Republic of the Philippines
NATIONAL IRRIGATION ADMINISTRATION
Region VII

BOHOL NORTHEAST BASIN MULTI-PURPOSE DAM PROJECT, PACKAGE 2 (CONST. OF CANAL LINING AND OTHER IRRIGATION FACILITIES), KINAN-OAN TRINIDAD, BOHOL

RIO-LMC-06b-2021

11 August 2021

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Glossary of Terms, Abbreviations, and Acronyms

ABC – Approved Budget for the Contract.

ARCC – Allowable Range of Contract Cost.

BAC – Bids and Awards Committee.

Bid – A signed offer or proposal to undertake a contract submitted by a bidder in response to and in consonance with the requirements of the bidding documents. Also referred to as *Proposal* and *Tender*. (2016 revised IRR, Section 5[c])

Bidder – Refers to a contractor, manufacturer, supplier, distributor and/or consultant who submits a bid in response to the requirements of the Bidding Documents. (2016 revised IRR, Section 5[d])

Bidding Documents – The documents issued by the Procuring Entity as the bases for bids, furnishing all information necessary for a prospective bidder to prepare a bid for the Goods, Infrastructure Projects, and/or Consulting Services required by the Procuring Entity. (2016 revised IRR, Section 5[e])

BIR – Bureau of Internal Revenue.

BSP – Bangko Sentral ng Pilipinas.

CDA – Cooperative Development Authority.

Consulting Services – Refer to services for Infrastructure Projects and other types of projects or activities of the GOP requiring adequate external technical and professional expertise that are beyond the capability and/or capacity of the GOP to undertake such as, but not limited to: (i) advisory and review services; (ii) pre-investment or feasibility studies; (iii) design; (iv) construction supervision; (v) management and related services; and (vi) other technical services or special studies. (2016 revised IRR, Section 5[i])

Contract – Refers to the agreement entered into between the Procuring Entity and the Supplier or Manufacturer or Distributor or Service Provider for procurement of Goods and Services; Contractor for Procurement of Infrastructure Projects; or Consultant or Consulting Firm for Procurement of Consulting Services; as the case may be, as recorded in the Contract Form signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein.

Contractor – is a natural or juridical entity whose proposal was accepted by the Procuring Entity and to whom the Contract to execute the Work was awarded. Contractor as used in these Bidding Documents may likewise refer to a supplier, distributor, manufacturer, or consultant.

CPI – Consumer Price Index.

DOLE – Department of Labor and Employment.

DTI – Department of Trade and Industry.

Foreign-funded Procurement or Foreign-Assisted Project – Refers to procurement whose funding source is from a foreign government, foreign or international financing institution as specified in the Treaty or International or Executive Agreement. (2016 revised IRR, Section 5[b]).

GFI – Government Financial Institution.

GOCC – Government-owned and/or –controlled corporation.

Goods – Refer to all items, supplies, materials and general support services, except Consulting Services and Infrastructure Projects, which may be needed in the transaction of public businesses or in the pursuit of any government undertaking, project or activity, whether in the nature of equipment, furniture, stationery, materials for construction, or personal property of any kind, including non-personal or contractual services such as the repair and maintenance of equipment and furniture, as well as trucking, hauling, janitorial, security, and related or analogous services, as well as procurement of materials and supplies provided by the Procuring Entity for such services. The term "related" or "analogous services" shall include, but is not limited to, lease or purchase of office space, media advertisements, health maintenance services, and other services essential to the operation of the Procuring Entity. (2016 revised IRR, Section 5[r])

GOP – Government of the Philippines.

Infrastructure Projects – Include the construction, improvement, rehabilitation, demolition, repair, restoration or maintenance of roads and bridges, railways, airports, seaports, communication facilities, civil works components of information technology projects, irrigation, flood control and drainage, water supply, sanitation, sewerage and solid waste management systems, shore protection, energy/power and electrification facilities, national buildings, school buildings, hospital buildings, and other related construction projects of the government. Also referred to as *civil works or works*. (2016 revised IRR, Section 5[u])

LGUs – Local Government Units.

NFCC – Net Financial Contracting Capacity.

NGA – National Government Agency.

PCAB – Philippine Contractors Accreditation Board.

PhilGEPS - Philippine Government Electronic Procurement System.

Procurement Project – refers to a specific or identified procurement covering goods, infrastructure project or consulting services. A Procurement Project shall be described, detailed, and scheduled in the Project Procurement Management Plan prepared by the agency which shall be consolidated in the procuring entity's Annual Procurement Plan. (GPPB Circular No. 06-2019 dated 17 July 2019)

PSA – Philippine Statistics Authority.

SEC – Securities and Exchange Commission.

SLCC – Single Largest Completed Contract.

UN – United Nations.

Section I. Invitation to Bid

Republic of the Philippines
NATIONAL IRRIGATION ADMINISTRATION
Region VII

INVITATION TO BID

FOR BOHOL NORTHEAST BASIN MULTI-PURPOSE DAM PROJECT, PACKAGE 2 (CONSTRUCTION OF CANAL LINING AND OTHER IRRIGATION FACILITIES), KINAN-OAN, TRINIDAD, BOHOL

1. National Irrigation Administration - Regional Office 7 (NIA-RO7), through General Appropriation Act – LINE Project (GAA-LINE) for Calendar Year (CY) 2021 intends to apply the sum of **Twenty Four Million Eight Hundred Sixty Seven Thousand Eight Hundred Seventy Seven Pesos and 45/100 (PhP 24,867,877.45)** being the Approved Budget for the Contract (ABC) to payment under contract for **Bohol Northeast Basin Multi-Purpose Dam Project, Package 2 (Construction of Canal Lining and Other Irrigation Facilities), Kinan-oan Trinidad, Bohol** with Contract No. **RIO-LMC-06b-2021**. Bids received in excess of the ABC shall be automatically rejected at bid opening.
2. The NIA-RO7 now invites bid for the above Procurement Project. Completion of the Work is required **Two Hundred Sixty Five (265) calendar days**. Bidders should have completed 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.
3. Bidding will be conducted through open competitive bidding procedures using non-discretionary "*pass/fail*" criterion as specified in the 2016 revised Implementing Rules and Regulations (IRR) of Republic Act (RA) No. 9184.
4. Interested Bidders may obtain further information from the NIA-RO7 and inspect Bidding Documents at the address given below from 8:00 AM to 5:00 PM except during declared (special & regular) holidays and weekends.
5. A complete set of Bidding Documents may be acquired by interested Bidders who were able to log-in in the Philippine Government Electronic Procurement System (PhilGEPS) wherein the name of the company will be reflected in the Documents Request List of the Bid Notice Abstract of the Procuring Entity, from **August 11, 2021, 8:00 AM to August 31, 2021, 9:30 PM** during office hour from the given address and website(s) below & upon presentation of the payment from NIA-RO7 Cashier of nonrefundable fee of **Twenty Five Thousand Pesos (PhP 25,000.00)** only. The Procuring Entity shall allow the bidder to present its proof of payment for the fees in person, by facsimile, or through electronic means.

   Interested Bidders' representatives must also present a letter duly signed by the General Manager/Owner, if a Sole Proprietorship, or authorized Signatory if a Corporation, authorizing him/her to acquire the Bidding Documents.

6. The NIA-RO7, will hold a Pre-Bid Conference on **August 19, 2021, 10:00 AM** at **Central Visayas Training Center (CVTC), NIA-RO7, Dao District, Tagbilaran City, Bohol** and/or through videoconferencing/webcasting via Google Meet**,** which shall be open to prospective bidder

7. Bids must be duly received by the BAC Secretariat through manual submission at the office address as indicated below on or before **August 31, 2021, 10:00 AM**. 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 18.

9. Bid opening shall be on **August 31, 2021, 10:00 AM** at **Central Visayas Training Center (CVTC), NIA-RO7, Dao District, Tagbilaran City, Bohol** and/or through video conferencing/webcasting Google Meet. Bids will be opened in the presence of the bidders' representatives who choose to attend the activity.

10. The NIA-RO7, 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 Implementing Rules and Regulations (IRR) of RA No. 9184, without thereby incurring any liability to the affected bidder or bidders.

11. For further information, please refer to:
    NIA-RO7, BAC Secretariat
    J.A. Clarin St., Dao District
    Tagbialran City, Bohol
    Email Address: niaro7.bacsec@gmail.com
    Telephone No.(038) 501 9421/ (038) 427 1018

12. You may visit the website (region7.nia.gov.ph) for downloading of Bidding Documents.

ENGR. ORENCIO M. APALE
BAC Chairperson

Section II. Instructions to Bidders

1. Scope of Bid

The *National Irrigation Administration - Regional Office 7(NIA-RO7) i*nvites Bids for the *Bohol Northeast Basin Multi-Purpose Dam Project, Package 2(Const. of Canal Lining and Other Irrigation Facilities), Kinan-oan, Trinidad, Bohol*, with Project Identification Number *RIO-LMC-06b-2021*.

[Note: The Project Identification Number is assigned by the Procuring Entity based on its own coding scheme and is not the same as the PhilGEPS reference number, which is generated after the posting of the bid opportunity on the PhilGEPS website.]

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

2. Funding Information

2.1. The GOP through the source of funding as indicated below for GAA-Line Project FY 2021 in the amount of PhP 24,867,877.45.

2.2. The source of funding is:

a. NGA, the General Appropriations Act or Special Appropriations.

3. Bidding Requirements

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

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

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

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

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

5. Eligible Bidders

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

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

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

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

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

6. Origin of Associated Goods

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

7. Subcontracts

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

The Procuring Entity has prescribed that:

a. Subcontracting is not allowed.

7.1. *[If Procuring Entity has determined that subcontracting is allowed during the bidding , state:]* 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.

7.2. *[If subcontracting is allowed during the contract implementation stage, state:]* The Supplier may identify its subcontractor during the contract implementation stage. Subcontractors identified during the bidding may be changed during the implementation of this Contract. Subcontractors must submit the documentary requirements under Section 23.1 of the 2016 revised IRR of RA No. 9184 and comply with the eligibility criteria specified in **ITB** Clause 5 to the implementing or end-user unit.

7.3. Subcontracting of any portion of the Project does not relieve the 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 **Section IX. Checklist of Technical and Financial Documents**.

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 **Section IX. Checklist of Technical and Financial Documents**.

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:*

a. 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 *120calendar days from opening of bid.* Any bid not accompanied by an acceptable bid security shall be rejected by the Procuring Entity as non-responsive.

16. Sealing and Marking of Bids

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

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

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

17. Deadline for Submission of Bids

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

18. Opening and Preliminary Examination of Bids

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

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

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

19. Detailed Evaluation and Comparison of Bids

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

19.2. If the Project allows partial bids, all Bids and combinations of Bids as indicated in the **BDS** shall be received by the same deadline and opened and evaluated simultaneously so as to determine the Bid or combination of Bids offering the lowest calculated cost to the Procuring Entity. Bid Security as required by **ITB** Clause 16 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

Bid Data Sheet

ITB Clause	
5.2	For this purpose, contracts similar to the Project refer to contracts which have the same major categories of work, which shall be: ***Canalization and Canal Structure***
7.1	***Sub-contracting is not allowed***
10.3	*[Specify if another Contractor license or permit is required.] None*
10.4	The key personnel must meet the required minimum years of experience set below:

Key Personnel		Relevant Experience
1 – Project Manager	–	Preferably Technical individual with at least three (3) years' experience as Project Manager;
1 – Project Engineer	–	A licensed Civil Engineer with at least two (2) years' experience as Project Engineer in similar works;
1 – Materials Engineer	–	With at least two (2) years' experience as Materials Engineer duly accredited by the DPWH provided that the limits of
Materials Engineer II	-	Two (2) projects located within the same province for simultaneous assignments, with an aggregate cost of not more than P150M
Materials Engineer I	-	Four (4) projects located within the same province for simultaneous assignments, with an aggregate cost of not more than P 50M
1 – Safety/Health Officer	–	With Training Certificate and with at least two (2) years' experience as Safety Officer.
1 - Foreman	–	with at least two (2) years' experience as Foreman for Earthworks, concreting and/or other related works;

<table>
<tr><td>10.5</td><td>The minimum major equipment requirements are the following:

<table><tr><th colspan="2">Equipment</th><th>Capacity</th><th>Number of Units</th></tr><tr><td>1.</td><td>Dump Truck</td><td>12 cu.m.</td><td>1</td></tr><tr><td>2.</td><td>Backhoe</td><td>1.00 cu.m., 128 Hp</td><td>1</td></tr><tr><td>3.</td><td>Vibratory Plate Compactor</td><td>450-600mm, 8Hp</td><td>1</td></tr><tr><td>4.</td><td>Bar Cutter</td><td></td><td>1</td></tr><tr><td>5.</td><td>Concrete Mixer</td><td>1 Bagger</td><td>2</td></tr><tr><td>6.</td><td>Concrete Vibrator</td><td></td><td>1</td></tr><tr><td>7.</td><td>Total Station</td><td>set</td><td>1</td></tr></table></td></tr>
<tr><td>12</td><td>[Insert Value Engineering clause if allowed.]</td></tr>
<tr><td>15.1</td><td>The bid security shall be in the form of a Bid Securing Declaration or any of the following forms and amounts:
a. The amount of not less than 2% of the ABC, if bid security is in cash, cashier’s/manager’s check, bank draft/guarantee or irrevocable letter of credit;

b. The amount of not less than 5% of the ABC if bid security is in Surety Bond.</td></tr>
<tr><td>19.2</td><td>Partial bids are not allowed:</td></tr>
<tr><td>20</td><td>None</td></tr>
<tr><td>21</td><td>Additional contract documents relevant to the Project that may be required by existing laws and/or the Procuring Entity, such as construction schedule and S-curve, manpower schedule, construction methods, equipment utilization schedule, construction safety and health program approved by the DOLE, and other acceptable tools of project scheduling.</td></tr>
</table>

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

4.1. 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.

4.2. 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

Special Conditions of Contract

GCC Clause	
2	*[If different dates are specified for completion of the Works by section, i.e. "sectional completion," these dates should be listed here.]*
4.1	*[Specify the schedule of delivery of the possession of the site to the Contractor, whether full or in part.]*
6	The site investigation reports are: *[list here the required site investigation reports.]*
7.2	*[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.
10	a. Dayworks are applicable at the rate shown in the Contractor's original Bid.
11.1	The Contractor shall submit the Program of Work to the Procuring Entity's Representative within 7 days of delivery of the Notice to Award.
11.2	The amount to be withheld for late submission of an updated Program of Work is [*insert amount*].
13	The amount of the advance payment is 15% of the Contract Price and to be recouped every progress billing, to be made as per herein schedule: a. First (1st) Installment – 7.5% of the Contract Price – upon submission to and acceptance by NIA of an Irrevocable Standby Letter of Credit of equivalent value issued by a commercial bank, a bank guarantee or surety bond, callable upon demand, issued by a surety or insurance company duly accredited by the Insurance Commission and confirmed by NIA. b. Second (2nd) Installment – 7.5% of the Contract Price – upon submission to and acceptance by NIA of an Irrevocable Standby Letter of Credit of equivalent value issued by a commercial bank, a bank guarantee or surety bond, callable upon demand, issued by a surety or insurance company duly accredited by the Insurance Commission and confirmed by NIA (if amount is not included in the first Installment), and after Contractor has fully mobilized the initial equipment requirement and Key Personnel indicated in its Manpower Utilization Schedule.
14	Materials and equipment delivered on the site but not completely put in place shall not be included for payment.
15.1	The date by which operating and maintenance manuals are required is *[date]*. The date by which "as built" drawings are required is *[date]*.

15.2	The amount to be withheld for failing to produce “as built” drawings and/or operating and maintenance manuals by the date required is *[amount in local currency]*.

Section VI. Specifications

CLEARING AND GRUBBING

SCOPE

The work under this section shall include clearing, grubbing and disposal, in a manner approved by the Engineer of all vegetation such as trees, stumps, roots, brush; rubbish and all objectionable matters within the entire right-of-way for canals, farm ditches, drainage ditches, diversion works and over borrow areas, road surfacing materials sources, stockpile areas and elsewhere mutually agreed upon by the Engineers and the Contractor all in accordance with the Drawings and these Specifications.

METHOD OF CONSTRUCTION

[a] Clearing on Lightly Vegetated Areas

The areas over which diversion works shall be constructed, the entire right-of-way for canals, farm ditches and drainage ditches, side borrow areas, borrow haul areas, aggregate sources and stockpile areas shall be cleared of all vegetation, tress and all other matters, except such trees or shrubs which the Engineer ma order to be preserved. All trees and shrubs orders to be preserved including all existing adjacent facilities, properties and utilities, if any, shall be protected from injury or damage resulting from the Contractor's operations. All combustible materials from clearing operations shall be burned thoroughly or removed from the site of work or otherwise disposed areas as directed by the Engineer.

All materials to be burned shall be piled neatly and when a suitable condition shall be burned thoroughly. Piling for burning shall be done in such a manner and in such locations as to cause the least of fire risk. The Contractor shall at all times take special precautions to prevent fire from spreading and shall have available at all times suitable equipment and supplies for use in preventing and fighting fires. In this connection, the Contractor shall be liable for all costs and damages resulting from such incidents.

