

# **PHILIPPINE BIDDING DOCUMENTS**

## ***Construction of Concrete Drainage Canal at Bolohaton Settler's Village***

**PID NO. 2022 - 135**

Government of the Republic of the Philippines

**Sixth Edition  
July 2020**

# TABLE OF CONTENTS

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

|     |                                                                         |           |
|-----|-------------------------------------------------------------------------|-----------|
| 7.  | Warranty.....                                                           | 21        |
| 8.  | Liability of the Contractor.....                                        | 21        |
| 9.  | Termination for Other Causes.....                                       | 21        |
| 10. | Dayworks .....                                                          | 21        |
| 11. | Program of Work.....                                                    | 22        |
| 12. | Instructions, Inspections and Audits .....                              | 22        |
| 13. | Advance Payment.....                                                    | 22        |
| 14. | Progress Payments .....                                                 | 22        |
| 15. | Operating and Maintenance Manuals.....                                  | 22        |
|     | <b>Section V. Special Conditions of Contract.....</b>                   | <b>24</b> |
|     | <b>Section VI. Specifications .....</b>                                 | <b>26</b> |
|     | <b>Section VII. Drawings.....</b>                                       | <b>65</b> |
|     | <b>Section VIII. Bill of Quantities .....</b>                           | <b>70</b> |
|     | <b>Section IX. Checklist of Technical and Financial Documents .....</b> | <b>71</b> |

# ***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 Davao de Oro  
**MUNICIPALITY OF COMPOSTELA**  
**BIDS AND AWARDS COMMITTEE**  
CP#: 0909-279-9827



## **Invitation to Bid for** ***Construction of Concrete Drainage Canal at Bolohaton Settler's Village***

1. The *Municipality of Compostela*, through the *Supplemental Budget No. 1 CY 2022 (General Fund)* intends to apply the sum of *Four Million Seven Hundred Fifty Thousand Pesos Only (P4,750,000.00)* being the Approved Budget for the Contract (ABC) to payments under the contract for *Construction of Concrete Drainage Canal at Bolohaton Settler's Village with Project Identification No. 2022-0135*. Bids received in excess of the ABC shall be automatically rejected at bid opening.
2. The Municipality of Compostela now invites bids for the above Procurement Project. Completion of the Works is required *120 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 Compostela and inspect the Bidding Documents at the address given below from *8:00 a.m. to 5:00 p.m.*
5. A complete set of Bidding Documents may be acquired by interested bidders on ***November 21, 2022 to December 13, 2022*** from given address and website below *upon payment of the applicable fee for the Bidding Documents, pursuant to the latest Guidelines issued by the GPPB, in the amount of Five Thousand Pesos (P5,000.00)*. The Procuring Entity shall allow the bidder to present its proof of payment for the fees ***presented in person.***
6. The Municipality of Compostela will hold a Pre-Bid Conference on ***November 29, 2022 at 1:30 p.m.*** at Office of the BAC, 2<sup>nd</sup> Floor, Municipal Hall Building, Dagohoy St., Purok 2, Poblacion, Compostela, Davao de Oro which shall be open to prospective bidders.
7. Bids must be duly received by the BAC Secretariat through manual submission at the office address as indicated below on ***December 13, 2022 at 1:00 p.m.*** Late bids shall not be accepted.
8. All bids must be accompanied by a bid security in any of the acceptable forms and in the amount stated in **ITB Clause 16**.



9. Bid opening shall be on ***December 13, 2022 at 1:30 p.m.*** at the given address below. Bids will be opened in the presence of the bidders' representatives who choose to attend the activity.
10. The *Municipality of Compostela* reserves the right to reject any and all bids, declare a failure of bidding, or not award the contract at any time prior to contract award in accordance with Sections 35.6 and 41 of the 2016 revised Implementing Rules and Regulations (IRR) of RA No. 9184, without thereby incurring any liability to the affected bidder or bidders.
11. For further information, please refer to:

**EDWARDFORD N. DAGATAN**

BAC Office

2<sup>nd</sup> Floor, Municipal Hall Building, Dagohoy St., Purok 2,

Poblacion, Compostela, Davao de Oro

CP#: 0909-279-9827

Email Add: compobacsec@gmail.com

12. You may visit **[www.philgeps.gov.ph](http://www.philgeps.gov.ph)** and search for Municipality of Compostela for downloading of Bidding Documents.

*November 21, 2022*

(Sgd.)  
**LUCELIA L. PAQUEO**  
BAC Chairperson

## ***Section II. Instructions to Bidders***

## **1. Scope of Bid**

The Procuring Entity, *Municipality of Compostela*, invites Bids for the *Construction of Concrete Drainage Canal at Bolohaton Settler's Village* with Project Identification Number 2022-135.

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

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

## **2. Funding Information**

2.1. The GOP through the source of funding as indicated below for *CY 2022* in the amount of *Four Million Seven Hundred Fifty Thousand Pesos Only (P4,750,000.00)*.

2.2. The source of funding is: LGUs, the 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: ***Subcontracting is not allowed.***

7.2. 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 at the *Office of the BAC, 2<sup>nd</sup> Floor, Municipal Hall Building, Dagohoy St., Purok 2, Poblacion, Compostela, Davao de Oro* 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: *Philippine Pesos*.

## **15. Bid Security**

- 15.1. The Bidder shall submit a Bid Securing Declaration or any form of Bid Security in the amount indicated in the **BDS**, which shall be not less than the percentage of the ABC in accordance with the schedule in the **BDS**.
- 15.2. The Bid and bid security shall be valid until *One Hundred Twenty (120) days*. 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 15 shall be submitted for each contract (lot) separately.

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

## **20. Post Qualification**

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

## **21. Signing of the Contract**

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



## ***Section III. Bid Data Sheet***

# Bid Data Sheet

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                          |                           |                            |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|----------------------------|
| <b>ITB Clause</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                          |                           |                            |
| 5.2               | For this purpose, contracts similar to the Project refer to contracts which have the same major categories of work, which shall be:<br><b><i>CONCRETE WORKS/ CONCRETE PAVEMENT</i></b>                                                                                                                                                                                                                                                   |                           |                            |
| 7.1               | <b><i>Subcontracting is not allowed.</i></b>                                                                                                                                                                                                                                                                                                                                                                                             |                           |                            |
| 10.3              | <i>No further instruction.</i>                                                                                                                                                                                                                                                                                                                                                                                                           |                           |                            |
| 10.4              | The key personnel must meet the required minimum years of experience set below:                                                                                                                                                                                                                                                                                                                                                          |                           |                            |
|                   | <u>Key Personnel</u>                                                                                                                                                                                                                                                                                                                                                                                                                     | <u>General Experience</u> | <u>Relevant Experience</u> |
|                   | Project Engineer                                                                                                                                                                                                                                                                                                                                                                                                                         | 5 years                   | 3 years                    |
|                   | Foreman                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3 years                   | 1 year                     |
|                   | Mason                                                                                                                                                                                                                                                                                                                                                                                                                                    | 3 years                   | 1 year                     |
|                   | Heavy equipment operator                                                                                                                                                                                                                                                                                                                                                                                                                 | 3 years                   | 1 year                     |
| 10.5              | The minimum major equipment requirements are the following:                                                                                                                                                                                                                                                                                                                                                                              |                           |                            |
|                   | <u>Equipment</u>                                                                                                                                                                                                                                                                                                                                                                                                                         | <u>Capacity</u>           | <u>Number of Units</u>     |
|                   | Backhoe                                                                                                                                                                                                                                                                                                                                                                                                                                  |                           | 1                          |
|                   | One Bagger Mixer                                                                                                                                                                                                                                                                                                                                                                                                                         |                           | 1                          |
|                   | Concrete Vibrator                                                                                                                                                                                                                                                                                                                                                                                                                        |                           | 1                          |
| 12                | <i>[Insert Value Engineering clause if allowed.]</i>                                                                                                                                                                                                                                                                                                                                                                                     |                           |                            |
| 15.1              | The bid security shall be in the form of a Bid Securing Declaration or any of the following forms and amounts:<br><br>a. The amount of not less than P 95,000.00 <i>[Two percent (2%) of ABC]</i> , if bid security is in cash, cashier's/manager's check, bank draft/guarantee or irrevocable letter of credit;<br><br>b. The amount of not less than P 237,500.00 <i>[Five percent (5%) of ABC]</i> if bid security is in Surety Bond. |                           |                            |
| 19.2              | Partial bid is not allowed. The infrastructure project is packaged in a single lot and the lot shall not be divided into sub-lots for the purpose of bidding, evaluation, and contract award.                                                                                                                                                                                                                                            |                           |                            |
| 20                | No further instructions.                                                                                                                                                                                                                                                                                                                                                                                                                 |                           |                            |
| 21                | Additional contract documents are the following: NONE                                                                                                                                                                                                                                                                                                                                                                                    |                           |                            |

