

PHILIPPINE BIDDING DOCUMENTS

(As Harmonized with Development Partners)



Procurement of INFRASTRUCTURE PROJECTS Improvement of Public Cemetery

Government of the Republic of the Philippines

**Sixth Edition
July 2020**

Preface

These Philippine Bidding Documents (PBDs) for the procurement of Infrastructure Projects (hereinafter referred to also as the “Works”) through Competitive Bidding have been prepared by the Government of the Philippines for use by all branches, agencies, departments, bureaus, offices, or instrumentalities of the government, including government-owned and/or -controlled corporations, government financial institutions, state universities and colleges, local government units, and autonomous regional government. The procedures and practices presented in this document have been developed through broad experience, and are for mandatory use in projects that are financed in whole or in part by the Government of the Philippines or any foreign government/foreign or international financing institution in accordance with the provisions of the 2016 revised Implementing Rules and Regulations (IRR) of Republic Act (RA) No. 9184.

The PBDs are intended as a model for admeasurements (unit prices or unit rates in a bill of quantities) types of contract, which are the most common in Works contracting.

The Bidding Documents shall clearly and adequately define, among others: (i) the objectives, scope, and expected outputs and/or results of the proposed contract; (ii) the eligibility requirements of Bidders; (iii) the expected contract duration; and (iv) the obligations, duties, and/or functions of the winning Bidder.

Care should be taken to check the relevance of the provisions of the PBDs against the requirements of the specific Works to be procured. If duplication of a subject is inevitable in other sections of the document prepared by the Procuring Entity, care must be exercised to avoid contradictions between clauses dealing with the same matter.

Moreover, each section is prepared with notes intended only as information for the Procuring Entity or the person drafting the Bidding Documents. They shall not be included in the final documents. The following general directions should be observed when using the documents:

- a. All the documents listed in the Table of Contents are normally required for the procurement of Infrastructure Projects. However, they should be adapted as necessary to the circumstances of the particular Project.
- b. Specific details, such as the “*name of the Procuring Entity*” and “*address for bid submission*,” should be furnished in the Instructions to Bidders, Bid Data Sheet, and Special Conditions of Contract. The final documents should contain neither blank spaces nor options.
- c. This Preface and the footnotes or notes in italics included in the Invitation to Bid, BDS, General Conditions of Contract, Special Conditions of Contract, Specifications, Drawings, and Bill of Quantities are not part of the text of the final document, although they contain instructions that the Procuring Entity should strictly follow.
- d. The cover should be modified as required to identify the Bidding Documents as to the names of the Project, Contract, and Procuring Entity, in addition to date of issue.

- e. Modifications for specific Procurement Project details should be provided in the Special Conditions of Contract as amendments to the Conditions of Contract. For easy completion, whenever reference has to be made to specific clauses in the Bid Data Sheet or Special Conditions of Contract, these terms shall be printed in bold typeface on Sections I (Instructions to Bidders) and III (General Conditions of Contract), respectively.
- f. For guidelines on the use of Bidding Forms and the procurement of Foreign-Assisted Projects, these will be covered by a separate issuance of the Government Procurement Policy Board.

TABLE OF CONTENTS

| | |
|--|-----------|
| Glossary of Terms, Abbreviations, and Acronyms | 5 |
| Section I. Invitation to Bid..... | 8 |
| Section II. Instructions to Bidders | 12 |
| 1. Scope of Bid..... | 14 |
| 2. Funding Information | 14 |
| 3. Bidding Requirements..... | 14 |
| 4. Corrupt, Fraudulent, Collusive, Coercive, and Obstructive Practices | 14 |
| 5. Eligible Bidders..... | 15 |
| 6. Origin of Associated Goods | 15 |
| 7. Subcontracts | 15 |
| 8. Pre-Bid Conference..... | 16 |
| 9. Clarification and Amendment of Bidding Documents..... | 16 |
| 10. Documents Comprising the Bid: Eligibility and Technical Components | 16 |
| 11. Documents Comprising the Bid: Financial Component | 16 |
| 12. Alternative Bids | 17 |
| 13. Bid Prices | 17 |
| 14. Bid and Payment Currencies..... | 17 |
| 15. Bid Security..... | 17 |
| 16. Sealing and Marking of Bids..... | 17 |
| 17. Deadline for Submission of Bids | 18 |
| 18. Opening and Preliminary Examination of Bids | 18 |
| 19. Detailed Evaluation and Comparison of Bids..... | 18 |
| 20. Post Qualification..... | 18 |
| 21. Signing of the Contract | 19 |
| Section III. Bid Data Sheet | 20 |
| Section IV. General Conditions of Contract..... | 23 |
| 1. Scope of Contract..... | 24 |
| 2. Sectional Completion of Works | 24 |
| 3. Possession of Site | 24 |
| 4. The Contractor’s Obligations..... | 24 |
| 5. Performance Security | 24 |
| 6. Site Investigation Reports | 25 |

| | | |
|-----|---|-----------|
| 7. | Warranty..... | 25 |
| 8. | Liability of the Contractor..... | 25 |
| 9. | Termination for Other Causes..... | 25 |
| 10. | Dayworks | 25 |
| 11. | Program of Work..... | 26 |
| 12. | Instructions, Inspections and Audits | 26 |
| 13. | Advance Payment..... | 26 |
| 14. | Progress Payments | 26 |
| 15. | Operating and Maintenance Manuals..... | 26 |
| | Section V. Special Conditions of Contract..... | 28 |
| | Section VI. Specifications | 30 |
| | Section VII. Drawings..... | 31 |
| | Section VIII. Bill of Quantities | 67 |
| | Section IX. Checklist of Technical and Financial Documents | 71 |

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
Province of Laguna
Municipality of Paete

Tel. Nos. (049) 501-6490-101, (049) 557-0001

Invitation to Bid for Improvement of Public Cemetery

- The *Municipality of Paete, Laguna*, through the *General Fund-Year 2024* intends to apply the sum of *seven hundred thousand pesos only (Php 700,000.00)* being the Approved Budget for the Contract (ABC) to payments under the contract for the *Improvement of Public Cemetery at Barangay Bagumbayan , Paete, Laguna*. Bids received in excess of the ABC shall be automatically rejected at bid opening.
 Description of Work

| NAME/LOCATION OF PROJECT | | APPROPRIATION | | | | |
|--|---------------------------|----------------------------|------------------------------|----------------|-------------|------------|
| IMPROVEMENT OF PUBLIC CEMETERY | | SOURCE OF FUND | | | | |
| | | ISSUED OBLIGATED AUTHORITY | | | | |
| PAETE, LAGUNA | | RELEASED | | | | |
| | | CALENDAR DAYS TO COMPLETE | | 45 Days | | |
| PROJECT CATEGORY : | | DESIRABLE STARTING DATE | | | | |
| PROJECT DESCRIPTION | | | | | | |
| IMPROVEMENT OF PUBLIC CEMETERY | | | | | | |
| MINIMUM EQUIPMENT REQUIREMENT | | | TECHNICAL PERSONNEL REQUIRED | | | |
| Description | | No. | Description | | No. | |
| Bagger Mixer | | 1 | Construction Foreman | | 2 | |
| | | | Mason / Carpentry | | 3 | |
| | | | Laborer | | 7 | |
| ESTIMATED COST OF PROPOSED WORK | | | | | | |
| Item No. | DESCRIPTION | % OF TOTAL | UNIT | QTY. | DIRECT COST | |
| | | | | | TOTAL | UNIT COST |
| I | GENERAL REQUIREMENTS | | I.s. | 1 | Php | Php |
| II | CONCRTE AND MASONRY WORKS | | I.s. | 1 | | |
| | | 0% | | | | |
| Direct Cost | | | | | Php | |
| Labor Cost | | | | | | Php |
| Indirect Cost | | | | | | |
| OCM (15%) | | | | | | |
| Contractor's Profit (10%) | | | | | | |
| VAT (5%) | | | | | | |
| TOTAL | | | | | | |

- The *Municipality of Paete, Laguna* now invites bids for the above Procurement Project. Completion of the Works is required *45 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 (Instructions 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 ***Municipality of Paete, Laguna*** and inspect the Bidding Documents at the address given below from ***8:00 am to 5:00 pm Monday to Friday***.
5. A complete set of Bidding Documents may be acquired by interested bidders on ***August 22-September 10, 2024 @9:00 am*** from given address and website/s upon payment of a nonrefundable fee for the Bidding Documents in the amount of **one thousand pesos only (Php 1,000.00)**. It may also be downloaded free of charge from the website of the Philippine Government Electronic Procurement System (PhilGEPS) and the website of the Procuring Entity, provided that bidders shall pay the applicable fee for the Bidding Documents not later than the submission of their bids. The Procuring Entity shall allow the bidder to present its proof of payment for the fees ***presented in person through BAC Secretariat***.
6. Bids must be duly received by the BAC Secretariat through manual submission at the office address as indicated below on or before ***September 10, 2024 @ 9:00 am***. Late bids shall not be accepted.
7. All bids must be accompanied by a bid security in any of the acceptable forms and in the amount stated in **ITB Clause 16**.
8. Bid opening shall be on ***September 10, 2024 @1:00 pm*** at the given address below ***Municipal Building, Municipal Hall, J.V. Quesada St. Brgy 1, Paete, Laguna*** Bids will be opened in the presence of the bidders’ representatives who choose to attend the activity.