No clearing shall be done on any areas where there are standing crops until such crops have been harvested or unless the Contractor shall have secured written permission from NIA.

[b] Clearing on Swampy Areas and/ or Second Growth Forested Areas

Clearing on swampy areas and/or second growth forested areas where canals are passing thru shall only be started when said areas are suitably dry or when directed by the Engineers. Clearing includes felling and bucking of trees using chain saws and cutting of tree branches extending over the entire right-of-way. Felled trees shall be cut into the longest usable lengths and shall be hauled and neatly stocked at designated stockpile areas. Small trees and stumps, branches, grass and liters shall be burned in accordance with the preceding paragraph [a].

[c] Grubbing

Grubbing shall consist of removal of all trees, stumps, roots, brush and rubbish from the above mentioned work areas. No roots shall be left within 50 cm. from the ground surface. It shall include necessary stripping of the natural ground surface to a depth not more than 10

centimeters by effective means to remove all objectionable materials or organic matters from the said areas. Stripping beyond the limit of 10 centimeters shall be subject to the approval of the Engineer and payment thereof shall be considered included under Section IV, Canal Excavation.

If required by the Engineer, stripped top soil shall be temporarily stored at the edges of the right-of-way for subsequent use on slopes to encourage vegetative growth and minimize erosion.

METHOD OF MEASUREMENT

The area to be measured for payment shall be within the limit of the entire right-of-way as shown on the Drawings or as staked by the Engineer during Construction Operations.

All clearing and grubbing operations for side borrow areas, borrow haul areas, aggregate sources, stockpile areas and elsewhere are considered subsidiary works required for other pay items in the Bill of quantities and will not be measured for payment under this Section. The Costs of such works shall be considered included in the contract unit price for the various items in the Bill of Quantities where clearing and grubbing are required.

BASIS OF PAYMENT

The cleared and grubbed areas measured as provided shall be paid at the contract unit price per square meter in the Bill of Quantities which price and payment shall constitute full compensation for furnishing all labor, tools, equipment, supplies and all incidentals or subsidiary works [including stripping within the 10 centimeters limit] necessary for the successful completion of the work. No payment shall be made on cleared and grubbed areas where no excavation or embankment constructions have been undertaken.

COMMON EXCAVATION

SCOPE

The work under this Section shall consist of excavating and removal of all classes of materials in canal prism and backfilling, and trimming of side slopes inside canal prism and canal beds except on portion of the canal where concrete lining is required (trimming of the foundation bed will be considered included under Section XV "Concrete Canal Lining") all in accordance with the Drawings and these Specifications or as directed by the Engineer.

All excavations shall be true to lines, grades, slopes and profiles shown on the Drawings or as required by the Engineer.

1. **CLASSIFICATION**

All excavated materials under this Section will be classified as follows:

(a) Rock Excavation

For purpose of classification of excavation, rock is defined as sound and solid masses or formation, layers or ledges of mineral matter in place of such hardness and texture that:

1) Cannot be effectively loosened or broken down by ripping in a single pass with a latest model tractor mounted hydraulic ripper equipped one digging point of standard manufacturer's design adequately sized for use with and propelled by a crawler-type tractor above 300HP

2) In the areas where it is impracticable to classify the use of the ripper described above, rock is defined as sound and solid material of such hardness and texture which cannot be loosened or broken by a 2.72 kg (6 pound) drifting pick.

3) Can only be loosened or broken by special equipment such as jackhammer and pencil hammer attached to an excavator.

All formation of materials as defined above whose volume is one (1) cubic meter or more will be classified as rock.

(b) Common Excavation - Excavation of any materials and boulders (whose volume is less than one cubic meter) that can be ripped to be loosed by, a dozer of equal or below 180 HP capacity.

(c) Hard Excavation - Excavation of any materials and boulders (whose volume is less than one cubic meter) that can be ripped to be loosed by, a dozer of above 180 HP to 300 HP.

1) Excavation of all soil materials, which can easily be removed by ordinarily excavator or manual operation.

2. **METHOD OF CONSTRUCTION**

Canal excavation shall include all excavation works in the canal prism whether common, indurated or rock materials, except additional excavations at structure sites which is specified to be done and measured for payment under excavation for structure.

3. **BASIS OF PAYMENT**

The volume measured as provided above shall be paid per cubic meter, which price and payment shall constitute full compensation for furnishing all materials, supplies, labor, equipment, tools and all incidentals necessary for the successful completion of the work described under this Section and for all subsidiary works except for hauling of excavated materials beyond the free haul distance for disposal to waste areas which shall be paid under Section.

BACKFILL WITH COMPACTION

1. SCOPE

The work under this section shall include hauling (if necessary) and backfilling with suitable materials taken under from Canal Excavation , Side Borrow or Borrow Haul all spaces excavated and not occupied by the structure and spaces between the natural ground surface and the finish lines indicated to be filled and all other sections directed to be filled by the Engineer, all in accordance with these specifications and in conformity with the lines, grades and dimensions shown in the Drawings or as ordered by the Engineer. It shall also include the dewatering and removal of all suitable materials as ordered by the Engineer from the spaces to be backfilled or filled.

2. METHOD OF CONSTRUCTION

All spaces to be backfilled or filled shall be cleared of all rubbish and other objectionable matter. The excavation pit to be backfilled shall dewatered and all mud and loose materials shall be removed before backfilling. The filling materials, with the proper moisture content determined by the Engineer, shall be deposited loose and layers not exceeding 30 centimeters and then thoroughly compacted by ramming, rolling or by means of mechanical tampers or portable vibratory compactors to obtain at least 85% compaction behind bridge abutments, retaining walls, cut-off walls and immediately above pipes, box or barrel conduits and gradually increasing to at least 90% compaction p to the surface of the roadway in the case of approaches to bridges, road crossing or Culvert Structures. The time when to start backfilling operation shall be determined by the Engineer.

3. METHOD OF MEASUREMENT

Backfill with Compaction shall be measured by the cubic meter in its final compacted and uncompacted position within the limits of structure excavation paylines and surfaces of concrete in contact with the backfilled materials as shown on the Drawings or as directed by the Engineer. Volumes occupied by the structures and other features will not be included.

4. BASIS OF PAYMENT

Backfill with Compaction will be paid for at the contract unit price per cubic meter, which price and payments shall constitute full compensation for the side borrow, borrow haul and overhaul operations and for furnishing all labor, equipments, tools and all incidentals and subsidiary works necessary for the successful completion of the work under this Section.

OVERHAUL (WASTE DISPOSAL)

SCOPE

Overhaul shall include the hauling of materials excavated from Canal Excavation or structure excavation and to be disposed either for roadway embankment, normal embankment, freeboard embankment, fill, structure backfill, or for disposal to waste disposal areas suggested by NIA or at the Contractor's choice including acquisition of right-of-ways thereto.

DISPOSAL OF EXCAVATED MATERIALS

a. Waste materials

Waste materials consisting of all excess excavated suitable materials and objectionable materials for canal embankment, and compacted backfill shall be placed in waste disposal areas outside the NIA right-of-way chosen by the contractor, leveled and sloped to drain as directed.

METHOD OF MEASUREMENT

Overhaul of waste materials will be measured by the cubic meter. The volume of waste materials to be measured for payment shall be computed based on the Net End Area versus Stationing Diagram and Mass diagram for each Lateral or canal which shall be submitted by the Contractor to the Administrator for approval.

Overhaul for canal embankment is a subsidiary work under Embankment Construction and compaction [ECC] hence, it will not be measured for payment, as the cost is already considered included in the contract unit price of ECC.

BASIS OF PAYMENT

Payment for overhaul for waste materials shall be per cubic-meter, which price and payment shall constitute full compensation for furnishing all labor, supplies, tools, equipment and all incidents necessary for the successful completion of the work including acquisition of right-of-way and access thereto for disposal areas chosen by the Contractor. Payment for overhaul for waste materials shall only be made when said Net End Area versus Stationing Diagram and Mass Diagram, where the volume measured for payment are based has been approved by the Administrator.

If during the implementation of the project, the waste disposal areas differ from those chosen by the Contractor considered in the derivation of his unit bid price for overhaul, the contractor shall not be entitled to any claim for unit price adjustment as a result of such alteration of disposal areas.

REINFORCING STEEL BARS

Scope

All reinforcing steel bars required for the works as detailed in the Construction Drawings or as directed by the Engineer shall be furnished by the Contractor.

The work under this Section includes the hauling of all reinforcing steel bars required for the works to the project site, storing, cutting, bending and proper placing, all in accordance with the drawings and these Specifications.

The length for each size of reinforcing steel bar to be furnished by the Contractor shall be computed by taking the theoretical length of steel bars down on the drawings multiplied by 1.07 to get the approximate length required for the work. All reinforcing steel bars shall be furnished in commercial standard lengths and the Contractor shall cut and bend the reinforcing steel bars to the detail and dimensions shown on the Drawings.

Materials

All reinforcing steel bars to be furnished by the Contractor shall be Grade 40 or PS 275, deformed type and conforming to the requirements of ASTM A-615. The nominal dimensions and unit weights of bars designation shall be in accordance with the following table:

		Nominal Dimensions	
Nominal Bar Diameter	Unit Weight (kg/m.)	Cross Section Area (sq. mm)	Perimeter (mm)
6 mm.	0.222	28.27	18.85
8 mm.	0.395	50.27	25.13
10 mm.	0.616	78.54	31.42
12 mm.	0.888	113.10	37.70
16 mm.	1.579	201.10	50.27
20 mm.	2.466	314.20	62.83
25 mm.	3.854	491.90	78.54
28 mm.	4.833	615.75	87.96
32 mm.	6.313	804.25	100.53
36 mm.	7.991	1,017.90	113.10

The nominal diameter of a deformed bar is equivalent to the diameter of a plain bar having the same weight per unit length of the deformed bar. Construction Workmanship shall be at the highest grade and shall be in accordance Requirement with the latest standard practice of the industry.

1. Cutting and Bending.

Cutting and bending of reinforcing bars may be done in shop or at the job site. All bending works shall be in accordance with the latest standard practice and by approved machine methods. Radii for bends and hooks will be specified on approved detailed reinforcement Drawings in accordance with sound design procedures.

2. Placing.

Reinforcement shall be laid, anchored and embedded I the concrete as shown on the Drawings or as directed by the Engineer. Unless otherwise directed, the spacing of reinforcement bars shall be measured along the center line of the bars. Reinforcement shall be inspected for compliance with requirements as to size, length, splicing, position and number after placement based on the approved reinforcement drawings.

Before reinforcement are placed, the surfaces of the bars and the surfaces of any metal bar support shall be cleaned of heavy flaky rust, loose scales, dirt, grease or other foreign substance which, in the opinion of the Engineer, are objectionable. Heavy flaky rust that can be removed by firm rubbing with burlap or equivalent treatment is considered objectionable. After being placed, the reinforcing bars shall be maintained in a clean condition until completely embedded in concrete.

Reinforcing bars shall be accurately placed and secured in position so as to avoid displacement during the pouring of concrete. Special care shall be exercised to prevent any disturbance of the embedded reinforcement during the setting of concrete. Metal chairs hangers, spacers or other approved support may be used by the Contractor for supporting reinforcing bars. Metal supports shall be galvanized when they are to be exposed to view on completed concrete surfaces or where it is use will contribute in any way to the discoloration of deterioration of the concrete.

4. Relation of Bars to Concrete Surfaces.

The minimum cover for all reinforcements shall conform to the dimensions shown on the detailed reinforcement Drawings.

5. **Splicing.**

All splices in reinforcement shall be as shown on the Drawings or as directed by the Engineer. The lapped ends to bars shall be either supported sufficiently to permit the embedment of the entire surface of each bar in concrete or shall be securely wired.

6. **Welding.**

Welding of bars shall be performed only where shown on the Drawings or as authorized in writing by the Engineer and shall conform to the requirements of AWS: D12.1, latest revision. All welders employed shall show proof of their welding qualifications to the Engineer. All welding shall be done using metal arc welding, pressure gas welding, submerged arc welding or thermit welding. All electric shall be acceptable to NIA. Coverings of low hydrogen electrodes must be thoroughly dry when used. The surfaces to be welds shall be clean and shall be free from rust and dirt. All welds shall develop the full strength of the bar or the smaller bar when two different sizes are welded. Test will be required of not more than five percent of the welds. Approved testing equipment for testing welds shall be furnished by Contractor.

7. Protection.

Reinforcement to remain exposed and intended for future concrete embedment shall be protected from corrosion or other damages in an approved manner where directed. The reinforcement protection shall be of such nature that it can be thoroughly cleaned without difficulty prior to encasement in concrete.

Sampling for Testing and Acceptance of Materials that fail to meet contract requirements (For Steel Bars Furnished by Contractor)
Sampling of reinforcing steel bars furnished by the Contractor for incorporation in the Permanent Worksshall be carried out by NIA at the manufacturer's stockyard before delivery to the project site. The NIA authorized representative shall, at random, take two representative samples of reinforcing steel bars per lot covered by the manufacturer's mill certificate. A lot shall consist of all steel bars of the same heat or blow as shown in the mill certificate, and the same nominal cross-section and grade. Samples shall be tested at the manufacturer's testing laboratory, if any, or to any approved Government testing laboratory at Contractor's expense. A lot or lots represented by samples tested which failed to meet specified requirements shall be in accordance with ASTM requirements. All deliveries shall be subject to prior approval of NIA.

The NIA reserves the right to accept steel bars that fail to meet the contract requirement provided that the deficiency is not more than nine percent (9 %) of the requirement per each type of test and provided further that a corresponding reduction in the unit price will be made. The percentage of reduction equal to the percentage of deficiency based on the minimum requirement of the ASTM A-615 Standard. For example, if the value of the test result for one type of test is five per cent (5 %) below the minimum requirement, the unit price for payment will be reduced by 5 %. If the non-compliance with the test requirements is on two or more tests, the price reduction will be the summation of the percentage of the deficiencies.

Method of Measurement

a. Cutting Bending and Placing. Measurement for payment of reinforcing steel bars will be made on the weight of reinforcing steel bars actually placed with the concrete structure and drilled holes for anchorage in accordance with the Drawings and Bar Schedule approved by NIA or as directed by the Engineer and weights will be computed based on the published manufacturer's weights or in the absence thereof, on the weights specified in the table presented in Paragraph 902. Steel bars in laps or splices indicated in the approved reinforcement Drawings, as required by NIA will be measured for payment. Additional steel bars in laps which are authorized for the convenience of the Contractor and such items as measured for payment. Where weld splices are specified on the Drawings, weld splices will not be measured for payment. Where contractor chooses to weld reinforcement bars for his convenience and welding is not specified, no separate payment will be made for such welds. Where Contractor substitute welded splices for lapped splices, separate payment will not be made for such welds, but instead the weight for the lapped splices shown on the Drawings will be measured for payment.

Basis of Payment

Payment for reinforcing steel bars measured as provided above, will be paid for at the contract unit price per kilogram which price and payment shall constitute full compensation for furnishing all labor, tools, equipment and all incidentals and subsidiary works necessary for the successful completion of the work described under this Section.

CONCRETING WORKS

GENERAL

This Section covers all the materials as cement, aggregates, water, admixtures and proportioning, mixing, transporting, placing, finishing, curing and protecting of concrete, including supplies, equipment, tools and all other incidentals necessary for concrete works.

All the applicable provisions of the latest revision of the ACI Building Code (ACI-308-63) and American Society for Testing Materials (ASTM) or other equivalent standards approved by the Engineer shall govern in all cases not specifically provided for herein.

CONCRETE COMPOSITION

Concrete shall be composed of Portland cement, fine and coarse aggregates, water, and if necessary admixtures or agents approved by the Engineer. The design of concrete mixtures and consistency shall be specified in this Section.

CEMENT

(1) General

The cement shall conform to the requirements of the standard Specifications for Portland Cement (ASTM: C-150 Type 1). Special cement may be used subject to the approval of the Engineer provided it meets the requirements of Portland Cement with respect to strength, soundness and setting time.

(2) Storage

The Contractor shall, immediately upon delivery of cement to the jobsite, store the same in a dry, weather tight and properly ventilated structure with adequate provisions for the prevention of absorption of moisture. All storage facilities shall be subject to the approval of the Engineer and shall be such as to permit easy access for inspection and identification. The Contractor's method of handling and storing cement shall be subject to the approval of the Engineer. The Contractors shall not use any cement which is stored at the site for the period more than three (3) months. Not more than fourteen (14) sacks of cement shall be permitted to be piled up and this number shall be limited to seven (7) each, when the storage is expected to be longer than two (2) months; these sacks of cement shall be piled up or stored so as to permit easy access for identification, inspection and testing.

(3) Payment

Payment for cement shall be considered to be included in the unit prices for the various items for concrete in the Bill of Quantities for which cement is used.

WATER

The water used in concrete, mortar and grout shall be free from objectionable quantities of silt, organic matter, alkali, salts other impurities. The recommendation of the seventh edition of the U.S. Bureau of Reclamation Concrete Manual for mixing water shall be followed.

