



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

BID DOCUMENTS

**Name of Project : CONSTRUCTION OF ACCESS ROAD
FROM CALAGUAS DPP TO SHORELINE
AND IMPROVEMENT OF OTHER
FACILITIES**

**Project Location : CALAGUAS DPP, VINZONS, CAMARINES
NORTE**

PR No. : S1-CDP24-001

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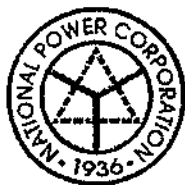
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Design and Development Department



SECTION I

INVITATION TO BID



National Power Corporation

INVITATION TO BID

PUBLIC BIDDING – BCS 2024-0491

1. The NATIONAL POWER CORPORATION (NPC), through its approved Corporate Budget of CY 2024 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
<p>S1-CDP24-001 / PB240709-JD00311 (PB2)</p> <p>Construction of Access Road from Calaguas DPP to Shoreline and Improvement of other Facilities</p> <p>• PCAB License: License Category of at least “Category D – General Building” and registration classification of at least “Small B – Building and Industrial Plant”</p>	<p>Construction of Warehouse, Office, Residential, Storage, Commercial Building or any Reinforced Concrete Structure</p>	<p>19 July 2024 9:30 A.M.</p>	<p>01 August 2024 9:30 A.M.</p>	<p>₱ 1,500,000.00 / ₱ 5,000.00</p>
<p>S1-MGP24-008 / PB240709-AM00308 (PB2)</p> <p>Construction of Material Recovery Facility and Hazardous Waste Facility for Mangsee DPP</p> <p>• PCAB License: License Category of at least “Category D – General Building” and registration classification of at least “Small B – Building and Industrial Plant”</p>	<p>Construction of Warehouse, Office, Residential, Storage, Commercial Building or ant reinforced concrete structure</p>	<p>19 July 2024 9:30 A.M.</p>	<p>01 August 2024 9:30 A.M.</p>	<p>₱ 1,331,300.00 / ₱ 5,000.00</p>
<p style="text-align: center;">Venue: Kaňao Function Room, NPC Bldg. Diliman, Quezon City</p>				

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

PR No/s. / PB Ref No/s.	Delivery Period / Contract Duration	Relevant Period of SLCC reckoned from the date of submission & receipt of bids
S1-CDP24-001	Seventy-Five (75) Calendar Days	-
S1-MGP24-008	Ninety (90) Calendar Days	-

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

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

4. Prospective Bidders may obtain further information from National Power Corporation, Bids and Contracts Services Division and inspect the Bidding Documents at the address given below during office hours (8:00AM to 5:00PM), Monday to Friday.
5. A complete set of Bidding Documents may be acquired by interested Bidders from the given address and website(s) and upon payment of the applicable fee for the Bidding Documents, pursuant to the latest Guidelines issued by the GPPB. Bidding fee may be refunded in accordance with the guidelines based on the grounds provided under Section 41 of R.A. 9184 and its Revised IRR.
6. The National Power Corporation will hold Pre-Bid Conference (**see table above**) and/or through video conferencing or webcasting which shall be open to prospective bidders. Only registered bidder/s shall be allowed to participate in the conduct of virtual pre-bid conference. **Unregistered bidders** may attend the Pre-Bid Conference at the Kañao Room, NPC subject to the following:
- Only a maximum of two (2) representatives from each bidder / company shall be allowed to participate during the virtual pre-bid conference.
 - Wearing of Face Masks is recommended but not required in view of Proclamation No. 297 S.2023 lifting the State of Public Health Emergency Throughout the Philippines
 - The requirements herein stated including the medium of submission shall be subject to GPPB Resolution No. 09-2020 dated 07 May 2020
 - 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 in the 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**
Gabriel Y. Itchon Building
Senator Miriam P. Defensor-Santiago Ave. (formerly BIR Road)
Cor. Quezon Ave., Diliman, Quezon City, 1100
Tel Nos.: Tel Nos.: 8921-3541 local 5564/5713
Email: bcsd@napocor.gov.ph /

12. You may visit the following websites:

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



ATTY. MELCHOR P. RIDULME
Sr. Vice President & COO and
Chairman, Bids and Awards Committee

SECTION II

INSTRUCTIONS TO BIDDERS

SECTION II - INSTRUCTIONS TO BIDDERS**TABLE OF CONTENTS**

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Provided, however, That contractors under Small A and Small B categories without similar experience on the contract to be bid may be allowed to bid if the cost of such contract is not more than the Allowable Range of Contract Cost (ARCC) of their registration based on the guidelines as prescribed by the PCAB. For Foreign-funded Procurement, the GoP and the foreign government/foreign or international financing institution may agree on another track record requirement.

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

- 5.3. For Foreign-funded Procurement, the Procuring Entity and the foreign government/foreign or international financing institution may agree on another track record requirement, as specified in the Bidding Document prepared for this purpose.
- 5.4. The Bidders shall comply with the eligibility criteria under Section 23.4.2 of the 2016 IRR of RA No. 9184.

6. Origin of Associated Goods

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

7. Subcontracts

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

8. Pre-Bid Conference

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

9. Clarification and Amendment of Bidding Documents

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

10. Documents Comprising the Bid: Eligibility and Technical Components

- 10.1. The first envelope shall contain the eligibility and technical documents of the Bid as specified in **Form NPCSF-INFR-01 - Checklist of Technical and Financial Documents, Section VIII - Bidding Forms.**
- 10.2. If the eligibility requirements or statements, the bids, and all other documents for submission to the BAC are in foreign language other than English, it must be accompanied by a translation in English, which shall be authenticated by the appropriate Philippine foreign service establishment, post, or the equivalent office having jurisdiction over the foreign bidder's affairs in the Philippines. For Contracting Parties to the Apostille Convention, only the translated documents shall be authenticated through an apostille pursuant to GPPB Resolution No. 13-2019 dated 23 May 2019. The English translation shall govern, for purposes of interpretation of the bid.
- 10.3. A valid PCAB License is required, and in case of joint ventures, a valid special PCAB License, and registration for the type and cost of the contract for this Project. Any additional type of Contractor license or permit shall be indicated in the BDS.
- 10.4. A List of Contractor's key personnel (e.g., Project Manager, Project Engineers, Materials Engineers, and Foremen) assigned to the contract to be bid, with their complete qualification and experience data shall be provided. These key personnel must meet the required minimum years of experience set in the BDS.
- 10.5. A List of Contractor's major equipment units, which are owned, leased, and/or under purchase agreements, supported by proof of ownership, certification of availability of equipment from the equipment lessor/vendor for the duration of the project, as the case may be, must meet the minimum requirements for the contract set in the BDS.

11. Documents Comprising the Bid: Financial Component

- 11.1. The second bid envelope shall contain the financial documents for the Bid as specified in **Form NPCSF-INFR-01 - Checklist of Technical and Financial Documents, Section VIII - Bidding Forms.**
- 11.2. Any bid exceeding the ABC indicated in paragraph 1 of the IB shall not be accepted.
- 11.3. For Foreign-funded procurement, a ceiling may be applied to bid prices provided the conditions are met under Section 31.2 of the 2016 revised IRR of RA No. 9184.

12. Alternative Bids

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

13. Bid Prices

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

14. Bid and Payment Currencies

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

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

15. Bid Security

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

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

16. Sealing and Marking of Bids

Each Bidder shall submit Two (2) copies of the first and second components of its Bid, marked **Original** and photocopy. Only the original copy will be read and considered for the bid.

Any misplaced document outside of the **Original** copy will not be considered. The photocopy is **ONLY FOR REFERENCE**.

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

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

Bidders must also comply with the Disclaimer and Data Privacy Notice specified in the **BDS**.

17. Deadline for Submission of Bids

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

18. Opening and Preliminary Examination of Bids

18.1. The BAC shall open the Bids in public at the time, on the date, and at the place specified in paragraph 9 of the IB. The Bidders' representatives who are present shall sign a register evidencing their attendance. In case videoconferencing, webcasting or other similar technologies will be used, attendance of participants shall likewise be recorded by the BAC Secretariat. In case the Bids cannot be opened as scheduled due to justifiable reasons, the rescheduling requirements under Section 29 of the 2016 revised IRR of RA No. 9184 shall prevail.

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

19. Detailed Evaluation and Comparison of Bids

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

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

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

20. Post Qualification

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

21. Signing of the Contract

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

SECTION III

BID DATA SHEET

SECTION III - BID DATA SHEET

ITB Clause	
5.2	<p>For this purpose, contracts similar to the Project refers to construction of warehouse, office, residential, storage, commercial building or any reinforced concrete structure.</p> <p>The Single Largest Completed Contract (SLCC) as declared by the bidder shall be verified and validated to ascertain such completed contract. Hence, bidders must ensure access to sites of such projects/equipment to NPC representatives for verification and validation purposes during post-qualification process.</p> <p>It shall be a ground for disqualification, if verification and validation cannot be conducted for reasons attributable to the Bidder.</p>
7.1	<p>Only a maximum of fifty percent (50%) of the Works may be subcontracted. All Subcontractors must be approved by NPC.</p>
10.1	<p>The prospective bidder shall submit a valid and updated Certificate of PhilGEPs Registration under Platinum Membership (all pages including the Annex A of the said Certificate). Non-compliance shall be a ground for disqualification.</p> <p>The list of on-going contracts (Form No. NPCSF-INFR-02) shall be supported by the following documents for each on-going contract to be submitted during Post-Qualification:</p> <ol style="list-style-type: none"> 1. Contract/Purchase Order and/or Notice of Award 2. Certification coming from the project owner/client that the performance is satisfactory as of the bidding date. <p>The bidder shall declare in this form all his on-going government and private contracts including contracts where the bidder (either as individual or as a Joint Venture) is a partner in a Joint Venture agreement other than his current joint venture where he is a partner. Non declaration will be a ground for disqualification of bid.</p> <p>The Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid (Form No. NPCSF-INFR-03) shall be supported by the following documents to be submitted during Bid Opening:</p> <ol style="list-style-type: none"> 1. Owner's Certificate of Final Acceptance issued by the project owner other than the contractor or a final rating of at least Satisfactory in the Constructors Performance Evaluation System (CPES). In case of contracts with the private sector, an equivalent document (Ex. Official Receipt or Sales Invoice) shall be submitted. <p>NOTE: If the Bidder has no Single Largest Completed Contract (SLCC)/similar experience on the contract to be bid pursuant to ITB Clause 5.2, the SLCC Form (Form No. NPCSF-INFR-03) shall still be submitted and the Bidder shall indicate <i>"NONE – PCAB License Category D, Registration Classification – Small B"</i></p>

10.3	The required License Issued by the Philippine Contractors Accreditation Board (PCAB): License Category of at least "CATEGORY D – GENERAL BUILDING" and registration classification of at least "SMALL B – BUILDING AND INDUSTRIAL PLANT"									
10.4	<p>The list of key personnel shall include the following minimum requirements:</p> <p>a. One (1) Project Engineer</p> <p>Registered Civil Engineer who had supervised at least a project similar in nature as to the type of the proposed project within the last 10 years. Must have 3 years professional as Civil Engineer on similar project</p> <p>b. One (1) Safety Officer 2</p> <p>Construction Safety Officer who has completed at least forty (40) hours of Construction Safety and Health Training (COSH) from Occupational Safety and Health Center (OSHC) or Safety Training Organizations (STOs) accredited by the Department of Labor and Employment (DOLE)</p> <p>The above key personnel must either be employed by the Bidder or contracted by the Bidder to be employed for the contract to be bid.</p>									
10.5	<p>The list of construction equipment (owned or leased) shall include the following minimum requirements:</p> <table><tr><td>a. Bar cutter (at least 20mm ø capable)</td><td>-</td><td>1 unit</td></tr><tr><td>b. Welding Machine (at least 300A)</td><td>-</td><td>1 unit</td></tr><tr><td>c. Concrete Mixer (at least 1 bagger)</td><td>-</td><td>1 unit</td></tr></table>	a. Bar cutter (at least 20mm ø capable)	-	1 unit	b. Welding Machine (at least 300A)	-	1 unit	c. Concrete Mixer (at least 1 bagger)	-	1 unit
a. Bar cutter (at least 20mm ø capable)	-	1 unit								
b. Welding Machine (at least 300A)	-	1 unit								
c. Concrete Mixer (at least 1 bagger)	-	1 unit								
10.6	<p>Bidders shall also submit the following requirements in their first envelope, Eligibility and Technical Component of their bid:</p> <p>1. Complete eligibility documents of the proposed sub-contractor, if any</p>									
10.7	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.									
12	No further instructions									
15.1	<p>The bid security shall be in the form of a Bid Securing Declaration or any of the following forms and amounts:</p> <p>1. The amount of not less than 2% of ABC, if bid security is in cash, cashier's/manager's check, bank draft/guarantee or irrevocable letter of credit;</p> <p>2. The amount of not less than 5% of ABC if bid security is in Surety Bond.</p>									
16.0	All bid submissions and related correspondences are confidential and for viewing only by the intended recipient/s. Any unauthorized access to review, reproduce, or disseminate the information contained therein is strictly prohibited. The National Power Corporation (NAPOCOR) does not guarantee the security of any information electronically transmitted.									

	<p>Bid submissions and related correspondences may contain personal and sensitive personal information, and are subject to the Data Privacy Act of 2012, its implementing rules, regulations and issuances of the National Privacy Commission of the Philippines ("Privacy Laws"). By viewing, using, storing, sharing and disposing (collectively "Processing"), such bids submissions and correspondences, you agree to comply with the Privacy Laws. By responding to correspondence, you consent to the Processing by NAPOCOR of the Personal Data contained in your submission/reply in accordance with NAPOCOR's Personal Data Privacy Policy which you can find at http://www.napocor.gov.ph.</p> <p>To report any privacy issue, contact the Data Privacy Officer at dpo@napocor.gov.ph.</p> <p>NAPOCOR is not liable for the proper and complete transmission of the information contained in bid submission/correspondences nor for any delay in its receipt.</p>
19.2	Partial Bid is not allowed. The project is grouped in a single lot and the lot shall not be divided into sub-lots for the purpose of bidding, evaluation, and contract award.
20	<p>Additional documents to be submitted during post-qualification:</p> <ol style="list-style-type: none"> Class A – Eligibility Documents listed on the Annex A of Certificate of PhilGEPs Registration under Platinum Membership pursuant to Section 34.3 of the Revised IRR of R.A. 9184 Contract/Purchase Order and/or Notice of Award for the contracts stated in the List of all Ongoing Government & Private Contracts Including Contracts Awarded but not yet Started (NPCSF-INFR-02) Certification coming from the project owner/client that the performance is satisfactory as of the bidding date for all ongoing contracts stated in form NPCSF-INFR-02 Contract/Purchase Order for the contract stated in the Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid (Form No. NPCSF-INFR-03) Certificate of Employment, Bio Data and valid PRC License of the (professional) personnel (NPCSF-INFR-10a, NPCSF-INFR-11) Certificate of Employment, Bio Data and Construction Safety and Health Training Certificate from OSHC/STOs accredited by DOLE of the Safety Officer (NPCSF-INFR-10b, NPCSF-INFR-11) Proof of ownership and/or certificate of availability issued by Equipment Lessors for the submitted List of Contractor's Equipment (owned, leased or under purchase agreement) under form NPCSF-INFR-12 The licenses and permits relevant to the Project and the corresponding law requiring it as specified in the Technical Specifications, if any

21.	<p>The following documents shall form part of the contract:</p> <ol style="list-style-type: none">1. Notice to Proceed2. Construction schedule and S-curve3. Manpower Schedule4. Construction Methods5. Equipment Utilization Schedule6. Construction safety and health program of the contractor duly approved by the Bureau of Working Condition (BWC) of the Department of Labor and Employment (DOLE) or proof of submission to BWC7. PERT/CPM.
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SECTION IV

GENERAL CONDITIONS OF CONTRACT

SECTION IV – GENERAL CONDITIONS OF CONTRACT**TABLE OF CONTENTS**

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SECTION IV – GENERAL CONDITIONS OF CONTRACT**1. Scope of Contract**

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

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

2. Sectional Completion of Works

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

3. Possession of Site

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

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

4. The Contractor's Obligations

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

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

5. Performance Security

- 5.1. Within ten (10) calendar days from receipt of the Notice of Award from the Procuring Entity but in no case later than the signing of the contract by both parties, the successful Bidder shall furnish the performance security in any of the forms prescribed in Section 39 of the 2016 revised IRR.
- 5.2. The Contractor, by entering into the Contract with the Procuring Entity, acknowledges the right of the Procuring Entity to institute action pursuant to RA No. 3688 against any subcontractor be they an individual, firm, partnership, corporation, or association supplying the Contractor with labor, materials and/or equipment for the performance of this Contract.

6. Site Investigation Reports

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

7. Warranty

- 7.1. In case the Contractor fails to undertake the repair works under Section 62.2.2 of the 2016 revised IRR, the Procuring Entity shall forfeit its performance security, subject its property(ies) to attachment or garnishment proceedings, and perpetually disqualify it from participating in any public bidding. All payables of the GOP in his favor shall be offset to recover the costs.
- 7.2. The warranty against Structural Defects/Failures, except that occasioned-on force majeure, shall cover the period from the date of issuance of the Certificate of Final Acceptance by the Procuring Entity. Specific duration of the warranty is found in the SCC.

8. Liability of the Contractor

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

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

9. Termination for Other Causes

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

10. Dayworks

Subject to the guidelines on Variation Order in Annex "E" of the 2016 revised IRR of RA No. 9184, and if applicable as indicated in the SCC, the Dayworks rates in the Contractor's Bid shall be used for small additional amounts of work only when the

Procuring Entity's Representative has given written instructions in advance for additional work to be paid for in that way.

