



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

## **BID DOCUMENTS**

**Name of Project : DESIGN, SUPPLY, DELIVERY, INSTALLATION, TEST AND COMMISSIONING OF 25-TON GANTRY CRANE AT THE POWERHOUSE OF PULANGI IV HE PLANT**

**Project Location : MARAMAG, BUKIDNON**

**PR No. : MG-PLM23-010**

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Design and Development Department



## SECTION I

# INVITATION TO BID





# National Power Corporation

## INVITATION TO BID

### PUBLIC BIDDING – BCS 2023-0479

1. The NATIONAL POWER CORPORATION (NPC), through its approved Corporate Budget of CY 2023 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-B2023-009/ PB231010-CM00302</p> <p>Supply, Delivery, Installation and Test of Auxiliary Equipment for Power Barge 120</p>	<p>Supply and Delivery of Diesel Generating Sets or Mechanical and/or Electrical Parts / Components / Equipment for Diesel Generating Sets</p>	<p>28 September 2023 9:30 A.M.</p>	<p>10 October 2023 9:30 A.M.</p>	<p>₱ 1,500,000.00 / ₱ 5,000.00</p>
<p>MG-PLM23-010 / PB231010-JD00303</p> <p>Design, Supply, Delivery, Installation, Test and Commissioning of 25 Ton Gantry Crane at the Powerhouse Pulangi IV HE Plant, Rehabilitation of Gantry Crane for Agus 2 HEP</p> <p>• PCAB License: License Category of at least <b>“Category D – General Building”</b> and registration classification of at least <b>“Small B – Building and Industrial Plant”</b> or at least <b>“Small B – Foundation Work”</b> or at least <b>“Small B – Structural Steel Work”</b></p>	<p>Supply, Delivery, Installation, Test and Commissioning of Gantry / Hoisting Equipment of at least 25 Tons Capacity for Hydroelectric Plant</p>	<p>28 September 2023 9:30 A.M.</p>	<p>10 October 2023 9:30 A.M.</p>	<p>₱ 20,000,000.00 / ₱ 25,000.00</p>
<b>Venue: Kaňao Function Room, NPC Bldg. Diliman, Quezon City</b>				

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

PR No/s. / PB Ref No/s.	Delivery Period / Contract Duration	Relevant Period of SLCC reckoned from the date of submission & receipt of bids
S1-B2023-009	Sixty (60) Calendar Days	Ten (10) Years
MG-PLM23-010	Three Hundred (300) 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:
  - a. Only a maximum of two (2) representatives from each bidder / company shall be allowed to participate during the virtual pre-bid conference.
  - b. 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
  - c. The requirements herein stated including the medium of submission shall be subject to GPPB Resolution No. 09-2020 dated 07 May 2020
  - d. The Guidelines on the Implementation of Early Procurement Activities (EPA) shall be subject to GPPB Circular No. 06-2019 dated 17 July 2019
7. Bids must be duly received by the BAC Secretariat through (i) manual submission at the office address indicated below; (ii) online or electronic submission before the specified time stated in the table above for opening of bids. Late bids shall not be accepted.
8. All Bids must be accompanied by a bid security in any of the acceptable forms and in the amount stated in ITB Clause 14.
9. Bid opening shall be 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**

BIR Road cor. Quezon Avenue

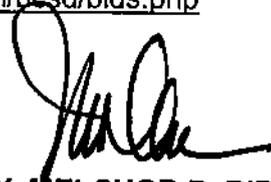
Diliman, Quezon City

Tel Nos.: 8924-5211 and 8921-3541 local 5564/5211

Email: [bcsd@napocor.gov.ph](mailto: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**  
Vice President, Office of the Legal Counsel and  
Chairman, Bids and Awards Committee

## SECTION II

# INSTRUCTIONS TO BIDDERS



**SECTION II - INSTRUCTIONS TO BIDDERS**

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## SECTION II - INSTRUCTIONS TO BIDDERS

### 1. Scope of Bid

NPC invites Bids for the **DESIGN, SUPPLY, DELIVERY, INSTALLATION, TEST AND COMMISSIONING OF 25-TON GANTRY CRANE AT THE POWERHOUSE OF PULANGI IV HE PLANT**, with Project Identification Number **PR NO. MG-PLM23-010**.

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

### 2. Funding Information

The GOP through the source of funding as indicated below for CY 2023 in the amount specified in the Invitation to Bid. The source of funding is the proposed Corporate Operating Budget of the National Power Corporation (NPC).

### 3. Bidding Requirements

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

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

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

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

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

### 5. Eligible Bidders

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

- 5.2. The bidder must have completed an SLCC that is similar to the contract to be bid, and whose value, adjusted to current prices using the PSA consumer price indices, must be at least fifty percent (50%) of the ABC to be bid: 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 criterial 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 supply, delivery, installation, test and commissioning of gantry/hoisting equipment of at least 25 Tons Capacity for Hydroelectric Plant (HEP).</p> <p>The Single Largest Completed Contract (SLCC) as declared by the bidder shall be verified and validated to ascertain such completed contract. Hence, bidders must ensure access to sites of such projects/equipment to NPC representatives for verification and validation purposes during post-qualification process.</p> <p>It shall be a ground for disqualification, if verification and validation cannot be conducted for reasons attributable to the Bidder.</p>
7.1	<p>Only a maximum of fifty percent (50%) of the Works may be subcontracted. All Subcontractors must be approved by NPC.</p>
10.1	<p>The list of on-going contracts (Form No. NPCSF-INFR-02) shall be supported by the following documents for each on-going contract to be submitted during Post-Qualification:</p> <ol style="list-style-type: none"> <li>1. Contract/Purchase Order and/or Notice of Award</li> <li>2. Certification coming from the project owner/client that the performance is satisfactory as of the bidding date.</li> </ol> <p>The bidder shall declare in this form all his on-going government and private contracts including contracts where the bidder (either as individual or as a Joint Venture) is a partner in a Joint Venture agreement other than his current joint venture where he is a partner. Non declaration will be a ground for disqualification of bid.</p>
	<p>The Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid (Form No. NPCSF-INFR-03) shall be supported by the following documents to be submitted during Bid Opening:</p> <ol style="list-style-type: none"> <li>1. Contract/Purchase Order</li> <li>2. Owner's Certificate of Final Acceptance issued by the project owner other than the contractor or a final rating of at least Satisfactory in the Constructors Performance Evaluation System (CPES). In case of contracts with the private sector, an equivalent document (Ex. Official Receipt or Sales Invoice) shall be submitted.</li> </ol>
10.3	<p>The required License issued by the Philippine Contractors Accreditation Board (PCAB): License Category of at least <b>"CATEGORY D – GENERAL BUILDING"</b> and registration classification of at least <b>"SMALL B – BUILDING AND INDUSTRIAL PLANT"</b> OR at least <b>"SMALL B – FOUNDATION WORK"</b> OR at least <b>"SMALL B – STRUCTURAL STEEL WORK"</b></p>

<p>10.4</p>	<p>The list of key personnel shall include the following minimum requirements:</p> <p><b>a. One (1) Project Engineer/Site Engineer</b></p> <p>Registered Civil Engineer who had supervised at least a project similar in nature as to the type of the proposed project within the last 10 years. Must have at least 3 years professional experience as Civil Engineer on similar project</p> <p><b>b. One (1) Materials Engineer</b></p> <p>Registered Civil Engineer with valid accreditation from the Department of Public Works and Highways (DPWH) as Materials Engineer I</p> <p><b>c. One (1) Safety Officer 2</b></p> <p>Construction Safety Officer who has completed at least forty (40) hours of Construction Safety and Health Training (COSH) from Occupational Safety and Health Center (OSHC) or Safety Training Organizations (STOs) accredited by the Department of Labor and Employment (DOLE)</p> <p>The above key personnel must either be employed by the Bidder or contracted by the Bidder to be employed for the contract to be bid.</p>																
<p>10.5</p>	<p>The list of construction equipment (owned or leased) shall include the following minimum requirements:</p> <table border="0"> <tr> <td>a. Service Vehicle</td> <td>- 1 unit</td> </tr> <tr> <td>b. Mobile Crane 25Tons</td> <td>- 1 unit</td> </tr> <tr> <td>c. Boom Truck 5 Tons</td> <td>- 1 unit</td> </tr> <tr> <td>d. Welding Machine (at least 300 A)</td> <td>- 2 units</td> </tr> <tr> <td>e. Heavy Duty Cutting Torch Set</td> <td>- 2 units</td> </tr> <tr> <td>f. Electric Drill</td> <td>- 2 units</td> </tr> <tr> <td>g. Oxy-acetylene cutting outfit</td> <td>- 5 units</td> </tr> <tr> <td>h. Electric Grinder</td> <td>- 2 units</td> </tr> </table>	a. Service Vehicle	- 1 unit	b. Mobile Crane 25Tons	- 1 unit	c. Boom Truck 5 Tons	- 1 unit	d. Welding Machine (at least 300 A)	- 2 units	e. Heavy Duty Cutting Torch Set	- 2 units	f. Electric Drill	- 2 units	g. Oxy-acetylene cutting outfit	- 5 units	h. Electric Grinder	- 2 units
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<p>10.6</p>	<p>Bidders shall also submit the following requirements in their first envelope, Eligibility and Technical Component of their bid:</p> <ol style="list-style-type: none"> <li>1. Duly signed and completely filled-out Technical Data Sheets (Section VI – Part II)</li> <li>2. Complete eligibility documents of the proposed sub-contractor, if any</li> </ol>																
<p>10.7</p>	<p>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.</p>																
<p>12</p>	<p>No further instructions</p>																
<p>15.1</p>	<p>The bid security shall be in the form of a Bid Securing Declaration or any of the following forms and amounts:</p> <ol style="list-style-type: none"> <li>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;</li> <li>2. The amount of not less than 5% of ABC if bid security is in Surety Bond.</li> </ol>																

<p>16.0</p>	<p>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> <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 <a href="http://www.napocor.gov.ph">http://www.napocor.gov.ph</a>.</p> <p>To report any privacy issue, contact the Data Privacy Officer at <a href="mailto:dpo@napocor.gov.ph">dpo@napocor.gov.ph</a>.</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>
<p>19.2</p>	<p>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.</p>
<p>20</p>	<ul style="list-style-type: none"> <li>a. Contract/Purchase Order and/or Notice of Award for the contracts stated in the List of all Ongoing Government &amp; Private Contracts Including Contracts Awarded but not yet Started (NPCSF-INFR-02);</li> <li>b. Certification coming from the project owner/client that the performance is satisfactory as of the bidding date for all ongoing contracts stated in form NPCSF-INFR-02.</li> <li>c. Certificate of Employment, Bio Data and valid PRC License of the (professional) personnel (NPCSF-INFR-10a, NPCSF-INFR-11)</li> <li>d. 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)</li> <li>e. The licenses and permits relevant to the Project and the corresponding law requiring it as specified in the Technical Specifications, if any.</li> </ul>

21	<p>The following documents shall form part of the contract:</p> <ol style="list-style-type: none"><li>1. Notice to Proceed</li><li>2. Construction schedule and S-curve</li><li>3. Manpower Schedule</li><li>4. Construction Methods</li><li>5. Equipment Utilization Schedule</li><li>6. Construction safety and health program of the contractor duly approved by the Bureau of Working Condition (BWC) of the Department of Labor and Employment (DOLE) or proof of submission to BWC</li><li>7. PERT/CPM.</li></ol>
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## SECTION IV

# GENERAL CONDITIONS OF CONTRACT



## SECTION IV – GENERAL CONDITIONS OF CONTRACT

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## SECTION IV – GENERAL CONDITIONS OF CONTRACT

### 1. Scope of Contract

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

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

### 2. Sectional Completion of Works

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

### 3. Possession of Site

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

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

### 4. The Contractor's Obligations

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

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

## 5. Performance Security

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

## 6. Site Investigation Reports

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

## 7. Warranty

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

## 8. Liability of the Contractor

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

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

## 9. Termination for Other Causes

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

## 10. Dayworks

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

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

## **11. Program of Work**

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

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

## **12. Instructions, Inspections and Audits**

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

## **13. Advance Payment**

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

## **14. Progress Payments**

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

## **15. Operating and Maintenance Manuals**

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

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

## SECTION V

# SPECIAL CONDITIONS OF CONTRACT



**SECTION V – SPECIAL CONDITIONS OF CONTRACT**

GCC Clause	
2	Sectional completion is not specified.
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 &amp; Employment (DOLE) and in compliance with the DOLE Department Order No. 13 – The Guidelines Governing Occupational Safety and Health in the Construction Industry.</p> <p>Failure to comply with the approved CSHP will be considered as non-compliance with the Contract and shall result to the imposition of Section 19, Violation and Penalties of the DOLE Department Order No. 13 and any appropriate sanctions such as, but not limited to:</p> <ol style="list-style-type: none"> <li>1. Suspend the work until the Contractor complies with the approved CSHP with the condition that the work resumption will not incur additional cost to the Corporation;</li> <li>2. Suspend payment of the portion of work under question;</li> <li>3. Correct the situation by employing 3<sup>rd</sup> party and charge all expenses incurred to the Contractor's collectibles/securities; and</li> <li>4. Report the condition to the Bureau of Working Conditions of the DOLE for their appropriate action.</li> </ol> <p>b. The Contractor shall be responsible for the strict compliance with the provision of the Philippine Laws affecting labor and operation of Work under the contract and shall be responsible for the payment of all indemnities arising out of any labor accident which may occur in the execution of the Works and for which he may be responsible under Republic Act 3428, as amended, known as the Workmen's Compensation Law.</p> <p>c. The Contractor is obliged to exercise due care so as not to endanger life and property in the vicinity of the Works where he operates in connection with this Contract. He shall be liable for all damages incurred in any manner by acts of negligence of his own, or his agents, employees, or workmen.</p> <p>d. It is the responsibility of the Contractor for the strict compliance with the requirements of the Philippine Clean Air Act of 1999 (R.A. 8749) and Philippine Clean Water Act of 2004 (R.A. 9275). The Contractor shall be liable for any damages/destructions to the environment</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>
<p>5</p>	<p>1. The following must be indicated in the performance bond to be posted by the Contractor:</p> <ul style="list-style-type: none"> <li>i. Company Name</li> <li>ii. Correct amount of the Bond</li> <li>iii. Contract/Purchase Order Reference Number</li> <li>iv. Purpose of the Bond:                      "To guarantee the faithful performance of the Principal's obligation to undertake <u>(Contract/Purchase Order Description)</u> in accordance with the terms and conditions of <u>(Contract No. &amp; Schedule/Purchase Order No.)</u> entered into by the parties."</li> </ul> <p>2. The bond shall remain valid and effective until the duration of the contract <u>(should be specific date reckoned from the contract effectivity)</u> plus sixty (60) days after NPC's acceptance of the last delivery/final acceptance of the project.</p> <p>3. In case of surety bond, any extension of the contract duration or delivery period granted to the CONTRACTOR shall be considered as given, and any modification of the contract shall be considered as authorized, as if with the expressed consent of the surety, provided that such extension or modifications falls within the effective period of the said surety bond. However, in the event that the extension of</p>