FINE AGGREGATES

(1) General

The term "Fine Aggregates" is used to designate aggregates in which the maximum size of particles is 3/16 of an inch (5 millimeters). Fine aggregates for concrete, mortar and grout shall be provided by the Contractor and shall consist of natural sand, manufactured sand, or a combination of both. The different components shall be batched separately, or subject to the written approval of the Engineer, or blended prior to delivery to the batching plant.

As a means of providing moisture control, the Contractor may be required to stockpile the fine aggregates over porous drain to prevent excessive water and to stabilize the moisture content.

(2) Quality

Fine aggregates shall conform to the requirements of ASTM C-33 and shall consist of hard, tough, durable, uncoated rock particles. The Contractor shall exercise every possible precaution in transporting, washing and screening operations to prevent contamination of sand particles. Fine aggregates shall conform to the following requirements:

(a) Grading

It is assumed that the sand available in natural deposits will require processing to provide a suitable gradation. Regardless of the source, the fine aggregate shall be well graded from fine to coarse and the gradation as delivered to the mixers shall conform to the following requirements unless otherwise approved:

Sieve Designation US Standard Square-Mesh		Percent by Weight Passing Individual - Sizes		
3/8"	(9.50 mm)			100
No. 4	(4.75 mm)	95	-	100
No. 8	(2.36 mm)	80	-	95
No. 16	(1.18 mm)	60	-	85
No.30	(0.600 mm)	25	-	60
No. 50	(0.300 mm)	10	-	30
No. 100	(0.150 mm)	2	-	10
No. 200	(0.074 mm)	0	-	-

In addition to the grading limits shown above, the fine aggregates as delivered to the mixer shall have the fineness modulus of not less than 2.30 or more than 3.00.

The grading of the fine aggregates shall be also controlled so that the fineness moduli of at least 9 to 10 test samples of the fine aggregates as delivered to the mixer shall not vary more than 0.10 from the average fineness modulus of all samples previously taken. The fineness modulus shall be determined by dividing by 100, the sum of the cumulative percentages retained on US Standard Sieves No. 4, 8, 16, 50 and 100. At the option of the Contractor fine aggregates may be separated into two or more sizes or

classifications, but the resulting sand when combined before entering the concrete mixer shall be of uniform grading within the limits specified above.

(b) Particles Shape

The shape of the particles shall be generally spherical or cubical and reasonably free from flat or elongated particles. A flat or elongated particles is defined as a particle having a maximum dimension. Rock which breaks down into such shape, regardless of the type of processing equipment used, will not be approved for use in the production of fine aggregates.

(c) Deleterious Substance

The maximum percentages of deleterious substance in the fine aggregates as delivered to the mixer shall not exceed the following values:

Deleterious Substance	Percent by Weight	Designation*
- Materials passing No. 200 screen	3	16
- Shale	1	17
- Clay	1	13
- Total of each other deleterious substance (such as alkali, mica, soft, flaky particles and loam)	2	-

*Note: The designation refers to methods of testing described in the seventh (7^{th}) edition of the Bureau of Reclamation Concrete Manual and ASTM.

The sum of the percentage of all deleterious substances shall not exceed 5% by weight. Fine aggregates producing a color darker than the standard in the colometric test for organic impurity (USBR Designation 14 or ASTM C-40) may be rejected. The fine aggregates may be rejected if the portion retained on No. 50 (0.300 mm) screen, when subjected to five cycles of sodium sulphate test for soundness (USBR Designation 19 or ASTM C-88) shows an average loss of more than 18% by weight.

Fine aggregates delivered to the batching plant may be rejected if it contains more than 0.15% soluble sulphate for any one sample or more than 0.10% for an average of at least 9 out of 10 consecutive test samples of finished sand, when samples are taken hourly. The percent soluble sulphate in fine aggregates shall be determined in accordance with the method of test prescribed in Sub-paragraph (d) below.

(d) Sampling

Sampling of fine and coarse aggregates shall be done in accordance with the appropriate requirements of Section 12 of ASTM: C-33.

The source from which fine and coarse aggregates are to be obtained shall be selected well in advance of the time when the materials will be required in the work.

Unless otherwise specified, all test samples shall be taken under the supervision of the Engineer in sufficient time as approved to permit adequate testing and examination of results sufficient in advance at the time for use in concrete.

Routine control test and analysis of the fine and coarse aggregates at various stages in the processing operation shall be made. The approval of a source shall not be construed as containing approval of all materials from the source, and the Contractor shall be responsible for the specified quality of all such materials used in the work.

(3) Storage

Fine aggregates shall be stored in such a manner as to avoid the inclusion of any foreign materials in the concrete. The storage or stockpile shall be constructed so as to prevent segregation. Depositing of materials in storage and its removal there from shall be done in such a manner as to result in increasing the uniformity of the grading insofar as this is practicable. All fine aggregates shall remain in free drainage storage for at least seventy two (72) hours prior to use. Sufficient live storage shall be maintained at all times to permit continuous placement of concrete.

(4) Measurement and Payment

Fine aggregates will not be measured for payment. The cost of excavation, stockpiling, transporting, processing, blending, handling and other costs for providing fine aggregates shall be considered to be included in the contract unit prices bid for the various items in the Bill of Quantities for which fine aggregates are used.

COARSE AGGREGATES

(1) General

The term "Coarse Aggregates" is used to designate aggregates of such sizes as to fall within the range of 3/16 inch to 2 inches (0.5 cm to 5.1 cm) or any size or range of sizes within such limits. The coarse aggregate shall be reasonably well graded within the nominal size ranges hereinafter specified. Coarse aggregates for concrete shall be furnished by the Contractor and shall consist of natural gravel, crushed rock or mixture of natural gravel and crushed rock as provided in Paragraph 1008. Coarse aggregates as delivered to the batching plant shall have a uniform and stable moisture content. Any rewashing found necessary to provide clean aggregate shall be done prior to finish screening. Re-washing shall not be performed in finish screens.

(2) Quality

Coarse aggregates shall conform to the requirement of ASTM C-33 and shall consist of hard, dense, uncoated durable rock fragments.

(a) Grading

The coarse aggregates shall be well graded from fine to coarse. It shall be stocked separately in the following specific size groups. The grading of the aggregates within the separated size groups as delivered to the mixer shall be as follows:

Sieve Sizes US Std. Sq. mesh		Size Group (% by weight) ¾" Size (20 mm)	Size Group (% by weight) 1-½ Size (40 mm)
2"	(50.8 mm)	-	- 100
1½"	(38.1 mm)	-	90 - 100
1"	(25.4 mm)	100	20 - 55
¾"	(19.1 mm)	-	-
½"	(12.7 mm)	-	-
⅜"	(9.52 mm)	20 - 55	0 - 5
No. 4	(4.76 mm)	0 - 10	-

Coarse aggregates shall contain not more than one and one half (1-½) percent of materials passing the NO. 200 sieve by meshing, or more than 5 percent of soft fragments.

It shall have an abrasion loss of not more than 45 percent at 500 revolutions.

Unless otherwise directed, the maximum sizes of aggregates to be used in concrete for the various parts of the works shall be in accordance with the following:

	General Use	Maximum Size of Aggregates	
(a)	Concrete for thin walls, slabs, beams, less than 0.22 meters thick	¾"	(20 mm)
(b)	Concrete for reinforced concrete pipes	¾"	(20 mm)
(c)	Concrete for footings, walls, slabs, beams, more than 0.22 meters thick	1-½"	(40 mm)
(d)	Concrete for canal lining	1-½"	(40 mm)
(e)	Mass concrete for diversion conduit, and spillway wire and wall	1-½"	(40 mm)
(f)	Lean concrete and other miscellaneous use	1-½"	(40 mm)

In all cases, the size of the aggregates shall not exceed ½ the distance between the reinforcing steel bars of the members being placed.

(b) Particles Shape

The particle shape of the crushed coarse aggregate shall be generally spherical or cubical and reasonably free from flat or elongated particles. A flat or elongated particle is defined as a particle having a maximum dimension in excess of five times the minimum dimensions. Rocks which break down into such shape will not be approved for the production of aggregate.

(c) Deleterious Substances

The deleterious substances in any size of coarse aggregate, as delivered to the mixer, shall not exceed the following values:

	Deleterious Substances	Percent by Weight		Designation *
-	Materials passing No. 200 screen	1/2	16	
-	Shale	1		18
-	Clay lumps	1/2		13
-	Other deleterious substances	1		-

*Note: The designation refers to methods of Testing described in the seventh (7^{th}) edition of the U.S. Bureau of Reclamation Concrete Manual and ASTM.

The sum of the percentages of all deleterious substances in any size, as delivered to the mixer, shall not exceed three (3) % by weight. Coarse aggregates may be rejected if it fails to meet the following requirements:

(i) Petrographic Examination

If more than 10 % of poor aggregate particles can be identified in physical quality test and in case 20 % of the particles would be classified with respect to the chemical quality (USBR Designation 7 or ASTM C-295).

(ii) Sodium Sulfate Test for Soundness (USBR Designation 9 or ASTM C-88)

If the weighted average loss, after 5 cycles is more than 10 % by weight.

(iii) Specific Gravity (USBR Designation 10 or ASTM C-127

If the specific gravity (saturated surface-dry basis) is less than 2.60.

(iv) Sampling

All sampling of coarse aggregates shall be in accordance with Paragraph 1006 (2) d.

(3) Storage

Coarse aggregate storage or stockpiles shall be built in such a manner as to avoid the inclusion of any foreign materials in the concrete and to prevent segregation and excessive breakage. Water sprayers shall be installed to keep that portion of the coarse aggregate stockpiles saturated which is intended for immediate use in the concrete. Sufficient live storage shall be maintained at all times to permit continuous placement of concrete.

(4) Measurement and Payment

Coarse aggregates will not be measured for payment. The cost of excavation, production, stockpiling processing, blending handling and other cost providing coarse aggregates shall be

considered to be included in the contract unit prices bid for the various items in the Bill of Quantities for which coarse aggregates are used.

AGGREGATES SAMPLING AND TESTING

Sampling of the aggregate materials approved for use in the work shall be done by the Contractor in accordance with ASTM Sampling Method 10 days in advance of the time when placing of concrete is expected to begin. Aggregate studies and tests shall be made by the Contractor at its own expense. It shall be the responsibility of the Contractor to obtain the necessary samples and subject them to tests.

The samples of aggregates shall be obtained and tested in accordance with the following ASTM standard methods:

	Items	ASTM code No.	
-	Sampling aggregate	C	75
-	Sieve analysis	C	136
-	Amount of material finer than 200 sieve	C	117
-	Organic impurities	C	40
-	Mortar strength	C	87
-	Soundness	C	88
-	Soft particles	C	235
-	Abrasion	C	131
-	Clay lumps	C	142

No aggregate shall be used until official advice has been received that it has satisfactorily pass all tests, at which time written authority shall be given for its use. Material from source which has been previously tested and shown satisfactory compliance with all the requirements given herein may be used without further testing upon written permission of the Engineer. Test reports for previous rests shall be available before approval can be given.

During construction aggregates shall be sampled at weighing hopper to determine compliance with the provisions of the Specification. Test shall be made in accordance with the applicable ASTM Standards. Routine control test and analysis of aggregates at various stages in processing, transporting, stockpiling, redraining, and batching shall be made by the Contractor. The Contractor shall provide such facilities as may be considered necessary for the counter test and supervision to be made by the Engineer.

CLASSIFICATION AND PROPORTIONING OF CONCRETE MIXTURES

(1) Classification and Design Mixture

The mixtures for all classes of concrete shall be designed by the Contractor and approved by the Engineer to obtain the compressive strength at the age of twenty eight (28) days as specified below.

Class	Minimum Aggregate Size (inch)	(mm)	1 Minimum Compressive Strength (psi eq.)	(kg/cm^2)	Maximum Water/Cement Ratio (%)	Minimum Cement Content (kg/m^3)	Allowable Slump (cm)
A	1-1/2	40	3,000	210	60	300	7 – 9
B	¾"	20	3,000	210	60	320	10 – 12
BB	¾"	20	3,500	240	55	350	5 – 8
C	1-1/2	40	2,500	180	55	250	5 – 7
D	1-1/2	40	2,000	140	60	200	5 - 10

Class A Concrete for ordinary structural members having more than 22 cm thick with clear space between reinforcing bars not less than 10 cm.

Class B Concrete for reinforced members such as thin wall, slabs, beams etc., less than 22 cm thick and concrete block-out (secondary concrete) with clear space between reinforcing bars less than 10 cm.

Class BB Concrete for pre-cast structures such as concrete flume, concrete pipes, etc.

Class C Concrete for canal lining, plain and massive structure section.

Class D Dental works, leveling structure, backfill concrete and foundation concrete.

Design of mixture by the Contractor shall be completed and submitted for approval of the Engineer not later than 45 days prior to use of the respective class of concrete for the contract works.

The Contractor shall at his own expense adjust mix proportion by trial mix depending on the physical properties of aggregates, moisture content, brand of cement, etc. subject to the direction of the Engineer.

(2) Aggregate Content

Concrete mixture shall be designed to use the largest size and the maximum amount of coarse aggregate as practicable for the intended use of the concrete.

(3) Consistency

The amount of water to be used in the concrete shall be regulated as required to secure concrete of the proper consistency and to adjust for any variation in the moisture content or grading of the aggregates as they enter the mixer.

It shall be of such consistency that it will flow around reinforcing steel bars, but individual particles of the coarse aggregate when isolated shall have coating of mortar containing its proportionate amount of sand. The consistency shall be gauged by the ability of the equipment to properly place it and not by the difficulty in mixing or transporting. Addition of water to compensate for stiffening of the concrete before placing shall not be permitted. Uniformity in concrete consistency from batch to batch will be required.

(4) Not withstanding the approval of the Engineer of the design mixtures and minimum cement content for different classes or gradation of aggregates, the Contractor shall be responsible that all the concrete meet the designed strength.

SAMPLING AND TESTING OF CONCRETE

The Contractor shall at his expense perform sampling and testing of concrete materials in accordance with the latest Japanese Industrial Standards and the Manual of Concrete Quality Control to be prepared by NIA.

All the tests designated in the manual shall be carried out at the Project site by the Contractor under the direction of the Engineer. The Contractor shall furnish all materials and labor for testing and shall provide own laboratory, tools and equipment for testing except compression machine.

Concrete sampling shall be carried out during concrete operations at the rate of one standard sample for each 75 cubic meters of concrete or fraction thereof placed during each continuous placing operations but in no case shall there be less than one sample for each day of concreting. Each standard sample shall consist of three (3) standard cylinders 6 inch (15 cm) diameter by 12 inch (30 cm) high.

The Contractor shall keep a record of the samples and the portion of the structures and volume represented which shall be available to NIA on demand.

Superintendents, testing equipment and tools t be provided by the Contractor for quality control of the construction shall be subject to the prior approval of the Engineer.

FAILURE TO CURE

The Engineer shall have the authority to suspend the work wholly or in part, by written order, for such period as he may deem necessary for failure on the part of the Contractor to perform proper curing of the concrete work and to withhold payment for the corresponding work pending result of test, that shall subsequently be made on these concrete works. The contractor shall immediately secure core samples of such members and from parts of the structure as shall be designated by the Engineer and shall have them tested in a Testing Laboratory approved by the Engineer. If the results of test are found satisfactory, payment of the concrete in question shall be made and the work ordered be resumed, but if the results of tests are unsatisfactory to meet the structural requirements, the Contractor shall replace such parts at his own expense.

FAILURES TO MEET SPECIFIED STRENGTHS

If the specified strengths have not been met, the Contractor shall remove and replace the concrete concerned or take such other remedial measures as the Engineer order, all at his own expense.

Before proceeding with the remedy, the Contractor shall subject for approval of the Engineer details of the action proposed to ensure that the concrete and steel to be placed in the works will comply with the Specifications.

PROTECTION OF CONCRETE WORKS

The Contractor shall protect all concrete against injury until final acceptance by NIA. Final acceptance shall be considered to mean acceptance of the whole after the Contract has been completed or satisfactorily terminates.

MEASUREMENT AND PAYMENT

(1) Concrete

Measurement and payment of concreting works shall be made separately for every class specified in the Bill of Quantities. Measurement for payment of concreting works for each class shall be made by volume in cubic meter for respective items of various works in the Bill of Quantities, unless otherwise stipulated. It shall be computed to the neat lines as if these works were constructed to the details shown on the Drawings or as established by the Engineer. In measuring concrete for payment, volume of all cavities, depressions, openings, embedded wood works and metal works, except reinforcement bar, anchor bolts and bars, and dowel bars, will be deducted.

Payment for concrete works measured as provided above shall be made at the unit prices per cubic meter bid therefore in the Bill of Quantities, which price and payment shall include the cost of all labor, materials and equipment, furnishing and handling of cement, aggregates and admixtures, mixing hauling, placing and finishing concrete furnishing of forms and subsequent removal of form works and necessary false work (unless otherwise stipulated), construction of joint (excluding furnishing and placing such joint materials as waterstops, dowel bars, etc., as specified in Section XVI "Concrete Joints and Joints Materials"), dewatering and keeping dry during pouring concrete, and all necessary items incidental thereto for the successful completion of the work described in the Drawings and these Specifications, except for payments for furnishing and placing reinforcement bars and joint materials which shall be separately made at appropriate unit prices therefore in the Bill of Quantities.