The schedule of BAC activities is as follows:

| BAC Activities | Schedule |
|--|-----------------------------|
| 1. Advertisement/Issuance of Bidding Documents | August 22-Sep. 10, 2024 |
| 2. Deadline of Submission of Bids | September 10, 2024 @9:00 am |
| 3. Opening of Bids | September 10, 2024 @1:00 pm |
| 6. Bid Evaluation | September 11, 2024 |

| | |
|-----------------------|-----------------------|
| 7. Post-qualification | September 12-13, 2024 |
| 8. Notice of Award | September 17, 2024 |
| 9. Contract Agreement | September 27, 2024 |
| 10. Notice to Proceed | September 30, 2024 |

9. The *Municipality Of Paete, Laguna* 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.

10. For further information, please refer to:

Christine M. Cainto
Bac Secretariat
J.V. Quesada St. B-1 Paete, Laguna
odacrem_12@yahoo.com
049-501-6490-101
Paete.gov.ph

11. You may visit the following websites:

For downloading of Bidding Documents: www.philgeps.gov.ph and www.Paete.gov.ph

Date : July 29, 2024

ENGR. JOHN LAURENCE M. CADAWAS
BAC CHAIRMAN

Section II. Instructions to Bidders

INSTRUCTIONS TO BIDDERS

1. Introduction

The Municipality of Paete, Laguna, through the General Fund-Supplemental, intends to apply the sum of Seven hundred thousand pesos only (Php 700,000.00) being the Approved Budget for the Contract (ABC) to payments under the contract for the Improvement of Public Cemetery at Barangay Bagumbayan Paete, Laguna. The bidding process assumes the following timetable:

| BAC Activities | Schedule |
|--|-----------------------------|
| 1. Advertisement/Issuance of Bidding Documents | August 22-Sep. 10, 2024 |
| 2. Deadline of Submission of Bids | September 10, 2024 @9:00 am |
| 3. Opening of Bids | September 10, 2024 @1:00 pm |
| 6. Bid Evaluation | September 11, 2024 |
| 7. Post-qualification | September 12-13, 2024 |
| 8. Notice of Award | September 17, 2024 |

The eligibility and technical documents of the Bid as specified in Section IX. Checklist of Technical and Financial Documents.

1. Affidavit of site Inspection.
2. Please read Bid Data Sheet for additional requirements.
3. Additional documents copy of Mayor's Permit, DTI or SEC, PCAB, Tax Clearance, Audited Financial Statement with ITR

Note: deadline of Submission is on September 10, 2024 @9:00 am based on the Municipal Bundy clock, Late bids will not be accepted.

ENGR. JOHN LAURENCE M. CADA WAS

BAC Chairman

1. Scope of Bid

The Procuring Entity, *Municipality of Paete, Laguna* invites Bids for the Improvement of Public Cemetery at Barangay Bagumbayan, Paete, Laguna, with Project Identification Number *IP-016-24cemetery*

[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 the Improvement of Public Cemetery, as described in Section VI (Specifications).

2. Funding Information

2.1. The GOP through the source of funding as indicated below for **year 2024** in the amount of *Seven hundred thousand pesos only(Php 700,000.00)*.

2.2. The source of funding is:
LGUs, the Annual or Supplemental Budget, as approved by the Sanggunian.

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. 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 Municipal Building, Municipal Hall J.V. Quesada st. Brgy 1 Paete, Laguna and 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 **January 8, 2025**. 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: <i>Concrete works and Mansory works</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7.1 | <i>Subcontracting is not allowed.</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10.3 | <i>Valid PCAB License</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10.4 | <p>The key personnel must meet the required minimum years of experience set below:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Key Personnel</u></th> <th style="text-align: center;"><u>General Experience</u></th> <th style="text-align: center;"><u>Relevant Experience</u></th> </tr> </thead> <tbody> <tr> <td>Project Manager,</td> <td style="text-align: center;">3 years</td> <td style="text-align: center;">3 years</td> </tr> <tr> <td>Project Engineer</td> <td style="text-align: center;">3 years</td> <td style="text-align: center;">3 years</td> </tr> <tr> <td>Materials Engineer</td> <td style="text-align: center;">3 years</td> <td style="text-align: center;">3 years</td> </tr> <tr> <td>Foremen</td> <td style="text-align: center;">3 years</td> <td style="text-align: center;">3 years</td> </tr> <tr> <td>Mason-carpentry</td> <td></td> <td></td> </tr> <tr> <td>First Aider</td> <td></td> <td></td> </tr> <tr> <td>Partime Practitioner</td> <td></td> <td></td> </tr> <tr> <td>Laborer</td> <td></td> <td></td> </tr> </tbody> </table> | <u>Key Personnel</u> | <u>General Experience</u> | <u>Relevant Experience</u> | Project Manager, | 3 years | 3 years | Project Engineer | 3 years | 3 years | Materials Engineer | 3 years | 3 years | Foremen | 3 years | 3 years | Mason-carpentry | | | First Aider | | | Partime Practitioner | | | Laborer | | |
| <u>Key Personnel</u> | <u>General Experience</u> | <u>Relevant Experience</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Project Manager, | 3 years | 3 years | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Project Engineer | 3 years | 3 years | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Materials Engineer | 3 years | 3 years | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Foremen | 3 years | 3 years | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mason-carpentry | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| First Aider | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Partime Practitioner | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Laborer | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10.5 | <p>The minimum major equipment requirements are the following:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Equipment</u></th> <th style="text-align: center;"><u>Capacity</u></th> <th style="text-align: center;"><u>Number of Units</u></th> </tr> </thead> <tbody> <tr> <td><u>Minor tools</u></td> <td></td> <td style="text-align: center;"><u>1</u></td> </tr> <tr> <td><u>Bagger mixer</u></td> <td></td> <td style="text-align: center;"><u>1</u></td> </tr> </tbody> </table> | <u>Equipment</u> | <u>Capacity</u> | <u>Number of Units</u> | <u>Minor tools</u> | | <u>1</u> | <u>Bagger mixer</u> | | <u>1</u> | | | | | | | | | | | | | | | | | | |
| <u>Equipment</u> | <u>Capacity</u> | <u>Number of Units</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <u>Minor tools</u> | | <u>1</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <u>Bagger mixer</u> | | <u>1</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | <i>alternative Bids shall not be accepted.</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15.1 | <p>The bid security shall be in the form of a Bid Securing Declaration or any of the following forms and amounts:</p> <p>a. The amount of not less than fourteen thousand pesos only (Php14,000.00) [two percent (2%) of ABC], if bid security is in cash, cashier's/manager's check, bank draft/guarantee or irrevocable letter of credit;</p> <p>b. The amount of not less than thirty-five thousand pesos and 94/100 only (Php35,000.00) [five percent (5%) of ABC] if bid security is in Surety Bond.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19.2 | <i>N/A</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | <i>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)</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | |
|----|---|
| 21 | 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. |
|----|---|

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 | The Intended Completion Date is <i>forty -five(45) calendar days which will commence within three calendar days from receipt of the Notice to Proceed.</i> |
| 4.1 | <i>from the receipt of the Notice to proceed</i> |
| 6 | The site investigation reports are: <i>Affidavit of Site Inspection</i> |
| 7.2 | <i>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.</i> |
| 10 | No dayworks are applicable to the contract. |
| 11.1 | The Contractor shall submit the Program of Work to the Procuring Entity's Representative for approval within <i>ten (10) days</i> of delivery of the Notice of award. |
| 11.2 | The Contractor shall submit to the Procuring Entity's Representative for approval an updated Program of Work every week, the Procuring Entity may withhold the amount of Five thousand pesos only if the contractor failed to Submit the updated program. |
| 13 | The amount of the advance payment is <i>15% of the total contract price.</i> |
| 14 | <i>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.</i> |
| 15.1 | The date by which operating and maintenance manuals are required is NOT LATER THAN 2 WEEKS AFTER THE COMPLETION OF THE PROJECT The date by which "as built" drawings are required is NOT LATER THAN 2 WEEKS AFTER THE COMPLETION OF THE PROJECT |
| 15.2 | The Procuring Entity may withhold the amount Php 70,00.00 of the remaining balance of the Contractor failed to submit or produce "as built" drawings. |

Section VI. Specifications

PROJECT : IMPROVEMENT OF PUBLIC CEMETERY

LOCATION : PAETE, LAGUNA

TECHNICAL SPECIFICATIONS

SUPER STRUCTURES CONSTRUCTION

ITEM 403

403.1 Description

This work shall consist of steel structures and the steel structure portions of composite structures, in reasonably close conformity with the lines, grades and dimensions shown on the plans.

The work will include the fabricating, hauling, erecting, welding and painting of structural metals called for in the special provision or shown on the plans. Structural metals will include structural steel, rivet, welding, special alloy steel, steel forging and casting, and iron castings. This work will also include furnishings of all plant, tools, equipment, materials and labor in the installation of metal framing, roof framing and roofing, including miscellaneous sheet metal works as required in accordance with these specifications, plans and special provisions.

403.2 Materials Requirements

Materials shall meet the requirements of Item 712, structural metal; item 409, welded structural steel and welded structural steel; and item 709, paint.

403.3 Construction Requirements

403.3.1 Inspection

The contractor shall give the Engineer at least fifteen (15) days notice prior to the beginning of work at the mill or shop, so that the mill, shop or foundry where material for the work is to be manufactured or fabricated. No material shall be rolled or fabricated until said inspection has been provided.

The contractor shall furnish the Engineer with copies of the certified mill reports of the structural steel, preferably before but not later than the delivery of the steel to the job site.

The contractor shall furnish all facilities for inspection and the Engineer shall be allowed free access to the mill or shop and premises at all times. The contractor shall furnish, without charge, all labor, machinery, material and tools necessary to prepare test specimens.