	<p>the contract duration or delivery schedule would be beyond the effective period of the surety bond first posted, it shall be the sole obligation of the CONTRACTOR to post an acceptable Performance Security within ten (10) calendar days after the contract duration/delivery period extension has been granted by NPC.</p> <p>4. Other required conditions in addition to the standard policy terms issued by the Bonding Company:</p> <ul style="list-style-type: none"> <li>i. The bond is a penal bond, callable on demand and the entire amount thereof shall be forfeited in favor of the Obligee upon default of the Principal without the need to prove or to show grounds or reasons for demand for the sum specified therein;</li> <li>ii. The amount claimed by the Obligee under this bond shall be paid in full and shall never be subject to any adjustment by the Surety;</li> <li>iii. In case of claim, the Surety shall pay such claim within sixty (60) days from receipt by the Surety of the Obligee's notice of claim/demand letter notwithstanding any objection thereto by the Principal.</li> </ul>
<p>6</p>	<p>No site investigation report.</p>
<p>7.2</p>	<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>
<p>10</p>	<p>No dayworks are applicable to the contract.</p>
<p>11.1</p>	<p>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.</p>
<p>11.2</p>	<p>The period between Program of Work updates is Thirty (30) calendar days.</p> <p>The amount to be withheld for late submission of an updated Program of Work is One percent (1%) of contract amount.</p>



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



## SECTION VI

# TECHNICAL SPECIFICATIONS

## SECTION VI

# TECHNICAL SPECIFICATIONS

# PROJECT HIGHLIGHTS

**SECTION VI - TECHNICAL SPECIFICATIONS**

**PH – PROJECT HIGHLIGHTS**

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## **PART 1 - TECHNICAL SPECIFICATIONS**

### **PH – PROJECT HIGHLIGHTS**

#### **PH-1.0 PROJECT HIGHLIGHTS**

##### **PH-1.1 General**

This section covers the general technical requirements for furnishing all supervision, labor, materials, supplies, tools and equipment in accordance with specifications contained herein and as shown on the accompanying drawings to complete the **SUPPLY, DELIVERY, INSTALLATION, TEST AND COMMISSIONING OF 25-TON GANTRY CRANE AT THE POWERHOUSE OF PULANGI IV HE PLANT.**

The proposed gantry crane installation at the Pulangi IV Hydroelectric Power Plant (HEP) aims to enhance safety, operational efficiency, and productivity during preventive maintenance schedules for the three (3) generating units. By providing a reliable and efficient solution for lifting bulk head gates/stop logs, the gantry crane will contribute to streamlined maintenance procedures and improved productivity at the Pulangi IV HEP. Its high lifting capacity ensures effective handling of heavy loads, while its efficient operation enhances operational efficiency and workplace safety.

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

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

##### **PH-1.2 Project Location**

The project is located at Pulangi IV Hydroelectric Plant, Maramag, Bukidnon.

##### **PH-1.3 Scope of Work**

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

- a) Mobilization and establishment of the Contractor's complete construction camp, equipment and other facilities;
- b) Installation of safe barricade and safety devices before start of work;
- c) Coordination with the plant end-user and technical personnel;
- d) Ocular site inspection and structure investigation;
- e) Complete design and construction of all structural steel components (i.e. double crane girder, columns, beams, braces, brackets, gusset plates, railings, stiffener, baseplate, non-shrink cementitious grout, concrete jacketing for baseplate, hoist shelter, bolts, nuts and washers,

- etc.), including fabrication, installation/erection and painting of metal/steel structures;
- f) Furnish, Install & Test of main hoist 25-Tons and 3-Tons auxiliary hoist Crane complete with electric motor-operated trolley, electric hoist, crane girder, bumper-end stopper, pendant type controls, power cables and other works and services as described in technical specifications;
  - g) Disconnecting electrical supply to the Crane from DSL Line. Disconnecting all the cables from panels, resistances boxes and junction boxes. Removing the cables from the cable reeling system. Details/numbering to be documented properly;
  - h) Rolling all the removed cables into circles and bringing them down. Bringing down current collectors along with bracket;
  - i) Dismantling the cable reeling system "I" beam and supporting brackets (of the cross trolley) location on the bridges and bringing them down. Disconnecting the hooks from the drums by removing the wire ropes;
  - j) Placement of panels, resistance boxes, cable reeling system brackets (CT & Pendant) and "I" section on the platform and fixing them. Placement of cabin in position and connecting it to the bridges. Putting back CT shed in position. Placement of all the ladders in the position and fixing them;
  - k) Connecting the cables inside the panels, junction boxes and components on the crane and reconnection of electrical supply to DSL line;
  - l) Installation of hoisting mechanism on platform including ladder and carrying out necessary welding works. Connecting hooks and wire rope onto wire rope drums respectively;
  - m) Installation of wireless vibration sensors at hoisting geared motor for maintenance monitoring;
  - n) Trail run and ensure current collector are smoothly running on DSL line. LT, CT and hoist movements checking and ensure they are smooth;
  - o) Application of special cathodic galvanizing material for all steel structure components for anti-corrosion protection;
  - p) Load Test with certificate before turn over;
  - q) Turnover of technology and commissioning; and
  - r) Demobilization and removal/clearing of the Contractor's equipment, construction camp/facilities.

#### **PH-1.4 Contract Period**

The contractor shall complete the works as specified in clause PH-1.3 within Three Hundred (300) calendar days. The contract duration is inclusive of ten (10) unworkable days considered unfavorable for the prosecution of works at the site. The total contract duration shall be reckoned from the date of contract effectivity as specified in the **Notice to Proceed**.

#### **PH-1.5 Contractor's Classification**

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

The Contractor must have undertaken similar contracts and/or projects involving structural steel works.

#### **PH-1.6 Minimum Required Key Personnel**

From 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 ten (10) years. Must have at least three (3) years professional experience as Civil Engineer on similar project.
- b. One (1) Occupational Safety and Health Practitioner – An Occupational Safety and Health Practitioner in construction accredited by the Department of Labor and Employment (DOLE).

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

- c. One (1) Materials Engineer I - with accreditation from the Department of Public Works and Highways (DPWH).

The above key personnel must be either be employed by the Applicant or contracted by the Applicant to be employed for the contract to be bid. The professional personnel (Project Engineer) must have a valid Professional Regulation Commission (PRC) license.

#### **PH-1.7 Minimum Required Construction Equipment (Owned or Under Lease)**

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

- |                                 |           |
|---------------------------------|-----------|
| a. Service Vehicle              | - 1 unit  |
| b. Mobile Crane 25 Tons         | - 1 unit  |
| c. Boom Truck 5 Ton             | - 1 unit  |
| d. Welding Machine 300 Amp      | - 2 units |
| e. Heavy Duty Cutting Torch Set | - 2 units |
| f. Electric Drill               | - 2 units |
| g. Cutting Outfit               | - 5 units |
| h. Electric Grinder             | - 2 units |



SECTION VI

**TECHNICAL SPECIFICATIONS**

**CIVIL WORKS**

## SECTION VI – TECHNICAL SPECIFICATIONS

### CW – CIVIL WORKS

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## TECHNICAL SPECIFICATIONS

### CW – CIVIL WORKS

#### **CW-1.0 GENERAL CONSTRUCTION FACILITIES**

##### **CW-1.1 Scope**

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

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

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

##### **CW-1.3 Contractor's Camp Facilities**

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

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

##### **CW-1.4 Water Supply**

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

##### **CW-1.5 Sewerage Disposal and Sanitation**

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

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

#### **CW-1.6 Fire Protection**

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

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

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

#### **CW-1.7 Construction Power**

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

#### **CW-1.8 Camp Security**

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

#### **CW-1.9 Construction Material Storage**

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

#### **CW-1.10 Removal of Camp and Construction Facilities**

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

**CW-1.11 Measurement and Payment**

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

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

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

**CW-2.2 Drainage and Dewatering**

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

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

**CW-2.3 Measurement and Payment**

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

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

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

**CW-3.2 General Conditions**

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

- a) Designate a Safety Officer and a Pollution Control Officer who shall respectively handle all safety and environmental concerns of the project.
- b) Prepare and submit Construction Safety and Health Plan.
- 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 STRUCTURAL EXCAVATION, FILL AND BACKFILL**

**CW-4.1 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-4.2 Materials**

**CW-4.2.1 Structural Excavation**

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

**CW-4.2.2 Structural Fill**

a. Sand and Gravel Fill

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

<b><u>Sieve Designation (Square Mesh Sieves)</u></b>	<b><u>Percentage by Weight Passing</u></b>
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-4.2.3 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-4.2.4 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-4.3 Construction****CW-4.3.1 Excavation****a. General**

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

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

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

**b. Structural Excavation, Structure Other Than Pipes**

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

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

c. Drainage and Sewerage Pipes and Cable Trench

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

d. Water Supply Pipes

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

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

**CW-4.3.2 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-4.3.3 Special Foundations**

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

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

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

**CW-4.3.4 Backfill****1. Structures, Other Than Pipes**

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

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

**2. Drainage and Sewerage Pipes**

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

**3. Water Supply Pipes**

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

**CW-4.4 Measurement and Payment**

No separate measurement and payment will be made for the Structural Excavation, Fill and Backfill. The entire cost thereof shall be included in the various pay items in the Bill of Quantities.

**CW-4.4.1 Miscellaneous Works**

Measurement for payment for miscellaneous work such as demolition, restoration, dismantling, 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 various pay items under 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 items.

**CW-5.0 CONCRETE****CW-5.1 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-5.2 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-5.3 Materials****CW-5.3.1 Cement**

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

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

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

**CW-5.3.2 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-5.3.3 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-5.3.4 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-5.3.5 Formwork**

Timber, lumber and plywood to be used for falsework and formwork shall be sound and shall comply with the requirements of this specifications. Use

forms where a smooth form finish is required. Lumber shall be square-edged or tongue-and-groove boards, free or raised grain, knotholes and the other surfaces defects. Steel when used shall conform to the requirements of the ASTM A36. Steel form surfaces shall not contain irregularities, dents, or sags.

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

#### **CW-5.4 Storage of Materials**

##### **CW-5.4.1 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-5.4.2 Reinforcing Steel**

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

**CW-5.5      Concreting****CW-5.5.1    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-5.5.2    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-5.5.3 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-5.5.4 Mixing Concrete**

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

#### **CW-5.5.5 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-5.5.6 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-5.5.7 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-5.5.8 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-5.5.9 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-5.5.10 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-5.5.11 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-5.6 Measurement and Payment**

No separate measurement and payment will be made for the Concrete and Formworks. The entire cost thereof shall be included in the various pay items in the Bill of Quantities.

**CW-6.0 REINFORCING STEEL****CW-6.1 Description**

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

**CW-6.2 Material Requirement**

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

**CW-6.2.1 Bar Reinforcement**

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

**CW-6.2.2 Sampling**

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

**CW-6.3 Construction Requirement****CW-6.3.1 Order List for Bent Bars**

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

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

**CW-6.3.2 Fabrication**

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

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

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

**CW-6.3.3 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-6.3.4 Placing and Fastening Reinforcement & Miscellaneous Material (ACI-301)**

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

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

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

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

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

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

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

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

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

**CW-6.3.5 Splicing**

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

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

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

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

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

**CW-6.4 Measurement and Payment**

No separate measurement and payment will be made for the Steel Reinforcement. The entire cost thereof shall be included in the various pay items in the Bill of Quantities.



