1:150





BEAM (B-1) DETAILS
BDSH-BDC-13.002 SCALE NTS

COLUMN (C-1) DETAILS
BDSH-BDC-13.002 SCALE NTS

COLUMN (C-2) DETAILS
BDSH-BDC-13.002 SCALE NTS

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

OWNER: NATIONAL POWER CORPORATION
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY

LOCATION: BO. OBRERO, ILO-ILO CITY

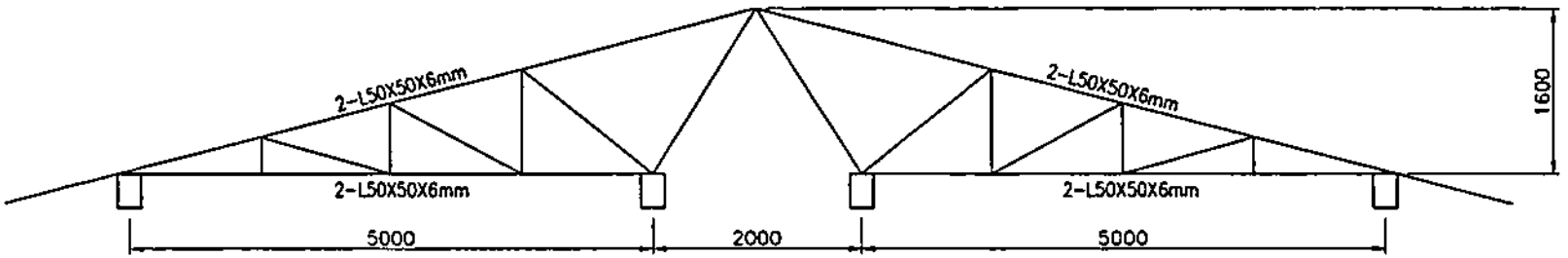
TITLE: ROOF FRAMING PLAN

	BY	CHKD	DATE
DESIGNED			
DRAWN			
REVIEWED	PRINCIPAL ENGR. / ARCHT.		
CIVIL/ARCHT			
ELEC.			
MECH.			

SUBMITTED: H. L. MENDOZA, PRINCIPAL ENGINEER A, CEAD
RECOMMENDED: A. C. ESPIRITU, MANAGER, CEAD
APPROVED: M. G. SOMOSIERRA, MANAGER, DDD

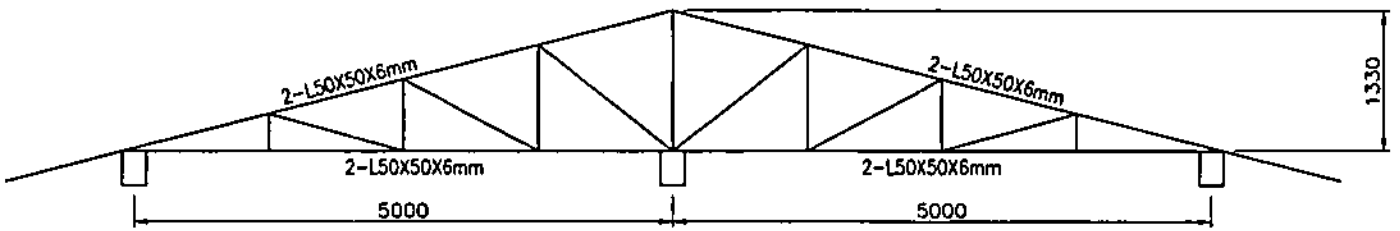
DWG. NO. BDSH-BDC-13.002 SPECS. NO. VIsP21Z1292Sr

SCALE: AS SHOWN BID DRAWING REV. 0



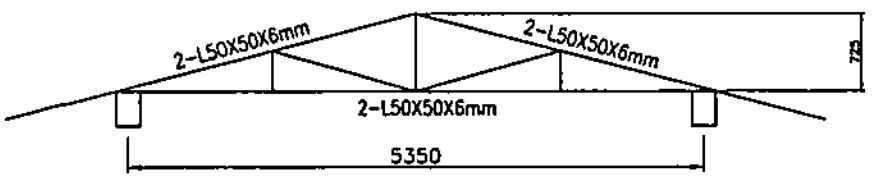
NOTE: ALL OTHER VERTICAL AND DIAGONAL MEMBERS: 2-L50X50X5mm

TRUSS - 1
BDSH-BDC-13.003 SCALE 1:50



NOTE: ALL OTHER VERTICAL AND DIAGONAL MEMBERS: 2-L50X50X5mm

TRUSS - 2
BDSH-BDC-13.003 SCALE 1:50



NOTE: ALL OTHER VERTICAL AND DIAGONAL MEMBERS: 2-L50X50X5mm

TRUSS - 3
BDSH-BDC-13.003 SCALE 1:50

OWNER: NATIONAL POWER CORPORATION
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY

LOCATION: BO. OBRERO, ILO-ILO CITY

TITLE: TRUSS DETAILS

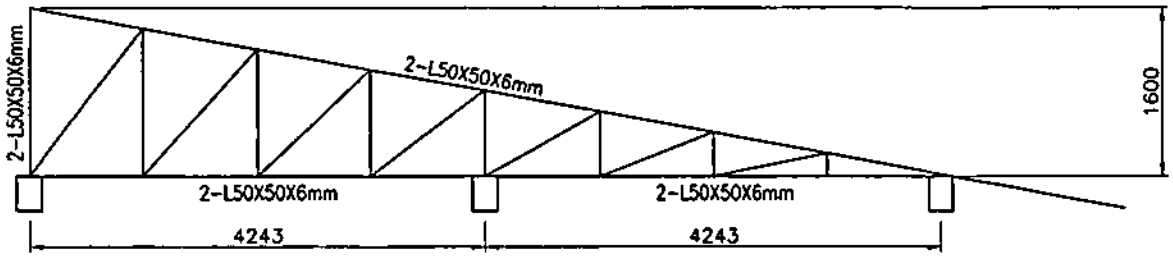
	BY	CHKD	DATE
DESIGNED			
DRAWN			
REVIEWED	PRINCIPAL ENGR. / ARCHT.		
CIVIL/ARCHT			
ELEC.			
MECH.			

SUBMITTED: H. L. MENDOZA, PRINCIPAL ENGINEER A, CEAD
RECOMMENDED: A. C. ESMURTU, MANAGER, CEAD
APPROVED: [illegible], MANAGER, DDD

DWG. NO. BDSH-BDC-13.003 SPECS. NO. VisP21Z1292Sr

SCALE: AS SHOWN BID DRAWING REV. 0

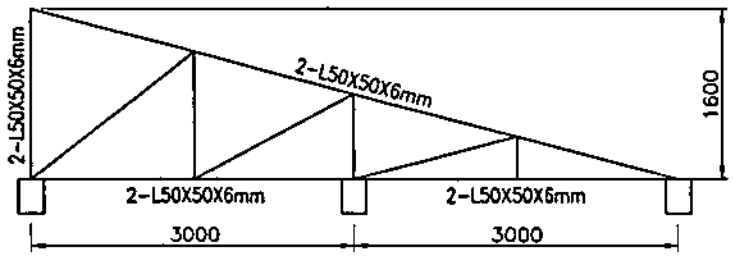
REV.	DATE	NATURE OF REVISION	BY	CHKD.	RECD.	APPD.



NOTE: ALL OTHER VERTICAL AND DIAGONAL MEMBERS: 2-L50X50X5mm

HALF TRUSS - 1

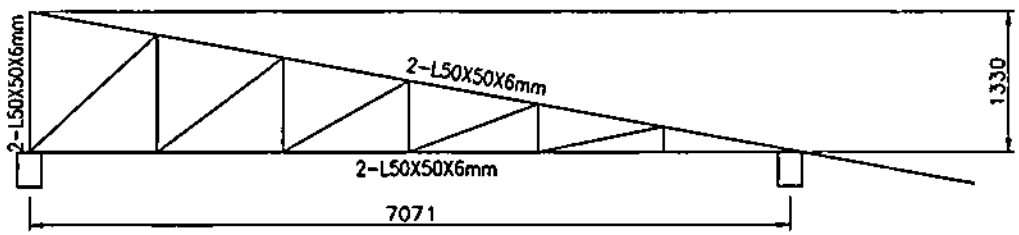
BDSH-BDC-13.004 SCALE 1:50



NOTE: ALL OTHER VERTICAL AND DIAGONAL MEMBERS: 2-L50X50X5mm

HALF TRUSS - 2

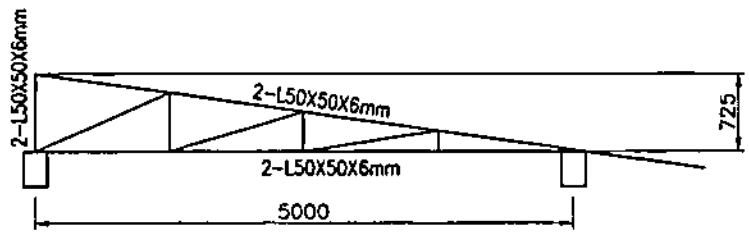
BDSH-BDC-13.004 SCALE 1:50



NOTE: ALL OTHER VERTICAL AND DIAGONAL MEMBERS: 2-L50X50X5mm

HALF TRUSS - 3

BDSH-BDC-13.004 SCALE 1:50



NOTE: ALL OTHER VERTICAL AND DIAGONAL MEMBERS: 2-L50X50X5mm

HALF TRUSS - 4

BDSH-BDC-13.004 SCALE 1:50

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

OWNER: NATIONAL POWER CORPORATION
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY

LOCATION: BO. OBRERO, ILO-ILO CITY

TITLE: HALF TRUSS DETAILS

	BY	CHKD	DATE
DESIGNED			
DRAWN			
REVIEWED	PRINCIPAL ENGR. I ARCHT.		
CIVIL/ARCHT			
ELEC.			
MECH.			

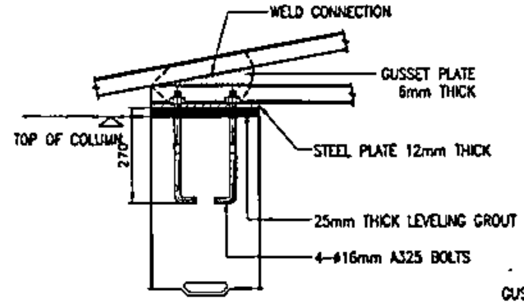
SUBMITTED: H. L. MENDOZA, PRINCIPAL ENGINEER A, OIC-H

RECOMMENDED: A. C. ESPIRITU, MANAGER, OIC-H

APPROVED: R. [illegible], MANAGER, ODD

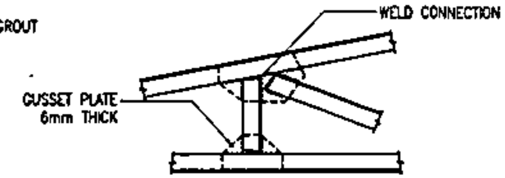
DWG. NO. BDSH-BDC-13.004 SPECS. NO. VIsP21Z1292Sr

SCALE: AS SHOWN BID DRAWING REV. 0



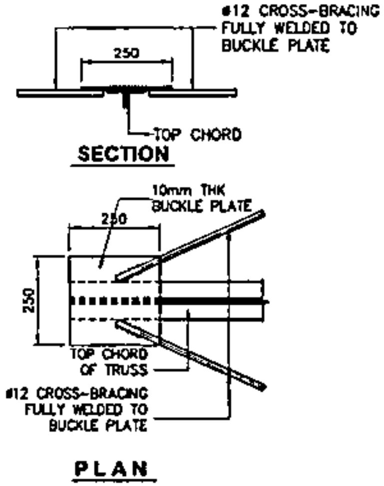
TRUSS CONNECTION DETAIL

BDSH-BDC-13.005 SCALE 1:15



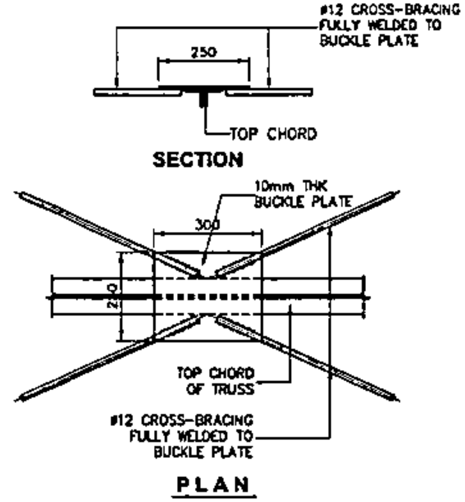
TRUSS CONNECTION DETAIL

BDSH-BDC-13.005 SCALE 1:15



DETAIL CONNECTION OF CROSS BRACING AT SUPPORT

BDSH-BDC-13.005 SCALE 1:15

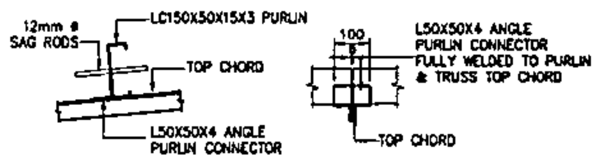


DETAIL CONNECTION OF CROSS BRACING AT TRUSS APEX

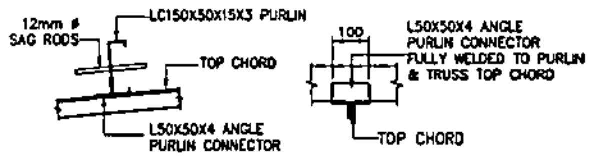
BDSH-BDC-13.005 SCALE 1:15

NOTES ON STRUCTURAL STEEL:

1. STRUCTURAL STEEL TO BE USED FOR FABRICATION AND ERECTION OF THIS STRUCTURE SHALL COMPLY WITH ALL THE PERTINENT PROVISION OF AISC SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDING LATEST EDITION.
2. ALL STRUCTURAL STEEL SHAPES SHALL CONFORM TO ASTM A36 STRUCTURAL STEEL UNLESS OTHERWISE INDICATED.
3. ALL BOLTS USED UNLESS OTHERWISE SPECIFIED SHALL BE A325 BOLTS.
4. ALL CONNECTION DETAILS SHOWN ARE CONCEPTUAL DESIGN AND OF CONNECTION DETAILS IS THE RESPONSIBILITY OF THE CONTRACTOR.
5. SUBMIT SHOP DRAWINGS FOR REVIEW AND APPROVAL PRIOR TO FABRICATION WORKS.