## ***Section IV. General Conditions of Contract***

## 1. **Scope of Contract**

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

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

## 2. **Sectional Completion of Works**

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

## 3. **Possession of Site**

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

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

## 4. **The Contractor's Obligations**

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

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

## **5. Performance Security**

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

## **6. Site Investigation Reports**

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

## **7. Warranty**

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

## **8. Liability of the Contractor**

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

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

## **9. Termination for Other Causes**

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

## **10. Dayworks**

Subject to the guidelines on Variation Order in Annex “E” of the 2016 revised IRR of RA No. 9184, and if applicable as indicated in the **SCC**, the Dayworks rates in the Contractor’s Bid shall be used for small additional amounts of work only when the Procuring Entity’s Representative has given written instructions in advance for additional work to be paid for in that way.

## **11. Program of Work**

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

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

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

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

## **13. Advance Payment**

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

## **14. Progress Payments**

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

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

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

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

## *Section V. Special Conditions of Contract*



# Special Conditions of Contract

| GCC Clause |                                                                                                                                                                                                                     |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2          | <i>Not applicable.</i>                                                                                                                                                                                              |
| 4.1        | <i>The procuring entity shall give possession of all parts of the site to the contractor upon receipt of the NTP.</i>                                                                                               |
| 6          | The site investigation reports are: <i>none</i>                                                                                                                                                                     |
| 7.2        | Five (5) years.                                                                                                                                                                                                     |
| 10         | No dayworks are applicable to the contract.                                                                                                                                                                         |
| 11.1       | The Contractor shall submit the Program of Work to the Procuring Entity's Representative within <i>Ten (10)</i> days of delivery of the Notice of Award.                                                            |
| 11.2       | The amount to be withheld for late submission of an updated Program of Work is Fifty Thousand Pesos (P50,000.00).                                                                                                   |
| 13         | The amount of the advance payment shall not exceed 15% of the total contract price which will only be released upon complete mobilization.                                                                          |
| 14         | Materials and equipment delivered on the site but not completely put in place shall be included for payment.                                                                                                        |
| 15.1       | The date by which operating and maintenance manuals are required is upon acceptance of the project.<br><br>The date by which "as built" drawings are required is prior to the release of certificate of completion. |
| 15.2       | The amount to be withheld for failing to produce "as built" drawings and/or operating and maintenance manuals by the date required is <i>one percent (1%) of the contract amount.</i>                               |

## *Section VI. Specifications*

**PROJECT NAME: CONSTRUCTION OF CONCRETE DRAINAGE CANAL @ BOLOHATON SETTLER'S VILLAGE**

***DESCRIPTION: CONSTRUCTION OF CONCRETE DRAINAGE 1,187 L.M. WITH 77 L.M. 24" DIA.***

***LOCATION: P-13, Osmeña ,Compostela, Davao de Oro***

**GENERAL CONDITION & SPECIFICATIONS**

**GENERAL CONDITION**

**1. GENERAL**

The drawing and the specifications are complementary to each other. Drawings are graphic means of showing work to be done. They are particularly suited to showing where materials are located. Thus, drawing exists essentially to show dimensions, location and placement. Not all works however can be presented in the drawings. Any doubts in the part of contractor shall be refer to the Municipal Engineer or the project engineer on site. Generalized works are usually in statement form, and hence the contractor is required to read the specifications carefully.

Specifications, on the other hand, are used to describe the materials, construction techniques, samples, shop drawings, guarantees and other contract requirements. Together, the drawing and the specifications are used to inform the contractor. In cases where the specified brand carries with it the manufacturer's specifications, the manufacturer's specifications shall hold precedence over these specifications.

**2. SPECIFICATION**

***ITEM 100 – CLEARING AND GRUBBING***

**100.1 Description**

This item shall consist of clearing, grubbing, removing and disposing all vegetation and debris as designated in the Contract, except those objects that are designated to remain in place or are to be removed in consonance with other provisions of this Specification. The work shall also include the preservation from injury or defacement of all objects designated to remain.

**100.2 Construction Requirements**

**100.2.1 General**

The Engineer will establish the limits of work and designate all trees, shrubs, plants and other things to remain. The Contractor shall preserve all objects designated to remain. Paint required for cut or scarred surface of trees or shrubs selected for retention shall be an approved asphaltum base paint prepared especially for tree surgery.

Clearing shall extend one (1) meter beyond the toe of the fill slopes or beyond rounding of cut slopes as the case maybe for the entire length of the project unless otherwise shown on the plans or as directed by the Engineer and provided it is within the right of way limits of the project, with the exception of trees under the jurisdiction of the Forest Management Bureau (FMB).

### **100.2.2 Clearing and Grubbing**

All surface objects and all trees, stumps, roots and other protruding obstructions, not designated to remain, shall be cleared and/or grubbed, including mowing as required, except as provided below:

- (1) Removal of undisturbed stumps and roots and nonperishable solid objects with a minimum depth of one (1) meter below subgrade or slope of embankment will not be required.
- (2) In areas outside of the grading limits of cut and embankment areas, stumps and nonperishable solid objects shall be cut off not more than 150 mm (6 inches) above the ground line or low water level.
- (3) In areas to be rounded at the top of cut slopes, stumps shall be cut off flush with or below the surface of the final slope line.
- (4) Grubbing of pits, channel changes and ditches will be required only to the depth necessitated by the proposed excavation within such areas.
- (5) In areas covered by cogon/talahib, wild grass and other vegetations, top soil shall be cut to a maximum depth of 150 mm below the original ground surface or as designated by the Engineer, and disposed outside the clearing and grubbing limits as indicated in the typical roadway section.

Except in areas to be excavated, stump holes and other holes from which obstructions are removed shall be backfilled with suitable material and compacted to the required density.

If perishable material is burned, it shall be burned under the constant care of component watchmen at such times and in such a manner that the surrounding vegetation, other adjacent property, or anything designated to remain on the right of way will not be jeopardized. If permitted, burning shall be done in accordance with applicable laws, ordinances, and regulation.

The Contractor shall use high intensity burning procedures, (i.e., incinerators, high stacking or pit and ditch burning with forced air supplements) that produce intense burning with little or no visible smoke emission during the burning process. At the conclusion of each burning session, the fire shall be completely extinguished so that no smoldering debris remains.

In the event that the Contractor is directed by the Engineer not to start burning operations or to suspend such operations because of hazardous weather conditions, material to be burned which interferes with subsequent construction operations shall be moved by the Contractor to temporary locations clear of construction operations and later, if directed by the Engineer, shall be placed on a designated spot and burned.

Materials and debris which cannot be burned and perishable materials may be disposed off by methods and at locations approved by the Engineer, on or off the project. If disposal is by burying, the debris shall be placed in layers with the material so disturbed to avoid nesting. Each layer shall be covered or mixed with earth material by the land-fill method to fill all voids. The top layer of material buried shall be covered with at least 300 mm (12 inches) of earth or other approved material and shall be graded, shaped and compacted to present a pleasing appearance. If the disposal location is off the project, the Contractor shall make all necessary arrangements with property owners in writing for obtaining suitable disposal locations which are outside the limits of view from the project. The cost involved shall be included in the unit bid price. A copy of such agreement shall be furnished to the Engineer. The disposal areas shall be seeded, fertilized and mulched at the Contractor's expense.