ROAD SURFACING

SCOPE

The work under this section shall consist of quarrying which includes clearing and grubbing [if necessary] including acquisition of necessary right-of-way and access thereto by the contractor of the quarry areas he has chosen or as suggested by the engineers in the project area, stockpiling, loading, hauling, dumping and compaction of road surfacing materials into roadway including the furnishing of equipment supplies, labor and tools, all in accordance with these specifications and in conformity with the lines, grades, and typical section shown on the drawings.

MATERIALS

Road surfacing materials for roadway shall consist of pitrun gravel, talus rock, volcanic cinders, sand collars, or other similar granular materials selected under the direction of the engineer. Oversized materials, if any, shall be removed at the borrow pit by screens or handpicking expert that if the materials is such that it will break under rolling, the engineer may permit the breaking down to the required size in the road. If necessary to obtain proper uniformity, additional materials shall be blended by mixing in the roadway. The Contractor if he so chooses, may crush the oversized materials in lieu of washing it. Road surfacing materials shall meet the following requirements.

Sieve Designation [Square Mesh Sieve]	Percent Weight Passing
No. 4	25-45
No. 200	5-12

The portion of the filler passing the No. 4 sieve, including blending filler for top coarse materials shall have a plasticity of 6-20 as determined by ASTM Designation D424-39.

Source of road surfacing materials may be those indicated on the Drawing or those suggested by the engineer in the project area. The contractor shall clear and grub the sources of road surfacing materials strip over-burdens and dispose all waste materials from said clearing and grubbing or stripping operations by the engineer.

METHOD OF CONSTRUCTION

1. Sub-grade Preparation
    a. New Roadway

        Surfacing of canal embankments or protection dikes for roadway shall be performed after operations for the construction of said embankments or protection dikes are completed.

        All compacted embankments that are prepared for roadway sub-grade shall be tested of its uniformity and degrees of compaction before road surfacing materials are placed.

    b. Existing roadways

The contractor shall prepare the sub-grade of existing roadways before surfacing materials needed in upgrading roadways are to be placed.

2. Placing, Rolling, and Grading of Road Surfacing Materials.
    a. Method of Placing

    All road surfacing materials shall be placed simultaneously with the road shoulder materials on the prepared sub-grade for road directed by the engineers.

    b. Spreading and Grubbing]

    Spreading shall be done manually or mechanically at the option of the Contractor, in such a way that segregation of size will be avoided and such that the road surfacing materials shall not be mixed with the road shoulder materials, spreading shall be performed subsequently after every dumping. Whether to spread first the road surfacing materials within the limits of the road bed before spreading the road shoulder materials or vice versa or simultaneously shall be at the option of the contractor provided that the said materials will not mixed. If additional filler materials shall mixed with loosely spread road surfacing materials by ay method the contractor may apply provided a satisfactory uniform mixture is obtained before compaction. Quantity of filler materials shall be such the blend of added and original materials placed shall meet grading quality requirements in all respect.

    c. Rolling

    Compaction operations shall only be started when ordered by the engineer, after the above operations have been duly inspected and verified by the engineers or his authorized representative. The road surfacing and road shoulder materials shall be compacted simultaneously. All materials shall be compacted to the full width of the roadway by rolling. Rolling shall progress gradually from the sides to the center, parallel with the center line of the road lapping each preceding rolled track by one half the width of the roller. Rolling shall continue until the desired degree of compaction is attained. Any irregularities or depression that develop under such rolling shall be corrected by loosening the materials at these places and adding or removing materials unit such surfaces are smooth and uniform.

    Road surfacing materials shall be compacted to achieve density of 95% of the maximum dry as determined in the modified Proctor Test using the CBR [15 cm mould].

    Watering of the materials shall be carried out prior to compaction to ensure that the materials is at or close to its optimum moisture content as required for embankment fill.

    Placing, spreading, grading and compaction will not be measured for payment. Cost of these works shall be included in the contract unit price for road surfacing materials.

METHOD OF MEASUREMENT

Road surfacing materials will be measured in cubic meters in its final compaction position, satisfactorily placed and accepted and computed by the Average End Area Method for every 20 meter station. Before acceptance is to be made, the average actual thickness of road surfacing materials compacted shall be determined by the Engineer by means of a boring test at reasonable intervals. In no case shall thickness of road surfacing materials at any point be less than that specified in the drawings.

BASIS OF PAYMENT

Road surfacing materials measured as provided above shall be paid at the contract unit price per cubic meter, which price and payment shall constitute full compensation furnishing.

STRUCTURE EXCAVATION

SCOPE

Structure excavation includes the removal of all materials within the structure lines including necessary dewatering operations not otherwise specified. It shall also include additional excavation within the vicinity of the structure in order to shape the ground shown on the Drawing or as directed by the Engineer.

LASSIFICATION

Structure excavation shall be classified in accordance with paragraph 402.

CONSTRUCTION REQUIREMENTS

All excavation requirements described 403 are applicable under this section.

METHOD OF CONSTRUCTION

All structure where practicable shall be constructed in open excavation. The method of construction or excavations shall be in accordance with the applicable provisions of paragraph 404 and the following requirements.

Foundation shall be excavated according to the outline of the footing and floors of structure as shown on the Drawings or as directed by the Engineers, and shall be of sufficient size to permit free movement of workers.

On excavation of common materials the foundation bed upon which structures are to be placed shall be finished accurately to the established lines and grades after a thorough compaction and trimming of the foundation with the use of suitable tools and equipment. As soon as the foundation excavations have been trimmed to their final level, it should be protected from degradation by weathering. Should the foundation materials soften exposure then the soft materials shall be removed and replaces at the Contractor's expense. If at any point, material is excavated beyond the lines and grades of any part of the structure, the over-excavation shall be more filled with selected materials approved by the engineer and shall be placed in the layers of not more than 20 centimeters think, moistened and thoroughly compacted by special roller mechanical tempers or by other approved methods. A density not less than 90% of the maximum dry density determines by ASTM test D-698 is required. The cost of filling over-excavation ordered by the Engineer shall be borne by the contractor.

On excavation of rock materials, the bottom and side surfaces of excavated rock excavation upon or against which concrete and weep holes are to place shall conform to the required grades and dimensions as shown on the drawings or as established by the engineer. If at any point, materials are excavated beyond the required limits the over-excavation shall be filled with concrete at the expense of the Contractor including the cost of all materials required.

When concrete is to be placed upon or against rock, the excavation shall be of sufficient dept to provide for the minimum thickness of concrete at all points and any deviation from the

required minimum thickness of concrete shall be avoid as much as possible. The surface on which concrete will be laid shall be trimmed ad thoroughly cleaned as directed by the engineer.

When excavation of rock materials reaches the surface upon or against which concrete is to placed, blasting

On excavation of rocks materials, the bottom and side surfaces of excavated rock excavation upon or against which concrete and weep holes are to be placed shall conform to the required grades and dimensions as shown on the drawings or as established by the engineers. If they filled with concrete at the expense of the contractor including the cost of all materials required.

When concrete is to be upon or against rock, the excavation shall be of sufficient dept to provide for the minimum thickness of concrete at all points and any deviation from the required minimum thickness of concrete shall be avoided as much as possible. The surface on which concrete will be laid shall be trimmed and thoroughly cleaned as directed by the Engineer.

When excavation of rock materials reaches the surface upon or against which concrete is to be placed, blasting shall be stopped and the remaining mass of rocks shall be carefully removed by means of jack-hammer or any appropriate hand tool. The point beyond which blasting will not be allowed shall be determined by the engineer. All damages to the rock foundation caused by improper blasting operation shall be repaired by the contractor at his own expense in a manner acceptance to the engineer.

All foundations for bridge pier footing shall be excavated to such depths as may be necessary to secure stable bearing for the structure. Whenever the safe bearing power of the soil as uncovered is less that that called for on the drawing, pilings or appropriate spread footings will be used. The elevations of the bottoms of footings, as shown in the drawings shall be considered as approximate, and the engineers may order, in writing, such changes in elevations and dimensions of footings as may be necessary to ensure a satisfactory foundations. Bearing test, upon written order of the engineer, shall be taken to determine the supporting power of the soil. Cost of bearing test will be paid as “Extra work”.

If, in the opinion of the engineer, the material at the base of the excavation is unsuitable for the foundation he shall instruct the contractor to either a] carry out additional excavation to a depth of 50 cm. below the proposed bottom of concrete shown on the drawings and to maximum depth of 60 cm. outside of the outermost lines of said base and replace with backfill compacted to at least 90% of the maximum dry density or b] strengthen the soft materials by ramming in gravel and cobbles until a firm foundation is obtained. Measurement and payment for the backfill shall be made under section XII, “Structure backfill”.

METHOD OF MEASUREMENT

Structure excavation shall be measured by the cubic meter in its original position before being excavated in accordance with the drawings, or as may be ordered by the engineer, no excavation beyond the pay lines shown on the drawings will be measured for payment. For canal structures, the limit of measurement along the lines perpendicular to the flow of water shall be the vertical planes at the outer edges of the inlet cut-ff walls. The upper limits of the solid, measured for payment shall be the canal bottom for canal structures of the original ground surface in case of diversion structures. The lower limits shall be the bottom of the required

excavation. Excavated materials not vertically above the boundaries as specified above shall not be measures for payment. The volume measured shall not include water and other liquids removable by pumping. Such materials as mud, quagmire and other similar semi-solid not removable by ordinary pumping shall be considered pay quantities and shall be measured and paid for as "Structure Excavation".

However, in case of structure excavation for canal structures is done before canal excavation, the upper limit of the solid measured for payment shall be the original ground surface in accordance with the surface in accordance with the structure excavation pay lines.

BASIS OF PAYMENT

The volume measured as provided above will be paid per cubic meter, which price and payment shall constitute full compensation for furnishing all materials, supplies, labor, equipment, tools and accidents and subsidiary works necessary to complete the work described under this section.

For diversion works, canal siphons and bridge structure excavations, the cost of the dewatering operation unless otherwise specifies in the Bill of Quantities shall be paid under a separate item in the Bill of Quantities. For all other structure excavations, dewatering operations involved are considered subsidiary work and the cost thereof shall be considered included in the unit price of structure excavation.

The contractor shall be paid sixty percent [60%] of the pay quantities of the actual excavation acceptably accomplished in accordance with the pay lines as shown on the drawings or as directed by the engineer. The remaining forty percent [40%] will be paid upon pouring of concrete for the foundation or upon placing the riprap, gravel blanket or grouted riprap in accordance with drawing and specifications.

STRUCTURE BACKFILL

1. SCOPE

The work under this section shall include hauling (if necessary) and backfilling with suitable materials taken under from Structure Excavation , Side Borrow or Borrow Haul all spaces excavated and not occupied by the structure and spaces between the natural ground surface and the finish lines indicated to be filled and all other sections directed to be filled by the Engineer, all in accordance with these specifications and in conformity with the lines, grades and dimensions shown in the Drawings or as ordered by the Engineer. It shall also include the dewatering and removal of all suitable materials as ordered by the Engineer from the spaces to be backfilled or filled.

2. METHOD OF CONSTRUCTION

All spaces to be backfilled or filled shall be cleared of all rubbish and other objectionable matter. The excavation pit to be backfilled shall dewatered and all mud and loose materials shall be removed before backfilling. The filling materials, with the proper moisture content determined by the Engineer, shall be deposited loose and layers not exceeding 30 centimeters and then thoroughly compacted by ramming, rolling or by means of mechanical tampers or portable vibratory compactors to obtain at least 85% compaction behind bridge abutments, retaining walls, cut-off walls and immediately above pipes, box or barrel conduits and gradually increasing to at least 90% compaction p to the surface of the roadway in the case of approaches to bridges, road crossing or Culvert Structures. The time when to start backfilling operation shall be determined by the Engineer.

3. METHOD OF MEASUREMENT

Structure backfill shall be measured by the cubic meter in its final compacted and uncompacted position within the limits of structure excavation paylines and surfaces of concrete in contact with the backfilled materials as shown on the Drawings or as directed by the Engineer. Volumes occupied by the structures and other features will not be included

4. BASIS OF PAYMENT

Structure backfill will be paid for at the contract unit price per cubic meter, which price and payments shall constitute full compensation for the side borrow, borrow haul and overhaul operations and for furnishing all labor, equipments, tools and all incidentals and subsidiary works necessary for the successful completion of the work under this Section.

STRUCTURE BACKFILL WITH COMPACTION

1. SCOPE

The work under this section shall include hauling (if necessary) and backfilling with suitable materials taken under from Canal Excavation , Side Borrow or Borrow Haul all spaces excavated and not occupied by the structure and spaces between the natural ground surface and the finish lines indicated to be filled and all other sections directed to be filled by the Engineer, all in accordance with these specifications and in conformity with the lines, grades and dimensions shown in the Drawings or as ordered by the Engineer. It shall also include the dewatering and removal of all suitable materials as ordered by the Engineer from the spaces to be backfilled or filled.

2. METHOD OF CONSTRUCTION

All spaces to be backfilled or filled shall be cleared of all rubbish and other objectionable matter. The excavation pit to be backfilled shall dewatered and all mud and loose materials shall be removed before backfilling. The filling materials, with the proper moisture content determined by the Engineer, shall be deposited loose and layers not exceeding 30 centimeters and then thoroughly compacted by ramming, rolling or by means of mechanical tampers or portable vibratory compactors to obtain at least 85% compaction behind bridge abutments, retaining walls, cut-off walls and immediately above pipes, box or barrel conduits and gradually increasing to at least 90% compaction p to the surface of the roadway in the case of approaches to bridges, road crossing or Culvert Structures. The time when to start backfilling operation shall be determined by the Engineer.

3. METHOD OF MEASUREMENT

Backfill with Compaction shall be measured by the cubic meter in its final compacted and uncompacted position within the limits of structure excavation paylines and surfaces of concrete in contact with the backfilled materials as shown on the Drawings or as directed by the Engineer. Volumes occupied by the structures and other features will not be included

4. BASIS OF PAYMENT

Backfill with Compaction will be paid for at the contract unit price per cubic meter, which price and payments shall constitute full compensation for the side borrow, borrow haul and overhaul operations and for furnishing all labor, equipment, tools and all incidentals and subsidiary works necessary for the successful completion of the work under this Section.

RUBBLE MASONRY

SCOPE

The work under this section shall include furnishing all materials, supplies, tools and equipment; construction of all necessary form work; placing rubble stone and concrete binder on an approved foundation and form work; the removal of forms and curing of the rubble masonry, all in accordance with the drawings and these specification or as directed by the engineer.

MATERIALS

Rubble stones consists of filed stones that are cleans, sound durable, resistant the action of water, and must have specific gravity of at least two and six tenths [2.6], and diameter ranging from 15 centimeters to 60 centimeters, sixty percent[60%] which comprises the bigger sizes. Stones shall have the prior approval of the engineer before their use. Materials for concrete binder shall be in accordance with the applicable provisions of Section XV. Concrete binder shall be Class "A" concrete with 37.50 millimeters maximum size of aggregates.

METHOD OF CONSTRUCTION

Preparation and handling of the concrete binder shall been in accordance with section XV. The stones shall be thoroughly wet before they are installed in place. The entire surface of every stone shall be thoroughly covered with concrete binder. In general, one cubic meter of rubble masonry will require one-half cubic meter of concrete binder. Actual variation in this proportion will not entitle the contractor to any price adjustment. It is expected that the whole rubble masonry especially in the case of dam and apron as well as other structures should be well encased and covered by the concrete so that it forms the heating of the body of dam and apron and will act contiguous with the concrete shell. This can be achieved by tamping the stones into the concrete using heavy wooden blocks handled by one or two people. After the bed has been prepared as required the first layer of mortar should be laid and rubble embedded in them. The thickness of mortar should be such that each rubble embedded at least 50% of its longest dimension in the mortar so that when the next layer of mortar is poured the rubble which has been embedded is not disturbed. The next layer of boulders can be arranged in the mortar now placed following the same procedure. This will ensure that all the boulders are fully covered with mortar and they are well entrenched and stable in the mortar so that they are not disturbed when subsequent layers of mortar stones are poured. The stones shall be well set such that no stone will protect beyond the lines on the drawings.

The concrete binder shall be properly worked into the spaces between stones so that no void is left within the rubble masonry. In case reinforcements are placed, no stone shall be closer than four inches [10 centimeters] to the nearest reinforcing bars. Rubble masonry shall be cured by water for five days.

The general construction procedure should be always to start from lowest elevations so that the sub-grade on which the concrete is laid is not disturbed by the seepage forces when concrete is laid is not disturbed by the seepage forces when the higher layers are excavated and prepared for concrete pouring.

In situation when rubble masonry is directly constructed on the sub-grade should be prepared exactly as for any other concrete structures. In these cases, also the first layer can consist of concrete of 15 centimeters thickness in the case of minor structures and 20 centimeters in the case of major structures. The concrete manufacture etc. will be as specified under section XV and the strength will be as of Class "A" concrete.

METHOD OF MEASUREMENT

"Rubble Masonry" will be measured in cubic meters in its final position based on the treat lines of the structure as shown on the drawings.

BASIS OF PAYMENT

The volume measured as provided above will be paid at the contract unit price per cubic meter, which price and payment shall constitute full compensation for furnishing all materials, supplies, labor, tools, equipment and all incidentals or subsidiary works necessary for the success completion of the work described under this section.