FOR NON-CONTINUOUS PURLINS



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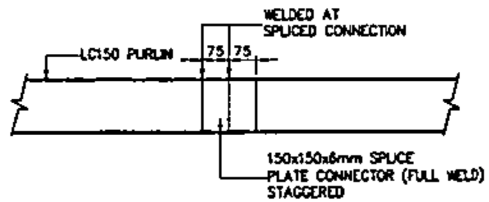


PURLIN CONNECTION DETAIL

BDSH-BDC-13.005 SCALE 1:15

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

OWNER: NATIONAL POWER CORPORATION
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY

LOCATION: BO. OBRERO, ILO-ILO CITY

TITLE: PURLINS CROSSBRACE & TRUSS (CONNECTION DETAILS)

	BY	CHKD	DATE
DESIGNED			
DRAWN			
REVIEWED	PRINCIPAL ENGR / ARCHT.		
CIVIL/ARCHT			
ELEC.			
MECH.			

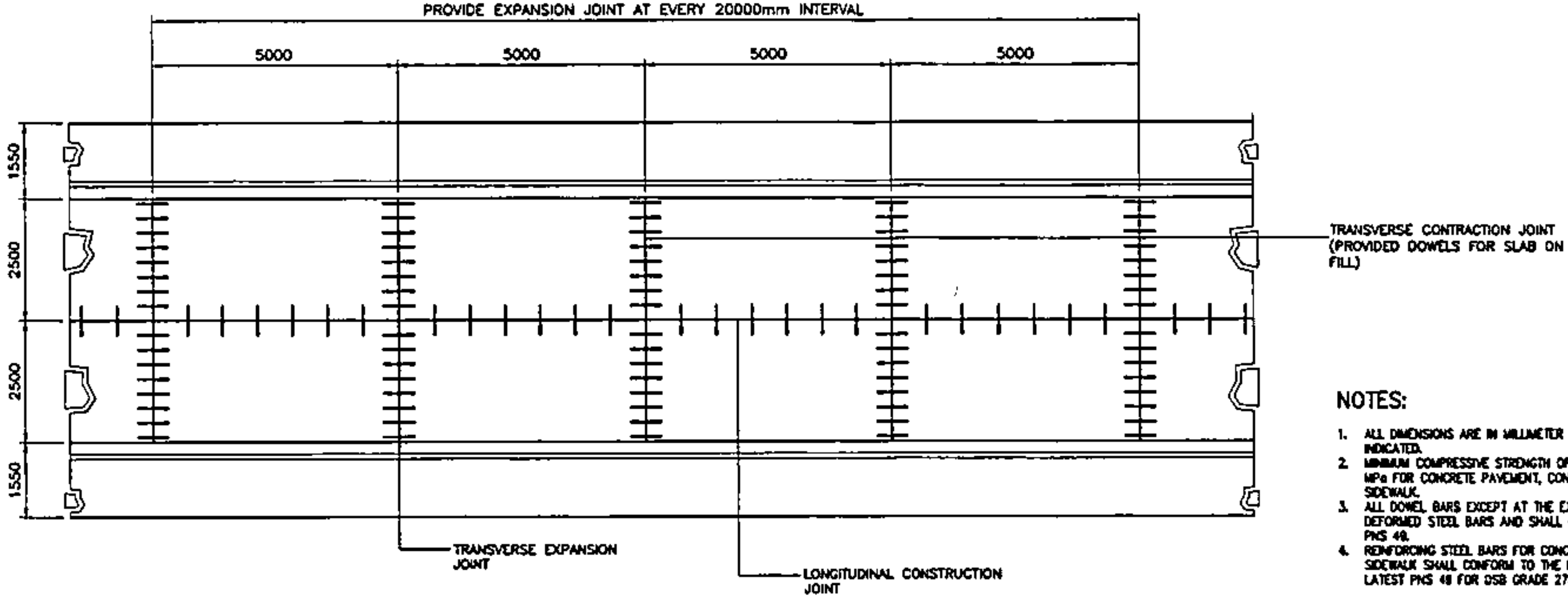
SUBMITTED: H. L. MENDOZA, PRINCIPAL ENGINEER A CEAD

RECOMMENDED: A. C. ESPIRITU, MANAGER CEAD

APPROVED: N. G. [illegible], MANAGER, DDD

DWG. NO. BDSH-BDC-13.005 | SPECS. NO. VIsP21Z1292Sr

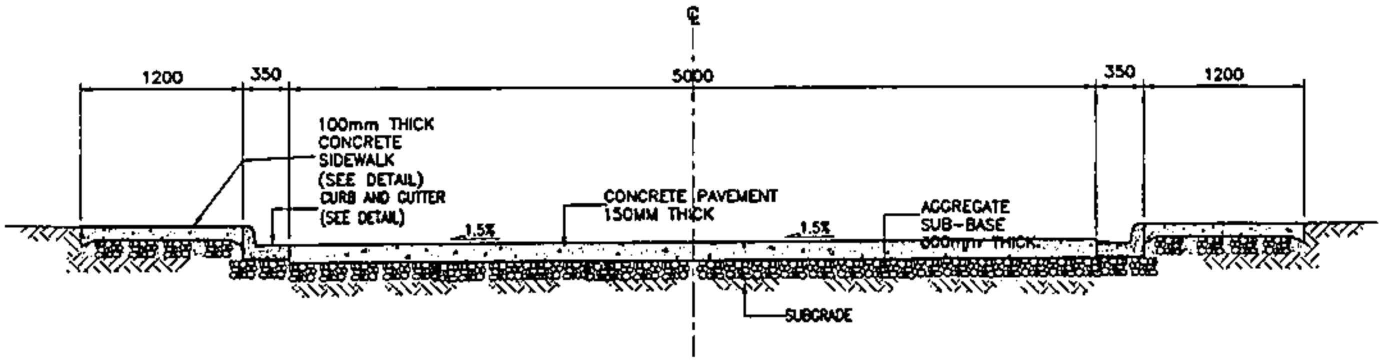
SCALE: AS SHOWN | BID DRAWING | REV. 0



ROADWAY PLAN
BDSH-BDC-13.006 SCALE 1:100

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETER UNLESS OTHERWISE INDICATED.
2. MINIMUM COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 20.7 MPa FOR CONCRETE PAVEMENT, CONCRETE CURB, GUTTER AND SIDEWALK.
3. ALL DOWEL BARS EXCEPT AT THE EXPANSION JOINTS SHALL BE DEFORMED STEEL BARS AND SHALL CONFORM TO THE LATEST PNS 49.
4. REINFORCING STEEL BARS FOR CONCRETE CURB, GUTTER AND SIDEWALK SHALL CONFORM TO THE REQUIREMENTS OF THE LATEST PNS 49 FOR DSB GRADE 275.



ROAD SECTION ADJACENT TO BUILDING
BDSH-BDC-13.006 SCALE 1:40

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

OWNER: **NATIONAL POWER CORPORATION**
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY

LOCATION: BO. OBRERO, ILO-ILO CITY

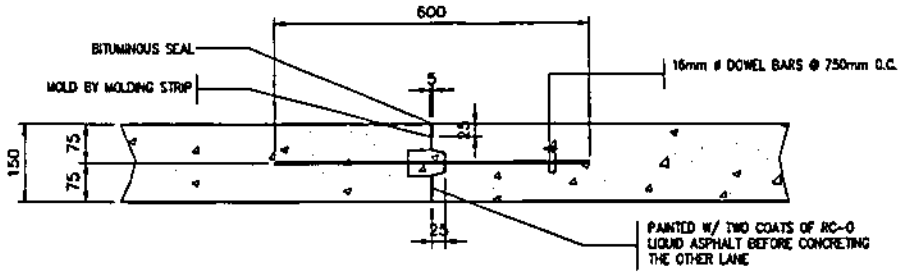
TITLE: **ROADWAY (ROAD PLAN & SECTION)**

	BY	CHKD	DATE
DESIGNED			
DRAWN			
REVIEWED	PRINCIPAL ENGR / ARCHT.		
CIVIL/ARCHT			
ELEC.			
MECH.			

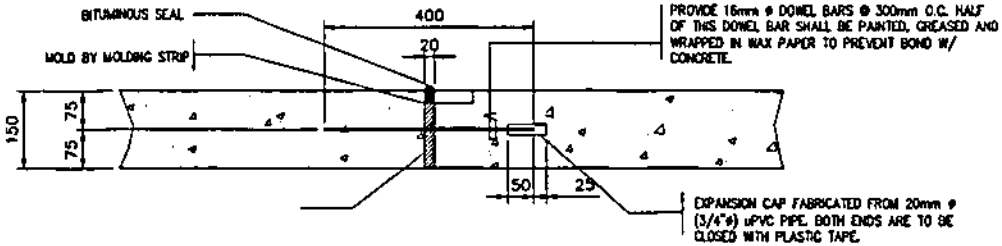
SUBMITTED: H. E. MENDOZA, PRINCIPAL ENGINEER A, CEAD
RECOMMENDED: A. C. ESPIRITU, MANAGER, CEAD
APPROVED: MANAGER, DOD

DWG. NO. BDSH-BDC-13.006 SPECS NO. VIsP21Z1292Sr

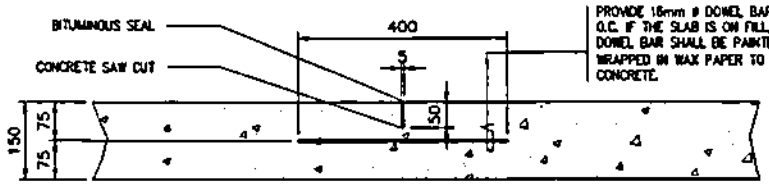
SCALE: AS SHOWN **BID DRAWING** REV. 0



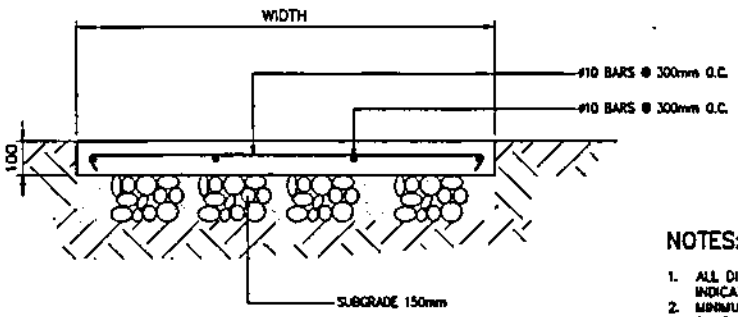
LONGITUDINAL CONSTRUCTION JOINT
BDSH-BDC-13.007 SCALE NTS



TRANSVERSE EXPANSION JOINT
BDSH-BDC-13.007 SCALE NTS



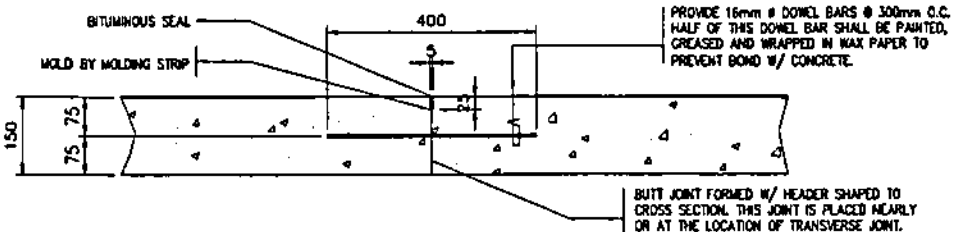
TRANSVERSE CONTRACTION JOINT
BDSH-BDC-13.007 SCALE NTS



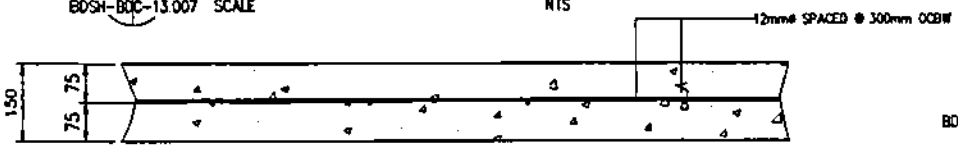
DET. OF CONCRETE SIDEWALK
BDSH-BDC-13.007 SCALE NTS

NOTES:

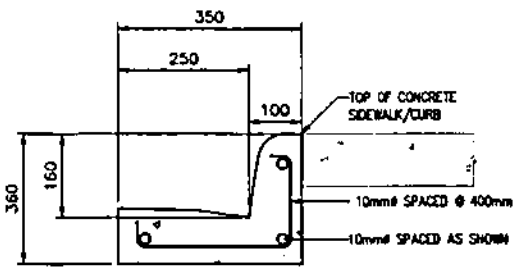
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
2. MINIMUM COMPRESSIVE STRENGTH OF CONCRETE FOR PAVEMENT, SIDEWALK, CURB & GUTTER SHALL BE 20.7 MPa AT 28 DAY PERIOD.
3. THE MINIMUM YIELD STRENGTH OF REINFORCEMENT SHALL BE GRADE 40 (275MPa).
4. ALLOWABLE BEARING CAPACITY OF SOIL SHALL NOT BE LESS THAN 140 KPa AND SHALL BE VERIFIED IN THE FIELD.



TRANSVERSE CONSTRUCTION JOINT
BDSH-BDC-13.007 SCALE NTS



PARKING PAVEMENT DETAILS
BDSH-BDC-13.007 SCALE NTS



DETAIL OF CURB & GUTTER
BDSH-BDC-13.007 SCALE NTS

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

OWNER: NATIONAL POWER CORPORATION
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY

LOCATION: BO. OBRERO, ILO-ILO CITY

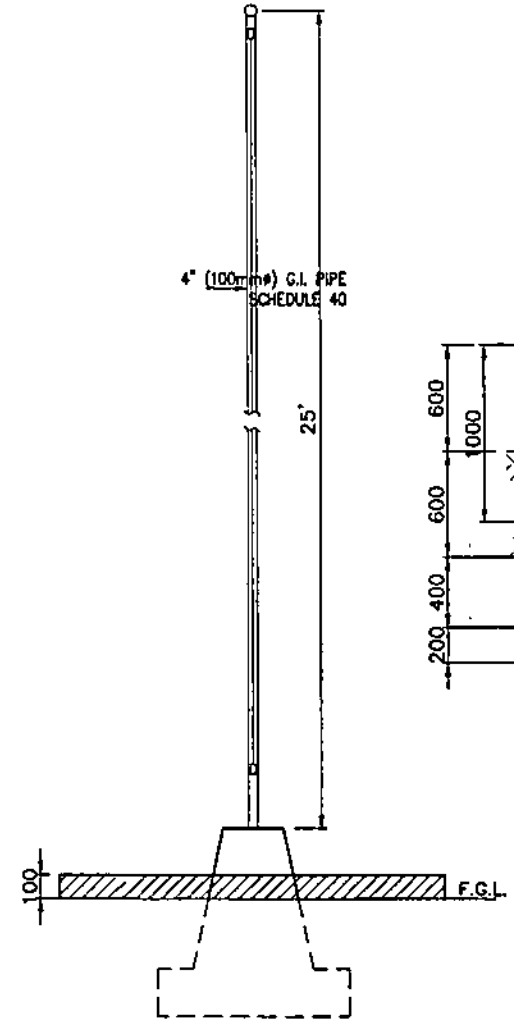
TITLE: **ROADWAY (TYPICAL DETAILS)**

	BY	CHKD	DATE
DESIGNED			
DRAWN			
REVIEWED	PRINCIPAL ENGR. / ARCHT.		
CIVIL/ARCHT			
ELEC.			
MECH.			