Inspection at the mill or shop is intended as a means of facilitating the work and avoiding errors and it is expressly understood that it will not relieve the contractor from any responsibility for imperfect material or workmanship and the necessity for replacing same. The acceptance of any material or finished member at the mill or shop by the Engineer shall not preclude their subsequent rejection if found defective before final acceptance of the work. Inspection of welding will be in accordance with the provision of section 5 of the "Standard code for arc and gas welding in building construction" of the American Welding Society.

403.3.2 Stock Material Control

When so specified in the contract, stock material shall be segregated into classes designated as "identified" or "unidentified". Identified material is material which can be positively identified as having been rolled from a given heat for which certified mill test can be produced. Unidentified material shall include all other general stock materials. When it is proposed to use unidentified material, the Engineer shall be notified of such intention at least fifteen (15) days in advance of commencing fabrication to permit sampling and testing. When so indicated or directed, the contractor shall select such material as he wishes to use from stock, and place it in such position that it will be accessible for inspection and sampling. The contractor shall select identified material from as few heat numbers as possible, and furnish the certified mill test reports on each of such heat numbers. Two samples shall be taken from each heat number as directed, one for a tension test and one for a bend test.

In case of unidentified stock, the Engineer may, at his discretion, select any number of random test specimens.

Structural material, either plain or fabricated, shall be stored above the ground upon platforms, skids, or other supports, it shall be kept free from dirt, grease or other foreign matter, and shall be protected as far as practicable from corrosion.

403.3.3 Fabrication

These specifications apply to welded construction. The contractor may, however, with the approval of the Engineer, substitute high tensile strength steel bolts equivalent to the welds in any connection.

Workmanship and finish shall be in accordance with the best general practice in modern shops. Portions of the work exposed to view shall be finished neatly. Shearing, flame cutting, and chipping shall be done carefully and accurately.

Structural material, either plain or fabricated, shall be stored above the ground upon platforms, skids or other supports. Rolled material before being laid off or worked must be straight. If straightening is necessary, it shall be done by methods that will not injure the metal. Sharp kinks and bends will be cause for rejection of the material.

Preparation of material shall be in accordance with AWS D 1.1, paragraph 3.2 as modified by AASHTO standard specification for welding of structural steel highway bridges.

403.3.4 Finishing and Shaping

Finished members shall be true to line and free from twists, bends and open joints.

1. Edge Planing

Sheared edges of plates more than 15.9 mm in thickness and carrying calculated stresses shall be planed to a depth of 6.3 mm. Re-entrant cuts shall be filleted before cutting.

2. Facing of Bearing Surfaces

The surface finish of bearing and based plates and other bearing surfaces that are to come in contact with each other or with concrete shall meet the American national standards institute surface roughness requirements as defined in ANSI B-46, 1-47, Surface roughness waviness and lay, Part I:

| | |
|---|------------|
| Steel Slabs | ANSI 2,000 |
| Heavy plates in contact in shoes to be welded | ANSI 1,000 |
| Milled ends of compression member, stiffeners and fillers | ANSI 500 |
| Bridge rollers and rockers | ANSI 250 |
| Pins and pin holes | ANSI 125 |

| | |
|------------------|----------|
| Sliding bearings | ANSI 125 |
|------------------|----------|

3. Abutting Joints

Abutting joints in compression members and girders flanges, and in tension members where so specified on the drawings, shall be faced and brought to an even bearing. Where joints are not faced, the opening shall not exceed 6.3 mm.

4. End Connection Angles

Floor beams, stringers and girders having end connection angles shall be built to plan length back to back of connection angles with a permissible tolerance of 0 mm. to minus 1.6 mm. If end connections are faced, the finished thickness of the angles shall not be less than shown on the detail drawings, but in no case less than 9.5 mm.

5. Lacing Bars

The ends of lacing bars shall be neatly rounded unless another form is required.

6. Fabrication of Members

Unless otherwise shown on the plans, steel plates for main members and splice plates for flanges and main tension members, not secondary members, shall be cut and fabricated so that the primary direction of rolling is parallel to the direction of the main tensile and/or compressive stresses.

Fabricated members shall be true to line and free from twists, bends and open joints.

403.3.5 Shop Assembly

The field connections of main members of trusses, arches, continuous beam spans, bents, towers (each face), plate girders and rigid frames shall be assembled in the shop with milled ends of compression members in full bearing, and then shall have their sub-size holes reamed to specified size while the connections are assembled. Assembly shall be "Full Truss or Girders Assembly" Unless "Progressive Chord Assembly" or "Special Complete Structure Assembly" is specified in the Special provisions on the plans.

Check assemblies with numerically-controlled drilled fields connections shall be in accordance with the provision of 2 (f) of this subsection.

Truss, Purlins and Tank Structures

(1) Structural Steel Shapes, Plates and Bars

Unless otherwise shown or specified on the drawings, structural steel shapes plates and bare shall conform to ASTM specification A36/A36M.

(2) Hot-Formed Steel Sheet and Strip

Unless otherwise shown or specified on the drawings, hot-formed steel sheet and strip shall conform to ASTM A570.

(3) Bolts, Nuts and Washer

It shall conform to specification ASTM A370, with a minimum yield point of 33,000 psi, unless otherwise shown in the drawings. Heavy hexagonal structural bolts, heavy hexagonal nuts, and hardened washers, shall be quenched and tempered medium-carbon steel bolts, nuts and washers complying with ASTM A325.

(4) Screw and Expansion Bolts

Screws and expansion bolts shall be of standard commercial grade, and of the sizes and types indicated as approved by the Consultant.

(5) Electrodes

Electrodes for arc welding shall be E60 or E70, AWS D1.1.

(6) Pipe Columns and Hand Rails

Pipe columns and hand rails shall be zinc-coated steel pipe of standard weight conforming to ASTM A53.

(7) Galvanizing

Unless otherwise specified, galvanizing shall be of standard quality, hot-dipped process of 1.25 ounces per square foot of coating. Galvanized surfaces that are damaged prior to final acceptance shall be repaired using an approved repair compound to the satisfaction of the Engineer.

(8) Miscellaneous Metals

Miscellaneous metal including fastening, anchorages and incidentals not specifically mentioned herein or in other sections of this specifications but are required to complete the work, for which there are no detailed drawings, shall be provided and installed in accordance with standard practice of the traders as approved by the Engineer.

(9) Delivery, Storage and Handling

Fabricated materials delivered to job site shall be stored in clean and protected dry area in manufacturer's protective packaging. Structural steel materials to be stored shall be placed on skids above the ground. It shall be kept clean and properly drained. Long members, such as purlins and chords, shall be supported by skids placed near enough together to prevent injury from deflection. The contractor shall check the quantity and quality of materials turned over to him against the delivery lists and report promptly in writing any shortage or damage discovered.

403.4 Method of Measurement

403.4.1 Unit Basis

The quantity of structural steel to be paid for shall be number of kilograms complete in place and accepted. For the purpose of measurement for payment components fabricated from metals listed in (1) below, such as casting alloy steels, steel plates, anchor bolts and nuts, shoes, rockers, rollers, pins and nuts, expansion dams, roadway drains and sumpers, weld metal, bolts embedded in concrete, cradles and brackets, posts, conduits and ducts, and structural shapes or expansion joints and pier protection will be considered as structural steel.

Unless otherwise provided, the mass of metal paid for shall be computed and based upon the following mass:

1. Unit Density, kg/m³

| | |
|--------------------------|---------|
| Aluminum, cast or rolled | 2,771.2 |
| Bronze or copper alloy | 8,585.9 |
| Copper sheet | 8,938.3 |
| Iron, cast | 7,128.2 |

| | |
|---|---------|
| Iron, malleable | 7,528.7 |
| Lead, sheet | 1,122.9 |
| Steel, cast or rolled, including alloy copper bearing and stainless | 7,849 |
| Zinc | 7,208.3 |

2. Shapes, Plates Railing and Flooring

The mass of steel shapes and plates shall be computed on the basis of their nominal mass and dimensions as shown on the approved shop drawings, deducting for copes, cuts and open holes, exclusive of rivets holes. The mass of all plates shall be computed on the basis of nominal dimensions with no additional for overrun.

The mass of railing shall be included as structural steel unless the Bill of Quantities contains as pay item for bridge railing under item 401, Railings.

The mass of steel grid flooring shall be computed separately.

3. Welds

The mass of shop and field fillet weld shall be assumed as follows:

| Size of Weld (mm) | Kg. per linear meter |
|-------------------|----------------------|
| 6.3 | 0.984 |
| 7.9 | 1.213 |
| 9.5 | 1.771 |
| 12.7 | 2.690 |
| 5.9 | 3.936 |
| 19.0 | 5.379 |

| | |
|------|-------|
| 22.2 | 7.314 |
| 25.4 | 9.774 |

The mass of other welds will be computed on the basis of the theoretical volume from dimensions of the welds, with an addition of 50 mass percent as an allowance for overrun.

4. Other Items

The quantities of other contract items which enter into the completed and accepted structure shall be measured for payment in the manner prescribed in Subsection 403.5.1 (4).

403.5 Basis of Payment

403.5.1 Structural Steel

1. Furnished, fabricated and Erected

The quantity, determined as provided above, shall be paid for at the contract unit price per kilogram for "Structural Steel, furnished, fabricated and erected", which price and payment shall constitute full compensation for furnishing, galvanizing, fabricating, radiographing, magnetic particle, inspection, delivering, erecting ready for use, and painting all steel and other metal including all labor, equipment, tools and incidentals necessary to complete the work, except as provided in Subsections 403.5.2, 403.5.3 and 403.5.4.