GROUTED RIPRAP

SCOPE

The work under this section shall include furnishing and placing appropriate sizes of stones or spalls for riprap and grouting the riprap with cement mortar, in accordance with the drawings and these specifications or as directed by the engineer. The stones and spalls be obtained from quarry areas or stockpile areas designated by the engineer.

MATERIALS

Stones for riprap shall be least 15 centimeters in diameter and shall be sound, tough, durable , dense and resistant to the action and water with a specific gravity of a least two and six tenths [2.6].

Mortar for grouted riprap shall consists of one part cement to three parts sand by volume and sufficient water to produce a thick and creamy moisture conforming to the provisions of Section XV, Concrete.

METHOD OF CONSTRUCTION

a. Non-sloping Grouted Riprap

The foundation bed shall be moistened, well compacted and brought to the required elevation. The stones be well laid with close joints by hands. The stones shall be well arranged in such a manner that the stones can resist disturbance. If big spaces occur between stones and formation bed said spaces be well packed with spall of appropriate sizes or stones. The stones so arranged shall be moistened before placing the grout. All spaces between the stones shall be completely filled with grout from bottom to top and the surfaces swept with stiff broom. The first layer shall consists of at least 15 centimeters mortar and the boulders should be embedded in this mortar. Thus the mortar poured is worked into the intercises so that the whole mass of boulders from bottom to top is covered and connected with mortar and will act as one mass. The grouted riprap shall be cured with water for a minimum period of three [3] days.

b. Sloping Grouted Riprap

The slopes where the grouted riprap is going to be constructed should be well cured and compacted and trimmed to the required grade and elevation. If the grouted riprap is on the slopes of the embankment, the embankment to the required degree of compaction. The layer of 15 centimeters thick mortar should be laid to a height of 60 centimeters to 90 centimeters and to a length which can be handled conveniently so that there is no initial set of mortar. The stones shall be well laid with close joints by hand and shall be well arranged in such a manner that the stones can resist disturbances. If big spaces occur between stones and formation bed, said spaces shall be well packed with spalls of appropriate sizes of stones. The stones so arranged shall be moistened before

placing the grout. This will act as base to the subsequent lifts. The next lift can be 1 to 1.25 meters height. Thus the whole sloping grouted riprap should be constructed in 1 to 1.25 meters height lifts at a time. All spaces between the stones shall be completely filled with grout from bottom to top and the surfaces swept with stiff broom. Thus mortar poured is worked into the intercesses so that the whole mass of boulders from bottom to top is covered and that the whole mass boulders from bottom to top is covered and connected with mortar and will act as one mass. The grouted riprap shall be cured with water for a period of three [3] days.

The general construction procedure should be always to start from lowest elevations.

METHOD OF MEASUREMENT

Grouted riprap will be measured by the number of cubic meter of materials acceptably placed and computed based on the neat lines as shown on the drawings.

BASIS OF PAYMENT

The volume measured as provided above shall be paid at the contract unit price per cubic meter, which price and payment shall constitute full compensation for furnishing all labor, tools, equipment, supplies and materials and all incidentals or subsidiary works necessary for the successful completion of the work described under this section. Excavation involved under this section is not considered a subsidiary work, hence, it will not be measured for payment under this section. Rather, it will be measured and paid for under "Structure Excavation".

STEEL GATES AND LIFTING MECHANISM

SCOPE

The contractor work calls for the fabrication supply delivery and installation supervision of steel gates, stop log, lifting mechanism embedded part including all accessories and field painting all in accordance with these specifications and the drawings.

STANDARD AND SPECIFICATION

All materials and equipment to be incorporated in the works shall conform to the latest applicable standards and specifications established and adopted in the country of manufacture of the materials and equipment.

Reference to standards and specifications or to materials shall be considered as followed by the words "or equivalent". Contractor may propose equivalent standards, specifications and materials which shall conform to that specified.

If contractor proposes equivalent standards and specifications or equivalent materials, Contractor shall state the exact nature of the change, and shall submit complete standards and Contractor shall state the exact nature of the change and shall submit complete standards and specifications of materials for the approval of NIA.

Such submittals shall be along with the bid and failure to do so, or purchase of any proposed equivalent materials prior to approval of NIA, will end at the Contractor's risk.

Abbreviations of the titles of officials' bodies which issue standard or specifications whenever referred to in these specifications are as follows:

ASTM	-	American Society for Testing Materials
AISC	-	American Institute of Steel Construction
AISI	-	American iron and Steel Institute
ANSI	-	American National Standards Institute
AISE	-	Association of Iron and Steel Engineers
AWS	-	American Welding Society
JIS	-	Japanese Industrial Standards
SSPC	-	Steel Structures Painting Council
AGMA	-	American Gear Manufacturers Association
SAE	-	Society of Automotive Engineers

MATERIALS

a. General

All materials shall be new and shall be the test be the best available for the purpose for which they will be used considering strength, ductility, durability for the intended service and best engineering practice.

Materials to be used for the various components of gates and hoists shall conform to the following specifications:

Components	Materials	International Specification
Fixed wheel gates frames, girders, sill beam, rail beams, guide frames, seal clamps and other miscellaneous fabricated parts.	Structure Steel	ASTM A-504/A-148 Specifications for Structural Steel
Gate Wheels and Guide Rollers	Wrought Steel	ASTM A-504/ A-148 Specifications for Wrought Carbon Steels
Wheel pins	Corrosion Resistant Steel	ASTM A-276 Specifications for Hot-Rolled and cold finished corrosion resisting steel bars Type 316.
Seal seats and clamp plates	Corrosion Resistant Steel	ASTM A-240 Specifications for Chromium-Nickel Stainless Steel Plate, Sheet and Strip
Standard steel bolts, nuts and washers	Galvanized Steel	ASTM A-307 Specifications for low Carbon Steel Externally Threaded Fasteners
High strength steel bolts, nuts and washers	Carbon steel	ASTM A-325 Specifications for Steel bolts and studs with suitable nuts and plain washers
Rope drum	Cast steel	ASTM A-27/ ASTM A-36 Specifications for mild to medium strength carbon steel castings for General Applications

Gears/ Pinions	Cast Steel / Forged Steel	ASTM A-27/ ASTM A-291 Specifications for Alloy and Carbon Steel Forgings for Gears and Pinions.
Worm Gears	Case hardened Ground steel	AISI-3120
Iron casting		ASTM A-48, Class 30
Stems & Shaftings	Carbon steel	ASTM-A 108, Grade 1018 or Grade 1117 Specifications for cold finished carbon steel bars and shaftings
Wire rope	Improved plow steel	R R W-410 Federal Specifications
Bronze bushings, bearings, washers	High Lead Tin Bronze or Manganese Bronze	ASTM B-144 or B-147
Covers	Mild Steel	ASTM A-36
Bronze casting for lift nut, thrust nut	Manganese Bronze	ASTM B-147 Specifications for Manganese Bronze Sand Castings- Alloy BA
Anti-friction Bearing		Ball & Roller Bearings shall be equivalent to those manufactured by SKF Industries.
Gear Housing Oil Seals		Spring loaded and made of synthetic compound enclosed in a metal retainer, "Synthetic Seals
Lubricating Fitting		Alemite type 1610-3 or equivalent

Rubber Seal

The rubber seal shall be molded from the natural or synthetic rubber containing not less than one percent by weight of copper inhibitor and shall have the following physical properties:

Property	Limit	ASTM- Test
a. Shore A Durometer Hardness	65+ -r – 5	D-675
b. Minimum Elongation	450 percent	D-412
c. Uttimate Tensile Strength (min.)	14.5 N/ sq. mm	D-412
d. Water Absorption (70 degrees C-7 days	Less than 10% by weight	D-417
e. Tensile strength after accelerated ageing test of 48 hours in oxygen at 70 degrees C and 2.1 N/sq. mm pressure	80 or more percent of strength before ageing	D-572
f. Compression Set (Max.)	30 percent	D-395

B. Test of Materials

i. All materials, supplies, parts assemblies used for the work to be done these specifications shall be tested according to modern approved methods for the particular type and class of work. Certified copies in triplicate of the tests made and results thereof shall be made available to NIA as soon as possible. The data shall be in such a form as to provide means of assessing compliance with the applicable relevant specifications for the material tested. The contractor shall state in his tender the place of manufacture, testing, inspection of the various components of the work included in the contract.

ii. Wherever required, at the discretion, NIA may nominate an Inspector to inspect the test or trials on their behalf. Sufficient notice must be given by the Contractor to the Inspector to enable him to reach the site of tests/ trials except the pay and expanses of the Inspector shall be included in the quoted price. All authorized representatives of NIA shall have free access to the work premises of the contract at all reasonable times and shall be provided by the Contractor full facilities and safety to inspect the process of manufacture and the materials used. NIA will reject any materials/ work that in their opinion do not conform to the specifications and will order the same to be removed and replaced or altered at the expense of the Contractor to conform to the specifications.

iii. If materials are not referred to in the applicable Standard Specification but are required to have certain and / or chemical properties, such properties shall be checked by two chemical samples for each 5 tonnes of materials and fractions thereof in each lot. For lots less than 250 kilograms, Contractor's warrants will be acceptable in lieu of actual tests provided heat treatment of the fabricated parts using such materials is not required. A lots shall consist of all materials is from the same melt and on which any subsequent heat treatment has been performed at the same conditions. Not more than two heat treatment to attain physical properties shall be permitted.

iv. Notwithstanding the above tests, examination and inspection, the contractor shall be responsible for the acceptability of the finished work.

C. Manufacturing/ Fabrication Program

i. The fabricator/ manufacturer shall prepare a manufacturing/ fabrication program in Bar Graph Form showing the activities and its sequencing in sufficient details such that the contract works can be properly monitored from commencement to completion.

ii. The fabricator/ manufacturer shall submit said within thirty [30] calendar days after the date of receipt of Notice of Award.

iii. The fabricator/ manufacturer shall show the target dates for commencing and completing the principal activities as required in the contract works including but not limited to the following;

a. Procurement of materials and the like
b. Fabrication and manufacture
c. Painting
d. Delivery dates

D. Pre-fabrication Inspection Woks

i. The fabricator / manufacturer shall be required to submit mill and/ or manufacturer's certificate for the steel materials, welding electrode, paints, etc. intended for use in the works

ii. Materials to be used in the fabrication shall be adequately sampled and tested to check its compliance with the specification/ standard requirements.

iii. No fabrication work and /or use of materials in such works shall commence unless materials for said works are duly inspected, tested, and certified by NIA or his authorized representatives as to conformity with the specification/ standard requirements.

iv. NIA technical inspector shall prepare and submit inspection and acceptance report on materials for use in the fabrication works.

E. Inspection Works during Actual Fabrication

1. The NIA should assign knowledgeable and experienced technical inspectors, to conduct inspection.
2. The NIA's authorized technical inspector shall be entitled at the reasonable time free access to the manufacturer's/ fabricator's plant to conduct inspection during fabrication, to ascertain that all the works shall comply in all aspect with the standards and requirements set forth in the contract documents.
3. The NIA technical inspectors shall monitor progress and conduct of the fabrication works and prepare and submit progress report on said works at regular intervals.

F. Final Inspection Works

1.)Intake Gates, Main Canal Gates, Lateral and Turnout Gates

i. The NIA technical inspector shall conduct final inspection based on the approved fabrication drawings and specifications.

ii. The gates should be properly marked with the corresponding identification as per approved schedule of dimension such as of gate, laterals, stationing for proper identification by the end user.

2.)Sluice Gate, Barrage, Stop log and Radial Steel Gates

i. The NIA technical inspector should see to it that all component parts should be properly pre-assembled at the fabricator's/manufacturer's shop to ascertain the proper fitness of all adjoining parts and should be properly punch mark before disassembling for guidance and reference during field installation.
ii. The NIA shall issue certificate of pre-delivery inspection and acceptance of completed fabrication works as a basis for the final inspection and acceptance by the field of deliveries made at the site.

3304 WORKMANSHIP

A. General

i. All works shall be performed in accordance with the best modern practice of the manufacturer of high grade machinery. All parts shall have accurately machined mounting and bearing surfaces so that they can be assembled without filing, chipping, or remachining. All parts shall conform accurately to the design dimensions and shall be free from any defect in workmanship or materials that will impair their services. All attaching bolt holes shall be accurately drilled to the layout indicated on the approved drawings. The steel gates shall be completely shop assembled to insure the proper fit and adjustment.

B. Welding

i. General

Whenever welding is specified or permitted, the electric arc welding process, manual or machine welding shall be used.

Contractor shall provide adequate amount of materials for each type of welding and shall specify the materials on all relevant drawings. Contractor shall also provide detailed drawings showing joint preparation required for each type of welding to be carried out on the site.

ii. Preparation

The parts to be joined by electric welding shall be cut precisely to the correct size by machine methods suitable for the type of weld to be used and to allow the proper penetration and good fusion of the weld with the base metal. The cut surfaces shall not have visible defects such as scabs, superficial defects caused by shearing or torch cutting operations or any other damaging effect. The surfaces of a 40mm wide strip on each side of the plate adjacent to the edge and the edges to be welded shall be free from rust, oil, grease and other foreign matter.

iii. Lamination

Any plate in which lamination has been discovered after cutting shall be rejected unless the laminated portion of plate is local and can be cut out and replaced by the welding of a sound plate in the cut out area with the approval of NIA. Repaired surfaces shall be ground smooth to assure neat appearance.

iv. Welding methods and Welder's Qualifications

The welding method that would be employed by the Contractor shall be submitted to NIA for approval. Welds shall be balanced as far as possible to minimize distortion. Welding shall conform to AWS D1.1, Parts Procedures [Welding of Stressed Structural Components] not only with regard to workmanship but also with regard to qualifications of welders. Welders should be certified in the trade and such certification shall be submitted to NIA.

v. Electrodes

Contractor shall indicate on all detailed drawings the type and size of electrode he proposed for use for shop and/or field welding.

In general, welding electrodes for structural steel shall conform on Table 1.17.2 of the AISC Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.

Contractor shall provide the net quantity plus ten percent [10%] of each type of electrode required to complete each field welded joint.

C. Non-Destructive Testing

i. General

All tests shall be conducted with the approval of NIA and the cost of test shall be borne by the contractor.

Radiographic, ultrasonic, magnetic particles or liquid dye penetrant tests shall be conducted on components as specified below. Where ultrasonic or magnetic particle tests indicate the possibility of a flaw, the suspected part shall be tested by radiography. All flaws shall be removed by the thermal or mechanical gauging processed and replaced by welding. The replacement weld and contiguous part of the original weld, if any, shall then be tested radiographically. All radiographs shall become the property of NIA.

ii. Welds

Radiographic examination shall be applied to the whole length of butt welds in plate furnishing stressed members.

Ultrasonic examination shall be applied to all other stressed groove welds.

Radiographic and ultrasonic examination shall be in accordance with AWS D1.1, Section 6.

iii. Castings

Castings shall be of fine grain quality and the surfaces which do not undergo machining, particularly those of steel or iron in contact with water, shall be dressed smooth in the foundry with all joints blended into adjacent surfaces and shall be free from foundry irregularities, such as projections, ridges, hollows, honeycombing, pock marks, blow holes and crack or chip marks, so that they will not require surface smoothing operations prior to painting. All defects shall be fully explored and castings shall be repaired, plugged or welded to the satisfaction of NIA.

iv. Carbon Steel Plates and Shapes

Carbon steel plates, shapes bars, etc. for welded construction shall conform to materials specifications ASTM A-36, Steel shapes shall be in accordance with ASTM specification. Plates from which webs, flanges and other stressed members are cut shall be ultrasonically tested for laminations according to ASTM A-578 at the place of manufacture.

v. Forging

Forging shall conform to ASTM A-668 Class D and shall be free form defects affecting their strength and durability, including seams, pipes, flaws, cracks, scales, fins, porosity, hard spots, excessive non-metallic inclusions and segregations.

The largest fillets compatible with the design shall be incorporated wherever a change in section occurs.

Tools marks or tearing of the metal by the finishing tools will not be acceptable on the surface of fillets. Such marks if it occurs shall be removed by grinding or polishing. All finished or forging shall be smooth and free form tool marks.

All forging in excess of 150 mm diameter shall be subjected to examination internally for the detection of flaws and to heat treatment for the relief of residual stresses.

D. Fastenings

i. All screws, bolts, studs and nuts shall be of International Standard [metric] form of treads. Bolt heads and nuts shall be hexagonal recesses shall be provided in the head of countersunk head bolts and machine screws. The bolt length shall be such as to ensure that at least two full treads are projecting after nut has been tightened.

ii. Nuts and bolts for pressure containing parts shall be of best quality bright steel machined on the shank and bearing faces of head and nut.

iii. Where there is risk of corrosion, bolts shall be finished flush with the top of the nut after tightening, except in cases where the connected components are required to be frequently removed for replacement or adjustment when the bolts and nuts shall be of corrosion resisting steel or bronze.

All nuts shall be provided with washers, parallel or taper as appropriate. Mechanical locking devices of an approved form shall be provided where there is a possibility of nuts becoming loose due to vibration. Spring type washers will not be permitted where they maybe damaged any protective coating. Special locking compounds may be used as an alternative to mechanical devices subject to NIA approval.