SUBMITTED: H.T. MENDOZA, PRINCIPAL ENGINEER A (CIVIL)
RECOMMENDED: A.C. ESPIRITU, MANAGER/CEAD
APPROVED: [illegible], MANAGER, OCO

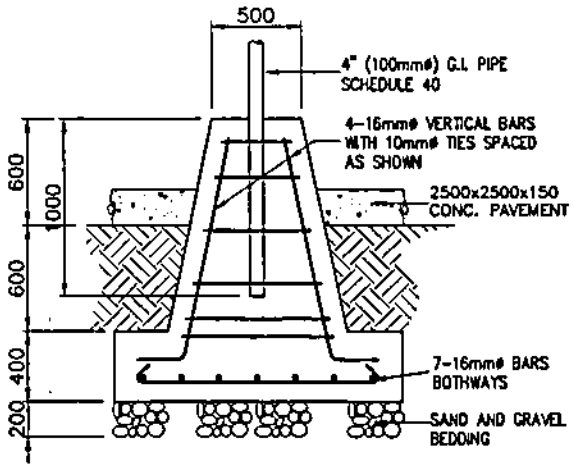
DWG. NO. BDSH-BDC-13.007 SPECS. NO. VIaP21Z1292Sr

SCALE: AS SHOWN BID DRAWING REV. 0

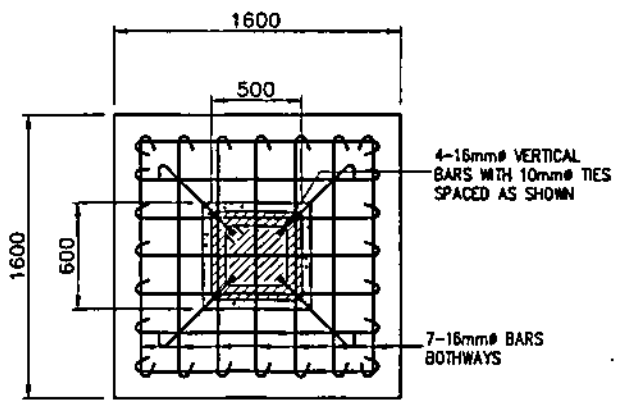


FLAG POLE ELEVATION

BDSH-BDC-13.008 SCALE NTS



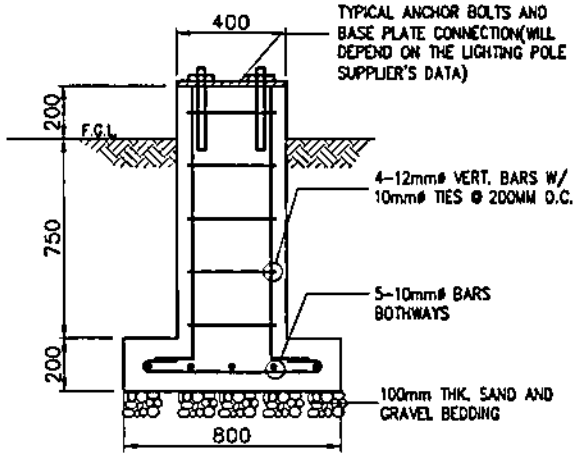
SECTION



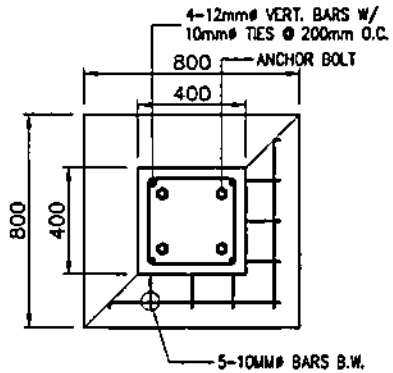
PLAN

FLAG POLE FOUNDATION

BDSH-BDC-13.008 SCALE 1:30



SECTION



PLAN

PERIMETER LIGHTING POLE FOUNDATION (*NOT USED*)

BDSH-BDC-13.008 SCALE NTS

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
2. MINIMUM COMPRESSIVE STRENGTH OF CONCRETE AT 28 DAY PERIOD SHALL BE 17.25MPa (2500psi).
3. REINFORCING STEEL BARS SHALL CONFORM TO THE LATEST REQUIREMENTS OF PNS 49 FOR DEFORMED STEEL BARS GRADE 275.

OWNER: NATIONAL POWER CORPORATION
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY

LOCATION: BO. OBRERO, ILO-ILO CITY

TITLE: TYPICAL FLAG POLE & PERIMETER LIGHTING FOUNDATION (PLAN, SECTIONS & DETAILS)

	BY	CHKD	DATE
DESIGNED			
DRAWN			
REVIEWED	PRINCIPAL ENGR. / ARCHT.		
CIVIL/ARCHT			
ELEC.			
MECH.			

SUBMITTED: H. L. MENDOZA, PRINCIPAL ENGINEER A, OG&D

RECOMMENDED: C. A. C. ESPIRITU, MANAGER, OG&D

APPROVED: [illegible], MANAGER, OGD

DWG. NO. BDSH-BDC-13.008 SPECS. NO. VIsP21Z1292Sr

SCALE: AS SHOWN BID DRAWING REV. 0

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

SECTION IX

BID DRAWINGS

EW - (ELECTRICAL WORKS)

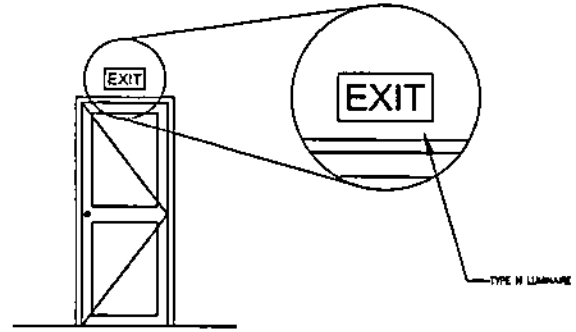
SECTION IX - BID DRAWINGS

EW – ELECTRICAL WORKS

DRAWING NO.	TITLE
BDSH-BDE-13.001	GENERAL NOTES, DETAILS OF LIGHTING FIXTURES AND MOUNTING DETAIL
BDSH -BDE-13.002	LIGHTING LAYOUT
BDSH-BDE-13.003	SCHEDULE OF LOADS AND RISER DIAGRAM (LIGHTING PANELBOARD)
BDSH-BDE-13.004	POWER LAYOUT
BDSH-BDE-13.005	SCHEDULE OF LOADS AND RISER DIAGRAM (POWER PANELBOARD)
BDSH-BDE-13.006	SCHEDULE OF LOADS AND RISER DIAGRAM (ACU PANELBOARD)
BDSH-BDE-13.007	SCHEDULE OF LOADS AND RISER DIAGRAM (WATER HEATER PANELBOARD AND MAIN DISTRIBUTION PANELBOARD)
BDSH-BDE-13.008	STRUCTURED CABLING SYSTEM
BDSH-BDE-13.009	STRUCTURED CABLING NETWORK DIAGRAM AND RACK ELEVATIONS

GENERAL NOTES:

1. ALL WORKS SHALL BE DONE IN ACCORDANCE WITH THE LATEST PROVISIONS OF THE PHILIPPINE ELECTRICAL CODE, LAWS AND ORDINANCES OF THE LOCAL CODE ENFORCING AUTHORITIES.
2. POWER SUPPLY SHALL BE FROM THREE PHASE, 230 VOLTS, 60 HERTZ, DISTRIBUTION UTILITY.
3. METHOD OF WIRING SHALL BE IN PVC WITH PROPER FITTINGS, DEVICES, BOXES AND SUPPORTS, WORK SHALL BE AS PER PLAN AND SPECIFICATIONS AS TO LOCATION, TYPE AND USE.
4. ALL SWITCHES AND CONVENIENCE OUTLETS SHALL BE FLUSH-MOUNTED 1.37 METERS AND 0.30 METER RESPECTIVELY ABOVE THE FINISHED FLOOR.
5. CONDUIT RUNS ARE INDICATIVE ONLY. THE ACTUAL RUNS SHALL BE DETERMINED IN THE FIELD.
6. OUTLETS FOR EMERGENCY LIGHTING FIXTURE SHALL BE FLUSH-MOUNTED, 2.0 M ABOVE THE FINISHED FLOOR.
7. 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.
8. ALL ELECTRICAL MATERIALS TO BE USED IN THE INSTALLATION SHALL BE NEW, STANDARD AND APPROVED TYPE AS TO LOCATION, TYPES AND PURPOSE.
9. MINIMUM SIZE OF CONDUCTOR TO BE USED SHALL BE 3.5 mm^2 THWN IN 20 mmø uPVC, SCH.40 CONDUIT UNLESS OTHERWISE SPECIFIED IN THE PLAN.
10. ELECTRICAL WORKS SHALL BE DONE UNDER THE DIRECT SUPERVISION OF A DULY LICENSED ELECTRICAL ENGINEER.



MOUNTING DETAIL OF FIXTURE TYPE H

A	B	C	D	E
				
IP20 RECESSED MOUNTED TYPE LOUVERED LIGHTING FIXTURE, WITH MIRROR FINISH ALUMINUM REFLECTOR, 2 x 18 WATTS COOL WHITE HIGH OUTPUT BALLAST- BYPASS TYPE LED LAMP TUBE LUMINAIRES.	IP20 ROUND CEILING LUMINAIRE, SURFACE MOUNTED, 350mm DIAMETER, WHITE STEEL BASE, WHITE OPAL GLASS DIFFUSER AND COMPLETE WITH 2 x 18 WATTS, E27 BASE, FROSTED FINISH COMPACT LED LAMP.	IP54 FLUSHED MOUNTED TYPE LIGHTING FIXTURE, 1200mmx300mm WITH 3mm THICK PRISMATIC DIFFUSER, ZINC PHOSPHATED STEEL SHEET HOUSING, 2 x 18 WATTS, HIGH OUTPUT LED TUBE LAMP.	IP44 WALL MOUNTED LIGHTING FIXTURE, STEEL BASE, WHITE SATINATED GLASS DIFFUSER WITH 1 x 12 WATTS DAY LIGHT COMPACT LED LAMP	IP20 OPEN TYPE LUMINAIRE, WITH ZINC PHOSPHATED DIE-FORMED STEEL SHEET BASE AND WHITE POWDER COAT PAINT FINISH COMPLETE WITH 1 X 9 WATTS LED TUBE LAMP.
F	G	H	I	J
				
IP44 RECESSED MOUNTED VERTICAL PROFILE DOWNLIGHT WITH ALUMINUM REFLECTOR AND POWDER COATED RIM FITTED WITH VERTICALLY PLACED E27 BASE 1 x 12 WATTS COMPACT LED LAMP.	IP20 SURFACE MOUNTED VERTICAL PROFILE DOWNLIGHT WITH ALUMINUM REFLECTOR AND POWDER COATED RIM FITTED WITH VERTICALLY PLACED E27 BASE 1 x 9 WATTS COMPACT LED LAMP.	IP30 WALL MOUNTED LED EMERGENCY EXIT SIGN LIGHT, 2 WATTS.	PORTABLE EMERGENCY LIGHTING FIXTURE, 2 x 2 WATTS LED WARM WHITE WITH BUILT-IN SEALED LEAD ACID BATTERY. CHARGING TIME < 20 HRS; USAGE TIME <= 4 HRS	IP65 UP DOWN WALL MOUNTED OUTDOOR LIGHTING FIXTURE, WITH TOUGHENED GLASS AND DIE-CAST ALUMINUM, AND WITH VERTICALLY PLACED E27 BASE 2 X 9 WATTS COMPACT LED LAMPS.

DETAIL OF LIGHTING FIXTURES

NATURE OF REVISION	BY	CHKD	RECD	APPD

OWNER: **NATIONAL POWER CORPORATION**
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY

LOCATION: BO. OBRERO, ILO-ILO CITY

TITLE: **GENERAL NOTES, DETAILS OF LIGHTING FIXTURES & MOUNTING DETAIL**

	BY	CHKD	DATE
DESIGNED	AMP		
DRAWN	AMP		
REVIEWED	PRINCIPAL ENGR. / ARCHT.		
CIVIL/ARCHT			
ELEC.			
MECH.			