Woody material may be disposed off by chipping. The wood chips may be used for mulch, slope erosion control or may be uniformly spread over selected areas as directed by the Engineer. Wood chips used as mulch for slope erosion control shall have a maximum thickness of 12 mm (1/2 inch) and faces not exceeding 3900 mm<sup>2</sup> (6 square inches) on any individual surface area. Wood chips not designated for use under other sections shall be spread over the designated areas in layers not to exceed 75 mm (3 inches) loose thickness. Diseased trees shall be buried or disposed off as directed by the Engineer.

All merchantable timber in the clearing area which has not been removed from the right of way prior to the beginning of construction, shall become the property of the Contractor, unless otherwise provided.

Low hanging branches and unsound or unsightly branches on trees or shrubs designated to remain shall be trimmed as directed. Branches of trees extending over the roadbed shall be trimmed to give a clear height of 6 m (20 feet) above the roadbed surface. All trimming shall be done by skilled workmen and in accordance with good tree surgery practices.

Timber cut inside the area staked for clearing shall be felled within the area to be cleared.

### **100.2.3 Individual Removal of Trees or Stumps**

Individual trees or stumps designated by the Engineer for removal and located in areas other than those established for clearing and grubbing and roadside cleanup shall be removed and disposed off as specified under Subsection 100.2.2 except trees removed shall be cut as nearly flush with the ground as practicable without removing stumps.

### **100.3 Method of Measurement**

Measurement will be by one or more of the following alternate methods:

1. Area Basis. The work to be paid for shall be the number of **hectares** and fractions thereof acceptably cleared and grubbed within the limits indicated on the Plans or as may be adjusted in field staking by the Engineer. Areas not within the clearing and grubbing limits shown on the Plans or not staked for clearing and grubbing will not be measured for payment.

2. Lump-Sum Basis. When the Bill of Quantities contains a Clearing and Grubbing lump-sum item, no measurement of area will be made for such item.

3. Individual Unit Basis (Selective Clearing). The diameter of trees will be measured at a height of 1.4 m (54 inches) above the ground. Trees less than 150 mm (6 inches) in diameter will not be measured for payment.

When Bill of Quantities indicates measurement of trees by individual unit basis, the units will be designated and measured in accordance with the following schedule of sizes:

| Diameter at height of 1.4 m | Pay Item Designation |
|-----------------------------|----------------------|
| Over 150 mm to 900 mm       | Small                |
| Over 900 mm                 | Large                |

#### 100.4 Basis of Payment

The accepted quantities, measured as prescribed in Section 100.3, shall be paid for at the Contract unit price for each of the Pay Items listed below that is included in the Bill of Quantities, which price and payment shall be full compensation for furnishing all labor, equipment, tools and incidentals necessary to complete the work prescribed in this Item.

Payment will be made under:

| Pay Item Number | Description                        | Unit of Measurement |
|-----------------|------------------------------------|---------------------|
| 100 (1)         | Clearing and Grubbing              | Hectare             |
| 100 (2)         | Clearing and Grubbing              | Lump Sum            |
| 100 (3)         | Individual Removal of Trees, Small | Each                |
| 100 (4)         | Individual removal of Trees, Large | Each                |

### ITEM 103 – STRUCTURE EXCAVATION

#### 103.1 Description

This Item shall consist of the necessary excavation for foundation of bridges, culverts, underdrains, and other structures not otherwise provided for in the Specifications. Except as otherwise provided for pipe culverts, the backfilling of completed structures and the disposal of all excavated surplus materials, shall be in accordance with these Specifications and in reasonably close conformity with the Plans or as established by the Engineer.

This Item shall include necessary diverting of live streams, bailing, pumping, draining, sheeting, bracing, and the necessary construction of cribs and cofferdams, and furnishing the

materials therefore, and the subsequent removal of cribs and cofferdams and the placing of all necessary backfill.

It shall also include the furnishing and placing of approved foundation fill material to replace unsuitable material encountered below the foundation elevation of structures.

No allowance will be made for classification of different types of material encountered.

## **103.2 Construction Requirements**

### **103.2.1 Clearing and Grubbing**

Prior to starting excavation operations in any area, all necessary clearing and grubbing in that area shall have been performed in accordance with Item 100, Clearing and Grubbing.

### **103.2.2 Excavation**

(1) General, all structures. The Contractor shall notify the Engineer sufficiently in advance of the beginning of any excavation so that cross-sectional elevations and measurements may be taken on the undisturbed ground. The natural ground adjacent to the structure shall not be disturbed without permission of the Engineer.

Trenches or foundation pits for structures or structure footings shall be excavated to the lines and grades or elevations shown on the Plans or as staked by the Engineer. They shall be of sufficient size to permit the placing of structures or structure footings of the full width and length shown. The elevations of the bottoms of footings, as shown on the Plans, shall be considered as approximate only and the Engineer may order, in writing, such changes in dimensions or elevations of footings as may be deemed necessary, to secure a satisfactory foundation.

Trenches or foundation pits for structures or structure footings shall be excavated to the lines and grades or elevations shown on the Plans or as staked by the Engineer. They shall be of sufficient size to permit the placing of structures or structure footings of the full width and length shown. The elevations of the bottoms of footings, as shown on the Plans, shall be considered as approximate only and the Engineer may order, in writing, such changes in dimensions or elevations of footings as may be deemed necessary, to secure a satisfactory foundation.

(2) Structures other than pipe culverts. All rock or other hard foundation materials shall be cleaned all loose materials, and cut to a firm surface, either level, stepped, or serrated as directed by the Engineer. All seams or crevices shall be cleaned and grouted. All loose and disintegrated rocks and thin strata shall be removed. When the footing is to rest on material other than rock, excavation to final grade shall not be made until just before the footing is to be placed. When the foundation material is soft or mucky or otherwise unsuitable, as determined by the Engineer, the Contractor shall remove the unsuitable material and backfill with approved granular material. This foundation fill shall be placed and compacted in 150 mm (6 inches) layers up to the foundation elevation.

When foundation piles are used, the excavation of each pit shall be completed before the piles are driven and any placing of foundation fill shall be done after the piles are driven. After

the driving is completed, all loose and displaced materials shall be removed, leaving a smooth, solid bed to receive the footing.

(3) Pipe Culverts. The width of the pipe trench shall be sufficient to permit satisfactory jointing of the pipe and thorough tamping of the bedding material under and around the pipe.

Where rock, hardpan, or other unyielding material is encountered, it shall be removed below the foundation grade for a depth of at least 300 mm or 4 mm for each 100 mm of fill over the top of pipe, whichever is greater, but not to exceed three-quarters of the vertical inside diameter of the pipe. The width of the excavation shall be at least 300 mm (12 inches) greater than the horizontal outside diameter of the pipe. The excavation below grade shall be backfilled with selected fine compressible material, such as silty clay or loam, and lightly compacted in layers not over 150 mm (6 inches) in uncompacted depth to form a uniform but yielding foundation.

Where a firm foundation is not encountered at the grade established, due to soft, spongy, or other unstable soil, such unstable soil under the pipe and for a width of at least one diameter on each side of the pipe shall be removed to the depth directed by the Engineer and replaced with approved granular foundation fill material properly compacted to provide adequate support for the pipe, unless other special construction methods are called for on the Plans.

The foundation surface shall provide a firm foundation of uniform density throughout the length of the culvert and, if directed by the Engineer, shall be cambered in the direction parallel to the pipe centerline.

Where pipe culverts are to be placed in trenches excavated in embankments, the excavation of each trench shall be performed after the embankment has been constructed to a plane parallel to the proposed profile grade and to such height above the bottom of the pipe as shown on the Plans or directed by the Engineer.

### **103.2.3 Utilization of Excavated Materials**

All excavated materials, so far as suitable, shall be utilized as backfill or embankment. The surplus materials shall be disposed off in such manner as not to obstruct the stream or otherwise impair the efficiency or appearance of the structure. No excavated materials shall be deposited at any time so as to endanger the partly finished structure.

### **103.2.4 Cofferdams**

Suitable and practically watertight cofferdams shall be used wherever water-bearing strata are encountered above the elevation of the bottom of the excavation. If requested, the Contractor shall submit drawings showing his proposed method of cofferdam construction, as directed by the Engineer.