E. Structural Work

i. Unless otherwise, specified, design and fabrication of structural parts shall conform to the applicable provisions of the AISC "Specifications for the Design, Fabrication and Erection of Structural Steel in Building" of the AISC "Code Standard Practice for Steel Building and Bridges."

F. Machine Work

All tolerances, allowances and gauges for metal shall conform to the ASA Standard B42, Tolerances, Allowances and Gauges for Metal Fits, for the class of fits as required.

Finished contact of bearing surfaces shall be true and exact to secure full contact. All holes or field assembly with bolts shall be accurately located and drilled for shop assembly. Journal surfaces

shall be polished and all surfaces shall be finished with sufficient smoothness and accuracy to insure proper operation when assembled. All drilled holes for bolts shall be accurately located and drilled from template.

PROTECTION OF MACHINED SURFACES

Machined finished surfaces shall be thoroughly cleaned of foreign matter. Finished surfaces of large parts and other surfaces shall be protected with wooden pads or other suitable means. Unassembled pins and bolts shall be oiled and wrapped with moisture resistant paper or protected by other approved means.

FABRICATION

a. General

All members shall be free from twist, bonds or other deformation, and all surfaces that will be in contact shall be thoroughly cleaned before assembling.

All parts shall be cut accurately to the dimensions shown on the drawings. All edges shall show sound metal, free from laminations, surface cracks and other injuries defects.

Bumping or heating will not be allowed. Parts shall be adjusted to fit and shall be firmly bolted or otherwise held securely together so that surfaces are in closer contact before welding is commenced. Close adherence to the dimensions and tolerance called for in the drawings required.

b. Straightening

Rolled materials shall be straight and true before being laid out or worked. Necessary straightening shall be accomplished by methods that will not injure the metal. Sharp kinks or bents will be considered causes for rejection.

c. Bending

Where to the proper curvature by cold forming, heating shall not be employed except with specified approval of the Administrator and special precautions, therefore shall be taken to avoid overheating. Prior to rolling or bending the plates, the edges shall be pressed properly to the correct curvature as determined by templates to produce continuity form the edges. Corrections of curvature by hammering will not be permittedbending or forming of plated or shapes is required, the plates or shapes shall be bent.

d. Shearing, Chipping and Flame- Cutting

All plates or shapes shall be cut accurately to shape and size, with the edges to be joined by welding formed properly to suit the selected type of welding and allow thorough penetration of the weld metal. Sheared edges shall be machined to a depth of not less than one-quarter of the thickness of the materials, to remove surface cracks caused by the shearing operation. Flame-cut edges shall be uniform and smooth and shall be free from loose scale and slag accumulations before being welded. Whenever possible, flame-cutting shall be guided by mechanical means. No materials shall be cut by electric arc. Chipping shall be done neatly and accurately and exposed edges, shall be smooth.

b. Preparation for Field Welding

All necessary chipping, grinding, leveling and other preparation for joints or splice to be made by field welding shall be done in the shop.

c. Punching

In punch works holes in materials having a thickness of less than three-quarter of an inch may be punched to full size. Holes in material having a thickness equal to or greater than three-quarter of an inch shall be drilled to full size. All holes shall be clean-cut, without torn or ragged edges.

d. Drilling, Reaming, Countersinking and Trapping

Unless otherwise called for on the drawings and except where reaming or tapping is required or where tight bolts are to be used, full sized drill and/ or reamed holes shall be not less than 1.59 millimeter not more than 2.38 millimeter larger than the nominal drilled and/ or reamed perpendicular to the face of the member and if necessary, shall be true and square with the holes. Outside burns shall be removed. Tapped holes shall be drilled to the proper diameter for the tap used and shall be tapped carefully so that the threads will be continuous, smoothly cut, and free form imperfection.

e. Tolerance

Contact faces of gates and guides shall not depart more than 1 millimeter from a plane surface. Bottom contact edges shall not depart more than 2 millimeters from the designated planes. Fits, tolerance and finish when not specified, shall conform to the best modern shop practice in the manufacture of finished products of similar nature shall be cleaned **and lubricated** with an approved oil or grease. After assembly each lubricating system shall be filled with an approved lubricant.

GENERAL DESCRIPTION OF THE INSTALLATION AND OPERATING ARRANGEMENT

A. Sluice Gates

Sluice gates as shown on the Drawings are to be installed to desilt the sluiceway. The gate shall be of fixed wheel type. Each gate shall consist of an upstream skin plate supported by vertical and horizontal stiffeners spaced at required intervals which in turn shall be supported by end vertical girders. Wheels are to be mounted on the end vertical girders and provided with necessary bronze bushings. The total horizontal load on the gate shall be transmitted through the wheels on to the wheel track plates on the piers with necessary embodiments. Rubber seals on side and bottom shall be provided on the upstream side of the gate to render the gate leak proof.

B. Intake Gates

i. Intake gates of different sizes as shown on the drawing are to be installed to regulate the flow of water through the intake. The gates shall be of sliding type. Each gate shall consist of downstream skin plate supported by vertical stiffeners spaced at required intervals and horizontal girders. The total horizontal load on the gate shall be transmitted to the vertical frame fixed on the piers with necessary embedments. The details of construction are shown in the NIA bid drawings.
ii. The gates are to operate at water level corresponding to normal and high flood level condition and the operation is hydraulically unbalanced.
iii. The gates are to be operated through manually operated pedestal lift with rising stem, of adequate capacity.

C. Flap Gate

a. General

Flap gates are to be installed to allow free flow through the gate and to close automatically to prevent backflow should a head reversal occur.

b. Flap Cover and Frame

The flap gate cover shall be made of steel and shall consist of an upstream skin plate supported by vertical and horizontal stiffeners spaced at required intervals. Music note type 6The flap gate cover shall be made of steel and shall consist of an upstream skin plate supported by vertical and horizontal stiffeners spaced at required intervals. Music note type rubber seals shall be provided on the two sides as well as on the top and bottom of the upstream side of the flap to render the gate leak proof. These rubber seals shall be fixed to the flap by means of clamp steel and stainless steel bolt.

The flap gate shall be provided with arms mounted on steel hinges of the double pivot type using stainless steel pins and bronze bushings. A concrete counterweight shall be provided and attached to the arms in such a way that its position is adjustable in order to ease the opening of the flap gate. Final position of this counterweight will be determined by the field office.

All edges of the gate opening where the music note type rubber seal is on contact shall be provided with stainless steel seal seats. This seal seats shall be fixed/ welded to the steel frames embedded on the concrete.

STRUCTURE DESIGN CRITERIA FOR GATES

A. General

The design shall ensure that:

The gates shall be reasonably watertight.

They shall be capable of being raised or lowered by the hoist at the speed specified.

Since all the gates are for regulation, they shall held in partially open position within the range of travel to pass the required discharge without undue vibration.

B. Wheels and Wheel Tracks

The gate wheels shall be suitable to withstand the stresses developed due to the loads they carry.

The wheels and wheel tracks shall be machined true and shall operate smoothly without vibration and without undue drift.

The hardness of wheel track shall be 50 points Brinell hardness number [BHN] higher than the BHN of the wheel tread.

C. Wheel Bearing

The wheel bearing shall be bronze bushing with grooves for lubrication.

D. Wheel Pin

1. The wheel shall be mounted on fixed pin and the pin shall be harder than the bushing. Wheel pin shall be of stainless steel and the contact surfaces shall be finished smoothly.

2. The wheel pin shall be of cantilever type with support from the cantilever box of the end vertical girder. The rigidity of cantilever box should be ensured.

E. Seal and Accessories

1.) Seal shall be fixed by means of stainless steel seal clamps and galvanized steel bolts to ensure positive water pressure between the seal and the gate and to bear tightly on the seal to prevent leakage. Edges of seal clamp adjacent to seal bulb shall be rounded.
2.) Side rubber shall be flat or angle shape type- Bottom seal may be of wedge type.
3.) The initial interference of side rubber shall be 3 mm pre-compression. The projection of bottom wedge seal shall be 6 mm. suitable chamfer shall be provided at the bottom of skin plate/ clamp plate to accommodate the bottom wedge seal in compressed position.

F. Guides and Still Frames

1. the guide frames and sill frames shall be composed of steel plates and steel sections so built up as to suit the gate structure. They shall be securely fixed in concrete by means of anchor members to ensure that all hydraulic loads exerted on the gate will be safely carried and transmitted to the concrete works.
2. the guide frames shall be true and shall be sufficient for the lifting height of the gate.
3. the side seal seat shall be stainless steel with a minimum width of 75 mm. The seal seat shall be fixed on the seal seat base by welding. The fixing of the seal seat on its base shall ensure rigidity and water tightness. The seal seat shall be finished smooth and the edges shall be rounded/ chamfered to prevent damage to the seal.
4. all the seal seat base including the sillbeam shall be embedded in concrete.
5. seal beam flange width shall not be less than 100 mm and the length shall cover the entire waterway. The seal seat (stainless steel plate) welded to the top flange shall be at least 25 mm wider than the top flange width of still beam. It shall be flushed with surrounding concrete. Each end of sill beam shall have provision for the connection of each side vertical to facilitate their location.

G. Embedded Part

i. all structural parts of the guides, seal seats, wheel tracks shall be constructed straight and the free from twists and warping. The end of sections of side guides shall be machined so that when assembled, the finished surfaces of adjoining sections shall be flushed and ends butt firmly watertight joints. The faces of all seal seats shall be in a true common plane and this plane shall be parallel to the plane tangent to wheel-track face. The ends of track sections shall also be machined smooth and square so that when tracks are assembled to the track base, the ends of adjoining shall butt firmly.

HOIST

A. Hoist for Sluice Gate

1. General

a. The contractor shall provide manually operated rope drum hoist of adequate capacity complete in every respect along with hoist supporting units and all accessories that would be required for the satisfactory operation of the sluice gates.
b. Each hoist mechanism shall consist of gear reducers, wire ropes, rope drum, shaftings, bearings, and sprockets for diesel engine drive and all other mechanical accessories for the satisfactory operation of hoist.

c. The hoisting equipment shall be designed to raise, lower and hold the gate in any position between fully opened and fully closed positions. Hoisting equipment shall be enclosed in dust proof housing with suitable lugs and eye bolts for handling.
d. The complete equipment shall rest on a steel base framework which shall rest on the pier top.

B. Mechanical Parts

1. General

The components of the hoist mechanism shall be so proportioned as to take the severest load coming on individual components.

2. Wire Rope

a.) The wire rope shall be made from improves plough steel of 6 X 37 construction with steel center, right regular lay, performed and lubricated.
b.) A turnbuckle shall be provided on one side of the wire rope connecting the gate and hoist to equalize the tension in the rope. Turnbuckle and wire rope fitting shall be galvanized.
c.) The breaking strength of wire rope shall be as per standard manufacturer's specifications.
d.) The strength of socket and of wire rope shall be approximately equal to the strength of the rope itself. The end shall be safely secured against twisting.

3. Drums

i. The groove drum shall be of such size that there will be not more than one layer of rope on the drum when the rope is in it's fully wound position.
ii. The length of the drum shall be such that each lead-off rope has minimum two full turns on the drum when the gate is at its lowest position and one spare groove for each lead-off of the drum when the gate is at its highest position.
iii. If the ends of the drum are flanged, the flanges shall project to a height not less than two rope diameter above the rope. A spur gear secured to the drum may be regarded as forming as one of the flanges.
iv. The lead angle (fleet angle) of the ropes shall not exceed 5 degrees or 1 on 12 on either side of helix angle of groove in the drum.
v. The drum shall be made of cast steel.
vi. The drum shall be machined groove. Grooving shall be finished smooth and edges between grooves rounded. The contour at the bottom shall be circular over an angle of at least 120 degrees. The groove radius shall be 0.53 times the diameter of rope. The depth of groove shall not less than 0.35 times the diameter of the rope.
vii. The pitch of the grooves shall be such that the clearance between adjacent turn of rope is at least:

1.5 mm for ropes up to 12 mm diameter
2.5 mm for ropes over 12 mm diameter up to 30 mm diameter and 3.0 mm for ropes of over 30 m diameter,

viii. The ends of the rope shall be fixed to the drum to such a way that the fixing device is accessible. Each rope shall be wound at least two turns before it is fixed (dead wrap).

4. Gearing

a. The reduction units of the hoist shall be composed of spur gears, bevel gears, worm and worm gears. The gears shall be machined cut with smooth finish.
b. Tooth form of spur and bevel gears shall be 20 degrees full depth involute system.
c. Spur and bevel gears shall be of cast steel, forged steel of surface hardened steel. The gears and pinions shall be made from two different grades of materials; the higher strength grade material for the pinions shall be made from two different grades of materials; the higher strength grade material for the pinion.
d. Standard worm and worm gears shall be high grade reduction unit of good efficiency suitable for long service life. The proportioning of parts therein shall be in accordance with the best engineering practice. The bearing section of the rotating shaft is fitted with anti-fitted with friction bearings designed for thrust and radia loads and the helical angle of the worm shall be designed for self locking.
e. Keys in gear trains shall be fitted and secured that they should not work loose when in service.
f. Gears shall have removable housing with provision for convenient access for lubrication. All bolts and cap screws shall be provided with lock washers. All machined units shall be thoroughly cleaned to ensure that they are free of cutting and objectionable and abrasive material.

5. Shafts

a. The shaft shall be designed for appropriate torque/ load that are being transmitted. Shafts have liberal factor of safety for strength and rigidity and shall have adequate bearing surfaces. They shall be finished smooth and, if shouldered, shall be provided with fillets of large radius.
b. All shafts shall be designed for safety against simple bending, pure torsion and the combined effect of bending and torsion.

6. Bearing

a. All the running shafts shall be provided with ball, roller or bush bearings. Selection of bearings shall be done on consideration of duty, load and speed of the shaft.
b. Bearing shall be easily accessible for lubrication and/ or replacement.

C. Intake Gate Hoist

1. General

Intake gate hoist shall be manually operated. The pedestal lift shall be crank operated and the direction of rotation of the crank to open the gate shall be clearly indicated on the lifting mechanism.

2. Manual Operation

ix. The manual operation should be designed in such a manner that the continuous effort per man does not exceed a crank force of 98 Newton [10 Kgf] with 400 mm of crank radius at a continuous rating of 24 RPM.

3. Gate Stem, Coupling and Stem Guides

i. Stems shall be of old finished steel. Each stem shall be of adequate size to safely withstand operation of the gate (Both raising and lowering) under the specified head and shall be furnished in sections of suitable length with necessary couplings to facilitate removal and replacement, if necessary. The couplings shall be of the same materials as the stem and shall be safely pinned, bolted or threaded and keyed to the stem. The bolts and pins shall be of stainless steel. The stems shall be provided with suitable stop nuts with provision for adjustment to prevent damage to the bottom of the gate due to overrun of the gate when closing.

ii. Stem guides shall be as recommended by the manufacturer and shall be adjustable in two directions. Stem guides shall be provided with either bronze-bushed cast iron or steel collars bolted into place.

4. Pedestal and Lifting Mechanism
    i. The pedestal shall have a cast bronze lift nut threaded to fit the operating stem. Ball thrust bearings shall be provided above and below this left nut to take the computed maximum thrust developed in opening and closing the gate.
    ii. Gears shall be of cast steel accurately machined with cut teeth and smooth operating with drive shafts running in bronze sleeve bearing of ample size
    iii. All gears and bearings shall be enclosed in cast iron housing. The gears and bearings shall be easily accessible for maintenance and lubrication. The housing shall be adequate to withstand the tropical climate.
    iv. The lift mechanism shall be provided with a cast iron or structural steel pedestal machined and drilled to accommodate the gear housing and suitable for bolting to the operating floor.
    v. The crank shall be of cast iron and detachable and provided with a rotating handle.

D. Lubrication

1. General

    i. All bearings, journals and locations where sliding between parts shall be provided with adequate means of lubrication.
    ii. Adequate seals shall be provided wherever necessary to prevent the escape of lubricants during normal operation and the entry of foreign matter.
    iii. All equipment covered under the scope of this contract shall be handed over to NIA in running order with all moving parts properly and fully charged with the recommended lubricant.
    iv. Contractor shall provide a list of all recommended lubricant for each location and the compatible types of lubricant from the product line of all major companies in the Philippines.

2. Grease Lubrication

    i. Unless otherwise specified, all greasing shall be effected by high pressure hand grease gun.
    ii. All fitting shall, if possible, be of the same size.
    iii. Underwater equipment shall be charges with lithium base grease, for other location the grease shall be calcium based.

3. Oil Lubrication

    i. Gears boxes shall be provided with am oil level sight glass or dipstick, a screw capped filling and drain cock.
    ii. Where pressure oil lubrication of bearings is adopted, a filter and overload facility shall be provided in an accessible position.
    iii. All opening or joints in the gear box casing shall be provided in an accessible position.
    iv. Contractor shall provide the net quantity plus ten percent [10%] of the required oils and grease for the first filling and charging of the equipment at site.
    v. The oil shall be delivered in steel drums and grease in steel kegs. The containers shall be non-returnable.