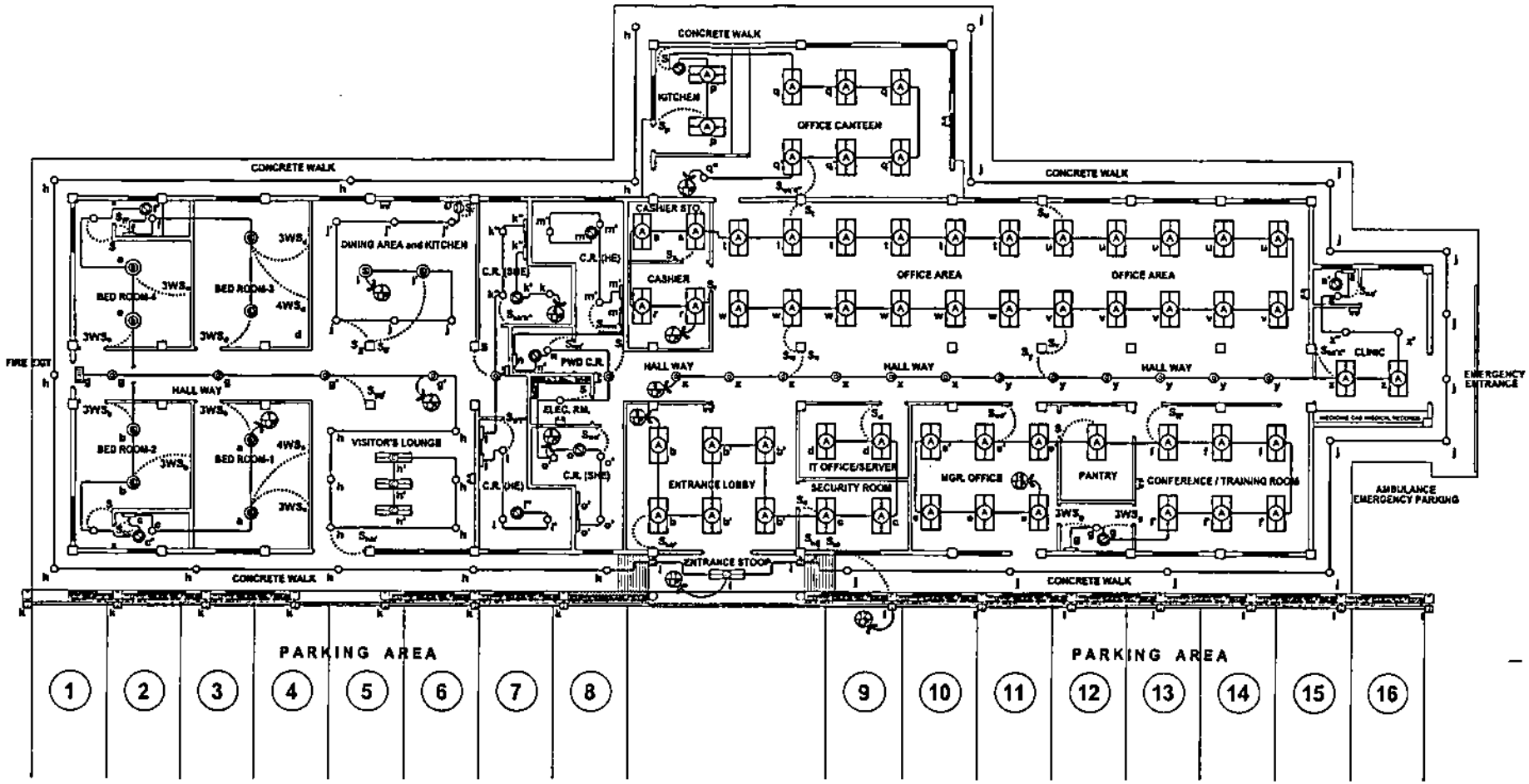
SUBMITTED: B. M. AGUILA

RECOMMENDED: G. Z. C. LUGOD, JR

APPROVED: N. G. SOMOSIERRA
MANAGER, ILO

DWG. NO **BDSH-BDE-13.001** | SPECS NO. **VisP21Z1292Sr**

SCALE: N, T, S | **BID DRAWING** | REV 0



LIGHTING LAYOUT

SCALE 1:150

LEGENDS:

- 2x18W FIXTURE TYPE A
- 2x18W FIXTURE TYPE B
- 2x18W FIXTURE TYPE C
- 1x12W FIXTURE TYPE D
- 1x9W FIXTURE TYPE E
- 1x12W FIXTURE TYPE F
- 1x9W FIXTURE TYPE G
- 2W FIXTURE TYPE H
- 2x2W FIXTURE TYPE I
- 2X9W FIXTURE TYPE J
- CEILING MOUNTED EXHAUST FAN
- WALL MOUNTED EXHAUST FAN OUTLET
- SINGLE POLE SWITCH (SUBSCRIPT DENOTES LAMP BEING CONTROLLED)
- DUPLEX POLE SWITCH (SUBSCRIPT DENOTES LAMP BEING CONTROLLED)
- TRIPLEX POLE SWITCH (SUBSCRIPT DENOTES LAMP BEING CONTROLLED)
- THREE WAY SWITCH (SUBSCRIPT DENOTES LAMP BEING CONTROLLED)
- CIRCUIT RUNNING ON CEILING
- CONTROL CIRCUIT
- CIRCUIT HOMERUN
- LIGHTING PANELBOARD
- POWER PANELBOARD
- WATER HEATER PANELBOARD
- ACU PANELBOARD
- MDP - MAIN DISTRIBUTION PANELBOARD

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETER UNLESS OTHERWISE INDICATED.
2. THIS DRAWING SHALL BE WORKED WITH CIVIL AND MECHANICAL BID DRAWINGS

OWNER: **NATIONAL POWER CORPORATION**
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY

LOCATION: BO. OBRERO, ILO-ILO CITY

TITLE: **LIGHTING LAYOUT**

	BY	CHKD	DATE
DESIGNED	AMP		
DRAWN	AMP		
REVIEWED	PRINCIPAL ENGR. / ARCHT.		
CIVIL/ARCHT			
ELEC.			
MECH.			

SUBMITTED: B. M. AGUILA, PROJECT ENGINEER II, LECD

RECOMMENDED: C. C. C. LUCOD JR., MANAGER, LECD

APPROVED: N. G. BONOSTENKA, MANAGER, DOD

DWG. NO. BDSH-BDE-13.002 SPECS. NO. VisP21Z1292Sr

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

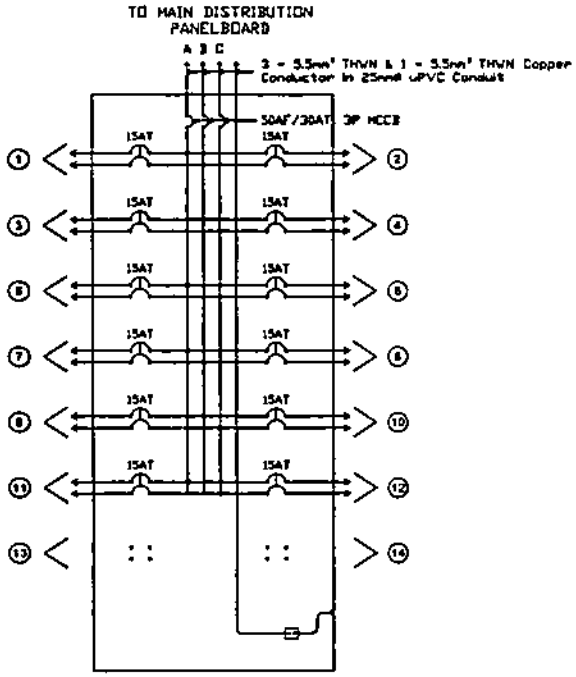
CKT NO.	DESCRIPTION	KVA	VOLTAGE (V)	CURRENT (A)				SIZES		
				3Ø	AB	BC	CA	BREAKER	WIRE	CONDUIT
1	8 – 2x18W FIXTURE TYPE B 2 – 1x9W FIXTURE TYPE E 4 – 1x12W FIXTURE TYPE F 2 – 12W CEILING MOUNTED EXHAUST FAN	487	230		2.03			15AT	2-3.5mm² THWN	20ø mm uPVC
2	3 – 2x18W FIXTURE TYPE C 6 – 1x12W FIXTURE TYPE F 4 – 1x9W FIXTURE TYPE G 1 – 2X2W FIXTURE TYPE H	275	230		1.20			15AT	2-3.5mm² THWN	20ø mm uPVC
3	2 – 2x18W FIXTURE TYPE B 6 – 1x12W FIXTURE TYPE F 1 – 84W WALL MOUNTED EXHAUST FAN	264	230			1.15		15AT	2-3.5mm² THWN	20ø mm uPVC
4	4 – 1x9W FIXTURE TYPE E 8 – 1x12W FIXTURE TYPE F 1 – 1x9W FIXTURE TYPE G 2 – 36W CEILING MOUNTED EXHAUST FAN	219	230			0.95		15AT	2-3.5mm² THWN	20ø mm uPVC
5	5 – 1x9W FIXTURE TYPE E 8 – 1x12W FIXTURE TYPE F 1 – 1x9W FIXTURE TYPE G 2 – 36W CEILING MOUNTED EXHAUST FAN 1 – 12W CEILING MOUNTED EXHAUST FAN	272	230				1.18	15AT	2-3.5mm² THWN	20ø mm uPVC
6	8 – 2x18W FIXTURE TYPE A 1 – 1x9 W FIXTURE TYPE F 1 – 90W CEILING MOUNTED EXHAUST FAN	462	230				2.01	15AT	2-3.5mm² THWN	20ø mm uPVC
7	28 – 2x18W FIXTURE TYPE A	1170	230		5.09			15AT	2-3.5mm² THWN	20ø mm uPVC
8	2 – 2x18W FIXTURE TYPE A 1 – 1x9W FIXTURE TYPE E 3 – 1x12W FIXTURE TYPE F 12 – 1x9W FIXTURE TYPE G 1 – 10W CEILING MOUNTED EXHAUST FAN	291	230		1.27			15AT	2-3.5mm² THWN	20ø mm uPVC
9	10 – 2x18W FIXTURE TYPE A	450	230			1.96		15AT	2-3.5mm² THWN	20ø mm uPVC
10	13 – 2x18W FIXTURE TYPE A 1 – 1x9 W FIXTURE TYPE E 1 – 1x12W FIXTURE TYPE F 1 – 14.5W CEILING MOUNTED EXHAUST FAN	626	230			2.72		15AT	2-3.5mm² THWN	20ø mm uPVC
11	1 – 2x18W FIXTURE TYPE C 2 – 1x12W FIXTURE TYPE D 23 – 1x12W FIXTURE TYPE F	420	230				1.83	15AT	2-3.5mm² THWN	20ø mm uPVC
12	14 – 2X9W FIXTURE TYPE J	315	230				1.37	15AT	2-3.5mm² THWN	20ø mm uPVC
13	SPACE									
14	SPACE									
	TOTAL	5231			9.58	6.78	6.39			

PROVIDE: 50AF/30AT, 3P MCCB
WITH BRANCH CIRCUIT OF:
12 – 15AT, 2P, MCB

USE: 3 – 5.5mm² THWN & 1 – 5.5mm² THWN Copper Conductor in 25mmø uPVC Conduit

SCHEDULE OF LOADS

LIGHTING PANELBOARD



RISER DIAGRAM

LIGHTING PANELBOARD

OWNER: NATIONAL POWER CORPORATION
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY

LOCATION: BO. OBRERO, ILO-ILO CITY

TITLE: SCHEDULE OF LOADS AND RISER DIAGRAM
LIGHTING PANELBOARD

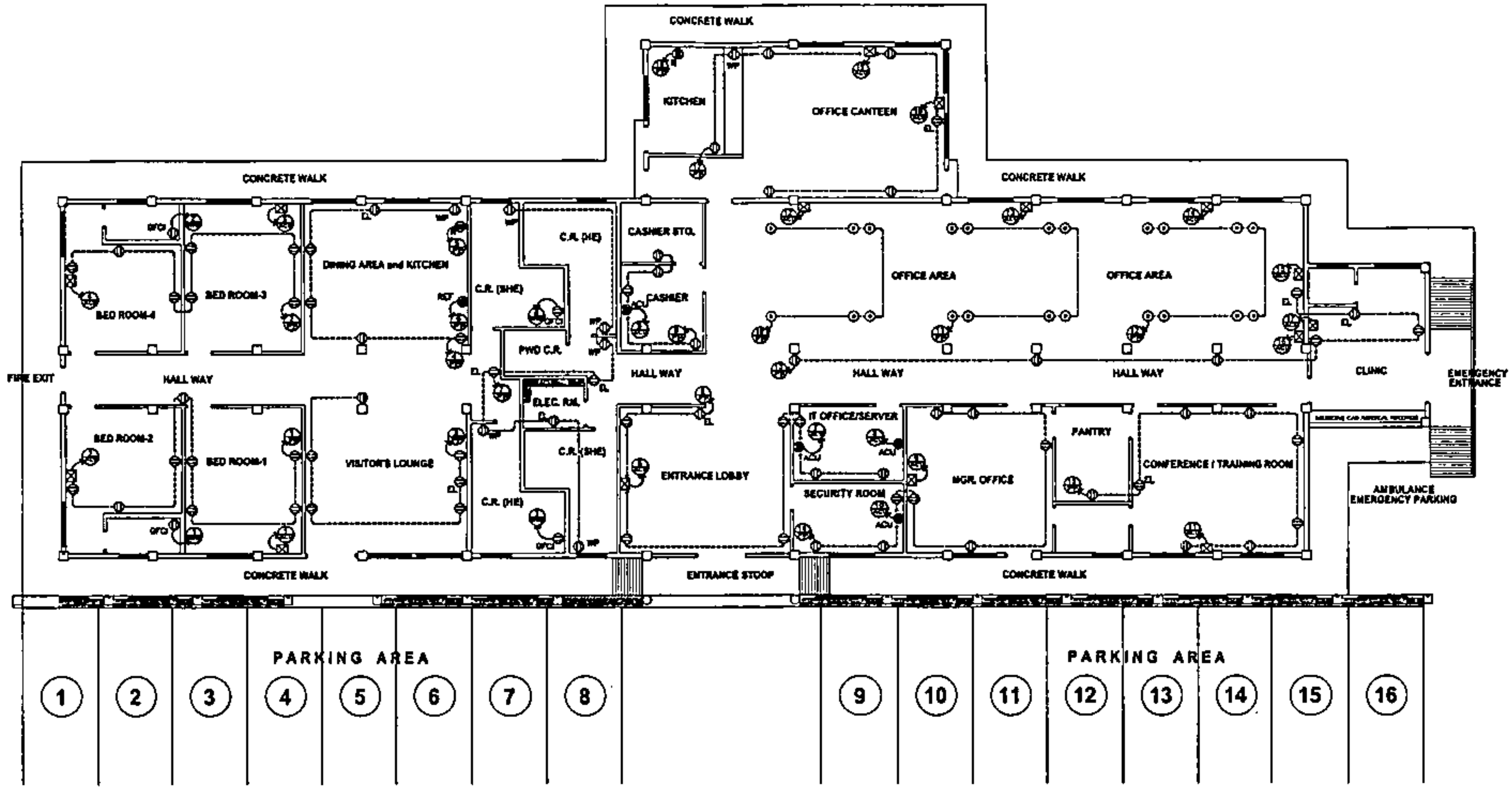
	BY	CHKD	DATE
DESIGNED	AMP		
DRAWN	AMP		
REVIEWED	PRINCIPAL ENGR./ARCHT.		
CIVIL/ARCHT			
ELEC.			
MECH.			