403.5.2 Metal Considered as Structural Steel

For the purpose of subsection 403.5.1 and unless otherwise shown on the plans, castings, forgings, special alloy steels and steel plates, wrought iron, and structural shapes of expansion

joints and pier protection shall be considered as structural steel except that when quantities and unit price for certain alloy steels, forgings, castings and other specific categories of metal are called for in the bill of quantities, the mass of such selected material, determined as provided above, shall be paid for at the respective contract unit price per kilogram for “Structural Steel (Alloy steel, forgings, castings, and/or other category), furnished and fabricated, and erected” or Structural Steel (Subsection 403.4.1), furnished and fabricated as named in the Bill of Quantities.

403.5.3 other Items

The quantities of all other contract items which enter into the completed and accepted structure shall be paid for all the contract unit prices for the several pay items as prescribed for the items involved.

403.5.4 Payment as Reinforcing Steel

When the bill of quantities does not contain a pay item for structural steel, the quantities of metal drains, scuppers, conduits, ducts and structural shapes for expansion joints and pier protection, measured as provided above will be paid for as Reinforcing Steel under item 404.

Payment will be made under:

| <u>Pay item no.</u> | <u>Description</u> | <u>Unit of Measurement</u> |
|---------------------|--|----------------------------|
| 403 (1) | Structural Steel, Furnished, fabricated and erected | Kilograms (kg) |
| 403 (2) | Structural Steel, Furnished, fabricated and erected | Kilograms (kg) |
| 403 (3) | Structural Steel, | |

Furnished, fabricated and erected Kilograms (kg)

Where separate payment is to be made for certain metals or for certain particular components, other than under the general provision for structural steel, designation of those particular cases shall be inserted in the spaces provided in the pay names for item 404 (2), 403 (4) or 403 (6), as the case may be.

ITEM 404- REINFORCING STEEL

404.1 Description

This item shall consist of furnishing, bending, fabricating and placing of steel reinforcement of the type, size, shape and grade required in accordance with this Specification and in conformity with the requirements shown on the plans or as directed by the Engineer.

404.2 Material Requirements

Reinforcing steel shall meet the requirements of item 710, Reinforcing Steel and Wire Rope.

404.3 Construction Requirements

404.3.1 Order List

Before materials are ordered, all order lists and bending diagrams shall be furnished by the contractor, for approval of the Engineer. The approved order lists and bending diagrams by the Engineer shall in no way relieve the contractor of responsibility for the correctness of such

lists diagrams. Any expense incident to the revisions of materials furnished in accordance with such lists and diagrams to make them comply with the plans shall be borne by the contractor.

404.3.2 Protection of Material

Steel reinforcement shall be stored above the surface of the ground upon platforms, skid or other support and shall be protected as far as practicable from mechanical injury and surface deterioration caused by exposure to conditions producing rust. When placed in the work, reinforcement shall be free from dirt, detrimental rust, loose scale, paint, grease, oil, or other foreign materials. Reinforcement shall be free from injurious defects such as cracks and laminations. Rust, surface seams, surface irregularities or mill scale will not be caused for rejection, provided the minimum dimension, cross sectional area and tensile properties of the material meets the physical requirements for the size and grade of steel specified.

404.3.3 Bending

All reinforcing bars requiring bending shall be cold-bent to the shapes shown on the plans or required by the Engineer. Bars shall be bent around a circular pin having the following diameter (D) in relation to the diameter of the bar (d):

Bends and Hooks

| Nominal diameter, (d), mm | Pin diameter (D) |
|---------------------------|------------------|
| 10 to 20 | 6d |
| 25 to 28 | 8d |
| 32 and greater | 10d |

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

404.3.4 Placing and Fastening

All steel reinforcement shall be accurately placed in the position shown on the plans and firmly held there during the placing and settling of the concrete. Bars shall be tied at all intersections except where spacing is less than 300 mm in each directions, in which case, alternate intersections shall be tied. Ties shall be fastened on the inside.

Distance from the forms shall be maintained by means of stays, blocks, ties, hangers, or other approved supports, so that it does not vary from the position indicated on the plans by more than 6 mm. blocks for holding reinforcement from contact with the forms shall be precast mortar blocks approved shapes and dimensions. Layers of bars shall be separated by precast blocks or by other equally suitable devices. The use of Peebles, pieces of broker stone or brick, metal pipe and wooden blocks shall not be permitted. The minimum distance between bars shall be 40 mm. reinforcement any member shall be placed, inspected and approved by the Engineer before the concrete begins. Concrete placed in violation of this provision may be rejected and removal may be required.

404.3.5 Splicing

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

Unless otherwise shown on the plans, bars shall be tapped a minimum distance of:

| | | | |
|--------|----------|----------|--------------|
| Splice | Grade 40 | Grade 50 | But not less |
| than | | | |

| | | | |
|-------------|-------------|-------------|---------|
| Tension | 24 bar dia. | 36 bar dia. | 300 mm |
| Compression | 20 bar dia. | 24 bar dia. | 300 m m |

In lapped splices, the bars shall be placed in contact and wired together. Lapped splices will not be permitted at locations where the concrete section is insufficient to provide minimum clear distance of one and one-third ($1 \frac{1}{3}$) the maximum size coarse aggregate between the splice and the nearest adjacent bar. Welding of reinforcing steel shall be done only if detailed on the plans or if authorized by the Engineer in writing. Spiral reinforcement shall be spliced by lapping at least one and a half turns or by butt welding unless otherwise shown on the plans.

404.4 Method of Measurement

The quantity of reinforcing steel to be paid for will be the final quantity placed and accepted in the completed structure. No allowance will be made for tie-wires, separators, wire chairs and other material used in fastening the reinforcing steel in place. No measurement or payment will be made for splices added by the contractor. When there is no item for reinforcing steel in the bill of quantities, cost will be considered as incidental to the other items. (i.e. structural concrete, masonry, etc.) in the bill of quantities.

404.5 Basis of Payment

The accepted quantity, measured as prescribed in section 404.4 shall be paid for at the contract unit price for reinforcing steel which price and payment shall be full compensation for furnishing and placing all materials, including all labor, equipment, tools, and incidentals necessary to complete the work prescribed in this item.

Payment will be made under:

| <u>Pay item no.</u> | <u>Description</u> | <u>Unit of Measurement</u> |
|---------------------|-----------------------|----------------------------|
| 404 (1) | Reinforcing Steel (d) | Kilograms (kgs) |

ITEM 405- STRUCTURAL CONCRETE

405.1 Description

405.1.1 Scope of Work

This item shall consist of furnishing, bending, placing and finishing concrete in all structures except pavements in accordance with this specification and conforming to the lines, grades, and dimensions shown on the plans. Concrete shall consist of a mixture of Portland Cement, fine aggregate, coarse aggregate, admixture when specified or approved by the Engineer.

405.1.2 Classes and Uses of Concrete

Five classes of concrete are provided for in this item, namely: A, B, C, P and Seal. Each class shall be used in that part of the as called for on the plans. The classes of concrete will generally be used as follows:

Class A – All superstructures and heavily reinforced substructures. The important parts of the structure included are slabs, beams, girders, columns, arch ribs, box culverts, reinforced abutments, retaining walls, and reinforced footings.

Class B – Footings, pedestals, massive pier shafts, pipe bedding, and gravity walls, unreinforced or with only a small amount of reinforcement.

Class C – Thin reinforcement sections, precast R.C. piles and cribbing and for filler in steel grid floors.

Class P – Prestressed concrete structures and members.

Seal – Concrete deposited in water.

405.2 Material Requirements

405.2.1 Portland Cement

It shall conform to all the requirements of Subsection 311.2.1

405.2.2 Fine Aggregate

It shall conform to all the requirements of Subsection 311.2.2

405.2.3 Coarse Aggregate

It shall conform to all the requirements of Subsection 311.2.3 except that gradation shall conform to Table 405.1

Table 405.1- Grading Requirements for Coarse Aggregate

| Standard (Mm) | Alternate US Standard | Class A | Class B | Class C | Class D | Class Seal |
|---------------|-----------------------|---------|---------|---------|---------|------------|
| 63 | 2- ½" | | | | | |
| 50 | 2' | 100 | 100 | | | |
| 37.5 | 1- ½" | 95-100 | - | | | 100 |
| 25 | 1" | - | 35-70 | - | 100 | 95-100 |
| 19.0 | ¾" | 35-70 | - | 100 | - | 25-60 |
| 12.5 | ½" | - | 10-30 | 90-100 | - | 25-60 |

| | | | | | | |
|------|------|-------|-----|-------|-------|-------|
| 9.5 | 3/8" | 10-30 | - | 40-70 | 20-55 | - |
| 4.75 | No.4 | 0-5 | 0-5 | 0-15" | 0-10" | 0-10" |

The measured cement content shall be within plus (+) or minus (-) 2mass percent of the design cement content.

405.2.4 Water

It shall conform to all the requirements of Subsection 311.2.4

405.2.5 Reinforcing Steel

(1) General

Steel reinforcement shall be provided as indicated, together with all necessary wire ties, chair, spacers, supports and other devices necessary to install and secure the reinforcement properly. All reinforcement, when placed, shall be free from loose, flaky rust and scale, oil grease, clay, and other coating and foreign substances that would reduce or destroy its bond with concrete. Reinforcement shall be placed accurately and secured in place by use of metal or concrete supports, spacers and ties. Such supports shall be of sufficient strength to maintain the reinforcement in place throughout the concreting operations. The supports shall be used in such manner that they will not be exposed or contribute in any way to the discoloration or deterioration of the concrete.