**CW-7.0 STRUCTURAL STEEL****CW-7.1 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-7.1.1 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-7.1.2 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-7.2 Materials**

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

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

**CW-7.2.1 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-7.2.2 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-7.2.3 Accessories:**

Welding electrodes and steel structural members shall use:

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

**CW-7.3 Execution**

**CW-7.3.1 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-7.3.2 Welding of Structural Steel Work:**

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

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

**CW-7.3.3 Shop Painting**

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

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

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

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

**CW-7.3.4 Erection**

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

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

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

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

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

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

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

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

#### **CW-7.3.5 Tests and Inspections**

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

**Non-Destructive Testing:** 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-7.4 Measurement and Payment**

No separate measurement and payment will be made for the Structural Steel. The entire cost thereof shall be included in the various pay items in the Bill of Quantities.

**CW-8.0 GROUTING****CW-8.1 Scope**

This specification covers the requirements for the furnishing and installation of 2 component concrete epoxy grout unless shown otherwise on the design drawings.

**CW-8.2 Physical Properties**

The cured product shall have the following properties:

Tensile Strength = 27.65 MPa (4000 psi) min.

Compressive Strength = 63.60 MPa (9200 psi)

**CW-8.3 Submittals**

The Contractor shall submit copies of brochures/specifications for NPC's approval.

**CW-8.4 Measurement and Payment**

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

**CW-9.0      STRUCTURE CORROSION PROTECTION****CW-9.1      General**

This specification shall outline the requirement for structure corrosion protection using cathodic galvanizing. The cathodic galvanizing coating shall consist of aromatic hydrocarbon, a binder, and zinc powder.

**CW-9.2      Material Properties**

The cathodic galvanizing coating shall possess the following properties:

- Density: The material shall have a density of 2.67kg/dm<sup>3</sup> ((±0.06/dm<sup>3</sup>).
- Solid Content: The solid content shall be 80% by weight (±2%) and 58% by volume (±2%) according to ASTM D2697.
- Flash Point: The material shall have a flash point ranging from 40°C - 60°C.
- Non-Toxicity: The material shall meet the No Toxicity standard (AS/NSZ 4020).
- VOC: The material shall have a VOC content of 474 g/L (measured by EPA Method 24, SMI. INC.).
- Color: The coating shall be grey with a matt finish.
- Zinc Content: The coating shall contain 96% (±%) zinc by weight with a purity of 99.995%.
- Special Characteristics:
  - The coating shall exhibit excellent resistance to atmospheric temperature variations, with a dry film range of 40°C - 120°C.
  - pH Resistance: The coating shall maintain its performance between a pH range of 5.5 to 9.5, 12 days after polymerization.
  - The coating shall provide excellent UV resistance.
- Dry Time: The coating shall be touch dry within 30 minutes, dry to handle within 1.5 hours, and fully cured within 24 hours.
- Certificates and Standards: The coating shall comply with Environmental ISO 14001:2015, ISO 9001:2015, ISO 12944, and Norsok standards.

**CW-9.3      Surface Preparation**

The structure's surface shall be thoroughly prepared in accordance with industry standards. This includes cleaning, removal of contaminants, and proper profiling to ensure optimal adhesion of the cathodic galvanizing coating.

**CW-9.4 Application**

The cathodic galvanizing coating shall be applied in strict accordance with the manufacturer's instructions and industry best practices. The coating shall be evenly and uniformly applied to achieve the specified dry film thickness. If necessary, multiple coats may be required to achieve the desired corrosion protection.

**CW-9.5 Quality Control**

Experienced personnel shall be responsible for the application of the cathodic galvanizing coating, ensuring adherence to established industry standards.

Inspection and quality control procedures shall be implemented during and after the application process to verify compliance with specifications.

Visual inspection shall be conducted to ensure proper application, even coverage, and strong adhesion of the coating.

**CW-9.6 Measurement and Payment**

Unless otherwise specified in the Bill of Quantities, no separate measurement and payment will be made for structure corrosion protection – cathodic galvanizing. The entire cost thereof shall be included in the various pay items in the Bill of Quantities.

## SECTION VI

# TECHNICAL SPECIFICATIONS

# ELECTRICAL WORKS



**PART I - TECHNICAL SPECIFICATION**

**EW-ELECTRICAL WORKS**

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**EW - ELECTRICAL WORKS****EW-1.0 GENERAL**

The work to be done under this section shall include the furnishing of all labor, materials, equipment, tools, and other incidentals for all mechanical jobs for the Supply, Delivery, Installation, Test, and Commissioning of 25-Ton Gantry Crane at the Powerhouse of Pulangi 4 HEP Plant.

All equipment and materials to be supplied shall be new and unused. They shall suit their intended purpose and comply with all applicable regulations, quality, and dimension standards.

The work shall be performed and completed with high-quality quality under generally accepted modern practices in installation and erection works.

Suppose any such damage should occur due to the Contractor's carelessness, negligence, or fault. In that case, the Contractor shall repair or replace all damaged items at his own expense and to the satisfaction of NPC.

The Contractor shall accept full responsibility for his works, including performance qualifications, documentation, reports, cleaning, corrosion protection, installation, shop testing, field testing, warranty provisions, and compliance with the applicable codes and standards, statutes, and ordinances and the requirements of this Specification.

The Contractor shall strictly observe the requirement specified in this Specific Technical Specification (Electrical Works) in conjunction with the General Technical Specification (Project Highlights). In case of any contradiction, the requirement specified in this Specification shall take precedence over the General Technical Specifications.

**EW-2.0 SCOPE OF WORK**

The Contractor's scope of work covers the design, manufacture/fabrication, supply, delivery, installation, testing, and commissioning of a 25-Tons Capacity Gantry Crane complete with an electric motor-operated trolley, electric hoist, control panel, control joystick, and associated electrical devices for the project by the requirements of the Specifications.

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

1. Supply, Laying, and Test of Power Cables of the Gantry Crane, including ground conductors and other appurtenances required for the interfacing of supplied equipment;
2. Dismantling of existing circuit breaker and supply, installation and test of the new circuit breaker of the Gantry Crane and other appurtenances required for the interfacing of supplied equipment;

3. Supply, Delivery, Installation, and Test of Wireless Vibration Sensor and other accessories required;
4. Provide tools, equipment, and materials/consumables during the conduct of testing and commissioning;
5. Submission of electrical drawings, brochures/catalogs, operation and maintenance manual, and spare parts;

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

6. 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;
7. Conduct of inspection to verify and assess the extent of the related and incidental works needed to implement the project competently and efficiently; and

The Contractor shall bear full responsibility that the materials have been designed and fabricated by all codes, standards, and applicable governmental regulations and performed 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 intended purpose. Unless otherwise specified, materials shall conform to the latest applicable standard issued by the following authorities:

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

Other recognized national standards may be accepted if, in the opinion of NPC representatives, such will guarantee a quality similar to that guaranteed by the above criteria.

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

**EW-4.0 DESIGN REQUIREMENTS****EW-4.1 GANTRY CRANE**

The Contractor shall furnish and mount all electrical equipment required for Gantry Crane electric, including motors for trolley, hoist, brakes, controllers, and resistors with magnetic contactors where necessary, overload relays or fuse panels, limit switches, lights, and wiring complete with hardware, controls, and conduits under the Crane Manufacturer's Standard. Supplier shall state the description, rating, type of motors, enclosures, brakes, rules, and other requirements in his proposal.

**EW-4.2 CONTROL CIRCUIT**

A door safety switch device should be installed in the driver's cab platform (if any) only when the door switch is on to prepare for crane operation. An emergency stop button should also be installed for disconnecting the main power supply when the driver experiences an emergency.

The limit switch ensures no significant equipment or personal accidents in the crane operation. The overload limiter is connected to the contactor circuit for protection when the lift is overloaded. The lifting height limiter is used for limit protection when the hook reaches the upper and lower limits of the crane.

**EW-4.3 PANELBOARD**

The panelboard shall be installed in the fixed structure and accessible from the floor, rated at 480V, 60Hz, weatherproof, and operating on a three-phase system. The panelboard should have a grounding bus and be appropriately connected to the ground.

The power supply for the conductor of the motor for trolleys, hoists, brakes, and controllers shall be controlled by a switch or circuit breaker. Circuit breaker shall be quick-make, quick-break, thermal magnetic, and trip indicating type with a rating as required by connected load.

The panel shall be labeled with ISO symbols and comply with a protection rating of IP 65 for outdoor operation and IP 44 for indoor operation. The panelboard shall also comply with NEMA 12 protection standards.

The nameplate shall be black plastic with engraved white letters. The Contractor shall be responsible for correctly identifying and labeling all branch circuits.

**EW-4.4 CONTROL JOYSTICK**

The crane operator shall be controlled by a weather-proof control joystick suspended from the crane. The joystick shall be able to move along the crane bridge during operation. The joystick should have a 500V rated insulated voltage and one (1) million operating cycles. The weather-proof pendant shall be in the control platform (see attached civil drawings).

The control joystick shall have an emergency cut-out button, key-operated buttons, signal lights for start-stop operation, and a standard switch for the crane's load lighting. The enclosure shall have durable, clearly marked legend plates and guards to protect switches from damage or accidental actuation and shall allow for all the positions of the operation. The control joystick to be supplied shall comply with ISO 9001:2015, ISO 14001:2015, ISO45001:2018, and CEPROM: Certificate of Conformity.

#### **EW-4.5 POWER, CONTROL, AND INSTRUMENTATION CABLES**

This specification covers the technical and associated requirements of power, control, and instrumentation cables and medium voltage power cable for use in equipment.

All cables shall be designed to withstand the short-circuit condition and voltage drop of 3% (max.).

##### **EW-4.5.1 TECHNICAL CHARACTERISTICS AND REQUIREMENTS**

The cables to be supplied shall have insulation levels able to withstand any voltage surges which are usually expected to occur in the power system in which the line is to be used due to switching operations, sudden load variations, faults, etc. The medium voltage XLPE power cable and the 600V power, control, and instrumentation cable to be supplied shall be compliant with ICEA S-66-524 or IEC 60502-2 and UL 83, PNS 35, ICEA S-73-532 specification and requirements of PEC respectively.

The cables shall be selected to withstand without distress any short-circuit currents in the conductor and sheath related to the existing fault levels.

The cables and accessories shall be manufactured to fulfill the requirements when operating with a full load or at any load factor.

##### **EW-4.5.1.1 Insulation**

Insulation shall be of the type specified in the Technical Data Sheets.

##### **EW-4.5.1.2 Jacket**

A tough, ozone, low chlorine, heat, flame, and moisture-resistant PVC or Nylon jacket capable of protecting against sunlight, acids, alkalis, and oils shall be furnished for all cables.

##### **EW-4.5.1.3 Assembly**

All multi-conductor cables shall be bundled with non-hygroscopic fillers to ensure a smooth circular assembly. A lapped core binding tape shall be applied over the body.

**EW-4.5.1.4 Application**

All cables shall be suitable for installation in cable trays, trolleys, conduits, trenches, and underground ducts in wet and dry locations and above-ground raceways in damp and dry places.

**EW-4.6 WIRELESS VIBRATION SENSOR**

The vibration sensor is wireless and powered by a rechargeable battery. The vibration sensor is designed to monitor, collect data, and balance industrial machines in areas with potentially explosive atmospheres. The vibration sensor shall comply with the protection system of the IP65 case with shock protection rubber resistant to a fall of 1.2 meters.

**EW-4.7 EQUIPMENT GROUNDING**

The motor, control, and protection panel boards and gantry crane parts shall be adequately grounded by the latest electrical and electronics industry standards.

**EW-5.0 DATA AND DOCUMENTATION REQUIREMENTS**

Contractor-furnished data and information shall be guaranteed performance data, predicted performance, interface requirements, and construction features of all Contractor's furnished equipment. The Contractor's sole responsibility is the accuracy of such information and its compatibility with overall performance requirements specified by NPC.

All information submitted as part of Proposal Data would become contract data for the successful Contractor. Any deviation from such data requires NPC's approval.

**EW-6.0 MEASUREMENT OF PAYMENT**

Payment for all works shall be based on the bid price of each item as shown in the Bill of Quantities, including all incidental components/parts necessary for the complete installation/assembly/erection of the electrical works. The cost shall cover all positions required and described in the pertinent provisions of the specifications.

**EW-7.0 GUARANTEE**

The Contractor shall guarantee that he will repair and replace the supplied equipment/component/devices at his own cost against defects in quality and materials for one (1) year after issuance of the Acceptance Certificate by NPC.

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

After the lapse of the warranty period, provided that no defects are found, NPC shall release the warranty security/certificate.

**SECTION VI - TECHNICAL SPECIFICATIONS****PART II - TECHNICAL DATA SHEETS****TABLE OF CONTENTS**

<b>SECTION</b>	<b>DESCRIPTION</b>	<b>PAGE</b>
	<b>EQUIPMENT/COMPONENT DATA</b>	
1.0	Gantry Crane	TDS-2
2.0	Wireless Vibration Damper	TDS-3

Name of Firm

Name &amp; Signature of Representative

Designation



**SECTION VI - TECHNICAL SPECIFICATIONS**

**PART II - TECHNICAL DATA SHEETS**

**SUPPLY, DELIVERY, INSTALLATION, TEST, AND COMMISSIONING OF 25-TON GANTRY CRANE AT THE POWERHOUSE OF PULANGI IV HE PLANT**

- a) The Contractor shall complete this technical data sheet and submit the filled-up form with the technical proposal. The Contractor shall use continuation sheets as necessary for any additional information keeping to the format shown herein or reproducing the same.
- b) NPC reserves the right to reject Bids without accurate and specific data and information as required.
- c) The data required are technical features and characteristics of the Equipment/component/material to be provided by the Contractor. The contractor's proposal shall at least be equal or superior to the requirements specified by NPC.