LIFTING MECHANISM INSTALLATION, TEST AND ADJUSTMENTS

The installation of the lifting mechanism and anchorage shall be in accordance with the details as shown on the Drawings. The Contractor shall send qualified and experienced Installation Supervisor who will supervise the installation of the lifting mechanism.

Listing mechanism shall be installed complete with gear reductions, couplings, shafting, shaft bearings, drums, wire, ropes, anchor bolts and all other materials for complete assembly. Lifting mechanism shall be assembled and accurately placed in correct alignment by the use of shims and wedges between the sole plates or base plates and concrete. Dry packing shall be done after the dry –pack has set.

After the lifting mechanism have been completely installed, adjusted and made ready for operation, the contractor shall conduct test runs for the gates and lifting mechanism. All units shall be tested for normal operating speed to ensure that all necessary clearances and tolerances have provided and that no binding occurs in any moving part. The cost of performing all the required test shall be borne by the Contractor.

All tests shall be performed in the presence of an authorized representatives of NIA. All data shall be certified correct and submitted to NIA. All defects found during the test as a result of the installation work shall be corrected accordingly to the satisfaction of NIA.

EMBEDDED PARTS

Special attention shall be given to the method by which embedded parts are aligned during erection and secured against movements during the placing of the second stage concrete.

The proposed method which is indicated on the Drawings utilize adjusting anchor welded at the first stage concrete and fastened by means of two adjusting nuts at the other end to the embedded parts.

CORROSION MEASURES AND PAINTING

A. General

i. The steel gate shall be designed to minimize as much as possible the effects of localized corrosion. Drain holes shall be provided in all locations where the entrapment of water can occur.
ii. All steel surfaces stainless steel surfaces shall be coated and/ or painted with a protective film specified under Section below.
iii. Crevices over which the protective film can bridge shall be retouched prior to coating.
iv. Boxed in members shall be provided with access holes or shall be treated internally with an effective coating material.
v. All coating or paint materials to be used shall be original sealed container bearing the manufacturer’s label revealing complete identification of content and shall be subject to inspection by NIA prior to coating and/or painting. The NIA shall have the right to reject any paint material supplied under these specifications which is found to be defective.

B. Surface Preparation and Shop Painting

Upon completion of fabrication and machining works but prior to application of coating materials, the contractor application shall commerce only after the NIA or their duly authorized representatives have inspected and subsequently approved the surface preparation in accordance with these specifications.

NIA or their designated inspectors shall undertake from time to time, inspection of the painting works while it is in progress. NIA shall be at liberty to reject outright any deviation to material specification and procedure noted during inspection.

Notwithstanding such inspection, the Contractor shall be removed from steel and cast iron surfaces by the use of clean solvent, emulsion, cleaning compound or other methods which involve cleaning action.

Following the solvent, the surfaces shall be cleaned of all defective or damage areas of existing paint, and all loose rust, loose mill scale and other foreign substance in accordance with the requirements for surface preparation as specified hereunder.

i. Immersed Steel

Except where otherwise specified, all steel surfaces and all parts of structure that have surfaces which are exposed and/ or permanently immersed in water shall be blast cleaned by commercial blast cleaning (SSPC-SP6) then painted with 2 coats of coal tar epoxy paint conforming to U.S Military Specifications MIL-P23236 (Ships) Type I, Class 2 to produce a total dry film thickness of 400 microns (16 mils).

ii. Steel Exposed to atmosphere (Lifting Mechanism and Accessories including Enclosures)

Except where otherwise specified all steel and cast iron surfaces of lifting mechanism and accessories including its enclosure which are exposed to atmosphere shall be blast cleaned by commercial blast cleaning (SSPC-SP6) then applied with 1 coat of Alkyd Red Lead Primer. After proper drying time as attained apply 2 coats of Alkyd Enamel finish to attain a total dry film thickness of 175 microns (7 mils.)

iii. Embedded Steel Work

Where not otherwise specified, all steel surfaces which will be embedded or against which concrete will be placed shall be cleaned by power tool cleaning (SSPC-SP3) then painted with 1 coat of cement latex milk consisting of 10 parts of Portland Cement (by weight), 5 parts of water and 1 part modified latex emulsion.

iv. Repair of Paint Film

The contractor shall retouch or repair areas of steel gates which may be damaged during transit from shop to the site of delivery.

All paints shall be applied in conformity with SSPC-PAI Shop, Field and maintenance painting, by skilled personnel fully experienced in the type of work.

C. Machine Surfaces

All finished surfaces of ferrous metals that will be exposed during shipment or while waiting installation shall be cleaned in accordance with a coating of heavy, gasoline rust preventive compound.

D. Stainless Steel Surfaces

No painting is required for finished or unfinished stainless steel parts.

PREPARINGFOR TRANSPORTATION

i. Shipment of fabricated works to the Project Office should be made only upon issuance of pre-delivery inspection and acceptance report to the fabricator/ manufacturer by the NIA Office.
ii. The project office reserves the right to conduct its own final inspection upon arrival at the project before issuance of final acceptance report and any findings made thereat should be noted in the final inspection report for appropriate action by the central office.
iii. All parts shall be prepared for transportation so that slings for handling maybe attached readily wherever the parts are to be moved. When it us unsafe to attach slings to the boxes/crates boxed parts shall be packed with sling attached to the part and the slings shall be project through the box or crate so that attachment can be made easily.
iv. All exposed finished surfaces shall be adequately protected against abrasion and injury during transportation and all long and slender pieces shall be safely supported and blocked.
v. Rubber seats shall be dismantled after shop assembly and shall be transported separately. They shall be so packed and protected that their size, shape and physical properties are not affected during transportation.
vi. The gates shall be prepared for transportation as to involve the minimum amount of field assembly.

A. Packing

i. The bid price shall include and provide for securely protecting and packing the equipment so as to avoid the damage during transport. All packing shall allow for easy removal and checking at site. Special precaution shall be taken to prevent rusting of the parts. Gas seal or other methods if proposed to be used shall the approval of NIA. Each carton or package contains a packing memorandum mentioning the name of the Contractor, the number and date of the Contract and the name of the office placing the order.
ii. The equipment shall be insured for loss or damage during transit to the field, the cost being borne by the contractor.
iii. Notwithstanding anything stated above, the contractor shall be entirely responsible for loss, damage or depreciation to the equipment and materials.

B. Marking

i. Each part of gates, hoist and embedded parts which need to be transported from the shop to the field site as separate piece shall be marked to show the unit of which it is a part and marks and match marks shall be made with heavy steel stamps and paints. Each piece, sub-assembly or package to be transported separately shall be labeled or tagged with transportation designation consisting of the Specification number and the mark number of such piece or the number of parts grouped in such assemblies or package.

ACCEPTANCE OF WORKS

After the steel gates have been installed in the field, it will be operated and tested by the NIA and when so operated and tested it shall meet all the requirements of the specifications. The gates shall be raised and lowered several times for the full length of the travel. The primary requisite for acceptance shall be that each gate operates smooth and shall be watertight.

A. Tests

i. The contractor shall carry on the gates and hoist equipment as maybe required by the engineer. Contractor shall be responsible for all modifications and adjustments required for the works as a result of such tests.
ii. The test shall include:
    a. Operational tests in the dry
    b. Operational tests with fully hydrostatic load
    c. Leakage test

iii. Test maybe repeated, if necessary, until they successfully carried out the satisfaction of the engineer.
iv. The test will be carried out at the convenience of the engineer the cost thereof shall be borne by the contractor.

B. Operational Tests in the Dry

Operational tests in the dry shall be carried out after completion of erection when all the power supply have been connected and adjusted. The tests shall include at least two complete traverses from the maximum raised position to the full seating position. Manual operation will also be similarly tested. All adjustments, clearances, brakes, motors and controls, etc. shall be checked for proper operations,

C. Operational Test Under Hydrostatic Head

i. These tests shall simulate the actual operating conditions as closely as possible.
ii. At least one complete traverse will be made on the sluice and intake gates from the fully closed position to the normal raised position as follows.

a. With the gate initially in the fully closed position raised it to the normal open position until stopped by the limit switch;
b. Lower the gate to the fully closed position;

c. Ascertain proper operation against over-travel;
d. Record and report fan speed, motor torque and current while raising and fan speed during closing.

D. Leakage Rests

Leakage test shall be carried out with the gate lowered on the sill. Before the observation for leakage, the gate shall be raised and lowered by about one meter, several times to dislodge any debris that might have lodged on the side seals. The rectified until it is reduces to 15 (fifteen) liters/minutes / meter length of the seal.

MANUALS

The fabricator/ manufacturer shall prepare and furnish NIA and the installation contractor's staff, the installation procedure, operation and maintenance manuals for all of the work as provided for in the Contract Documents.

METHOD OF MEASUREMENT

Measurement for furnishing and installation of gates and stop log will be made on the number of assemblies of the different classes and sizes acceptably installed and tested.

BASIS OF PAYMENT

The cost of the supply and delivery of various steel gates will be paid at the contract unit price per assembly or per piece whichever is stated in the Bill of Quantities, which shall include all equipment and materials prescribed in this section and directed by the Engineer.

The cost for the installation provided under this item will be paid at the contract unit price which shall constitute full compensation for furnishing all labor, materials, tools, equipment, supplies and all incidentals and subsidiary works necessary for the successful completion of the works.

Payment for the work provided under this item will be made separately for the supply and delivery, and installation of various gates and lifting mechanism as follows:

a. Supply and delivery

For the supply and delivery of various gates and lifting mechanism, 70 percent [70%] of the respective unit price in the Bill of Quantities shall be paid upon delivery to the project site in accordance with this technical specification acceptable to NIA.

All equipment/ materials delivered at the site shall be kept by the Contractor and will be responsible for any loss or damage of the equipment/ materials until they are installed. Any loss or damage to the equipment/ materials shall be replaced by the contractor at his own expense.

Twenty percent [20%] shall be paid upon installation of the equipment and materials, and ready for operation.

The remaining ten percent (10%) for each unit price shall be paid upon the final acceptance by NIA of the contract works.

b. Installation

Ninety percent (90%) of the respective unit price of each installation works which shall include labor, consumable materials, subsidiary works and other incidentals required for the successful completion of the works shall be paid upon complete installation of the respective equipment/ materials all in accordance with the drawing and accepted by NIA.

The remaining ten percent (10%) of each installation cost shall be paid upon final acceptance by NIA of the contract work

TEMPORARY WORKS, CONSTRUCTIONS, MOBILIZATION OF CONSTRUCTION EQUIPMENT AND DEMOBILIZATION WORK

SCOPE

[a] Temporary works

The contractor shall furnish all materials, labor, equipment, tools and install such temporary works as are necessary for the successful completion of the Contract Work. The Contractor shall negotiate the site for his construction camp, office and work areas.

The temporary works shall include but will not be limited to the following:

1. Construction of temporary facilities shall have a minimum floor area of 50 (5x10) square meters.

2. Facilities such as potable water, drainage, sewage, disposal, sanitation, first aid and fire protection facilities.

3. Workshops, warehouses, site offices, stockpile areas, storage areas for materials, equipment, spare parts, fuel and oil.

Temporary works shall conform to all government standards and codes and shall meet the sanitary requirements of the Department of Health.

[b] Mobilization of Equipment

The Contractor shall mobilize and move into Project Site within 7 calendar days after receipt of Notice to Proceed the required initial equipment requirement as listed of the Bid Documents.

Notwithstanding the mobilization of the initial equipment requirements, the Contractor shall mobilize to the site the additional equipment requirement within 20 calendar days upon receipt of the approval Equipment Moving-in and Utilization Schedule.

If for the reasons or causes other than "major calamities", the Contractor fails to mobilize fully the initial equipment required with said period, and all other equipment listed in his approved Equipment Moving-in and Utilization Schedule, at the discretion of the Regional Manager, he may be given an extension of time to mobilize them fully but in no case shall it exceed 30 calendar days. Failure to fully mobilize the required construction equipment within said period will be a ground for contract rescission. During said extension period liquidated damages equivalent to the daily operated ACEL rental rate of eight hours of the undelivered equipment per day of delay shall be imposed and collectible from any subsequent payment due the Contractor. If delays are caused by "major calamities", the corresponding number of calendar days caused by such calamities will not be counted. Delays shall be reckoned starting at 12:00 O'clock noon of the succeeding day after the date scheduled for the mobilization of the programmed equipment. The Engineer shall certify to the date of actual mobilization of the programmed equipment to the site.

The Engineer shall check and verify the number, type and actual condition of the equipment moved into the Project Site. The NIA reserves the right to order the removal of such

equipment that are not in good working condition from the Project Site at the Contractor's expenses and said equipment are not be counted for as mobilized.

Construction equipment once moved into the Project Site, checked and accounted for by the Engineer shall not be permitted, prior to the completion of the Contract Work, to be moved out or transferred by the Contractor to another Project Site without the written approval of the Engineer.

Periodic check-up of the Contractor's equipment moved-in for the Contract Work shall be conducted by NIA. The Contractor will pay to NIA the amount equivalent to the ACEL Rental Rate of any equipment not accounted for during said check-up for the number of calendar days the equipment have been removed [without the written consent of the Engineers] from the Project Site until said equipment have been returned. Such cases are grounds for disapproval of claims by the Contractor for time extensions.

[c] Demobilization

Demobilization shall include dismantlement and removal from the site of Contractor's Plant, materials and equipment and all Temporary Facilities with the exception of some facilities which NIA shall consider to remain and which shall be handed over to NIA at the time of demobilization in a fully operational condition. Demobilization shall also include clean-up of the site after completion of the Contract Work as approved and accepted by NIA and transportation of Contractor's employees from the site.

BASIS OF PAYMENT

Payment for furnishing of all materials, equipment and labor for the temporary works, mobilization of construction equipment including demobilization work, shall be made at the fixed lump sum price or lump sum bid price whichever is stated in the Bid of Quantities which shall not be subject to price escalation and adjustment, in accordance with the following:

1. Twenty percent [20%] of the lump sum price will be paid upon complete mobilization of the initial equipment requirement.

2. Twenty percent [30%] of the lump sum price will be paid upon the completion of the Contractor temporary works.

3. Thirty percent [30%] of the lump sum price will be paid upon the completion of moving-in of all the construction equipment approved under Equipment Moving-in and Utilization Schedule, duly certified by the Engineer, Project Auditor or their duly authorized representatives. Partial payment of this 30 % may be given on a pro-rata basis after fifty percent [50%] of the approved equipment has been moved-in to the project site.

   For the purposes of computing the percentage of equipment moved-in. corresponding number of points of each equipment listed in the Equipment Moving-in and Utilization Schedule shall be provided by NIA to serve as the basis for any partial payment.

4. The remaining twenty percent [20%] of the lump sum price will be paid to the contractor upon completion of the Contract Work.

CONSTRUCTION SAFETY AND HEALTH

BASIC PPE'S FOR WORKERS:

1. Helmet/Safety Hardhat
2. Safety Shoes
3. Rubber Boots
4. Working Gloves
5. Rain Coats

Section VII. Drawings

[Insert here a list of Drawings. The actual Drawings, including site plans, should be attached to this section, or annexed in a separate folder.]

Section VIII. Bill of Quantities

BILL OF QUANTITIES

Contract No.: RIO-LMC-06b-2021

Description of Contract: Bohol Northeast Basin Multi-Purpose Dam Project, Package 2 (Const. of Canal Lining and Other Irrigation Facilities)

Location: Kinan-oan, Trinidad, Bohol

ITEM NO.	DESCRIPTION	QTY.	UNIT
Canalization			
1	Clearing and Grubbing	12,958.00	sq.m.
2	Common Excavation (mechanized)	16,715.58	cu.m.
3	Backfill with Compaction (manual)	2,311.92	cu.m.
4	Waste Disposal	14,403.66	cu.m.
5	Class B Concrete	674.00	cu.m.
6	Reinforcing Steel Bars (all sizes)	22,920.99	kg.
7	Road Surfacing	637.43	cu.m.
Canal Structures			
1	Clearing and Grubbing	1,079.88	sq.m.
2	Structure Common Excavation (Mechanized)	2,509.00	cu.m.
3	Structure Backfill with Compaction (Mechanized)	1,725.91	cu.m.
4	Waste Disposal	783.50	cu.m.
5	Class A Concrete	136.53	cu.m.
6	Reinforcing Steel Bars (all sizes)	19,483.65	kgs.
7	Lean Concrete	13.32	cu.m.
8	Rubble Masonry	1.24	cu.m.
9	Grouted Riprap	130.70	cu.m.
10	Road Surfacing	61.50	cu.m.
Supply, Fabrication & Installation of Head Gates			
1	1.60 m x 1.10 m	1.00	pc.
2	1.20 m x 1.10 m	1.00	pc.
3	0.80 m x 0.80 m	1.00	pc.
4	0.65 m x 0.65 m	3.00	pcs.
5	1.00 m x 0.80 m	1.00	pc.
6	1.10 m x 0.80 m	1.00	pc.
Project Facilities			
1	Temporary Facilities, Project Signage and Mobilization & Demobilization	1.00	l.s.
2	Construction Safety and Health	1.00	l.s.

Section IX LOCAL CONDITION

LC-01 PROJECT LOCATION

Bohol Northeast Basin Multi-Purpose Dam Project, Package 2 is located at Kinan-oan, Danao, Bohol. The project site is approximately 90 kilometers from Tagbilaran City accessible through Tagbilaran City – Balilihan – Hanopol -Batuan- Carmen - Trinidad, Bohol route.