11. Program of Work

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

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

12. Instructions, Inspections and Audits

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

13. Advance Payment

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

14. Progress Payments

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

15. Operating and Maintenance Manuals

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

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

SECTION V

SPECIAL CONDITIONS OF CONTRACT

SECTION V – SPECIAL CONDITIONS OF CONTRACT

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

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

	<p>effective period of the surety bond first posted, it shall be the sole obligation of the CONTRACTOR to post an acceptable Performance Security within ten (10) calendar days after the contract duration/delivery period extension has been granted by NPC.</p> <p>4. Other required conditions in addition to the standard policy terms issued by the Bonding Company:</p> <ol style="list-style-type: none"> 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; 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; In case of claim, the Surety shall pay such claim within sixty (60) days from receipt by the Surety of the Obligee's notice of claim/demand letter notwithstanding any objection thereto by the Principal.
6	No site investigation report.
7.2	<p>In case of permanent structures, such as buildings of types 4 and 5 as classified under the National Building Code of the Philippines and other structures made of steel, iron, or concrete which comply with relevant structural codes (e.g., DPWH Standard Specifications), such as, but not limited to, steel/concrete bridges, flyovers, aircraft movement areas, ports, dams, tunnels, filtration and treatment plants, sewerage systems, power plants, transmission and communication towers, railway system, and other similar permanent structures: Fifteen (15) years.</p> <p>In case of semi-permanent structures, such as buildings of types 1, 2, and 3 as classified under the National Building Code of the Philippines, concrete/asphalt roads, concrete river control, drainage, irrigation lined canals, river landing, deep wells, rock causeway, pedestrian overpass, and other similar semi-permanent structures: Five (5) years.</p> <p>In case of other structures, such as Bailey and wooden bridges, shallow wells, spring developments, and other similar structures: Two (2) years.</p>
8.0	<p>CORRECTION OF PUNCHLIST ITEMS:</p> <p>After to the conduct of Test and Commissioning/Joint Final Inspection or upon the advice by the NPC, the Contractor/Supplier must correct any remaining works and work deficiencies identified in the punchlist issued for the project within one (1) month considering the approved remaining contract time.</p> <p>Failure to comply with this provision shall be grounds for non-issuance of Certificate of Satisfactory Performance which is a requirement for future bidding with the NPC. This, however, shall not preclude NPC's claim for liquidated damages, imposition of any other penalties and/or filing of blacklisting actions in accordance with the blacklisting guidelines issued by the Government Procurement Policy Board (GPPB).</p>

10	No dayworks are applicable to the contract.
11.1	The Contractor shall submit the Program of Work to the Procuring Entity's Representative within Ten (10) calendar days of delivery of the Notice of Award/Letter of Acceptance.
11.2	The period between Program of Work updates is Thirty (30) calendar days. The amount to be withheld for late submission of an updated Program of Work is One percent (1%) of contract amount.
12	<p>During contract implementation, the Procuring Entity shall conduct Constructors Performance Evaluation in accordance with Section 12, Annex E of the Revised Implementing Rules and Regulation of R.A. 9184 using the NPC Constructors Performance Evaluation System (CPES) Guidelines.</p> <p>CPES ratings shall be used for the following purposes: a) eligibility screening/post-qualification; b) awarding of contracts; c) project monitoring & control; d) issuance of Certificate of Completion; and in adopting measures to further improve performance of contractors in the prosecution of government projects.</p> <p>Qualified Constructors Performance Evaluators (CPE) shall conduct project evaluation as follows:</p> <p>(a) During Construction - Except for those projects with a duration of 90 calendar days and below which may be subjected to at least one (1) visit, all projects shall be subjected to a minimum of two (2) evaluations to be performed by the CPE. The number of evaluations beyond the prescribed minimum shall be determined by the CPES-Implementing Unit based on the size, nature and complexity of the project and shall be subject to approval by the proper authorities within the agency. The first evaluation shall be performed when the project is at least thirty percent (30%) physically complete or as maybe required by the CPES-IU using the S-curve or other appropriate means to determine whether there is substantial work completed for evaluation.</p> <p>(b) Upon Completion - only one evaluation shall be performed by the CPE right after the Project Implementation Group reports one hundred percent (100%) completion of the project.</p>
13	The maximum amount of advance payment is fifteen percent (15%) of the Contract Price and paid in lump sum.
14	No further instructions.
15.1	The date by which "as built" drawings and operating and maintenance manuals are required is within thirty (30) calendar days after completion of contract.
15.2	The amount to be withheld for failing to produce "as built" drawings and/or operating and maintenance manuals by the date required is Five percent (5%) of contract amount.

SECTION VI

TECHNICAL SPECIFICATIONS

SECTION VI

**TECHNICAL SPECIFICATIONS
FOR
GENERAL WORKS**

SECTION VI - TECHNICAL SPECIFICATIONS

GW – GENERAL WORKS

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TECHNICAL SPECIFICATIONS**GW – GENERAL WORKS****GW-1.0 PROJECT HIGHLIGHTS****GW-1.1 General**

This section covers the general technical requirements for furnishing all supervision, labor, materials, supplies, tools and equipment in accordance with specifications contained herein and as shown on the accompanying drawings to complete the **CONSTRUCTION OF ACCESS ROAD FROM CALAGUAS DPP TO SHORELINE AND IMPROVEMENT OF OTHER FACILITIES**.

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

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

GW-1.2 Project Location

The project is located within the Calaguas Diesel Power Plant, Vinzons, Camarines Norte.

GW-1.3 Scope of Work

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

Architectural Works

- a) Supply and installation of roofing sheets and other accessories;
- b) Concrete and masonry works;
- c) Insulation, ceiling and fenestration works;
- d) Painting and varnishing works;
- e) Installation of downspout and roof drains
- f) All other works and services requires to complete the project.

Civil Works

- a) Mobilization and establishment of the Contractor's complete construction camp, equipment and other facilities;
- b) Demolition/ removal of existing seclusion fence and pre-insulated wall panels as specified and/or as shown in the drawings;
- c) Complete construction of control room (expansion).
- d) Complete construction of seclusion fence including pedestrian gate.



- e) Complete construction of access road from plant to shoreline.
- f) Laying of gravel surfacing at switchyard area.
- g) Demobilization including clearing of contractor's camp facilities after the works; and
- h) All other works and services including those not specifically detailed herein but are required to fully complete the project.

Electrical Works

- a) Supply, Installation and Test of Lighting and Power System for the expansion of Control Room in Calaguas DPP;
- b) All other works and services including those not specifically detailed herein but are required to fully complete the project.

GW-1.4 Contract Period

The Supplier shall complete the works as herein specified within seventy-five (75) calendar days. The contract period is inclusive of five (5) unworkable days considered unfavorable for the execution of the works. The total contract duration shall be reckoned from the date of contract effectivity as specified in the **Notice to Proceed**.

GW-1.5 Contractor's Classification

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

The Contractors must have undertaken similar contracts and projects.

GW-1.6 Minimum Required Personnel

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

- a. One (1) Project Engineer

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

- b. One (1) Safety Officer 2

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

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

NPCSF-INFR-09 List of Key Personnel Proposed to be Assign to the Contract.

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

GW-1.7 Minimum Required Construction Equipment

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

- | | |
|--------------------------------------|----------|
| a. Bar cutter (20 mm Φ capable) | - 1 unit |
| b. Welding Machine (at least 300A) | - 1 unit |
| c. Concrete Mixer (1-2 bagger) | - 1 unit |

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

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

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

GW-2.2 Correspondence

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

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

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

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

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

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

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

GW-2.3.2 Personnel/Key Positions

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

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

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

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

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

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

GW-2.4.2 Format and Presentation

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

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

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

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

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

GW-2.4.3 Progress Monitoring Principle and System

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

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

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

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

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

GW-2.4.4 Meetings**A. Progress Review Meetings**

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

B. Interface Meetings

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

C. Design Review Meetings

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

D. Other Meetings

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

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

E. Call for Meetings

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

F. Minutes of Meetings

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

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

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

GW-2.4.5 Reports**A. Monthly Reports**

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

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

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

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

B. Project Control Close-out Reports

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

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

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

GW-2.5 Documents to be Prepared by the Contractor

GW-2.5.1 General

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

GW-2.5.2 Detailed Drawings, Design and Specifications

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

The detailed drawings and specification shall include the following:

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

GW-2.5.3 Design Calculation and Final Design Data

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

GW-2.5.4 Critical Path Network and Time Bar Diagram

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

GW-2.5.5 Catalogue Cuts, Illustrations, Etc.

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

GW-2.5.6 Final / As-Built Drawings

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

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

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

GW-2.5.7 Presentation/Submission of Documents

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

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

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



corresponding drawings, specifications or designs for approval before commencing the Work indicated.

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

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

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

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

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

GW-2.5.8 Building/Occupancy Permit and other Licenses and Permits imposed for the Contract

All forms of taxes, such as value added tax (VAT) including Local Government Unit (LGU) licenses and permits, and others that may be imposed by the Philippine Government or any of its agencies and political subdivisions in connection with Contract shall be for the account of the Contractor. NPC shall provide assistance to the Contractor in securing the needed documents for the permits/licenses or approvals.

Whenever Building/Occupancy Permit is required at the place where the subject building/structure is located or to be erected, the Contractor shall apply, process, submit and bear all costs and charges to the corresponding fees/incidental services of the required documents in securing a building permit.

For Building/Occupancy Permit purposes, the assigned Project Manager or designated representative of NPC shall be the signatory for the Owner's Representative/Procuring Entity and Full-time Inspector and Supervisor for the Construction Works. The Manager of the DDD or designated representative of NPC shall be the signatory of the Project Specifications and the drawings and design analysis/computation of Architectural, Structural, Electrical, Mechanical & Plumbing. While the Contractor will be the signatory for the Bill of Quantities/Cost Estimates. NPC may opt to require the contractor to provide the professional/eligible personnel to sign the permits especially but not limited to project with construct and design contract. The Contractor at his own expense shall bear all the costs and

charges needed to comply with the said documents. The Contractor shall not be relieved on its responsibility with regards to the reliability and integrity of the project concern.

GW-3.0 MATERIALS AND EQUIPMENT

GW-3.1 General

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

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

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

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

GW-3.2 Codes and Standards

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

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

Other standards not mentioned above may be accepted provided that they ensure equal or higher quality; provided; further, that they meet the



requirements of existing laws and regulations of the Government of the Republic of the Philippines.

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

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

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

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

GW-3.3 Test of Materials

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

GW-3.4 Tropical Serviceability

GW-3.4.1 General

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

GW-3.4.2 Metals

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

GW-3.5 Workmanship

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

GW-4.0 DESIGN AND CONSTRUCTION CONDITIONS**GW-4.1 Acknowledgement to Site Conditions**

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

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

GW-4.2 Site Conditions

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

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

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

GW-4.3 Earthquake and Wind Design Requirements

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

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

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



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

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

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

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

GW-4.4 Sound Control

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

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

GW-5.0 DRAWINGS

GW-5.1 Drawings Contained in the Tender Document

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

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

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

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

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



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

GW-5.2 Contractor/Manufacturer Drawings

GW-5.2.1 General

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

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

The Manager, Project Management Department
National Power Corporation
BIR Road corner Quezon Avenue,
Diliman, Quezon City 1100

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

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

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

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

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



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

All approved drawings shall form part of the Contract.

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

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

GW-5.2.2 As-Built Drawings

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

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

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

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

GW-5.2.3 Processing of Drawings

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

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

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

each for final approval. Every revision shall be shown by number, date and subject in a revision block.

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

GW-5.2.4 Documents for NPC's Records

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

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

GW-6.0 INSPECTION AND TESTS

GW-6.1 General

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

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

NPC and/or his duly authorized representatives shall witness all applicable tests detailed in the relevant sections. NPC shall be notified by the Contractor thirty (30) days in advance of all test programs and schedule to be conducted requiring the presence of NPC.

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

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

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

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

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

GW-6.2 Inspection/Tests at Contractor's Premises

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

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

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

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

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

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

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

GW-6.3 Tests Failures

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



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

GW-6.4 Test Reports/Certificates

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

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

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

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

GW-7.0 QUALITY ASSURANCE REQUIREMENTS

GW-7.1 General

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

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

GW-7.2 Quality Assurance Program

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

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

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

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

GW-7.3 Quality Plan

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

GW-7.4 Records

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

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

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

GW-7.5 Reporting and Corrective Action

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

GW-8.0 CERTIFICATE OF COMPLETION AND ACCEPTANCE

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

The Defects Liability Period of one (1) year for the completed Works shall commence on the date of issue of the Certificate of Completion. During this period, the Contractor shall undertake the repair works, at his own expense, of any damage to the infrastructure on account of the use of



materials of inferior quality, within ninety (90) days from the time NPC has issued an order to undertake repair. In case of failure or refusal to comply with this mandate, NPC shall undertake such repair works and shall be entitled to full reimbursement of expenses incurred therein upon demand.

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

GW-9.0**GUARANTEE**

The Contractor guarantees that structural defects/failures shall comply with the provision stipulated in GCC 7.2. The Contractor also guarantees that when the equipment and/or material are placed in operation and/or use, it will perform in the manner as set forth in the Contract.

SECTION VI

TECHNICAL SPECIFICATIONS FOR ARCHITECTURAL WORKS

SECTION VI – TECHNICAL SPECIFICATIONS**AW – ARCHITECTURAL WORKS****TABLE OF CONTENTS**

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TECHNICAL SPECIFICATIONS**AW – ARCHITECTURAL WORKS****AW-1.0 GENERAL ARCHITECTURAL REQUIREMENTS****AW-1.1 General**

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

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

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

AW-1.2 Submission of Samples

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

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

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

AW-1.3 Substitution of Materials

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

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

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

AW-1.4 Certification of Materials

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

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

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

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

AW-1.6 Measurement and Payment

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

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

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

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

AW-2.0 CONCRETE MASONRY WORKS**AW-2.1 General**

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

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

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

AW-2.2 Materials

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

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

Mortar Proportions:

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

- a) Masonry grout for filling cells of concrete blocks shall consist of one (1) Portland cement, one-fourth (1/4) part lime, three (3) parts sand to which three (3) pea gravel is added by volume. Mortar materials shall be accurately measured by volume and thoroughly mixed until evenly distributed throughout the batch mechanical mix. The actual mixing time shall not be less than two minutes.
- b) Intersecting hollow blocks walls and partitions shall be bonded by overlapping units on alternative course or by the use of 6.3mm (1/4") diameter ties at 610mm (24") O. C. every second course (maximum) anchored in filled cells.

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

- a) Concrete studs, reinforced with one 12.7mm (1/2") diameter bar, shall be placed at both sides of all window and door openings.
- b) All horizontal reinforcement shall be tied to vertical reinforcement.
- c) Reinforcement shall be as specified in Section "Structural Steel".

Cement shall be Portland cement of approved brand conforming to ASTM Specifications C150, Type I; or ASTM C595, Type 1P.

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

AW-2.3 Installation

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

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

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

AW-2.4 Concrete Lintel

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

AW-2.5 Testing of CHB

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

AW-2.6 Measurement and Payment

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

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

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

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



AW-3.0 PLASTERED PLAIN CEMENT FINISH**AW-3.1 General**

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

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

AW-3.2 Materials

- a) Portland cement conforming to the latest edition of ASTM Standards C-150 or C-595.

Lime - Slaked quicklime or hydrated lime to make lime putty.

Sand - Natural sand, white or light grey, washed and cleaned, strong and free from injurious amount of dust and flaky particles.

Water - Clean and fresh contains no salt, potable and free from sulfur oil and other impurities that may cause discoloration of the finish.

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

AW-3.3 Application

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

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

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

All internal corners should be reinforced by lapping wire lath.

Mixture for various coats should be checked to see that proportions are correct.

Manufacturer's directions for applying the various types of plaster should be followed scrupulously. The NPC Representative should check whether they conform to end use of the plaster.

AW-3.4 Measurement and Payment

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

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

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

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

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

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

AW- 4.2 Materials

Fiber Cement Fascia Board or Senepa shall be weather, water, moisture and rot resistant fiber cement. It shall be 1/2 inch thick, 12 inch wide and 12ft long and shall be impact resistant and non-combustible material.

AW- 4.3 Workmanship

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

AW- 4.4 Measurement and Payment

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

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

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

AW- 5.0 ROOFING SHEETS**AW- 5.1 General**

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

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

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

AW- 5.2 Materials

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

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

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

AW- 5.3 Workmanship

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

AW- 5.4 Measurement and Payment

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

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

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

AW-6.0 PAINTING AND VARNISHING**AW-6.1 General**

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

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

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

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

AW-6.2 Inspection of Surfaces

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

AW-6.3 Materials

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

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

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

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

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

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

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

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

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

Paints which do not have to be prepared by mixing several constituents just prior to use shall be brought to the Site in such a state of readiness that they need only be adjusted to brushing or spraying consistency to meet the relevant working conditions (e.g., temperature), by adding the particular thinners in accordance with the maker's instructions.

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

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

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

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

AW-6.4 Colors and Samples

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

NPC Representative must give his approval before work is commenced. If required, three panels, 200 mm x 250 mm (8" x 10") of each color and finish

shall be prepared in advance, with the NPC Representative. "Of color selected" shall be understood as all coats specified herein.

AW-6.5 Workmanship

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

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

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

Application of succeeding coats shall strictly follow the over-coating times specified by the paint manufacturer. If no specific data are available, all coats shall be thoroughly dry before painting shall be applied. At least twenty-four (24) hours shall be allowed between coats. Exterior painting under damp/wet conditions is not allowed.

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

All parts of moldings and ornament shall be left clean and true to details.

All finish shall be uniform as to sheen, color and texture, except when glazing is required.

AW-6.6 Protection

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

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



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

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

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

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

AW-6.7 Paint Application

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

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

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

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

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

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

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

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

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

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



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

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

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

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

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

The first priming coat shall be applied by brush. Further coats shall be applied by brush if nothing to the contrary is stipulated in the Specifications. Smaller and specially shaped brushes shall be used for rivet and bolt heads, protruding corners, sharp section edges and places of difficult access.

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

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

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

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

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

AW-6.8 Painting Systems

All surfaces which are required by the Finish Schedules or specifications to be painted, or otherwise finished, shall be given coats of paints or varnish as specified herein. Individual directions printed on the label of the approved



paint and varnish shall be strictly followed. Paint thinner or linseed oil of the same brand as the paint to be thinned shall be used.

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

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

Concrete and Plastered Surface

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

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

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

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

- 1 coat with a plastic-modified hydraulic mortar.
- 2 coats of an oil-resistant synthetic resin-based paint.

Concrete exposed to Mechanical and Chemical attack.

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

Concrete flooring exposed to mechanical wear and oil.

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

Internal concrete, plastered walls exposed to abrasion.

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

Concrete flooring subject to minor mechanical wear.

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

Internal plastered ceilings and walls.

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

Wooden Surfaces

- a) Exterior Parts – N/A

- b) Surface shall be smoothed down with adhesive; if machine sanding is involved, a sanding is involved, a sanding sealer to bind the fibres shall be applied; the surface shall also be dry and free from dust.
- 1 coat of fungicide and bactericide ingredients after first coat.
 - 2 coats of synthetic resin-based lacquer with white active pigments.
- c) Interior Parts - Application of varnish on wooden interior walls, partitions, T&G ceiling panelling and closets/cabinets.