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Name of Firm

Name & Signature of Representative

Designation



**EQUIPMENT/COMPONENT DATA**

ITEM	DESCRIPTION	NPC REQUIREMENT	CONTRACTOR'S DATA
1.0	<b>Gantry Crane</b>		
1.2	Manufacturer	By Contractor	
1.3	Brand/Model	By Contractor	
1.4	Place of Manufacture	By Contractor	
1.5	Main Hoist Capacity	25 Ton	
1.6	Auxiliary Hoist	3 Ton (25 meters Lifting Height x 8mm wire rope diameter)	
1.7	Span	3 Meters	
1.8	Lifting Height	37 meters (22mm wire rope diameter)	
1.9	Main Hoisting Speed	0.5-5m/min	
1.10	Auxiliary Hoisting Speed	6-0.96m/min	
1.11	Travelling Speed	8-32m/min	
1.12	Weight of Trolley	7.85T	
1.13	Power Supply	480V/48V/60Hz	
1.14	Crane Group	A5	
1.15	Hoist Machinery Group	M5	
1.16	Hoisting Motor Power	38kW	
1.17	Traveling Motor Power	2x2 5kW	
1.18	Supply Power	45.4kW	
1.19	Max Wheel Load	68kn	
1.20	Cable Drum	Q345 Carbon Steel Seamless Tube	
1.21	Lifting Drive Duty Class	60% High-Frequency Heavy Duty	
1.22	Braking Operation	1 million times braking	
1.23	Wire Rope Tensile Strength	Up to 2160Mpa	
1.24	Control Joystick		
1.25	Contact Operation	Slow Break N/O	
1.26	Connection	Screw and Captive Cable Clamp Terminals	
1.27	Mechanical Life	At least 1 million Operation Cycles	
1.28	Rated Insulation Voltage	500V	
1.29	Operation Position	All position	
1.30	Rated Impulse with Stand Voltage	U imp=6kV	
1.31	Manufacturer Experience	At least 18 years in	

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		manufacturing cranes for parts availability, safety standards, and quality	
1.32	ISO Certificates/Standards	ISO 9001:2015 ISO 14001:2015 ISO 45001:2018 CEPROM: Certificate of Conformity	
<b>2.0</b>	<b>Wireless Vibration Sensor</b>		
2.1	Manufacturer	By Contractor	
2.2	Brand/Model	By Contractor	
2.3	Place of Manufacture	By Contractor	
2.4	Data Collector and Balancer	Intelligent, Portable Vibration Analyzer	
2.5	Sensor	Wireless, Triaxial	
2.6	Anti-Shock Design	Yes	
2.7	Touchscreen	Graphic Color Touchscreen:800x480 Pixel Dimension: 154x92mm (D7")	
2.8	Acquisition	Synchronous on four (4) channels + Trigger Input 24 Bits Conversion	
2.9	Sampling Frequency	-102.4kHz for each channel up to 204.8kHz on 1 channel	
2.10	Antialiasing Filter	Yes	
2.11	Digital Signal Processors	Real-time processing: 40kHz on 4 channels up to 80kHz on 2 channels	
2.12	Memory	3.5GB for measurement	
2.13	Frequency Range	0-4kHz on channels, 80kHz on 1 channel	
2.14	IEPE Interface with Real-Time Integrity Control Range	± 8V	
2.15	Trigger Input Range	+/-10V, 0 to +24V, 0 to -24V	
2.16	Accelerometer Dimension	40xH115m	
2.17	Accelerometer Shock Resistance	5000g	
2.18	Accelerometer Mounting	Fixing studs/bipolar magnet	
2.19	Accelerometer Signal to Noise	80dB	

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2.20	Battery	Rechargeable through USB Automatic stand-by mode: after 10mins	
2.21	Signal Acquisition Capability	4,096Ksamples or 80s	
2.22	Ingress Protection	IP65, Case with shock protection rubber resistance to a fall of 1.2m	

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Designation



## SECTION VI

# TECHNICAL SPECIFICATIONS

# MECHANICAL WORKS



## PART I - TECHNICAL SPECIFICATIONS

### MW - MECHANICAL WORKS

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## **PART I - TECHNICAL SPECIFICATIONS**

### **MW - MECHANICAL WORKS**

#### **MW-1.0 GENERAL**

The work to be done under this section shall include the furnishing of all labor, materials, equipment, tools and equipment including other incidentals for all mechanical works for the Supply, Delivery, Installation, Test and Commissioning of 25-Ton Gantry Crane at Powerhouse of Pulangi IV HEP.

All equipment and materials to be supplied shall be new and unused. They shall be suitable for their intended purpose and shall comply with all applicable regulations, quality and dimension standards.

The work shall be performed and completed with high quality workmanship in accordance with generally accepted modern practice in installation and erection works.

Utmost care shall be strictly observed by the Contractor during delivery to avoid damage of any kind to the supplied equipment/component and the existing equipment & structure at site.

In the event that any such damage should occur due to the carelessness, negligence or fault of the Contractor, the Contractor shall repair or replace all damaged items at his own expense and to the satisfaction of NPC.

The Contractor shall accept full responsibility for his works including performance qualifications, documentation, reports, cleaning, corrosion protection, installation, shop testing, field testing, warranty provisions and compliance with the applicable codes and standards, statutes, and ordinances and the requirements of this Specification.

The Contractor shall strictly observe the requirement specified in this Specific Technical Specification (Mechanical Works) in conjunction with the General Technical Specification (Project Highlights). In case of any contradiction, the requirement specified in this Specification shall take precedence over the General Technical Specifications.

#### **MW-2.0 SCOPE OF WORK**

##### **MW-2.1 General**

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

The Contractor shall conduct actual inspection at site and thoroughly investigate and familiarize himself with all the conditions at site, make assessment on the existing physical conditions and configurations of the plant equipment to be supplied/utilized during the project execution, determine possible sources of materials and equipment to be supplied/utilized, and verify the actual scope of works and relative costs.

The Contractor shall secure insurance against loss or damage incidental to dismantling/disassembly, reassembly, and erection/installation of the gantry crane and components (mechanical, electrical and associated structural supports).

The Contractor shall also be responsible to assess and determine all and every work and service although not specifically detailed but are deemed required to fully complete the work and placing ready for the safe and reliable operation of the gantry crane. Relative costs of any additional works or materials which the Contractor deemed required or necessary to complete the works shall be included in the bid proposal.

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

#### **MW-2.2 Contractor's Scope**

The Contractor scope of work covers the design, manufacture/fabrication, supply, delivery, installation, testing and commissioning of 25-Tons Capacity Gantry Crane complete with electric motor-operated trolley, electric hoist, and associated mechanical devices for the project in accordance with the requirements of the Specifications.

The work shall include all and every work and service although not specifically detailed herein but are required to fully complete and placing ready for the safe and reliable operation of the gantry crane, which shall consist of, but not limited to the following:

- a) Conduct actual site inspection/verification to have clear view and understanding of the Pulangi IV HEP Management requirements;
- b) Provide the services of a competent technical personnel who shall be responsible for the supervision of installation/erection, test and commissioning;
- c) Design/prepare detailed drawings. The drawing shall be approved by NPC designated representative before start of fabrication and/or installation;
- d) Provide tools, equipment and materials/consumables during the conduct of test and commissioning;
- e) Restore all affected structures to the satisfaction of the Pulangi IV HEP/NPC;

- f) Conduct training of Pulangi IV HEP personnel in the operation and maintenance of the Gantry Crane;
- g) Supply of spare parts for One (1) year including quarterly check-up and repair/maintenance;
- h) Submit necessary drawings and documents, in three (3) copies, for NPC's approval prior to procurement/implementation of materials and equipment such as schematics and wiring diagrams, control panel assembly and layout/arrangement, dimensioned drawings, interconnecting diagrams identifying by terminal numbers, dismantling procedures for all affected components;
- i) Provide technical assistance during the warranty period (after sales) such as, safety adjustment of controls and components, assessment of operating conditions, performance of preventive maintenance of the equipment, etc. at no cost to NPC. This shall include any maintenance services rendered upon request of NPC in the event of any abnormality occurs within the warranty period;
- j) Provide technical training/seminar at site **of not less than 4 NPC personnel** on proper operations and maintenance of the unit by highly qualified technical personnel after completion of the project; and
- k) Corrosion protection and painting.

The Contractor shall also provide all other related works not specifically mentioned in the Specifications but are necessary to complete the works so as to be ready for commercial operation in accordance with the intent of the contract. It is understood that all costs pertinent thereto are included in the Bill of Quantities.

### MW-3.0 APPLICABLE CODES AND STANDARDS

The supply of equipment and materials shall conform to the latest specifications and provisions of the following engineering societies or other internationally accepted standards. Other standards which ensure equal or higher quality than the standards mentioned below will be accepted provided they meet the requirements of existing laws and regulations of the Government of the Republic of the Philippines.

AGMA	-	American Gear Manufacturers Standards
AISC	-	American Institute of Steel Construction
ANSI	-	American National Standard Institute
ASME	-	American Society of Mechanical Engineers
ASTM	-	American Society of Testing Materials
AWS	-	American Welding Society
CMAA	-	Crane Manufacturers Association of America
FM	-	Factory Mutual Engineering
HIS	-	Hydraulic Institute Standards
HMI	-	Hoist Manufacturers Institute
NEC	-	National Electric Code

NEMA	-	National Electrical Manufacturer's Association
NFPA	-	National Fire Protection Association
OSHA	-	Occupational Safety Health Act of 1970
SSPC	-	Steel Structures Painting Council
NEC	-	National Electrical Code
NESC	-	National Electrical Safety Code
PEC-I	-	Philippine Electrical Code – Part I
PEC-II	-	Philippine Electrical Code – Part II
AMCA	-	Air Moving & Conditioning Association

In the event of any conflict among the above listed codes or this Specification, Appendices and Attachments, the bidder shall refer the conflict to NPC for written resolution. In addition to the above codes and standards, the bidder shall comply with all applicable state and local laws and regulations.

In addition to the above codes and standards, the Supplier shall comply with all applicable national and local laws, codes, regulations, statutes and ordinances. 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 bidder proposes to adopt must be attached to his Bid for acceptance. In every case, bidders must list fully the standards they will conform to for this Contract.

In case of conflicting requirements between authorities cited above or between authorities cited and those specified, such disagreement shall be resolved by NPC and its decision shall be final. The responsibility shall be on the bidder to show the suitability of any alternative standards he may wish to use.

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

#### **MW-4.0 MATERIALS AND EQUIPMENT**

##### **MW-4.1 General**

All materials, equipment/component/devices and accessories to be supplied under this contract shall be new and unused, free from defects and imperfections, and best suited for the purpose intended.

Materials and components/devices used in the manufacture and assembly of the specified mechanical works shall be essentially the current design products of a reputable manufacturer regularly engaged in the production of such equipment. It shall be designed and manufactured for maximum safety and reliability in accordance with applicable codes and standards.

All equipment or substitute materials to be used shall conform to the latest specifications and provisions of approved standards of engineering societies or other equivalent standards approved by NPC.

All materials, parts and assemblies to be used shall be tested conforming to the latest specifications and provisions of approved Standards of Testing

Materials. Results of the test shall be made to provide means of determining compliance with the applicable specifications. When requested, all tests or trials shall be made in the presence of NPC's duly authorized representative.

The relative experience of the Manufacturer for the Gantry Crane shall comply with the following:

- a) The Manufacturer should have been in the business of manufacturing the equipment for not less than Ten (10) years; and
- b) The Model/Type of gantry crane being offered should have been in the actual service for not less than five (5) years.

**NOTE:** *Experience less than what is required will be ground for rejection of equipment being offered.*

#### **MW-5.0 WORKMANSHIP**

Workmanship shall be of high quality and in accordance with the best modern engineering practice for the manufacture/fabrication, assembly, installation and testing of all mechanical equipment/component/devices. All works shall be done by personnel skilled in the related professions and trade. All parts shall be made accurately to the standard gauges so as to facilitate replacement and repairs. All special gauges and templates necessary for field erection/installation shall become the property of NPC.

Like parts and spare parts shall be interchangeable. Machining of fits on renewable parts shall be accurate and to specified dimensions so that replacement parts may be readily installed.

The parts or components shall be designed and arranged so that they can be easily inspected, cleaned, erected and dismantled without involving large scale dismantling.

#### **MW-6.0 ACKNOWLEDGEMENT TO SITE CONDITIONS**

The Contractor shall be responsible for visiting the plant site and take particular reference to accessibility to the site. The Contractor shall thoroughly investigate and familiarize himself with all the conditions at the site, the surrounding area, means of communication and transportation, and all other factors that could hamper the smooth execution of the contract.

