



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

BID DOCUMENTS

Name of Project : **SUPPLY, DELIVERY, AND INSTALLATION OF COLLAPSIBLE/ CONTAINERIZED BUNKER FOR CATANDUANES 69KV T/L & S/S**

Location : **VARIOUS LOCATIONS IN CATANDUANES**

Specs No. : **LuzP21Z1270Ss** | *S1-CTL22-002*

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Design and Development Department



SECTION I

INVITATION TO BID



National Power Corporation

INVITATION TO BID

PUBLIC BIDDING – BCS 2022-0112

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
HO-PIB21-016 / PB220118-HG00516 (PB3) Construction of Power Facilities for the Four (4) Units Modular Diesel Generating Sets Including Hauling, Installation, Test and Commissioning of Balance of Plant in Calutcot, Burdeos Quezon and Butawan, Siruma, Camarines Sur • PCAB License: License Category of at least "Category D – General Building" and registration classification of at least "Small B – Building and Industrial Plant"	Construction of Industrial Building, Warehouse, Office Building	15 March 2022 9:30 A.M	28 March 2022 9:30 A.M	P 24,450,000.00 / P 25,000.00
S1-IDP22-002 / PB220223-NA00041 (PB2) Supply and Delivery of Intermediate Overhauling Spare Parts of (Nameplate: 192.5kW) 160kW FG-Wilson, 6 Cyl, Model P300-1, Serial No. FGWNAV04KJSW00254 of Itbayat DPP	Supply and Delivery of Diesel Generating Sets or Mechanical and/or Electrical Parts / Components / Equipment for Diesel Generating Sets	15 March 2022 9:30 A.M	28 March 2022 9:30 A.M	P 1,148,048.00 / P 5,000.00
S1-CTL22-002 / PB220328-RM00042 Supply, Delivery and Installation of Collapsible / Containerized Bunker for Catanduanes 69kV T/L & S/S	Supply, Delivery and Installation of Collapsible, Containerized House / Office or Staff Room or Other Containerized Structures	15 March 2022 9:30 A.M	28 March 2022 9:30 A.M	P 1,876,048.00 / P 5,000.00

S3-BAI22-002 / PB220328-SV00043 Supply and Delivery of Various Electrical Spare Parts for MAN Diesel 6L21/31 Generator Sets of Basilan DPP	Supply and Delivery of Diesel Generating Sets or Mechanical and/or Electrical Parts / Components / Equipment for Diesel Generating Sets	15 March 2022 9:30 A.M	28 March 2022 9:30 A.M	P 3,605,000.00 / P 5,000.00
Venue: Kañao Function Room, NPC Bldg. Dilliman, 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
HO-PIB21-016	Two Hundred Ten (210) Calendar Days	-
S1-IDP22-002	Ninety (90) Calendar Days	Ten (10) Years
S1-CTL22-002	Ninety (90) Calendar Days	Five (5) Years
S3-BAI22-002	Sixty (60) Calendar Days	Ten (10) Years

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

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

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

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

- a. Only a maximum of two (2) representatives from each bidder / company shall be allowed to participate during the virtual pre-bid conference.
 - b. A "No Face mask / No Entry" policy shall be implemented in the NPC premises. Face mask shall be 3-ply surgical or KN95 mask type.
 - c. The requirements herein stated including the medium of submission shall be subject to GPPB Resolution No. 09-2020 dated 07 May 2020
 - d. The Guidelines on the Implementation of Early Procurement Activities (EPA) shall be subject to GPPB Circular No. 06-2019 dated 17 July 2019
7. Bids must be duly received by the BAC Secretariat through (i) manual submission at the office address indicated below; (ii) online or electronic submission before the specified time stated in the table above for opening of bids. Late bids shall not be accepted.
 8. All Bids must be accompanied by a bid security in any of the acceptable forms and in the amount stated in ITB Clause 14.
 9. Bid opening shall be on Kañao Function Room, NPC Head Office, 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 5361/5397/5504

Fax No.: 8922-1622

Email: bcسد@napocor.gov.ph / bcسد_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**TABLE OF CONTENTS**

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SECTION II – INSTRUCTIONS TO BIDDERS

1. Scope of Bid

The National Power Corporation (NPC or NAPOCOR) wishes to receive Bids for the **SUPPLY, DELIVERY AND INSTALLATION OF COLLAPSIBLE/CONTAINERIZED BUNKER FOR CATANDUANES 69kV T/L & S/S**, with identification number LuzP21Z1270Ss.

The Procurement Project (referred to herein as "Project") is composed of one (1) lot and will be awarded to one (1) Bidder in one complete contract, the details of which are described in Section VI (Technical Specifications).

2. Funding Information

- 2.1. The GOP through the source of funding as indicated below for CY 2021 in the amount of ₱ 1,876,000.00.
- 2.2. The source of funding is the Corporate Operating Budget of the National Power Corporation.

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 Manuals 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 IB 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 verified and accepted the general requirements of this Project, including 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, and Coercive Practices

The Procuring Entity, as well as the Bidders and Suppliers, 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. Foreign ownership exceeding those allowed under the rules may participate when citizens, corporations, or associations of a country, included in the list issued by the GPPB, the laws or regulations of which grant reciprocal rights or privileges to citizens, corporations, or associations of the Philippines.

The foreign bidder claiming eligibility by reason of their country's extension of reciprocal rights to Filipinos shall submit a certification from the relevant government office of their country stating that Filipinos are allowed to participate in their government procurement activities for the same item/product. The said certification shall be validated during the post-qualification of bidders.

- 5.3. Pursuant to Section 23.4.1.3 of the 2016 revised IRR of RA No.9184, the Bidder shall have an SLCC that is at least one (1) contract similar to the Project the value of which, adjusted to current prices using the PSA's CPI, must be at least equivalent to at least fifty percent (50%) of the ABC.
- 5.4. The Bidders shall comply with the eligibility criteria under Section 23.4.1 of the 2016 IRR of RA No. 9184.

6. Origin of 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, subject to Domestic Preference requirements under ITB Clause 18.

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 twenty percent (20%) of the Project.

The portions of Project and the maximum percentage allowed to be subcontracted are indicated in the **BDS**, which shall not exceed twenty percent (20%) of the contracted Goods.

- 7.2. The Supplier may identify its subcontractor during the contract implementation stage. Subcontractors identified during the bidding may be changed during the implementation of this Contract. Subcontractors must submit the documentary requirements under Section 23.1 of the 2016 revised IRR of RA No. 9184 and comply with the eligibility criteria specified in ITB Clause 5 to the implementing or end-user unit.
- 7.3. Subcontracting of any portion of the Project does not relieve the Supplier 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 Supplier'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 Section VIII (NPCSF-GOODS-01 - Checklist of Technical and Financial Documents).

10.2. The Bidder's SLCC as indicated in ITB Clause 5.3 should have been completed within Five (5) Years years prior to the deadline for the submission and receipt of bids.

10.3. 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. Similar to the required authentication above, 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.

10.4. The Statement of the bidder's Single Largest Completed Contract (SLCC) (NPCSF-GOODS-03) and List of all Ongoing Government & Private Contracts Including Contracts Awarded but not yet Started (NPCSF-GOODS-02) shall comply with the documentary requirements specified in the BDS.

11. Documents comprising the Bid: Financial Component

11.1. The second bid envelope shall contain the financial documents for the Bid as specified in Section VIII (NPCSF-GOODS-01 - Checklist of Technical and Financial Documents).

11.2. If the Bidder claims preference as a Domestic Bidder or Domestic Entity, a certification issued by DTI shall be provided by the Bidder in accordance with Section 43.1.3 of the 2016 revised IRR of RA No. 9184.

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

11.4. 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. Bid Prices

12.1. Prices indicated on the Price Schedule shall be entered separately in the following manner:

- a. For Goods offered from within the Procuring Entity's country:
 - i. The price of the Goods quoted EXW (ex-works, ex-factory, ex-warehouse, ex-showroom, or off-the-shelf, as applicable);
 - ii. The cost of all customs duties and sales and other taxes already paid or payable;
 - iii. The cost of transportation, insurance, and other costs incidental to delivery of the Goods to their final destination; and
 - iv. The price of other (incidental) services, if any, listed in the **BDS**.
- b. For Goods offered from abroad:
 - i. Unless otherwise stated in the **BDS**, the price of the Goods shall be quoted delivered duty paid (DDP) with the place of destination in the Philippines as specified in the **BDS**. In quoting the price, the Bidder shall be free to use transportation through carriers registered in any eligible country. Similarly, the Bidder may obtain insurance services from any eligible source country.
 - ii. The price of other (incidental) services, if any, as listed in the **BDS**.

13. Bid and Payment Currencies

13.1. For Goods that the Bidder will supply from outside the Philippines, the 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.

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

14. Bid Security

14.1. 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**.

14.2. The Bid and bid security shall be valid for **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.

15. 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.

SECTION II – INSTRUCTIONS TO BIDDERS

If the Procuring Entity allows the submission of bids through online submission 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.

16. Deadline for Submission of Bids

16.1. 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.

17. Opening and Preliminary Examination of Bids

17.1. 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.

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

18. Domestic Preference

18.1. The Procuring Entity will grant a margin of preference for the purpose of comparison of Bids in accordance with Section 43.1.2 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 the 2016 revised IRR of RA No. 9184.

19.2. If the Project allows partial bids, bidders may submit a proposal on any of the lots or items, and evaluation will be undertaken on a per lot or item basis, as the case maybe. In this case, the Bid Security as required by ITB Clause 14 shall be submitted for each lot or item separately.

19.3. The descriptions of the lots or items shall be indicated in **Section VI (Technical Specifications)**, although the ABCs of these lots or items are indicated in the **BDS** for purposes of the NFCC computation pursuant to Section 23.4.2.6 of the 2016 revised IRR of RA No. 9184. The NFCC must be sufficient for the total of the ABCs for all the lots or items participated in by the prospective Bidder.

19.4. The Project shall be awarded to one (1) Bidder in one complete contract.

- 19.5. Except for bidders submitting a committed Line of Credit from a Universal or Commercial Bank in lieu of its NFCC computation, all Bids must include the NFCC computation pursuant to Section 23.4.1.4 of the 2016 revised IRR of RA No. 9184, which must be sufficient for the total of the ABCs for all the lots or items participated in by the prospective Bidder. For bidders submitting the committed Line of Credit, it must be at least equal to ten percent (10%) of the ABCs for all the lots or items participated in by the prospective Bidder.

20. Post-Qualification

- 20.1. 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

- 21.1. 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	
5.3	<p>For this purpose, similar contracts shall refer to supply, delivery and installation of collapsible, containerized house/office or staff room or other containerized structures.</p> <p>The Single Largest Completed Contract (SLCC) as declared by the bidder shall be verified and validated to ascertain such completed contract. Hence, bidders must ensure access to sites of such projects/equipment to NPC representatives for verification and validation purposes during post-qualification process.</p> <p>It shall be a ground for disqualification, if verification and validation cannot be conducted for reasons attributable to the Bidder.</p>
7.1	<p>Subcontracting may be allowed on transport, local/non-skilled labor under the supervision of the Bidder. The Bidder shall not be relieved from any liability or obligation that may arise from the performance of the Subcontractor.</p>
10.4	<p>The list of on-going contracts (Form No. NPCSF-GOODS-02) shall be supported by the following documents for each on-going contract to be submitted during Post-Qualification:</p> <ol style="list-style-type: none"> 1. Contract/Purchase Order and/or Notice of Award 2. Certification coming from the project owner/client that the performance is satisfactory as of the bidding date <p>The bidder shall declare in this form all his on-going government and private contracts including contracts where the bidder (either as individual or as a Joint Venture) is a partner in a Joint Venture agreement other than his current joint venture where he is a partner. Non declaration will be a ground for disqualification of bid.</p> <p>The Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid (Form No. NPCSF-GOODS-03) shall be supported by the following documents to be submitted during Bid Opening:</p> <ol style="list-style-type: none"> 1. Contract/Purchase Order 2. Certificate of Acceptance; or Certificate of Completion; or Official Receipt (O.R); or Sales Invoice <p>The prospective bidders shall declare its Joint Venture partner during the purchase of bid/tender documents. Any single bidder/s who already procured/secured the bidding documents but want to avail the Joint Venture Agreement (JVA) shall inform the BAC in writing prior to the bid opening for records and documentation purposes. Failure to do so shall be a ground for disqualification/non-acceptance of its bid.</p>

10.5	<p>Bidders shall also submit the following requirements in their first envelope, Eligibility and Technical Component of their bid:</p> <ol style="list-style-type: none"> 1. Duly signed and completely filled-out Technical Data Sheet – Section VI Part II <p>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.</p> <ol style="list-style-type: none"> 2. Complete eligibility documents of the proposed sub-contractor, if any
12	The price of the Goods shall be quoted DDP Project Site or the applicable International Commercial Terms (INCOTERMS) for this Project.
14.1	<p>The bid security shall be in the form of a Bid Securing Declaration, or any of the following forms and amounts:</p> <ol style="list-style-type: none"> a) The amount of not less two percent (2%) of ABC, if bid security is in cash, cashier's/manager's check, bank draft/guarantee or irrevocable letter of credit; or b) The amount of not less than five percent (5%) of ABC, if bid security is in Surety Bond.
19.3	<p>The Goods are grouped together in one (1) lot and will be awarded to one (1) Bidder in one complete contract.</p> <p>Partial bid is not allowed. The Goods are grouped in a single lot and the lot shall not be divided into sub-lots for the purpose of bidding, evaluation, and contract award.</p> <p>The Bidders bid offer must be within the ABC of the lot and ABC per item.</p> <p>Bid offers that exceed the ABC of the lot or any of the item, with incomplete price, shall be rejected.</p>
19.5	If the Bidder opted to submit a Committed Line of Credit (CLC), the bidder must submit a granted credit line valid/effective at the date of bidding.
20.1	<p>Additional documents to be submitted during Post-Qualification:</p> <ol style="list-style-type: none"> a. Contract/Purchase Order and/or Notice of Award for the contracts stated in the List of all Ongoing Government & Private Contracts Including Contracts Awarded but not yet Started (NPCSF-GOODS-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-GOODS-02;

20.2	The licenses and permits relevant to the Project and the corresponding law requiring it as specified in the Technical Specifications, if any.
21.2	Notice to Proceed.

4.

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.

Additional requirements for the completion of this Contract shall be provided in the **Special Conditions of Contract (SCC)**.

2. Advance Payment and Terms of Payment

- 2.1. Advance payment of the contract amount is provided under Annex "D" of the revised 2016 IRR of RA No. 9184.
- 2.2. The Procuring Entity is allowed to determine the terms of payment on the partial or staggered delivery of the Goods procured, provided such partial payment shall correspond to the value of the goods delivered and accepted in accordance with prevailing accounting and auditing rules and regulations. The terms of payment are indicated in the **SCC**.

3. Performance Security

- 3.1. Within ten (10) calendar days from receipt of the Notice of Award by the Bidder 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 of RA No. 9184.
- 3.2. The performance bond to be posted by the Contractor must also comply with additional requirements specified in the **SCC**.

4. Inspection and Tests

The Procuring Entity or its representative shall have the right to inspect and/or to test the Goods to confirm their conformity to the Project specifications at no extra cost to the Procuring Entity in accordance with the Generic Procurement Manual. In addition to tests in the **SCC, Section VI (Technical Specifications)** shall specify what inspections and/or tests the Procuring Entity requires, and where they are to be

conducted. The Procuring Entity shall notify the Supplier in writing, in a timely manner, of the identity of any representatives retained for these purposes.

All reasonable facilities and assistance for the inspection and testing of Goods, including access to drawings and production data, shall be provided by the Supplier to the authorized inspectors at no charge to the Procuring Entity.

5. Warranty

5.1 In order to assure that manufacturing defects shall be corrected by the Supplier, a warranty shall be required from the Supplier as provided under Section 62.1 of the 2016 revised IRR of RA No. 9184.

5.2 The Procuring Entity shall promptly notify the Supplier in writing of any claims arising under this warranty. Upon receipt of such notice, the Supplier shall, repair or replace the defective Goods or parts thereof without cost to the Procuring Entity, pursuant to the Generic Procurement Manual.

6. Liability of the Supplier

The Supplier's liability under this Contract shall be as provided by the laws of the Republic of the Philippines.

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

SECTION V

SPECIAL CONDITIONS OF CONTRACT

SECTION V – SPECIAL CONDITIONS OF CONTRACT

GCC Clause	
1	<p>Delivery and Documents –</p> <p>The delivery terms applicable to the Contract is DDP delivered to the project site specified in the technical specifications, in accordance with INCOTERMS. Risk and title will pass from the Supplier to the Procuring Entity upon receipt and final acceptance of the Goods at their final destination.</p> <p>Delivery of the Goods shall be made by the Supplier in accordance with the terms specified in Section VI – Technical Specifications. The details of shipping and/or other documents to be furnished by the Supplier are as follows:</p> <p><i>For Goods supplied from within the Philippines</i></p> <p>Upon delivery of the Goods to the Project Site, the Supplier shall notify the Procuring Entity and present the following documents to the Procuring Entity:</p> <ul style="list-style-type: none"> (i) Original and four copies of the Supplier's invoice showing Goods' description, quantity, unit price, and total amount; (ii) Original and four copies of Supplier's factory test/inspection report; (iii) Original and four copies of the certificate of origin (for imported Goods); (iv) Delivery receipt detailing number and description of items received signed by the Procuring Entity's representative at the Project Site; (v) Certificate of Completion/Inspection Report signed by the Procuring Entity's representative at the Project Site; (vi) Original and four copies of the Inspection Receiving Report signed by the Procuring Entity's representative at the Project Site; (vii) Original and four copies of the Manufacturer's and/or Supplier's warranty certificate; and (viii) Documents specified in the Technical Specifications, if any. <p><i>For Goods supplied from abroad:</i></p> <p>Upon shipment, the Supplier shall notify the Procuring Entity and the insurance company by e-mail the full details of the shipment, including Contract Number, description of the Goods, quantity, vessel, bill of lading number and date, port of loading, date of shipment, port of discharge etc. Upon delivery to the Project Site, the Supplier shall notify the Procuring Entity and present the following documents as applicable with the documentary requirements of any letter of credit issued taking precedence:</p>

- (i) Original and four copies of the Supplier's invoice showing Goods' description, quantity, unit price, and total amount;
- (ii) Original and four copies of the negotiable, clean shipped on board bill of lading marked "freight pre-paid" and five copies of the non-negotiable bill of lading ;
- (iii) Original and four copies of Supplier's factory test/inspection report;
- (iv) Delivery receipt detailing number and description of items received signed by the Procuring Entity's representative at the Project Site;
- (v) Certificate of Completion/Inspection Report signed by the Procuring Entity's representative at the Project Site;
- (vi) Original and four copies of the Inspection Receiving Report signed by the Procuring Entity's representative at the Project Site;
- (vii) Original and four copies of the certificate of origin (for imported Goods); and
- (viii) Original and four copies of the Manufacturer's and/or Supplier's warranty certificate including all other documents specified in the Technical Specifications, if any.

For purposes of this Clause the Procuring Entity's Representative at the Project Site is Vice President - SPUG or duly authorized representative.

Incidental Services –

The Supplier is required to provide all of the following services, including additional services, if any, specified in Section VI. Schedule of Requirements:

- a. performance or supervision of on-site assembly and/or start-up of the supplied Goods;
- b. furnishing of tools required for assembly and/or maintenance of the supplied Goods;
- c. furnishing of a detailed operations and maintenance manual for each appropriate unit of the supplied Goods;
- d. performance or supervision or maintenance and/or repair of the supplied Goods, for a period of time agreed by the parties, provided that this service shall not relieve the Supplier of any warranty obligations under this Contract; and
- e. training of the Procuring Entity's personnel, at the Supplier's plant and/or on-site, in assembly, start-up, operation, maintenance, and/or repair of the supplied Goods.