SUBMITTED: B. M. AGUILA, PRINCIPAL ENGINEER A, ESGD
RECOMMENDED: E. Z. C. LUGOD, JR., MANAGER, ELCD
APPROVED: N. G. [illegible], MANAGER, DDD

DWG NO: BDSH-BDE-13.003 | SPECS NO: VisP21Z1292Sr

SCALE: N.T.S | BID DRAWING | REV. 0

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



POWER LAYOUT
SCALE 1:150

LEGENDS:

CONVENIENCE OUTLET	CIRCUIT BREAKER WITH BUILT-IN OUTLET
FLOOR MOUNTED CONVENIENCE OUTLET	CIRCUIT RUNNING UNDER GROUND
WEATHERPROOF CONVENIENCE OUTLET	CIRCUIT HOMERUN
EMERGENCY LIGHT OUTLET	LIGHTING PANELBOARD
REFRIGERATOR UNIT	POWER PANELBOARD
RANGE OUTLET	WATER HEATER PANELBOARD
GFCI OUTLET	ACU PANELBOARD
AIRCONDITIONING UNIT OUTLET	MAIN DISTRIBUTION PANELBOARD

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETER UNLESS OTHERWISE INDICATED.
2. THIS DRAWING SHALL BE WORKED WITH CIVIL AND MECHANICAL BID DRAWINGS

OWNER: NATIONAL POWER CORPORATION
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY

LOCATION: BO. OBRERO, ILO-ILO CITY

TITLE: POWER LAYOUT

	BY	CHKD	DATE
DESIGNED	AMP		
DRAWN	AMP		
REVIEWED	PRINCIPAL ENGR. / ARCHT.		
CIVIL/ARCHT			
ELEC.			
MECH.			

SUBMITTED: B. M. AGUILA, PRINCIPAL ENGINEER

RECOMMENDED: C. C. LUGOD, JR.

APPROVED:

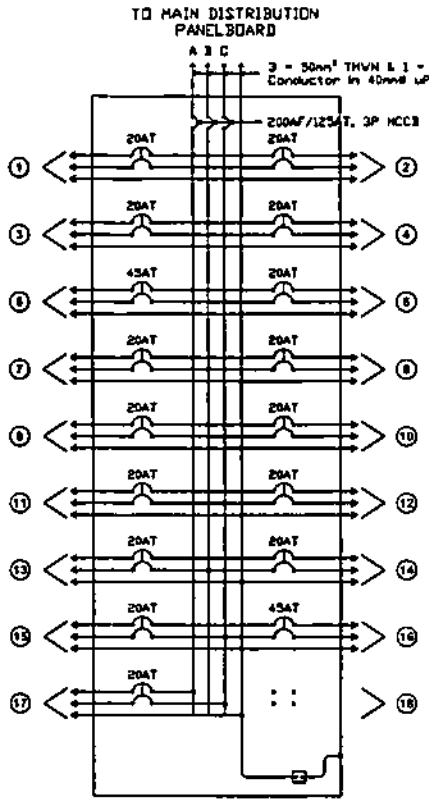
DWG. NO. BDSH-BDE-13.004
SPECS. NO. VIsP21Z1292Sr
SCALE: AS SHOWN
BID DRAWING
REV. 0

CKT NO.	DESCRIPTION	VA	VOLTAGE (V)	CURRENT (A)				SIZES		
				3Ø	AB	BC	CA	BREAKER	WIRE	CONDUIT
1	6 – 200 VA DUPLEX CONVENIENCE OUTLET	1600	230		6.96			20AT	3–3.5mm² THWN	20ø mm uPVC
2	7 – 200 VA DUPLEX CONVENIENCE OUTLET	1400	230		6.09			20AT	3–3.5mm² THWN	20ø mm uPVC
3	5 – 200 VA DUPLEX CONVENIENCE OUTLET 1 – 100 VA OUTLET FOR EMERGENCY LIGHT	1100	230			4.78		20AT	3–3.5mm² THWN	20ø mm uPVC
4	4 – 200 VA DUPLEX CONVENIENCE OUTLET 1 – 100 VA OUTLET FOR EMERGENCY LIGHT 1 – 200 VA WEATHERPROOF CONVENIENCE OUTLET	1100	230			4.78		20AT	3–3.5mm² THWN	20ø mm uPVC
5	1 – 8 KW RANGE OUTLET	8000	230				34.78	45AT	2–8.0mm² THWN 1–5.5mm² THWN	25ø mm uPVC
6	1 – REFRIGERATOR UNIT	2000	230				8.70	20AT	3–3.5mm² THWN	20ø mm uPVC
7	5 – 200 VA WEATHERPROOF CONVENIENCE OUTLET 3 – 100 VA OUTLET FOR EMERGENCY LIGHT	1300	230		5.65			20AT	3–3.5mm² THWN	20ø mm uPVC
8	7 – 200 VA DUPLEX CONVENIENCE OUTLET 1 – 100 VA OUTLET FOR EMERGENCY LIGHT	1500	230		6.52			20AT	3–3.5mm² THWN	20ø mm uPVC
9	4 – 200 VA DUPLEX CONVENIENCE OUTLET	800	230			3.48		20AT	3–3.5mm² THWN	20ø mm uPVC
10	6 – 200 VA FLOOR MOUNTED DUPLEX CONVENIENCE OUTLET	1200	230			5.22		20AT	3–3.5mm² THWN	20ø mm uPVC
11	8 – 200 VA FLOOR MOUNTED DUPLEX CONVENIENCE OUTLET	1600	230				6.96	20AT	3–3.5mm² THWN	20ø mm uPVC
12	8 – 200 VA FLOOR MOUNTED DUPLEX CONVENIENCE OUTLET	1600	230				6.96	20AT	3–3.5mm² THWN	20ø mm uPVC
13	5 – 200 VA DUPLEX CONVENIENCE OUTLET 2 – 100 VA OUTLET FOR EMERGENCY LIGHT	1200	230		5.22			20AT	3–3.5mm² THWN	20ø mm uPVC
14	8 – 200 VA DUPLEX CONVENIENCE OUTLET	1600	230		6.96			20AT	3–3.5mm² THWN	20ø mm uPVC
15	7 – 200 VA DUPLEX CONVENIENCE OUTLET 1 – 100 VA OUTLET FOR EMERGENCY LIGHT	1500	230			6.52		20AT	3–3.5mm² THWN	20ø mm uPVC
16	1 – 8 KW RANGE OUTLET	8000	230			34.78		45AT	2–8.0mm² THWN 1–5.5mm² THWN	25ø mm uPVC
17	5 – 200 VA DUPLEX CONVENIENCE OUTLET 1 – 200 VA WEATHERPROOF CONVENIENCE OUTLET 1 – 100 VA OUTLET FOR EMERGENCY LIGHT	1300	230				5.65	20AT	3–3.5mm² THWN	20ø mm uPVC
18	SPACE									
	TOTAL	31600			37.39	59.57	63.04			

PROVIDE: 200AF/125AT, 3P MCCB
WITH BRANCH CIRCUIT OF:
15 – 20AT, 2P, MCB
2 – 45AT, 2P, MCB

USE: 3 – 50mm² THWN & 1 – 14.0mm² THWN Copper Conductor in 40mmø uPVC Conduit

SCHEDULE OF LOADS
POWER PANELBOARD



RISER DIAGRAM
POWER PANELBOARD

OWNER: NATIONAL POWER CORPORATION
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY

LOCATION: BO. OBRERO, ILO-ILO CITY

TITLE: SCHEDULE OF LOADS AND RISER DIAGRAM
POWER PANELBOARD

	BY	CHKD	DATE
DESIGNED	AMP		
DRAWN	AMP		
REVIEWED	PRINCIPAL ENGR./ARCHT.		
CIVIL/ARCHT			
ELEC.			
MECH.			

SUBMITTED: S. M. AGUILA, PRINCIPAL ENGINEER A, LUCO
RECOMMENDED: C. C. LUCOD, JR., MANAGER, LUCO
APPROVED: N. C. SOMOSIERRA, MANAGER, DDD

DWG. NO. BDSH-BDE-13.005
SPECS. NO. VIsP21Z1292Sr
SCALE: N.T.S
BID DRAWING
REV. 0

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

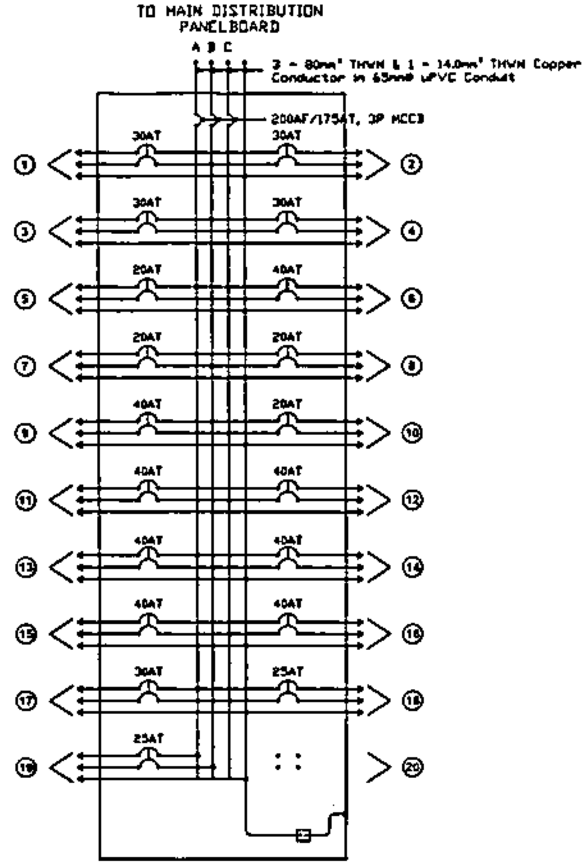
CKT NO.	DESCRIPTION	VA	VOLTAGE (V)	CURRENT (A)				SIZES		
				3Ø	AB	BC	CA	BREAKER	WIRE	CONDUIT
1	2.0 HP WINDOW TYPE AIR CONDITIONING UNIT (BEDROOM 1)	2760	230		12			30AT	3-5.5mm² THWN	20Ø mm uPVC
2	2.0 HP WINDOW TYPE AIR CONDITIONING UNIT (BEDROOM 2)	2760	230		12			30AT	3-5.5mm² THWN	20Ø mm uPVC
3	2.0 HP WINDOW TYPE AIR CONDITIONING UNIT (BEDROOM 3)	2760	230			12		30AT	3-5.5mm² THWN	20Ø mm uPVC
4	2.0 HP WINDOW TYPE AIR CONDITIONING UNIT (BEDROOM 4)	2760	230			12		30AT	3-5.5mm² THWN	20Ø mm uPVC
5	1.0 HP SPLIT TYPE AIR CONDITIONING UNIT (CASHIER)	1840	230				8	20AT	3-3.5mm² THWN	20Ø mm uPVC
6	2.5 HP SPLIT TYPE AIR CONDITIONING UNIT (OFFICE LOBBY)	3335	230				14.5	40AT	2-8.0mm² THWN 1-5.5mm² THWN	25Ø mm uPVC
7	1.0 HP SPLIT TYPE AIR CONDITIONING UNIT (IT OFFICE/SERVER)	1840	230		8			20AT	3-3.5mm² THWN	20Ø mm uPVC
8	1.0 HP SPLIT TYPE AIR CONDITIONING UNIT (IT OFFICE/SERVER)	1840	230		8			20AT	3-3.5mm² THWN	20Ø mm uPVC
9	2.5 HP SPLIT TYPE AIR CONDITIONING UNIT (MANAGER'S OFFICE)	3335	230			14.5		40AT	2-8.0mm² THWN 1-5.5mm² THWN	25Ø mm uPVC
10	1.0 HP SPLIT TYPE AIR CONDITIONING UNIT (SECURITY ROOM)	1840	230			8		20AT	3-3.5mm² THWN	20Ø mm uPVC
11	2.5 HP SPLIT TYPE AIR CONDITIONING UNIT (CONFERENCE ROOM)	3335	230				14.5	40AT	2-8.0mm² THWN 1-5.5mm² THWN	25Ø mm uPVC
12	2.5 HP SPLIT TYPE AIR CONDITIONING UNIT (OFFICE AREA)	3335	230				14.5	40AT	2-8.0mm² THWN 1-5.5mm² THWN	25Ø mm uPVC
13	2.5 HP SPLIT TYPE AIR CONDITIONING UNIT (OFFICE AREA)	3335	230		14.5			40AT	2-8.0mm² THWN 1-5.5mm² THWN	25Ø mm uPVC
14	2.5 HP SPLIT TYPE AIR CONDITIONING UNIT (OFFICE AREA)	3335	230		14.5			40AT	2-8.0mm² THWN 1-5.5mm² THWN	25Ø mm uPVC
15	2.5 HP SPLIT TYPE AIR CONDITIONING UNIT (OFFICE AREA)	3335	230			14.5		40AT	2-8.0mm² THWN 1-5.5mm² THWN	25Ø mm uPVC
16	2.5 HP SPLIT TYPE AIR CONDITIONING UNIT (OFFICE AREA)	3335	230			14.5		40AT	2-8.0mm² THWN 1-5.5mm² THWN	25Ø mm uPVC
17	2.0 HP SPLIT TYPE AIR CONDITIONING UNIT (CLINIC)	2760	230				12	30AT	3-5.5mm² THWN	20Ø mm uPVC
18	1.5 HP SPLIT TYPE AIR CONDITIONING UNIT (CANTEEN)	2300	230				10	25AT	3-3.5mm² THWN	20Ø mm uPVC
19	1.5 HP SPLIT TYPE AIR CONDITIONING UNIT (CANTEEN)	2300	230		10			25AT	3-3.5mm² THWN	20Ø mm uPVC
20	SPACE									
	TOTAL	52440			79.00	75.50	73.50			

PROVIDE: 200AF/175AT, 3P MCCB
WITH BRANCH CIRCUIT OF:
4 - 20AT, 2P, MCB
2 - 25AT, 2P, MCB
5 - 30AT, 2P, MCB
8 - 40AT, 2P, MCB

USE: 3 - 80mm² THWN & 1 - 14.0mm² THWN Copper Conductor in 65mmØ uPVC Conduit

SCHEDULE OF LOADS

ACU PANELBOARD



RISER DIAGRAM

ACU PANELBOARD

OWNER: NATIONAL POWER CORPORATION
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY

LOCATION: BO. OBRERO, ILO-ILO CITY

TITLE: SCHEDULE OF LOADS AND RISER DIAGRAM
ACU PANELBOARD

	BY	CHKD	DATE
DESIGNED	AMP		
DRAWN	AMP		
REVIEWED	PRINCIPAL ENG'R / ARCHT.		
CIVIL/ARCHT			
ELEC.			
MECH.			