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

**MW-7.0 DESIGN REQUIREMENTS**

**MW-7.1 General**

The 25-Tons Capacity Gantry Crane shall be designed, installed, tested and commissioned in accordance with international codes and standards. The Gantry Crane Motors and accessories shall conform to the following general requirements:

PARTICULAR		NPC REQUIREMENT
<b>1.0 Gantry Crane</b>		
1.1. Type		Double Girder Crane
1.2. Main Hoist		
1.2a. Capacity		25 tons (min.)
1.2b. Lifting Height		37 mtrs. (min.)
1.2c. Wire Rope Diameter		22 mm (min.)
1.2d. Hoisting Speed		0.5-5m/min
1.3. Auxiliary Hoist		
1.3a. Capacity		3 tons (min)
1.3b. Lifting Height		25 mtrs. (min)
1.3c. Wire Rope Diameter		8 mm (min)
1.3d. Hoisting Speed		6-0.96m/min
1.4. Span		3 meters
1.5. Travelling Speed		8-32m/min
1.6. Weight of Trolley		By Supplier
1.7. Total Weight		By Supplier
1.8. Power Supply		480v/48v/60Hz
1.9. Crane Group		A5
1.10. Hoist Machinery Group		M5
1.11. Hoisting Motor Power		By Supplier
1.12. Travelling Motor Power		By Supplier
1.13. Supply Power		By Supplier
1.14. Max. Wheel Load		68kN
1.15. Cable Drum		Q345 Carbon Steel Seamless Tube or Equivalent
1.16. Lifting Drive Duty Class		60% High Frequency Heavy Duty or Equivalent
1.17. Braking Operation		1 million times of braking
1.18. Wire Rope Tensile Strength		Up to 2160 Mpa

PARTICULAR	NPC REQUIREMENT
<b>2.0 Control Joystick</b>	
Control Operation	Slow Break N/O
Connection	Screw & Captive cable clamp terminals
Mechanical Life	1 million Operating Cycles
Rated Insulation Voltage	500V
Operation Position	All Position
Rated Impulse with Stand Voltage	By Supplier

The Contractor shall be responsible for a well-coordinated, complete and adequate design of the Gantry Crane in accordance with the load requirements as stated in this specification.

### MW-7.1 Structural Requirements

#### MW-7.1.1 General

The Gantry Crane construction shall generally conform to the requirements of the latest edition of CMAA Specification No. 70 – Specifications for Electric Overhead Traveling Cranes, or B.S. 466 – Specifications for Power Driven Overhead Traveling Cranes including other standards specified in Clause MW-3.0.

The Gantry Crane and its components shall be designed and fabricated to adequate strength, stiffness and lateral rigidity to withstand all vertical, lateral and torsional forces resulting from operation of the crane under service conditions. Allowance shall be made for impact and lateral loads arising from acceleration and deceleration of the crane rails and from seismic force as specified, torsion from starting and stopping of the gantry crane motors, and from the eccentric action of vertical and horizontal forces. Allowance shall also be made for loads arising from collision with the stops.

#### MW-7.1.2 Construction

The structure shall be welded construction but all field connections shall be made by precision high strength bolting and these bolts shall be fitted into reamed holes. Bolted joints shall have a calculated strength not less than 125% of the net strength of the member.

The frame and bridge shall be heavy duty welded steel construction and shall be of rigid design to transmit the load without undue deflection.

The bridge rails shall be of first class quality and shall be of the type most suited to the particular crane model being proposed. Bridge rails shall be securely fastened in place to maintain center to center distance of rails by welding or by other means whichever is standard to the crane manufacturer.

**MW-7.1.3 End Stops**

Rigid end stops shall be provided at both ends of the trolley and runway rails. The end stops shall be of height not less than one half diameter of the driving wheel.

**MW-7.1.4 Bumpers**

Spring or rubber bumpers shall be provided at the ends of the trolley and crane frames to prevent damage when in collision with the stops.

**MW-7.1.5 Drum Position**

The electric hoisting drum shall be arranged on the trolley so that the hook is on the centerline of the crane. The horizontal distance between a vertical line through the hook is not to be greater than 1.0 meter.

**MW-7.1.6 Rails**

The runway and trolley rails shall be of first class quality conforming to the requirements of applicable standards. The section and weight of the rails shall be adequate for the wheel load. The rails shall be installed by welded connection made at appropriate staggered locations and securely fastened in place to maintain center distance of rails. The ends of rail shall be cut diagonal and the sections joined shall have no opening between ends.

Manufacturers are to state the tolerance position required in both the horizontal and vertical directions for the operations of the crane.

**MW-7.2 Mechanical Requirements****MW-7.2.1 Hoist Drum**

The hoist drum shall be made of cast and /or welded steel construction with heavy section and shall be reinforced to sustain the concentrated loads due to the rope pulls. The drum shall be made of such diameter and length that will take the full length of the ropes for the lift required plus the extra turns of each end, with not more than four layers of windings. Right and left hand helical grooves shall be machined on the surface of the drum to receive the two (2) hoisting ropes. The depths of the grooves shall not be less than 30 percent of the diameter of the rope. The rope attachments to the drum shall be simple and secure so that adjustments and replacement of the ropes may be accomplished without dismantling the parts. The drum shall be in the true running balance, and the gears shall be pressed or shrunk onto the drum and provided with standard rectangular keys or dowels. The pitch diameter of drum shall be not less than 20 times the outside diameter of the rope.

**MW-7.2.2 Rope Sheaves**

The rope sheaves shall be made of wrought steel with turned rope grooves with suitable tolerance. The pitch diameter of the rope grooves for all moving sheaves shall be not less than 20 times the nominal diameter of the rope. All revolving sheaves shall be in true running balance. The sheaves on the block

and the sheaves leading to the hoist drum shall be bronze bearing mounted. If fleeting sheaves are used, they shall be bronze bushed and provided with grease grooves. Pressure grease fittings shall be provided on all sheaves.

### **MW-7.2.3 Wire Ropes**

The wire ropes shall be cut from a common master run and match marked to exact length while under tension. The wire ropes shall be supplied by a reputable manufacturer of hoisting wire ropes. The wire ropes shall be adjusted so that each individual wire rope will carry its proportionate share of the total load. An equalizer shall be furnished if multi-wiring system is adopted. The wire ropes shall have sufficient length to provide the required lift, plus two turns on the drums in addition to adequate length for attaching to the drums. This safety factor of wire rope shall not be less than 5.

Hoist rope shall be equipped with overload device to prevent lifting loads in excess of 125%. Hoist shall also be equipped with upper and lower limit switches which are adjustable to set the extreme upper and lower limits of hook travel.

### **MW-7.2.4 Lifting Hooks and Blocks**

The blocks shall be arranged to lift without twisting and sideways pull of the load, and dead end ropes shall be avoided. The blocks shall be provided with a hook which shall be drop-forged and heat-treated. The lifting hook with factor of safety not less than 5.0 shall be swiveled on an anti-friction thrust bearing and shall be annealed forged alloy or carbon steel.

The bearings shall be totally enclosed, dust tight, and arranged to prevent leakage of grease. The hook under maximum load shall be easily rotated by hand on its bearing. The hook for the hoist shall be of the single hook type. The cross head shall be made of annealed carbon or alloy steel and shall have such proportions as to provide ample sheave bearing area.

The block shall be constructed so as to guard the hoisting ropes fully and prevent them from leaving the sheaves under any operating condition. The guards shall be made of cast steel or plate steel, shall be fitted close to the periphery of the sheaves, and shall be arranged for proper drainage.

### **MW-7.2.5 Gear Reducers**

The gear reducer for the hoist and trolley shall be completely enclosed grease lubricating construction. All gears shall have standard involute teeth, machine cut from the cast or forged steel solid rim of adequate strength and durability to meet the requirements for the intended class of service and designed in accordance with American Gear Manufacturer's Association Standards or equivalent approved standards. All bearings shall be of the ball or roller type, and shall be designed to permit easy removal of the shaft and gears.

### **MW-7.2.6 Brakes**

Brakes shall be provided so that the crane is capable of raising or lowering smoothly or holding in any position at any load up to and including the test load.

The hoist shall be provided with spring sets, electrical release thrust type magnetic brake with a rated capacity of not less than 150 percent of the rated full load torque of the hoist motor. The thrust brake shall be arranged to set when the motor power supply is cut off or fails, and to release when the hoist motor is operated. The brake enclosed shall be of weather-proof construction with convenient access to the enclosed mechanism. The magnetic coil shall be of moisture and fungus-proof construction. Means shall be provided for auto-adjusting to compensate for wear.

Nameplates shall be provided for each brake and attached to a part of the brake which ordinarily will not be rendered during its service life. Each nameplate shall conform to standard practice and clearly indicate the manufacturer's name, identification symbols, serial number and salient design features such as type, frame, torque rating and voltage.

#### **MW-7.2.7 Travelling Wheels**

The traveling wheels shall be made from the solid wrought or rolled steel wheel blanks machined accurately to size and the flanges tapered and radiused. The wheels shall be properly heat-treated to carry the maximum rated load under normal conditions without undue wear.

#### **MW-7.2.8 Drum**

The drum shall be steel or minimum ASTM Grade A48-64 Class 40 Cast Iron or equal materials as specified by the crane manufacturer. It shall be designed to withstand combined crushing and bending loads.

#### **MW-7.2.9 Bolts and Set Screws**

Bolts and Set Screws in rotating parts shall be locked, but this provision does not apply to set screws used for locking purposes.

#### **MW-7.2.10 Lubrication**

Service lubrication of all bearings shall be by means of manual grease central feed systems with individual lubrication lines to each bearing. Ball and roller bearings shall be suitably lubricated before assembly.

#### **MW-7.2.11 Pendant Station**

The crane operation shall be controlled by a weather-proof pendant mounted push-button switches suspended from the crane. The pendant shall be able to move along the crane bridge during operation. The weather-proof pendant shall be located in the control platform (see attached civil drawings).

The control pendant shall be equipped with an emergency cut-out button, key-operated buttons, signal lights for start-stop operation and a common switch for the crane's load lighting. The enclosure shall have durable, clearly marked legend plates, guards to protect switches from damage or accidental actuation and shall allow for right or left hand operation.

**MW-7.3 Electrical and Civil Works Requirements**

The Contractor shall furnish and mount all electrical equipment required for Gantry Crane electric including motors for trolley, hoist, brakes, controllers, and resistors with magnetic contactors where necessary, overload relays or fuse panels, limit switches, lights and wiring complete with hardware, controls and conduits in accordance with the Crane Manufacturer's Standard. Supplier shall state in his proposal the description, rating and type of motors, enclosures, brakes and controls and in accordance with the requirements specified in the relevant Electrical Technical Specifications.

The Contractor shall furnish labor, materials, equipment, tools and other incidentals for the Structural Supports in accordance with the requirements of the relevant Civil Technical Specifications.

**MW-7.4 Painting Requirements**

**MW-7.4.1 General**

The crane structural surfaces and associated mechanical/electrical equipment shall be painted in accordance with first class standard practice suitable for the purpose.

All paint and shop primer to be used shall be of standard types of a well-known manufacturer subject to the approval of NPC.

**MW-7.4.2 Color Schedule**

All surfaces to be painted shall be applied with minimum of one (1) coat (80 microns) zinc rich epoxy primer and two (2) coats of chlorinated rubber of 80 microns DFT each coating. Final color of paint shall conform to the following:

	<u>Color Munsell No.</u>
Overhead Crane Structures	7.5Y 9/12
Lower Pulley Block	Black & Yellow Stripe
Motors	7.5Y R 7.5/16

**MW-8.0 MODIFICATION/UPGRADING WORK REQUIREMENTS**

The Contractor shall furnish all necessary equipment, tools, labor and material to execute the modification and upgrading works of the gantry crane for Pulangi IV HEP.

The modification/upgrading works shall be in accordance with the Contractor's standard practice and other applicable codes and standards.

Disassembly and assembly of the equipment and components shall be in accordance with the procedures/instructions specified in the Operation and Maintenance Manuals. It shall be performed by highly qualified and experienced technical people following the manufacturer's standard and industry standard practice.

The gantry crane shall perform satisfactorily after the modification and upgrading works.

Prior to installation, the Contractor shall submit in three (3) copies for NPC's review and approval detailed drawings covering the arrangement, actual layout, pipe conduit and cable routes, interface connections, wiring diagrams, manufacturer's details of equipment/devices, catalogues, and other information as specified in the relevant sections of this specification.

The Contractor shall strictly observe the safety requirements/regulations of existing plants during the performance of the work. All works shall be coordinated with NPC at site so that interference in the performance of works will be avoided or on-going works/activities would not interfere or interrupt the operation of Pulangi IV HEP. In case interference occurs, NPC will decide which work is to be relocated.

Any required modification from the approved drawings or specification to suit actual site conditions, shall be permitted only with prior consent of NPC.

#### **MW-9.0 SPARE PARTS AND TOOLS**

The Contractor shall furnish spare parts required for regular maintenance during the one-year warranty period and complete set of tools per manufacturer's standard. The required Spare Parts and Tools shall be specified in the Forms attached in Part II – Technical Data Sheets of this Section VI, (Technical Specifications).

The Contractor shall supply any special tools and instrument required for start-up, test and commissioning, operation and normal maintenance of all the mechanical equipment/component/devices and auxiliaries supplied by the Contractor.

Each tool or appliance supplied by the Contractor is to be clearly marked with its sign and purpose identifying the function of each tool and the specific item(s) for which it is used. Each set of tools and appliances shall be fitted in a custom built lockable box clearly marked with the name of the item or equipment for which they are used and with a list of the tools contained, stamped and attached on an attached metal tab.

Every special tool and instrument shall be accompanied or furnished with maintenance or instruction manuals in English language.

All tools and appliances supplied shall be handed over to NPC in perfect condition at the time of taking over.

#### **MW-10.0 INSPECTION AND TEST**

##### **MW-10.1 Material Tests**

The Contractor shall furnish NPC with five (5) copies of certified mill and mechanical test reports covering crane hooks, hoist ropes and structural steel.