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

- 1) First Coat. Fill open grained wood with natural wood paste fillers, as is, or mixed with oil-wood stain to obtain desired shade. Apply along the grain within 30 minutes. Let dry overnight and sand lightly.
- 2) Second Coat. Apply any one (1) of the colors of oil-wood stain: oak, walnut, marble, and mahogany. Dry overnight and sand lightly.
- 3) Third Coat. Spray required coats of lacquer sanding sealer. Let dry for 30 minutes and sand to smooth.
- 4) Choice of any of the following topcoats:
 - Clear flat lacquer - for standard flat effect.
 - Clear dead flat lacquer - for complete flat lacquer.
 - Super dead flat lacquer - for complete flat lacquer.
 - Clear gloss lacquer - for standard gloss effect.
 - Water white gloss lacquer - for brilliant crystal-clear effect.
 - Versatile spar varnish - for glossy thick coating also applicable for exterior wood surfaces.

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

Steel Surfaces

Details are given General Technical Requirements.



AW-6.9 Measurement and Payment

Measurement and payment for **Painting and Varnishing** will be based on the gallons/liters applied and accepted by the NPC Representative.

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

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

AW-7.0 WOOD DOORS**AW-7.1 General**

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

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

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

AW-7.2 Samples

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

AW-7.3 Workmanship

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

AW-7.4 Materials

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

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

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

Jambs shall be S4S Yakal, common to all doors.

AW-7.5 Measurement and Payment

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

Payment will be made at the corresponding contract unit price per set for the pertinent item under Architectural Works in the Bill of Quantities. Payment shall constitute full compensation for all labor, materials, equipment, tools and incidentals necessary for the completion of this work.

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



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AW-8.0 VINYL QUARTZ TILES**AW-8.1 General**

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

AW-8.2 Materials

Vinyl Quartz Tiles shall be 304mm x 304mm (12" x 12") and 3mm thick. Tiles shall have a smooth surface, containing no sand or grit and shall be free from the lumps and unmixed coloring pigments. Materials shall consist of only the highest grade laboratory approved uPVC resin, plasticizer and stabilizers, pigments and quartz filler, which is used to insure abrasion resistance and dimensional stability.

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

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

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

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

AW-8.3 Installation

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

Preparation - Concrete sub-floors to receive the tile shall be clean, thoroughly dry, smooth, firm and sound; and they shall be free from oil, dirt, curing compounds, or other deleterious materials. Sub-floors shall be swept, vacuumed and damp-mopped when necessary to remove dust and oil. It shall be scrubbed with a strong detergent solution, thoroughly rinsed, and spot primed, when necessary to remove oil or grease stains. All edges shall be ground smooth and all holes and cracks less than 1.6mm shall be filled

with an approved plastic emulsion. Large holes and depressions, if any, shall be filled and treated with underlayment mortar troweled on to smooth surface and shall be completely dried before the application of adhesive.

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

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

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

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

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

AW-8.4 Measurement and Payment

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

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

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



AW-9.0 ALUMINUM DOORS AND WINDOWS**AW-9.1 General**

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

AW-9.2 Materials**Aluminum Glass Door**

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

Aluminum Glass Windows

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

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

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

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

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

AW-9.3 Installation

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

AW-9.4 Measurement and Payment

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

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

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



AW-10.0 DOWNSPOUTS AND ROOF DRAINS**AW-10.1 Scope of Works****a) Downspouts**

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

b) Roof Drain

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

AW-11.2 Measurement and Payment**a) Downspouts**

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

b) Roof Drains

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

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

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



SECTION VI

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TECHNICAL SPECIFICATIONS**CW - CIVIL WORKS****CW-1.0 GENERAL CONSTRUCTION FACILITIES****CW-1.1 Scope**

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

CW-1.2 Moving-in

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

CW-1.3 Contractor's Camp Facilities

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

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

CW-1.4 Water Supply

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

CW-1.5 Sewerage Disposal and Sanitation

The Contractor shall, at his own expense, be responsible for the installation operation and maintenance of an adequate sewerage disposal and sanitation system and shall provide adequate toilet and wash-up

and other facilities therein shall be removed by the Contractor. The site shall be cleared and cleaned as directed by the NPC.

CW-1.11 Measurement and Payment

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

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

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

CW-3.2 General Conditions

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

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

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

CW-3.3 Measurement and Payment

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

CW-4.0 SITE GRADING**CW-4.1 Scope**

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

CW-4.2 Clearing, Grubbing and Miscellaneous Work**CW-4.2.1 Clearing and Grubbing**

The Contractor shall perform clearing and grubbing on the project site¹. The site shall be cleared and grubbed of all trees and brush except particular trees, which may be retained by the NPC for preservation. Particular trees to be left in place shall be protected from scarring and/or other injuries during clearing and grubbing work and other construction operations.

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

CW-4.2.2 Miscellaneous Work

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

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

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

CW-4.3.2 Classification of Materials

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

¹ Site refers exclusively to the area affected by this project.

CW-4.3.3 Stripping

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

CW-4.3.4 Excavation and Fill

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

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

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

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

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

In the event that construction of concrete footing or other concrete foundations is on fill, the fill shall be compacted efficiently and thoroughly so that when the fill is tested for compaction at the required foundation elevation for the structure, the required bearing capacity is attained but in no case less than 143 kPa. In no case shall filling and compaction work to be done without the presence of NPC's inspectors. The Contractor shall be held liable for any structural instability or damage that might result in consequence to non-compliance of this requirement. The Contractor shall institute corrective measures to bring the foundation base to a condition or state that will conform to the required bearing capacity; and also to repair and make good any damage on the structure to the satisfaction and at no cost to NPC.

CW-4.3.5 Slides

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

CW-4.3.6 Slip-outs

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

CW-4.4 Disposal

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

CW-4.5 Sources of Fill Materials

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

CW-4.6 Environmental Requirements

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

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

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

CW-4.7.2 Miscellaneous Works

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

CW-4.7.3 Stripping

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

CW-4.7.4 Grading Excavation

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

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

CW-4.7.5 Grading Fill

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

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

CW-5.0 STRUCTURAL EXCAVATION, FILL AND BACKFILL**CW-5.1 Scope**

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

CW-5.2 Materials**CW-5.2.1 Structural Excavation**

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

CW-5.2.2 Structural Fill**a. Sand and Gravel Fill**

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

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

b. Structural Earth Fill

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

CW-5.2.3 Special Foundation, if any

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

a. Lean Concrete

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

b. Selected Materials

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

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

CW-5.2.4 Structural Backfill

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

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

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

CW-5.3 Construction**CW-5.3.1 Excavation****a. General**

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

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

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

b. Structural Excavation, Structure Other Than Pipes

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

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

c. Drainage and Sewerage Pipes and Cable Trench

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

d. Water Supply Pipes

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

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

CW-5.3.2 Structural Foundation Fill

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

CW-5.3.3 Special Foundations

If unsuitable material is encountered or if the foundation material is unsuitable such that the required bearing capacity of the foundation cannot be attained at the required elevation, further excavation shall be performed by the Contractor as stated in CW-4.3.1b.

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-4.2.3.

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

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

No separate measurement and payment will be made for structural excavation. Payment will be made at the corresponding pertinent pay items with Structural Excavation in the Bill of Quantities, 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.

No separate measurement and payment will be made for structural foundation fill. Payment will be made at the corresponding pertinent pay items with Sand and Gravel Fill/Base shown in the Bill of Quantities, 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.

No separate measurement and payment will be made for special foundations. Payment will be made at the various pertinent pay items shown in the Bill of Quantities, 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.

No separate measurement and payment will be made for structural backfill. Payment will be made at the corresponding pertinent pay items with Structural Backfill, in the Bill of Quantities, -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

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

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

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

CW-6.2 Class of Concrete

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

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

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

Unless otherwise specified, cement shall be ordinary Portland Cement, Type I for general construction which concrete is not in contact with soils or ground water and Type II for concrete in contact with soil or ground water. However, the use of Portland Pozzolan Cement Type IP meeting the AASHTO/ ASTM requirements may be allowed, provided that trial mixes shall be done and that the mixes meeting the concrete strength requirements of the AASHTO/ ASTM provisions, pertaining the use of Portland Pozzolan Cement Type IP, shall be adopted.

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

CW-6.3.2 Reinforcing Steel

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

CW-6.3.3 Water

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

CW-6.3.4 Aggregates

All coarse and fine aggregates shall consist of hard, tough, durable and clean, uncoated particles. All foreign materials and dust shall be removed by processing. Aggregates shall generally be rounded and reasonably

free from thin, flat and elongated particles in all sizes and well graded from coarse to fine.

CW-6.3.5 Formwork

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

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

CW-6.4 Storage of Materials

CW-6.4.1 Cement and Aggregates

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

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

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

CW-6.4.2 Reinforcing Steel

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

CW-6.5 Concreting**CW-6.5.1 General**

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

CW-6.5.2 Formwork Construction

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

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

Formwork for concrete placed underwater shall be watertight.

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

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

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

- **Coating:** Before placing the concrete, the contact surface of forms shall be coated with a non-staining mineral oil or suitable non-staining form coating compound or shall be given two coats of nitrocellulose lacquer, except as specified otherwise. Mineral oil shall not be used on forms for surfaces, which are to be painted. For surfaces not exposed to view in the finished structure, sheathing may be wetted thoroughly with clean water. All excess coating shall be removed by wiping with cloths. Reused forms shall have the contact surfaces cleaned thoroughly. Those that have been coated shall be given an additional application of the coating. Plaster waste molds shall be layered with two coats of the thin shellac or lacquer and coated with soft or thinned non-staining grease.
- **Tolerance and Variations:** The Contractor shall set and maintain concrete forms to ensure that, after removal of the forms and prior to patching and finishing, no portion of the concrete work will exceed any of the tolerances specified. Variations in floor levels shall be measured before removal of supporting shores. The Contractor shall make the necessary corrective measures for the variations resulting from deflection, or when the latter affects concrete quality or curing. The tolerances specified shall not exceed by any portion of the concrete surfaces; the specified variation for one element of the structure shall be considered unacceptable when it permits another element of the structure to exceed its allowable variations. Except as otherwise specified herein, tolerances shall conform to ACI 347.

CW-6.5.3 Placing Reinforcement

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

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

CW-6.5.4 Mixing Concrete

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

CW-6.5.5 Placing Concrete

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

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

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

CW-6.5.6 Finishing Concrete

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

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

CW-6.5.7 Removal of Forms

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

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

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

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

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

CW-6.5.8 Curing and Protection

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

CW-6.5.9 Sampling and Testing of Concrete

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

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

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

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

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

The compressive strength of the concrete shall be deemed acceptable if the 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 Contractor can provide evidence, by means of core tests, that the quality of concrete represented by the failed test result is acceptable in place. Three (3) cores shall be taken in accordance with ASTM C42 and soaked for 24 hours prior to testing. Concrete in the area represented by the cores will be deemed acceptable if the average strength of the cores is equal to at least 85% of and no single core is less than 75% of the specified strength.

CW-6.5.10 Tolerances and Repair for Concrete Construction

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

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

CW-6.5.11 Second Stage Concrete

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

CW-6.6 Measurement and Payment

Measurement for payment for Concrete (except 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 Bill of Quantities. Payment shall cover all costs for furnishing all labor, materials, including equipment and tools required for concreting work. Payment shall also include non shrink cementitious grout and epoxy grout inside foundation block out and above engine base plate and care of water.

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

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

CW-7.3.2 Fabrication

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

Bars 6mm 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-7.3.3 Protection of Material

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

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

CW-7.3.4 Placing and Fastening Reinforcement & Miscellaneous Material (ACI-301)

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

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

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

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

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

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

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

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

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

CW-7.4 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 related materials used for positioning and fastening the reinforcement in place as required by the NPC shall not be included in the weight-calculated payment under this item. If bars are substituted upon the Contractor's request and as result, more steel is used than specified; only the amount specified shall be included.

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

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

CW-8.0 STRUCTURAL STEEL**CW-8.1 General**

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

CW-8.1.1 Submittals

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

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

Certificates of Conformance for the following:

- Bolts, Nuts and Washers
- Welding Electrodes and Rods
- Paint
- Steel
- Certified Test Reports

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

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

CW-8.1.2 Delivery and Storage

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

CW-8.2 Materials

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

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

CW-8.2.1 Steel

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

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

CW-8.2.2 Bolts, Nuts and Washers:

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

Bolts:	ASTM A307, Grade C or ASTM A36 for Anchor Bolts; ASTM A325 for Fastening Bolts
Nuts:	ASTM A563, Grade A, heavy hex style, except nuts less than 38mm may be provided in hex style
Washers:	ANSI B18.22.1, Type B

CW-8.2.3 Accessories:

Welding electrodes and steel structural members shall use:

Rods	E70XX electrodes
Non-shrink Grout	ASTM C827, non-metallic

CW-8.3 Execution**CW-8.3.1 Fabrication**

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

CW-8.3.2 Welding of Structural Steelwork:

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

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

CW-8.3.3 Shop painting

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

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

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

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

CW-8.3.4 Erection

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

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

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

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

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

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

Any structure that does not conform shall be repaired, removed and/or erected anew by the Contractor at no additional cost to NPC.

Tolerances on structural steel shall be in accordance with the "Code of Standard Practice" of the AISC "Manual of Steel Construction".

CW-8.3.5 Tests and Inspections

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

Non-Destructive Testing²: In accordance with AWS D1.1 Twenty-five percent (25%) of the total number of joints, as selected by the NPC, shall be tested. If more than 20 percent of welds contain defects identified by testing, then all welds shall be tested by radiographic or ultrasonic testing, and to be approved by the NPC. When all welds made are required to be tested, magnetic particle testing shall be used only in areas inaccessible to either radiographic or ultrasonic testing. Retest defective areas after repair.

CW-8.4 Measurement and Payment

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

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

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

CW-9.0 GRAVEL SURFACING**CW-9.1 Scope**

The Contractor shall furnish gravel surfacing in areas as required in the drawings or as directed by the NPC. The Contractor shall furnish all materials, labor, equipment and other necessary accessories so as to complete the work satisfactorily.

CW-9.2 Materials and Workmanship

All gravel surfacing as shown in the drawing shall consist of a base layer and finish layer. Material for base layer shall be natural or crushed stone of a clean, hard and durable quality. Before placing of the base course, the surface of the subgrade shall be cleaned of all objectionable substances and properly shaped and drained. The material for base layer shall not be more than 5 cm. in size, and placed and spread on the prepared subgrade to a thickness of 7.5 cm. Spread materials shall be compacted by means of rammer, tapping machine or approved equal equipment. The material for finish layer shall not be more than 2.5 cm. in size, and placed, spread, and compacted satisfactorily.

CW-9.3 Measurement and Payment

Measurement and payment will be based on the number of cubic meters of materials placed and compacted according to the drawings or as directed by NPC.

Payment will be made at the contract unit price for the item Gravel Surfacing in the Bill of Quantities. The unit price shall include all cost of subgrade preparation, materials, hauling, compacting equipment need to complete the item.

CW-10.0 CONCRETE PAVEMENT**CW-10.1 Scope**

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

CW-10.2 Grading

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

CW-10.3 Sub-Grade Preparation

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

CW-10.4 Aggregate Sub-Base/Base Course**CW-10.4.1 Aggregate Sub-Base Course**

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

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

CW-10.4.2 Aggregate Base Course

Aggregate base course material shall consist of hard, durable fragments of crushed gravel or crushed stone and filler and sand or other finely

divided mineral matter. The composite material for the aggregate base shall be free from vegetable matter and lumps or balls of clay, and shall be uniformly graded from coarse to fine in accordance with the grading requirement shown below. The portion of the material retained in a No. 4 sieve shall be known as filler.

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

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

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

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

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

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

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

CW-10.4.1 Construction

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

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

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

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

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

CW-10.5 Concrete Pavement

CW-10.5.1 Materials

Cement and reinforcing steel shall be furnished by the Contractor, subject to the approval of NPC. Unless otherwise indicated in the drawings and/or Bill of Quantities, concrete strength shall be at least 20.70 MPa.

Fine/Coarse aggregates and water shall conform to the applicable provisions of CW-7.0 (Concrete).

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

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

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

CW-10.5.2 Construction

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

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

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

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

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

Mixing: Unless given the written approval by NPC, hand mixing of concrete will not be permitted. Machine mixer, if used, shall have a standard mixer of an approved type with a capacity of at least 0.76 m³. (1 cubic yard) unless specified otherwise by the NPC. Truck mixer, if used, shall be of the revolving drum type, watertight, and so constructed that the concrete can be mixed to insure uniform distribution of materials throughout the mass.

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

Finishing: After the concrete has been deposited, distributed and vibrated, the concrete shall be struck off and screened by mechanical means approved by the NPC. The finishing machines shall be of the screeding and troweling type designed and operated both to strike off and to consolidate. Hand finishing may be employed when suitable finishing machines are not available. Finishing of concrete shall be done, as directed to the satisfaction of the NPC. All finished surfaces shall be tested with a 3-meter straight edge and any variation of the surface from the desired crown or cross-section shall be properly corrected.

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

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

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

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

CW-10.6 Measurement and Payment**CW-10.6.1 Grading**

No separate measurement and payment will be made for grading work for the construction of concrete and asphalt pavements. Payment for grading work for the construction of concrete and asphalt pavements will be included in the unit bid price for the item, Aggregate Sub-base and/or Aggregate Base Course, in the Bill of Quantities.

CW-10.6.2 Aggregate Sub-Base/Base Course

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

CW-10.6.3 Concrete Pavement

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

CW-11.0 SECLUSION AND CYCLONE WIRE FENCE**CW-11.1 Scope**

In accordance with the specifications contained herein, the Supplier shall furnish all labor, materials, equipment and tools and shall construct the seclusion fence including vehicular and pedestrian gate to the length or extent shown on the drawings or as established in the field.

CW-11.2 Materials**CW-11.2.1 Cement and Reinforcing Steel**

Cement and Reinforcing steel shall conform to the requirements set forth in the Section CW-6.0 – Concrete. Class of concrete shall be 20.7MPa or as shown on the drawings.

CW-11.2.2 Heavy Galvanized Cyclone Wire

The material shall be made from steel wire helically wound and interwoven in such a manner as to provide a continuous mesh without knots or ties except in the form of knuckling or of twisting and barbing the ends of the wires to form the selvage of the fabric. The base metal shall be steel of such quality and purity that, when drawn to the size of wire specified and coated with zinc either before or after fabrication, the finished fencing shall be of uniform quality and have the properties and characteristics conforming to ASTM Designation A392. Fabric that is zinc coated after weaving and produced in accordance with this specification shall be hot-dip galvanized. Fabric that is zinc coated before waving may be either electronically or hot-dip galvanized.