(2) Splicing

Splices shall be by lapping to develop the full strength of the bars unless otherwise indicated, the minimum splice length shall be 40 times the bar diameter or the development length shown in Subsection 404.3.5 and item 710, Reinforcing Steel-splicing.

405.2.5.2 Admixtures

Admixtures shall conform to the requirements of Subsection 311.2.7

405.2.5.3 Curing Materials

Curing materials shall conform to the requirements of Subsection 311.2.8

405.2.5.4 Storage of Cement and Aggregates

Storing of cement and aggregates shall conform to all the requirements of Subsection 311.2.10

405.3 Sampling and Testing of Structural Concrete

As work progresses, at least one (1) sample consisting of three (3) concrete cylinder test specimens, 150mm x 300mm (6"x12") shall be taken from each seventy five (75) cubic meter of each class of concrete of fraction thereof placed each day. Compliance with the requirements of this section shall be determined in accordance with the following standard methods of AASHTO:

| | |
|---|-------|
| Sampling of fresh concrete | T 141 |
| Weight per cubic meter and air content (gravi-metric) of concrete | T 121 |
| Sieve analysis of fine and coarse aggregates | T 27 |
| Slump of Portland Cement Concrete | T 119 |
| Specific gravity and absorption of fine aggregate | T 84 |

Test for strength shall be made in accordance with the following:

Making and curing concrete comprehensive and flexural test

Specimens in the field T 23

Comprehensive strength of molded concrete cylinders T 22

405.4 Production Requirements

405.4.1 Proportioning and Strength of Structural Concrete

The concrete materials shall be proportioned in accordance with the requirements for each class of concrete as specified in Table 405.4.1, using absolute method as outlined in the American Concrete Institute (ACI) Standard 211.1. "Recommended Practice for Selecting proportions for Normal and Heavyweight Concrete". Other methods of proportioning may be employed in the mix design with prior approval of the Engineer. The mix shall either be designed or approved by the Engineer. A change in the source of materials during the progress of work may necessitate a new mix design.

The strength requirements for each class of concrete shall be specified in Table 405.4.1

Table 405.4.1 – Composition and Strength of Concrete for use in Structure

| | | | | | |
|-------------------------|---|---|---|---|--|
| Class Of Concrete | Minimum Cement Content Per m ³ Kg (bag **) | Maximum Water Cement Ratio Kg/kg | Consistency Range in Slump Mm (inch) | Designated Size of Coarse Aggregate Square | Minimum Compressive Strength of 150 mm x 300mm |
|-------------------------|---|---|---|---|--|

| | | | | Opening Std. mm | Conc. Cylinder Specimen at 28 days, MN/m ³ (psi) |
|------|-------------------|------|----------------------|--------------------------------|--|
| A | (360) (9 bags) | 0.53 | 50-100 (2 – 4) | 37.5 – 4.75 (1 – ½" – No.4) | 20.7 (3000) |
| B | (320) (8 bags) | 0.58 | 50 – 100 (2 – 4) | 50 – 4.75 (2" – No.4) | 16.5 (2400) |
| C | 380 (9.5 bags) | 0.55 | 50 – 100 (2 – 4) | 12.5 – 4.75 (1/2" – No.4) | 20.7 (3000) |
| P | 440 (11 bags) | 0.49 | 100 max. (4 max.) | 19.0 – 4.75 (¾" – No.4) | 37.7 (5000) |
| Seal | 380 (9.5 bags) | 0.58 | 100 – 200 (4 – 8) | 25 – 4.75 (1" – No.4) | 20.7 (3000) |

The measured cement content shall be within plus (+) or minus (-) 2 mass percent of the design cement content. Based on 40 kg/bag.

405.4.2 Consistency

Concrete shall have a consistency such that it will be workable in the required position. It shall be of such a consistency that it will flow around reinforcing steel but individual particles of the coarse aggregate when isolated shall show a coating of mortar containing its proportionate amount of sand. The consistency of concrete shall be gauged by the ability equipment to properly place it and not by difficulty in mixing and transporting. The quantity of mixing water

shall be determined by the Engineer and shall not be varied without his consent. Concrete as dry as it is practical to place with the equipment specified shall be used.

405.4.3 Mixing and Delivery

Concrete may be mixed at the site of the construction, at a central point or by a combination of central point and mixing or by a combination of central point mixing truck agitating. Mixing and delivery of concrete shall be in accordance with the appropriate requirement of AASHTO M 157 except as modified in the following paragraphs of this section, for truck mixing in combination of central point and mixing or truck agitating. Delivery of concrete shall be regulated so that placing is at a continuous rate unless delayed by placing operations. The intervals between delivery of batches shall not be so long as to allow the concrete in place to hardened partially, and in no case shall such an interval exceed 30 minutes.

In exceptional cases and volumetric measurements are authorized, for small project requiring less than 75 cubic meters per day of pouring, the weight proportions shall be converted to equivalent volumetric proportions. In such cases, suitable allowance shall be made for variations in the moisture condition of the aggregates, including the bulking effect in the aggregate. Batching and mixing shall be in accordance with ASTM C 685, Section 6 through 9.

405.4.3.1 Mixing Concrete: General

Concrete shall be thoroughly mixed in a mixer of an approved size and type that will insure a uniform distribution of the materials throughout the mass.

All concrete shall be mixed in mechanically operated mixers, mixing plant and equipment for transporting and placing concrete shall be arranged with an ample auxiliary installation to provide minimum supply of concrete in case of breakdown of machinery or in case the normal supply of concrete is disrupted. The auxiliary supply of concrete shall be sufficient to complete the casting of a section up to a construction joint that will meet the approval of the Engineer.

405.4.3.2 Mixing Concrete at Site

Concrete mixers may be of the revolving drum or the revolving blade type and the mixing drum or blades shall be operated uniformly at the mixing speed recommended by the manufacturer. The pick-up and throw-over blades of mixers shall be restored or replaced when any part or section is worn 20mm or more below the original height of the manufacturer's design. The first batch of concrete materials placed in the mixer shall contain a sufficient excess of cement, sand and water to coat inside the drum without reducing the required mortar content of the mix.

When the aggregate contains more water than the quantity necessary to produce a saturated surface dry condition, representative samples shall be taken and the moisture content determined for each kind of aggregate.

The batch shall be so charged into the mixer that some water will enter in advance of cement and aggregate. All water shall be in the drum by the end of the first quarter of the specified mixing time. Cement shall be batched and charged into the mixer so that it will not result in loss of cement due to the effect of wind, hoppers, or other conditions which reduce or vary the required quantity of cement in the concrete mixture.

The entire content of a batch mixer shall be removed from the drum before materials for a succeeding batch are placed therein, the materials composing a batch except water shall be deposited simultaneously in the mixer.

All concrete shall be mixed for a period of not less than 1 – ½ minutes after all materials, including water, are in the mixer. During the period of mixing, the mixer shall operate at the speed for which it has been designed. When mixing is to cease for a period of one hour or more, the mixer shall be thoroughly cleaned. Mixers and agitators which have an accumulation of hard concrete or mortar shall not be used.

405.5 Formwork Construction

Concrete form shall be mortar-tight, true to the dimensions, lines and grades of the structure and with sufficient strength, rigidity, shape and surface smoothness as to leave the finished works true to the dimension shown on the plans or required by the Engineer and the surface finish as specified.

The inside surface of form shall be cleaned of all dirt, mortar and foreign material. From which will later be removed shall be thoroughly coated with form oil prior to use. The form oil shall be of commercial quality form oil or other approved coating which will permit the read release of the forms and will not discolor the concrete.

Concrete shall not be deposited in the forms until work in connection with the constructing the forms has been completed, all inspected and approved said forms and materials. Such work shall include the removal of all dirt, chips, sawdust and other foreign material from the forms.

The rate of depositing concrete in forms shall be such to prevent bulging of the forms or form panels in excess of the deflections permitted by this specification. Forms shall have sufficient strength to withstand the pressure resulting from placement and vibration of the concrete, and shall be maintained rigidly in correct position.

405.5.1 Removal of Forms and Falsework

Forms and falsework shall not be removed without the consent of the Engineer. The Engineer's consent shall not relieve the contractor of responsibility for the safety of the work. Blocks and bracing shall be removed at the time the forms are removed and in no case shall any portion of the wood forms be left in the concrete.

Falsework removal for continuous or cantilevered structures shall be as directed by the Engineer or shall be such that the structure is gradually subjected to its working stress.

When concrete strength tests are used for removal of forms and supports, such removal should not begin until the concrete has attained the percentage of the specified design strength shown in the table below;

Table 405.1 – Requirements for Removal of Forms

| Element | Minimum Time | Minimum Percentage Design Strength |
|---|--------------|--|
| Centering under beams frames or arches, girders | 14 days | 80% |
| Floor slabs: | 14 days | 70% |
| Walls | 1 day | 70% |
| Columns | 2 days | 70% |
| Side of Beams and all other vertical surfaces | 1 day | 70% |

Forms and falsework shall not be released from under concrete without first determining if the concrete has gained adequate strength without regard to the time element. In the absence of strength determination, the forms and falsework are to remain in place until removal is permitted by the Engineer.

To facilitate finishing, forms used on ornamental work, railing, parapets and exposed vertical surfaces shall be removed in not less than 12 or more than 48 hours, depending upon the weather condition of concrete in columns, forms shall always be removed from them before the removal of shoring from beneath beams and girders.

405.5.2 Construction Joints

Construction joints shall be made only where shown on the plans or called for in the pouring schedule, unless otherwise approved by the Engineer. Shear keys or reinforcement shall be used, unless otherwise specified, to transmit shear or to bond the two sections together.