Properties of materials (e.g. material specifications, yield strength, elongation at yield, ultimate strength) and maximum calculated stresses of the following components shall also be submitted in tabular form;

1. Main structural members
2. Axles
3. Gears
4. Drums, sheaves pins and associated fittings
5. Hooks
6. Wheels
7. Rails

#### **MW-10.2 Shop Assembly and Tests**

The crane shall be completely assembled in the shop to ensure that the parts are properly fitted. The crane shall be centered upon and supported by two parallel and level rails to simulate the runway. After accurately aligning all shafts, couplings, bearings and gears, the motor bases, bearings, gear cases and structural supports shall be solidly doweled. All mating gears and especially the open gears shall be evenly across the entire tooth faces, and distance of mating gears and their shafts shall be accurate to a tolerance of 0.16 mm per meter. Shims used in shop alignment shall be left bolted or welded in place. The hoist, trolley and bridge drives shall be operated by power to check the operation of the gearing. The hoist shall be operated for 15 minutes in the slowest speed step to demonstrate that the control equipment has been designed for continuous duty.

#### **MW-10.3 Field Testing**

The crane shall be tested by the Contractor in the presence of NPC and at such time as will be directed by NPC. Before testing, the hoist shall be operated under light load for a period of time equivalent to several hours of continuous operation to run-in the gearing and ensure that all parts are properly lubricated. After this run-in period, the crane shall be inspected to see that all parts have remained in alignment and that no excessive wear has occurred. Adjustments shall be made in accordance with the manufacturer's recommendations or standard practice. All tests instruments and weights shall be furnished by the Contractor. At least two observations or readings shall be made and recorded for each test. During all the tests, volts, amperes and watts input for each applicable motor shall be recorded.

On compliance of the tests the crane will be inspected for misalignment, breakage, and undue wear.

All equipment of the crane shall operate without undue noise or vibration.

##### **a) Overload Test**

Hoist shall be tested in an overload condition as follows:

The hoist shall raise, lower and hold in any position a test load of 125% of its rated capacity. Second hoisting position shall raise this load, and it

shall not be lower than the first hoisting position. Trolley and crane shall transport at full speed, or as directed, along full runway length a test load of 125% rated capacity.

**b) Hoisting Test**

With rated load on the lifting hook, the following tests shall be made:

- b.1 "Inch" the load both in the hoisting and lowering direction. Determine and record the vertical movement of the hook for each direction.
- b.2 Determine and record the hook speed for each point of the controller which will move the load both in the hoisting and lowering direction.
- b.3 Permissible temperature rise of eddy current brakes or other speed controlling equipment shall not be exceeded when rated load on the hook is lowered through the full length of travel with controller in first lowering position. With no load on the hook determine and record the hook speeds for each point of the controller which will move the hook both in the hoisting and lowering directions.

**c) Trolley and Crane Travel Test**

The following tests will be conducted separately with the rated load on the hook:

- c.1 "Inch" the trolley in each direction of travel and determine/record the distance of the trolley travels in each direction. When starting from standstill it shall be possible to limit the movement of the crane to 6 mm.
- c.2 Determine and record the trolley speed for each point of the controller which will move the trolley. This test is to be conducted for both directions of travel.

The first controller point shall release the trolley brake, and the second controller point shall move the trolley at not more than fifty percent (50%) of the designed maximum trolley speed by approximately equal increments to the full-rated speed on the last point. Tests will be conducted for both directions of travel.

- c.3 "Inch" the bridge in each direction of travel and determine/record the distance of the bridge moves in each direction. When starting from standstill it shall be possible to limit the movement of the bridge to 6 mm.
- c.4 Determine and record the speed for each point of the controller which will move the bridge. This test is to be conducted for both directions of travel.

The first controller point shall move the bridge at a speed of not more than fifty percent (50%) of the designed maximum bridge speed. Successive points shall increase the speed by

approximately equal increments to the full-rated speed on the last point.

With no load on the hook, determine and record the trolley and crane bridge speeds in both directions for each point of the controller which will move the trolley and bridge.

**d) Speeds and Electrical Characteristics**

Test the electric hoist under loads of 100, 75, 50 and 25 percent of rated capacity to determine and record electrical characteristics as directed by NPC.

Any defect or improper operation discovered during the test due to design deficiency will be corrected by the Contractor to the satisfaction of the NPC.

In the above outline of tests the work "inch" is used to denote the minimum movement possible.

**MW-11.0 DRAWINGS AND INFORMATION**

**MW-11.1 General**

In addition to the requirements stated elsewhere in this Specification the Contractor shall submit, as a minimum requirement, the following drawings, calculations as required and information to demonstrate compliance with this Specification.

**MW-11.2 Drawings**

- a) Drawings with full dimensions, construction details and arrangements of:
- a.1 Complete assembly
  - a.2 Main crane girders
  - a.3 End truck girders
  - a.4 Trolley
  - a.5 Hook and block
  - a.6 End stops and attachment loads
  - a.7 Electrical motors and equipment (motor ratings and power requirements to be shown)
  - a.8 Motor mounting details
  - a.9 Braking systems
  - a.10 Gearing and gear boxes
- b) Wiring diagrams including full cable schedules for:
- b.1 Complete wiring system
  - b.2 Control wiring
  - b.3 Installation wiring
  - b.4 Logic diagrams in a flow chart presentation showing automatic and manual sequence steps.

**MW-11.3 Operation and Maintenance Manuals**

The Contractor shall provide three (3) sets of comprehensive manuals to fully describe all aspects of design, operation and maintenance of the crane components and equipment.

**MW-12.0 TRAINING OF NPC PERSONNEL**

The Contractor shall conduct training of at least four (4) engineers/operators/technicians of NPC on operation and maintenance of the systems including management and trouble shooting at site starting from start of Test and Commissioning until completion of the Work.

The Contractor shall prepare and submit a training program and schedule to NPC for approval.

The program shall cover on the techniques of safe operation, daily and monthly inspections and troubleshooting.

Training at site shall consist of having the operators actually operate the crane and perform a daily inspection. If necessary, a written exam shall be conducted to insure the operator's understanding and compliance with the required codes of conduct.

**MW-13.0 CLEAN UP**

When the Works are completed and before the issuance of Certificate of Completion, the Contractor shall remove from the Site, without expense to NPC, all temporary structures, all materials and rubbish of every sort, shall fill all holes and cavities made for his convenience, and shall leave the whole area in good order and condition, all as required and directed by NPC.

All excess materials, devices and component which form part of the equipment supply and identified to be no longer required for installation, shall remain at site and properly turned over to NPC.

**MW-14.0 MEASUREMENT OF PAYMENT**

Measurement of payment for all works shall be based on the bid price of each item as shown in the Bill of Quantities including all incidental components/parts necessary for the complete installation/assembly/erection of the mechanical works. The cost shall cover all works required and described in the pertinent provisions of the specifications.

**MW-15.0 GUARANTEE**

The Contractor shall guarantee that he will repair and/or replace at his own cost, the supplied equipment/component/devices against defect in workmanship and materials and shall include labor, parts and travel time for necessary repairs at the plant for a period of one (1) year after issuance of Acceptance Certificate by NPC.

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

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

## SECTION VI - TECHNICAL SPECIFICATIONS

### PART II - TECHNICAL DATA SHEETS

#### TABLE OF CONTENTS

SECTION	DESCRIPTION	PAGE
1.0	EQUIPMENT/COMPONENT DATA Gantry Crane	TDS-1
2.0	SPARE PARTS Spare Parts for Gantry Crane during the Warranty Period (Per Manufacturer's Standard and Recommended Spare Parts)	TDS-3
3.0	TOOLS LIST Tools and Appliances including Special Tools for Gantry Crane (Per Manufacturer's Standard and Recommended Tools and Appliances)	TDS-4



## SECTION VI - TECHNICAL SPECIFICATIONS

### PART II - TECHNICAL DATA SHEETS

#### GANTRY CRANE

- a) The Bidder shall complete this technical data sheet and submit the filled-up form with the technical proposal. The Bidder shall use continuation sheets as necessary for any other additional information keeping to the format shown herein or by reproducing the same.
- b) NPC reserves the right to reject Bids without proper and/or specific data and information as required herein.
- c) The data required are technical features and characteristics of the Equipment/component/material to be provided by the bidder. Bidder's proposal shall at least be equal or superior to the requirements specified by NPC.

#### 1.0 EQUIPMENT/COMPONENT DATA

ITEM	DESCRIPTION	UNIT	NPC REQUIREMENT	CONTRACTOR'S DATA
1.1	25 Tons Capacity Gantry Crane			
1.1.1	Type		Gantry Crane (Double Girder)	
1.1.2	Manufacturer		By Contractor	
1.1.3	Brand/Model		By Contractor	
1.1.4	Place of Manufacture		By Contractor	
1.1.5	Gantry Crane Manufacturer's Experience	year	At least 10 yrs. in manufacturing cranes for parts availability, safety standard & quality	
1.1.6	Main Hoist			
1.1.6.1	Capacity	ton	25 (min.)	
1.1.6.2	Lifting Height	m	37 (min.)	
1.1.6.3	Wire Rope Diameter	mm	22 (min.)	
1.1.6.4	Hoisting Speed	m/min	0.5-5	
1.1.7	Auxiliary Hoist			
1.1.7.1	Capacity	ton	3 (min)	
1.1.7.2	Lifting Height	m	25 (min)	
1.1.7.3	Wire Rope Diameter	mm	8 (min)	
1.1.7.4	Hoisting Speed	m/min	6-0.96	
1.1.8	Span	m	3	
1.1.9	Travelling Speed	m/min	8-32	
1.1.10	Weight of Trolley	Ton	By Contractor	

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

\_\_\_\_\_  
Name & Signature of Representative

\_\_\_\_\_  
Designation

**1.0 EQUIPMENT/COMPONENT DATA (Cont'd...)**

ITEM	DESCRIPTION	UNIT	NPC REQUIREMENT	CONTRACTOR'S DATA
1.1.11	Total Weight	Ton	By Contractor	
1.1.12	Power Supply	v/v/hz	480/48/60	
1.1.13	Crane Group		A5	
1.1.14	Hoist Machinery Group		M5	
1.1.15	Hoisting Motor Power	kW	By Contractor	
1.1.16	Travelling Motor Power	kW	By Contractor	
1.1.17	Supply Power	kW	By Contractor	
1.1.18	Max. Wheel Load	kN	68	
1.1.19	Cable Drum		Q345 Carbon Steel Seamless Tube or Equivalent	
1.1.20	Lifting Drive Duty Class		60% High Frequency Heavy Duty or Equivalent	
1.1.21	Braking Operation		1 million times of braking	
1.1.22	Wire Rope Tensile Strength		Up to 2160 Mpa	
<b>1.2</b>	<b>Control Joystick</b>			
1.2.1	Control Operation		Slow Break N/O	
1.2.2	Connection		Screw & Captive cable clamp terminals	
1.2.3	Mechanical Life		1 million Operating Cycles	
1.2.4	Rated Insulation Voltage	V	500	
1.2.5	Operation Position		All Position	
1.2.6	Rated Impulse with Stand Voltage		By Contractor	
<b>1.3</b>	<b>Manufacturer Quality/System</b>		ISO 9001:2015 ISO 14001:2015 ISO 45001:2018	
<b>1.4</b>	<b>Certificate of Conformity</b>		CEPROM	

Name of Firm

Name & Signature of Representative

Designation



## 2.0 SPARE PARTS

### SPARE PARTS FOR GANTRY CRANE DURING THE WARRANTY PERIOD (Per Manufacturer's Standard and Recommended Spare Parts)

ITEM	DESCRIPTION	PART NO.	QUANTITY*
2.1	Limit switches		
2.2	Bearings		
2.3	Brake end cap		
2.4	Friction disc		
2.5	Fuses		
2.6	Rope guide		
2.7	Push button contact block		
2.8	Contactors		
2.9	Gear box gasket		
2.10	Other spare parts recommended by Manufacturer for 1 year operation		

**NOTES:** *\*Contractor to provide minimum quantity required per Manufacturer's/Contractor's recommendation during the warranty period.*

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

\_\_\_\_\_  
Name & Signature of Representative

\_\_\_\_\_  
Designation



## SECTION VII

# BILL OF QUANTITIES



SECTION VII - BILL OF QUANTITIES

**BILL OF QUANTITIES  
CIVIL WORKS**

**25-TON GANTRY CRANE AT THE POWERHOUSE OF PULANGI IV HEP**

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	Dismantling of Existing Gantry Crane including electromechanical works	dismantle and remove	Refer to NPC TS & Drawing	lot	1	_____ (P_____)	_____ (P_____)
CW-2.0	Column and Girder Assembly (A36 steel) including control operators cabin, runaway rails, access ladder handrails	design, furnish and install/construct	Refer to NPC TS & Drawing	lot	1	_____ (P_____)	_____ (P_____)
CW-3.0	Corrosion Protection (cathodic galvanizing anti-corrosion material including surface preparation)	furnish & apply	Refer to NPC TS & Drawing	lot	1	_____ (P_____)	_____ (P_____)

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

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

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

\_\_\_\_\_  
Name and Signature of Authorized Representative

\_\_\_\_\_  
Designation



SECTION VII - BILL OF QUANTITIES

**BILL OF QUANTITIES  
 ELECTRICAL WORKS**

**25-TON GANTRY CRANE AT THE POWERHOUSE AT PULANGI IV HEP**

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-1.1	25-Tons Gantry Crane, controller, wireless vibration sensor, power and control cables; conduit; panelboard and grounding on other accessories as described in the technical specification and technical data sheet.	Supply, Erection/ Install, Test and Commissioning	EW-TS & TDS	lot	1	_____ (P _____)	_____ (P _____)