	<p>f. Additional requirements specified in Section VI – Technical Specifications, if any.</p> <p>The Contract price for the Goods shall include the prices charged by the Supplier for incidental services and shall not exceed the prevailing rates charged to other parties by the Supplier for similar services.</p> <p>Transportation –</p> <p>Where the Supplier is required under Contract to deliver the Goods CIF, CIP, or DDP, transport of the Goods to the port of destination or such other named place of destination in the Philippines, as shall be specified in this Contract, shall be arranged and paid for by the Supplier, and the cost thereof shall be included in the Contract Price.</p> <p>Where the Supplier is required under this Contract to transport the Goods to a specified place of destination within the Philippines, defined as the Project Site, transport to such place of destination in the Philippines, including insurance and storage, as shall be specified in this Contract, shall be arranged by the Supplier, and related costs shall be included in the contract price.</p> <p>Where the Supplier is required under Contract to deliver the Goods CIF, CIP or DDP, Goods are to be transported on carriers of Philippine registry. In the event that no carrier of Philippine registry is available, Goods may be shipped by a carrier which is not of Philippine registry provided that the Supplier obtains and presents to the Procuring Entity certification to this effect from the nearest Philippine consulate to the port of dispatch. In the event that carriers of Philippine registry are available but their schedule delays the Supplier in its performance of this Contract the period from when the Goods were first ready for shipment and the actual date of shipment the period of delay will be considered force majeure.</p> <p>The Procuring Entity accepts no liability for the damage of Goods during transit other than those prescribed by INCOTERMS for DDP deliveries. In the case of Goods supplied from within the Philippines or supplied by domestic Suppliers risk and title will not be deemed to have passed to the Procuring Entity until their receipt and final acceptance at the final destination.</p> <p>Intellectual Property Rights –</p> <p>The Supplier shall indemnify the Procuring Entity against all third-party claims of infringement of patent, trademark, or industrial design rights arising from use of the Goods or any part thereof.</p>
2.2	<p>Advance payment not to exceed fifteen percent (15%) of the contract amount shall be allowed and paid within sixty (60) calendar days from effectivity of the contract and upon the submission to and acceptance by the Procuring Entity of an irrevocable letter of credit or bank guarantee issued by a Universal or Commercial Bank. The irrevocable letter of credit or bank guarantee must be for an equivalent amount, shall remain valid until the goods are delivered, and accompanied by a claim for advance payment.</p>

All progress payments shall first be charged against the advance payment until the latter has been fully exhausted.

The terms of payment shall be as follows:

1) For Supply and Delivery Contracts:

- (a) On Contract Effectivity: Advance payment of Fifteen percent (15%) of the total Contract Price shall be paid within sixty (60) days from effectivity of the Contract and upon submission of a claim and an irrevocable letter of credit or bank guarantee issued by a Universal or Commercial Bank for the equivalent amount valid until the Goods are delivered and in the form provided in Section VIII- Bidding Forms.
- (b) On Delivery: Eighty percent (80%) of the Contract Price of the **delivered Goods** shall be considered for payment, less the total amount of advance payment, if any and other deductions. If the amount is sufficient to fully recoup the advance payment, the remainder after deductions shall be paid to the Supplier within sixty (60) days after the date of receipt of the Goods and upon submission of the documents (i) through (vi) specified in the SCC provision on Delivery and Documents. Otherwise, the total delivery payment shall be charged against the advance payment and the remaining advance payment will be fully recouped from the succeeding claims.
- (c) On Acceptance: The remaining twenty percent (20%) of the Contract Price of the **delivered Goods** shall be paid to the Supplier within sixty (60) days after the date of submission of the acceptance and inspection certificate for the respective delivery issued by the Procuring Entity's authorized representative. In the event that no acceptance certificate is issued by the Procuring Entity's authorized representative within forty five (45) days after successful test and commissioning, if required, the Supplier shall have the right to claim payment of the remaining twenty percent (20%) subject to the Procuring Entity's own verification of the reason(s) for the failure to issue documents (vii) and (viii) as described in the SCC provision on Delivery and Documents.

2) For Supply, Delivery, Installation, Test and Commissioning Contracts:

- (a) On Contract Effectivity: Advance payment of Fifteen percent (15%) of the total Contract Price shall be paid within sixty (60) days from effectivity of the Contract and upon submission of a claim and an irrevocable letter of credit or bank guarantee issued by a Universal or Commercial Bank for the equivalent amount valid until the Goods are delivered and in the form provided in Section VIII- Bidding Forms.
- (b) On Delivery: Eighty percent (80%) of the price of the **delivered Goods**, excluding price for installation, test and commissioning shall be considered for payment, less the total amount of advance payment, if any and other deductions. If the amount is sufficient to fully recoup the advance payment, the remainder after deductions shall be paid to the Supplier within sixty (60) days after the date of receipt of the Goods and upon submission of the documents (i) through (vi) specified in the

SCC provision on Delivery and Documents. Otherwise, the total delivery payment shall be charged against the advance payment and the remaining advance payment will be fully recouped from the succeeding claims.

- (c) On Acceptance: The remaining twenty percent (20%) of the price of the **delivered Goods** plus price for installation, test and commissioning shall be paid to the Supplier within sixty (60) days after the date of submission of the acceptance and inspection certificate for the respective delivery issued by the Procuring Entity's authorized representative. In the event that no acceptance certificate is issued by the Procuring Entity's authorized representative within forty five (45) days after successful test and commissioning, the Supplier shall have the right to claim payment subject to the Procuring Entity's own verification of the reason(s) for the failure to issue documents (vii) and (viii) as described in the SCC provision on Delivery and Documents.

3) For Supply, Delivery, Installation, Test and Commissioning Contracts where Installation, Test and Commissioning prices are included in the supply price:

- (a) On Contract Effectivity: Advance payment of Fifteen percent (15%) of the total Contract Price shall be paid within sixty (60) days from effectivity of the Contract and upon submission of a claim and an irrevocable letter of credit or bank guarantee issued by a Universal or Commercial Bank for the equivalent amount valid until the Goods are delivered and in the form provided in Section VIII- Bidding Forms.
- (b) On Delivery: Sixty percent (60%) of the price of the **delivered Goods** shall be considered for payment, less the total amount of advance payment, if any and other deductions. If the amount is sufficient to fully recoup the advance payment, the remainder after deductions shall be paid to the Supplier within sixty (60) days after the date of receipt of the Goods and upon submission of the documents (i) through (vi) specified in the SCC provision on Delivery and Documents. Otherwise, the total delivery payment shall be charged against the advance payment and the remaining advance payment will be fully recouped from the succeeding claims.
- (c) On Acceptance: The remaining forty percent (40%) of the price of the **delivered Goods** shall be paid to the Supplier within sixty (60) days after the date of submission of the acceptance and inspection certificate for the respective delivery issued by the Procuring Entity's authorized representative. In the event that no acceptance certificate is issued by the Procuring Entity's authorized representative within forty five (45) days after successful test and commissioning, the Supplier shall have the right to claim payment subject to the Procuring Entity's own verification of the reason(s) for the failure to issue documents (vii) and (viii) as described in the SCC provision on Delivery and Documents

3.2	<ol style="list-style-type: none"> 1. The following must be indicated in the performance bond to be posted by the Contractor: <ol style="list-style-type: none"> i. Company Name ii. Correct amount of the Bond iii. Contract/Purchase Order Reference Number iv. Purpose of the Bond: "To guarantee the faithful performance of the Principal's obligation to undertake <u>(Contract/Purchase Order Description)</u> in accordance with the terms and conditions of <u>(Contract No. & Schedule/Purchase Order No.)</u> entered into by the parties." 2. The bond shall remain valid and effective until the duration of the contract <u>(should be specific date reckoned from the contract effectivity)</u> plus sixty (60) days after NPC's acceptance of the last delivery/final acceptance of the project. 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: <ol style="list-style-type: none"> i. The bond is a penal bond, callable on demand and the entire amount thereof shall be forfeited in favor of the Obligee upon default of the Principal without the need to prove or to show grounds or reasons for demand for the sum specified therein; ii. The amount claimed by the Obligee under this bond shall be paid in full and shall never be subject to any adjustment by the Surety; iii. In case of claim, the Surety shall pay such claim within sixty (60) days from receipt by the Surety of the Obligee's notice of claim/demand letter notwithstanding any objection thereto by the Principal.
4	The inspections and tests that will be conducted are specified in the Technical Specifications.

SECTION VI

TECHNICAL SPECIFICATIONS

PROJECT HIGHLIGHTS

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SECTION VI - TECHNICAL SPECIFICATIONS**PH – PROJECT HIGHLIGHTS****PH-1.0 PROJECT HIGHLIGHTS****PH-1.1 General**

This section covers the general technical requirements for furnishing all supervision, labor, materials, supplies, tools and equipment in accordance with specifications contained herein and as shown on the accompanying drawings to complete the **SUPPLY, DELIVERY, AND INSTALLATION OF COLLAPSIBLE/ CONTAINERIZED BUNKER FOR CATANDUANES 69kV T/L & S/S**

PH-1.2 Project Location

The project is located at Various locations in Catanduanes:

- Brgy. Kilikilihan, San Miguel
- Marinawa, Bato
- Asgad, San Andres

PH-1.3 Scope of Work

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

Architectural Works

- a) Supply and installation of three (3) units twenty (20) feet Prefabricated Container House;
- b) Application of touch up paint for scratch during installation
- c) Removal/clearing of all debris and waste/excess materials prior to demobilization.
- d) All other works and services required to complete the project.

Civil Works

- a) Moving-in including furnishing, supervision, construction, operation and maintenance of general construction facilities and moving-out thereof after completion and acceptance;
- b) Construction of reinforced concrete foundation including all required structural excavation, backfill and proper disposal of all excess excavated materials
- c) Complete construction of drainage connections and appurtenances;
- d) Rain testing on the roof of the collapsible/containerized bunker; and
- e) All other works and services required to complete the project.

Electrical Works

- a) Supply, Installation and Test of Lighting and Power System of the Collapsible/Containerized Bunker for San Miguel Substation, Codon Substation and Marinawa Substation;



Mechanical Works

- a) One (1) lot of Domestic Water Supply System consisting of pipes, valves, pipe fittings, gaskets, flanges, bolts and nuts, pipe supports including the required excavation and backfilling of embedded pipes and other incidentals to complete the domestic water supply piping system;
- b) Three (3) units of Inverter-Window Type Air Conditioner of 11,500 kJ/hr minimum cooling capacity for Bedroom, complete with its mounting accessories and controls;
- c) Three (3) units of Wall Mounted Exhaust Fan, 100 m³/hr minimum capacity for Comfort Rooms, complete with its mounting accessories and control;
- d) Three (3) units of Portable Type Fire Extinguisher, Clean Agent (HCFC or Halotron I Type), 7.1 kg. (15.5 lbs), non-expiry, multi-shots, wall-hung type and PS/ICC and/or BFP approved; and
- e) All other works and services required to complete the project.

PH-1.4**Contract Period**

The Supplier shall complete the works as herein specified within Ninety (90) 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**.

SECTION VI

TECHNICAL SPECIFICATIONS

ARCHITECTURAL WORKS

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AW- ARCHITECTURAL WORKS

AW-1.0 GENERAL ARCHITECTURAL REQUIREMENTS

AW-1.1 General

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

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

Materials and structural parts that the Supplier 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 Supplier 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 Supplier 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 a sufficient period in order that adequate supply is available at any time when needed.

AW-1.3 Substitution of Materials

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

In the 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 Supplier 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 Supplier shall submit a written request for substitution at least one (1) month before such materials are actually needed. Such a 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 Supplier shall submit to the NPC Representative signed certificates from the manufacturer or sole distributor of equipment and materials to be furnished and installed by the Supplier/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 Schedule of Requirements 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 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 Supplier 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 the number of pieces/sets, for the pertinent items under Architectural Works in the Schedule of Requirements.

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



AW-2.0 PREFABRICATED CONTAINER HOUSE**AW-2.1 General**

The specification covers the features and technical requirements for the supply, delivery and erection/installation of three (3) units, 20ft. Prefabricated Container House. Other parts and accessories which are not specifically mentioned herein but are necessary for the proper assembly and erection of the staff house shall be included to be furnished.

All materials to be used and incorporated into the staff house shall be new and unused. They shall be suitable for the intended purpose and shall comply with all applicable regulations, quality, and standards.

The Supplier shall accept full responsibility for his work including design, performance qualifications, specifications, documentation, reports, fabrication, assembly, corrosion protection, shop testing, preparation for shipment, field testing, warranty provisions and compliance with the applicable codes and standards and the requirements of this Specification.

AW-2.2 Work Scope

The works and services to be performed by the successful bidder shall cover the supply, delivery, and complete erection/installation of three (3) units, 20ft. Prefabricated Container House which shall essentially consist of but not limited to the following:

1. Moving-in including furnishing, installation, construction, operation and maintenance of general construction facilities.
2. Clearing and grading of the project site and disposal of all excess materials to designated areas.
3. Construction of reinforced concrete foundation including all required structural excavation, backfill and proper disposal of all excess excavated materials as per detailed drawings.
4. Supply and installation of three (3) units twenty (20) feet Prefabricated Container House with the following specifications and fixtures:

Dimensions	6.0 meters length by 2.4 meters width by 2.6m height
Container Frame	Square tubing, 4 mm base metal thickness, pre-painted.
Wall Panels	50mm Polysterene insulation with double-sided 0.45mm pre-painted GI sheet
Roof Panels	50mm Glasswool insulation with pre-painted GI sheet roof and interior ceiling



Flooring	MGO board with linoleum tiles
Windows (4 sets - 1.0m x 1.0m)	Aluminum sliding windows
Door (1 set - 0.80m x 2.1m)	Steel Door
Toilet & Bath (Office Area) (1 set - 1.20m x 1.20m)	Complete with fixtures & fittings, including ceramic floor tiles, door, window and plumbing

5. Application of touch up paint for scratch during installation.

6. Removal/clearing of all debris and waste/excess materials prior to demobilization.

AW-2.3 Design Criteria for Prefabricated Container House

The prefabricated container house shall be designed for the erection on the concrete foundation. All materials under these specifications shall be designed, constructed and erected in accordance with the requirement of the specification and codes of AISC, ASTM and other such regular published and accepted codes except where modified or supplemented by these specifications.

Wind load

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

AW-2.4 Measurement and Payment

Measurement and payment for prefabricated container house will be based on the corresponding contract unit price (set) under the architectural work's Schedule of Requirements.

Payment shall be made at the contract unit price, which payment shall cover costs of furnishing all materials and labor including equipment and tools required to complete the work and all associated costs for site grading, foundation/ slab construction including transport to site.



AW-3.0 PLUMBING FIXTURES AND FITTINGS**AW-3.1 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-3.2 Make

The model numbers herein given 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-3.3 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-3.4 Fixtures

Water Closet – as shown in the drawings or as specified in the Schedule of Requirements

- a) Bibbs - Nickel Plated Copper or Brass Alloy
- b) Kitchen Sink - Stainless
- c) Floor Drain - Stainless or Brass Alloy
- d) Clean-outs - Brass alloy

AW-3.5 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 rigid 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-3.6 Toilet Accessories

- a) Soap Holders – colored, vitreous China to match fixtures quality, brand and wainscoting color.
- b) Tissue Paper Holder - colored, to follow Water Closet brand and quality. Provide and fit, ready for use, on the most convenient side of the wall inside each water closet compartment, 750mm (30") above the finish floor.
- c) Liquid Soap Dispenser

AW-3.7 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 Schedule of Requirements.

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



SECTION VI

**TECHNICAL
SPECIFICATIONS**

CIVIL WORKS

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SECTION VI – TECHNICAL SPECIFICATIONS

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CW – CIVIL WORKS

CW-1.0 GENERAL CONSTRUCTION FACILITIES

CW-1.1 Scope

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

CW-1.2 Moving-in Supplier's Camp Facilities

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

CW-1.3 Supplier's Camp Facilities

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

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

CW-1.4 Water Supply

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

CW-1.5 Sewerage Disposal and Sanitation

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

The Supplier shall execute the work with due regard to adequate sanitary provisions and applicable codes and shall take all necessary steps to prevent the pollution of water in any spring, river, or other sources of water supply. All

toilets or wash-up facilities shall be subject to the prior and continuing approval of the NPC.

CW-1.6 Fire Protection

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

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

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

CW-1.7 Construction Power

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

CW-1.8 Camp Security

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

CW-1.9 Construction Material Storage

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

CW-1.10 Removal of Camp and Construction Facilities

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

CW-1.11 Measurement and Payment

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

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

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

CW-2.2 Drainage and Dewatering

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

After the work is completed and before it is accepted by the NPC, the Supplier 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 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 Schedule of Requirements for structures where such care of water is required.

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

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

CW-3.2 General Conditions

The Supplier 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 the 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, striped topsoil, 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 of, 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 of the same as soon as practicable.
- j) Preserve or replace, if practicable, natural drainage patterns (when disturbed by civil works) with appropriate drainage channels.

- k) Convey oil-contaminated wastewater from workshops, garages, or gas filling stations through an oil trap (i.e. improvised oil-water separator) prior to discharge.
- l) Spray water, wherever and whenever necessary, to minimize dust generation.
- m) Provide PPEs and other safety provisions required by DOLE, for its project/site works.
- n) Take all necessary steps to prevent the pollution of groundwater and/or water bodies in the vicinity of the project site.

CW-3.3 Measurement and Payment

No separate measurement and payment will be made for the Supplier's compliance with the foregoing. The entire cost thereof shall be included in the various pay items in the Schedule of Requirements.

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 Supplier 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 Supplier 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 the 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 Work

Where shown on the drawings or if not shown but directed by the NPC, the Supplier 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 the Supplier shall determine his unit bid price for grading excavation and grading fill.

CW-4.3.3 Stripping

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

CW-4.3.4 Excavation and Fill

Areas required to be brought to grade shall be excavated or filled as the case may be. Grading work shall be carried out in such a manner that the free drainage is maintained at all times and nowhere shall bondage 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 Supplier as a basis for additional compensation over and above the contract unit prices.

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

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 Schedule of Requirements.

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 they 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 144 KPa. In no case shall filling and compaction work to be done without the presence of NPC's inspectors. The Supplier shall be held liable for any structural instability or damage that might result in consequence to non-compliance with this requirement. The Supplier 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 Supplier 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 Supplier. 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 Supplier shall rebuild such a portion of the fill. In the case it is determined that the slip-outs was caused through the fault of the Supplier, the rebuilding of the fill shall be performed by the Supplier 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 by the Supplier. 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 Supplier at no cost to NPC. The Supplier 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 Supplier 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. The

acquisition of right-of-way to these sources shall be the responsibility and account of the Supplier.

CW-4.6 Environmental Requirements

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

CW-4.7 Measurement and Payment

CW-4.7.1 Clearing and Grubbing

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

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 Schedule of Requirements. Payment will be made at the contract unit price for the item Miscellaneous Works, which payment shall cover all costs 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 Schedule of Requirements, no separate measurement and payment will be made for Stripping. Corresponding cost hereof shall be included in the unit bid price of the relevant item(s) in the Schedule of Requirements.

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 of. Volume shall be computed by the average end area method which shall be the volume between the original ground (as determined by a survey to be made by representatives of both NPC and the Supplier) 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 Schedule of Requirements, 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 Schedule of Requirements, 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 Supplier 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 Supplier shall determine his 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:

<u>Sieve Designation (Square Mesh Sieves)</u>	<u>Percentage by Weight Passing</u>
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 Supplier 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 the 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 Supplier 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 are shown on the drawings. In case an increase or decrease in quantities occurs 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 Supplier 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 written approval has been issued by the NPC.