Before depositing new concrete on or against concrete which has hardened, the forms shall be retightened. The surface of the hardened concrete shall be roughened as required by the Engineer, in a manner that will not leave loose particles or aggregate or damage concrete at the surface.

The placing of concrete shall be carried continuously from joint to joint. The face edges of all joints which are exposed to view shall be carefully finished true to line and elevation.

405.5.3 Concrete Surface Finishing

Surface finishing shall be classified as follows:

Class 1 – Ordinary Finish

Immediately following the removal of forms, all formwork and irregular protection shall be removed from all surfaces except from those which are not to be exposed or are not to be waterproofed. On all surfaces the cavities produced by form ties and all other holes, honeycomb spots, broken corners or edges and other defects shall be thoroughly cleaned, and having been kept saturated with water and made true with a mortar and fine aggregate mixed in the proportions used in the grade of concrete being finished. Mortar to be used shall not be more than one (1) hour old. The mortar patches shall be cured as specified under Subsection 407.3.8 All construction and expansion joints in the completed work shall be left carefully tooled and free of all mortar and concrete. The joint filler shall be left exposed for its full length, with clean and true edges.

All concrete shall be given Class 1, Ordinary finish and additionally any further finish as specified. The resulting surfaces shall be true and uniform. All repaired surfaces, the appearance of which is not satisfactory to the Engineer, shall be “rubbed” as specified below.

Class 2 – Rubbed Finish

After removal of forms, the rubbing of concrete shall be started as soon as its condition will permit. Immediately before starting this work, the concrete shall be kept thoroughly saturated with water for a minimum period of three hours. Sufficient time shall have elapsed before the wetting down to allow the mortar used to thoroughly set. The mortar shall be composed of cement and fine sand mixed in the proportions used in the grade of concrete being finished. Rubbing shall be continued until all form marks, protections and irregularities have been removed, all voids have been filled, and a uniform surface has been obtained.

Unless otherwise specified, the following surfaces shall be given a Class 2, Rubbed Finish

- (1) The exposed faces of piers, abutments, wingwalls and retaining walls.
- (2) The outside face of girders, T-beams, slabs, columns, brackets, curbs, headwalls, railings, arch rings, spandrel walls and parapets.

405.5 Method of Measurement

The quantity of structural concrete to be paid for will be the final quantity placed and accepted in the completed structure. No deduction will be made for the volume occupied less than 100 mm (4 inches) in diameter or by reinforcing steel, anchor, conduits, weep hole or expansion joint materials.

405.6 Basis of Payment

The accepted quantities measured prescribed in Section 405.5., shall be paid for at the contract unit price for each of the pay item listed below that is included in the Bill of Quantities. Forms and accessories shall likewise be included in each item.

Payment, shall constitute full compensation for furnishing, placing and finishing concrete including all labor, equipment, tools and incidentals necessary to complete the work prescribed in the item.

Payment will be made under:

| <u>Pay item No.</u> | <u>Description</u> | <u>Unit of Measurement</u> |
|---------------------|------------------------------|----------------------------|
| 405 (1) | Structural concrete, Class A | Cubic meter |
| 405 (2) | Structural concrete, Class B | Cubic meter |
| 405 (3) | Structural concrete, Class C | Cubic meter |
| 405 (4) | Structural concrete, Class P | Cubic meter |
| 405 (5) | Seal concrete | Cubic meter |

ITEM 409- WELDED STRUCTURAL STEEL

409.1 Description

This work shall consist of the joining of structural steel members with welds of the type, dimensions, and design shown on the plans and in accordance with this Specification.

It is the intent of this specification to provide for work of a quality comparable to that required under the Standards Specifications for Welded Highway and Railway Bridges of the American Welding Society. In case of dispute of for situations not adequately provided for in this Specification, those designated Standard Specifications shall be considered as the final authority and shall govern except as amended by the Special Provisions.

Welding of structural Steel shall be done only when shown on the Plans or authorized in writing by the Engineer.

409.2 Material Requirements

Steel base metal to be welded shall be open-hearth or electric furnace steel conforming to AASHTO M 183.

All arc-welding electrodes shall conform to the requirements of American Welding Society Specifications. Electrodes shall be of classification numbers E7016, E7018 or E7028 as required for the positions, type of current and polarity, and other conditions of intended use, and to conform to any special requirements indicated on the plans.

Filler material to be used in the repair or strengthening of old structures or for joining new parts to existing steel members, shall be adopted to the material to be welded and may depart from the foregoing requirements only if agreed by the Engineer.

409.3 Construction Requirements

409.3.1 Equipment

409.3.1.1 General

All items of equipment for welding and gas cutting shall be so designed and manufactured and in such condition as to enable qualified welders to follow the procedures and attain the results prescribed in this specification

409.3.1.2 Arc-Welding Equipment

Welding generators and transformers shall be designed expressly for welding. They shall be capable of delivering steady currents adjustable through a range ample for the work

requirements. They shall respond automatically and quickly to changes in power requirements due to variations in arc length and shall deliver full current promptly on striking an arc.

Welding cable shall have sufficient conductivity to avoid overheating and inadequate current at the arc and shall be effectively insulated against welding circuit voltage. Earth or ground connections and circuits shall be secured and adequate to carry the welding currents.

Electrode holders shall grip the electrode firmly and with good electrical contact. Approved automatic welding heads may be used, with suitable auxiliary handling equipment to provide automatic instead of manual control of electrode and welding arc.

409.3.1.3 Gas-Cutting Equipment

Torches and tips shall be of proper size and type of the work at hand. Suitable regulators shall afford the welder complete control over the pressure and rate of flow of each gas.

409.3.1.4 Protective Equipment

All personnel protective equipment shall conform to the American Standard Association Code for such equipment.

The contractor shall enforce the use of approved accessories necessary for the protection and convenience of the welders and for the proper and efficient execution of the work.

Suitable protection against the light of the arc shall be maintained by the contractor when arc-welding operation might be viewed within harmful range by persons other than the actual welders and inspectors.

409.3.2 Welding

409.3.2.1 General

Welding shall be performed by the metal-arc process using the electrodes specified with either direct or alternating current.

Surfaces to be welded shall be smooth, uniform and free from fins, tears and other defects which would adversely affect the quality of the weld. Edges of the material shall be trimmed by machining, chipping, grinding or machine gas-cutting to produce a satisfactory welding edge wherever such edge is thicker than: 13mm for sheared edge of material; 16mm for toes of angles or rolled shapes (other than twice flange sections); 25mm for universal mill plate or edges of flange sections.

The width of root face used, shall be not more than 1.5mm for parts less than 10mm in thickness nor more than 3mm for parts 10mm or more in thickness.

Butt welds shall be proportioned so that their surface contours will lie in gradual transition curves. For butt welded joints between base metal parts of unequal thickness, a transition shall be provided on a slope or level not greater than 1 in 2.5 to join the offset surfaces. This transition may be provided by sloping the surface of the weld material or beveling the thicker part or by combination of these two methods.

Surfaces to be welded shall be free from loose scale, slag, rust grease or other material that will prevent proper welding. Scale mill that withstands vigorous wire brushing or a light film of drying oil or rust inhibitive coating may remain.

409.3.2.2 Welders

All welding shall be done by approved competent and experienced and fully qualified welders.

409.3.2.3 Preparation of Materials for Welding

Dimensional tolerance, straightness and flatness of the structure shapes and plates shall be within the limits prescribed in the Specification.

Structural steel which is to be welded shall preferably not be painted until all welding is completed.

Preparation of edges by gas-cutting shall, wherever practicable, be done by machine gas - cutting. Machine gas-cutting edges shall be substantially as smooth and regular as those produced by edge planning and shall be left free of slag. Manual gas cutting shall be permitted only where machine gas-cutting is not practicable and with the approval of the Engineer. The edge resulting from manual gas cutting shall be inspected and smoothed with special care. All re-entrant corners shall be filleted to a radius at least 19mm. The cut lines shall not extend beyond the fillet and all cutting shall follow closely the line prescribed.

409.3.2.4 Assembly

The parts to be joined by fillet welds shall be brought into a close contact as practicable, and no event shall be separated more than 5mm. If the separation is 1.5mm or greater, the leg of the fillet weld shall be increased by the amount of separation. The separation between faying surfaces of lap joints and of butt joints landing on a backing structure shall not exceed 1.5mm. The fits of joints which are not sealed by welds throughout their length shall be sufficiently close to exclude water after painting. Where irregularities in rolled shape or plates, after straightening, do not permit contact within the above limits, the procedure necessary to bring the material within these limits shall be subject to the approval of the Engineer.

Cutting parts to be joined by butt welds shall be carefully aligned. Where the parts are effectively restrained against bending due to eccentricity or alignment, a maximum offset of 10 percent of the thickness or the thinner part joined, but in no case more than 3mm, may be permitted as a departure from the theoretical alignment. In connecting alignment in such cases, the parts shall not be drawn into a greater slope than two (2) degrees (1 in 30). Measurement of offset shall be between centerline of parts unless otherwise shown on the plans.

When parts abutting edge to edge differ in thickness, the joint shall be of such form that the slope of either surface through the transition zone does not exceed 1 in 2.5, the thicker part being beveled, if necessary.

Members to be welded shall be brought into correct alignment and held in position by bolts, clamps, wedges, guy lines, strut and other suitable devices or tack welds until welding has been completed. The use of jigs and fixtures is recommended where applicable. Such fastening devices as may be used shall be adequate to insure safety.

Plug and slot welds may be used to transmit shear in a lap joint or to prevent the buckling or separation of lapped parts.

The diameter of the hole for a plug weld shall not be less than the thickness of the part containing it plus 8mm nor shall it be greater than 2.25 times the thickness of the weld.