Cofferdams or cribs for foundation construction shall in general, be carried well below the bottoms of the footings and shall be well braced and as nearly watertight as practicable. In general, the interior dimensions of cofferdams shall be such as to give sufficient clearance for the construction of forms and the inspection of their exteriors, and to permit pumping outside of the forms. Cofferdams or cribs which are tilted or moved laterally during the process of sinking shall be righted or enlarged so as to provide the necessary clearance.



When conditions are encountered which, as determined by the Engineer, render it impracticable to dewater the foundation before placing the footing, the Engineer may require the construction of a concrete foundation seal of such dimensions as he may consider necessary, and of such thickness as to resist any possible uplift. The concrete for such seal shall be placed as shown on the Plans or directed by the Engineer. The foundation shall then be dewatered and the footing placed. When weighted cribs are employed and the mass is utilized to overcome partially the hydrostatic pressure acting against the bottom of the foundation seal, special anchorage such as dowels or keys shall be provided to transfer the entire mass of the crib to the foundation seal. When a foundation seal is placed under water, the cofferdams shall be vented or ported at low water level as directed.

Cofferdams shall be constructed so as to protect green concrete against damage from sudden rising of the stream and to prevent damage to the foundation by erosion. No timber or bracing shall be left in cofferdams or cribs in such a way as to extend into substructure masonry, without written permission from the Engineer.

Any pumping that may be permitted from the interior of any foundation enclosure shall be done in such a manner as to preclude the possibility of any portion of the concrete material being carried away. Any pumping required during the placing of concrete, or for a period of at least 24 hours thereafter, shall be done from a suitable sump located outside the concrete forms. Pumping to dewater a sealed cofferdam shall not commence until the seal has set sufficiently to withstand the hydrostatic pressure.

Unless otherwise provided, cofferdams or cribs, with all sheeting and bracing involved therewith, shall be removed by the Contractor after the completion of the substructure. Removal shall be effected in such manner as not to disturb or mar finished masonry.

### **103.2.5 Preservation of Channel**

Unless otherwise permitted, no excavation shall be made outside of caissons, cribs, cofferdams, or sheet piling, and the natural stream bed adjacent to structure shall not be disturbed without permission from the Engineer. If any excavation or dredging is made at the side of the structure before caissons, cribs, or cofferdams are sunk in place, the Contractor shall, after the foundation base is in place, backfill all such excavations to the original ground surface or stream bed with material satisfactory to the Engineer.

### **103.2.6 Backfill and Embankment for Structures Other Than Pipe Culverts**

Excavated areas around structures shall be backfilled with free draining granular material approved by the Engineer and placed in horizontal layers not over 150 mm (6 inches) in thickness, to the level of the original ground surface. Each layer shall be moistened or dried as required and thoroughly compacted with mechanical tampers.

In placing backfills or embankment, the material shall be placed simultaneously in so far as possible to approximately the same elevation on both sides of an abutment, pier, or wall. If conditions require placing backfill or embankment appreciably higher on one side than on the opposite side, the additional material on the higher side shall not be placed until the masonry has been in place for 14 days, or until tests made by the laboratory under the supervision of the

Engineer establishes that the masonry has attained sufficient strength to withstand any pressure created by the methods used and materials placed without damage or strain beyond a safe factor.

Backfill or embankment shall not be placed behind the walls of concrete culverts or abutments or rigid frame structures until the top slab is placed and cured. Backfill and embankment behind abutments held at the top by the superstructure, and behind the sidewalls of culverts, shall be carried up simultaneously behind opposite abutments or sidewalls.

All embankments adjacent to structures shall be constructed in horizontal layers and compacted as prescribed in Subsection 104.3.3 except that mechanical tampers may be used for the required compaction. Special care shall be taken to prevent any wedging action against the structure and slopes bounding or within the areas to be filled shall be benched or serrated to prevent wedge action. The placing of embankment and the benching of slopes shall continue in such a manner that at all times there will be horizontal berm of thoroughly compacted material for a distance at least equal to the height of the abutment or wall to the backfilled against except insofar as undisturbed material obtrudes upon the area.

Broken rock or coarse sand and gravel shall be provided for a drainage filter at weepholes as shown on the Plans.

### **103.2.7 Bedding, Backfill, and Embankment for Pipe Culverts**

Bedding, Backfill and Embankment for pipe culverts shall be done in accordance with Item 500, Pipe Culverts and Storm Drains.

## **103.3 Method of Measurement**

### **103.3.1 Structure Excavation**

The volume of excavation to be paid for will be the number of cubic metres measured in original position of material acceptably excavated in conformity with the Plans or as directed by the Engineer, but in no case, except as noted, will any of the following volumes be included in the measurement for payment:

- (1) The volume outside of vertical planes 450 mm (18 inches) outside of and parallel to the neat lines of footings and the inside walls of pipe and pipe-arch culverts at their widest horizontal dimensions.
- (2) The volume of excavation for culvert and sections outside the vertical plane for culverts stipulated in (1) above.
- (3) The volume outside of neat lines of underdrains as shown on the Plans, and outside the limits of foundation fill as ordered by the Engineer.
- (4) The volume included within the staked limits of the roadway excavation, contiguous channel changes, ditches, etc., for which payment is otherwise provided in the Specification.

(5) Volume of water or other liquid resulting from construction operations and which can be pumped or drained away.

(6) The volume of any excavation performed prior to the taking of elevations and measurements of the undisturbed ground.

(7) the volume of any material rehandled, except that where the Plans indicate or the Engineer directs the excavation after embankment has been placed and except that when installation of pipe culverts by the imperfect trench method specified in Item 500 is required, the volume of material re-excavated as directed will be included.

(8) The volume of excavation for footings ordered at a depth more than 1.5 m (60 inches) below the lowest elevation for such footings shown on the original Contract Plans, unless the Bill of Quantities contains a pay item for excavation ordered below the elevations shown on the Plans for individual footings.

### **103.3.2 Bridge Excavation**

The volume of excavation, designated on the Plans or in the Special Provisions as “Bridge Excavation” will be measured as described below and will be kept separate for pay purposes from the excavation for all structures.

The volume of bridge excavation to be paid shall be the vertical 450 mm (18 inches) outside of and parallel to the neat lines of the footing. The vertical planes shall constitute the vertical faces of the volume for pay quantities regardless of excavation inside or outside of these planes.

### **103.3.3 Foundation Fill**

The volume of foundation fill to be paid for will be the number of cubic metres measures in final position of the special granular material actually provided and placed below the foundation elevation of structures as specified, complete in place and accepted.

### **103.3.4 Shoring, Cribbing, and Related Work**

Shoring, cribbing and related work whenever included as a pay item in Bill of Quantities will be paid for at the lump sum bid price. This work shall include furnishing, constructing, maintaining, and removing any and all shoring, cribbing, cofferdams, caissons, bracing, sheeting water control, and other operations necessary for the acceptable completion of excavation included in the work of this Section, to a depth of 1.5 m below the lowest elevation shown on the Plans for each separable foundation structure.

### **103.3.5 Basis of Payment**

The accepted quantities, measured as prescribed in Section 103.3, shall be paid for at the contract unit price for each of the particular pay items listed below that is included in the Bill of Quantities. The payment shall constitute full compensation for the removal and disposal of excavated materials including all labor, equipment, tools and incidentals necessary to complete the work prescribed in this Item, except as follows:

(1) Any excavation for footings ordered at a depth more than 1.5 m below the lowest elevation shown on the original Contract Plans will be paid for as provided in Part K, Measurement and Payment, unless a pay item for excavation ordered below Plan elevation appears in the Bill of Quantities.

(2) Concrete will be measured and paid for as provided under Item 405, Structural Concrete.

(3) Any roadway or borrow excavation required in excess of the quantity excavated for structures will be measured and paid for as provided under Item 102.

(4) Shoring, cribbing, and related work required for excavation ordered more than 1.5 m (60 inches ) below Plan elevation will be paid for in accordance with Part K.