At the option of NPC, Heavy Galvanized Cyclone wire delivered to the site shall be tested. One roll from every fifty (50) rolls or fraction thereof shall be taken at random as a sample for test purposes, except in no case shall less than two (2) samples be tested. To determine compliance with the requirements of this specification, the test specimens for each of the test specified shall be taken from the outside end of the sample rolls representing the lot. If any specimen tested fails to meet the requirements of this specification, the roll represented by the specimen shall be rejected and two (2) additional rolls shall be tested, both of which shall meet the requirements in every respect, otherwise the lot represented by the sample may be rejected.

CW-11.2.3 Fine/Coarse Aggregates and Water

Fine and coarse aggregates and water shall conform to the requirements stated in Section CW-6.0 – Concrete.

CW-11.2.4 G.I. Pipes

Galvanized iron pipes for the seclusion fence and gates shall conform to ASTM A120-68A.

CW-11.2.5 Structural Steel

All structural steel (rolled shapes and plates) for the fabrication of the vehicular and pedestrian gates, unless otherwise specified on the drawings, shall conform to ASTM A36.

CW-11.3 Construction

- a) Excavation, backfilling and concreting work shall be in accordance with the applicable provisions of Section CW-5.0 – Structural Excavation, Fill and Backfill and Section CW-6.0 – Concrete.
- b) Fabrication and installation of the heavy galvanized cyclone wire seclusion fence and gate shall be in accordance with the drawings or as directed by the NPC.
- c) All welding work shall conform to the Specification for Welded Highway and Railway Bridges of the American Welding Society (AWS).

CW-11.4 Measurement and Payment**CW-11.4.1 Seclusion Fence including Pedestrian Gate**

Measurement for payment shall be based on the number of linear meters of seclusion fence including pedestrian gate constructed and accepted.

Payment shall be made at the corresponding contract unit price for seclusion fence, shown on the Schedule of Requirements, which payment shall include the cost of furnishing all labor, materials, equipment and tools necessary for the construction of seclusion fence including reinforced concrete posts, CHB wall and footing, excavation and backfill.

CW-11.4.2 Cyclone Wire Fence

Measurement for payment shall be based on the number of linear meters of cyclone wire fence constructed and accepted.

Payment shall be made at the corresponding contract unit price for cyclone wire fence, shown on the Schedule of Requirements, which payment shall include the cost of furnishing all labor, materials, equipment and tools necessary for the construction of cyclone wire fence including reinforced concrete posts, CHB wall and footing, excavation and backfill.

SECTION VI

**TECHNICAL SPECIFICATIONS
FOR
ELECTRICAL WORKS**

SECTION VI – TECHNICAL SPECIFICATIONS**EW – ELECTRICAL WORKS****TABLE OF CONTENTS**

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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 **Construction of Access Road from Calaguas DPP to Shoreline and Improvement of Other Facilities**.

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 for the expansion of Control Room in Calaguas DPP;
2. 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 Luminaires

a. Fixture Type A

IP20 Recessed Type Lighting Fixture, with Mirror Finish Aluminum Reflector, 1200mm X 600mm Zinc Phosphate Steel Sheet Housing, 2 X 18 Watts, Cool White, High Output LED Lamp Tube Luminaires.

b. Fixture Type B

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 VII

BILL OF QUANTITIES

SECTION VII - BILL OF QUANTITIES

**BILL OF QUANTITIES
ARCHITECTURAL WORKS**

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount (in Figures)
AW-1.0 EXPANSION OF CONTROL ROOM							
AW-1.1 WALL SYSTEM AND FINISHES							
a.	150mm thk. CHB wall including mortars and reinforcement bars	furnish & lay	Refer to NPC TS & Drawing	sq.m.	38.00	_____ (P _____)	_____ (P _____)
b.	Plain cement plaster wall finish	furnish & apply	Refer to NPC TS & Drawing	sq.m.	59.00	_____ (P _____)	_____ (P _____)
AW-1.2 FLOOR FINISHES							
a.	Plain concrete floor finish	furnish and apply	Refer to NPC TS & Drawing	sq.m.	13.00	_____ (P _____)	_____ (P _____)
b.	Vitrified unglazed floor tiles 200mm x 200mm including bonding materials	furnish and install	Refer to NPC TS & Drawing	sq.m.	13.00	_____ (P _____)	_____ (P _____)
AW-1.3 ROOFING AND BUILDING BLANKETS							
a.	Roofings: 2.0mm thick Metallic Plastic corrugated roofing sheet including polystyrene insulation, stainless steel fasteners, sealants and accessories	furnish & install	Refer to NPC TS & Drawing	sq.m.	21.00	_____ (P _____)	_____ (P _____)
b.	Gutter: 2.0mm thick Metallic Plastic Gutter including fasteners, sealants, hardware and accessories.	furnish & install	Refer to NPC TS & Drawing	li.m.	7.00	_____ (P _____)	_____ (P _____)
c.	End Flashing: 2.0mm thick Metallic Plastic End Flashing including fasteners, sealants, hardware and accessories.	furnish & install	Refer to NPC TS & Drawing	li.m.	13.00	_____ (P _____)	_____ (P _____)
d.	Facia Board: 1/2"x12"x12' fiber cement board including steel frame hardware and accessories.	furnish & install	Refer to NPC TS & Drawing	li.m.	7.00	_____ (P _____)	_____ (P _____)

Note: The total amount shall be inclusive of Mark-Up (OCM and Profit) and VAT

Name of Firm

Name and Signature of Authorized Representative

Designation

SECTION VII - BILL OF QUANTITIES

**BILL OF QUANTITIES
ARCHITECTURAL WORKS**

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount (In Figures)
	e. Downspout: 3" Φ uPVC pipe series 1000 downspout including joint fittings solvents and brackets	furnish & install	Refer to NPC TS & Drawing	li.m.	8.00	_____ (P _____)	_____ (P _____)
	f. Roof Drain: Removable stainless wire basket strainer.	furnish & install	Refer to NPC TS & Drawing	pcs.	2.00	_____ (P _____)	_____ (P _____)
AW-1.4 CEILING SYSTEM							
	6mm thick. Marine Plywood Ceiling on standard metal furring spaced '⊕ 0.40 O.C.B.W. and metal hangers spaced ⊕ 0.80m O.C.B.W.	furnish & install	Refer to NPC TS & Drawing	sq.m.	21.00	_____ (P _____)	_____ (P _____)
AW-1.5 FENESTRATION							
	a. D-1 (2100mm x 900 mm) Flush type Wooden Door, marine plywood both side, 2" x 5" hard wood jamb, including heavy duty loose pin hinges, door knobs/ lockset weather proof and painting	furnish & install	Refer to NPC TS & Drawing	sets	2.00	_____ (P _____)	_____ (P _____)
	b. W-1 (1000mm x 1000mm) 6mm thick clear glass viewing window, sliding type, anodized frame	furnish & install	Refer to NPC TS & Drawing	sets	4.00	_____ (P _____)	_____ (P _____)
AW-1.6 PAINTING							
	a. All Concrete Surfaces	furnish & apply	Refer to NPC TS & Drawing	sq.m.	59.00	_____ (P _____)	_____ (P _____)
	b. All Metal Surfaces	furnish & apply	Refer to NPC TS & Drawing	sq.m.	20.00	_____ (P _____)	_____ (P _____)

Note: The total amount shall be inclusive of Mark-Up (OCM and Profit) and VAT

**SUB-TOTAL AMOUNT OF BID (ARCHITECTURAL WORKS)
CALAGUAS DPP**

_____ (P _____) _____ (P _____)

Name of Firm

Name and Signature of Authorized Representative

Designation

NATIONAL POWER CORPORATION

VII-BOQ(AW)-2

SECTION VII - BILL OF QUANTITIES

**BILL OF QUANTITIES
CIVIL WORKS**

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount (In Figures)
CW-1.0 DEMOLITION WORKS							
a.	Demolition of existing insulated wall panel	demolish & dispose	Refer to NPC TS & Drawing	lot.	1.00	(P) (P)	
b.	Demolition of switchyard fence	demolish & dispose	Refer to NPC TS & Drawing	lot.	1.00	(P) (P)	
CW-2.0 EXPANSION OF CONTROL ROOM (including concrete steps)							
a.	Structural Excavation	excavate, chip & dispose	Refer to NPC TS & Drawing	cu.m.	7.00	(P) (P)	
b.	Structural Fill	spread, level & compact	Refer to NPC TS & Drawing	cu.m.	4.70	(P) (P)	
c.	Structural Backfill	spread, level & compact	Refer to NPC TS & Drawing	cu.m.	6.00	(P) (P)	
d.	Sand and Gravel Bedding	furnish, place level & compact	Refer to NPC TS & Drawing	cu.m.	1.20	(P) (P)	
e.	Concrete (20.7 Mpa)	furnish & place	Refer to NPC TS & Drawing	cu.m.	6.00	(P) (P)	
f.	Reinforcing Steel Bars (Grade 275)	furnish, cut, bend schedule & install	Refer to NPC TS & Drawing	kgs.	715.00	(P) (P)	
g.	Structural Steel (A36) (including anchor bolts, nuts and washers)	furnish, fabricate and install	Refer to NPC TS & Drawing	kgs.	355.00	(P) (P)	

Note: The total amount shall be inclusive of Mark-Up (OCM and Profit) and VAT

Name of Firm

Name and Signature of Authorized Representative

Designation

SECTION VII - BILL OF QUANTITIES

**BILL OF QUANTITIES
CIVIL WORKS**

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount (in Figures)
CW-3.0 ACCESS ROAD							
a.	Subgrade preparation	grade, level and compact	Refer to NPC TS & Drawing	sq.m.	230.00	_____ (P _____)	_____ (P _____)
b.	Aggregate subbase	furnish, place level and compact	Refer to NPC TS & Drawing	cu.m.	34.00	_____ (P _____)	_____ (P _____)
c.	Concrete pavement (20.7Mpa) (including, gutters, sidewalk, forms, joints butimuous filler & dowels)	furnish and place	Refer to NPC TS & Drawing	cu.m.	32.00	_____ (P _____)	_____ (P _____)
CW-4.0 SWITCHYARD APPURTENANCES							
a.	Seclusion Fence (including con. post, chb wall, pedestrian gate, excavation & fill)	furnish & compact	Refer to NPC TS & Drawing	li.m.	15.00	_____ (P _____)	_____ (P _____)
b.	Gravel Surfacing (150mm thick)	furnish, place, level & compact	Refer to NPC TS & Drawing	cu.m.	4.50	_____ (P _____)	_____ (P _____)
c.	50mm dia. uPVC Weep Holes	furnish and install	Refer to NPC TS & Drawing	li.m.	2.00	_____ (P _____)	_____ (P _____)

Note: The total amount shall be inclusive of Mark-Up (OCM and Profit) and VAT

**SUB-TOTAL AMOUNT OF BID (CIVIL WORKS)
CALAGUAS DPP**

_____ (P _____) _____ (P _____)

Name of Firm

Name and Signature of Authorized Representative

Designation

SECTION VII - BILL OF QUANTITIES

**BILL OF QUANTITIES
ELECTRICAL WORKS**

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount (In Figures)
EW-1.0 LIGHTING FIXTURES							
a.	Fixture Type A 2 x 18W LED Recessed Type Lighting Fixture, 1200 x 600mm Zinc Phosphate Steel Sheet Housing as shown on Dwg. No. CalDPP-BDE-17.001	Furnish, Install and Test	Refer to NPC TS & Drawing	set(s)	2.00	_____ (P _____)	_____ (P _____)
b.	Fixture Type B Portable Emergency Lighting Fixture, 2 X 2 Watts Led Warm White with Built-In Sealed Lead Acid Battery Charging Time < 20 hrs; Usage Time <= 4 hrs as shown on CalDPP-BDE-17.001	Furnish, Install and Test	Refer to NPC TS & Drawing	set(s)	1.00	_____ (P _____)	_____ (P _____)
EW-2.0 OUTLETS AND SWITCHES INCLUDING PLATE COVER, FLUSH-MOUNTED, GROUNDING TYPE							
a.	Duplex Convenience Outlet, 16A, 250V Grounding Type	Furnish, Install and Test	Refer to NPC TS & Drawing	set(s)	2.00	_____ (P _____)	_____ (P _____)
b.	Single Convenience Outlet, 16A, 250V Grounding Type for Emergency Light	Furnish, Install and Test	Refer to NPC TS & Drawing	set(s)	1.00	_____ (P _____)	_____ (P _____)
c.	Single Pole Wall Switch, 10 A, 250 V butimunos filler & dowels)	Furnish, Install and Test	Refer to NPC TS & Drawing	set(s)	1.00	_____ (P _____)	_____ (P _____)
d.	Boxes, Fittings, and Accessories	Furnish, Install and Test	Refer to NPC TS & Drawing	lot	1.00	_____ (P _____)	_____ (P _____)

Name of Firm_____
Name and Signature of Authorized Representative_____
Designation

NATIONAL POWER CORPORATION



VII-BOQ(EW)-1

SECTION VII - BILL OF QUANTITIES

**BILL OF QUANTITIES
ELECTRICAL WORKS**

Item No.	Description of Work or Materials	Work to Be Done	Reference	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount (In Figures)
EW-3.0 INSULATED COPPER CONDUCTORS INCLUDING TERMINAL LUGS, CONNECTORS, CABLE TIES, IDENTIFICATION TAGS, ETC.							
a.	3.5 mm ² , 600 V, Moisture and Heat Resistant Thermoplastic, (THHN/THWN-2), Copper Conductor	Furnish, Install and Test	Refer to NPC TS & Drawing	lot	1.00	_____ (P _____)	_____ (P _____)
EW-4.0 CONDUITS							
a.	2.0 mm dia. uPVC	Furnish, Install and Test	Refer to NPC TS & Drawing	lot	1.00	_____ (P _____)	_____ (P _____)
b.	Boxes, Locknuts, Elbows, and other Fittings	Furnish, Install and Test	Refer to NPC TS & Drawing	lot	1.00	_____ (P _____)	_____ (P _____)
SUB-TOTAL AMOUNT OF BID (ELECTRICAL WORKS) CALAGUAS DPP						_____ (P _____)	_____ (P _____)

Name of Firm

NATIONAL POWER CORPORATION

Name and Signature of Authorized Representative



Designation

VII-BOQ(EW)-2

SECTION VIII

BIDDING FORMS

SECTION VIII – BIDDING FORMS

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Standard Form No: NPCSF-INFR-01

Checklist of Technical & Financial Envelope Requirements for Bidders**A. THE 1ST ENVELOPE (TECHNICAL COMPONENT) SHALL CONTAIN THE FOLLOWING:****1. ELIGIBILITY DOCUMENTS****a. (CLASS A)**

- PhilGEPs Certificate of Registration and Membership under Platinum Category (all pages) in accordance with Section 8.5.2 of the Revised IRR of RA. 9184;

Note: The failure by the prospective bidder to update its Certificate with the current and updated Class "A" eligibility documents shall result in the automatic suspension of the validity of its Certificate until such time that all of the expired Class "A" eligibility documents has been updated

- Special PCAB License in case of Joint Ventures; and registration for the type and cost of the contract to be bid
- Statement of all its ongoing government and private contracts if any, whether similar or not similar in nature and complexity to the contract to be bid (NPCSF-INFR-02)
- The Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid, and whose value, adjusted to current prices using the Philippine Statistics Authority (PSA) consumer price index, must be at least 50% of the ABC (NPCSF-INFR-03) complete with the following supporting documents:

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

NOTE: If the Bidder has no Single Largest Completed Contract (SLCC)/similar experience on the contract to be bid pursuant to ITB Clause 5.2, the SLCC Form (Form No. NPCSF-INFR-03) shall still be submitted and the Bidder shall indicate "NONE – PCAB License Category D, Registration Classification – Small B"

(The Single Largest Completed Contract (SLCC) as declared by the bidder shall be verified and validated to ascertain such completed contract. Hence, bidders must ensure access to sites of such projects/equipment to NPC representatives for verification and validation purposes during post-qualification process.

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

- Duly signed computation of its Net Financial Contracting Capacity (NFCC) at least equal to the ABC (NPCSF-INFR-04);

b. (CLASS B)

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

2. Technical Documents

- Bid Security, any one of the following:

- Bid Securing Declaration (NPCSF-INFR-06c)

OR

- Cash or Cashier's/Manager's check issued by a Universal or Commercial Bank – 2% of ABC;

OR

This Checklist of Requirements shall be provided to prospective suppliers/contractors including all forms. Suppliers/contractors are encouraged to consult this checklist before submitting their proposals on the deadline for the submission and receipt of offers.

Standard Form No: NPCSF-INFR-01
Page 2 of 3

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

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

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

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

CONDITIONS:

1. *Each Bidder shall submit Two (2) copies of the first and second components of its Bid, marked Original and photocopy. Only the original copy will be read and considered for the bid. Any misplaced document outside of the Original copy will not be considered. The photocopy is ONLY FOR REFERENCE. NPC may request additional hard copies and/or electronic copies of the Bid. However, failure of the Bidders to comply with the said request shall not be a ground for disqualification.*
2. *A Bidder not submitting bid for reason that his cost estimate is higher than the ABC, is required to submit his letter of non-participation/regret supported by corresponding detailed estimates. Failure to submit the two (2) documents shall be understood as acts that tend to defeat the purpose of public bidding without valid reason as stated under Section 69.1.(i) of the revised IRR of R.A. 9184.*

Standard Form Number: NPCSF-INFR-02

List of All Ongoing Government and Private Contracts Including Contract Awarded But Not Yet StartedBusiness Name : _____
Business Address : _____

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

The bidder shall declare in this form all his on-going government and private contracts including contracts where the bidder (either as individual or as a Joint Venture) is a partner in a Joint Venture agreement other than his current joint venture where he is a partner. Non declaration will be a ground for disqualification of bid.

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

1. Contract/Purchase Order and/or Notice of Award
2. Certification coming from the project owner/client that the performance is satisfactory as of the bidding date.