**SUB TOTAL AMOUNT OF BID (ELECTRICAL WORKS)**

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

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

\_\_\_\_\_  
Name and Signature of Authorized Representative

\_\_\_\_\_  
Designation



**MECHANICAL WORKS**

Item No.	Description of Work or Materials	Work to be Done	Ref.	Unit	Estimated Quantity	Unit Price in Pesos (Words and Figures)	Total Amount
1.0	25-Tons Gantry Crane complete with electric motor-operated trolley, electric hoist, and associated mechanical devices; required spare parts during the warranty period; standard and special tools; electrical controls and protection system; switches, push button pendant; power and control cables; conduit; grounding and other accessories and appurtenaces including test and commissioning and other works and services as described in the technical specification.	Design, Supply, Install, Test and Commissioning including dismantling/ replacement of existing crane	MW-7.0	lot	1	<p>_____ P _____</p> <p>_____ (P _____)</p>	<p>_____ P _____</p> <p>_____ (P _____)</p>
<b>TOTAL MECHANICAL WORKS</b>						<p>_____ P _____</p> <p>_____ (P _____)</p>	<p>_____ P _____</p> <p>_____ (P _____)</p>

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

\_\_\_\_\_  
Name and Signature of Authorized Representative

\_\_\_\_\_  
Designation



## SECTION VIII

# BIDDING FORMS



## SECTION VIII – BIDDING FORMS

### TABLE OF CONTENTS

NPCSF-INFR-01	- Checklist of Technical and Financial Envelope Requirements for Bidders
NPCSF-INFR-02	- List of all Ongoing Government & Private Construction Contracts Including Contracts Awarded but not yet Started
NPCSF-INFR-03	- Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid
NPCSF-INFR-04	- Computation of Net Financial Contracting Capacity (NFCC)
NPCSF-INFR-05	- Joint Venture Agreement
NPCSF-INFR-06a	- Form of Bid Security : Bank Guarantee
NPCSF-INFR-06b	- Form of Bid Security : Surety Bond
NPCSF-INFR-06c	- Bid Securing Declaration Form
NPCSF-INFR-07	- Omnibus Sworn Statement (Revised)
NPCSF-INFR-08	- Contractor's Organizational Chart for the Project
NPCSF-INFR-09	- List of Key Personnel Proposed to be Assigned to the Project
NPCSF-INFR-10a	- Key Personnel's Certificate of Employment (Professional Personnel) <b><u>(TO BE SUBMITTED DURING POST-QUALIFICATION)</u></b>
NPCSF-INFR-10b	- Key Personnel's Certificate of Employment (Construction Safety and Health Officer) <b><u>(TO BE SUBMITTED DURING POST-QUALIFICATION)</u></b>
NPCSF-INFR-11	- Key Personnel's Bio-Data <b><u>(TO BE SUBMITTED DURING POST-QUALIFICATION)</u></b>
NPCSF-INFR-12	- List of Equipment, Owned or Leased and/or under Purchase Agreement, Pledged to the Proposed Project
NPCSF-INFR-13	- Bid Letter
NPCSF-INFR-14	- Detailed Cost Estimate Form
NPCSF-INFR-15	- Summary Sheets of Materials Prices, Labor Rates and Equipment Rental Rates

Standard Form No: NPCSF-INFR-01

**Checklist of Technical & Financial Envelope Requirements for Bidders**

**A. THE 1<sup>ST</sup> ENVELOPE (TECHNICAL COMPONENT) SHALL CONTAIN THE FOLLOWING:**

**1. ELIGIBILITY DOCUMENTS**

**a. (CLASS A)**

➤ Any of the following:

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

**OR:**

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

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

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

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

**OR:**

- A combination thereof.

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

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

- Contract/Purchase Order
- 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

## SECTION VIII – BIDDING FORMS

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

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

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

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

**b. (CLASS B)**

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

**2. Technical Documents**

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

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

- Duly signed and completely filled-out Technical Data Sheets (Section VI – Part II)
- Complete eligibility documents of proposed sub-contractor, if applicable

**B. THE 2<sup>ND</sup> ENVELOPE (FINANCIAL COMPONENT) SHALL CONTAIN THE FOLLOWING:**

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

**CONDITIONS:**

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



Standard Form Number: NPCSF-INFR-03

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

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

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

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

Submitted by \_\_\_\_\_  
 (Printed Name & Signature)

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

Standard Form Number: NPCSF-INFR-04

**NET FINANCIAL CONTRACTING CAPACITY (NFCC)**

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

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

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

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

NFCC = P \_\_\_\_\_

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

Submitted by:

\_\_\_\_\_  
Name of Bidder/Contractor

\_\_\_\_\_  
Signature of Authorized Representative

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

Standard Form Number: NPCSF-INFR-05

**JOINT VENTURE AGREEMENT**

**KNOW ALL MEN BY THESE PRESENTS:**

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

- and -

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

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

**NAME OF PROJECT**

**CONTRACT AMOUNT**

That the capital contribution of each member firm:

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

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

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

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

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

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

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

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

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

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

*Witnesses*

1. \_\_\_\_\_ 2. \_\_\_\_\_

**[Jurat]**

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

*If the bidder is a joint venture, one of the requirements is the submission of a valid joint venture agreement.*

Standard Form Number: NPCSF-INFR-06a

**FORM OF BID SECURITY (BANK GUARANTEE)**

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

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

SEALED with the Common Seal of the said Bank this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_.

THE CONDITIONS of this obligation are that:

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

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

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

DATE \_\_\_\_\_ SIGNATURE OF THE BANK \_\_\_\_\_

WITNESS \_\_\_\_\_ SEAL \_\_\_\_\_

\_\_\_\_\_  
*(Signature, Name and Address)*

Standard Form Number: NPCSF-INFR-06b

**FORM OF BID SECURITY (SURETY BOND)**

BOND NO.: \_\_\_\_\_ DATE BOND EXECUTED: \_\_\_\_\_

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

SEALED with our seals and dated this \_\_\_\_\_ day of \_\_\_\_\_ 20 \_\_\_\_\_

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

NOW, THEREFORE, the conditions of this obligation are:

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

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

PROVIDED HOWEVER, that the Surety shall not be:

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

*Standard Form Number: NPCSF-INFR-06b*  
*Page 2 of 2*

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

PRINCIPAL \_\_\_\_\_ SURETY \_\_\_\_\_

SIGNATURE(S) \_\_\_\_\_ SIGNATURE(S) \_\_\_\_\_

NAME(S) AND TITLE(S) \_\_\_\_\_ NAME(S) \_\_\_\_\_

SEAL \_\_\_\_\_ SEAL \_\_\_\_\_

Standard Form No: NPCSF-INFR-06c

REPUBLIC OF THE PHILIPPINES )  
CITY OF \_\_\_\_\_ ) S.S.

**BID-SECURING DECLARATION**  
**DESIGN, SUPPLY, DELIVERY, INSTALLATION, TEST AND COMMISSIONING OF 25-TON GANTRY CRANE AT THE POWERHOUSE OF PULANGI IV HE PLANT**  
**PR NO. MG-PLM23-010**

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

I/We<sup>1</sup>, the undersigned, declare that:

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

**IN WITNESS WHEREOF**, I/we have hereunto set my hand this \_\_\_\_ day of \_\_\_\_ 20\_\_\_\_ at \_\_\_\_\_, Philippines.

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

**[Jurat]**

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

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

Standard Form No: NPCSF-INFR-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	
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:

Table with 4 columns: NAME OF PROJECT, OWNER, COST, DATE COMPLETED

At present, I am supervising the following projects:

Table with 4 columns: 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
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:

Table with 2 columns: Name and Address of Employer, Length of Service. Includes fields for year(s) from and 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).

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

Submitted by: \_\_\_\_\_  
*(Printed Name & Signature)*

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

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

*One of the requirements from the bidder to be included in its Technical Envelope is the list of its equipment units pledged for the contract to be bid, based on minimum equipment required in the bidding docs. which are owned (supported by proof/s of ownership), leased, and/or under purchase agreements (with corresponding engine numbers, chassis numbers and/or serial numbers), supported by certification of availability of equipment from the equipment lessor/vendor for the duration of the project*

Standard Form No. : NPCSF-INFR-13

**BID LETTER**

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

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

We, the undersigned, declare that:

(a) We have examined and have no reservation to the Bidding Documents, including Addenda, for the Contract **DESIGN, SUPPLY, DELIVERY, INSTALLATION, TEST AND COMMISSIONING OF 25-TON GANTRY CRANE AT THE POWERHOUSE OF PULANGI IV HE PLANT (PR NO. MG-PLM23-010)**.

(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 **DESIGN, SUPPLY, DELIVERY, INSTALLATION, TEST AND COMMISSIONING OF 25-TON GANTRY CRANE AT THE POWERHOUSE OF PULANGI IV HE PLANT (PR NO. MG-PLM23-010)** of the National Power Corporation.
  
- (k) We acknowledge that failure to sign each and every page of this Bid Letter, including the Bill of Quantities, shall be a ground for the rejection of our bid.

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

In the capacity of: \_\_\_\_\_

Signed: \_\_\_\_\_

Duly authorized to sign the Bid for and on behalf of: \_\_\_\_\_

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



Standard Form No. : NPCSF-INFR-15

**SUMMARY SHEETS OF MATERIALS PRICES, LABOR RATES AND EQUIPMENT RENTAL RATES**

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

**I. Unit Prices of Materials**

Materials Description	Unit	Unit Price
1.		
2.		
3.		
4.		
5.		
6.		
7.		

**II. Manpower Hourly Rates**

Designation	Rate/Hr.
1.	
2.	
3.	
4.	
5.	
6.	
7.	

**III. Equipment Hourly Rental Rates**

Equipment Description	Rental Rate/Hr.
1.	
2.	
3.	
4.	
5.	
6.	
7.	

\_\_\_\_\_  
Name, Signature of Authorized Representative

\_\_\_\_\_  
Designation

## SECTION IX

# BID DRAWING

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

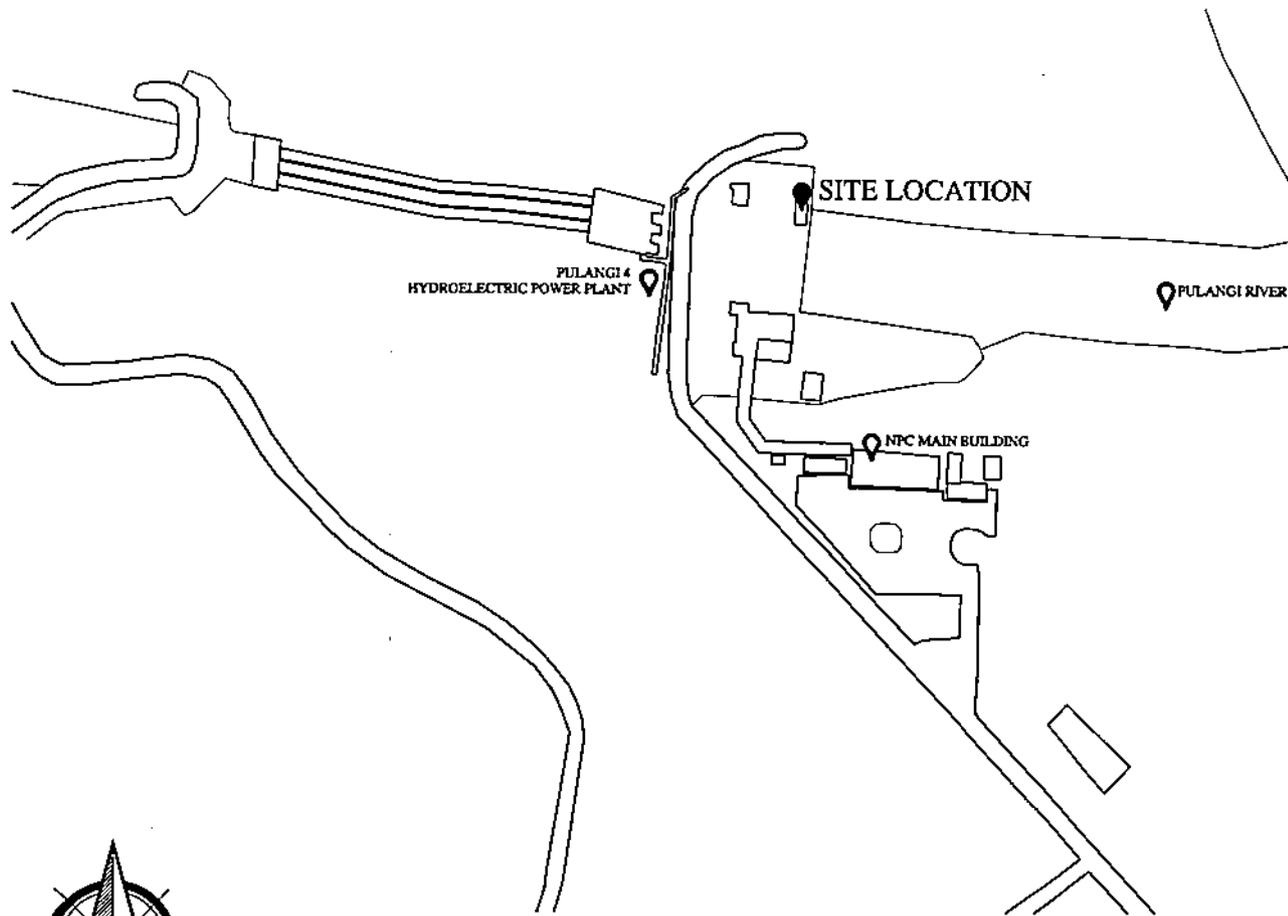
<b>DRAWING NO.</b>	<b>TITLE</b>
PLHP-BDC-10.001	GENERAL NOTES
PLHP-BDC-10.002	VICINITY PLAN
PLHP-BDC-10.003	GENERAL ASSEMBLY (25-Ton Gantry Crane)