Payment will be made under:

| Pay Item Number | Description                             | Unit of Measurement |
|-----------------|-----------------------------------------|---------------------|
| 103 (1)         | Structure Excavation                    | Cubic Meter         |
| 103 (2)         | Bridge Excavation                       | Cubic Meter         |
| 103 (3)         | Foundation Fill                         | Cubic Meter         |
| 103 (4)         | Excavation ordered below Plan elevation | Cubic Meter         |
| 103 (5)         | Shoring, cribbing, and related work     | Lump sum            |
| 103 (6)         | Pipe culverts and drain excavation      | Cubic Meter         |

## ITEM 104 – EMBANKMENT

### 104.1 Description

This Item shall consist of the construction of embankment in accordance with this Specification and in conformity with the lines, grades and dimensions shown on the Plans or established by the Engineer.

### 104.2 Material Requirements

Embankments shall be constructed of suitable materials, in consonance with the following definitions:

1. Suitable Material – Material which is acceptable in accordance with the Contract and which can be compacted in the manner specified in this Item. It can be common material or rock.

Selected Borrow, for topping – soil of such gradation that all particles will pass a sieve with 75 mm (3 inches) square openings and not more than 15 mass percent will pass the 0.075 mm (No. 200) sieve, as determined by AASHTO T 11. The material shall have a plasticity index

of not more than 6 as determined by ASSHTO T 90 and a liquid limit of not more than 30 as determined by AASHTO T 89.

2. Unsuitable Material – Material other than suitable materials such as:
  - (a) Materials containing detrimental quantities of organic materials, such as grass, roots and sewerage.
  - (b) Organic soils such as peat and muck.
  - (c) Soils with liquid limit exceeding 80 and/or plasticity index exceeding 55.
  - (d) Soils with a natural water content exceeding 100%.
  - (e) Soils with very low natural density, 800 kg/m<sup>3</sup> or lower.
  - (f) Soils that cannot be properly compacted as determined by the Engineer.

### **104.3 Construction Requirements**

#### **104.3.1 General**

Prior to construction of embankment, all necessary clearing and grubbing in that area shall have been performed in conformity with Item 100, Clearing and Grubbing.

Embankment construction shall consist of constructing roadway embankments, including preparation of the areas upon which they are to be placed; the construction of dikes within or adjacent to the roadway; the placing and compacting of approved material within roadway areas where unsuitable material has been removed; and the placing and compacting of embankment material in holes, pits, and other depressions within the roadway area.

Embankments and backfills shall contain no muck, peat, sod, roots or other deleterious matter. Rocks, broken concrete or other solid, bulky materials shall not be placed in embankment areas where piling is to be placed or driven.

Where shown on the Plans or directed by the Engineer, the surface of the existing ground shall be compacted to a depth of 150 mm (6 inches) and to the specified requirements of this Item.

Where provided on the Plans and Bill of Quantities the top portions of the roadbed in both cuts and embankments, as indicated, shall consist of selected borrow for topping from excavations.

#### **104.3.2 Methods of Construction**

Where there is evidence of discrepancies on the actual elevations and that shown on the Plans, a preconstruction survey referred to the datum plane used in the approved Plan shall be undertaken by the Contractor under the control of the Engineer to serve as basis for the computation of the actual volume of the embankment materials.

When embankment is to be placed and compacted on hillsides, or when new embankment is to be compacted against existing embankments, or when embankment is built one-half width at a time, the existing slopes that are steeper than 3:1 when measured at right angles to the roadway shall be continuously benched over those areas as the work is brought up in layers. Benching will be subject to the Engineer's approval and shall be of sufficient width to permit operation of placement and compaction equipment. Each horizontal cut shall begin at the intersection of the original ground and the vertical sides of the previous cuts. Material thus excavated shall be placed and compacted along with the embankment material in accordance with the procedure described in this Section.

Unless shown otherwise on the Plans or special Provisions, where an embankment of less than 1.2 m (4 feet) below subgrade is to be made, all sod and vegetable matter shall be removed from the surface upon which the embankment is to be placed, and the cleared surface shall be completely broken up by plowing, scarifying, or steeping to a minimum depth of 150 mm except as provided in Subsection 102.2.2. This area shall then be compacted as provided in Subsection 104.3.3. Sod not required to be removed shall be thoroughly disc harrowed or scarified before construction of embankment. Wherever a compacted road surface containing granular materials lies within 900 mm (36 inches) of the subgrade, such old road surface shall be scarified to a depth of at least 150 mm (6 inches) whenever directed by the Engineer. This scarified materials shall then be compacted as provided in Subsection 104.3.3.

When shoulder excavation is specified, the roadway shoulders shall be excavated to the depth and width shown on the Plans. The shoulder material shall be removed without disturbing the adjacent existing base course material, and all excess excavated materials shall be disposed off as provided in Subsection 102.2.3. If necessary, the areas shall be compacted before being backfilled.

Roadway embankment of earth material shall be placed in horizontal layers not exceeding 200 mm (8 inches), loose measurement, and shall be compacted as specified before the next layer is placed. However, thicker layer maybe placed if vibratory roller with high compactive effort is used provided that density requirement is attained and as approved by the Engineer. Trial section to this effect must be conducted and approved by the Engineer. Effective spreading equipment shall be used on each lift to obtain uniform thickness as determined in the trial section prior to compaction. As the compaction of each layer progresses, continuous leveling and manipulating will be required to assure uniform density. Water shall be added or removed, if necessary, in order to obtain the required density. Removal of water shall be accomplished through aeration by plowing, blading, discing, or other methods satisfactory to the Engineer.

Where embankment is to be constructed across low swampy ground that will not support the mass of trucks or other hauling equipment, the lower part of the fill may be constructed by dumping successive loads in a uniformly distributed layer of a thickness not greater than necessary to support the hauling equipment while placing subsequent layers.

When excavated material contains more than 25 mass percent of rock larger than 150 mm in greatest diameter and cannot be placed in layers of the thickness prescribed without crushing, pulverizing or further breaking down the pieces resulting from excavation methods, such materials may be placed on the embankment in layers not exceeding in thickness the approximate average size of the larger rocks, but not greater than 600 mm (24 inches).

Even though the thickness of layers is limited as provided above, the placing of individual rocks and boulders greater than 600 mm in diameter will be permitted provided that when placed, they do not exceed 1200 mm (48 inches) in height and provided they are carefully distributed, with the interstices filled with finer material to form a dense and compact mass.

Each layer shall be leveled and smoothed with suitable leveling equipment and by distribution of spalls and finer fragments of earth. Lifts of material containing more than 25 mass percent of rock larger than 150 mm in greatest dimensions shall not be constructed above an elevation 300 mm (12 inches) below the finished subgrade. The balance of the embankment shall be composed of suitable material smoothed and placed in layers not exceeding 200 mm (8 inches) in loose thickness and compacted as specified for embankments.

Dumping and rolling areas shall be kept separate, and no lift shall be covered by another until compaction complies with the requirements of Subsection 104.3.3.

Hauling and leveling equipment shall be so routed and distributed over each layer of the fill in such a manner as to make use of compaction effort afforded thereby and to minimize rutting and uneven compaction.

### **104.3.3 Compaction**

#### **Compaction Trials**

Before commencing the formation of embankments, the Contractor shall submit in writing to the Engineer for approval his proposals for the compaction of each type of fill material to be used in the works. The proposals shall include the relationship between the types of compaction equipment, and the number of passes required and the method of adjusting moisture content. The Contractor shall carry out full scale compaction trials on areas not less than 10 m wide and 50 m long as required by the Engineer and using his proposed procedures or such amendments thereto as may be found necessary to satisfy the Engineer that all the specified requirements regarding compaction can be consistently achieved. Compaction trials with the main types of fill material to be used in the works shall be completed before work with the corresponding materials will be allowed to commence.

Throughout the periods when compaction of earthwork is in progress, the Contractor shall adhere to the compaction procedures found from compaction trials for each type of material being compacted, each type of compaction equipment employed and each degree of compaction specified.