Submitted by : _____
(Printed Name & Signature)

Designation : _____

Date : _____

SECTION VIII – BIDDING FORMS

Standard Form Number: NPCSF-INFR-03

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

Business Name : _____
 Business Address : _____

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

- Notes:
1. The bidder must state only one (1) Single Largest Completed Contract (SLCC) similar to the contract to be bid.
 2. Supporting documents such as any of the following: Owner's Certificate of Final Acceptance issued by the project owner other than the contractor; or A final rating of at least Satisfactory in the Constructors Performance Evaluation System (CPES); or Official Receipt (O.R); or Sales Invoice for the contract stated above shall be submitted during Bid Opening.
 3. If the Bidder has no Single Largest Completed Contract (SLCC)/similar experience on the contract to be bid pursuant to ITB Clause 5.2, the SLCC Form (Form No. NPCSF-INFR-03) shall still be submitted and the Bidder shall indicate "NONE – PCAB License Category D, Registration Classification – Small B"

Submitted by _____
 (Printed Name & Signature)

Designation : _____
 Date : _____

Standard Form Number: NPCSF-INFR-04

NET FINANCIAL CONTRACTING CAPACITY (NFCC)

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

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

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

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

NFCC = P _____

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

Submitted by:

Name of Bidder/Contractor

Signature of Authorized Representative

Date : _____

Standard Form Number: NPCSF-INFR-05

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

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

- and -

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

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

NAME OF PROJECT**CONTRACT AMOUNT**

That the capital contribution of each member firm:

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

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

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

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

Name & Signature of Authorized Representative

Official Designation

Name of Firm

Name & Signature of Authorized Representative

Official Designation

Name of Firm

Witnesses

1. _____ 2. _____

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

Standard Form Number: NPCSF-INFR-06a

FORM OF BID SECURITY (BANK GUARANTEE)

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

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

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

THE CONDITIONS of this obligation are that:

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

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

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

DATE _____ SIGNATURE OF THE BANK _____

WITNESS _____ SEAL _____

(Signature, Name and Address)

Standard Form Number: NPCSF-INFR-06b

FORM OF BID SECURITY (SURETY BOND)

BOND NO.: _____ DATE BOND EXECUTED: _____

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

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

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

NOW, THEREFORE, the conditions of this obligation are:

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

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

PROVIDED HOWEVER, that the Surety shall not be:

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

Standard Form Number: NPCSF-INFR-08b
Page 2 of 2

This Surety executing this instrument hereby agrees that its obligation shall be valid for 120 calendar days after the deadline for submission of Bids as such deadline is stated in the Instructions to Bidders or as it may be extended by the Employer, notice of which extension(s) to the Surety is hereby waived.

PRINCIPAL _____ SURETY _____

SIGNATURE(S) _____ SIGNATURES(S) _____

NAME(S) AND TITLE(S) _____ NAME(S) _____

SEAL _____ SEAL _____

Standard Form No: NPCSF-INFR-06c

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

BID-SECURING DECLARATION
CONSTRUCTION OF ACCESS ROAD FROM CALAGUAS DPP TO SHORELINE AND
IMPROVEMENT OF OTHER FACILITIES
PR NO. S1-CDP24-001

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

I/We¹, the undersigned, declare that:

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

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

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

[Jurat]

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

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

Standard Form No: NPCSF-INFR-07b

Omnibus Sworn Statement (Revised)**REPUBLIC OF THE PHILIPPINES)**
CITY/MUNICIPALITY OF _____) S.S.**AFFIDAVIT**

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

*[Insert NAME OF BIDDER OR ITS AUTHORIZED
REPRESENTATIVE]*

[Insert signatory's legal capacity]
Affiant

[Jurat]

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

Standard Form Number: NPCSF-INFR-08

CONTRACTOR'S ORGANIZATIONAL CHART FOR THE CONTRACT

Submit Copy of the Organizational Chart that the Contractor intends to use to execute the Contract if awarded to him. Indicate in the chart the names of the Project Manager, Project Engineer, Foreman and other Key Engineering Personnel.

Attach the required Proposed Organizational Chart for the Contract as stated above

NOTES:

1. *This organization chart should represent the "Contractor's Organization" required for the Project, and not the organizational chart of the entire firm.*
2. *Each such nominated engineer/key personnel shall comply with and submit duly accomplished forms NPCSF-INFR-10a, NPCSF-INFR-10b and NPCSF-INFR-11, which shall be submitted during post-qualification.*
3. *All these are required to be in the Technical Envelope of the Bidder.*

Standard Form Number: NPCSF-INFR-09

LIST OF KEY PERSONNEL PROPOSED TO BE ASSIGNED TO THE CONTRACT
(Based on the Minimum Key Personnel Required in the Bidding Documents)

Business Name: _____

Business: _____

Particulars	Project Manager (if applicable)	Project Engineer	Materials Engineer (if applicable)	Safety Officer (if applicable)	
1 Name					
2 Address					
3 Date of Birth					
4 Education					
5 License/Qualification Details:					
a. Profession/Specialization					
b. Registration Number					
c. Registration Date					
d. Valid Until					
6 Experience Data:					
a. Years employed by the Bidder					
b. General Experience (yrs.)					
c. Professional Experience on similar project (yrs.)					

Submitted by: _____

(Printed Name & Signature)

Designation: _____

Date: _____

One of the requirements from the bidder to be included in its Technical Envelope is a list of contractor's key personnel (based on the minimum key personnel required in the bidding documents) to be assigned to the contract to be bid, with their complete qualification and experience data.

Standard Form Number: NPCSF-INFR-10a

NOTE: THIS FORM SHALL BE SUBMITTED DURING
POST-QUALIFICATION**KEY PERSONNEL'S CERTIFICATE OF EMPLOYMENT
(PROFESSIONAL PERSONNEL)**_____
Issuance Date**THE PRESIDENT**
National Power Corporation
BIR Road cor. Quezon Ave.
Diliman, Quezon City

Dear Sir:

I am (Name of Nominee) a Licensed _____ Engineer with
Professional License No. _____ issued on (date of Issuance) at (place of
Issuance) _____.I hereby certify that (Name of Bidder) has engaged my services as
(Designation) _____ for the (Name of Project) _____, if awarded to it.As (Designation) _____, I supervised the following completed projects similar to
the contract under bidding:

NAME OF PROJECT	OWNER	COST	DATE COMPLETED
_____	_____	_____	_____

At present, I am supervising the following projects:

NAME OF PROJECT	OWNER	COST	DATE COMPLETED
_____	_____	_____	_____

In case of my separation for any reason whatsoever from the above-mentioned
Contractor, I shall notify the National Power Corporation at least twenty one (21) days before the
effective date of my separation.As (Designation) _____, I know I will have to stay in the job site all the
time to supervise and manage the Contract works to the best of my ability, and aware that I am
authorized to handle only one (1) contract at a time.I do not allow the use of my name for the purpose of enabling the above-mentioned
Contractor to qualify for the Contract without any firm commitment on my part to assume the post
of (Designation) _____ therefor, if the contract is awarded to him since I understand
that to do so will be a sufficient ground for my disqualification as (Designation) _____ in
any future National Power Corporation bidding or employment with any Contractor doing
business with the National Power Corporation._____
(Name and Signature)
AFFIANT**[Jurat]***[Format shall be based on the latest Rules on Notarial Practice]*One of the requirements from the bidder is a list of contractor's key personnel (viz. Project Manager, Project Engineer,
Construction Safety Officer, Foremen, etc), to be assigned to the contract to be bid, with their complete qualification and
experience data (including the key personnel's signed written commitment to work for the project once awarded the contract).

Standard Form Number: NPCSF-INFR-10b

NOTE: THIS FORM SHALL BE SUBMITTED DURING
POST-QUALIFICATION**KEY PERSONNEL'S CERTIFICATE OF EMPLOYMENT
(CONSTRUCTION SAFETY AND HEALTH OFFICER)**_____
Issuance Date**THE PRESIDENT**National Power Corporation
BIR Road cor. Quezon Ave.
Diliman, Quezon City

Dear Sir:

I am (Name of Nominee) an Construction Safety & Health Officer with
Certificate No. _____ issued on (date of issuance) at (place of
issuance).

I hereby certify that (Name of Bidder) has engaged my services as
Construction Safety & Health Officer for the (Name of Project), if awarded to it.

I am the Construction Safety & Health Officer of the following completed projects similar
to the contract under bidding:

NAME OF PROJECT	OWNER	COST	DATE COMPLETED
_____	_____	_____	_____

At present, I am the Construction Safety & Health Officer of the following projects:

NAME OF PROJECT	OWNER	COST	DATE COMPLETED
_____	_____	_____	_____

In case of my separation for any reason whatsoever from the above-mentioned
Contractor, I shall notify the National Power Corporation at least twenty one (21) days before the
effective date of my separation.

As Construction Safety & Health Officer, I know I will have to stay in the job site all the
time and aware that I am authorized to handle only one (1) contract at a time.

I do not allow the use of my name for the purpose of enabling the above-mentioned
Contractor to qualify for the Contract without any firm commitment on my part to assume the post
of Construction Safety & Health Officer, if the contract is awarded to him since I understand that
to do so will be a sufficient ground for my disqualification as Construction Safety & Health Officer
in any future National Power Corporation bidding or employment with any Contractor doing
business with the National Power Corporation.

(Name and Signature)
AFFIANT**[Jurat]***[Format shall be based on the latest Rules on Notarial Practice]*

One of the requirements from the bidder is a list of contractor's key personnel (viz. Project Manager, Project Engineer,
Construction Safety Officer, Foremen, etc), to be assigned to the contract to be bid, with their complete qualification and
experience data (including the key personnel's signed written commitment to work for the project once awarded the contract).

Standard Form Number: NPCSF-INFR-11

**NOTE: THIS FORM SHALL BE SUBMITTED DURING
POST-QUALIFICATION****KEY PERSONNEL
(FORMAT OF BIO-DATA)**

Give the detailed information of the following personnel who are scheduled to be assigned as full-time field staff for the project. Fill up a form for each person.

1. Name : _____
2. Date of Birth : _____
3. Nationality : _____
4. Education and Degrees : _____
5. Specialty : _____
6. Registration : _____
7. Length of Service with the Firm : _____ Year from _____ (months) _____ (year)
To _____ (months) _____ (year)
8. Years of Experience : _____
9. If Item 7 is less than ten (10) years, give name and length of service with previous employers for a ten (10)-year period (attached additional sheet/s), if necessary:

Name and Address of EmployerLength of Service

_____	_____ year(s) from _____ to _____
_____	_____ year(s) from _____ to _____
_____	_____ year(s) from _____ to _____

10. Experience:

This should cover the past ten (10) years of experience. (Attached as many pages as necessary to show involvement of personnel in projects using the format below).

One of the requirements from the bidder is a list of contractor's key personnel (viz. Project Manager, Project Engineer, Construction Safety Officer, Foremen, etc), to be assigned to the contract to be bid, with their complete qualification and experience data (including the key personnel's signed written commitment to work for the project once awarded the contract).

SECTION VIII – BIDDING FORMS

PR NO. S1-CDP24-001

Standard Form Number: NPCSF-INFR-11
Page 2 of 2

1. Name : _____
2. Name and Address of Owner : _____
3. Name and Address of the
Owner's Engineer : _____
(Consultant)
4. Indicate the Features of Project
(particulars of the project
components and any other particular
interest connected with the project): _____
5. Contract Amount Expressed in
Philippine Currency : _____
6. Position : _____
7. Structures for which the employee
was responsible : _____
8. Assignment Period : from _____ (months) _____ (years)
: to _____ (months) _____ (years)

Name and Signature of Employee

It is hereby certified that the above personnel can be assigned to this project, if the contract is awarded to our company.

(Place and Date)_____
(The Authorized Representative)

One of the requirements from the bidder is a list of contractor's key personnel (viz. Project Manager, Project Engineer, Construction Safety Officer, Foremen, etc), to be assigned to the contract to be bid, with their complete qualification and experience data (including the key personnel's signed written commitment to work for the project once awarded the contract).

Standard Form Number: NPCSF-INFR-12

LIST OF EQUIPMENT, OWNED OR LEASED AND/OR UNDER PURCHASE AGREEMENTS
(Based on the Minimum Equipment Required in the Bidding Documents)

Business Name: _____

Business: _____

Description	Model/Year	Capacity / Performance / Size	Plate No.	Motor No. / Body No.	Location	Condition	Proof of Ownership / Lessor or Vendor
A. Owned							
i.							
ii.							
iii.							
iv.							
v.							
B. Leased							
i.							
ii.							
iii.							
iv.							
v.							
C. Under Purchase Agreements							
i.							
ii.							
iii.							
iv.							
v.							

Submitted by: _____

(Printed Name & Signature)

Designation: _____

Date: _____

One of the requirements from the bidder to be included in its Technical Envelope is the list of its equipment units pledged for the contract to be bid, based on minimum equipment required in the bidding documents, which are owned, leased, and/or under purchase agreements.
This shall be supported by proof of ownership and/or certification of availability of equipment from the equipment lessor for the duration of the project, to be submitted during post-qualification.

Standard Form No. : NPCSF-INFR-13

BID LETTER

Date: _____

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

We, the undersigned, declare that:

- (a) We have examined and have no reservation to the Bidding Documents, including Addenda, for the Contract **CONSTRUCTION OF ACCESS ROAD FROM CALAGUAS DPP TO SHORELINE AND IMPROVEMENT OF OTHER FACILITIES (PR NO. S1-CDP24-001)**.

- (b) We offer to execute the Works for this Contract in accordance with the Bid Documents, Technical Specifications, General and Special Conditions of Contract accompanying this Bid;

The total price of our Bid, excluding any discounts offered below is: insert information _____;

The discounts offered and the methodology for their application are: insert information _____;

- (c) Our Bid shall be valid for a period of insert number _____ days from the date fixed for the Bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

- (d) If our Bid is accepted, we commit to obtain a Performance Security in the amount of insert percentage amount _____ percent of the Contract Price for the due performance of the Contract;

- (e) Our firm, including any subcontractors or suppliers for any part of the Contract, have nationalities from the following eligible countries: insert information _____;

- (f) We are not participating, as Bidders, in more than one Bid in this bidding process, other than alternative offers in accordance with the Bidding Documents;

- (g) Our firm, its affiliates or subsidiaries, including any subcontractors or suppliers for any part of the Contract, has not been declared ineligible by the Funding Source;

- (h) We understand that this Bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal Contract is prepared and executed; and

- (i) We understand that you are not bound to accept the Lowest Calculated Bid or any other Bid that you may receive.

- (j) We likewise certify/confirm that the undersigned, is the duly authorized representative of the bidder, and granted full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for the **CONSTRUCTION OF ACCESS ROAD FROM CALAGUAS DPP TO SHORELINE AND IMPROVEMENT OF OTHER FACILITIES (PR NO. S1-CDP24-001)** of the National Power Corporation.
- (k) We acknowledge that failure to sign each and every page of this Bid Letter, including the Bill of Quantities, shall be a ground for the rejection of our bid.

Name: _____

In the capacity of: _____

Signed: _____

Duly authorized to sign the Bid for and on behalf of: _____

Date: _____

Standard Form No. : NPCSF-INFR-14

DETAILED COST ESTIMATE FORM

Name of Bidder :

[illegible]

NOTES:

1. The Bidder must provide all the information required above.
2. All pay items in the Bill of Quantities must be included the detailed cost estimate.
3. Unit Price and Total price in this form must be the same with the Bill of Quantities and Bid Letter.

Name, Signature of Authorized Representative

Designation

Standard Form No. : NPCSF-INFR-15

**SUMMARY SHEETS OF MATERIALS PRICES, LABOR RATES
AND EQUIPMENT RENTAL RATES**

Name of Bidder : _____

I. Unit Prices of Materials

Materials Description	Unit	Unit Price
1.		
2.		
3.		
4.		
5.		
6.		
7.		

II. Manpower Hourly Rates

Designation	Rate/Hr.
1.	
2.	
3.	
4.	
5.	
6.	
7.	

III. Equipment Hourly Rental Rates

Equipment Description	Rental Rate/Hr.
1.	
2.	
3.	
4.	
5.	
6.	
7.	

Name, Signature of Authorized Representative_____
Designation

SECTION IX

BID DRAWINGS

SECTION IX – BID DRAWINGS**AW – ARCHITECTURAL WORKS**

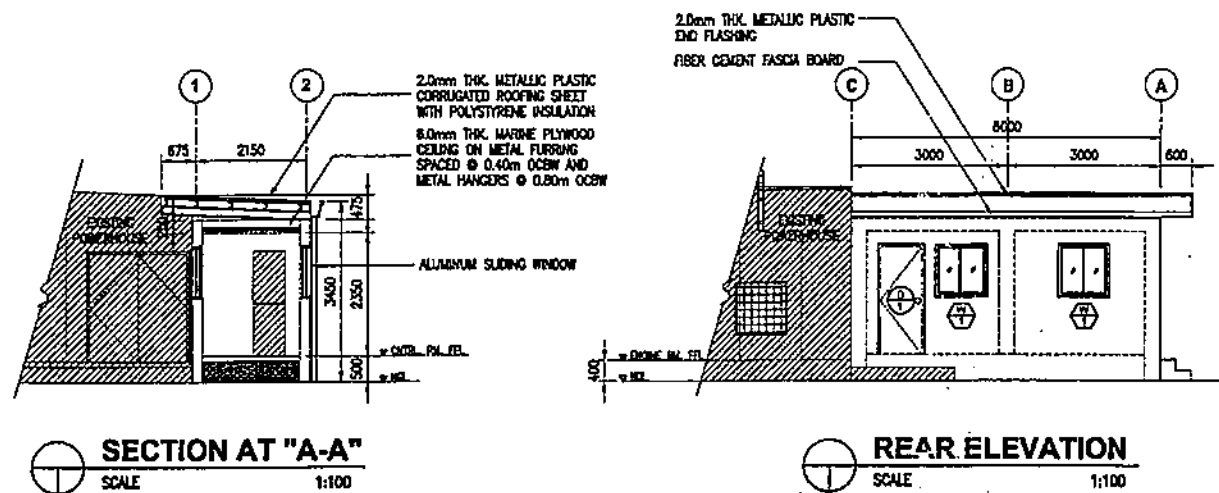
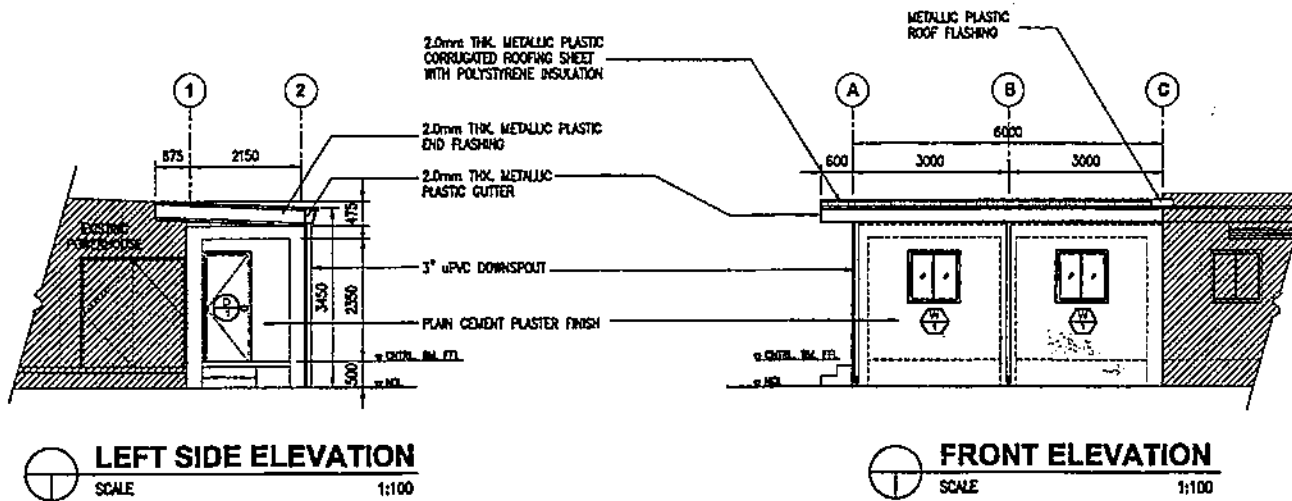
DRAWING NO.	TITLE
CalDPP-BDA-17.001	EXPANSION OF CONTROL ROOM (Plan, Schedule of Doors and Windows)
CalDPP-BDA-17.002	EXPANSION OF CONTROL ROOM (Section and Elevations)