The minimum center spacing of plug welds shall be four times the diameter of the hole.

The length of the slot shall be semicircular or shall have the corners rounded to a radius not less than the thickness of the part containing it plus 8mm nor shall it be greater than 2.25 times the thickness of the weld.

The end of the slot shall be semicircular or shall have the corners rounded to a radius not less than the thickness of the part containing it, except those ends which extend to the edge of the part.

The minimum spacing of lines of slot welds in a direction transverse to their length shall be 4 times the width of the slot. The minimum center to center spacing in a longitudinal direction on any line shall be 2 times the length of the slot.

The thickness of plug or slot welds in material 16mm or less in thickness shall be equal to the thickness of the material. In material over 16mm in thickness, it shall be at least one-half the thickness of the material but not less than 16mm.

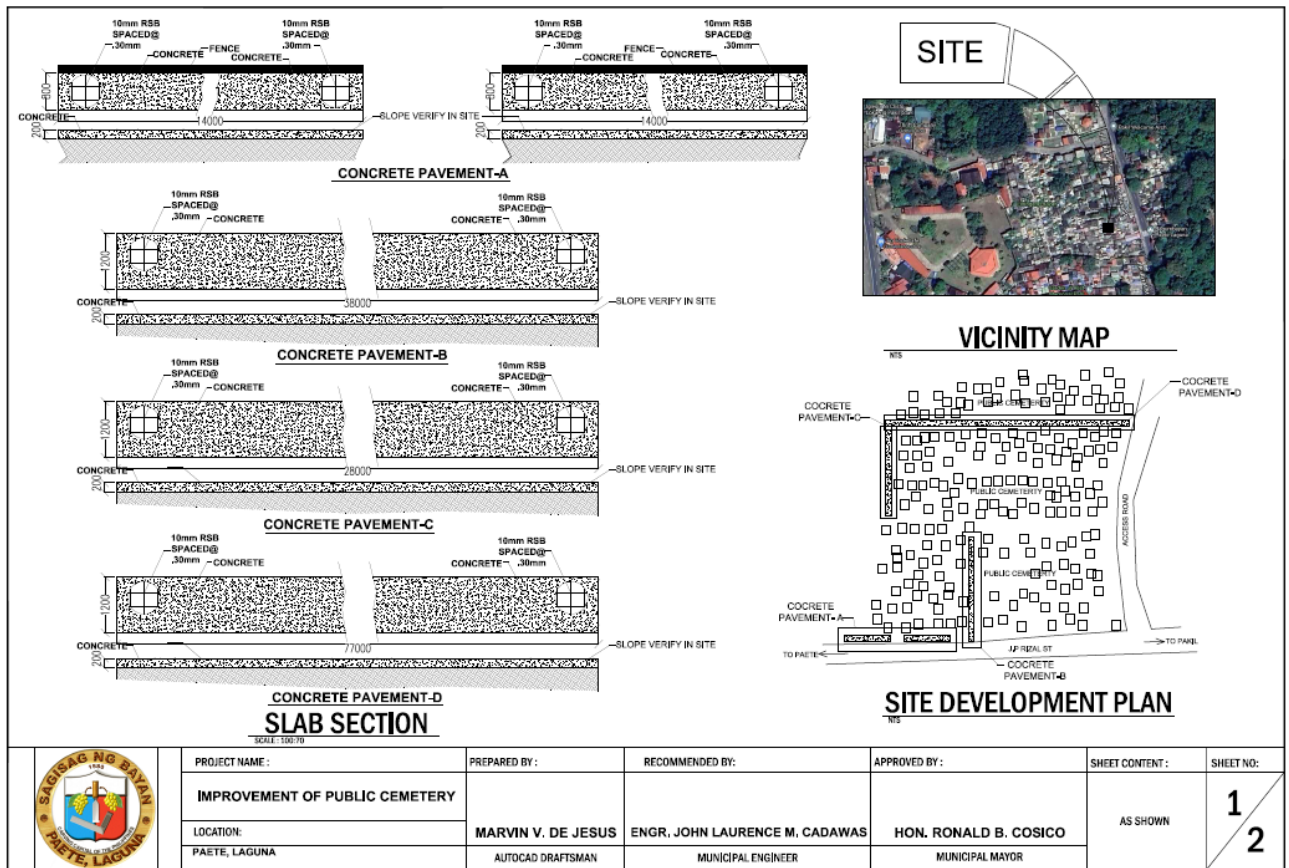
Tack welds, located where the final welds will later be made, shall be subject to the same quality requirements as the final weld. Tack welds shall be as small as practicable and where


encountered in the final welding, shall be cleaned and fused thoroughly with the final weld. Defective, cracked or broken tack welds shall be removed before final welding.

Members or component parts of structures shall be assembled and matchmarked prior to erection to insure accurate assembly and adjustment of position on final erection. Painted assembly marks shall be removed from any surface to be welded.

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.]



| | | | | | | |
|---|--------------------------------|--------------------|--------------------------------|-----------------------|----------------|-----------|
|  | PROJECT NAME: | PREPARED BY: | RECOMMENDED BY: | APPROVED BY: | SHEET CONTENT: | SHEET NO: |
| | IMPROVEMENT OF PUBLIC CEMETERY | MARVIN V. DE JESUS | ENGR. JOHN LAURENCE M. CADAWAS | HON. RONALD B. COSICO | AS SHOWN | 1 2 |
| | LOCATION: PAETE, LAGUNA | AUTOCAD DRAFTSMAN | MUNICIPAL ENGINEER | MUNICIPAL MAYOR | | |

CONCRETE NOTES:

1. ALL PHASES OF WORK PERTAINING TO THE CONCRETE CONSTRUCTION SHALL CONFORM TO THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318) WITH MODIFICATIONS AS NOTED IN THE DRAWINGS.
2. ALL CONCRETE SHALL BE STONED CONCRETE UTILIZING AGGREGATE CONFORMING TO ASTM C33 UNLESS NOTED OTHERWISE.
3. CEMENT SHALL BE TYPE I CONFORMING TO ASTM C150. MIXING OPERATIONS SHALL CONFORM TO ASTM C94. PLACEMENT SHALL CONFORM TO ACI STANDARDS.
4. THE CONTRACTOR SHALL SUBMIT COPIES OF CONCRETE MIX DESIGN TO OWNER'S REPRESENTATIVE FOR APPROVAL. ALL CONCRETE MIXES SHALL BE DESIGNED BY A TESTING LABORATORY WHO SHALL SUBMIT COPIES OF THE DESIGN FOR APPROVAL AND SHALL IN ADDITION SUBMIT COPIES OF 7 AND 28 DAY CYLINDER TEST RESULTS TO THE ENGINEER AND OBTAIN APPROVAL PRIOR TO USE.
5. BEFORE CONCRETE IS PLACED, THE CONTRACTOR SHALL COORDINATE AND CHECK WITH ALL TRADES TO INSURE PROPER PLACEMENT OF ALL OPENINGS, CURBS, SLEEVES, INSERTS, DEPRESSIONS, ETC. RELATING TO THE WORK. CURING IN CONCRETE IS NOT PERMITTED EXCEPT AS SHOWN. DO NOT CUT ANY REINFORCING WHICH MAY CONFLICT WITH SLEEVES OR INSERTS. NOTIFY THE ENGINEER IN ADVANCE OF CONDITIONS NOT SHOWN ON THE DRAWINGS.
6. ALL REINFORCING BARS, ANCHOR BOLTS, AND OTHER CONCRETE INSERTS SHALL BE WELL-SECURED IN POSITION PRIOR TO PLACING CONCRETE.
7. CONCRETE SHALL NOT BE FREELY DROP TO MORE THAN 1M.
8. ALL CONCRETE SHALL BE PLACED WITH A SLUMP NOT TO EXCEED 4 INCHES.
9. COMPRESSIVE STRENGTHS OF CONCRETE f_c' SHALL BE AS FOLLOWS:
 - ↳ BLINDING CONCRETE 16MPa.
 - ↳ ALL STRUCTURAL CONCRETE SHALL BE 21 Mpa.
 - ↳ CONCRETE TOPPING $f_c' = 21$ Mpa
10. STRENGTH TEST FOR CONCRETE SHALL BE MADE IN ACCORDANCE WITH THE "METHOD OF TEST FOR COMPRESSIVE STRENGTH OF MOLDED CONCRETE CYLINDERS" ASTM C 39.
11. UNLESS OTHERWISE INDICATED IN THE DWGS, CONCRETE CLEAR COVER TO REINFORCEMENT SHALL BE AS FOLLOWS.
 - ↳ 75mm FOR CONCRETE CAST AGAINST EARTH.
 - ↳ 50mm TO REINFORCEMENT OF ALL UNDERGROUND AND WATER RETAINING STRUCTURES.
 - ↳ 40mm FOR ALL BEAMS AND COLUMNS IN SUPER STRUCTURES.
 - ↳ 20mm FOR SLABS IN SUPERSTRUCTURES, WALLS AND PRECAST WALL PANELS.
12. SPLICES:
 - ↳ BARS MAY BE SPICED ONLY WHERE SHOWN ON THE DWGS, EXCEPT FOR BARS LABELLED CONTINUOUS WHICH MAY BE SPICED WITH CLASS B SPICE AT THE CONVINIENCE OF THE CONTRACTOR, PROVIDED NOT MORE THAN 50% OF THE BARS ARE SPICED WITHIN THE SPICED LENGTH.
 - ↳ SPLICE LENGTHS FOR EACH BAR SIZE AND EACH CLASS OF SPICE ARE AS FOLLOWS:
 - CLASS A: 1.0 Ld. (ANCHORAGE LENGTH)
 - CLASS B: 1.3 Ld.
 - CLASS C: 1.7 Ld.
 - ↳ IF NO SPICE LENGTH IS SHOWN ON DWGS, USE CLASS C SPICE.
 - ↳ WHERE SPICED BARS ARE DIFF. DIA., SPICE LENGTH SHALL BE DETERMINED FOR THE SMALLER BAR.
 - ↳ ALL REINFORCING BAR SHALL BE CONSIDERED AS BOTTOM BARS EXCEPT HORIZONTAL BARS IN SLABS, RIBS & BEAMS WITH MORE THAN 300mm OF CONCRETE BELOW THEM.
13. BAR BENDS
 - ↳ THE MINIMUM INSIDE DIAMETERS OF BEND ARE AS FOLLOWS (AC1 318)
 - 6 BAR DIAMETERS FOR Ø10 TO Ø20
 - 8 BAR DIAMETERS FOR Ø25 TO Ø32
 - 4 BAR DIAMETERS FOR STRUTS
 - ↳ ALL BARS SHALL BE BENT COLD. NO BARS PARTIALLY EMBEDDED IN CONCRETE CONCRETE SHALL BE FIELD BENT.
14. BAR SUPPORTS
 - ↳ PROVIDE BAR SUPPORTS IN ACCORDANCE WITH AC1 315 DETAILING MANUAL AND AS SPECIFIED
15. CONSTRUCTION
 - ↳ MUST BE MADE NEAR THE CENTER OF SPAN AND SHALL BE APPROVED BY THE ENGINEER ON SITE FOR BEAMS, JOINT SHALL BE MADE @ 1/3 SPAN.
16. ALL OPENINGS, PIPES AND SLEEVES INDICATED ON STRUCTURAL DWGS, SHALL BE COORDINATED WITH THE CIVIL, MECHANICAL AND ELECTRICAL DRAWINGS.
17. PROVIDE AROUND OPENINGS, ADDITIONAL REINFORCEMENT IN ACCORDANCE WITH THE TYPICAL DETAILS, UNLESS OTHERWISE SHOWN ON THE DWGS.
18. CONCRETE PROTECTION
 1. UNDERGROUND CONCRETE STRUCTURES SUCH AS POTABLE WATER TANK SHALL BE PROVIDE WITH PROTECTIVE WATER PROOFING MEMBRANE.
 2. ALL INTERNAL FACES OF SANITARY STRUCTURES IN CONTACT WITH INDUSTRIAL OR DOMESTIC WASTES SHALL BE PROTECTED BY AN APPROPRIATE WATER PROOFING COATING AS SPECIFIED.
19. CONCRETE SLAB-ON-GRADE
 1. FILL UNDER BASE SLABS ON GROUND SHALL BE ENGINEERED FILL COMPACTED 95% RELATIVE DRY DENSITY.
 2. PROVIDE WATERPROOF MEMBRANE UNDER SLABS ON GROUND (0.2mm MINIMUM THICKNESS), POLYTHENE SHEETS.
 3. CONSTRUCTION & CONTROL JOINTS SHALL BE WHERE SHOWN ON DWGS.