SUBMITTED: B. M. ACUÑA, PRINCIPAL ENGINEER B, ELCD

RECOMMENDED: C. C. LUGOD, JR., MANAGER, ELCD

APPROVED: MANAGER, DDD

DWG. NO. BDSH-BDE-13.006

SPECS NO. VisP21Z1292Sr

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

SCALE: N.T.S

BID DRAWING

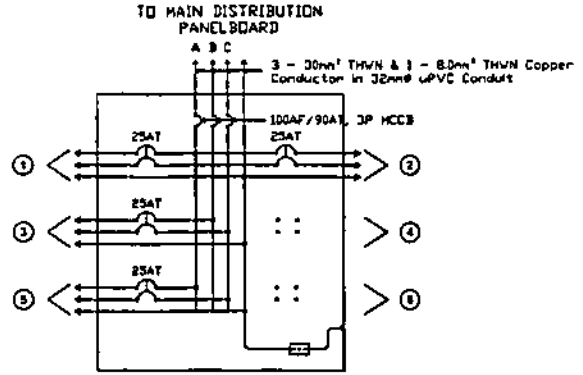
REV. 0

CKT NO.	DESCRIPTION	VA	VOLTAGE (V)	CURRENT (A)				SIZES		
				3Ø	AB	BC	CA	BREAKER	WIRE	CONDUIT
1	1 – 3.5KW BATHROOM SHOWER HEATER (BEDROOM 2)	4375	230		19.02			25AT	3–5.5mm² THWN	20ø mm uPVC
2	1 – 3.5KW BATHROOM SHOWER HEATER (BEDROOM 4)	4375	230		19.02			25AT	3–5.5mm² THWN	20ø mm uPVC
3	1 – 3.5KW BATHROOM SHOWER HEATER (BUNKHOUSE MALE C.R.)	4375	230			19.02		25AT	3–5.5mm² THWN	20ø mm uPVC
4	SPACE									
5	1 – 3.5KW BATHROOM SHOWER HEATER (BUNKHOUSE FEMALE C.R.)	4375	230				19.02	25AT	3–5.5mm² THWN	20ø mm uPVC
6	SPACE									
	TOTAL	13125			38.04	19.02	19.02			

PROVIDE: 100AF/90AT, 3P MCCB
WITH BRANCH CIRCUIT OF:
4 – 25AT, 2P, MCB

USE: 3 – 30mm² THWN & 1 – 8.0mm² THWN Copper Conductor in 32mmø uPVC Conduit

SCHEDULE OF LOADS
WATER HEATER PANELBOARD



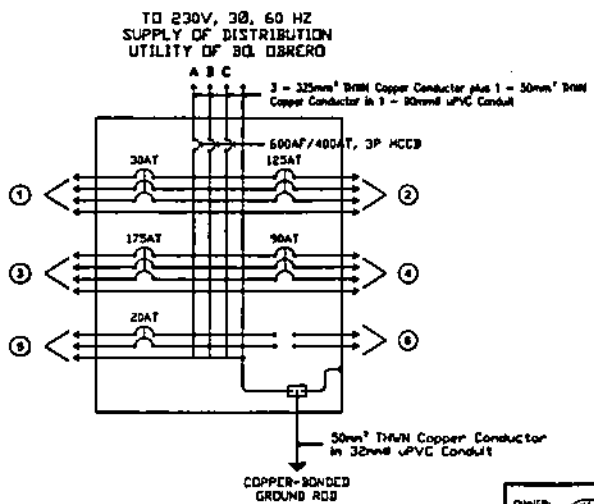
RISER DIAGRAM
WATER HEATER PANELBOARD

CKT NO.	DESCRIPTION	VA	VOLTAGE (V)	CURRENT (A)				SIZES		
				3Ø	AB	BC	CA	BREAKER	WIRE	CONDUIT
1	LIGHTING PANELBOARD	5231	230		9.58	8.78	6.39	30AT	3–5.5mm² THWN 1–5.5mm² THWN	25ø mm uPVC
2	POWER PANELBOARD	31600	230		37.39	58.57	63.04	125AT	3–50mm² THWN 1–14mm² THWN	50ø mm uPVC
3	AIR CONDITIONING PANELBOARD	52440	230		79.0	75.5	73.5	175AT	3–80mm² THWN 1–14mm² THWN	65ø mm uPVC
4	WATER HEATER PANELBOARD	17500	230		38.04	19.02	19.02	90AT	3–30mm² THWN 1–8.0mm² THWN	32ø mm uPVC
5	FIRE ALARM CONTROL PANEL	200	230		0.87			20AT	3–3.5mm² THWN	20ø mm uPVC
6	SPACE									
	TOTAL	106971			164.01	160.87	161.95			

PROVIDE: 600AF/400AT, 3P MCCB
WITH BRANCH CIRCUIT OF:
1 – 30AT, 3P, MCCB
1 – 90AT, 3P, MCCB
1 – 125AT, 3P, MCCB
1 – 175AT, 3P, MCCB
1 – 20AT, 2P, FIRE ALARM CIRCUIT BREAKER

PROVIDE: 3 – 325mm² THWN Copper Conductor plus
1 – 50mm² THWN Copper Conductor in
1 – 90mmø uPVC Conduit

SCHEDULE OF LOADS
MAIN DISTRIBUTION PANELBOARD



RISER DIAGRAM
MAIN DISTRIBUTION PANELBOARD

OWNER: NATIONAL POWER CORPORATION
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY

LOCATION: BO. OBRERO, ILO-ILO CITY

TITLE: SCHEDULE OF LOADS AND RISER DIAGRAM
WATER HEATER PANELBOARD & MAIN DISTRIBUTION PANELBOARD

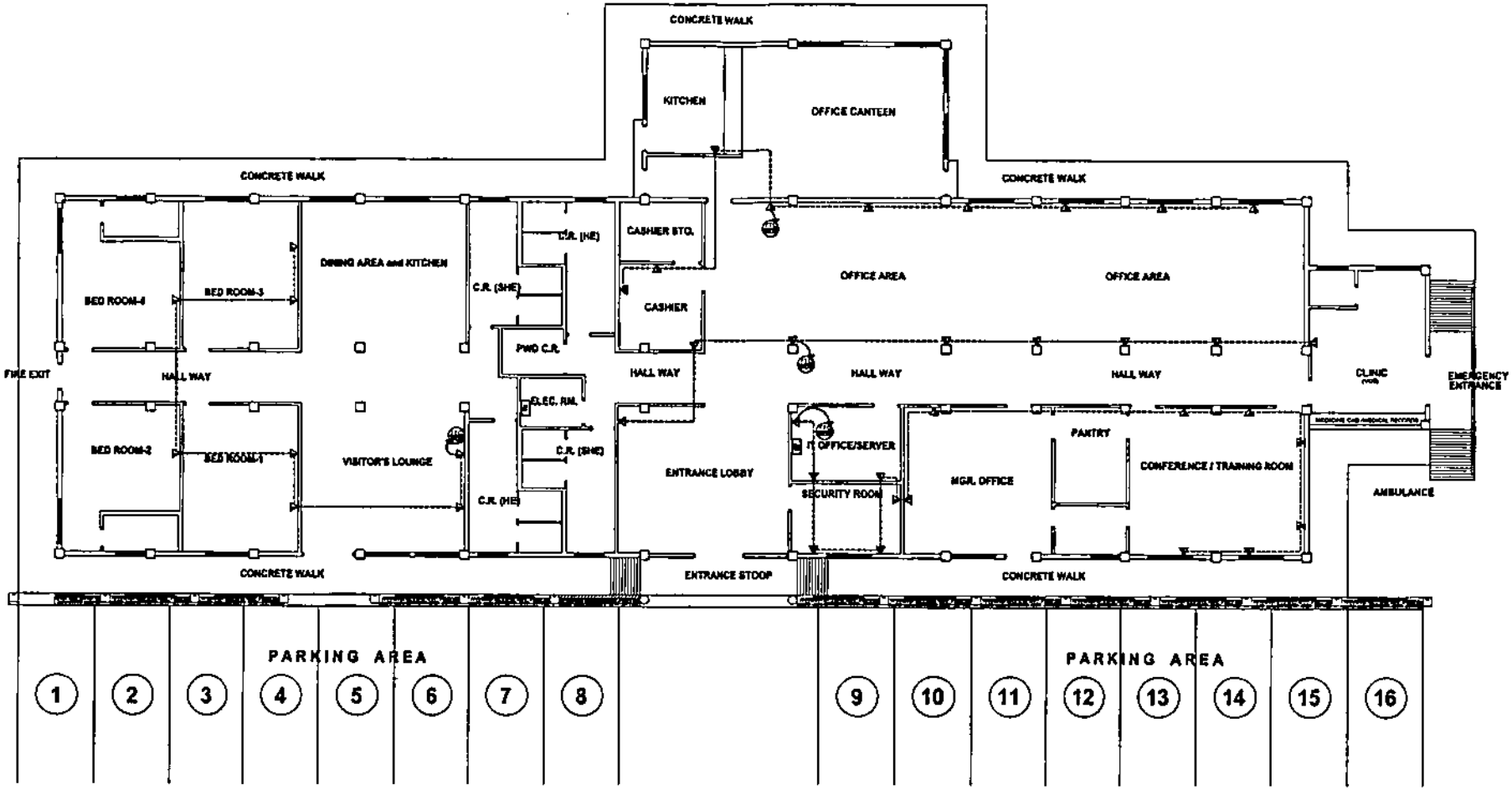
	BY	CHKD	DATE
DESIGNED	AMP		
DRAWN	AMP		
REVIEWED	PRINCIPAL ENGR./ ARCHT.		
CIVIL/ARCHT			
E.E/C.			
MECH.			

SUBMITTED: B. M. ABULA, PRINCIPAL ENGINEER A, ELECO
RECOMMENDED: C. Z. C. LUCOD JR., MANAGER, ELECO
APPROVED: N. U. [illegible], MANAGER, LDDD

DWG. NO. BDSH-BDE-13.007 | SPECS. NO. VisP21Z1292Sr

SCALE: N.T.S | BID DRAWING | REV. 0

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



STRUCTURED CABLING SYSTEM
SCALE 1:150

LEGENDS:

- SURFACE MOUNTED VOICE AND DATA OUTLET
- TTC - TELEPHONE TERMINAL CABINET
- MDF - MAIN DISTRIBUTION FRAME
- WIRING IN CONDUIT

NOTES:

1. CONDUITS SHALL BE uPVC, SCHEDULE 40, UNLESS OTHERWISE INDICATED.
2. ALL WORKS SHALL BE CONFORMED WITH THE LATEST PROVISIONS/ EDITIONS OF THE PHILIPPINE ELECTRICAL CODE.
3. THIS DRAWING SHALL BE WORKED WITH CIVIL AND MECHANICAL BID DRAWINGS.

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

OWNER: NATIONAL POWER CORPORATION
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY

LOCATION: BO. OBRERO, ILO-ILO CITY

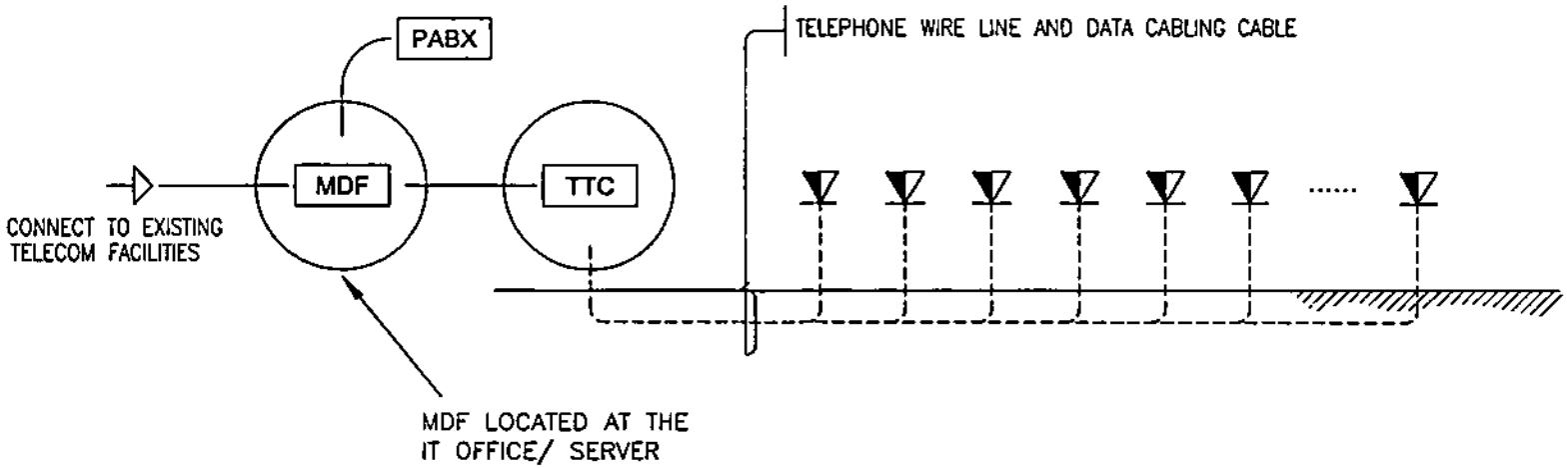
TITLE: **STRUCTURED CABLING SYSTEM**

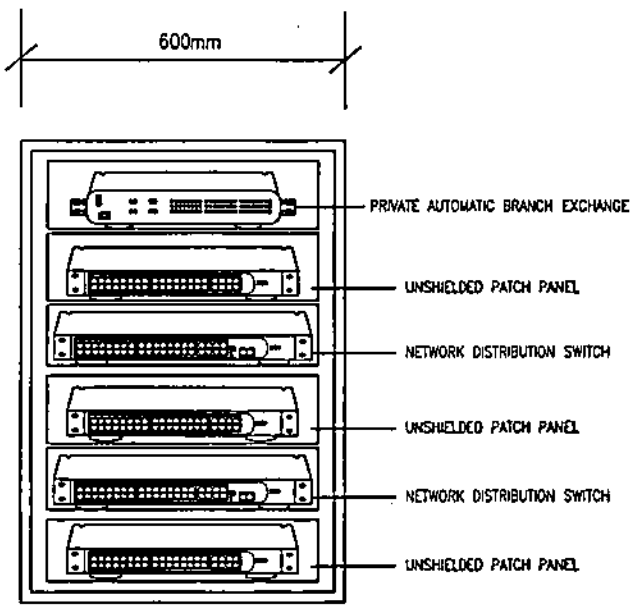
	BY	CHKD	DATE
DESIGNED			
DRAWN	JAC		
REVIEWED	PRINCIPAL ENGR. / ARCHT.		
CIVIL/ARCHT			
ELEC.			
MECH.			

SUBMITTED: B. M. AGUILA, PRINCIPAL ENGINEER A-ESCD
RECOMMENDED: C. Z. C. LUGOD JR., MANAGER, ESCD
APPROVED: N. G. SARMIENTA, MANAGER, DOD

DWG NO. BDSH-BDE-13.008 SPECS. NO. VisP21Z1292Sr

SCALE: AS SHOWN | BID DRAWING | REV. 0





NOTES:

1. THE DESIGN SYSTEM REQUIREMENTS SHALL NOT BE LESS THAN QUANTITIES SPECIFIED IN THE BILL OF QUANTITIES (BOQ).
2. CONDUITS SHALL BE uPVC, SCHEDULE 40, UNLESS OTHERWISE INDICATED.
3. ALL NECESSARY MATERIALS AND ACCESSORIES THAT ARE NEEDED FOR THE COMPLETE AND RELIABLE OPERATION OF THE SYSTEM SHALL HEREBY PROVIDED BY THE CONTRACTOR.