LEGEND:

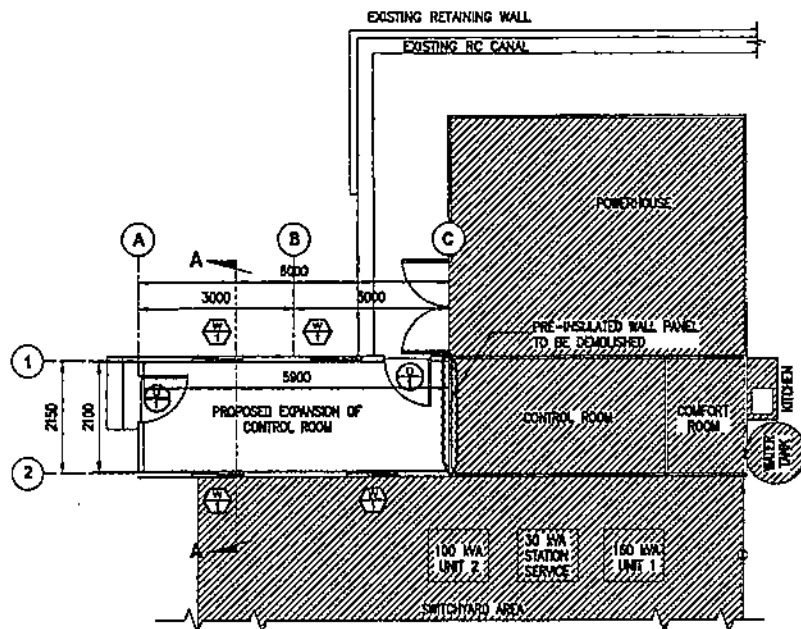
EXISTING STRUCTURES

NOTES:

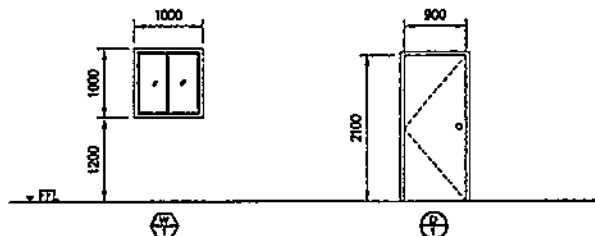
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
2. THIS DRAWING SHALL BE WORKED WITH ELECTRICAL BID DRAWINGS.



OWNER:		NATIONAL POWER CORPORATION GABRIEL Y. ITORON BLDG., GEN. ARMAND P. DE FORTES AVE., AVULAN (FORMERLY BUK ROAD) CORNER QUEZON AVENUE, DULUAN 1100 QUEZON CITY, PHILIPPINES	
PROJECT: CONSTRUCTION OF ACCESS ROAD FROM CALABUAS DPP TO SMOKELINE AND IMPROVEMENT OF OTHER FACILITIES			
LOCATION: CALABUAS DPP, VIÑEDOS, CAMARINES NORTE			
TITLE: EXPANSION OF CONTROL ROOM (SECTION AND ELEVATIONS)			
DESIGNED	BY	CHKD	DATE
DRAWN			
REVIEWED	PRINCIPAL ENGR./ARCHT.		RECOMMENDED:
CYCLARCHT			
ELEC.			
MECH.			
APPROVED:		 R.R.R. VILLANUEVA Principal Architect, CEAD A.G. ESPRITU Manager, CEAD G.B. MAGPOC, JR. Manager, OOO	
DWG. NO. CalDPP-BDA-17.002		PL. NO. S1-CDP24-001	
SCALE: AS SHOWN		BID DRAWING	
REV.	DATE	NATURE OF REVISION	BY



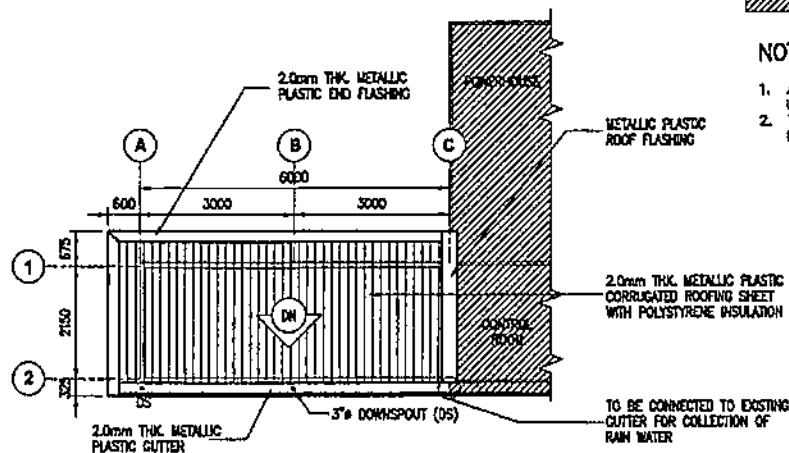
FLOOR PLAN
SCALE 1:100



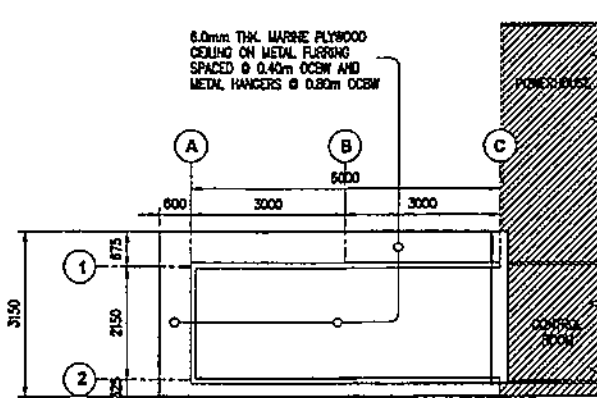
- 6mm THK. CLEAR GLASS
- VIEWING WINDOW
- SLIDING WINDOW
- ANODIZED FRAME

- FLUSH TYPE WOOD DOOR
- MARINE PLYWOOD BOTH SIDES
- 2" X 5" HARD WOOD JAMB
- 3 PIECES OF HEAVY DUTY LOOSE PIN HINGES
- ONE SET DOOR KICK, WEATHERPROOF
- GLAZED LACQUER PAINT FINISH ON DOOR AND JAMB

SCHEDULE OF DOORS AND WINDOWS
SCALE 1:75



ROOF PLAN
SCALE 1:100



REFLECTED CEILING PLAN
SCALE 1:100

LEGEND:

EXISTING STRUCTURES

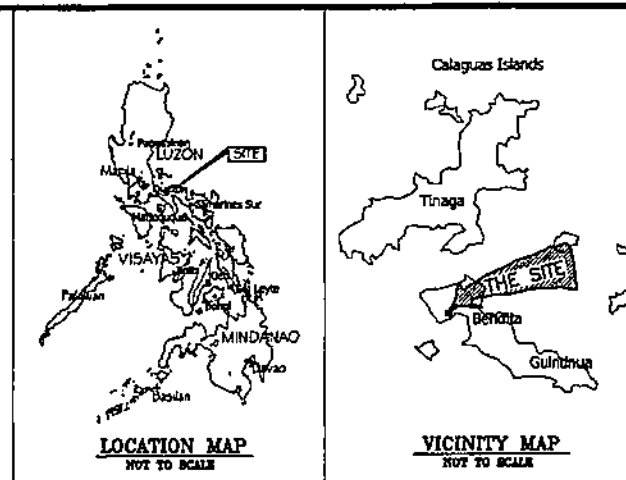
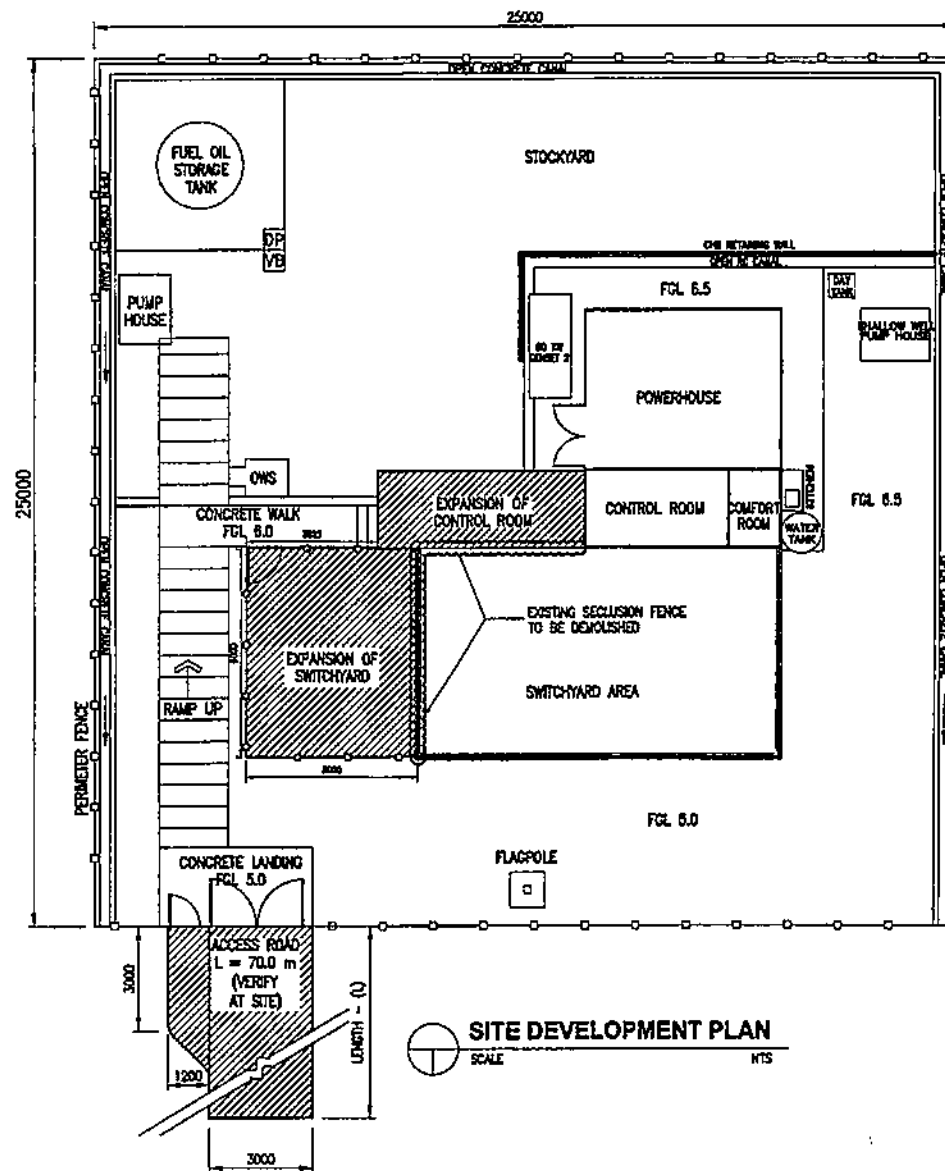
NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
2. THIS DRAWING SHALL BE WORKED WITH ELECTRICAL BID DRAWINGS.

NATIONAL POWER CORPORATION GABRIEL Y. ITCHON BLDG., 5th FLOOR, DEFENSESANTAGO AVENUE (FORMERLY 15th ROAD) CORNER QUEZON AVENUE, DULAN 1100 QUEZON CITY, PHILIPPINES	
PROJECT: CONSTRUCTION OF ACCESS ROAD FROM CALAGUAS DPP TO SHORELINE AND IMPROVEMENT OF OTHER FACILITIES LOCATION: CALAGUAS DPP, VINZONS, CAMARINES NORTE	
TITLE: EXPANSION OF CONTROL ROOM (PLANS, SCHEDULE OF DOORS AND WINDOWS)	
DESIGNED BY	DATE
DRAWN BY	DATE
REVIEWED BY	DATE
CHECKED BY	DATE
ELEC.	DATE
MECH.	DATE
SUBMITTED: R. R. R. VILLANUEVA PROJECT MANAGER, C&D	
RECOMMENDED: A. C. S. M. RITU PROJECT MANAGER, C&D	
APPROVED: G. B. MAGPOC, JR. Manager, C&D	
DWG. NO. CalDPP-BDA-17.001	P.R. NO. S1-CDP24-001
SCALE: AS SHOWN BID DRAWING	
REV. DATE NATURE OF REVISION BY CND. RECD. APPR.	

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

DRAWING NO.	TITLE
CalDPP-BDC-17.001	SITE DEVELOPMENT PLAN (Calaguas DPP)
CalDPP-BDC-17.002	EXPANSION OF CONTROL ROOM (Foundation and Roof Framing Details)
CalDPP-BDC-17.003	EXPANSION OF CONTROL ROOM (Column, Footing, Wall Footing and Concrete Steps Details)
CalDPP-BDC-17.004	EXPANSION OF CONTROL ROOM (Beam Section and Details)
CalDPP-BDC-17.005	SECLUSION FENCE & PEDESTRIAN GATE (Elevation, Section and Details)
CalDPP-BDC-17.006	ACCESS ROAD (Plan, Section and Details)
CalDPP-BDC-17.007	ACCESS ROAD (Typical Details)



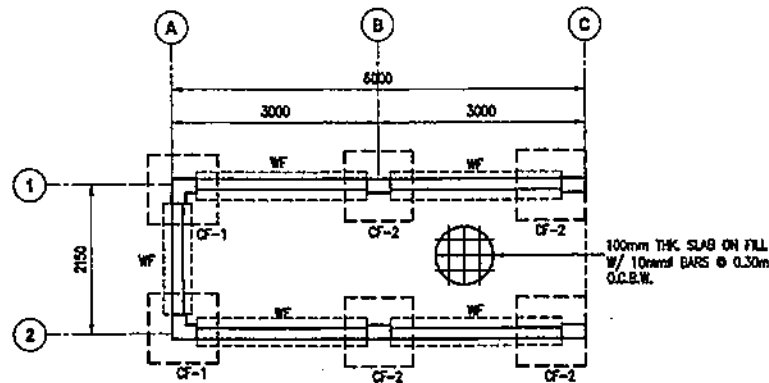
LEGEND:

- ▨ - PROPOSED STRUCTURES
- - EXISTING STRUCTURES
- OWS - OIL-WATER SEPARATOR
- DP - VALVE BOX
- VB - DRAIN PIT
- BARGED WIRE FENCE
- SECLUSION FENCE

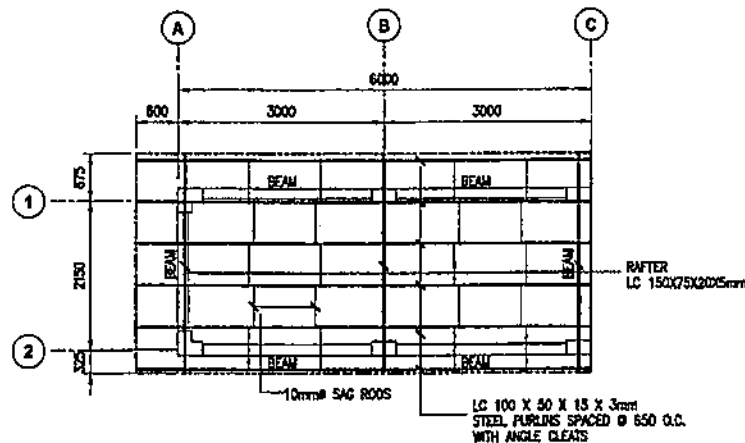
NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. LOCATIONS OF STRUCTURES MAY BE MODIFIED TO SUIT ACTUAL FIELD CONDITION.
3. THIS DRAWING IS FOR BIDDING PURPOSES ONLY. THE CONTRACTOR SHALL DEVELOP THE SITE BASED ON THE ACTUAL FIELD CONDITION.