LC-02 ACCESS TO THE SITE

The contract work is located at Trinidad, Bohol. Passing through different service roads by fairly to well graveled road which may deteriorate if used during rainy days. Maintenance and repair of these service roads by the contractor is necessary if so used by them. The cost of maintenance and repair shall be included in the unit bid price of the contractor.

LC-03 FUEL AND POWER SUPPLIES

The major fuel station outlets such as Petron, Caltex and Shell are found in the nearest city of the project and other surrounding municipalities.

The main source of energy is supplied by the National Grid Corporation of the Philippines (NGCP) and locally distributed by the respective electric cooperatives and is presently available at the above-stated address of the project site.

LC-04 CLIMATE AND HYDROLOGY

Bohol belongs to the type IV climate zone of the Philippines. It has a characteristic that the rainfall distribution is fairly even throughout the year as seen in the climatic data, three months from March to May are comparatively dry. Heavy rains are always brought by typhoons. During the past twenty years two super-typhoon visited Bohol: Ining in November, 1964 (record rainfall typhoons were accompanied by big floods in Wahig River. The peak flood water level of Ining reached the hand rail of the national highway bridge over the Wahig river.

But most of the normal rainfalls are strong showers but short. Earth gets dry very quickly after rainfall. On this account considerable working days will be secured even in the wet season.

Rainfall summarized in the following table, but NIA will assume no responsibility whatsoever for the accuracy of these data. Any risk arising from the interpretation of such data is to be entirely borne by the Contractor.

CLIMATE

Month	Rainfall in BES/1 (mm)	Rainy Days BES/2
Jan.	199.40	10
Feb.	170.50	8
March	127.40	8
April	90.06	5
May	178.30	7
June	174.03	8
July	142.65	9
Aug.	163.00	10
Sept.	165.25	8
Oct.	196.00	8
Nov.	212.30	9
Dec.	164.60	9
Total	2049.6	

/1: BES is the rainfall station close to the project area

/2: Daily rainfall less than 5 mm is deemed zero and not counted as rainy day.

LC-05 BANKING FACILITIES

Most rural banks are available at nearby of the project area while major banking facilities are found in Tagbilaran City like; Development Bank of the Philippines, Land Bank of the Philippines, Philippine National Bank and other private banks.

LC-06 COMMUNITY AND FIRST AID FACILITIES

The Contractor is advised that the NIA will take no direct part in providing community facilities such as churches, shops, community center and recreation facilities for Contractor's employees. The Contractor shall make his own arrangements for such as he considers being necessary for the approval of the NIA and shall meet all codes or regulations in effect. It shall be the responsibility of the Contractor to furnish and operate first aid for his personnel. Such facilities may be integrated with the NIA facilities, if any, upon mutual agreement.

LC-07 CONTRACTOR'S WORKING AREA AND SITE OFFICE

The Contractor shall, at his own expense, be responsible for housing, feeding and accommodation of all his employees for the execution of the Contract Work. Construction equipment, materials, tools, supplies, and other incidentals, and all cost incurred for the protection and safety shall be borne by him.

LC-08 WATER SUPPLY

The Contractor shall, at his own expense, be responsible for the provision or

installation, operation and maintenance of a safe, adequate and temporary supply of drinking and domestic water, and the adequate water supply for his construction purposes.

LC-09 RIGHT OF WAY

The NIA will provide all right of way, free of charge to the contractor, which, in the opinion of the Regional Manager, necessary for carrying out the contract work.

LC-10 SITE INVESTIGATION

It is the responsibility of the Contractor to visit the work site to make their own investigation to satisfy themselves as to the existing conditions affecting the work to be done under these Specifications.

The Contractor shall assume all responsibilities for deduction and conclusions that he may obtain or arrive at from the site inspection.

INFORMATION AND DATA REFERRED TO IN THESE BID DOCUMENTS

PROJECT: Bohol Northeast Basin Multi-Purpose Dam Project, Package 2 (Const. of Canal Lining and Other Irrigation Facilities), Kina-oan, Trinidad, Bohol

1. Site Visit and Inspection

   Register at NIA, Regional Office No.7, Dao District, Tagbilaran City, Bohol

2. Wet Season Period, Article LC-04

3. Contract Duration, Article SCC 1.16, ITB

   230 calendar days

4. List of Officers/Offices to be furnished correspondence from the Contractor

   The Deputy Administrator
   For Engineering & Operations
   National Irrigation Administration
   5th Floor, NIA Complex
   EDSA, Diliman, Quezon City

   The Regional Manager
   NIA Regional Office 7
   Dao District, Tagbilaran City

5. Minimum Equipment Requirement for the Contract:

Equipment		Capacity	Number of Units
1.	Dump Truck	12 cu.m.	1
2.	Backhoe	1.00 cu.m., 128 Hp	1
3.	Vibratory Plate Compactor	450-600mm, 8Hp	1
4.	Bar Cutter		1
5.	Concrete Mixer	1 Bagger	2
6.	Concrete Vibrator		1
7.	Total Station	set	1

6. List of Initial Equipment required to be mobilized within ten (7) calendar days after receipt of Notice to Proceed

Equipment		Capacity	Number of Units
1.	Dump Truck	12 cu.m.	1
2.	Backhoe	1.00 cu.m., 128 Hp	1
3.	Bar Cutter		1
4.	Concrete Mixer	1 Bagger	2
5.	Concrete Vibrator		1
6.	Total Station	set	1

Section X. Checklist of Technical and Financial Documents

Notes on the Checklist of Technical and Financial Documents

The prescribed documents in the checklist are mandatory to be submitted in the Bid, but shall be subject to the following:

a. GPPB Resolution No. 09-2020 on the efficient procurement measures during a State of Calamity or other similar issuances that shall allow the use of alternate documents in lieu of the mandated requirements; or

b. any subsequent GPPB issuances adjusting the documentary requirements after the effectivity of the adoption of the PBDs.

The BAC shall be checking the submitted documents of each Bidder against this checklist to ascertain if they are all present, using a non-discretionary "pass/fail" criterion pursuant to Section 30 of the 2016 revised IRR of RA No. 9184.

Checklist of Technical and Financial Documents

I. TECHNICAL COMPONENT ENVELOPE

Class "A" Documents

Legal Documents

☐ (b) Valid PhilGEPS Registration Certificate (Platinum Membership) (all pages);
Or

☐ (c) Registration certificate from Securities and Exchange Commission (SEC), Department of Trade and Industry (DTI) for sole proprietorship, or Cooperative Development Authority (CDA) for cooperatives or its equivalent document;
And

☐ (d) Mayor's or 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;
And

☐ (e) Tax clearance per E.O. No. 398, s. 2005, as finally reviewed and approved by the Bureau of Internal Revenue (BIR).

Technical Documents

☐ (f) Statement of the prospective bidder of all its ongoing government and private contracts, including contracts awarded but not yet started, if any, whether similar or not similar in nature and complexity to the contract to be bid; **and**

☐ (g) Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid, except under conditions provided under the rules; **and**

☐ (h) Philippine Contractors Accreditation Board (PCAB) License;
or
Special PCAB License in case of Joint Ventures;
and registration for the type and cost of the contract to be bid; **and**

☐ (i) Original copy of Bid Security. If in the form of a Surety Bond, submit also a certification issued by the Insurance Commission;
or
Original copy of Notarized Bid Securing Declaration; **and**

(j) Project Requirements, which shall include the following:

☐ a. Organizational chart for the contract to be bid;

☐ b. List of contractor's key personnel (*e.g.*, Project Manager, Project Engineers, Materials Engineers, and Foremen), to be assigned to the contract to be bid, with their complete qualification and experience data;

☐ c. List of contractor's major equipment units, which are owned, leased, and/or under purchase agreements, supported by proof of ownership or certification of availability of equipment from the equipment lessor/vendor for the duration of the project, as the case may be; **and**

☐ (k) Original duly signed Omnibus Sworn Statement (OSS);
and if applicable, Original Notarized Secretary's Certificate in case of a corporation, partnership, or cooperative; or Original Special Power of Attorney of all members of the joint venture giving full power and authority to its officer to sign the OSS and do acts to represent the Bidder.

Financial Documents

☐ (l) 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; **and**

☐ (m) The prospective bidder's computation of Net Financial Contracting Capacity (NFCC).

Class "B" Documents

☐ (n) If applicable, duly signed joint venture agreement (JVA) in accordance with RA No. 4566 and its IRR in case the joint venture is already in existence;
or
duly notarized statements from all the potential joint venture partners stating that they will enter into and abide by the provisions of the JVA in the instance that the bid is successful.

II. FINANCIAL COMPONENT ENVELOPE

☐ (o) Original of duly signed and accomplished Financial Bid Form; **and**

Other documentary requirements under RA No. 9184

☐ (p) Original of duly signed Bid Prices in the Bill of Quantities; **and**

☐ (q) Duly accomplished Detailed Estimates Form, including a summary sheet indicating the unit prices of construction materials, labor rates, and equipmen rentals used in coming up with the Bid; **and**

☐ (r) Cash Flow by Quarter.

Section X. BIDDING FORMS

National Irrigation Administration
Region 7

STATEMENT OF THE BIDDERS OF ALL ITS ONGOING GOVERNMENT & PRIVATE CONTRACTS INCLUDING CONTRACTS AWARDED BUT NOT YET STARTED

Business Name : _____

Business Address : _____

NAME OF CONTRACT	CONTRACT DATE	CONTRACT PERIOD	CONTRACT AMOUNT	Amount or Value of Outstanding Works or Unperformed Portion
Government				
Private				

Submitted by : _____
(Printed Name & Signature)

Designation : _____

Date : _____

National Irrigation Administration
Region 7

STATEMENT OF THE BIDDER'S SINGLE LARGEST COMPLETED CONTRACTS (SLCC) SIMILAR TO THE CONTRACT TO BE BID

Business Name : _____

Business Address : _____

NAME OF COMPLETED CONTRACT	DATE OF CONTRACT	CONTRACT DURATION	CONTRACT AMOUNT
Government			
Private			

Note: This statement shall be supported with:
Owner's Certificate of Final Acceptance or a final rating of at least Satisfactory in the CPES

Submitted by : _____
(Printed Name & Signature)

Designation : _____

Date : _____

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

BID SECURING DECLARATION
Project Identification No.: RIO-LMC-06b-2021

To: [Insert name and address of the Procuring Entity]

I/We, 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 procurement 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 RA No. 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; and
   c. I am/we are declared the bidder with the Lowest Calculated Responsive Bid, and I/we have furnished the performance security and signed the Contract.

IN WITNESS WHEREOF, I/We have hereunto set my/our hand/s this ____ day of [month] [year] at [place of execution].

[Insert NAME OF BIDDER OR ITS AUTHORIZED REPRESENTATIVE]
[Insert signatory's legal capacity]
Affiant

SUBSCRIBED AND SWORN to before me this ___ day of *[month] [year]* at *[place of execution]*, Philippines. Affiant/s is/are personally known to me and was/were identified by me through competent evidence of identity as defined in the 2004 Rules on Notarial Practice (A.M. No. 02-8-13-SC). Affiant/s exhibited to me his/her [insert type of government identification card used], with his/her photograph and signature appearing thereon, with no. _____ and his/her Community Tax Certificate No. _____ issued on ____ at _____.

Witness my hand and seal this ___ day of *[month] [year]*.

NAME OF NOTARY PUBLIC
Serial No. of Commission _____
Notary Public for _____ until _____
Roll of Attorneys No. _____
PTR No. _____ *[date issued], [place issued]*
IBP No. _____ *[date issued], [place issued]*

Doc. No. _____
Page No. _____
Book No. _____
Series of _____

LIST OF CONTRACTOR'S EQUIPMENT PLEDGE TO THE CONTRACT TO BE BID.

CONTRACT No. _____

NAME OF CONTRACT: _____

Name of Equipment	Unit	Plate No./Model	Motor No./Body No./Engine No.	Proof of Ownership	Present Location	Remarks

Submitted by :

_____ Date: _____

(Name of Contractor & Signature)

_____

(Name of Firm)

Omnibus Sworn Statement

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

SUBSCRIBED AND SWORN to before me this ___ day of *[month] [year]* at *[place of execution]*, Philippines. Affiant/s is/are personally known to me and was/were identified by me through competent evidence of identity as defined in the 2004 Rules on Notarial Practice (A.M. No. 02-8-13-SC). Affiant/s exhibited to me his/her [insert type of government identification card used], with his/her photograph and signature appearing thereon, with no. _____ and his/her Community Tax Certificate No. _____ issued on ____ at _____.

Witness my hand and seal this ___ day of *[month] [year]*.

NAME OF NOTARY PUBLIC
Serial No. of Commission _____
Notary Public for _____ until _____
Roll of Attorneys No. _____
PTR No. _____ *[date issued], [place issued]*
IBP No. _____ *[date issued], [place issued]*

Doc. No. _____
Page No. _____
Book No. _____
Series of _____

BID FORM

Date : _____

Project Identification No. : RIO-LMC-06b-2021

To: [name and address of Procuring Entity]

Having examined the Philippine Bidding Documents (PBDs) including the Supplemental or Bid Bulletin Numbers [insert numbers], the receipt of which is hereby duly acknowledged, we, the undersigned, declare that:

a. We have no reservation to the PBDs, including the Supplemental or Bid Bulletins, for the Procurement Project: [insert name of contract];

b. We offer to execute the Works for this Contract in accordance with the PBDs;

c. The total price of our Bid in words and figures, excluding any discounts offered below is: [insert information];

d. The discounts offered and the methodology for their application are: [insert information];

e. The total bid price includes the cost of all taxes, such as, but not limited to: [specify the applicable taxes, e.g. (i) value added tax (VAT), (ii) income tax, (iii) local taxes, and (iv) other fiscal levies and duties], which are itemized herein and reflected in the detailed estimates,

f. Our Bid shall be valid within the a period stated in the PBDs, and it shall remain binding upon us at any time before the expiration of that period;

g. 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, or a Performance Securing Declaration in lieu of the the allowable forms of Performance Security, subject to the terms and conditions of issued GPPB guidelines[12] for this purpose;

h. 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;

i. 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

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

k. 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 [Name of Project] of the [Name of the Procuring Entity].

l. We acknowledge that failure to sign each and every page of this Bid Form, including the Bill of Quantities, shall be a ground for the rejection of our bid.

Name: _____
Legal Capacity: _____
Signature: _____
Duly authorized to sign the Bid for and behalf of: _____
Date: _____

BILL OF QUANTITIES AND BID PRICES

Contract No.: RIO-LMC-06b-2021

Description of Contract: Bohol Northeast Basin Multi-Purpose Dam Project, Package 2 (Const. of Canal Lining and Other Irrigation Facilities)

Location: Kinan-oan, Trinidad, Bohol

ITEM NO.	DESCRIPTION	QTY.	UNIT	UNIT BID PRICE IN WORDS & IN FIGURES	TOTAL
Canalization					
1	Clearing and Grubbing	12,958.00	sq.m.	P	P
2	Common Excavation (mechanized)	16,715.58	cu.m.	P	P
3	Backfill with Compaction (manual)	2,311.92	cu.m.	P	P
4	Waste Disposal	14,403.66	cu.m.	P	P
5	Class B Concrete	674.00	cu.m.	P	P
6	Reinforcing Steel Bars (all sizes)	22,920.99	kg.	P	P
7	Road Surfacing	637.43	cu.m.	P	P
Canal Structures					
1	Clearing and Grubbing	1,079.88	sq.m.	P	P
2	Structure Common Excavation (Mechanized)	2,509.00	cu.m.	P	P
3	Structure Backfill with Compaction (Mechanized)	1,725.91	cu.m.	P	P
4	Waste Disposal	783.50	cu.m.	P	P
5	Class A Concrete	136.53	cu.m.	P	P
6	Reinforcing Steel Bars (all sizes)	19,483.65	kgs.	P	P
7	Lean Concrete	13.32	cu.m.	P	P
8	Rubble Masonry	1.24	cu.m.	P	P
9	Grouted Riprap	130.70	cu.m.	P	P
10	Road Surfacing	61.50	cu.m.	P	P
Supply, Fabrication & Installation of Head Gates					
1	1.60 m x 1.10 m	1.00	pc.	P	P
2	1.20 m x 1.10 m	1.00	pc.	P	P
3	0.80 m x 0.80 m	1.00	pc.	P	P
4	0.65 m x 0.65 m	3.00	pcs.	P	P
5	1.00 m x 0.80 m	1.00	pc.	P	P
6	1.10 m x 0.80 m	1.00	pc.	P	P
Project Facilities					
1	Temporary Facilities, Project Signage and Mobilization & Demobilization	1.00	l.s.	P	P
2	Construction Safety and Health	1.00	l.s.	P	P
	TOTAL AMOUNT OF BIDS (In words and Figures)				P

The undersigned bidder hereby certifies that he has fully informed himself of all condition, local and otherwise affecting the carrying out of the Contract works and that his bid has been prepared in strict accordance with the terms and condition.

Name of Firm: _____ _____

Name in Print & Signature of Bidder


NATIONAL IRRIGATION ADMINISTRATION
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