#### **Earth**

The Contractor shall compact the material placed in all embankment layers and the material scarified to the designated depth below subgrade in cut sections, until a **uniform density of not less than 95 mass percent of the maximum dry density determined by AASHTO T 99 Method C**, is attained, at a moisture content determined by Engineer to be suitable for such density. Acceptance of compaction may be based on adherence to an approved roller pattern developed as set forth in Item 106, Compaction Equipment and Density Control Strips.

The Engineer shall during progress of the Work, make density tests of compacted material in accordance with AASHTO T 191, T 205, or other approved field density tests, including the use of properly calibrated nuclear testing devices. A correction for coarse particles may be made in accordance with AASHTO T 224. If, by such tests, the Engineer determines that the specified density and moisture conditions have not been attained, the Contractor shall perform additional work as may be necessary to attain the specified conditions.

At least one group of three in-situ density tests shall be carried out for each 500 m of each layer of compacted fill.

## **Rock**

Density requirements will not apply to portions of embankments constructed of materials which cannot be tested in accordance with approved methods.

Embankment materials classified as rock shall be deposited, spread and leveled the full width of the fill with sufficient earth or other fine material so deposited to fill the interstices to produce a dense compact embankment. In addition, one of the rollers, vibrators, or compactors meeting the requirements set forth in Subsection 106.2.1, **Compaction Equipment**, shall compact the embankment full width with a minimum of three complete passes for each layer of embankment.

### **104.3.4 Protection of Roadbed During Construction**

During the construction of the roadway, the roadbed shall be maintained in such condition that it will be well drained at all times. Side ditches or gutters emptying from cuts to embankments or otherwise shall be so constructed as to avoid damage to embankments by erosion.

### **104.3.5 Protection of Structure**

If embankment can be deposited on one side only of abutments, wing walls, piers or culvert headwalls, care shall be taken that the area immediately adjacent to the structure is not compacted to the extent that it will cause overturning of, or excessive pressure against the structure. When noted on the Plans, the fill adjacent to the end bent of a bridge shall not be placed higher than the bottom of the backfill of the bent until the superstructure is in place. When embankment is to be placed on both sides of a concrete wall or box type structure, operations shall be so conducted that the embankment is always at approximately the same elevation on both sides of the structure.

### **104.3.6 Rounding and Warping Slopes**

**Rounding**-Except in solid rock, the tops and bottoms of all slopes, including the slopes of drainage ditches, shall be rounded as indicated on the Plans. A layer of earth overlaying rock shall be rounded above the rock as done in earth slopes.

**Warping**-adjustments in slopes shall be made to avoid injury in standing trees or marring of weathered rock, or to harmonize with existing landscape features, and the transition to such adjusted slopes shall be gradual. At intersections of cuts and fills, slopes shall be adjusted and warped to flow into each other or into the natural ground surfaces without noticeable break.



### **104.3.7 Finishing Roadbed and Slopes**

After the roadbed has been substantially completed, the full width shall be conditioned by removing any soft or other unstable material that will not compact properly or serve the intended purpose. The resulting areas and all other low sections, holes or depressions shall be brought to grade with suitable selected material. Scarifying, blading, dragging, rolling, or other methods of work shall be performed or used as necessary to provide a thoroughly compacted roadbed shaped to the grades and cross-sections shown on the Plans or as staked by the Engineer.

All earth slopes shall be left with roughened surfaces but shall be reasonably uniform, without any noticeable break, and in reasonably close conformity with the Plans or other surfaces indicated on the Plans or as staked by the Engineer, with no variations therefrom readily discernible as viewed from the road.

### **104.3.8 Serrated Slopes**

Cut slopes in rippable material (soft rock) having slope ratios between 0.75:1 and 2:1 shall be constructed so that the final slope line shall consist of a series of small horizontal steps. The step rise and tread dimensions shall be shown on the Plans. No scaling shall be performed on the stepped slopes except for removal of large rocks which will obviously be a safety hazard if they fall into the ditchline or roadway.

### **104.3.9 Earth Berms**

When called for in the Contract, permanent earth berms shall be constructed of well graded materials with no rocks having a diameter greater than 0.25 the height of the berm. When local material is not acceptable, acceptable material shall be imported, as directed by the Engineer.

#### ***Compacted Berm***

Compacted berm construction shall consist of moistening or drying and placing material as necessary in locations shown on the drawings or as established by the Engineer. Material shall contain no frozen material, roots, sod, or other deleterious materials. Contractor shall take precaution to prevent material from escaping over the embankment slope. Shoulder surface beneath berm will be roughened to provide a bond between the berm and shoulder when completed. The Contractor shall compact the material placed until at least 90 mass percent of the maximum density is obtained as determined by AASHTO T 99, Method C. The cross-section of the finished compacted berm shall reasonably conform to the typical cross-section as shown on the Plans.

#### ***Uncompacted Berm***

Uncompacted berm construction shall consist of drying, if necessary and placing material in locations shown on the Plans or as established by the Engineer. Material shall contain no frozen material, roots, sod or other deleterious materials. Contractor shall take precautions to prevent material from escaping over the embankment slope.

#### **104.4 Method of Measurement**

The quantity of embankment to be paid for shall be the volume of material compacted in place, accepted by the Engineer and formed with material obtained from any source.

Material from excavation per Item 102 which is used in embankment and accepted by the Engineer will be paid under Embankment and such payment will be deemed to include the cost of excavating, hauling, stockpiling and all other costs incidental to the work.

Material for Selected Borrow topping will be measured and paid for under the same conditions specified in the preceding paragraph.

#### **104.5 Basis of Payment**

The accepted quantities, measured as prescribed in Section 104.4, shall be paid for at the Contract unit price for each of the Pay Items listed below that is included in the Bill of Quantities. The payment shall continue full compensation for placing and compacting all materials including all labor, equipment, tools and incidentals necessary to complete the work prescribed in this Item.

Payment will be made under:

| Pay Item Number | Description                          | Unit of Measurement |
|-----------------|--------------------------------------|---------------------|
| 104 (1)         | Embankment                           | Cubic Meter         |
| 104 (2)         | Selected, Borrow for topping, Case 1 | Cubic Meter         |
| 104 (3)         | Selected Borrow for topping, Case 2  | Cubic Meter         |
| 104 (4)         | Earth Berm                           | Meter               |

### ***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.

#### **4.4.3 Construction Requirements**

##### **404.3.1 Order Lists**

Before materials are ordered, all order lists and bending diagrams shall be furnished by the Contractor, for approval of the Engineer. The approval of order lists and bending diagrams by the Engineer shall in no way relieve the Contractor of responsibility for the correctness of such lists and 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, skids, or other supports 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 cause for rejection, provided the minimum dimensions, cross sectional area and tensile properties of a hand wire brushed specimen 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 diameters (D) in relation to the diameter of the bar (d):

| 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 or required by the Engineer and firmly held there during the placing and setting of the concrete. Bars shall be tied at all intersections except where spacing is less than 300mm 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 6mm. Blocks for holding reinforcement from contact with the forms shall be precast mortar blocks of approved shapes and dimensions. Layers of bars shall be separated by precast mortar blocks or by other equally suitable devices. The use of pebbles, pieces of broken stone or brick, metal pipe and wooden blocks shall not be permitted. Unless otherwise shown on the Plans or required by the Engineer, the minimum distance between bars shall be 40mm. Reinforcement in any member shall be placed and then inspected and approved by the Engineer before the placing of concrete begins. Concrete placed in violation of this provision may be

rejected and removal may be required. If fabric reinforcement is shipped in rolls, it shall be straightened before being placed. Bundled bars shall be tied together at not more than 1.8m intervals.

#### **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 lapped a minimum distance of:

| Splice Type | Grade 40<br>min. lap | Grade 60<br>min. lap | But not less than |
|-------------|----------------------|----------------------|-------------------|
| Tension     | 24 bar dia           | 36 bar dia           | 300 mm            |
| Compression | 20 bar dia           | 24 bar dia           | 300 mm            |

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 the maximum size of 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.

#### **404.3.6 Lapping of Bar Mat**

Sheets of mesh or bar mat reinforcement shall overlap each other sufficiently to maintain a uniform strength and shall be securely fastened at the ends and edges. The overlap shall not be less than one mesh in width.