STRUCTURED CABLING NETWORK DIAGRAM AND RACK ELEVATIONS

SCALE N.T.S.

OWNER: **NATIONAL POWER CORPORATION**
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY

LOCATION: BO. OBRERO, ILO-ILO CITY

TITLE: **STRUCTURED CABLING NETWORK DIAGRAM AND RACK ELEVATIONS**

	BY	CHKD	DATE
DESIGNED			
DRAWN	JAC		
REVIEWED	PRINCIPAL ENGR. / ARCHT.		
CIVIL/ARCHT			
ELEC.			
MECH.			

SUBMITTED: B. M. AGUILA, PRINCIPAL ENGINEER A, EECD

RECOMMENDED: E. Z. C. LUCOD JR., MANAGER, EECD

APPROVED: [illegible], MANAGER, DDD

DWG. NO. BDSH-BDE-13.009 SPECS. NO. VisP21Z1292Sr

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

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

SECTION IX

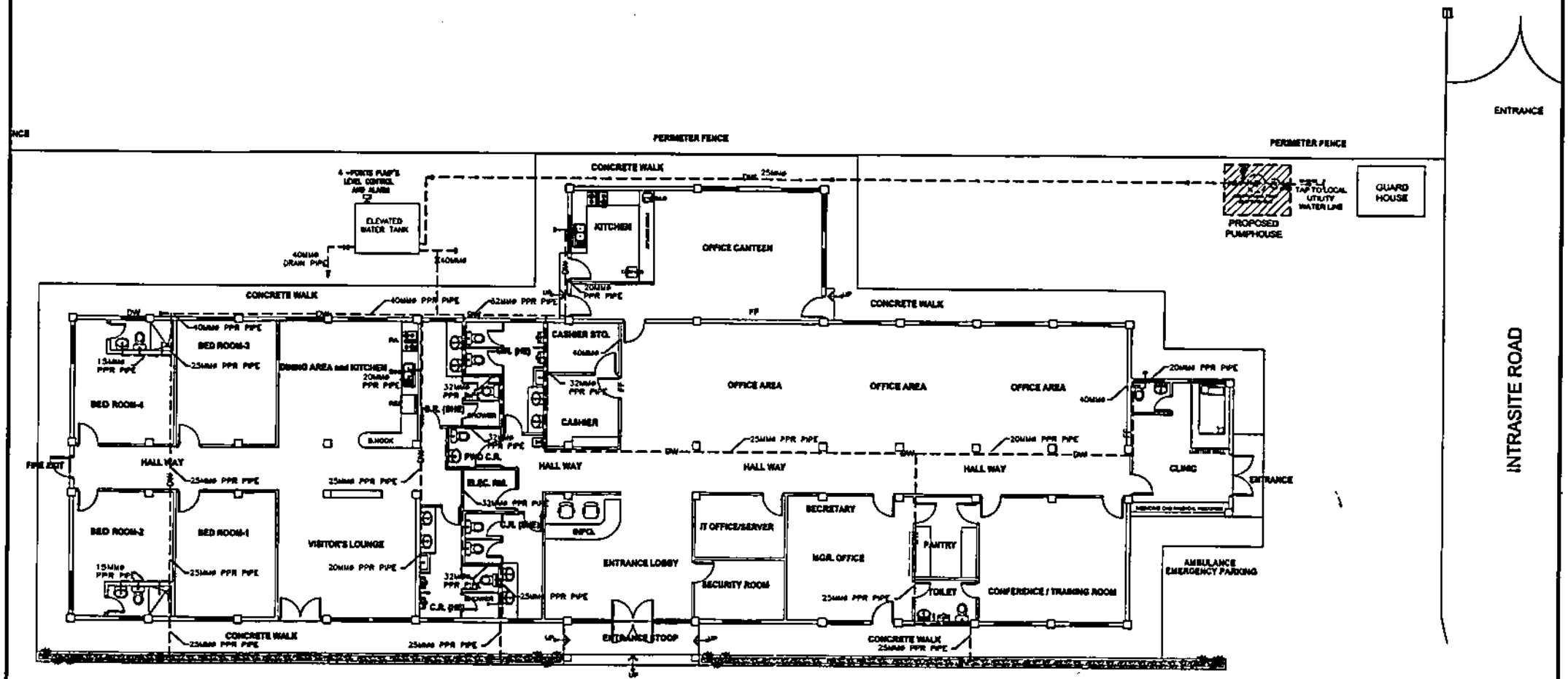
BID DRAWINGS

MW - (MECHANICAL WORKS)

SECTION IX - BID DRAWINGS

MW - MECHANICAL WORKS

DRAWING NO.	TITLE
BDSH-BDM-13.001	DOMESTIC WATER SYSTEM
BDSH-BDM-13.002	DOMESTIC WATER PIPING SYSTEM P & I DIAGRAM
BDSH -BDM-13.003	AIR CONDITIONING, VENTILATION SYSTEM AND FIRE FIGHTING SYSTEM (1 OF 2)
BDSH -BDM-13.004	AIR CONDITIONING, VENTILATION SYSTEM AND FIRE FIGHTING SYSTEM (2 OF 2)



NOTES:

1. THIS DRAWING IS FOR BIDDING PURPOSES ONLY.
2. ALL WORKS SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE TECHNICAL SPECIFICATIONS.
3. PIPING LAID UNDERGROUND SHALL NOT BE LESS THAN 300MM FROM THE GROUND SURFACE TO THE BOTTOM OF PIPE.
4. FOR PIPES THAT CROSSES ROADWAYS, PIPE SLEEVE OF STEEL MATERIAL SHALL BE PROVIDED.
5. ALL PIPES, VALVES, VALVE BOXES & FITTINGS, SHALL BE PROPERLY SUPPORTED/INSTALLED FOR THE EFFICIENT AND PROPER OPERATION OF THE SYSTEM.
6. ALL PIPES AND VALVES' BROCHURES/CATALOGUES SHALL BE SUBMITTED BY THE CONTRACTOR, FOR NPC'S REVIEW AND APPROVAL, PRIOR TO PROCUREMENT/INSTALLATION.
7. MAIN WATER PIPES/ LINES SHALL PREFERABLY BE INSTALLED UNDERGROUND NO LESS THAN 300 MM DEPTH.
8. 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.
9. ALL PP-R PIPE DIMENSIONS (CONFORMING TO PN 20 NOMINAL PRESSURE CLASS) SHOWN ARE IN NOMINAL DIAMETER (MM) WITH THE FOLLOWING EQUIVALENTS:

65MM (2 1/2")	=	75MM O.D. (OUTSIDE DIAMETER)
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.

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

OWNER: NATIONAL POWER CORPORATION
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY

LOCATION: BO. OBRERO, ILOILO CITY

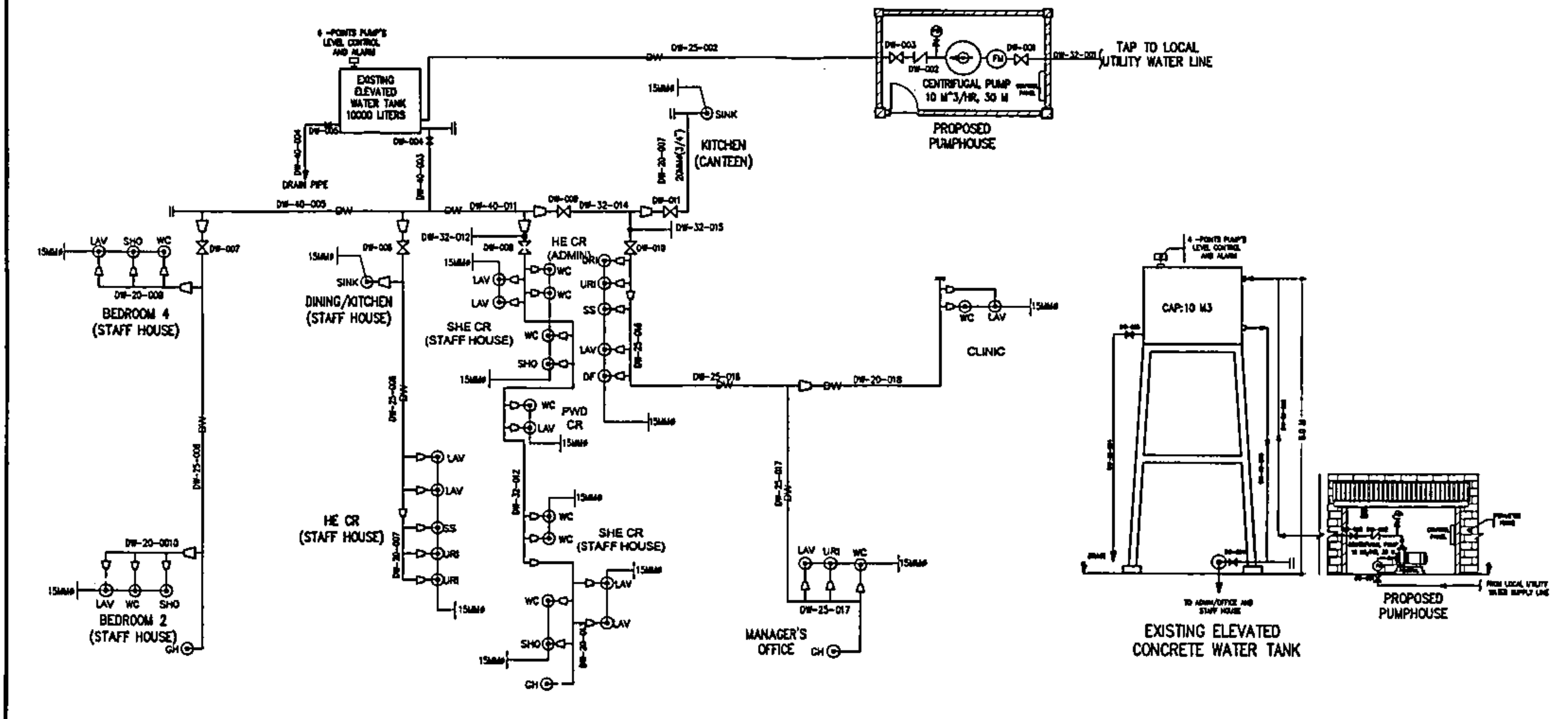
TITLE: DOMESTIC WATER SYSTEM

	BY	CHKD	DATE
DESIGNED	SEDB		JULY 2021
DRAWN	SEDB		JULY 2021
REVIEWED	PRINCIPAL C.O.R. / ARCHT.		
CIVIL/ARCHT			
ELEC.			
MECH.			

SUBMITTED: R. M. SAMARAWAN, Principal Engineer A
RECOMMENDED: J. A. [illegible], JR., Manager, SEDB
APPROVED: N. G. [illegible], Manager, SEDD

DWG. NO. BDSH-BDM-13.001 SPECS. NO. VisP21Z1292Sr

SCALE 1:50 BID DRAWING



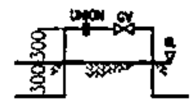
NOTES:

1. THIS DRAWING IS FOR BIDDING PURPOSES ONLY.
2. ALL WORKS SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE TECHNICAL SPECIFICATIONS.
3. PIPING LAID UNDERGROUND SHALL NOT BE LESS THAN 300MM FROM THE GROUND SURFACE TO THE BOTTOM OF PIPE.
4. FOR PIPES THAT CROSSES ROADWAYS, PIPE SLEEVE OF STEEL MATERIAL SHALL BE PROVIDED.
5. ALL PIPES, VALVES, VALVE BOXES & FITTINGS, SHALL BE PROPERLY SUPPORTED/INSTALLED FOR THE EFFICIENT AND PROPER OPERATION OF THE SYSTEM.
6. ALL PIPES AND VALVES' BROCHURES/CATALOGUES SHALL BE SUBMITTED BY THE CONTRACTOR, FOR NPC'S REVIEW AND APPROVAL, PRIOR TO PROCUREMENT/INSTALLATION.
7. FINAL DETAILS AND ADJUSTMENT SHALL BE DONE IN THE FIELD BY THE CONTRACTOR DURING INSTALLATION TO SUIT ACTUAL SITE CONDITIONS. ALL WORKS SHALL BE EXECUTED IN CLOSE COORDINATION WITH ALL TRADES.
8. MAIN WATER PIPES/ LINES SHALL PREFERABLY BE INSTALLED UNDERGROUND NO LESS THAN 300 MM DEPTH.
9. ALL PP-R PIPE DIMENSIONS (CONFORMING TO PN 20 NOMINAL PRESSURE CLASS) SHOWN ARE IN NOMINAL DIAMETER (MM) WITH THE FOLLOWING EQUIVALENTS:

   65MM (2 1/2") = 75MM O.D. (OUTSIDE DIAMETER)
   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.

LEGEND:

- ⊣| – BLIND FLANGE/CAP
- CHECK VALVE
- GATE VALVE
- GLOBE VALVE
- REDUCER
- DF – DRINKING FOUNTAIN
- GH – GARDEN HOSE
- LAV – LAVATORY
- WC – WATER CLOSET
- SS – SLOP SINK
- SNK – KITCHEN SERVICE SINK
- FHC – FIRE HOSE CABINET
- DW – DOMESTIC WATER LINE
- FF – FIRE FIGHTING WATER LINE



"ISOLATION VALVE" DETAIL "A"

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

OWNER: **NATIONAL POWER CORPORATION**
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOSUE AT BO. OBRERO, ILOILO CITY

LOCATION: BO. OBRERO, ILOILO CITY

TITLE: **DOMESTIC WATER PIPING SYSTEM P & I DIAGRAM**

	BY	CHKD	DATE
DESIGNED	SECB		JULY 2021
DRAWN	SECB		JULY 2021
REVIEWED	PRINCIPAL ENGTR. / ARCHT.		
CIVIL/ARCHT			
ELEC.			
MECH.			