Over-excavation performed by the Supplier 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 Supplier 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 Supplier 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 with such instruction shall not entitle the Supplier for additional compensation over and above the unit prices for excavation regardless of the nature of material excavated. For purposes of measurement, the applicable pay lines for the excavation under this condition or situation shall be as shown on the drawings that show the pay lines 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 Supplier 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 cm² 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 Supplier 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 Schedule of Requirements, 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 Schedule of Requirements, 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 Schedule of Requirements, 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 Schedule of Requirements, 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 Schedule of Requirements.

CW-6.0 Formwork**CW-6.1 Scope**

This work covers the supply, construction, erection and removal of formwork. Formwork shall be of sufficient strength with all necessary bracing, fasteners, etc. and in conformity with the specified requirements of applicable building code requirements for concrete formwork, and National Structural Code of the Philippines.

CW-6.2 Material Requirement

Timber, lumber and plywood to be used for false work and formwork shall be sound and shall comply with the requirements of these 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-6.3 Construction Requirements**CW-6.3.1 Formwork Construction**

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

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

- Coating: Before placing the concrete, the contact surface of forms shall be coated with a non-staining mineral oil or suitable non-staining form coating compound or shall be given two coats of nitrocellulose lacquer, except as specified otherwise. Mineral oil shall not be used on forms for surfaces, which are to be painted. For surfaces not exposed to view in the finished structure, sheathing may be wetted thoroughly with clean water. All excess coating shall be removed by wiping with cloths. Reused forms shall have the contact surfaces cleaned thoroughly. Those that have been coated shall be given an additional application of the coating. Plaster waste molds shall be layered with two coats of the thin shellac or lacquer and coated with soft or thinned non-staining grease.
- Tolerance and Variations: The Supplier shall set and maintain concrete forms to ensure that, after removal of the forms and prior to patching and finishing, no portion of the concrete work will exceed any of the tolerances specified. Variations in floor levels shall be measured before removal of supporting shores. The Supplier 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-6.3.2 Removal of Formwork

Formwork shall not be removed without the permission of NPC; where such permission, however, shall not relieve the Supplier 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-6.4 Measurement and Payment

No separate measurement for payment will be made for this item. The entire cost thereof shall be included in the relevant pay items in the Schedule of Requirements.

CW-7.0 CONCRETE

CW-7.1 Scope

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

CW-7.2 Class of Concrete

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

CW-7.3 Materials

CW-7.3.1 Cement

Cement for concrete works shall be furnished by the Supplier 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-7.3.2 Reinforcing Steel

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

CW-7.3.3 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-7.3.4 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-7.4 Storage of Materials**CW-7.4.1 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-7.4.2 Reinforcing Steel

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

CW-7.5 Concreting**CW-7.5.1 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-7.5.2 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-7.5.3 Mixing Concrete

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

CW-7.5.4 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-7.5.5 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-7.5.6 Removal of Forms

Forms shall be removed as soon as practicable in order to avoid delay in curing and to make possible earliest practicable repair of surface imperfections, but in no case shall they be removed without approval. Any needed repair or treatment shall be performed at once and shall be followed immediately by the specified curing. Forms shall be removed with care so as to avoid injury to the concrete and any concrete so damaged shall be repaired as directed.

CW-7.5.7 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-7.5.8 Sampling and Testing of Concrete

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

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

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.

Test cylinders shall be prepared from the concrete samples and tested. At least one set of four (4) cylinder samples shall be made for each major structural member. Two (2) cylinders shall be tested at 28 days for specification compliance and one shall be tested at 7 and 14 days respectively for information. The acceptance test result shall be the average of the strength of the two cylinders tested at 28 days.

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

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

Concrete deemed to be not acceptable using the above criteria maybe rejected unless the Supplier 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-7.5.9 Tolerances and Repair for Concrete Construction

Concrete structures shall be constructed to the lines shown on the drawings or where so required to suit actual field requirements. Any structure that does not

conform to such lines shall be repaired or removed and made anew by the Supplier 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-7.5.10 Second Stage Concrete

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

CW-7.6 Measurement and Payment

Measurement for payment for Concrete (except concrete which shall be measured for separate payment) 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 Schedule of Requirements. 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.

CW-8.0 REINFORCING STEEL

CW-8.1 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-8.2 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-8.2.1 Bar Reinforcement

Reinforcement bars for concrete shall be hot-rolled, weld able, deformed billet-steel bars conforming to the requirements specified in ASTM A615 and PNS 49 unless shown on the Drawings or as required by the NPC. The use of the

cold twisted bars is not permitted. Bar reinforcement shall be shipped in standard bundles, tagged and marked in accordance with the Code of Standard Practice of the Concrete Reinforcement Steel Institute.

CW-8.2.2 Sampling

The NPC's Representative will sample reinforcement bars at the source of supply or at the point of distribution, and the Supplier 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-8.3 Construction Requirement

CW-8.3.1 Order List for Bent Bars

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

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-8.3.2 Fabrication

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

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

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

CW-8.3.3 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-8.3.4 Placing and Fastening Reinforcement & Miscellaneous Material (ACI-301)

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

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

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

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

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

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

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

- | | |
|--|------------------|
| a. Height of bottom bars | ±6mm above form |
| b. Lengthwise positioning | ±50mm of bars |
| c. Spacing bars in walls and solid slabs | ±25mm |
| d. Spacing bars in beams and footings | ±6mm |
| e. Height of top bars | ±6mm |
| f. Stirrup spacing: | |
| (1) For anyone 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-8.3.5 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 overlapping for bar sizes larger than 32 mm Φ . Splices to be welded shall conform to AWS D1.4; certification of weldability of the reinforcement by the manufacturer shall be submitted to the NPC. If the Supplier elects to use butt splicing of reinforcing, he shall submit complete details of the process to be used by the NPC. If the butt splices are used the Supplier shall ensure that the splice meets the requirements specified herein by performing at least three splices that shall be submitted for tests to a testing laboratory that has been approved for such testing by the NPC. The cost of these shall be borne by the Supplier.

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

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

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

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

CW-8.4 Measurement and Payment

The quantity to be paid for shall be the calculated theoretical number of kilograms of reinforcement steel bars as determined from the net length of the steel shown on the drawings, incorporated in the concrete and accepted.

The weight of deformed bars will be computed from the theoretical weight of the same nominal size as shown in the following tabulation:

<u>Designation</u>	<u>Size (mm)</u>	<u>Weight (kg/m)</u>
#2	6	0.222
#3	10	0.616
#4	12	0.888
#5	16	1.579
#6	20	2.468
#8	25	3.854
#9	28	4.833
#10	32	6.313
#11	36	7.991

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

When laps are made for splices, other than those shown on the drawings or required by the NPC and for the convenience of the Supplier, 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 Schedule of Requirements which price and payment shall be made in full compensation for furnishing materials, labor, equipment and incidentals necessary to complete this.

CW-9.0 DRAINAGE SYSTEM AND APPURTENANT STRUCTURES**CW-9.1 Scope**

In accordance with the specifications contained herein, the Supplier 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 Supplier 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-9.2 Materials**CW-9.2.1 Non-reinforced Concrete Drainage Pipes**

Non-reinforced concrete drainage pipes shall meet the requirements of ASTM C14-68.

One 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 test requirements shall not be used in the work.

CW-9.2.2 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-9.2.3 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-9.2.4 Concrete Covered Rectangular Ditch

Cement, reinforcing steel, aggregate, and water to be used for the construction of concrete covered rectangular ditch and open rectangular canal shall conform to the requirements set forth in Section CW-7.0 – Concrete. Foundation base material for concrete canal shall be sand and gravel as described in Section CW-5.0.

CW-9.2.5 Bedding Material**A. For Stable Soil and Rock Foundation**

Bedding material for sewerage and drainage pipes unstable soil and rock foundation, as determined by NPC, shall consist of sand or natural sandy soil in which all the materials pass 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 the 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-9.3 Construction**CW-9.3.1 Trench Excavation and Backfill**

Trench excavation and backfill work shall be done in accordance with the pertinent provisions of Section CW-5.0.

CW-9.3.2 Concrete Canal

Concrete canal, open or covered, shall be constructed in accordance with the lines and grades shown on the drawings. The class of concrete shall be as indicated on the drawings or directed by the NPC.

CW-9.3.3 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 17.30 MPa concrete unless otherwise shown on the drawings.

CW-9.4 Pipe Installation**CW-9.4.1 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 are given. Succeeding pipe shall be joined 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 Supplier at his expense.

CW-9.4.2 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. The 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 the 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-9.5 Measurement and Payment

CW-9.5.1 Concrete Rectangular Ditch

Measurement for payment for the rectangular ditch and other channels will be based on the number of linear meters of canal constructed and accepted.

Payment will be made at the corresponding contract unit price per linear meter of the pertinent items shown in the Schedule of Requirements. Payment shall constitute full compensation for furnishing all labor, materials, equipment, and tools necessary for the construction of the concrete canal including attendant excavation and backfill.

CW-9.5.2 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 Schedule of Requirements. 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-9.5.3 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 Supplier will be paid at the contract unit price for the pertinent item for each appurtenant structure shown in the Schedule of Requirements. 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-9.5.4 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 Schedule of Requirements, which payment shall constitute full compensation for furnishing all labor, materials, equipment, and tools necessary to complete the items.

SECTION VI

TECHNICAL SPECIFICATIONS

ELECTRICAL WORKS

SECTION VI – TECHNICAL SPECIFICATIONS

EW – ELECTRICAL WORKS

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SECTION VI – TECHNICAL SPECIFICATIONS

EW - ELECTRICAL WORKS

EW-1.0 GENERAL

This specification covers the technical and associated requirements of complete lighting system for the **SUPPLY, DELIVERY, AND INSTALLATION OF COLLAPSIBLE/ CONTAINERIZED BUNKER FOR CATANDUANES 69kv T/L & S/S.**

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 Lighting and Power System of the Collapsible/Containerized Bunker for San Miguel Substation, Codon Substation and Marinawa Substation;
2. Dismantling of the existing branch circuit #3 of Lighting and Power Panelboard at Marinawa Substation and stocking to the designated stockyard to be provided by the end user; and
3. All other works and services including those not specifically detailed herein but are required to fully complete the project.

In addition, the following shall be provided by the Contractor:

1. Provision of services of a highly qualified and competent Electrical Engineer with experience in the implementation of electrical works to perform/direct supervision during installation and test of all supplied devices, including cabling works; and
2. Conduct of inspection to verify and assess the extent of the related and incidental works needed to implement the project competently and efficiently.

The Contractor shall bear full responsibility that the materials have been designed and fabricated in accordance with all codes, standards, and applicable governmental regulations and performs under the conditions and to the standards specified herein.

EW-3.0 STANDARD OF MATERIALS

All materials to be used in the work shall be new, of high quality, free from all defects and of proven acceptability for the purpose of intended. Unless

otherwise specified, materials shall conform to the latest applicable standard issued by the following authorities:

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

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

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

EW-4.0 LIGHTING SYSTEM

The lighting system covered by this specification shall include all indoor and outdoor lighting system of an electric generating plants and/or switchyard. Lighting system includes outlets (convenience and power), switches, associated conduits and cables, lighting fixtures (indoor, outdoor and emergency), fittings, distribution panelboards, lighting transformers, contactors, timers, 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, assembly and safe operation of the lighting system shall be identified by the Contractor and furnished by the Contractor at no cost to the NPC. Any cost involve are deemed to be included in the price for the Lighting System.

EW-4.1 Technical Requirements and Characteristic

Lighting fixtures shall be controlled and switched locally approximately as shown on the drawings.

Normal lighting/small power outlet and emergency lighting systems shall consist of:

- a. 240 VAC, 1-phase, 60Hz, normal station lighting system, including outlets (indoor and outdoor) and emergency lighting system;
- b. Automatic Stand-alone Emergency Lamp (12 VDC), dual lamp, portable type emergency station lighting system for warehouse, door entrances, guardhouse. This emergency lighting system must be switched on automatically in the event of a lighting failure.

The normal station lighting/small power and convenience outlet system, and the automatic stand-alone lamps power shall be supplied from the powerhouse 240 Volt AC lighting and power panelboard.

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 single-phase system.

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

Nameplate shall be black plastic with engraved white letter.

EW-4.3 Lighting Fixtures, Luminaires and Accessories

The Contractor shall submit for approval complete photometry data and type of lighting fixture to be installed together with the shop drawings.

All luminaires 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 housings shall be fabricated of steel sheet, corrosion resistant, good ventilation and easy installation.

Samples and catalogues of all luminaires to be supplied shall be submitted for NPC's review and approval prior to the order. No luminaire shall be installed without approval of NPC.

Luminaires 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 luminaires shall be protected from damage during installation. Any broken luminaire, receptacles, stems and the like, shall be replaced with new parts, at no cost to NPC.

Types of luminaires to be supplied, installed and tested are as follows:

Lighting Luminairesa. Wall Mounted Luminaire

Wall Mounted Luminaires shall have an IP44, steel base, satinated glass diffuser complete with compact LED lamp, rated at 230V AV, 60Hz
Luminaires in battery rooms shall be Acid Vapor Tight Type, Explosion Proof.

b. Round Ceiling Luminaire

Round Ceiling Lamp shall be 230V, 60Hz, IP20 rated, 350mm diameter, white steel base, opal glass diffuser and complete with 2x18W E27 base, frosted finish compact LED lamp.

c. Compact LED Lighting Fixture

IP20 Rating, 1 x 9 Watts, Cool White Classic Globe Shape Frosted Finish E27 Base with holder, Compact LED Lamp.

d. Emergency Lighting Fixture

The Contractor shall supply and install the automatic stand-alone emergency lamp of the 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.

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 240 VAC, 1-phase, 60 Hz. Rated Output of the batteries shall be 12 Volt DC.

EW-4.4 Conductors

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

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

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

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

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

EW-4.4.1 Conductor Installation

Conductors pulled through conduits shall be supported in an approved manner so as to avoid damage to the insulation. Grease or oily substances shall not be used to facilitate the passage of the conductor in conduits. The pull shall be applied only by means of approved grips and the end portion, which has been marked or deformed by the grip, shall be cut-off by the Contractor.

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

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

EW-4.5 Conduit

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

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

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

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

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

Non-Metallic Conduits

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

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

EW-4.6 Junction / Utility and Pull Boxes**Junction / Utility Boxes**

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

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

Pull Boxes

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

EW-5.0 MEASUREMENT OF PAYMENT

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

SECTION VI

TECHNICAL SPECIFICATIONS

MECHANICAL WORKS

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MW - MECHANICAL WORKS

MW-1.0 GENERAL

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

The work shall be performed and completed with high quality workmanship, in accordance with generally accepted modern practice in installation/erection works of Mechanical Equipment for the Supply, Delivery and Installation of Collapsible/Containerized Bunker for Catanduanes 69kV Transmission Line and Substation (T/L & S/S).

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

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

MW-2.0 SCOPE OF WORK

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

The Supplier 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 Supplier deemed required or necessary to complete the works shall be included in the bid proposal.

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

- a) One (1) lot of Domestic Water Supply System consisting of pipes, valves, pipe fittings, gaskets, flanges, bolts and nuts, pipe supports including the required excavation and backfilling of embedded pipes and other incidentals to complete the domestic water supply piping system (for each substation);
- b) One (1) unit of Inverter-Window Type Air Conditioner of 11,500 kJ/hr minimum cooling capacity, complete with its mounting accessories and controls (for each substation);



- c) One (1) unit of Wall Mounted Exhaust Fan, 100 m³/hr minimum capacity for Comfort Room, complete with its mounting accessories and control (for each substation);
- d) Three (3) units of Portable Type Fire Extinguisher, Clean Agent (HCFC or Halotron I Type), 7.1 kg. (15.5 lbs), non-expiry, multi-shots, wall-hung type PS/ICC and/or BFP approved; and
- e) All other works and services required to complete the project.

MW-3.0 MATERIALS AND EQUIPMENT

MW-3.1 General

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

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

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

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

MW-3.2 Applicable Codes and Standards

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

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

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



MW-3.3 Test of Materials

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

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

MW-3.4 Submittals

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

MW-4.0 DOMESTIC WATER SUPPLY SYSTEM**MW-4.1 General**

This section provides the essential information for the design, supply, installation, construction and test of the Domestic Water Supply System to provide the water requirements of the proposed Collapsible/Containerized Bunker for San Miguel Substation, Codon Substation and Marinawa Substation including all required excavation and backfilling works for the piping system.

The water supply shall be sourced and interconnected from the existing water supply line. Interconnection point shall be as directed by NPC representative/s.

MW-4.2 Domestic Water Supply Piping System

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

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

- a) One (1) unit of 20 mm Ø Gate Valve (for each substation);
- b) One (1) unit of 20 mm Ø Hose Bibb (for each substation);
- c) One (1) lot of domestic water piping, pipe fittings and other necessary accessories (for each substation).



MW-4.2.1 Pipe, Fittings and Accessories

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

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

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

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

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

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

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

MW-4.2.2 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 and globe valves, 50mm and smaller shall be made of bronze material, rising stem, union bonnet, inside screw, solid wedge or plug type disc, and screwed ends. Valves installed in valve boxes shall have flanged ends for easy replacement or if valves with screwed ends are used, appropriate unions shall be installed.

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

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



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

MW-4.3 Installation

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

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

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

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

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

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

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

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

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

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



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

MW-4.4 Testing, Cleaning and Disinfection

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 Supplier 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 Supplier.

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 Supplier at his own expense to the satisfaction of NPC.

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

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

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

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

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



MW-4.5 Submittal

The following documents shall be submitted by the Supplier 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.

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

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

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

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

Refrigerant to be used shall be environment-friendly.

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

MW-5.2 Design Conditions**a) Outdoor Conditions:**

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

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

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

c) Area to be air-conditioned shall be:

- c.1) Bedroom



d) Area to be ventilated shall be:

d.1) Comfort Room - 10 changes per hour

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

Location	Quantity	Cooling Load/Unit	Type
a.1) Bedroom – San Miguel Substation	One (1) unit	11,500 kJ/hr	Inverter Window Type
a.2) Bedroom – Codon Substation	One (1) unit	11,500 kJ/hr	Inverter Window Type
a.3) Bedroom – Marinawa Substation	One (1) unit	11,500 kJ/hr	Inverter Window Type

b) Ventilation Unit

Location	Quantity	Rating/Unit	Type
b.1) Comfort Room– San Miguel Substation	One (1) unit	100 m ³ /hr	Wall Mounted Exhaust Fan
b.2) Comfort Room – Codon Substation	One (1) unit	100 m ³ /hr	Wall Mounted Exhaust Fan
b.3) Comfort Room – Marinawa Substation	One (1) unit	100 m ³ /hr	Wall Mounted Exhaust Fan

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

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

All electrical materials such as circuit breakers, automatic controls, including all power and control wires, supervision, electrical outlets and fittings shall be included and provided by the Supplier including complete system of automatic temperature controls.



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

The air conditioning unit (window type) to be supplied and installed shall have the following features/accessories but not limited to:

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

MW-5.4.2 Window Type Air-Conditioning Systems

The Window Type Air Conditioning Unit to be supplied and installed for the bedroom in the bunker is as specified in the schedule of equipment or shown on the drawings.

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

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

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

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

MW-5.5 Ventilation Units

MW-5.5.1 General

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

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

MW-5.5.2 Wall Mounted Exhaust Fans

Thru-the-wall propeller exhaust fan shall be provided at the area as specified in the schedule of equipment.