## GENERAL CONSTRUCTION NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. FIELD VERIFY ACTUAL DIMENSIONS OF EXISTING STRUCTURES, REQUIRED CLEARANCES, REFERENCE LINES AND SITE CONDITIONS PRIOR TO START OF WORK.
3. THE CONTRACTOR SHALL SUBMIT FABRICATION/SHOP DRAWINGS INCLUDING DETAILS FOR APPROVAL BY NPC PRIOR TO START OF WORK.
4. MINIMUM COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 20.7MPa at 28th DAY PERIOD.
5. REINFORCING STEEL BARS SHALL CONFORM TO THE REQUIREMENTS OF PHS49:2001 DSB GRADE 275.
6. ALL STRUCTURAL STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM A36 STEEL.
7. ALL FASTENING BOLTS TO BE USED IN STRUCTURAL CONNECTIONS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 BOLTS. ALL BOLTS SHALL BE HEAVY HEX STRUCTURAL BOLT, TYPE 1, ASTM J25 WITH STANDARD OR COMPRESSIBLE WASHER, HOT-DIP GALVANIZED.
8. CONCRETE EPOXY FOR ANCHOR BOLTS SHALL BE LOW VISCOSITY TWO-COMPONENT CONCRETE AND MASONRY EPOXY WITH TENSILE STRENGTH OF 20.7MPa, COMPRESSIVE STRENGTH OF 70MPa AND NEGUGIBLE SHRINKAGE AT CURED STATE.
9. ALL WELDING WORKS SHALL CONFORM TO THE E70 SERIES OF SPECIFICATIONS FOR MILD STEEL ARC WELDING ELECTRODES ASTM A233.
10. THE CONTRACTOR SHALL CONDUCT ACTUAL SITE INSPECTION TO SUIT THE SPECIFIC DESIGN OF THE LIFTING STRUCTURE, RAILING AND FOUNDATION.

 <b>NATIONAL POWER CORPORATION</b> AGHAM ROAD, DILIMAN, QUEZON CITY																													
PROJECT: DESIGN, SUPPLY, DELIVERY, INSTALLATION, TEST AND COMMISSIONING OF 25-TON GANTRY CRANE AT THE POWERHOUSE OF PULANGI RHE PLANT LOCATION: BARAMAG, BUKIDNON																													
<b>GENERAL NOTES</b>																													
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>BY</th> <th>CHKD</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td>DESIGNED</td> <td></td> <td></td> <td></td> </tr> <tr> <td>DRAWN</td> <td style="text-align: center;">✗</td> <td></td> <td></td> </tr> <tr> <td>REVIEWED</td> <td></td> <td></td> <td></td> </tr> <tr> <td>CIVIL/ARCHT</td> <td></td> <td></td> <td></td> </tr> <tr> <td>ELEC.</td> <td></td> <td></td> <td></td> </tr> <tr> <td>MECH.</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		BY	CHKD	DATE	DESIGNED				DRAWN	✗			REVIEWED				CIVIL/ARCHT				ELEC.				MECH.				SUBMITTED: <i>H. L. MENDOZA</i> <small>Principal Engineer / Lead</small> RECOMMENDED: <i>A. F. RESAYTU</i> <small>Principal Engineer / Archt.</small> APPROVED: <i>H. L. MENDOZA</i> <small>Manager / EEC</small>
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DWG. NO. <b>PLHP-BDC-10.001</b> PRJ. NO. <b>MG-PLM23-010</b>																													
<b>BID DRAWING</b>																													
SCALE: NTS      REV. 0																													

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



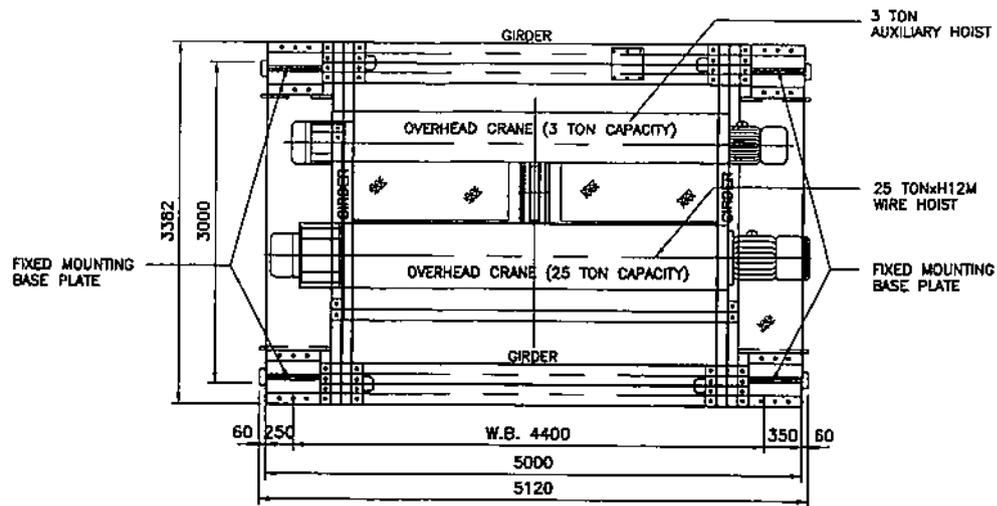
VICINITY PLAN  
SCALE 1:100



LOCATION PLAN  
NOT TO SCALE

OWNER		 <b>NATIONAL POWER CORPORATION</b> AGHAM ROAD, DILIMAN, QUEZON CITY	
PROJECT: DESIGN, SUPPLY, DELIVERY, INSTALLATION, TEST AND COMMISSIONING OF 25-TON GANTRY CRANE AT THE POWERHOUSE OF PULANGI IV HE PLANT			
LOCATION: MARAMAG, BUKIDNON			
TITLE: <b>VICINITY PLAN</b>			
DESIGNED	BY	CHKD	DATE
DRAWN	PRINCIPAL ENGR. H. MENDOZA		SUBMITTED: <i>H. L. MENDOZA</i> Principal Engineer in Charge
REVIEWED	PRINCIPAL ENGR. H. MENDOZA		RECOMMENDED: <i>A. S. M. RUTU</i> Chief Engineer
CIVIL/ARCHT			APPROVED: <i>N. G. S. OBERON</i> Manager, DCO
ELEC.			
MECH.			
DWG. NO. <b>PLHP-BDC-10.002</b>		PR. NO. <b>MG-PLM23-010</b>	
REV. DATE		NATURE OF REVISION	
SCALE: NTS		BID DRAWING	
		REV. 0	

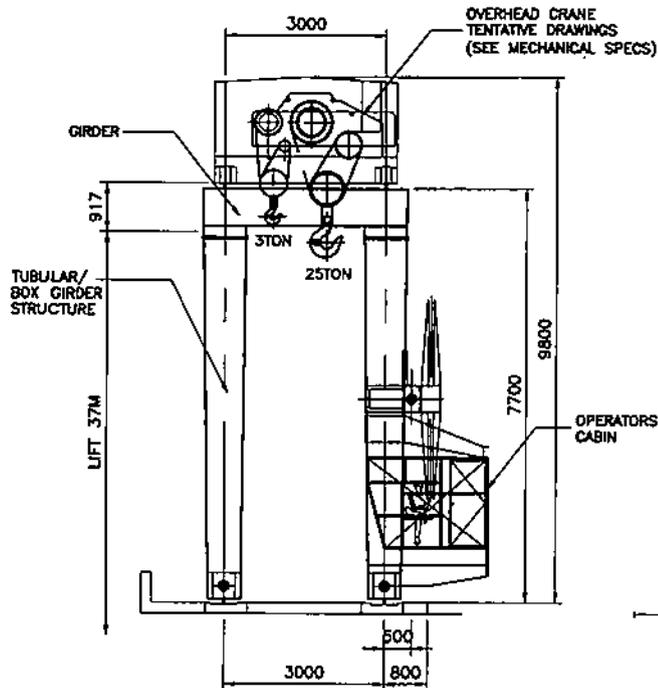
CRANE MINIMUM SPECIFICATIONS	
MAIN HOIST CAPACITY	25 TON
AUXILIARY HOIST	3 TON (25 METERS LIFTING HEIGHT X 8MM WIRE ROPE DIAMETER)
SPAN	3 METERS
LIFTING HEIGHT	37 METERS (22MM WIRE ROPE DIAMETER)
MAIN HOISTING SPEED	0.5-5m/min
AUXILIARY HOISTING SPEED	6-096m/min
TRAVELING SPEED	8-32m/min
WEIGHT OF TROLLEY	3.7 T
TOTAL WEIGHT	7.85 T
POWER SUPPLY	440v/48v/60Hz
CRANE GROUP	A5
HOIST MACHINERY GROUP	M5
HOISTING MOTOR POWER	38kW
TRAVELING MOTOR POWER	2X2.5kW
SUPPLY POWER	45.4kW
MAX. WHEEL LOAD	68KN
CABLE DRUM	Q345 CARBON STEEL SEAMLESS TUBE
LIFTING DRIVE DUTY CLASS	60% HIGH FREQUENCY HEAVY DUTY
BREAKING OPERATION	1 MILLION TIMES OF BRAKING
WIRE ROPE TENSILE STRENGTH	UP TO 2160Mpa



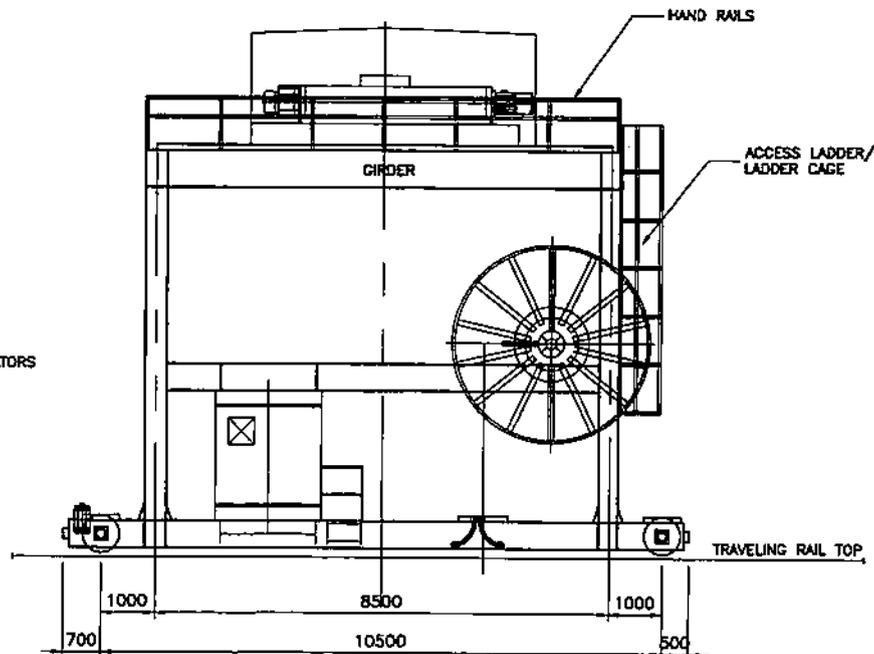
PLAN  
SCALE NTS

NOTES:

1. ALL THE DETAILS ARE CONCEPTUAL DESIGN ONLY. THE CONTRACTOR SHALL CONDUCT SITE INSPECTION TO SUIT THE ACTUAL FIELD CONDITION AND SUBMIT DESIGN CALCULATION AND DETAILED DRAWINGS OF GANTRY CRANE INCLUDING OPERATORS CABIN, LADDER CAGE AND STEEL CONNECTIONS FOR APPROVAL OF NPC.
2. THIS DRAWING IS FOR BIDDING PURPOSES ONLY.
3. PROVIDE SHELTER FOR OVERHEAD CRANE



ELEVATIONS  
SCALE NTS



OWNER:	<b>NATIONAL POWER CORPORATION</b> AGHAM ROAD, DILIMAN, QUEZON CITY		
PROJECT:	DESIGN, SUPPLY, DELIVERY, INSTALLATION, TEST AND COMMISSIONING OF 25-TON GANTRY CRANE AT THE POWERHOUSE OF PULANGI IV HE PLANT		
LOCATION:	MARAMAG, BUKIDNON		
TITLE:	<b>GENERAL ASSEMBLY</b> (25-TON GANTRY CRANE)		
DESIGNED	BY	CHD	DATE
DRAWN			
REVIEWED	PRINCIPAL ENGR. / ARCHT.		
CHECKED			
ELEC.			
MECH.			
SUBMITTED:	 <b>H. L. MENDOZA</b> Principal Engineer / ECE		
RECOMMENDED:	 <b>A. C. ESPINOSA</b> Principal Engineer / ECE		
APPROVED:	 <b>H. G. SOBERON</b> Engineer / ECE		
DWG. NO.	PLHP-BDC-10.003	PR. NO.	MG-PLM23-010

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