#### **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. If bars are substituted upon the Contractor's request and approved by the Engineer and as a result thereof more steel is used than specified, only the mass specified shall be measured for payment.

No measurement or payment will be made for splices added by the Contractor unless directed or approved by the Engineer.

When there is no item for reinforcing steel in the Bill of Quantities, costs will be considered as incidental to the other items 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:

| Pay Item Number | Description       | Unit of Measurement |
|-----------------|-------------------|---------------------|
| 404             | Reinforcing Steel | Kilogram            |

## ***ITEM 405 – STRUCTURAL CONCRETE***

### **405.1 Description**

#### **405.1.1 Scope**

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, and water mixed in the proportions 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 structure 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 reinforced sections, railings, 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 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**

| Sieve Designation |                       | Mass Percent Passing |          |          |          |            |
|-------------------|-----------------------|----------------------|----------|----------|----------|------------|
| Standard Mm       | Alternate US Standard | Class A              | Class B  | Class C  | Class P  | Class Seal |
| 63                | 2-1/2"                |                      | 100      |          |          |            |
| 50                | 2"                    | 100                  | 95 – 100 |          |          |            |
| 37.5              | 1-1/2"                | 95 – 100             | -        |          |          | 100        |
| 25                | 1"                    | -                    | 35 – 70  |          | 100      | 95 – 100   |
| 19.0              | 3/4"                  | 35 – 70              | -        | 100      | 95 – 100 | -          |
| 12.5              | 1/2"                  | -                    | 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 (-) 2 mass percent of the design cement content.

**405.2.4 Water**

It shall conform to the requirements of Subsection 311.2.4

**405.2.5 Reinforcing Steel**

It shall conform to the requirements of Item 710, Reinforcing Steel and Wire Rope.

**405.2.6 Admixtures**

Admixtures shall conform to the requirements of Subsection 311.2.7

**405.2.7 Curing Materials**

Curing materials shall conform to the requirements of Subsection 311.2.8.

**405.2.8 Expansion Joint Materials**

Expansion joint materials shall be:

1. Preformed Sponge Rubber and Cork, conforming to AASHTO M 153.
2. Hot-Poured Elastic Type, conforming to AASHTO M 173.
3. Preformed Fillers, conforming to AASHTO M 213.

#### **405.2.9 Elastomeric Compression Joint Seals**

These shall conform to AASHTO M 220.

#### **405.2.10 Elastomeric Bearing Pads**

These shall conform to AASHTO M 251 or Item 412 – Elastomeric Bearing Pads.

#### **405.2.11 Storage of Cement and Aggregates**

Storage 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, 150 x 300mm (6 x 12 inches), shall be taken from each seventy five (75) cubic meters of each class of concrete or 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 metre and air content (gravimetric) 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  |

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

|                                                                                  |      |
|----------------------------------------------------------------------------------|------|
| Making and curing concrete compressive and flexural tests specimens in the field | T 23 |
| Compressive 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 405.2, using the absolute volume 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 as specified in Table 405.2.

**Table 405.2 - Composition and Strength of Concrete for Use in Structures**

| Class Of Concrete | Minimum Cement Content Per m <sup>3</sup><br>kg (bag**) | Maximum Water/Cement Ratio<br>kg/kg | Consistency Range in Slump<br>mm (inch) | Designated Size of Coarse Aggregate<br>Square Opening Std. mm | Minimum Compressive Strength of 150x300mm Concrete Cylinder Specimen at 28 days, MN/m <sup>2</sup> (psi) |
|-------------------|---------------------------------------------------------|-------------------------------------|-----------------------------------------|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| A                 | 360<br>(9 bags)                                         | 0.53                                | 50 – 100<br>(2 – 4)                     | 37.5 – 4.75<br>(1-1/2" – No. 4)                               | 20.7<br>(3000)                                                                                           |
| B                 | 320<br>(8 bags)                                         | 0.58                                | 50 – 100<br>(2 – 4)                     | 50 – 4.75<br>(2" – No. 4)                                     | 16.5<br>(2400)                                                                                           |
| C                 | 380<br>(9.5 bags)                                       | 0.55                                | 50 – 100<br>(2 – 4)                     | 12.5 – 4.75<br>(1/2" – No. 4)                                 | 20.7<br>(3000)                                                                                           |
| P                 | 440<br>(11 bags)                                        | 0.49                                | 100 max.<br>(4 max.)                    | 19.0 – 4.75<br>(3/4" – No. 4)                                 | 37.7<br>(5000)                                                                                           |
| Seal              | 380<br>(9.5 bags)                                       | 0.58                                | 100 – 200<br>(4 - 8)                    | 25 – 4.75<br>(1" – No. 4)                                     | 20.7<br>(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 of the equipment to properly place it and not by the 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 Batching**

Measuring and batching of materials shall be done at a batching plant.

#### **1. Portland Cement**

Either sacked or bulk cement may be used. No fraction of a sack of cement shall be used in a batch of concrete unless the cement is weighed. All bulk cement shall be weighed on an approved weighing device. The bulk cement weighing hopper shall be properly sealed and vented to preclude dusting operation. The discharge chute shall not be suspended from the weighing hopper and shall be so arranged that cement will neither be lodged in it nor leak from it.

Accuracy of batching shall be within plus (+) or minus (-) 1 mass percent.

#### **2. Water**

Water may be measured either by volume or by weight. The accuracy of measuring the water shall be within a range of error of not more than 1 percent.

#### **3. Aggregates**

Stockpiling of aggregates shall be in accordance with Subsection 311.2.10. All aggregates whether produced or handled by hydraulic methods or washed, shall be stockpiled or binned for draining for at least 12 hours prior to batching. Rail shipment requiring more than 12 hours will be accepted as adequate binning only if the car bodies permit free drainage. If the aggregates contain high or non-uniform moisture content, storage or stockpile period in excess of 12 hours may be required by the Engineer.

Batching shall be conducted as to result in a 2 mass percent maximum tolerance for the required materials.

#### **4. Bins and Scales**

The batching plant shall include separate bins for bulk cement, fine aggregate and for each size of coarse aggregate, a weighing hopper, and scales capable of determining accurately the mass of each component of the batch.

Scales shall be accurate to one-half (0.5) percent throughout the range used.

#### **5. Batching**

When batches are hauled to the mixer, bulk cement shall be transported either in waterproof compartments or between the fine and coarse aggregate. When cement is placed in contact with moist aggregates, batches will be rejected unless mixed within 1-1/2 hours of such contact. Sacked cement may be transported on top of the aggregates.

Batches shall be delivered to the mixer separate and intact. Each batch shall be dumped cleanly into the mixer without loss, and, when more than one batch is carried on the truck, without spilling of material from one batch compartment into another.

#### 6. Admixtures

The Contractor shall follow an approved procedure for adding the specified amount of admixture to each batch and will be responsible for its uniform operation during the progress of the work. He shall provide separate scales for the admixtures which are to be proportioned by weight, and accurate measures for those to be proportioned by volume. Admixtures shall be measured into the mixer with an accuracy of plus or minus three (3) percent.

The use of Calcium Chloride as an admixture will not be permitted.

#### **405.4.4 Mixing and Delivery**

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

In exceptional cases and when volumetric measurements are authorized, for small project requiring less than 75 cu.m. 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 fine aggregate. Batching and mixing shall be in accordance with ASTM C 685, Section 6 through 9.

Concrete mixing, by chute is allowed provided that a weighing scales for determining the batch weight will be used.

For batch mixing at the site of construction or at a central point, a batch mixer of an approved type shall be used. Mixer having a rated capacity of less than a one-bag batch shall not be used. The volume of concrete mixed per batch shall not exceed the mixer's nominal capacity as shown on the manufacturer's standard rating plate on the mixer except that an overload up to 10 percent above the mixer's nominal capacity may be permitted, provided concrete test data for strength, segregation, and uniform consistency are satisfactory and provided no spillage of concrete takes place. The batch shall be so charge into the drum that a portion of the water shall enter in advance of the cement and aggregates. The flow of water shall be uniform and all water shall be in the drum by the end of the first 15 seconds of the mixing period. Mixing time shall be measured from the time all materials, except water, are in the drum. Mixing time shall not be less than 60 seconds for mixers having a capacity of 1.5m<sup>3</sup> or less. For mixers having a capacity greater than 1.5m<sup>3</sup>, the mixing time shall not be less than 90 seconds. If timing starts, the instant the skip reaches its maximum raised position, 4 seconds shall be added to the specified mixing time. Mixing time ends when the discharge chute opens.