The unit shall be properly sized to conform to the required air changes per hour at free air for this particular application but in no case be less than those specified elsewhere in this specification. Unit installed/mounted on the wall and directly discharges exhaust outside the bunker shall be provided with automatic shutter. It shall be of the direct driven type and corrosion resistant to operate on a 230 V, single phase, 60 Hz.

MW-5.6 Installation and Painting

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

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

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

MW-5.7 Spare Parts and Tools

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

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

MW-5.8 Acceptance Test

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

MW-5.9 Submittal

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



- a) Dimensional layout drawings of mechanical equipment and associated devices.
- b) Manufacturer's catalog sheets, marked as necessary, to indicate materials or equipment being furnished including instruments for control system;
- c) Complete control schematic and wiring diagrams for all equipment to be furnished;
- d) List of recommended Spare Parts and Special Tools; and
- e) Operation and Maintenance Manuals.

MW-6.0 FIRE FIGHTING SYSTEM**MW-6.1 General**

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

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

All the Fire Fighting System equipment shall be supplied by the Supplier complete with their corresponding technical brochures written in English that would 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.

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

MW-6.2 Portable Fire Extinguishers**MW-6.2.1 Scope of work**

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

- a) One (1) unit of Portable Type Fire Extinguisher, Clean Agent (HCFC or Halotron I Type), 7.1 kg. (15.5 lbs), non-expiry, multi-shots, wall-hung type and PS/ICC and/or BFP approved (for each substation).



MW-6.2.2 Fire Extinguisher

Fire extinguisher shall be Philippine Standard/International Certificate of Competence and/or Bureau of Fire Protection Approved and of rechargeable cylinder with five (5) years guarantee against leak. The 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 extinguisher shall be complete with carrying handle and wall-mounting bracket.

Portable fire extinguisher 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 extinguisher 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 Supplier at no expense to NPC.

MW-6.2.3 Submittal

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

MW-7.0 DRAWINGS

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

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

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

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



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

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

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

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

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

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

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

MW-8.0 GUARANTEE

The Supplier 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 unit shall be five (5) years. The Supplier shall guarantee that the equipment will perform in the manner as set forth in the equipment's manual and the Contract.

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

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

MW-9.0 MEASUREMENT OF PAYMENT

Measurement for payment for all works shall be based on the bid price of each item as shown in the Schedule of Requirements (Bid Price Schedule). The cost shall cover all works required and described in the pertinent provisions of the specifications.



SECTION VI – TECHNICAL SPECIFICATIONSLuzP21Z1270Ss

Measurement for payment for pipes shall be based on the bid price of actual length of pipe installed as shown in the Schedule of Requirements (Bid Price Schedule). 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 SPECIFICATIONS**TECHNICAL DATA SHEETS****TABLE OF CONTENTS**

SECTION	DESCRIPTION	PAGE
1.0	TECHNICAL DATA	TDS-1

SECTION VI – TECHNICAL DATA SHEETS

1. The Bidder shall complete this technical data sheet and submit the filled-up form with the technical proposal. The Bidder shall use continuation sheets as necessary for any other additional information keeping to the format shown herein or by reproducing the same.
2. Proposal not providing all the required specific data and information as required herein shall be rejected and shall be ground for disqualification.
3. The data required are technical features and characteristics of the Fixture/ Component/ Material to be provided by the bidder. Bidder's proposal shall at least be equal or superior to the requirements specified by NPC. Proposal not complying with these requirements shall likewise be rejected and shall be disqualified.

1.0 TECHNICAL DATA

ITEM	DESCRIPTION	NPC REQUIREMENTS		SUPPLIER'S DATA	
		QTY.		QTY.	
1.	Prefab Containerized House (Bedroom): <ul style="list-style-type: none"> • Dimensions: 6m length x 2.4m width x 2.6m height. • Flooring: MGO board with linoleum tiles. • Walls: 2" polystyrene insulation with double-sided .45mm pre-painted GI sheet. • Roofing: Glasswool insulation with pre-painted GI sheet roof and interior ceiling • Windows: 4 pcs aluminum frame sliding windows (1.0m x 1.0m), 1pc aluminum frame awning window (0.5m x 0.5m) • Door: 1pcs steel door (0.80m x 2.1m) 1 pc pvc door (0.60m x 2.1m) • Additional: toilet (1.2x1.2) including fixtures & plumbing including 50mm and 100mm dia. uPVC Pipes with fittings. • Including excavation, backfill, sand, and gravel bedding, concrete (20.70MPa), reinforcing steel bars (Grade 275), structural steel i.e. base plate & anchor bolts (A36). 	3	sets		

Name of Bidder: _____

Signature of Bidder: _____

SECTION VII

SCHEDULE OF REQUIREMENTS

SECTION VII - SCHEDULE OF REQUIREMENTS SUMMARY

SUPPLY, DELIVERY AND INSTALLATION OF COLLAPSIBLE/ CONTAINERIZED BUNKER FOR CATANDUANES 69kV T/L & S/S

ITEM NO.	PARTICULARS	TOTAL AMOUNT IN FIGURES		TOTAL PESO EQUIVALENT
		Foreign Currency	Phil. Peso	Phil. Peso
1.0	San Miguel Substation			
2.0	Marinawa Substation			
3.0	Codon Substation			
TOTAL AMOUNT				

Notes: Final delivery site of all equipment/materials shall be at the respective plant sites stated above

Name of Bidder

Name and Signature of Authorized Representative

Designation

SECTION VII- SCHEDULE OF REQUIREMENTS (SAN MIGUEL SUBSTATION)

ITEM NO.	DESCRIPTION	QTY.- UNIT	UNIT PRICE FOR GOODS AND RELATED SERVICES TO BE SUPPLIED AND DELIVERED			TOTAL PRICE
			Unit Price of Goods	Value Added Tax and other Taxes Imposed by Phil. Govt. (Phil. Peso)	Local Transport from Port to Delivery Site (Phil. Peso)>	Local Currency (Phil. Peso) (((d)+(e)+(f)) x(c))
(a)	(b)	(c)	(d)	(e)	(f)	(g)
1.0	Supply and Delivery of the following including other works/services in accordance with the requirements as described in the Technical Specifications:					
1.1	Architectural Works					
1.1	Prefab Containerized House (Bedroom):	1 set				
	• Dimensions: 6m length x 2.4m width x 2.6m height.					
	• Flooring: MGO board with linoleum tiles.					
	• Walls: 50mm polystyrene insulation with double-sided .45mm pre-painted GI sheet					
	• Roofing: Glasswool insulation with pre-painted GI sheet roof and interior ceiling					
	• Windows: 4 pcs aluminum frame sliding windows (1.0m x 1.0m), 1pc aluminum frame awning window (0.5m x 0.5m)					
	• Door: 1pc steel door (0.80m x 2.1m), 1pc pvc door (0.6m x 2.1m)					
	• Additional: toilet (1.2x1.2) including fixtures & plumbing					
1.2	Plumbing System:	1 lot				
	• 50mm diameter uPVC Pipes (15 l.m)					
	• 100mm diameter uPVC Pipes (10 l.m)					
	• Floor Drain, Stainless Steel (1pc)					
2.0	Civil Works					
2.1	Prefabricated Containerized House (Bedroom & Storage)					
	• Structural excavation	5.00 cu.m.				
	• Structural backfill	1.50 cu.m.				
	• Sand and gravel bedding	0.50 cu.m.				
	• Concrete (20.7Mpa)	1.50 cu.m.				
	• Reinforcing Steel Bars (Grade 275)	85.00 kgs				
	• Structural Steel (A36) including base plate and anchor bolts	35.00 kgs				
TOTAL			(Amount in Words)			P _____

- Bidders shall enter a code representing the Country of Origin of all imported equipment, materials and accessories
- + Cost of equipment, freight, insurance, etc. up to Phil. port of entry
- > Unit Price for Local Transportation, insurance and other local costs incidental to delivery of the goods from the Phil port of entry to final delivery site

Name of Bidder: _____

Signature of Bidder: _____

SECTION VII- SCHEDULE OF REQUIREMENTS

SPEC. NO. LuzP21Z1270Ss

SECTION VII- SCHEDULE OF REQUIREMENTS
(SAN MIGUEL SUBSTATION)

ITEM NO.	DESCRIPTION	QTY.- UNIT	UNIT PRICE FOR GOODS AND RELATED SERVICES TO BE SUPPLIED AND DELIVERED			TOTAL PRICE
			Unit Price of Goods	Value Added Tax and other Taxes Imposed by Phil. Govt. (Phil. Peso)	Local Transport from Port to Delivery Site (Phil. Peso)>	Local Currency (Phil. Peso) (((d)+(e)+(f)) x(c))
(a)	(b)	(c)	(d)	(e)	(f)	(g)
3.0	Electrical Works					
3.1	Lighting and power system of the Collapsible/ Containerized Bunker complete with the required panelboard, lighting fixtures, switches, outlets, cables, conduits, boxes and other fittings as described in the Technical Specifications and as shown on the Bid Drawings including installation works and tapping to the nearest power source.	1 lot				
4.0	Mechanical Works					
4.1	Domestic Water Supply Piping System (Including Supply, Installation and Testing)					
4.1.1	Gate Valve, 20 mm Ø, rising stem, cast bronze, screwed ends, Class 150	1 set				
4.1.2	Hose Bibb, 20 mm Ø, bronze body, screwed ends, Class 150	1 set				
4.1.3	Water Pipe, 25 mm O.D. (3/4" N.D.), uPVC pipe, sch. 80 of class 150, and its associated fittings, pipe supports and other accessories	12 lm				
4.1.4	Water Pipe, 20 mm O.D. (1/2" N.D.), uPVC pipe, sch. 80 of class 150, and its associated fittings, pipe supports and other accessories	6 lm				
4.2	Air-Conditioning and Ventilation System (Including Supply, Installation and Testing)					
4.2.1	Air conditioning unit for Bedroom, 11,500 kJ/hr minimum cooling capacity, inverter-window type, complete with necessary mounting accessories and controls (infrared remote) and other necessary accessories as described in the technical specifications.	1 set				
4.2.2	Exhaust fan for Comfort Room, 100 m³/h wall mounted, propeller type, direct driven, complete with automatic shutter, mounting accessories and controls.	1 set				
4.3	Fire Fighting System (Including Supply and Installation)					
4.3.1	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, PS/ICC and/or BFP approved.	1 unit				
TOTAL			(Amount in Words)			P _____

- * Bidders shall enter a code representing the Country of Origin of all imported equipment, materials and accessories
- + Cost of equipment, freight, insurance, etc. up to Phil. port of entry
- > Unit Price for Local Transportation, insurance and other local costs incidental to delivery of the goods from the Phil port of entry to final delivery site

Name of Bidder: _____

Signature of Bidder: _____

SECTION VII- SCHEDULE OF REQUIREMENTS
(MARINAWA SUBSTATION)

ITEM NO.	DESCRIPTION	QTY.- UNIT	UNIT PRICE FOR GOODS AND RELATED SERVICES TO BE SUPPLIED AND DELIVERED			TOTAL PRICE Local Currency (Phil. Peso) (((d)+(e)+(f)) x(c))
			Unit Price of Goods	Value Added Tax and other Taxes Imposed by Phil. Govt. (Phil. Peso)	Local Transport from Port to Delivery Site (Phil. Peso)>	
(a)	(b)	(c)	(d)	(e)	(f)	(g)
	Supply and Delivery of the following including other works/services in accordance with the requirements as described in the Technical Specifications:					
1.0 Architectural Works						
1.1 Prefab Containerized House (Bedroom):						
	• Dimensions: 6m length x 2.4m width x 2.6m height.	1 set				
	• Flooring: MGO board with linoleum tiles.					
	• Walls: 50mm polystyrene insulation with double-sided .45mm pre-painted GI sheet					
	• Roofing: Glasswool insulation with pre-painted GI sheet roof and interior ceiling					
	• Windows: 4 pcs aluminum frame sliding windows (1.0m x 1.0m), 1pc aluminum frame awning window (0.5m x 0.5m)					
	• Door: 1pc steel door (0.80m x 2.1m), 1pc pvc door (0.6m x 2.1m)					
	• Additional: toilet (1.2x1.2) including fixtures & plumbing					
1.2 Plumbing System:		1 lot				
	• 50mm diameter uPVC Pipes (15 l.m)					
	• 100mm diameter uPVC Pipes (10 l.m)					
	• Floor Drain, Stainless Steel (1pc)					
2.0 Civil Works						
2.1 Prefabricated Containerized House (Bedroom & Storage)						
	• Structural excavation	5.00 cu.m.				
	• Structural backfill	1.50 cu.m.				
	• Sand and gravel bedding	0.50 cu.m.				
	• Concrete (20.7Mpa)	1.50 cu.m.				
	• Reinforcing Steel Bars (Grade 275)	85.00 kgs				
	• Structural Steel (A36) including base plate and anchor bolts	35.00 kgs				
TOTAL			(Amount in Words)			P

- Bidders shall enter a code representing the Country of Origin of all imported equipment, materials and accessories
- + Cost of equipment, freight, insurance, etc. up to Phil. port of entry
- > Unit Price for Local Transportation, insurance and other local costs incidental to delivery of the goods from the Phil port of entry to final delivery site

Name of Bidder: _____

Signature of Bidder: _____

**SECTION VII- SCHEDULE OF REQUIREMENTS
(MARINAWA SUBSTATION)**

ITEM NO.	DESCRIPTION	QTY.- UNIT	UNIT PRICE FOR GOODS AND RELATED SERVICES TO BE SUPPLIED AND DELIVERED			TOTAL PRICE
			Unit Price of Goods	Value Added Tax and other Taxes Imposed by Phil. Govt. (Phil. Peso)	Local Transport from Port to Delivery Site (Phil. Peso)>	Local Currency (Phil. Peso) (((d)+(e)+(f)) x(c))
(a)	(b)	(c)	(d)	(e)	(f)	(g)
3.0	Electrical Works					
3.1	Lighting and power system of the Collapsible/ Containerized Bunker complete with the required panelboard, lighting fixtures, switches, outlets, cables, conduits, boxes and other fittings as described in the Technical Specifications and as shown on the Bid Drawings including installation works and tapping to the existing breaker inside the control room.	1 lot				
3.2	Dismantling of the existing branch circuit #3 of Lighting and Power Panelboard at Marinawa Substation and stocking to the designated stockyard to be provided by the end user.	1 lot				
4.0	Mechanical Works					
4.1	Domestic Water Supply Piping System (Including Supply, Installation and Testing)					
4.1.1	Gate Valve, 20 mm Ø, rising stem, cast bronze, screwed ends, Class 150	1 set				
4.1.2	Hose Bibb, 20 mm Ø, bronze body, screwed ends, Class 150	1 set				
4.1.3	Water Pipe, 25 mm O.D. (3/4" N.D.), uPVC pipe, sch. 80 of class 150, and its associated fittings, pipe supports and other accessories	12 lm				
4.1.4	Water Pipe, 20 mm O.D. (1/2" N.D.), uPVC pipe, sch. 80 of class 150, and its associated fittings, pipe supports and other accessories	6 lm				
4.2	Air-Conditioning and Ventilation System (Including Supply, Installation and Testing)					
4.2.1	Air conditioning unit for Bedroom, 11,500 kJ/hr minimum cooling capacity, inverter-window type, complete with necessary mounting accessories and controls (infrared remote) and other necessary accessories as described in the technical specifications.	1 set				
4.2.2	Exhaust fan for Comfort Room, 100 m³/h wall mounted, propeller type, direct driven, complete with automatic shutter, mounting accessories and controls.	1 set				
TOTAL			(Amount in Words)			P

- * Bidders shall enter a code representing the Country of Origin of all imported equipment, materials and accessories
- + Cost of equipment, freight, insurance, etc. up to Phil. port of entry
- > Unit Price for Local Transportation, insurance and other local costs incidental to delivery of the goods from the Phil port of entry to final delivery site

Name of Bidder: _____

Signature of Bidder: _____

SECTION VII -SCHEDULE OF REQUIREMENTS

SPEC. NO. LuzP21Z1270Ss

**SECTION VII- SCHEDULE OF REQUIREMENTS
(MARINAWA SUBSTATION)**

ITEM NO.	DESCRIPTION	QTY.- UNIT	UNIT PRICE FOR GOODS AND RELATED SERVICES TO BE SUPPLIED AND DELIVERED			TOTAL PRICE
			Unit Price of Goods	Value Added Tax and other Taxes Imposed by Phil. Govt. (Phil. Peso)	Local Transport from Port to Delivery Site (Phil. Peso)>	Local Currency (Phil. Peso) (((d)+(e)+(f)) x(c))
(a)	(b)	(c)	(d)	(e)	(f)	(g)
4.3	Fire Fighting System (Including Supply and Installation)					
4.3.1	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, PS/ICC and/or BFP approved.	1 unit				
TOTAL						P _____
(Amount in Words)						

- Bidders shall enter a code representing the Country of Origin of all imported equipment, materials and accessories
- + Cost of equipment, freight, insurance, etc. up to Phil. port of entry
- > Unit Price for Local Transportation, insurance and other local costs incidental to delivery of the goods from the Phil port of entry to final delivery site

Name of Bidder: _____

Signature of Bidder: _____

SECTION VII- SCHEDULE OF REQUIREMENTS

SPEC. NO. LuzP21212705s

**SECTION VII- SCHEDULE OF REQUIREMENTS
(CODON SUBSTATION)**

ITEM NO.	DESCRIPTION	QTY.- UNIT	UNIT PRICE FOR GOODS AND RELATED SERVICES TO BE SUPPLIED AND DELIVERED			TOTAL PRICE
			Unit Price of Goods	Value Added Tax and other Taxes Imposed by Phil. Govt. (Phil. Peso)	Local Transport from Port to Delivery Site (Phil. Peso)>	Local Currency (Phil. Peso) (((d)+(e)+(f)) x(c))
(a)	(b)	(c)	(d)	(e)	(f)	(g)
	Supply and Delivery of the following including other works/services in accordance with the requirements as described in the Technical Specifications:					
1.0 Architectural Works						
1.1 Prefab Containerized House (Bedroom):		1 set				
	• Dimensions: 6m length x 2.4m width x 2.6m height.					
	• Flooring: MGO board with linoleum tiles.					
	• Walls: 50mm polystyrene insulation with double-sided .45mm pre-painted GI sheet					
	• Roofing: Glasswool insulation with pre-painted GI sheet roof and interior ceiling					
	• Windows: 4 pcs aluminum frame sliding windows (1.0m x 1.0m), 1pc aluminum frame awning window (0.5m x 0.5m)					
	• Door: 1pc steel door (0.80m x 2.1m), 1pc pvc door (0.6m x 2.1m)					
	• Additional: toilet (1.2x1.2) including fixtures & plumbing					
1.2 Plumbing System:		1 lot				
	• 50mm diameter uPVC Pipes (15 l.m)					
	• 100mm diameter uPVC Pipes (10 l.m)					
	• Floor Drain, Stainless Steel (1pc)					
2.0 Civil Works						
2.1 Prefabricated Containerized House (Bedroom & Storage)						
	• Structural excavation	5.00 cu.m.				
	• Structural backfill	1.50 cu.m.				
	• Sand and gravel bedding	0.50 cu.m.				
	• Concrete (20.7Mpa)	1.50 cu.m.				
	• Reinforcing Steel Bars (Grade 275)	85.00 kgs				
	• Structural Steel (A36) including base plate and anchor bolts	35.00 kgs				
TOTAL			(Amount in Words)			P _____

- * Bidders shall enter a code representing the Country of Origin of all imported equipment, materials and accessories
- + Cost of equipment, freight, insurance, etc. up to Phil. port of entry
- > Unit Price for Local Transportation, insurance and other local costs incidental to delivery of the goods from the Phil port of entry to final delivery site

Name of Bidder: _____

Signature of Bidder: _____

SECTION VII - SCHEDULE OF REQUIREMENTS

SPEC. NO. LuzP21Z1270Ss

SECTION VII- SCHEDULE OF REQUIREMENTS
(CODON SUBSTATION)

ITEM NO.	DESCRIPTION	QTY.- UNIT	UNIT PRICE FOR GOODS AND RELATED SERVICES TO BE SUPPLIED AND DELIVERED			TOTAL PRICE
			Unit Price of Goods	Value Added Tax and other Taxes Imposed by Phil. Govt. (Phil. Peso)	Local Transport from Port to Delivery Site (Phil. Peso)	Local Currency (Phil. Peso) (((d)+(e)+(f)) x(c))
(a)	(b)	(c)	(d)	(e)	(f)	(g)
3.0	Electrical Works					
3.1	Lighting and power system of the Collapsible/ Containerized Bunker complete with the required panelboard, lighting fixtures, switches, outlets, cables, conduits, boxes and other fittings as described in the Technical Specifications and as shown on the Bid Drawings including installation works and tapping to the nearest power source.	1 lot				
4.0	Mechanical Works					
4.1	Domestic Water Supply Piping System (Including Supply, Installation and Testing)					
4.1.1	Gate Valve, 20 mm Ø, rising stem, cast bronze, screwed ends, Class 150	1 set				
4.1.2	Hose Bibb, 20 mm Ø, bronze body, screwed ends, Class 150	1 set				
4.1.3	Water Pipe, 25 mm O.D. (3/4" N.D.), uPVC pipe, sch. 80 of class 150, and its associated fittings, pipe supports and other accessories	12 lm				
4.1.4	Water Pipe, 20 mm O.D. (1/2" N.D.), uPVC pipe, sch. 80 of class 150, and its associated fittings, pipe supports and other accessories	6 lm				
4.2	Air-Conditioning and Ventilation System (Including Supply, Installation and Testing)					
4.2.1	Air conditioning unit for Bedroom, 11,500 kJ/hr minimum cooling capacity, inverter-window type, complete with necessary mounting accessories and controls (infrared remote) and other necessary accessories as described in the technical specifications.	1 set				
4.2.2	Exhaust fan for Comfort Room, 100 m³/h wall mounted, propeller type, direct driven, complete with automatic shutter, mounting accessories and controls.	1 set				
4.3	Fire Fighting System (Including Supply and Installation)					
4.3.1	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, PS/ICC and/or BFP approved.	1 unit				
TOTAL			(Amount in Words)			P

- * Bidders shall enter a code representing the Country of Origin of all imported equipment, materials and accessories
- + Cost of equipment, freight, insurance, etc. up to Phil. port of entry
- > Unit Price for Local Transportation, insurance and other local costs incidental to delivery of the goods from the Phil port of entry to final delivery site.