OWNER:		NATIONAL POWER CORPORATION <small>CHARLES Y. ITCHON BLDG., 25th FLOOR, DEFENSE COMPLEX, AVENUE 1 (FORMERLY SRP ROAD) CORNER QUEZON AVENUE, DELMAN 1140 QUEZON CITY, PHILIPPINES</small>	
PROJECT: CONSTRUCTION OF ACCESS ROAD FROM CALAGUAS DPP TO SHORELINE AND IMPROVEMENT OF OTHER FACILITIES			
LOCATION: CALAGUAS DPP, VISAYAS, CAMARINES NORTE			
TITLE: SITE DEVELOPMENT PLAN (CALAGUAS DPP)			
DESIGNED	BY	CHKD	DATE
DRAWN			
REVIEWED	PRINCIPAL ENGR./ARCHT.	RECOMMENDED	
CHECKED		APPROVED	
ELEC.			
MECH.			
DRAWING NO. CalDPP-BDC-17.001		PL. NO. S1-CDP24-001	
SCALE: NTS		BID DRAWING	
REV.		REV. 0	



FOUNDATION PLAN
SCALE 1/75



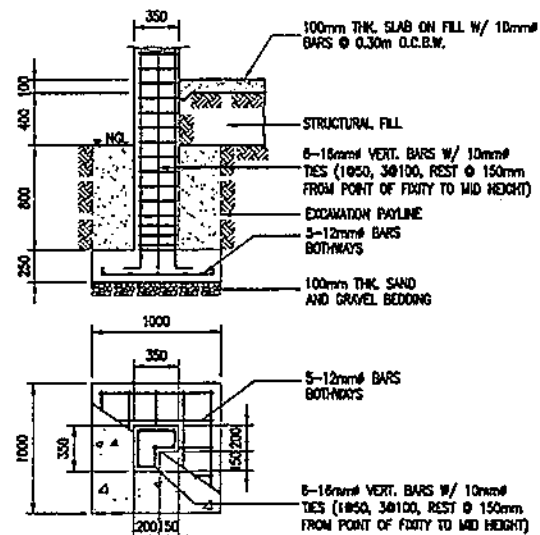
ROOF FRAMING PLAN
SCALE 1/75

NOTES:

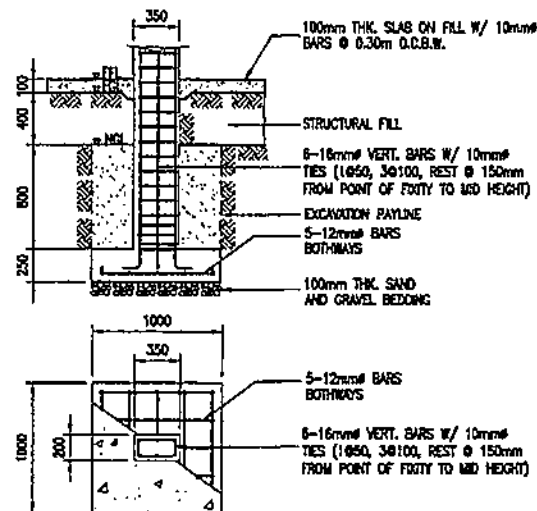
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
2. ALLOWABLE BEARING CAPACITY OF SOIL SHALL NOT BE LESS THAN 143 KPa (3000 psf).
3. MINIMUM COMPRESSIVE STRENGTH OF CONCRETE SHALL BE $f_c = 20.7 \text{ MPa}$ AT 28 DAYS PERIOD.
4. REINFORCING STEEL BARS SHALL CONFORM TO THE REQUIREMENTS OF THE PNS FOR DEFORMED STEEL BARS GRADE 275.
5. ALL ASPECTS OF CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE PROVISIONS OF THE LATEST APPLICABLE CODE.
6. ALL CONNECTIONS SHALL BE WELDED IN ACCORDANCE WITH THE AMERICAN WELDING SOCIETY.
7. ALL JOINTS, SPLICES AND CONNECTIONS SHALL BE FULLY WELDED.
8. ALL METAL SHALL BE CLEANED FROM RUST AND PAINTED WITH PRIMER PAINT.

NATIONAL POWER CORPORATION <small>QUINCELY, ITCHON BLVD., BSA, SARAS P. DEL ROSARIO-SANTAGO AVENUE (FORMERLY BIR ROAD) CORNER QUEZON AVENUE, DUMAN 1100 QUEZON CITY, PHILIPPINES</small>	
PROJECT: CONSTRUCTION OF ACCESS ROAD FROM CALAGUAS DPP TO SHORELINE AND IMPROVEMENT OF OTHER FACILITIES LOCATION: CALAGUAS DPP, VINZON, CALAMIANES NORTE	
TITLE: EXPANSION OF CONTROL ROOM (Foundation and Roof Framing Plan)	
DESIGNED BY: H. L. MENDOZA Principal Engineer A, CEAD	SUBMITTED:
DRAWN BY: A. C. ESPERITU Principal Engr. / Archt.	RECOMMENDED:
CHECKED BY: G. R. MAGPOC, JR. Manager, CDD	APPROVED:
DWG. NO.: CalDPP-BDC-17.002	REV. NO.: S1-CDP24-001
SCALE: AS SHOWN	
BID DRAWING	
REV. 0	

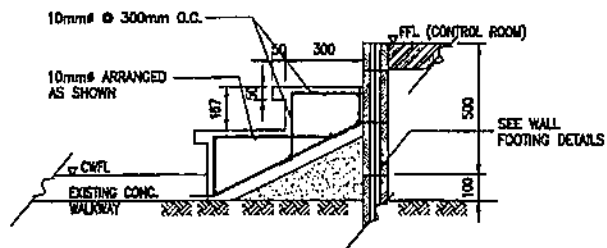
REV.	DATE	NATURE OF REVISION	BY	CHECKED	RECD.	APPR.



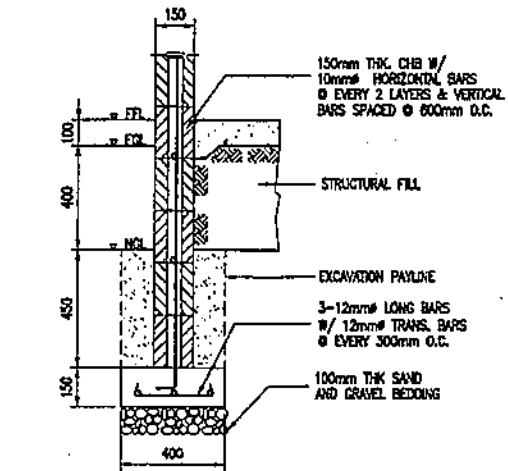
COLUMN - FOOTING 1 (CF-1)
SCALE 1:40



COLUMN - FOOTING 2 (CF-2)
SCALE 1:40



CONCRETE STEPS DETAILS
SCALE 1:20

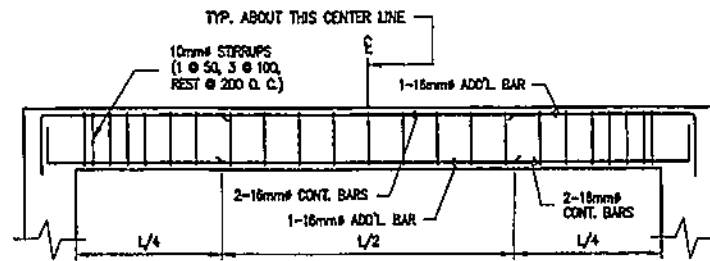


WALL FOOTING
SCALE 1:20

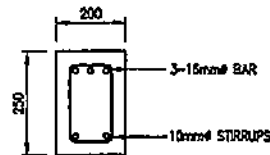
NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
2. ALLOWABLE BEARING CAPACITY OF SOIL SHALL NOT BE LESS THAN 143 kPa (3000 psf).
3. MINIMUM COMPRESSIVE STRENGTH OF CONCRETE SHALL BE $f_c = 20.7 \text{ MPa}$ AT 28 DAYS PERIOD.
4. REINFORCING STEEL BARS SHALL CONFORM TO THE REQUIREMENTS OF THE PNS FOR DEFORMED STEEL BARS GRADE 275.
5. ALL ASPECTS OF CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE PROVISIONS OF THE LATEST APPLICABLE CODE.

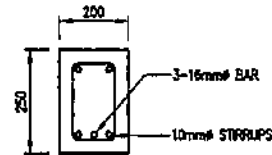
OWNER:		NATIONAL POWER CORPORATION GABRIEL Y. ITCHON BLDG., 25th FLOOR, P. DEFENSOR SANTIAGO AVENUE, FORCOSA, Y. BAR ROAD, CORNER QUEZON AVENUE, DUMANAY 1100 QUEZON CITY, PHILIPPINES	
PROJECT:		CONSTRUCTION OF ACCESS ROAD FROM CALAGUAS DFP TO SHORELINE AND IMPROVEMENT OF OTHER FACILITIES	
LOCATION:		CALAGUAS DFP, VIÑONS, CAMARINES NORTE	
TITLE:		EXPANSION OF CONTROL ROOM (COLUMN, FOOTING, WALL FOOTING AND CONCRETE STEPS DETAILS)	
DESIGNED	BY	CHKD	DATE
DRAWN	SUBMITTED: H. L. MENDOZA Principal Engineer A, CEAD		
REVIEWED	RECOMMENDED: A. C. ESPINOSA Manager, CEAD		
CHECKED	APPROVED: G. B. MAGPOC, JR. Manager, DDO		
ELEC			
MECH			
DWG. NO. CalDPP-BDC-17-003		PR. NO. S1-CDP24-001	
SCALE: AS SHOWN		BID DRAWING	
REV. DATE		NATURE OF REVISION	
BY	CHKD	REC'D	APPO.



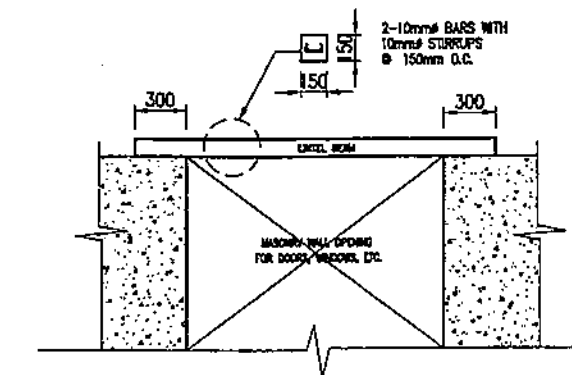
TYP. RC BEAM DETAILS
SCALE NTS



SECTION AT SUPPORT
SCALE NTS



SECTION AT MIDSPAN
SCALE NTS



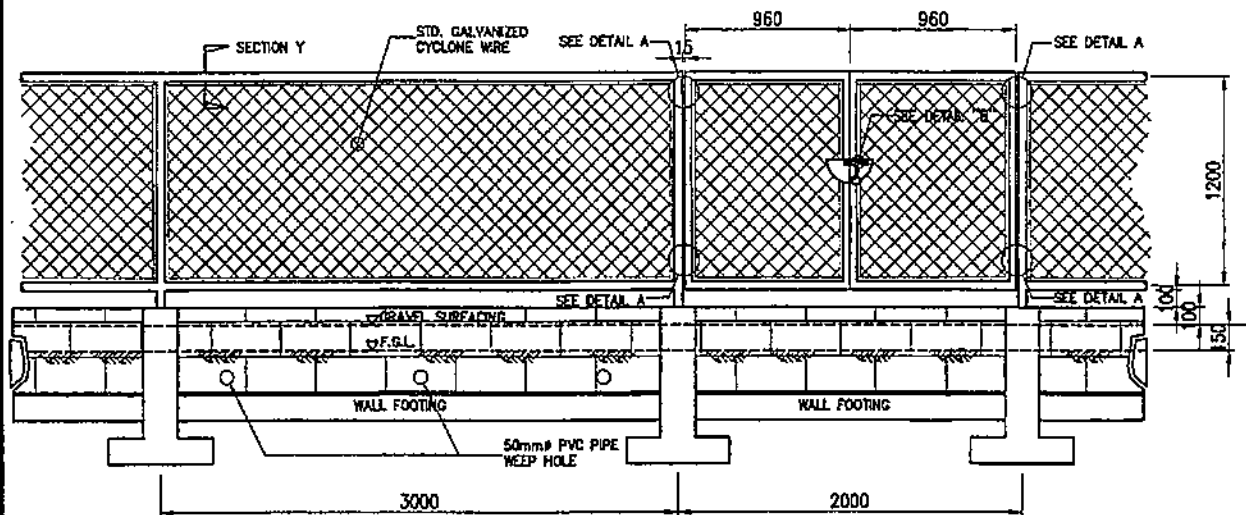
TYPICAL LINTEL BEAM DETAILS
SCALE 1:30

NOTES:

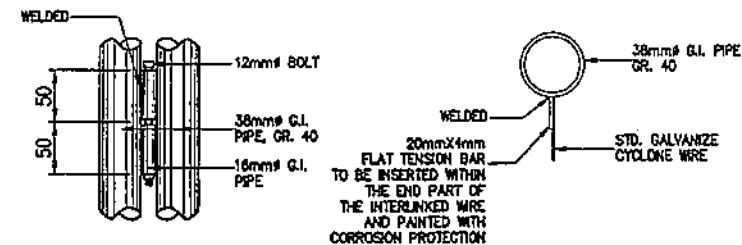
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
2. MINIMUM COMPRESSIVE STRENGTH OF CONCRETE SHALL BE $f'_c = 20.7 \text{ MPa}$ AT 28 DAYS PERIOD.
3. REINFORCING STEEL BARS SHALL CONFORM TO THE REQUIREMENTS OF THE PMS FOR DEFORMED STEEL BARS GRADE 275.
4. ALL ASPECTS OF CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE PROVISIONS OF THE LATEST APPLICABLE CODE.
5. MASONRY WALL OPENINGS FOR DOORS, WINDOWS SHALL BE PROVIDED WITH R.C. LINTEL BEAMS TO SUPPORT WALLS ABOVE THE OPENINGS.

OWNER:		NATIONAL POWER CORPORATION GABRIEL Y. ITCHON BLDG., 8001 MARIKINA P. DEFENSES AVENUE, AVENUE (FORMERLY BIR ROAD) CORNER QUEZON AVENUE, DUBAI 1100 QUEZON CITY, PHILIPPINES	
PROJECT: CONSTRUCTION OF ACCESS ROAD FROM CALAGUAS DPP TO SHORELINE AND IMPROVEMENT OF OTHER FACILITIES			
LOCATION: CALAGUAS DPP, VIÑONS, CAMARINES NORTE			
TITLE: EXPANSION OF CONTROL ROOM (BEAM SECTION AND DETAILS)			
DESIGNED	BY	CHKD	DATE
DRAWN			
REVIEWED	PRINCIPAL ENGR. / ARCHT.	RECOMMENDED:	
CIVIL/ARCHT.			
ELEC.		APPROVED:	
MECH.			
DWG. NO. CalDPP-BDC-17.004		PR. NO. S1-CDP24-001	
SCALE: AS SHOWN		BID DRAWING	
REV. 0			

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

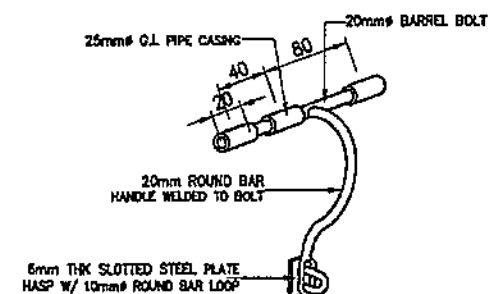


SECTION Y
SCALE 1:30



DETAIL 'A'

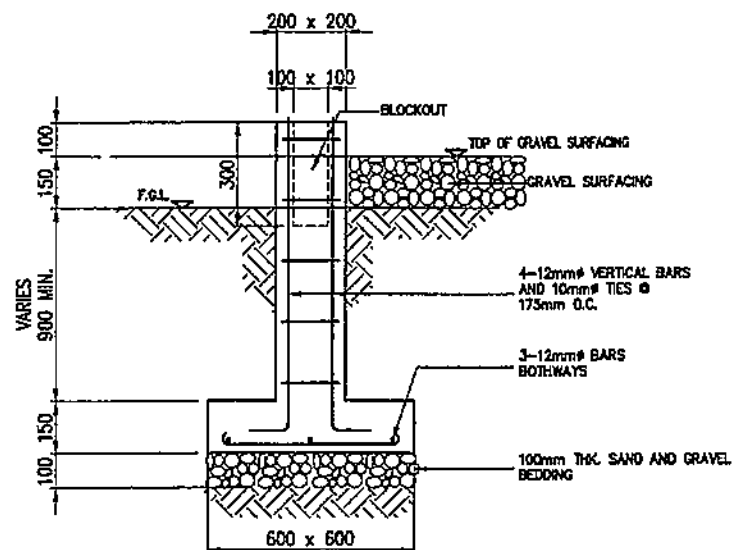
SECTION Y



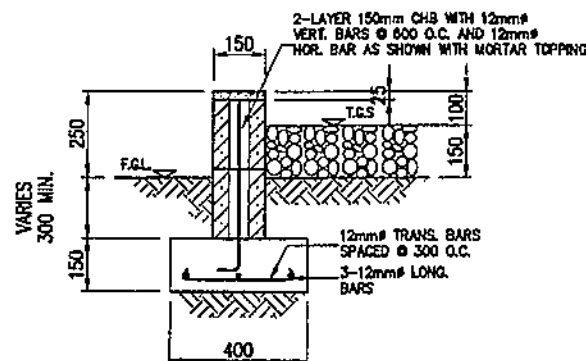
DETAIL 'B'

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
2. PLAN/LAYOUT OF SECLUSION FENCE TO BE CONSTRUCTED ARE INDICATED IN ELECTRICAL DRAWING.
3. WORK THIS WITH ELECTRICAL DRAWINGS.