| PROJECT NAME : | PREPARED BY : | RECOMMENDED BY : | APPROVED BY : | SHEET CONTENT : | SHEET NO.: |
|--------------------------------|---|--|--|-----------------|----------------------------------|
| IMPROVEMENT OF PUBLIC CEMETERY | | | | | AS SHOWN 2 2 |
| LOCATION: PAETE, LAGUNA | MARVIN V. DE JESUS AUTOCAD DRAFTSMAN | ENGR. JOHN LAURENCE M. CADAWAS MUNICIPAL ENGINEER | HON. RONALD B. COSICO MUNICIPAL MAYOR | | |

Section VIII. Bill of Quantities

| NAME/LOCATION OF PROJECT | | | | APPROPRIATION | | |
|--|---------------------------|------------|----------------------|------------------------------|-----------------------------|----------------|
| IMPROVEMENT OF PUBLIC CEMETERY | | | | SOURCE OF FUND | | |
| | | | | ISSUED OBLIGATED AUTHORITY | | |
| PAETE, LAGUNA | | | | RELEASED | | |
| | | | | CALENDAR DAYS TO COMPLETE | | 45 Days |
| PROJECT CATEGORY : | | | | DESIRABLE STARTING DATE | | |
| PROJECT DESCRIPTION | | | | | | |
| IMPROVEMENT OF PUBLIC CEMETERY | | | | | | |
| MINIMUM EQUIPMENT REQUIREMENT | | | | TECHNICAL PERSONNEL REQUIRED | | |
| Description | | No. | Description | | No. | |
| Bagger Mixer | | 1 | Construction Foreman | | 2 | |
| | | | Mason / Carpentry | | 3 | |
| | | | Laborer | | 7 | |
| ESTIMATED COST OF PROPOSED WORK | | | | | | |
| Item No. | DESCRIPTION | % OF TOTAL | UNIT | QTY. | DIRECT COST | |
| | | | | | TOTAL | UNIT COST |
| I | GENERAL REQUIREMENTS | | I.s. | 1 | Php | Php |
| II | CONCRTE AND MASONRY WORKS | | I.s. | 1 | | |
| | | 0% | | | | |
| | | | | | Direct Cost | Php |
| | | | | | Labor Cost | Php |
| | | | | | Indirect Cost | |
| | | | | | OCM (15%) | |
| | | | | | Contractor's Profit (10%) | |
| | | | | | VAT (5%) | |
| | | | | | TOTAL | |

| I GENERAL REQUIREMENTS | | | | | |
|------------------------|--|---------------|------------------------|------------|--------|
| | Designation | No. of Person | No. of Days | Daily Rate | Amount |
| A. | Labor | | | | |
| | Construction Foreman | 1 | 15 | | |
| | Laborer | 2 | 15 | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | Sub-Total for A | | | | - |
| B. | Name and Capacity | Unit | No. of Days | Unit Cost | Amount |
| | | | | | |
| | | | | | |
| | | | | | |
| | Sub - Total for B | | | | - |
| C. | Total (A+B) | | | | - |
| D. | Name and Specification | Unit | Quantity | Unit Cost | Amount |
| | Materials | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | Sub-Total for D | | | | - |
| E. | Direct Unit Cost (C+D) | | | | - |
| F. | Overhead, Contingencies & Miscellaneous (OCM) | | 15% of E | | - |
| G. | Contractor's Profit (CP) | | 10% of E | | - |
| H. | Value Added Tax (VAT) | | 5% of (E + F + G) | | - |
| | Total Unit Cost | | (E + F + G + H) | | - |

| II CONCRETE AND MASONRY | | | | | |
|-------------------------|--|---------------|-------------|-------------------|--------|
| | Designation | No. of Person | No. of Days | Daily Rate | Amount |
| A. | Labor | | | | |
| | Construction Foreman | 1 | 30 | | |
| | Mason-Carpenter | 3 | 30 | | |
| | Laborer | 5 | 30 | | |
| | Sub-Total for A | | | | - |
| | Name and Capacity | No. of Units | No. of Days | Daily Rate | Amount |
| B. | Equipment | | | | |
| | 1- Bagger Mixer | 1 | 6 | | |
| | Sub - Total for B | | | | - |
| C. | Total (A+B) | | | | - |
| | Name and Specification | Unit | Quantity | Unit Cost | Amount |
| D. | Materials | | | | |
| | Cement | bags | 350 | | |
| | Sand S1 | cu.m. | 22 | | |
| | Gravel | cu.m. | 22 | | |
| | Phenolic board 3/4 | pcs | 35 | | |
| | 10 mm RSB | pcs | 330 | | |
| | 12 mm RSB | pcs | 400 | | |
| | Common nail #2 | kl | 14 | | |
| | Common Nail #3 | kl | 14 | | |
| | Cocolumber 2x2x12 | pcs | 14 | | |
| | Sub-Total for D | | | | - |
| E. | Direct Unit Cost (C+D) | | | | - |
| F. | Overhead, Contingencies & Miscellaneous (OCM) | | | 15% of E | - |
| G. | Contractor's Profit (CP) | | | 10% of E | - |
| H. | Value Added Tax (VAT) | | | 5% of (E + F + G) | - |
| | Total Unit Cost | | | (E + F + G + H) | - |

Section IX. Checklist of Technical and Financial Documents

Checklist of Technical and Financial Documents

I. TECHNICAL COMPONENT ENVELOPE

Class “A” Documents

Legal Documents

- (a) Valid PhilGEPS Registration Certificate (Platinum Membership) (all pages) in accordance with Section 8.5.2 of the IRR;

Technical Documents

- (e) 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**
- (f) 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**
- (g) Special PCAB License in case of Joint Ventures; **and** registration for the type and cost of the contract to be bid; **and**
- (h) Original copy of Bid Security. If in the form of a Surety Bond, submit also a certification issued by the Insurance Commission;
- or**
- (i) Original copy of Notarized Bid Securing Declaration; **and**
- (i) 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**
- (j) 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

- (k) The prospective bidder’s computation of Net Financial Contracting Capacity (NFCC).

Class “B” Documents

- (l) 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

- (m) Original of duly signed and accomplished Financial Bid Form; **and**

Other documentary requirements under RA No. 9184

- (n) Original of duly signed Bid Prices in the Bill of Quantities; **and**
- (o) Duly accomplished Detailed Estimates Form, including a summary sheet indicating the unit prices of construction materials, labor rates, and equipment rentals used in coming up with the Bid; **and**
- (p) Cash Flow by Quarter.