Name of Bidder: _____

Signature of Bidder: _____

SECTION VIII

BIDDING FORMS

SECTION VIII – BIDDING FORMS

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Standard Form No: NPCSF-GOODS-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 or as stated under GPPB NPM-039-2014, for Non-Resident Foreign Corporation (NRFC) and Non-Resident Alien Not Engaged in Trade or Business (NRANETB), a Delinquency Verification Certificate may be submitted as a form of Tax Clearance;

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-GOODS-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-GOODS-03) complete with the following supporting documents:

1. Contract/Purchase Order
2. Certificate of Acceptance; or Certificate of Completion; or Official Receipt (O.R); or Sales Invoice

(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.)

Standard Form No: NPCSF-GOODS-01

- Duly signed computation of its Net Financial Contracting Capacity (NFCC) at least equal to the ABC (NPCSF-GOODS-04) or a Committed Line of Credit (CLC) at least equal to ten percent (10%) of the ABC, issued by a Universal or Commercial Bank; If the Bidder opted to submit a Committed Line of Credit (CLC), the bidder must submit a granted credit line valid/effective at the date of bidding.
- b. (CLASS B)**
- For Joint Venture (if applicable), any of the following:
 - Valid Joint Venture Agreement (NPCSF-GOODS-05)
OR
 - Notarized statements from all the potential joint venture partners stating that they will enter into and abide by the provisions of the JVA, if awarded the contract
- Certification from the relevant government office of their country stating that Filipinos are allowed to participate in their government procurement activities for the same item/product (*For foreign bidders claiming eligibility by reason of their country's extension of reciprocal rights to Filipinos*)

2. Technical Documents

- Bid Security, any one of the following:
 - Bid Securing Declaration (NPCSF-GOODS-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-GOODS-06a) - 2% of ABC;
OR
 - Surety Bond callable upon demand issued by a reputable surety or insurance company (NPCSF-GOODS-06b) - 5% of ABC, with
 - Certification from the Insurance Commission as authorized company to issue surety
- Duly signed, completely filled-out and notarized Omnibus Sworn statement (Revised) (NPCSF-GOODS-07), complete with the following attachments:
 - For Sole Proprietorship:
 - Special Power of Attorney
 - For Partnership/Corporation/Cooperative/Joint Venture:
 - Document showing proof of authorization (e.g., duly notarized Secretary's Certificate, Board/Partnership Resolution, or Special Power of Attorney, whichever is applicable)
- Duly signed and completely filled-out Technical Data Sheet – Section VI Part II
- Complete eligibility documents of the proposed subcontractor, if any

Standard Form No: NPCSF-GOODS-01

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-GOODS-08)
- Duly signed and completely filled-out Schedule of Requirement (Section VII) indicating the unit and total prices per item and the total amount in the prescribed Price Schedule form.
- For Domestic Bidder claiming for domestic preference:
 - Letter address to the BAC claiming for preference
 - Certification from DTI as Domestic Bidder in accordance with the prescribed forms provided

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. In the case of foreign bidders, the eligibility requirements under Class "A" Documents (except for Tax Clearance) may be substituted by the appropriate equivalent documents, if any, issued by the country of the foreign bidder concerned. The eligibility requirements or statements, the bids, and all other documents to be submitted to the BAC must be in English. If the eligibility requirements or statements, the bids, and all other documents submitted to the BAC are in foreign language other than English, it must be accompanied by a translation of the documents in English. The documents shall be translated by the relevant foreign government agency, the foreign government agency authorized to translate documents, or a registered translator in the foreign bidder's country; and 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.
These documents shall be accompanied by a Sworn Statement in a form prescribed by the GPPB stating that the documents submitted are complete and authentic copies of the original, and all statements and information provided therein are true and correct. Upon receipt of the said documents, the PhilGEPS shall process the same in accordance with the guidelines on the Government of the Philippines – Official Merchants Registry (GoP-OMR).
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-GOODS-02

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

Business Name : _____

Business Address : _____

Name of Contract/ Project Cost	a. Owner's Name b. Address c. Telephone Nos.	Nature of Work	Bidder's Role		a. Date Awarded b. Date Started c. Date of Completion or Contract Duration/ Date of Delivery	Value of Outstanding Works / Undelivered Portion
			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-GOODS-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: Certificate of Acceptance; or Certificate of Completion; or Official Receipt (O.R); or Sales Invoice for the contract stated above shall be submitted during Bid Opening.

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

Standard Form Number: NPCSF-GOODS-04

NET FINANCIAL CONTRACTING CAPACITY (NFCC)

- A. Summary of the Supplier's/Distributor's/Manufacturer'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 Supplier / Distributor / Manufacturer

Signature of Authorized Representative

Date : _____

Standard Form Number: NPCSF-GOODS-05

JOINT VENTURE AGREEMENT**KNOW ALL MEN BY THESE PRESENTS:**

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

- and -

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

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

NAME OF PROJECT**CONTRACT AMOUNT**

That the capital contribution of each member firm:

NAME OF FIRM	CAPITAL CONTRIBUTION
1. _____	P _____
2. _____	P _____

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

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

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

Name & Signature of Authorized Representative

Official Designation

Name of Firm

Name & Signature of Authorized Representative

Official Designation

Name of Firm

Witnesses

1. _____

2. _____

[Jurat]

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

Standard Form Number: NPCSF-GOODS-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-GOODS-06b

FORM OF BID SECURITY (SURETY BOND)

BOND NO.: _____ DATE BOND EXECUTED: _____

By this bond, We (Name of Bidder) (hereinafter called "the Principal") and (Name of Surety) of (Name of Country of Surety), authorized to transact business in the Philippines (hereinafter called "the Surety") are held and firmly bound unto National Power Corporation (hereinafter called "the Employer") as Obligee, in the sum of (amount in words & figures as prescribed in the bidding documents), callable on demand, for the payment of which sum, well and truly to be made, we, the said Principal and Surety bind ourselves, our successors and assigns, jointly and severally, firmly by these presents.

SEALED with our seals and dated this _____ day of _____ 20 _____

WHEREAS, the Principal has submitted a written Bid to the Employer dated the _____ day of _____ 20 _____, for the _____ (hereinafter called "the Bid").

NOW, THEREFORE, the conditions of this obligation are:

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

then this obligation shall remain in full force and effect, otherwise it shall be null and void.

PROVIDED HOWEVER, that the Surety shall not be:

- a) liable for a greater sum than the specified penalty of this bond, nor
- b) liable for a greater sum than the difference between the amount of the said Principal's Bid and the amount of the Bid that is accepted by the Employer.

Standard Form Number: NPCSF-GOODS-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-GOODS-06c

REPUBLIC OF THE PHILIPPINES)
CITY OF _____) S.S.

BID-SECURING DECLARATION
SUPPLY, DELIVERY AND INSTALLATION OF COLLAPSIBLE/CONTAINERIZED
BUNKER FOR CATANDUANES 69kV T/L & S/S,
LuzP21Z1270Ss

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

I/We¹, the undersigned, declare that:

1. I/We understand that, according to your conditions, bids must be supported by a Bid Security, which may be in the form of a Bid-Securing Declaration.
2. I/We accept that: (a) I/we will be automatically disqualified from bidding for any contract with any procuring entity for a period of two (2) years upon receipt of your Blacklisting Order; and, (b) I/we will pay the applicable fine provided under Section 6 of the Guidelines on the Use of Bid Securing Declaration, within fifteen (15) days from receipt of the written demand by the Procuring Entity for the commission of acts resulting to the enforcement of the Bid Securing Declaration under Sections 23.1 (b), 34.2, 40.1 and 69.1, except 69.1 (f) of the IRR of R.A. 9184; without prejudice to other legal action the government may undertake.
3. I/We understand that this Bid-Securing Declaration shall cease to be valid on the following circumstances:
 - (a) Upon expiration of the bid validity period, or any extension thereof pursuant to your request;
 - (b) I am/we are declared ineligible or post-disqualified upon receipt of your notice to such effect, and (i) I/we failed to timely file a request for reconsideration or (ii) I/we filed a waiver to avail of said right;
 - (c) I am/we are declared as the bidder with the Lowest Calculated and Responsive Bid, and I/we have furnished the performance security and signed the Contract.

IN WITNESS WHEREOF, I/we have hereunto set my hand this ____ day of ____
20____ at _____, Philippines.

[Name and Signature of Bidder's Representative/
Authorized Signatory]
[Signatory's legal capacity]
Affiant

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

¹ Select one and delete the other. Adopt same instruction for similar terms throughout the document.

Standard Form No: NPCSF-GOODS-07

Omnibus Sworn Statement (Revised)

REPUBLIC OF THE PHILIPPINES)
CITY/MUNICIPALITY OF _____) S.S.

AFFIDAVIT

I, [Name of Affiant], of legal age, [Civil Status], [Nationality], and residing at [Address of Affiant], after having been duly sworn in accordance with law, do hereby depose and state that:

1. *[Select one, delete the other:]*

[If a sole proprietorship:] I am the sole proprietor or authorized representative of [Name of Bidder] with office address at [address of Bidder];

[If a partnership, corporation, cooperative, or joint venture:] I am the duly authorized and designated representative of [Name of Bidder] with office address at [address of Bidder];

2. *[Select one, delete the other:]*

[If a sole proprietorship:] As the owner and sole proprietor, or authorized representative of [Name of Bidder], I have full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for [Name of the Project] of the [Name of the Procuring Entity], as shown in the attached duly notarized Special Power of Attorney;

[If a partnership, corporation, cooperative, or joint venture:] I am granted full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for [Name of the Project] of the [Name of the Procuring Entity], as shown in the attached [state title of attached document showing proof of authorization (e.g., duly notarized Secretary's Certificate, Board/Partnership Resolution, or Special Power of Attorney, whichever is applicable)];

3. [Name of Bidder] is not "blacklisted" or barred from bidding by the Government of the Philippines or any of its agencies, offices, corporations, or Local Government Units, foreign government/foreign or international financing institution whose blacklisting rules have been recognized by the Government Procurement Policy Board, by itself or by relation, membership, association, affiliation, or controlling interest with another blacklisted person or entity as defined and provided for in the Uniform Guidelines on Blacklisting;

4. Each of the documents submitted in satisfaction of the bidding requirements is an authentic copy of the original, complete, and all statements and information provided therein are true and correct;

5. [Name of Bidder] is authorizing the Head of the Procuring Entity or its duly authorized representative(s) to verify all the documents submitted;

6. *[Select one, delete the rest:]*

[If a sole proprietorship:] The owner or sole proprietor is not related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

[If a partnership or cooperative:] None of the officers and members of [Name of Bidder] is related to the Head of the Procuring Entity, members of the Bids and Awards Committee

(BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

[If a corporation or joint venture:] None of the officers, directors, and controlling stockholders of *[Name of Bidder]* is related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

7. *[Name of Bidder]* complies with existing labor laws and standards; and
8. *[Name of Bidder]* is aware of and has undertaken the responsibilities as a Bidder in compliance with the Philippine Bidding Documents, which includes:
 - a. Carefully examining all of the Bidding Documents;
 - b. Acknowledging all conditions, local or otherwise, affecting the implementation of the Contract;
 - c. Making an estimate of the facilities available and needed for the contract to be bid, if any; and
 - d. Inquiring or securing Supplemental/Bid Bulletin(s) issued for the *[Name of the Project]*.
9. *[Name of Bidder]* did not give or pay directly or indirectly, any commission, amount, fee, or any form of consideration, pecuniary or otherwise, to any person or official, personnel or representative of the government in relation to any procurement project or activity.
10. In case advance payment was made or given, failure to perform or deliver any of the obligations and undertakings in the contract shall be sufficient grounds to constitute criminal liability for Swindling (Estafa) or the commission of fraud with unfaithfulness or abuse of confidence through misappropriating or converting any payment received by a person or entity under an obligation involving the duty to deliver certain goods or services, to the prejudice of the public and the government of the Philippines pursuant to Article 315 of Act No. 3815 s. 1930, as amended, or the Revised Penal Code.

IN WITNESS WHEREOF, I have hereunto set my hand this ____ day of ____, 20__ at _____, Philippines.

[Insert NAME OF BIDDER OR ITS AUTHORIZED REPRESENTATIVE]

[Insert signatory's legal capacity]
Affiant

[Jurat]

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

Standard Form No: NPCSF-GOODS-08

BID LETTER

Date: _____

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

Gentlemen:

Having examined the Bidding Documents including Bid Bulletin Numbers *[insert numbers]*, the receipt of which is hereby duly acknowledged, we, the undersigned, offer to perform **SUPPLY, DELIVERY AND INSTALLATION OF COLLAPSIBLE/CONTAINERIZED BUNKER FOR CATANDUANES 69kV T/L & S/S (LuzP21Z1270Ss)** in conformity with the said Bidding Documents for the sum of *[total Bid amount in words and figures]* or such other sums as may be ascertained in accordance with the Schedule of Prices attached herewith and made part of this Bid.

We undertake, if our Bid is accepted, to supply and deliver the goods and perform other services, if required within the contract duration and in accordance with the scope of the contract specified in the Schedule of Requirements and Technical Specifications.

If our Bid is accepted, we undertake to provide a performance security in the form, amounts, and within the times specified in the Bidding Documents.

We agree to abide by this Bid for the Bid Validity Period specified in Bid Documents and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

Until a formal Contract is prepared and executed, this Bid, together with your written acceptance thereof and your Notice of Award, shall be binding upon us.

We understand that you are not bound to accept the Lowest Calculated Bid or any Bid you may receive.

We certify/confirm that we comply with the eligibility requirements pursuant to the Bidding Documents.

We likewise certify/confirm that the undersigned, *[for sole proprietorships, insert: as the owner and sole proprietor or authorized representative of [Name of Bidder]* has the full power and authority to participate, submit the bid, and to sign and execute the ensuing contract, on the latter's behalf for the *[Name of Project]* of the National Power Corporation *[for partnerships, corporations, cooperatives, or joint ventures, insert: is granted full power and authority by the [Name of Bidder]* to participate, submit the bid, and to sign and execute the ensuing contract on the latter's behalf for *[Name of Project]* of the National Power Corporation.

We acknowledge that failure to sign each and every page of this Bid Letter, including the attached Schedule of Requirements (Bid Price Schedule), shall be a ground for the rejection of our bid.

*[name and signature of authorized signatory]*_____
[in the capacity of]

Duly authorized to sign Bid for and on behalf of _____
[name of bidder]

Bank Guarantee Form for Advance Payment

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

[name of Contract]

Gentlemen and/or Ladies:

In accordance with the Advance Payment Provision, Clause 11 of the General Conditions of Contract, *[name and address of Supplier]* (hereinafter called the "Supplier") shall deposit with the PROCURING ENTITY a bank guarantee to guarantee its proper and faithful performance under the said Clause of the Contract in an amount of *[amount of guarantee in figures and words]*.

We, the *[name of the universal/commercial bank]*, as instructed by the Supplier, agree unconditionally and irrevocably to guarantee as primary obligator and not as surety merely, the payment to the PROCURING ENTITY on its first demand without whatsoever right of objection on our part and without its first claim to the Supplier, in the amount not exceeding *[amount of guarantee in figures and words]*.

We further agree that no change or addition to or other modification of the terms of the Contract to be performed thereunder or of any of the Contract documents which may be made between the PROCURING ENTITY and the Supplier, shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition, or modification.

This guarantee shall remain valid and in full effect from the date the advance payment is received by the Supplier under the Contract and until the Goods are accepted by the PROCURING ENTITY.

Yours truly,

Signature and seal of the Guarantors

[name of bank or financial institution]

[address]

[date]

CERTIFICATION AS A DOMESTIC BIDDER

This is to certify that based on the records of this office, (Name of Bidder) is
duly registered with the DTI on _____.

This further certifies that the articles forming part of the product of (Name of Bidder)
which are/is (Specify) _____ are substantially composed of
articles, materials, or supplies grown, produced or manufactured in the Philippines. (Please
encircle the applicable description/s).

This certification is issued upon the request of (Name of Person/Entity) in
connection with his intention to participate in the bidding for the (Name of Project)
of the National Power Corporation (NPC).

Given this ____ day of _____ 20__ at _____, Philippines

Name

Position

Department of Trade & Industry

SECTION IX

BID DRAWINGS

SECTION IX – BID DRAWINGS

AW – ARCHITECTURAL DRAWINGS

DRAWING NO.