SUBMITTED: R. M. [illegible]SAWAN, Principal Engineer A

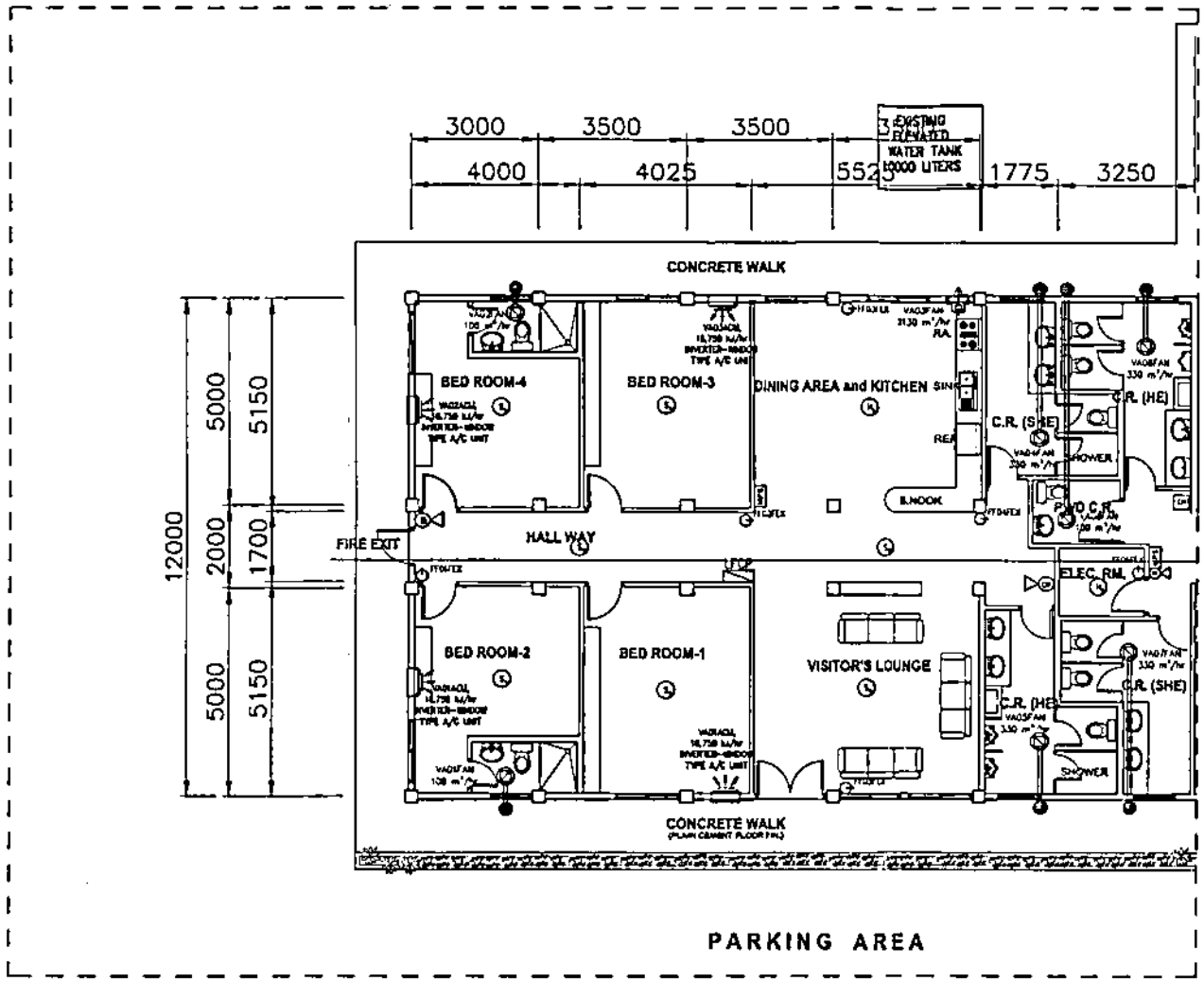
RECOMMENDED: J. A. TAPEL, JR.

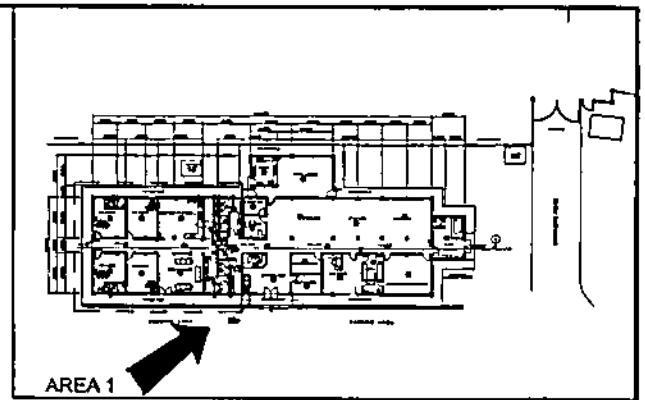
APPROVED: N. G. [illegible]

DWG. NO **BDSH-BDM-13.002** SPECS. NO. **VIsP21Z1292Sr**

SCALE NTS

BID DRAWING





NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED
2. THE CONTRACTOR SHALL SUBMIT TO NPC FOR REVIEW AND APPROVAL, BROCHURES, TECHNICAL SPECIFICATIONS/DATA, INSTALLATION DRAWINGS OF EQUIPMENT AND MATERIALS TO BE FURNISHED PRIOR TO EXECUTION OF WORKS.
3. LOCATION/LAYOUT OF EQUIPMENT AS SHOWN ARE PRELIMINARY/INDICATIVE ONLY . FINAL LOCATION/LAYOUT SHALL BE DETERMINED BY THE CONTRACTOR TO SUIT ACTUAL FIELD CONDITIONS AND AS REQUIRED BY THE MANUFACTURER TO ENSURE EASY OPERATION AND MAINTAINABILITY.
4. NECESSARY DRILLING/BORING SHALL BE DONE BY THE CONTRACTOR IN AN APPROVED MANNER AND PROPER CARE SHALL BE TAKEN TO ENSURE THAT THE STRUCTURAL INTEGRITY OF THE BUILDING IS PRESERVED. SIZE/S AND EXACT LOCATION OF PIPE SHALL BE APPROVED BY NPC.
5. SEISMIC RESTRAINTS FOR ALL RIGIDITY AND RESILIENTLY SUPPORTED EQUIPMENT SHALL BE PROVIDED BY THE CONTRACTOR. ALL PIPING RESTRAINTS SHALL BE DESIGNED TO PREVENT PERMANENT DISPLACEMENT IN ANY DIRECTION CAUSE BY LATERAL MOTION.
6. ALL EQUIPMENT AND PIPES SHALL BE ADEQUATELY SUPPORTED. ALL VIBRATING EQUIPMENT SHALL BE PROVIDED WITH INSULATOR WHEN NECESSARY TO PREVENT VIBRATION AND NOISE TRANSMISSION.
7. DRAINS FOR AIR CONDITIONING UNITS SHALL BE PROPERLY ROUTED/DISCHARGE OUTSIDE THE BUILDING
8. DISCHARGED AIR FROM CEILING TYPE EXHAUST FANS SHALL BE DIRECTED OUTSIDE THE BUILDING THROUGH FLEXIBLE HOSES OR DUCTS.

LEGEND:

- WINDOW TYPE AIR CONDITIONING UNIT (INVERTER)
- EXHAUST FAN (WALL MOUNTED)
- EXHAUST FAN (CEILING MOUNTED)
- SMOKE DETECTOR, ADDRESSABLE TYPE (PHOTOELECTRIC)
- SMOKE DETECTOR, CONVENTIONAL TYPE (PHOTOELECTRIC)
- HEAT DETECTOR, ADDRESSABLE TYPE (PHOTOELECTRIC)
- FIRE ALARM BELL
- MPS — MANUAL PULL STATION
- MFCP — MAIN FIRE ALARM CONTROL PANEL

OWNER: NATIONAL POWER CORPORATION
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOUSE AT BO. OBRERO, ILOILO CITY

LOCATION: BO. OBRERO, ILOILO CITY

TITLE: AIR CONDITIONING, VENTILATION SYSTEM AND FIRE FIGHTING SYSTEM (1 OF 2)

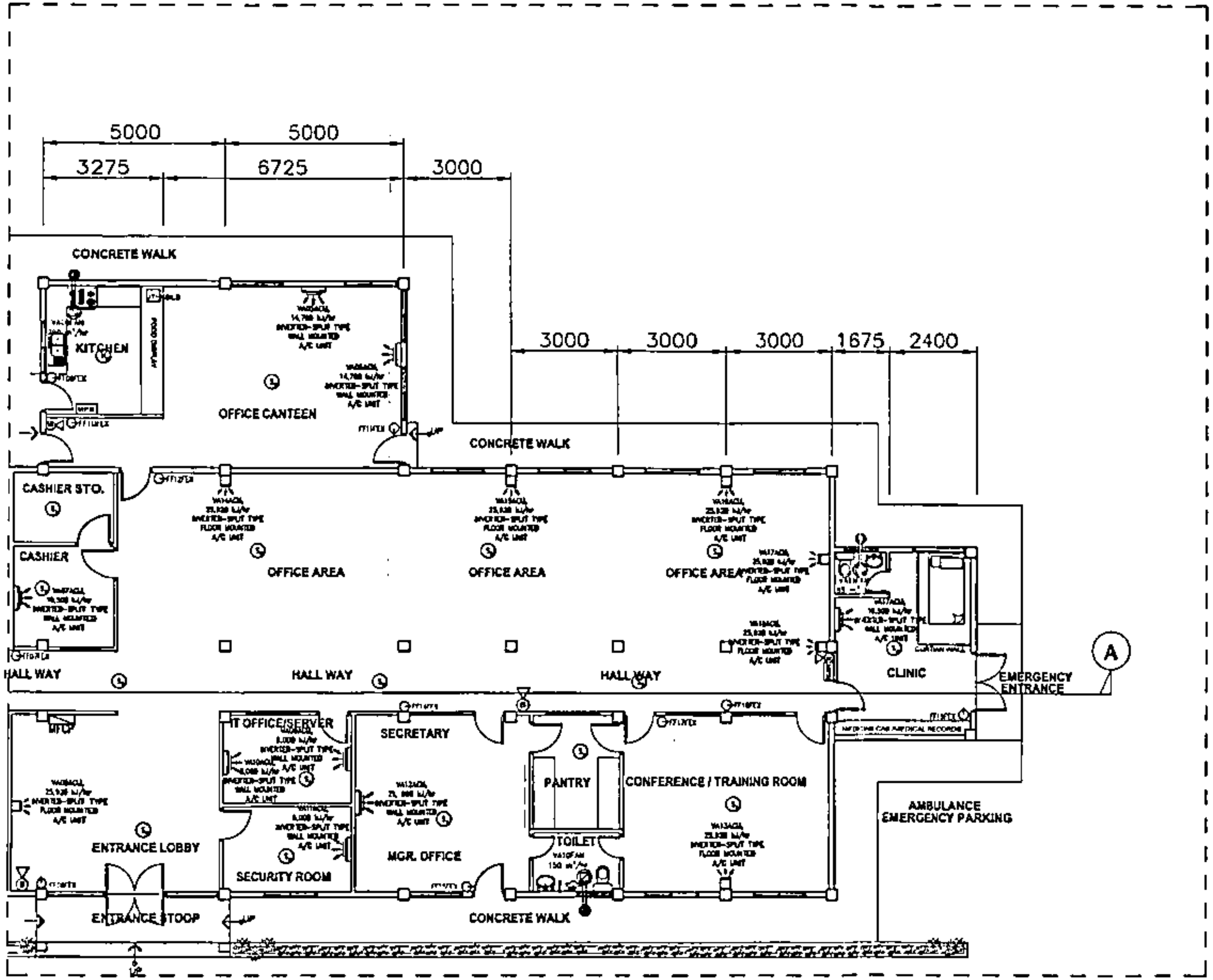
	BY	CHKD	DATE
DESIGNED	SEOB		JULY 2021
DRAWN	SEOB		JULY 2021
REVIEWED	PRINCIPAL ENGR. / ARCHT.		
CIVIL/ARCHT.			
ELEC.			
MECH.			

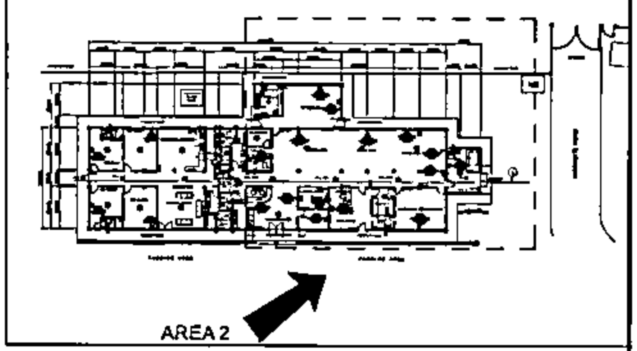
SUBMITTED: R. M. [illegible]OSAWAN, Project Engineer A
RECOMMENDED: J. A. [illegible]PEÑO, JR., Manager, DOB
APPROVED: N. G. SOMOSIERRA, Manager, DOB

DWG. NO. BDSH-BDM-13.003 | SPECS. NO. VIsP21Z1292Sr

SCALE 1:50 | BID DRAWING | REV. 1

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





NOTES:

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LEGEND:

- WINDOW TYPE AIR CONDITIONING UNIT (INVERTER)
- SPLIT TYPE WALL MOUNTED AIR CONDITIONING UNIT (INVERTER)
- SPLIT TYPE FLOOR MOUNTED AIR CONDITIONING UNIT (INVERTER)
- EXHAUST FAN (WALL MOUNTED)
- EXHAUST FAN (CEILING MOUNTED)
- SMOKE DETECTOR, ADDRESSABLE TYPE (PHOTOELECTRIC)
- SMOKE DETECTOR, CONVENTIONAL TYPE (PHOTOELECTRIC)
- HEAT DETECTOR, ADDRESSABLE TYPE (PHOTOELECTRIC)
- FIRE ALARM BELL
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REV.	DATE	NATURE OF REVISION	BY	CHKD.	RECD.	APPD.

OWNER: **NATIONAL POWER CORPORATION**
AGHAM ROAD, DILIMAN, QUEZON CITY

PROJECT: RENOVATION OF NPC OFFICE AND STAFFHOSUE AT BO. OBRERO, ILOILO CITY

LOCATION: BO. OBRERO, ILOILO CITY

TITLE:

AIR CONDITIONING, VENTILATION AND FIRE FIGHTING SYSTEM (2 OF 2)

	BY	CHKD	DATE
DESIGNED	SEOB		JUNE 2021
DRAWN	SEOB		JUNE 2021
REVIEWED	PRINCIPAL ENGR. / ARCHT.		
CIVIL/ARCHT			
ELEC.			
MECH.			

SUBMITTED: R. M. CABSAWAN, Principal Engineer A

RECOMMENDED: J. A. TADEO, JR.

APPROVED: N. G. [illegible]

DWG. NO. BDSH-BDM-13.004 | SPEC. NO. VisP21Z1292Sr

SCALE: 1:50 | BID DRAWING | REV. 0