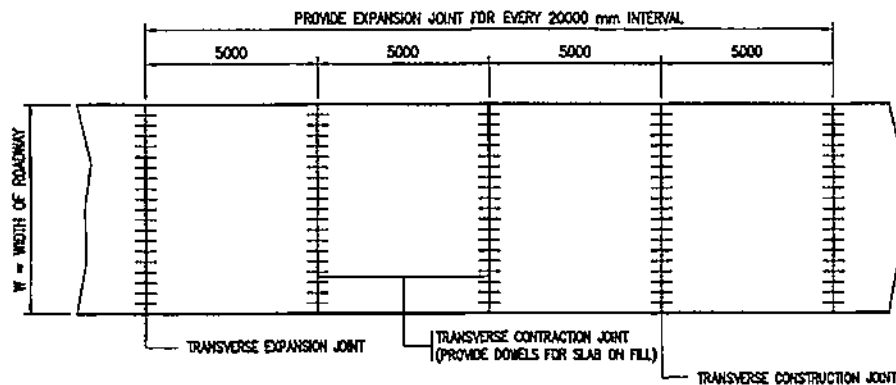
PEDESTAL FOOTING
SCALE 1:15



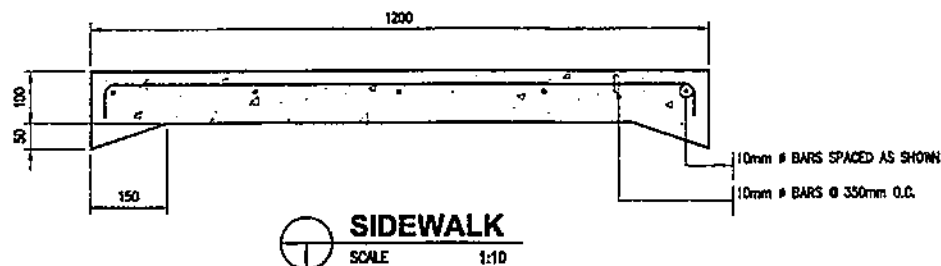
WALL FOOTING
SCALE 1:15

OWNER: NATIONAL POWER CORPORATION BARCEL Y. ITCHON BLDG., 8th FLOOR, P. DEL ROSARIO, SANTIAGO AVENUE (FORMERLY BUN ROAD) CORNER QUEZON AVENUE, DULAMAN 1100 QUEZON CITY, PHILIPPINES	
PROJECT: CONSTRUCTION OF ACCESS ROAD FROM CALAGUAS DFP TO SHORELINE AND IMPROVEMENT OF OTHER FACILITIES	
LOCATION: CALAGUAS DFP, VIÑEZON, CAMARINES NORTE	
TITLE: SECLUSION FENCE & PEDESTRIAN GATE (ELEVATION, SECTION AND DETAILS)	
DESIGNED: H.L. MEMDOZA DRAWN: PEREZ, ENGR. A. CAD REVISOR: FRODOPE, ENGR. I. AROGT. CIVIL/ARCHT: A.C. SERRITU ELEC: MARIC, ENGR. G.D. MECH: G.B. MAGPOC, JR. MARIC, ENGR. G.D.	SUBMITTED: H.L. MEMDOZA RECOMMENDED: A.C. SERRITU APPROVED: G.B. MAGPOC, JR. MARIC, ENGR. G.D.
DWG. NO. CalDPP-BDC-17.005 PR. NO. S1-CDP24-001	SCALE: AS SHOWN BID DRAWING REV. 0

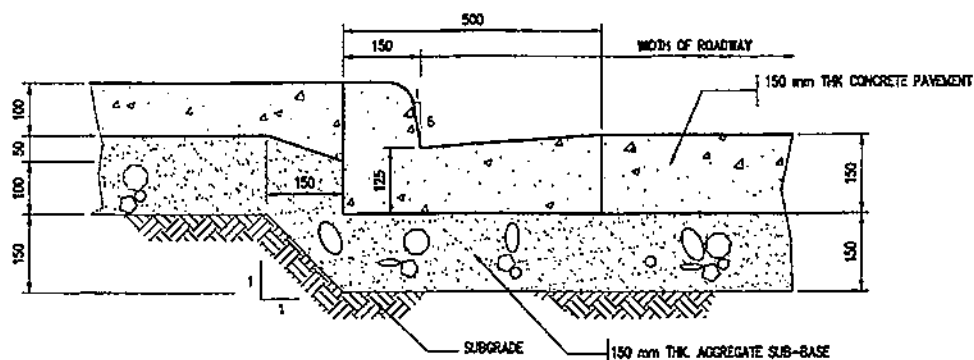
REV.	DATE	NATURE OF REVISION	BY	CHKD.	RECD.	APPD.



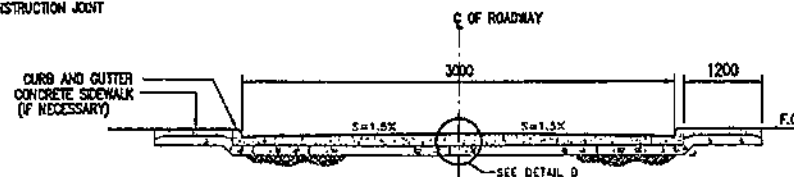
TYPICAL PLAN
SCALE 1:150



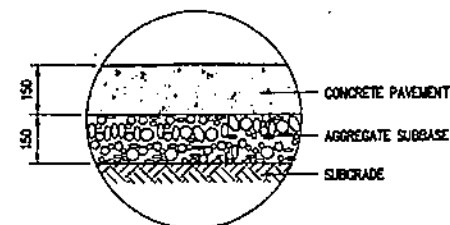
SIDEWALK
SCALE 1:10



DETAIL OF CURB & GUTTER
SCALE 1:10



TYPICAL SECTION
SCALE NTS



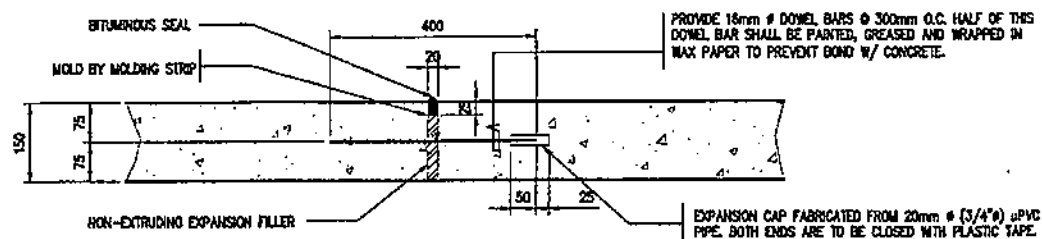
DETAIL B

NOTES:

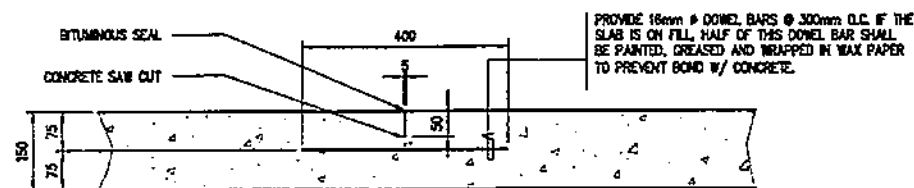
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
2. REINFORCING STEEL BARS SHALL CONFORM TO THE LATEST REQUIREMENTS OF PNS FOR DSB GRADE 275.
3. ALLOWABLE BEARING CAPACITY FOR SOIL SHALL NOT BE LESS THAN 143 KPA AND SHALL BE VERIFIED IN THE FIELD.
4. MINIMUM COMPRESSIVE STRENGTH OF CONCRETE SHALL BE $f'_c = 20.70 \text{ MPa}$ AT 28 DAY PERIOD.
5. ALL ASPECTS OF CONSTRUCTION AND DETAILING OF REINFORCEMENTS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE ACI CODE.

		NATIONAL POWER CORPORATION CARABEL Y. ITCHON BLDG., 8th FLOOR, DEFENSE BANTAGS AVENUE (FORMERLY YIP ROAD) CORNER QUEZON AVENUE, DUMAN 1100 QUEZON CITY, PHILIPPINES	
PROJECT: CONSTRUCTION OF ACCESS ROAD FROM CALAGUAS OFF TO SHORELINE AND IMPROVEMENT OF OTHER FACILITIES			
LOCATION: CALAGUAS OFF, VILVONS, CAMARINES NORTE			
TITLE: ACCESS ROAD (PLAN, SECTION AND DETAILS)			
DESIGNED	BY	CHKD	DATE
DRAWN	PRINCIPAL ENGR. / ARCHT.		RECOMMENDED
REVIEWED			APPROVED
CIVIL/ARCHT			
ELEC.			
MECH.			
SUBMITTED: H. C. MENDOZA Principal Engineer A. CEAD		APPROVED: G. S. MASPOC, JR. Manager, UOD	
DWG. NO. CaDPP-BDC-17.006		P/L NO. S1-CDP24-001	
SCALE: AS SHOWN		BID DRAWING	
REV. DATE NATURE OF REVISION		BY CHKD. RECD. APPD.	

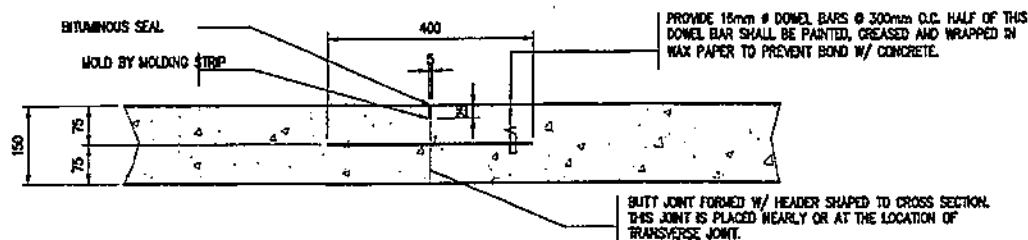
REV.	DATE	NATURE OF REVISION	BY	CHKD.	RECD.	APPD.



TRANSVERSE EXPANSION JOINT
SCALE 1:10



TRANSVERSE CONTRACTION JOINT
SCALE 1:10



TRANSVERSE CONSTRUCTION JOINT
SCALE 1:10

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
2. REINFORCING STEEL BARS SHALL CONFORM TO THE LATEST REQUIREMENTS OF PNS FOR DSB GRADE 275.
3. ALLOWABLE BEARING CAPACITY FOR SOIL SHALL NOT BE LESS THAN 143 KPA AND SHALL BE VERIFIED IN THE FIELD.
4. MINIMUM COMPRESSIVE STRENGTH OF CONCRETE SHALL BE $f_c = 20.70 \text{ MPa}$ AT 28 DAY PERIOD.
5. ALL ASPECTS OF CONSTRUCTION AND DETAILING OF REINFORCEMENTS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE ACI CODE.

OWNER:		NATIONAL POWER CORPORATION CARABEL V. ITCHON BLDG., 8th FLOOR, DEFENSE SANTIAGO AVENUE (FORMERLY RIZAL ROAD) CORNER QUEZON AVENUE DELMAN 1100 QUEZON CITY, PHILIPPINES	
PROJECT: CONSTRUCTION OF ACCESS ROAD FROM CALAGUAS DPP TO SHORELINE AND IMPROVEMENT OF OTHER FACILITIES			
LOCATION: CALAGUAS DPP, VIÑZON, CAMARINES NORTE			
TITLE:		ACCESS ROAD (TYPICAL DETAILS)	
DESIGNED	BY	CHKD	DATE
DRAWN			
REVIEWED	PRINCIPAL ENGR. / ARCHT.	RECOMMENDED	
CALCULATED			
CHECK		APPROVED	
MECH.			
SUBMITTED: H. L. MENDOZA Principal Engineer / CEAD		RECOMMENDED: A. C. ESPRITU Manager / CEAD	
APPROVED: G. B. RAGPOC, JR. Manager, DDO			
DWG. NO. CaIDPP-BDC-17.007		PL. NO. S1-CDP24-001	
REV. DATE		NATURE OF REVISION	
BY	CHKD	RECD	APPD.
SCALE: 1:10		BID DRAWING	
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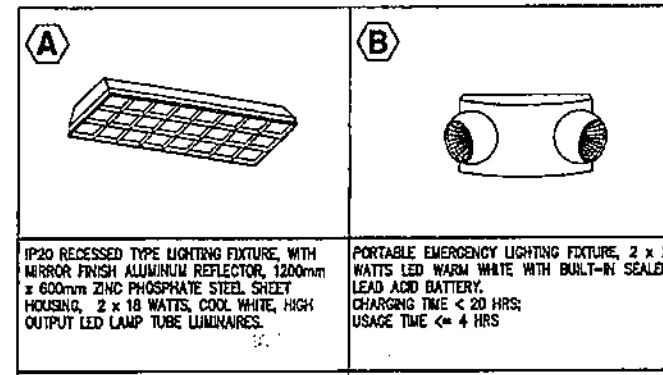
SECTION IX - BID DRAWINGS

EW - ELECTRICAL DRAWINGS


DRAWING NO.	TITLE
CalDPP-BDE-17.001	GENERAL NOTES & DETAILS OF LIGHTING FIXTURES
CalDPP-BDE-17.002	LIGHTING AND POWER LAYOUT

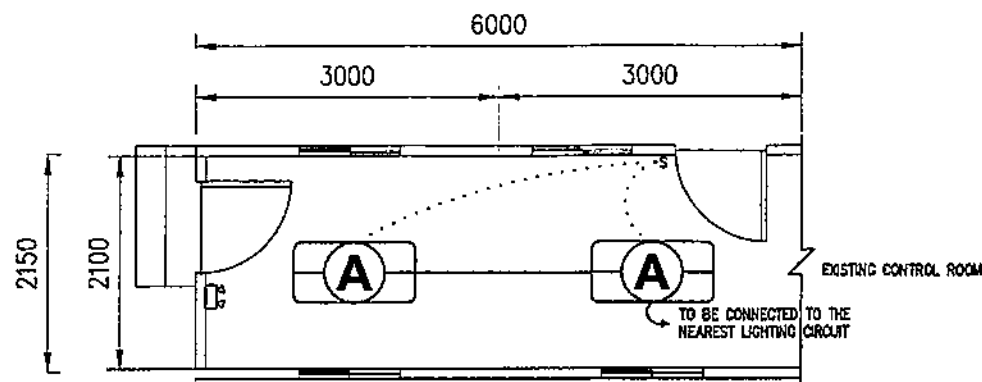
GENERAL NOTES:

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 TO THE NEAREST LIGHTING AND POWER CIRCUIT.
3. METHOD OF WIRING SHALL BE IN PVC WITH PROPER FITTINGS, DEVICES, BOXES AND SUPPORTS, WORK SHALL BE AS PER PLAN AND SPECIFICATIONS AS TO LOCATION, TYPE AND USE.
4. ALL SWITCHES AND CONVENIENCE OUTLETS SHALL BE FLUSH-MOUNTED 1.37 METERS AND 0.30 METER RESPECTIVELY ABOVE THE FINISHED FLOOR.
5. CONDUIT RUNS ARE INDICATIVE ONLY. THE ACTUAL RUNS SHALL BE DETERMINED IN THE FIELD.
6. OUTLETS FOR EMERGENCY LIGHTING FIXTURE SHALL BE FLUSH-MOUNTED, 2.0 M ABOVE THE FINISHED FLOOR.
7. WIRES, BOXES, ELECTRICAL AS WELL AS NON-ELECTRICAL MATERIALS NOT INCLUDED IN THE PLANS AND SPECIFICATION BUT NECESSARY TO COMPLETE THE JOB SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
8. ALL ELECTRICAL MATERIALS TO BE USED IN THE INSTALLATION SHALL BE NEW, STANDARD AND APPROVED TYPE AS TO LOCATION, TYPES AND PURPOSE.
9. MINIMUM SIZE OF CONDUCTOR TO BE USED SHALL BE 3.5^{mm}² THHN/THWN-2 IN 20 mm^ø 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.

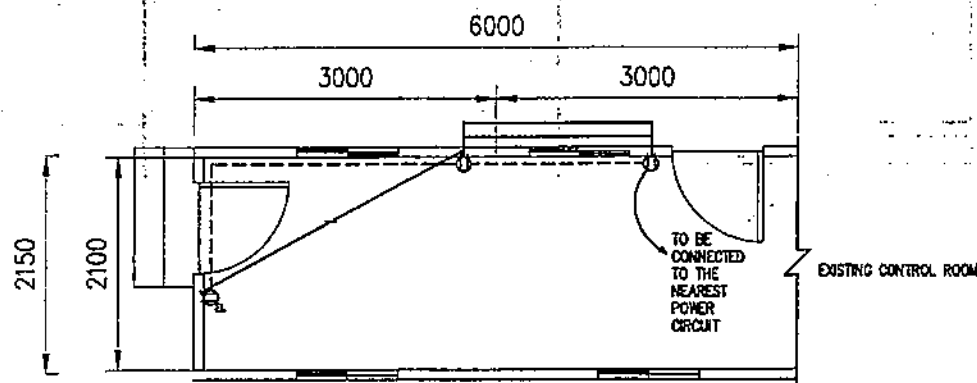


DETAILS OF LIGHTING FIXTURES.

 NATIONAL POWER CORPORATION <small>GABRIEL Y. ITCHEN BLDG., 5th FL. MIRAMAR P. DIVISION, SANTIAGO AVENUE (FORMERLY 688 P.O.) CORNER QUEZON AVENUE, DUMANAY QUEZON CITY, PHILIPPINES</small>	
PROJECT: CONSTRUCTION OF ACCESS ROAD FROM CALAGUAS DFP TO SHORELINE AND IMPROVEMENT OF OTHER FACILITIES LOCATION: CALAGUAS DFP, VISAYAS, CAGAIAN NORTH	
TITLE: GENERAL NOTES & DETAILS OF LIGHTING FIXTURES	
DESIGNED BY: B. M. ABUJA DRAWN BY: MCU REVIEWED BY: PRINCIPAL ENGR./ARCHT. CHECKED BY: C. Z. C. LUGOD, JR. ELEC. BY: CLM MECH. BY: CLM	SUBMITTED: B. M. ABUJA RECOMMENDED: C. Z. C. LUGOD, JR. APPROVED: CLM <small>Manager, E&C</small> <small>Manager, E&C</small>
ONG NO. CalDPP-BDE-17-001	SPECS. NO. S1-CDP24-001
SCALE: N.T.S.	BID DRAWING
REV. DATE NATURE OF REVISION BY CHD. RECD. APPD.	REV. 0



⊙ LIGHTING LAYOUT




⊙ POWER LAYOUT

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
2. THIS DRAWING SHALL BE WORKED WITH CIVIL BID DRAWINGS.

LEGEND:

- ⊙ - 2x18W FIXTURE TYPE A
- ⊙ - 2x18W FIXTURE TYPE B
- S - SINGLE POLE SWITCH
- ⊙ - DUPLEX CONVENIENCE OUTLET
- ⊙ - EMERGENCY LIGHT OUTLET
- - CIRCUIT RUNNING UNDER GROUND
- - CIRCUIT RUNNING ON CEILING
- ... - CONTROL CIRCUIT

OWNER		 NATIONAL POWER CORPORATION GABRIEL Y. ITDONG BLDG., GEN. ARMAND P. DEFENSOR SANTIAGO AVENUE FORMERLY 5th FLOOR CORNER QUEZON AVENUE, DUMAM 1100 QUEZON CITY, PHILIPPINES	
PROJECT: CONSTRUCTION OF ACCESS ROAD FROM CALAGUAN DFP TO SHORELINE AND IMPROVEMENT OF OTHER FACILITIES			
LOCATION: CALAGUAN DFP, VINEDES, CAGAIAN NORTH			
TITLE: LIGHTING AND POWER LAYOUT			
DESIGNED	BY	CHKD	DATE
DRAWN	MCN		
REVIEWED	PRINCIPAL ENGR./ARCHT.		
CIVIL/ARCHT			
ELEC			
MECH			
SUBMITTED:		B. M. ASULA PROJECT ENGINEER A (ELEC)	
RECOMMENDED:		D. C. LUGOD, JR. PROJECT ENGINEER C (ELEC)	
APPROVED:		C. B. MAGPONG, JR. PROJECT MGR	
DWG. NO. C&IDPP-BDE-17.002		SPEC. NO. S1-CDP24-001	
SCALE: N. T. S.		BID DRAWING	
REV. 0		REV. 0	

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