TITLE

CSSB-BDA-13.001

PREFABRICATED CONTAINER
HOUSE (PLAN, ELEVATIONS,
PLUMBING, AND DETAILS)

SECTION IX – BID DRAWINGS**CW – CIVIL WORKS****DRAWING NO.****TITLE**

CSSB-BDC-13.001

SITE DEVELOPMENT PLAN
(CODON SUBSTATION)

CSSB-BDC-13.002

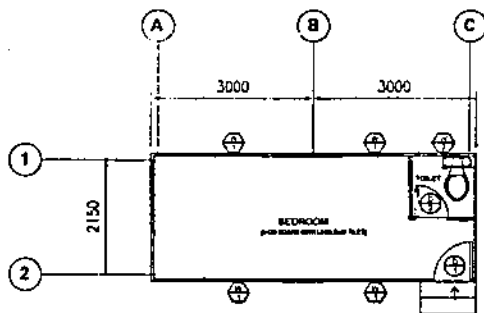
SITE DEVELOPMENT PLAN
(MARINAWA SUBSTATION)

CSSB-BDC-13.003

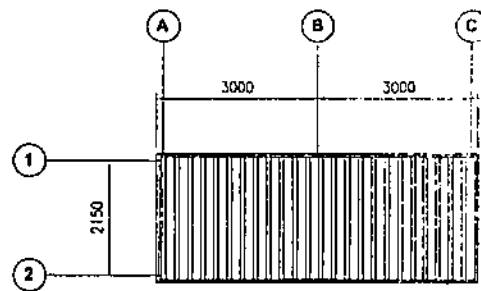
SITE DEVELOPMENT PLAN (SAN
MIGUEL SUBSTATION)

CSSB-BDC-13.004

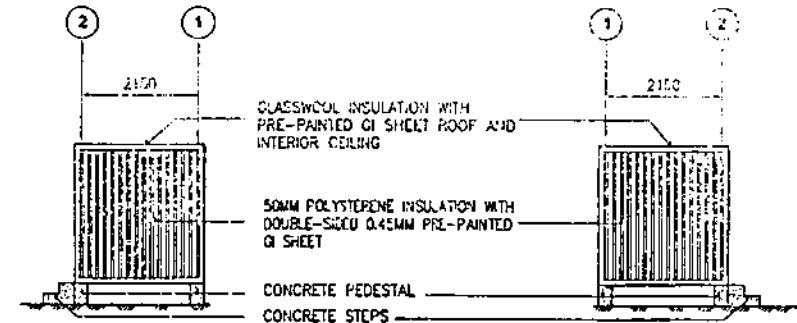
PREFABRICATED CONTAINER
HOUSE (FOUNDATION,
PEDESTAL, AND CONCRETE
STEPS)



FLOOR PLAN
SCALE 1:100

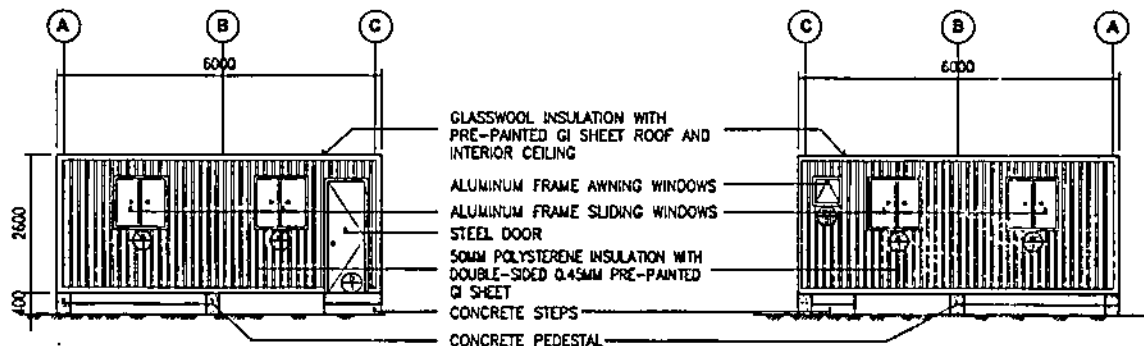


ROOF PLAN
SCALE 1:100



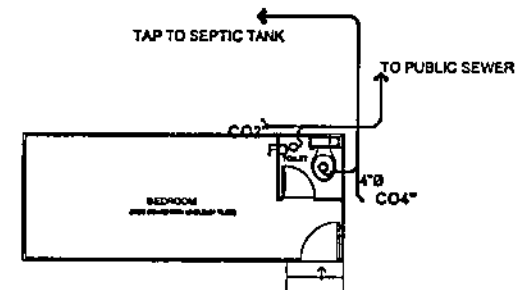
RIGHT SIDE ELEVATION
SCALE 1:100

LEFT SIDE ELEVATION
SCALE 1:100



FRONT ELEVATION
SCALE 1:100

REAR ELEVATION
SCALE 1:100



PLUMBING LAYOUT
SCALE 1:75



D1
: FLUSH TYPE STEEL DOOR

D2
: FLUSH TYPE PVC DOOR

W1
: GLASS AND ALUM. SLIDING WINDOW
: 6 MM THICK CLEAR GLASS
: ALUMINUM FRAME

W2
: GLASS AND ALUM. AWNING WINDOW
: 6 MM THICK CLEAR GLASS
: ALUMINUM FRAME

SCHEDULE OF DOORS AND WINDOWS
SCALE 1:100

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
2. LOCATION OF BUNKHOUSE SHALL BE VERIFIED AT SITE.

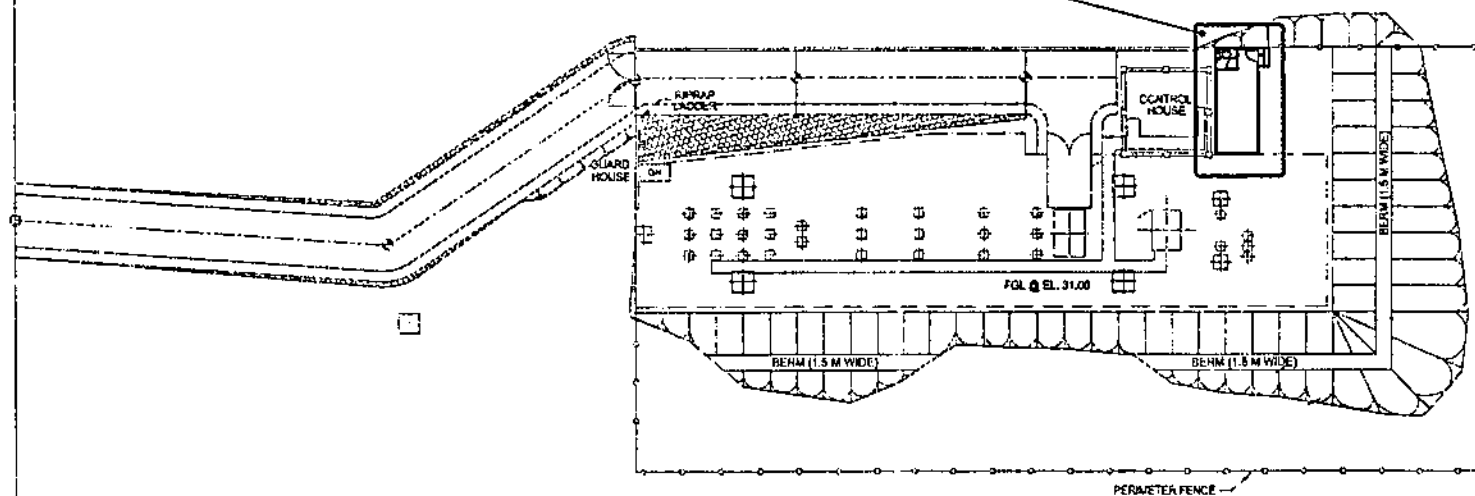
LEGEND:

FD - FLOOR DRAIN
CO - CLEAN OUT

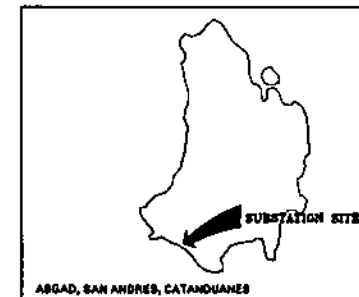
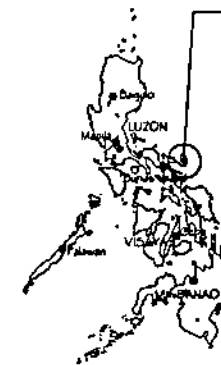
OWNER:		NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT: SUPPLY, DELIVERY AND INSTALLATION OF COLLAPSIBLE BUNKER FOR CATANDUANES 66 KV TA. & S/S			
LOCATION: BRK, KILIGOR, SAN MIGUEL, CATANDUANES			
TITLE: PREFABRICATED CONTAINER HOUSE (PLANS, ELEVATIONS, PLUMBING LAYOUT AND DETAILS)			
DESIGNED	BY	CHKD	DATE
DRAWN	J.G.A.C.		
REVIEWED	PRINCIPAL ENGR. / ARCHT.	RECOMMENDED	
CHECKED		APPROVED	
ELEC.			
MECH.			
DWG. NO. CSSB-BDA-13.001		SPEC. NO. LUZP21Z1270S#	
SCALE: AS SHOWN		BID DRAWING	
REV.	DATE	NATURE OF REVISION	BY

NATIONAL ROAD

PROPOSED SITE OF
COLLAPSIBLE BUNKER



Codon Substation
Substation Site




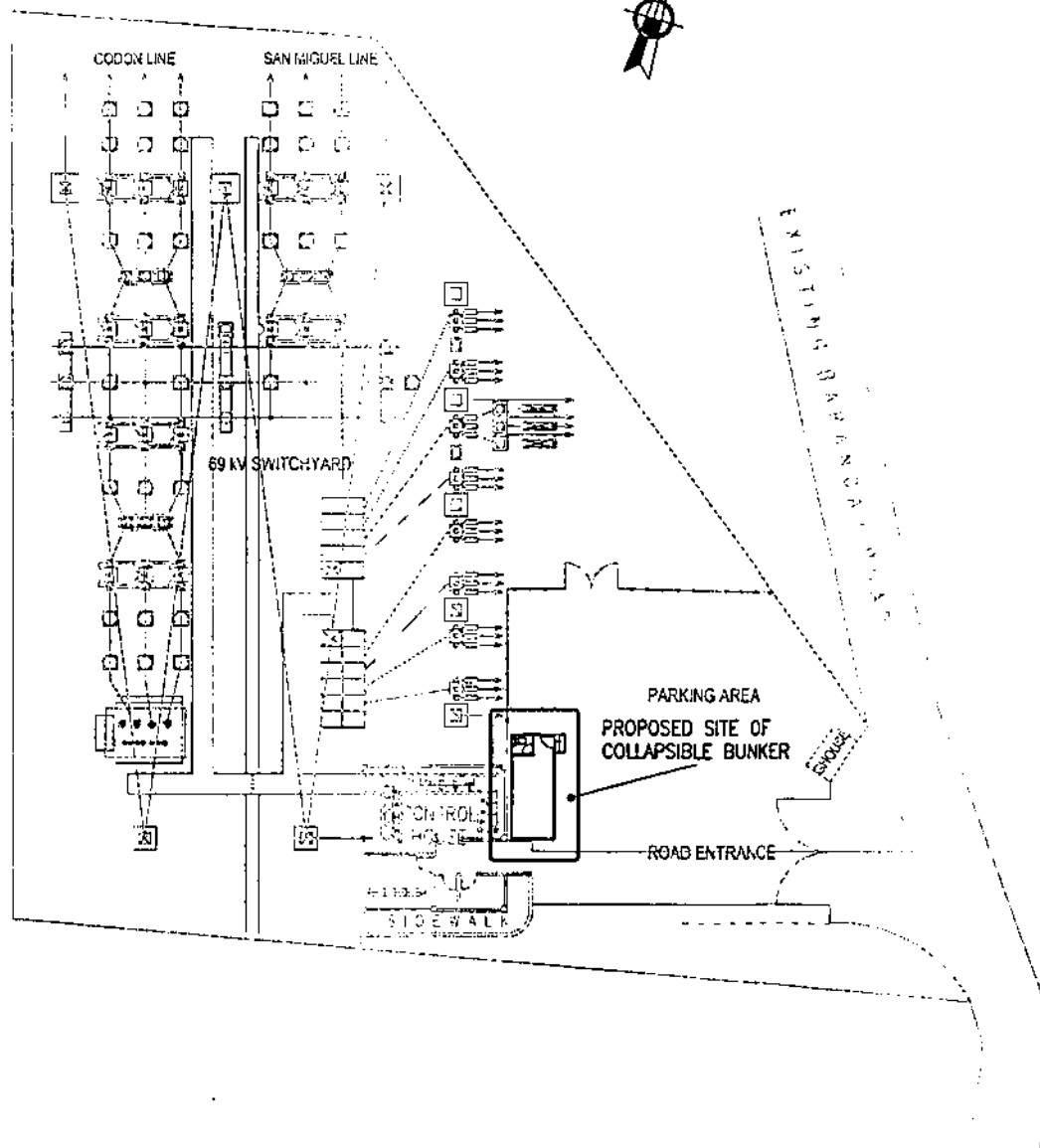
LOCATION MAP
NOT TO SCALE

- NOTE:
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
 2. LOCATION OF BUNKHOUSE SHALL BE VERIFIED AT SITE

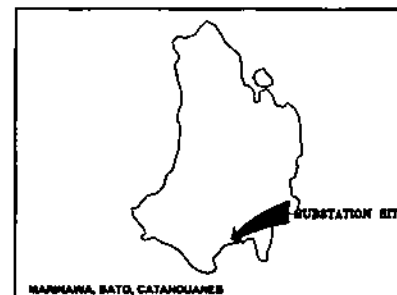
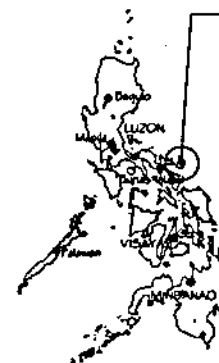


SCALE 1:500

OWNER:				NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT: SUPPLY, DELIVERY AND INSTALLATION OF COLLAPSIBLE BUNKER FOR CATANDUANES 66 KV TL & S/S					
LOCATION: ARAID, SAN ANDRES, CATANDUANES					
TITLE: SITE DEVELOPMENT PLAN (CODON SUBSTATION)					
DESIGNED	BY	CHKD	DATE	SUBMITTED:	M. L. SINDOZA Principal Engineer A. Class
DRAWN	JAC			RECOMMENDED:	A. C. ESPINOSA Principal Engineer
REVIEWED	PRINCIPAL ENGR. / ARCHT.			APPROVED:	M. L. SINDOZA Principal Engineer
CIVIL/ARCHT					
ELEC.					
MECH.					
DWG. NO. CSSB-BDC-13.001				SPEC. NO. LUZP21Z1270S	
REV.	DATE	NATURE OF REVISION	BY	CHKD	RECD
			APPRO.	SCALE: 1:100	
					BID DRAWING
					REV. 1




Marinawa Substation Substation Site

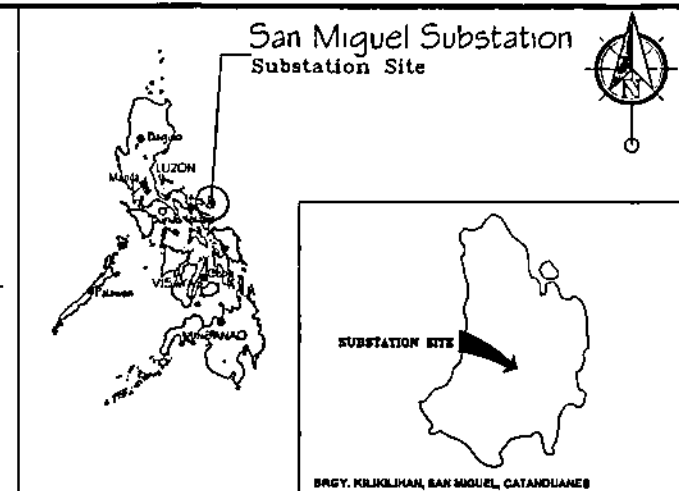
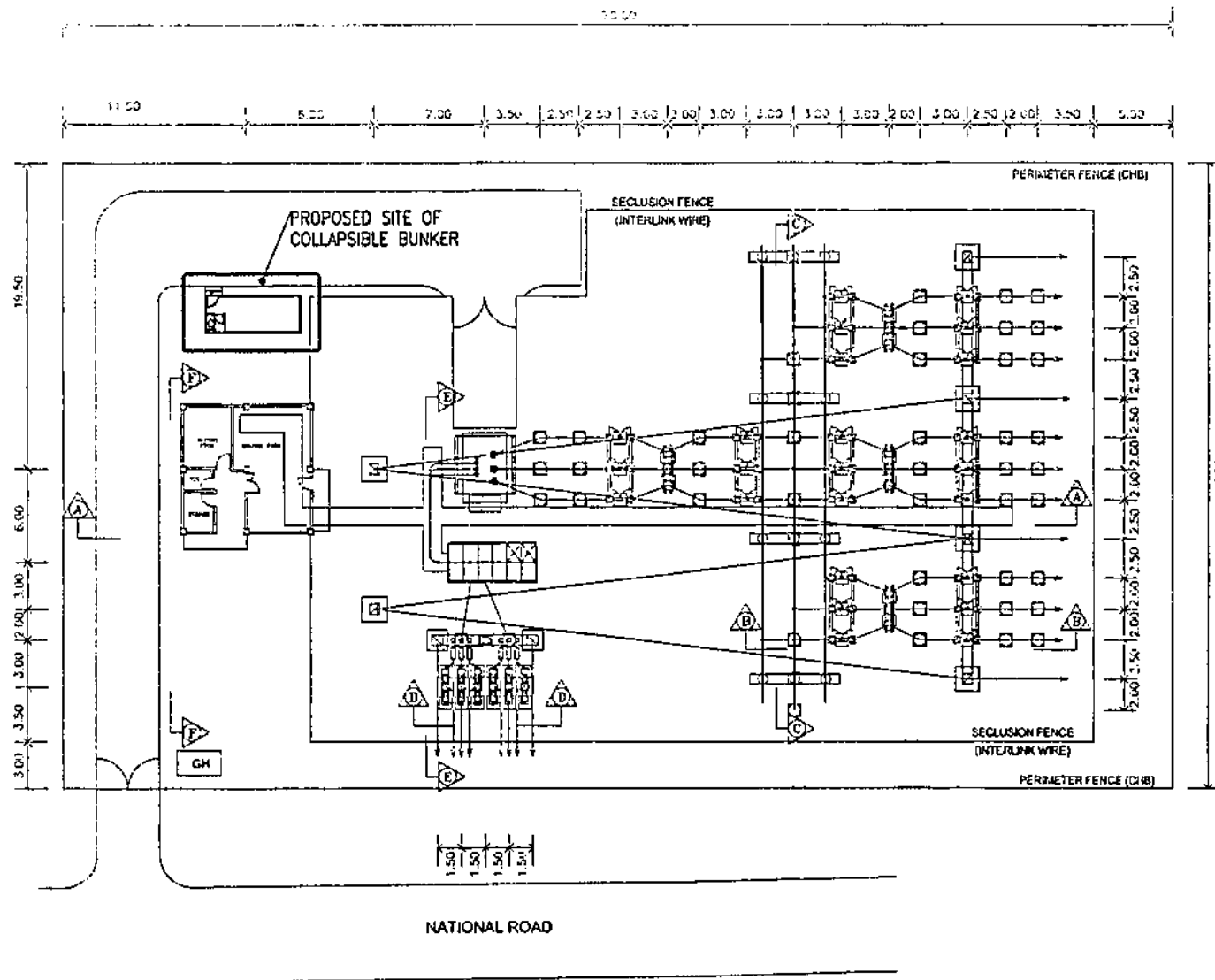


LOCATION MAP NOT TO SCALE

NOTE:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
2. LOCATION OF BUNKHOUSE SHALL BE VERIFIED AT SITE

OWNER		 NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT: SUPPLY, DELIVERY AND INSTALLATION OF COLLAPSIBLE BUNKER FOR CATANDUANES III LV TL & S/S			
LOCATION: MARINAWA, BATO, CATANDUANES			
TITLE: SITE DEVELOPMENT PLAN (MARINAWA SUBSTATION)			
DESIGNED	BY	CHKD	DATE
DRAWN	JAC		
REVIEWED	PRINCIPAL ENGR./ARCHT.		RECOMMENDER:
CHECKED			
ELEC.			APPROVED:
MECH.			
DWG. NO. CSSB-BDC-13.002		SPEC. NO. LUP21Z1270S	
REV.	DATE	NATURE OF REVISION	BY
SCALE: 1:100		BID DRAWING	
		REV. 0	

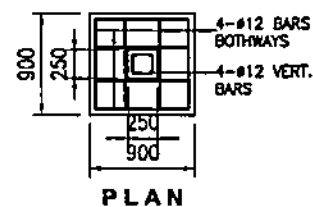
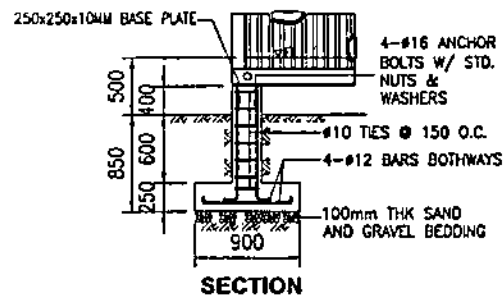
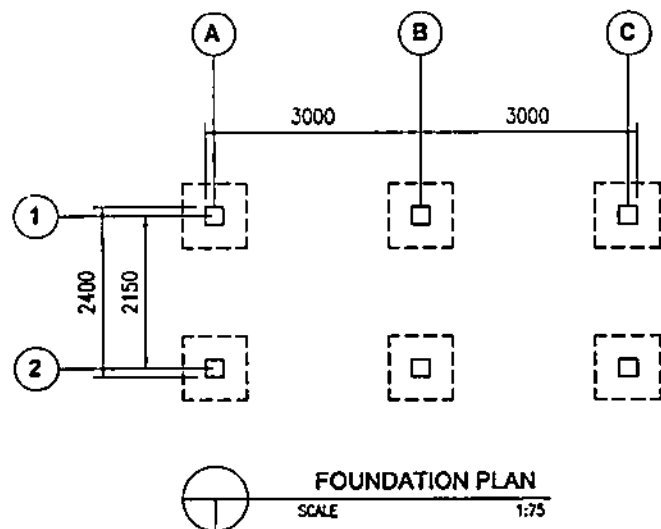


LOCATION MAP NOT TO SCALE

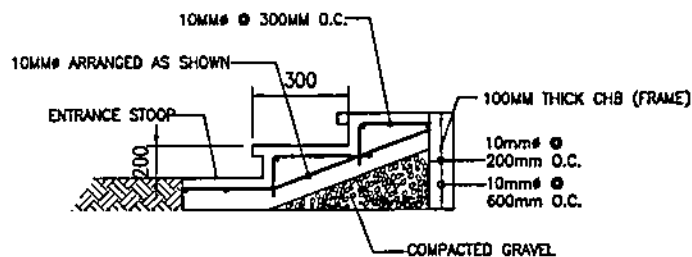
NOTE:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
2. LOCATION OF BUNKHOUSE SHALL BE VERIFIED AT SITE

OWNER		NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT: SUPPLY, DELIVERY AND INSTALLATION OF COLLAPSIBLE BUNKER FOR CATANDUANES 66 KV TL & SB			
LOCATION: BRGY. KIKILUHAN, SAN MIGUEL, CATANDUANES			
TITLE: SITE DEVELOPMENT PLAN (SAN MIGUEL SUBSTATION)			
DESIGNED	BY	CHKD	DATE
DRAWN	ASAC		
REVIEWED	PRINCIPAL ENGR. / ARCHT.		
CIVIL/ARCHT			
ELEC.			
MECH.			
DWG. NO. CSSB-BDC-13.003		SPEC. NO. LUZP21Z1270S	
REV. DATE		NATURE OF REVISION	
BY	CHKD.	RECD.	APPD.
SCALE: 1:100		BID DRAWING	
		REV. 1	



DETAILS OF PEDESTAL FOOTING
SCALE NTS



NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. FOOTING DESIGN BASED ON ALLOWABLE SOIL PRESSURE OF 144 KPa AND TO BE VERIFY BASED ON ACTUAL SOIL CONDITION.
3. UNLESS OTHERWISE INDICATED IN THE PLANS OR NOTED IN THE SPECIFICATIONS, THE MINIMUM 28 DAY CYLINDER COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 20.7MPa FOR PEDESTAL AND 17.30 MPa FOR CONCRETEWALK.
4. UNLESS OTHERWISE INDICATED SPECIFIED IN THE PLANS, THE MINIMUM YIELD STRENGTH OF REINFORCEMENT TO BE USED SHALL BE GRADE 40 (276MPa).
5. ALL REINFORCING STEEL SHALL BE DETAILED AND PLACED IN CONFORMANCE WITH ACI-318.

OWNER		NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT: SUPPLY, DELIVERY AND INSTALLATION OF COLLAPSIBLE BUNKER FOR CATANDUANES 66 KV TL & S/S			
LOCATION: BAY, KILILIHAN, SAN MIGUEL CATANDUANES			
TITLE: PREFABRICATED CONTAINER HOUSE (FOUNDATION, PEDESTAL, AND CONCRETE STEPS)			
DESIGNED	BY	CHECK	DATE
DRAWN	LEG.		
REVIEWED	PRINCIPAL ENGR. / ARCHT.	RECOMMENDED	
CIVIL/ARCHT			
ELEC.		APPROVED	
MECH.			
Dwg. No. CSSB-BDC-13.004		SPEC No. LUP21Z1270S	
SCALE: AS SHOWN		BID DRAWING	





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

SECTION IX - BID DRAWINGS**EW - ELECTRICAL DRAWINGS**

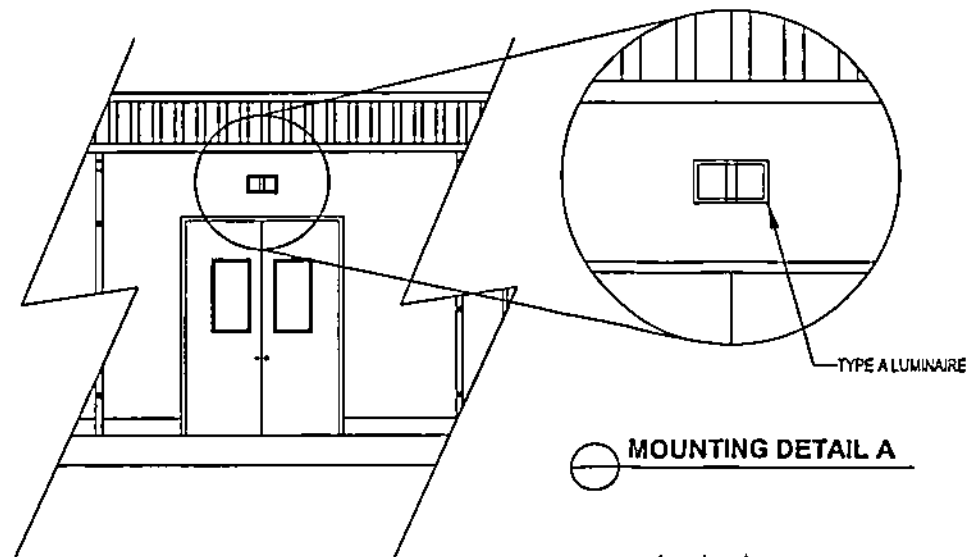
DRAWING NO.	TITLE
CSSB-BDE-13.001	GENERAL NOTES, DETAILS OF LIGHTING FIXTURES & MOUNTING DETAIL A
CSSB-BDE-13.002	LIGHTING LAYOUT AND POWER LAYOUT (SAN MIGUEL SUBSTATION AND CODON SUBSTATION)
CSSB-BDE-13.003	LIGHTING LAYOUT, POWER LAYOUT, SCHEDULE OF LOADS & RISER DIAGRAM (MARINAWA SUBSTATION)


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 EXISTING 220 VOLTS, 60 HERTZ, LIGHTING AND POWER PANEL.
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 mm² THHN/THWN-2 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.
11. ALL ELECTRICAL MATERIALS TO BE USED IN THE INSTALLATION SHALL BE NEW, STANDARD AND APPROVED TYPE AS TO LOCATION, TYPES AND PURPOSE.
12. ELECTRICAL WORKS SHALL BE DONE UNDER THE DIRECT SUPERVISION OF A DULY LICENSED ELECTRICAL ENGINEER.

			
<p>IP44 WALL MOUNTED LIGHTING FIXTURE, STEEL BASE, WHITE SATINATED GLASS DIFFUSER WITH 1 x 12 WATTS DAY LIGHT COMPACT LED LAMP</p>	<p>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.</p>	<p>IP20 1 x 8 WATTS COOL WHITE, CLASSIC GLOBE SHAPE, FROSTED FINISH, E27 BASE, COMPACT LED LAMP.</p>	<p>PORTABLE EMERGENCY LIGHTING FIXTURE, 2 x 2 WATTS LED WARM WHITE WITH BUILT-IN SEALED LEAD ACID BATTERY, CHARGING TIME = 20 HRS, USAGE TIME = 8 HRS</p>

DETAILS OF LIGHTING FIXTURES



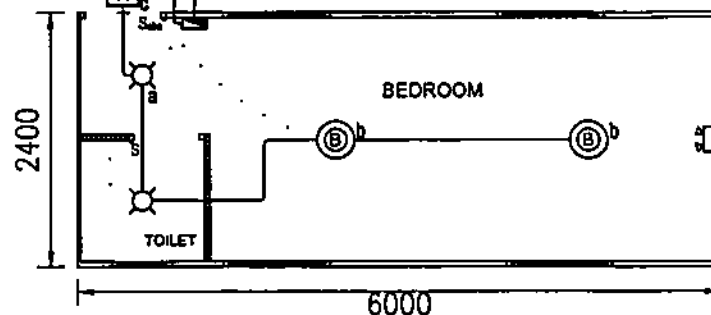
OWNER:				NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT: SUPPLY, DELIVERY AND INSTALLATION OF COLLAPSIBLE BUNKHOUSE FOR CATANDUANES 60 KVTL & S/S					
LOCATION: CATANDUANES 60 KVTL & S/S					
TITLE: GENERAL NOTES, DETAILS OF LIGHTING FIXTURES & MOUNTING DETAIL A					
DESIGNED	BY	CHKD	DATE	SUBMITTED:	B. M. GARCIA
DRAWN	RLS			RECOMMENDED:	C. C. LUCOD, JR.
REVIEWED	PRINCIPAL ENGR. / ARCHT.			APPROVED:	Manager, DDO
CIVIL/ARCHT					
ELEC.					
MECH.					
DWG NO CSS8-BDE-13.001				SPECS NO LuzP21Z1270S	
1		ADDITIONAL BUNKHOUSE FOR COON SUBSTATION AND MARINAWA SUBSTATION		REV. 1	
REV.	DATE	NATURE OF REVISION		BY	CHKD

1	REVISED	ADDITIONAL BUNKHOUSE FOR COON SUBSTATION AND MARINAWA SUBSTATION	RLD	BMA	CEL	NGS
REV.	DATE	NATURE OF REVISION	BY	CHKD	RECD	APPD

SCALE: N. T. S. BID DRAWING

TO BE TAPPED TO THE
EXISTING SPARE CIRCUIT
BREAKER #4 INSIDE THE
CONTROL ROOM

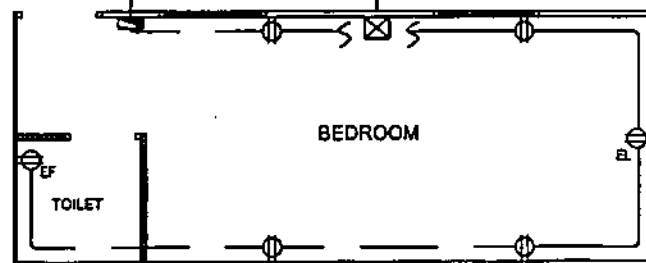
SEE HO-MATH DETAIL A-1071
DRAWING NO. 1288-002-12-00



 **LIGHTING LAYOUT**

TO BE TAPPED TO THE
EXISTING SPARE CIRCUIT
BREAKER #4 INSIDE THE
CONTROL ROOM

TO BE TAPPED TO THE
EXISTING SPARE CIRCUIT
BREAKER #10 INSIDE THE
CONTROL ROOM


















 **POWER LAYOUT**

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
2. THIS DRAWING SHALL BE WORKED WITH CIVIL AND MECHANICAL BID DRAWINGS.
3. SIZE OF CONDUCTOR TO BE USED FOR AIR CONDITIONING UNIT SHALL BE 5.5 mm² in 20 mm² UPVC.

LEGEND:

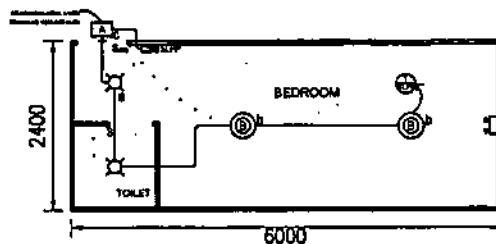
-  - 1x12W FIXTURE TYPE A
-  - 2x18W FIXTURE TYPE B
-  - 1x8W FIXTURE TYPE C
-  - 2x2W FIXTURE TYPE D
-  - 50 AF/15 AT CIRCUIT BREAKER WITH NEMA 1 ENCLOSURE
-  - 50 AF/25 AT CIRCUIT BREAKER WITH NEMA 3 ENCLOSURE
-  - SINGLE POLE SWITCH
-  - TRIPLEX POLE SWITCH (SUBSCRIPT DENOTES LAMP BEING CONTROLLED)
-  - CONVENIENCE OUTLET
-  - EXHAUST FAN OUTLET
-  - EMERGENCY LIGHT OUTLET
-  - CIRCUIT RUNNING UNDER GROUND
-  - CIRCUIT RUNNING ON CEILING
-  - CONTROL CIRCUIT

OWNER		 NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT: SUPPLY, DELIVERY AND INSTALLATION OF COLLAPSIBLE BUNGALOW FOR CATANDUANES 80 KV TL & S/S			
LOCATION: BRGY. KILILIMAN, SAN MIGUEL, CATANDUANES & ABAJO, SAN ANDRES, CATANDUANES			
TITLE: LIGHTING LAYOUT AND POWER LAYOUT (TYPICAL FOR SAN MIGUEL S/S AND CODON S/S)			
DESIGNED	BY	CHKD	DATE
DRAWN	BY	CHKD	DATE
REVIEWED	PRINCIPAL ENGR. / ARCHT.		
CIVIL/ARCHT	APPROVED		
ELEC.	APPROVED		
MECH.	APPROVED		

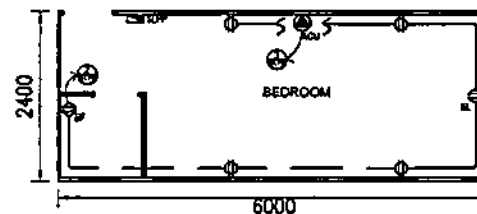
DWG. NO. **CSSB-BDE-13.002** SPEC. NO. **LuzP2121270Ss**

SCALE: 1:50 **BID DRAWING** REV. 1

REV.	DATE	NATURE OF REVISION	BY	CHKD	RECD	APPD
1	10/20/02	ADDITIONAL BUNGALOW FOR CODON SUBSTATION AND MARINAWA SUBSTATION	RLD	BMA	CDL	NCS



LIGHTING LAYOUT



POWER LAYOUT

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
- THIS DRAWING SHALL BE WORKED WITH CIVIL AND MECHANICAL BID DRAWINGS.
- SIZE OF CONDUCTOR TO BE USED FOR AIR CONDITIONING UNIT SHALL BE 5.5 mm² IN 20 mm² UPVC.

LEGEND:

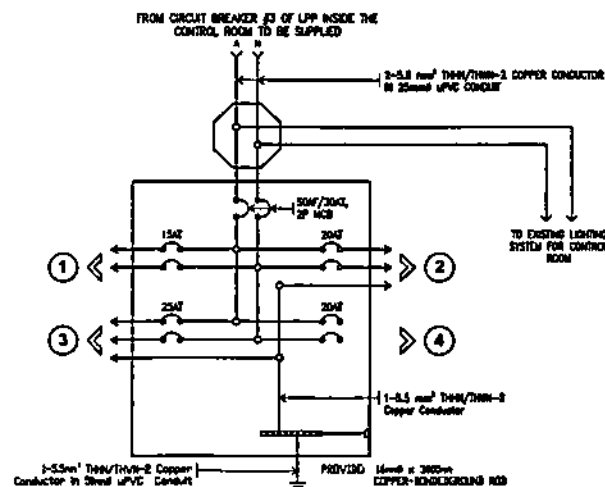
- 1x12W FIXTURE TYPE A
- 2x18W FIXTURE TYPE B
- 1x9W FIXTURE TYPE C
- SUB-LIGHTING AND POWER PANELBOARD
- SINGLE POLE SWITCH
- TRIPLEX POLE SWITCH (SUBSCRIPT DENOTES LAMP BEING CONTROLLED)
- CONVENIENCE OUTLET
- EXHAUST FAN OUTLET
- EMERGENCY LIGHT OUTLET
- CIRCUIT RUNNING UNDER GROUND
- CIRCUIT RUNNING ON CEILING
- CONTROL CIRCUIT

SCHEDULE OF LOADS						
DIS. NO.	DESCRIPTION	VA	V	A	SIZE	
					BREAKER	WIRE
1	1 - 1x12W FIXTURE TYPE A 2 - 2x18W FIXTURE TYPE B 2 - 1x9W FIXTURE TYPE C	126	230	0.54	50AF / 15AT	2 - 1.5mm ² THHN/THHN-2 20mm ² UPVC
2	4 - 200VA CONVENIENCE OUTLET 1 - 1x12W EMERGENCY LIGHT OUTLET 1 - 1x10V EXHAUST FAN OUTLET	805	230	3.50	50AF / 20AT	2 - 1.5mm ² THHN/THHN-2 1 - 3.5mm ² THHN/THHN-2 20mm ² UPVC
3	1 - 1.5 HP AIR CONDITIONING UNIT	3300	230	14	50AF / 20AT	2 - 5.5mm ² THHN/THHN-2 1 - 5.5mm ² THHN/THHN-2 20mm ² UPVC
4	SPARE	1500	230	6.50	50AF / 20AT	
	TOTAL	5131	230	24.04		

PROVIDE: 50 AF / 30 AT, 2P, MCB
WITH BRANCH CIRCUITS OF:
1 - 50AF/25AT, 2P, MCB
2 - 50AF/20AT, 2P, MCB
1 - 50AF/15AT, 2P, MCB

PROVIDE: 2 - 5.5 mm² THHN/THHN-2 Copper Conductor &
1 - 5.5 mm² THHN/THHN-2 Copper Conductor
in 25mm² UPVC Conduit

**SCHEDULE OF LOADS
SUB-LIGHTING AND POWER PANELBOARD**



**RISER DIAGRAM
SUB-LIGHTING AND POWER PANELBOARD**

OWNER:		NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT: SUPPLY, DELIVERY AND INSTALLATION OF COLLAPSIBLE BUNKHOUSE FOR CATANDUANES 88 KV TL & S/S			
LOCATION: MARINAWA, BATO, CATANDUANES			
TITLE: LIGHTING LAYOUT, POWER LAYOUT, SCHEDULE OF LOADS & RISER DIAGRAM (MARINAWA SUBSTATION)			
DESIGNED	BY	CHKD	DATE
DRAWN	BY	CHKD	DATE
REVIEWED	BY	CHKD	DATE
CHECKED	BY	CHKD	DATE
ELC.	BY	CHKD	DATE
MECH.	BY	CHKD	DATE
SUBMITTED:		APPROVED:	
BY: A. N. AGUILA		BY: P. C. LUGOD, JR.	
DATE: 10/10/2013		DATE: 10/10/2013	
RECOMMENDED:		APPROVED:	
BY: P. C. LUGOD, JR.		BY: N. C. LUGOD, JR.	
DATE: 10/10/2013		DATE: 10/10/2013	
TITLE: LIGHTING LAYOUT, POWER LAYOUT, SCHEDULE OF LOADS & RISER DIAGRAM (MARINAWA SUBSTATION)		APPROVED:	
BY: P. C. LUGOD, JR.		BY: N. C. LUGOD, JR.	
DATE: 10/10/2013		DATE: 10/10/2013	
DWD. NO. CSSB-BDE-13.003		SPECS. NO. LUZP2121270S8	
SCALE: 1:75		BID DRAWING	
REV. 1		REV. 1	

1	REVISION	ADDITIONAL BUNKHOUSE FOR CODON SUBSTATION AND MARINAWA SUBSTATION	BY	CHKD	RECD	APPD
REV.	DATE	NATURE OF REVISION	BY	CHKD	RECD	APPD

SECTION IX – BID DRAWINGS**MW – MECHANICAL WORKS****DRAWING NO.****TITLE**

CSSB-BDM-13.001

EQUIPMENT AND PIPING LAYOUT
(SAN MIGUEL SUBSTATION)

CSSB-BDM-13.002

EQUIPMENT AND PIPING LAYOUT
(CODON SUBSTATION)

CSSB-BDM-13.003

EQUIPMENT AND PIPING LAYOUT
(MARINAWA SUBSTATION)

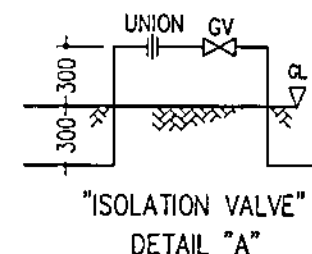
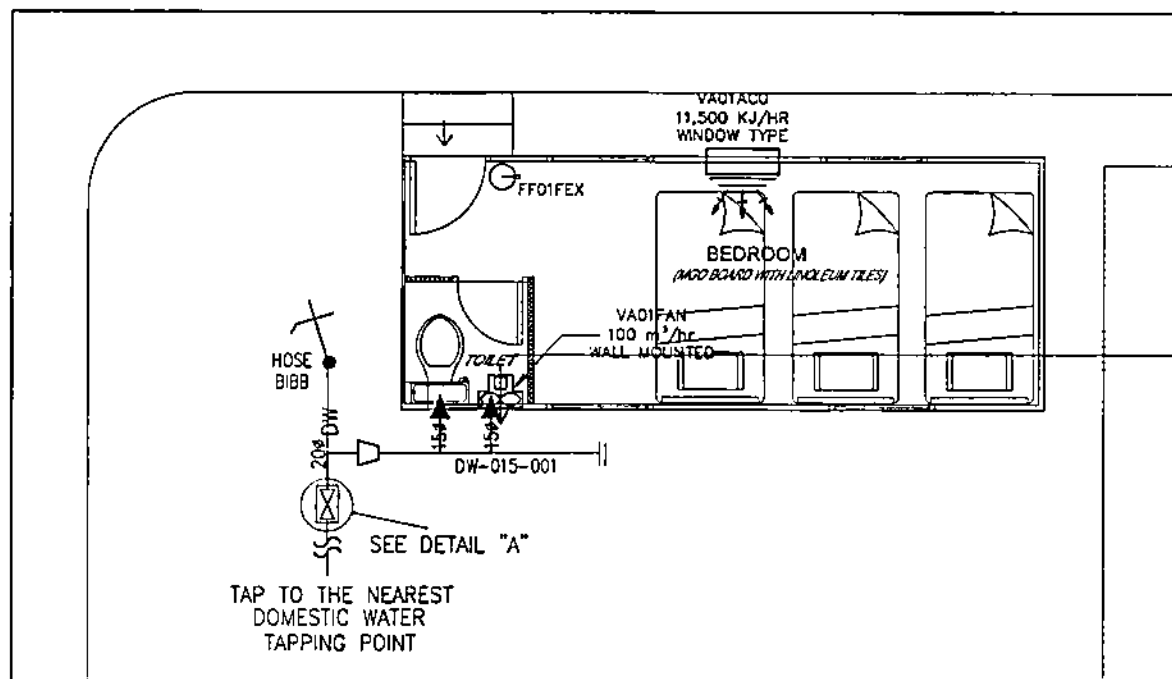
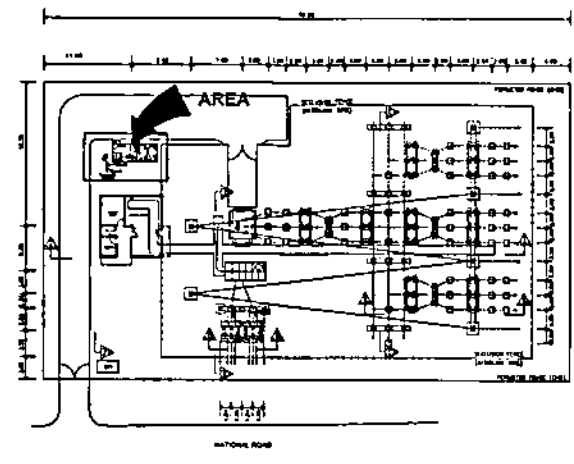
NOTES:

1. THIS DRAWING IS FOR BIDDING PURPOSES ONLY.
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
3. EQUIPMENT TO BE FURNISHED SHALL BE DESIGNED & CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE SPECIFICATIONS & SHALL FIT INTO THE SPACE AVAILABLE WITH PROPER REGARD TO ACCESSIBILITY, PASSAGEWAY, HANDLING AND STRUCTURE LIMITATIONS.
4. ALL WORKS SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE TECHNICAL SPECIFICATIONS.
5. ALL PIPES, VALVES, EXHAUST FAN, AND AIR CONDITIONING EQUIPMENT BROCHURES/CATALOGUES SHALL BE SUBMITTED BY THE CONTRACTOR FOR NPC'S REVIEW AND APPROVAL PRIOR TO PROCUREMENT/INSTALLATION.
6. ALL PIPES, CABLES, FITTINGS, AND ANGLE SUPPORTS SHALL BE INSTALLED FOR THE EFFICIENT AND PROPER OPERATION OF THE AIRCONDITIONING SYSTEM.
7. FINAL DETAILS AND ADJUSTMENT SHALL BE DONE IN THE FIELD BY THE CONTRACTOR DURING INSTALLATION TO SUIT ACTUAL SITE CONDITIONS. ALL WORKS SHALL BE EXECUTED IN CLOSE COORDINATION WITH ALL TRADES.
8. PIPING LAID UNDERGROUND SHALL NOT BE LESS THAN 300MM FROM THE GROUND SURFACE TO THE BOTTOM OF PIPE.
9. FOR PIPES THAT CROSSES ROADWAYS, PIPE SLEEVE OF STEEL MATERIAL SHALL BE PROVIDED.
10. ALL PIPES, VALVES, VALVE BOXES, FITTINGS, AND PIPE SUPPORTS SHALL BE INSTALLED FOR THE EFFICIENT AND PROPER OPERATION OF THE SYSTEM.
11. ALL PVC/PE PIPE DIMENSIONS SHOWN ARE IN NOMINAL DIAMETER (NM) WITH THE FOLLOWING EQUIVALENTS:

25MM (1")	= 32MM O.D. (OUTSIDE DIAMETER)
20MM (3/4")	= 25MM O.D.
15MM (1/2")	= 20MM O.D.

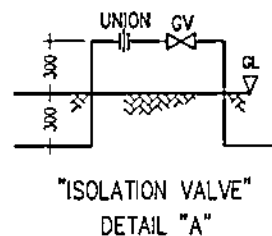
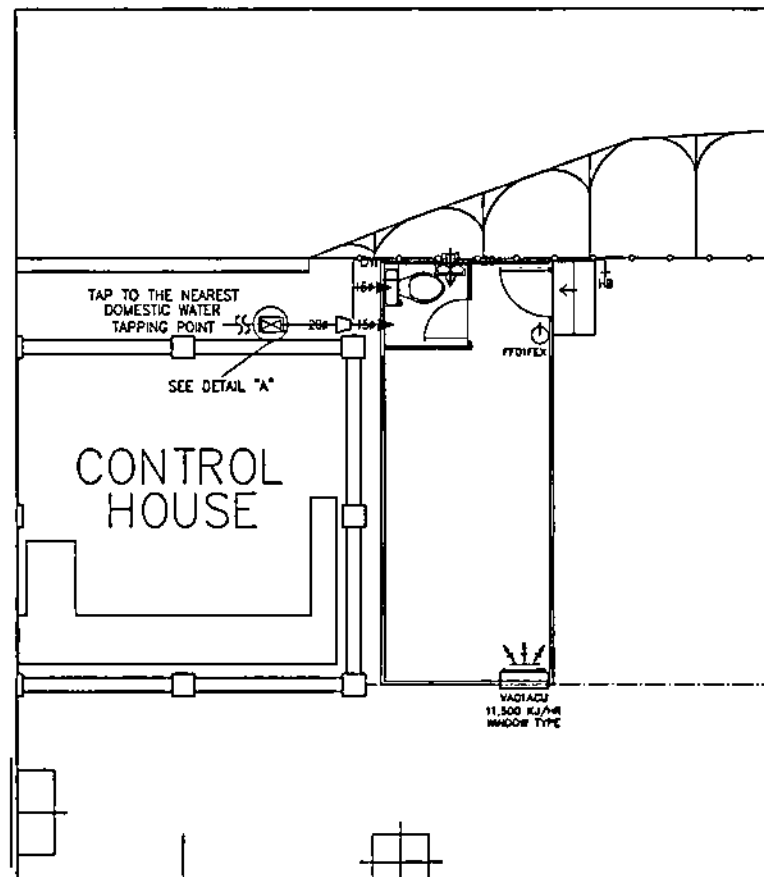
LEGEND:

- HOSE BIBB
- REDUCER
- GATE VALVE
- WINDOW TYPE AIR CONDITIONING UNIT (INVERTER)
- EXHAUST FAN (WALL MOUNTED)
- PORTABLE FIRE EXTINGUISHER (7.1KG HCFC OR HALOTRON)



OWNER		NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT: SUPPLY, DELIVERY AND INSTALLATION OF COLLAPSIBLE BUNKER FOR CATANDUANES 66 KV TL & S/S			
LOCATION: BRGY. KILIKILIAN, SAN MIGUEL, CATANDUANES			
TITLE: EQUIPMENT AND PIPING LAYOUT (SAN MIGUEL SUBSTATION)			
DESIGNED	BY	CHKD	DATE
DRAWN	MAN		
REVIEWED	PRINCIPAL ENGR. / ARCHT.		
CIVIL/ARCHT.			
ELEC.			
MECH.	JTC		
DWG. NO. CSSB-BDM-13.001		SPEC. NO. LuzP21Z1270Ss	
SCALE 1:50		BID DRAWING	

REV.	DATE	NATURE OF REVISION	BY	CHKD	RECD	APPR.



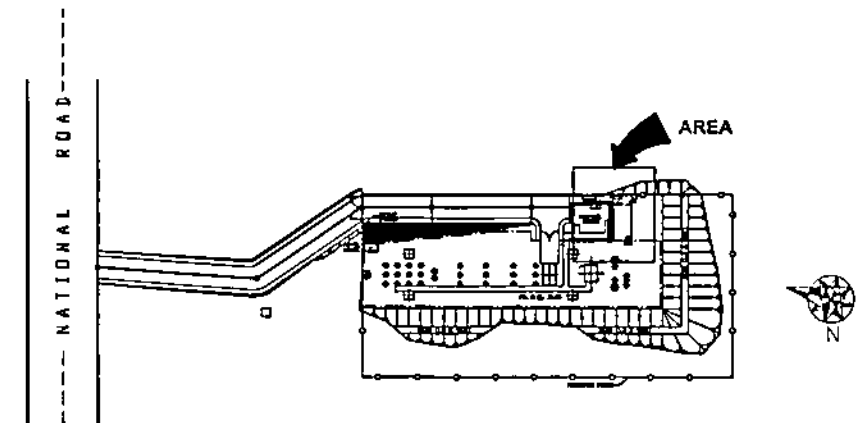
NOTES:

1. THIS DRAWING IS FOR BIDDING PURPOSES ONLY.
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
3. EQUIPMENT TO BE FURNISHED SHALL BE DESIGNED & CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE SPECIFICATIONS & SHALL FIT INTO THE SPACE AVAILABLE WITH PROPER REGARD TO ACCESSIBILITY, PASSAGEWAY, HANDLING AND STRUCTURE LIMITATIONS.
4. ALL WORKS SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE TECHNICAL SPECIFICATIONS.
5. ALL PIPES, VALVES, EXHAUST FAN, AND AIR CONDITIONING EQUIPMENT BROCHURES/CATALOGUES SHALL BE SUBMITTED BY THE CONTRACTOR FOR NPC'S REVIEW AND APPROVAL PRIOR TO PROCUREMENT/INSTALLATION.
6. ALL PIPES, CABLES, FITTINGS, AND ANGLE SUPPORTS SHALL BE INSTALLED FOR THE EFFICIENT AND PROPER OPERATION OF THE AIRCONDITIONING SYSTEM.
7. FINAL DETAILS AND ADJUSTMENT SHALL BE DONE IN THE FIELD BY THE CONTRACTOR DURING INSTALLATION TO SUIT ACTUAL SITE CONDITIONS. ALL WORKS SHALL BE EXECUTED IN CLOSE COORDINATION WITH ALL TRADES.
8. PIPING LAID UNDERGROUND SHALL NOT BE LESS THAN 300MM FROM THE GROUND SURFACE TO THE BOTTOM OF PIPE.
9. FOR PIPES THAT CROSSES ROADWAYS, PIPE SLEEVE OF STEEL MATERIAL SHALL BE PROVIDED.
10. ALL PIPES, VALVES, VALVE BOXES, FITTINGS, AND PIPE SUPPORTS SHALL BE INSTALLED FOR THE EFFICIENT AND PROPER OPERATION OF THE SYSTEM.
11. ALL PVC/PE PIPE DIMENSIONS SHOWN ARE IN NOMINAL DIAMETER (MM) WITH THE FOLLOWING EQUIVALENTS:

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15MM (1/2") = 20MM O.D.

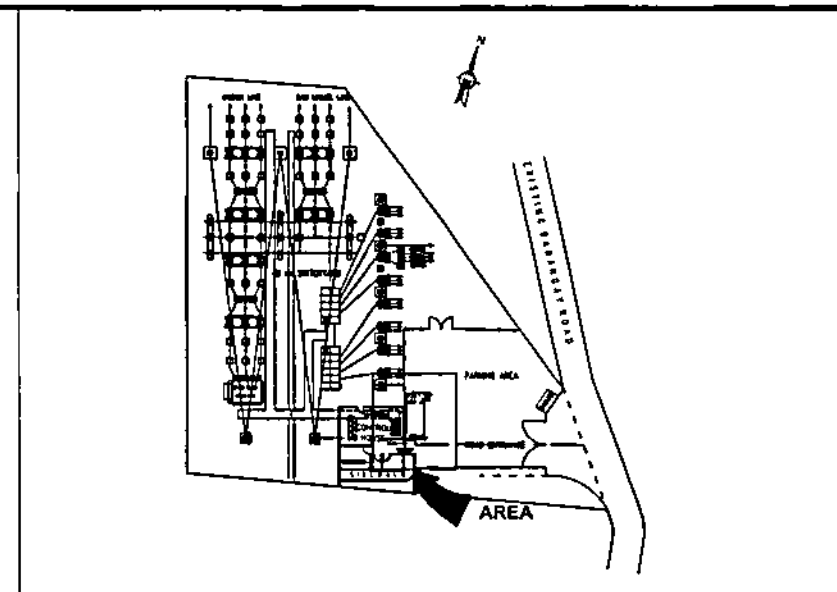








LEGEND:

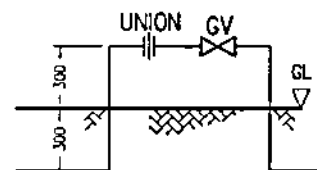
- HB - HOSE BIBB
- - REDUCER
- ⋈ - GATE VALVE
- ⊞ - WINDOW TYPE AIR CONDITIONING UNIT (INVERTER)
- ⊞ - EXHAUST FAN (WALL MOUNTED)
- ⊞ - PORTABLE FIRE EXTINGUISHER (7.1KG HCFC OR HALOTRON)

OWNER		NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT: SUPPLY, DELIVERY AND INSTALLATION OF COLLAPSIBLE BUNKER FOR CATANDUANES 50 KV TA & S/S			
LOCATION: ASOAG SAN ANDRES, CATANDUANES			
TITLE: EQUIPMENT AND PIPING LAYOUT (CODON SUBSTATION)			
DESIGNED	BY	CHKD	DATE
DRAWN	MAN		
REVIEWED	PRINCIPAL ENGR. / ARCHT.	RECOMMENDED	
CIVIL/ARCHT.		APPROVED	
ELEC.			
MECH.	JTC		
DWG. NO. CSSB-BDM-13.002		SPEC. NO. LuzP21Z1270Ss	
SCALE: 1:75		BID DRAWING	

REV.	DATE	NATURE OF REVISION	BY	CHKD	REC'D	APP'D



-  - HOSE BIBB
-  - REDUCER
-  - GATE VALVE
-  - WINDOW TYPE AIR CONDITIONING UNIT (INVERTER)
-  - EXHAUST FAN (WALL MOUNTED)
-  - PORTABLE FIRE EXTINGUISHER (7.1KG HCFC OR HALOTRON)







"ISOLATION VALVE"
DETAIL "A"

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3. EQUIPMENT TO BE FURNISHED SHALL BE DESIGNED & CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE SPECIFICATIONS & SHALL FIT INTO THE SPACE AVAILABLE WITH PROPER REGARD TO ACCESSIBILITY, PASSAGEWAY, HANDLING AND STRUCTURE LIMITATIONS.
4. ALL WORKS SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE TECHNICAL SPECIFICATIONS.
5. ALL PIPES, VALVES, EXHAUST FAN, AND AIR CONDITIONING EQUIPMENT BROCHURES/CATALOGUES SHALL BE SUBMITTED BY THE CONTRACTOR FOR NPC'S REVIEW AND APPROVAL PRIOR TO PROCUREMENT/INSTALLATION.
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20MM (3/4") = 25MM O.D.
15MM (1/2") = 20MM O.D.

REV.	DATE	NATURE OF REVISION	BY	CHKD.	RECD.	APP.
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OWNER:		 NATIONAL POWER CORPORATION AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT: SUPPLY, DELIVERY AND INSTALLATION OF COLLAPSIBLE BUNKER FOR CATANDUANES 66 IN TL & ES			
LOCATION: MARINAWA, SATO, CATANDUANES			
TITLE: EQUIPMENT AND PIPING LAYOUT (MARINAWA SUBSTATION)			
DESIGNED	BY	CHKD	SUBMITTED  J. A. REYES PROJECT ENGINEER
DRAWN	MAN		
REVIEWED	PRIN	ENGR. MARCOT	
CHECKED			
ELEC.			
MECH	JTC		RECOMMENDED  J. A. REYES PROJECT ENGINEER
		APPROVED  J. A. REYES Manager, E&P	
DWG. NO		CSSB-BDM-13.003	SPEC. NO LUZP212720Ss