The mixer shall be operated at the drum speed as shown on the manufacturer's name plate on the mixer. Any concrete mixed less than the specified time shall be discarded and disposed off by the Contractor at his own expenses.

The timing device on stationary mixers shall be equipped with a bell or other suitable warning device adjusted to give a clearly audible signal each time the lock is released. In case of failure of the timing device, the Contractor will be permitted to continue operations while it is being repaired, provided he furnishes an approved timepiece equipped with minute and second hands. If the timing device is not placed in good working order within 24 hours, further use of the mixer will be prohibited until repairs are made.

Retempering concrete will not be permitted. Admixtures for increasing the workability, for retarding the set, or for accelerating the set or improving the pumping characteristics of the concrete will be permitted only when specifically provided for in the Contract, or authorized in writing by the Engineer.

#### 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 a 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.

Equipment having components made of aluminum or magnesium alloys, which would have contact with plastic concrete during mixing, transporting or pumping of Portland Cement concrete, shall not be used.

Concrete mixers shall be equipped with adequate water storage and a device of accurately measuring and automatically controlling the amount of water used.

Materials shall be measured by weighing. The apparatus provided for weighing the aggregates and cement shall be suitably designed and constructed for this purpose. The accuracy of all weighing devices except that for water shall be such that successive quantities can be measured to within one percent of the desired amounts. The water measuring device shall be accurate to plus or minus 0.5 mass percent. All measuring devices shall be subject to the approval of the Engineer. Scales and measuring devices shall be tested at the expense of the Contractor as frequently as the Engineer may deem necessary to insure their accuracy.

Weighing equipment shall be insulated against vibration or movement of other operating equipment in the plant. When the entire plant is running, the scale reading at cut-off shall not vary from the weight designated by the Engineer more than one mass percent for cement, 1-1/2 mass percent for any size of aggregate, or one (1) mass percent for the total aggregate in any batch.

## 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. Mixers and agitators which have an accumulation of hard concrete or mortar shall not be used.

When bulk cement is used and volume of the batch is 0.5m<sup>3</sup> or more, the scale and weigh hopper for Portland Cement shall be separate and distinct from the aggregate hopper or hoppers. The discharge mechanism of the bulk cement weigh hopper shall be interlocked against opening before the full amount of cement is in the hopper. The discharging mechanism shall also be interlocked against opening when the amount of cement in the hopper is underweight by more than one (1) mass percent or overweight by more than 3 mass percent of the amount specified.

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, or in accumulation of cement on surface of conveyors or hoppers, or in 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 into the mixer.

All concrete shall be mixed for a period of not less than 1-1/2 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.

Mixers shall be operated with an automatic timing device that can be locked by the Engineer. The time device and discharge mechanics shall be so interlocked that during normal operation no part of the batch will be charged until the specified mixing time has elapsed.

The first batch of concrete materials placed in the mixer shall contain a sufficient excess of cement, sand, and water to coat inside of the drum without reducing the required mortar content of the mix. When mixing is to cease for a period of one hour or more, the mixer shall be thoroughly cleaned.

## 3. Mixing Concrete at Central Plant

Mixing at central plant shall conform to the requirements for mixing at the site.

#### 4. Mixing Concrete in Truck

Truck mixers, unless otherwise authorized by the Engineer, shall be of the revolving drum type, water-tight, and so constructed that the concrete can be mixed to insure a uniform distribution of materials throughout the mass. All solid materials for the concrete shall be accurately measured and charged into the drum at the proportioning plant. Except as subsequently provided, the truck mixer shall be equipped with a device by which the quantity of water added can be readily verified. The mixing water may be added directly to the batch, in which case a tank is not required. Truck mixers may be required to be provided with a means of which the mixing time can be readily verified by the Engineer.

The maximum size of batch in truck mixers shall not exceed the minimum rated capacity of the mixer as stated by the manufacturer and stamped in metal on the mixer. Truck mixing, shall, unless other-wise directed be continued for not less than 100 revolutions after all ingredients, including water, are in the drum. The mixing speed shall not be less than 4 rpm, nor more than 6 rpm.

Mixing shall begin within 30 minutes after the cement has been added either to the water or aggregate, but when cement is charged into a mixer drum containing water or surface wet aggregate and when the temperature is above 32°C, this limit shall be reduced to 15 minutes. The limitation in time between the introduction of the cement to the aggregate and the beginning of the mixing may be waived when, in the judgement of the Engineer, the aggregate is sufficiently free from moisture, so that there will be no harmful effects on the cement.

When a truck mixer is used for transportation, the mixing time specified in Subsection 405.4.4 (3) at a stationary mixer may be reduced to 30 seconds and the mixing completed in a truck mixer. The mixing time in the truck mixer shall be as specified for truck mixing.

#### 5. Transporting Mixed Concrete

Mixed concrete may only be transported to the delivery point in truck agitators or truck mixers operating at the speed designated by the manufacturers of the equipment as agitating speed, or in non-agitating hauling equipment, provided the consistency and workability of the mixed concrete upon discharge at the delivery point is suitable point for adequate placement and consolidation in place.

Truck agitators shall be loaded not to exceed the manufacturer's guaranteed capacity. They shall maintain the mixed concrete in a thoroughly mixed and uniform mass during hauling.

No additional mixing water shall be incorporated into the concrete during hauling or after arrival at the delivery point.

The rate of discharge of mixed concrete from truck mixers or agitators shall be controlled by the speed of rotation of the drum in the discharge direction with the discharge gate fully open.

When a truck mixer or agitator is used for transporting concrete to the delivery point, discharge shall be completed within one hour, or before 250 revolutions of the drum or blades, whichever comes first, after the introduction of the cement to the aggregates. Under conditions

contributing to quick stiffening of the concrete or when the temperature of the concrete is 30°C, or above, a time less than one hour will be required.

6. Delivery of Mixed Concrete

The Contractor shall have sufficient plant capacity and transportation apparatus to insure continuous delivery at the rate required. The rate of delivery of concrete during concreting operations shall be such as to provide for the proper handling, placing and finishing of the concrete. The rate shall be such that the interval between batches shall not exceed 20 minutes. The methods of delivering and handling the concrete shall be such as will facilitate placing of the minimum handling.

**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 by pipe less than 100mm (4 inches) in diameter or by reinforcing steel, anchors, conduits, weep holes or expansion joint materials.

**405.6 Basis of Payment**

The accepted quantities, measured as 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.

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:

| Pay Item Number | Description                  | Unit of Measurement |
|-----------------|------------------------------|---------------------|
| 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 500 – PIPE CULVERTS AND STORM DRAINS***

**500.1 Description**

This item shall consist of the construction or reconstruction of pipe culverts and storm drains, hereinafter referred to as “conduit” in accordance with this Specification and in conformity with the lines and grades shown on the Plans or as established by the Engineer.

**500.2 Material Requirements**

Material shall meet the requirements specified in the following specifications:

|                                                                            |              |
|----------------------------------------------------------------------------|--------------|
| Zinc coated (galvanized) corrugated iron or steel culverts and underdrains | AASHTO M 36  |
| Cast iron culvert pipe                                                     | AASHTO M 64  |
| Concrete sewer, storm drain and culvert pipe                               | AASHTO M 86  |
| Reinforced concrete culvert, storm drain and sewer pipe                    | AASHTO M 170 |
| Bituminous coated corrugated metal culvert pipe and pipe arches            | AASHTO M 190 |
| Reinforced concrete arch culvert, storm drain and sewer pipe               | AASHTO M 206 |
| Reinforced concrete elliptical culvert, storm drain and sewer pipe         | AASHTO M 207 |
| Asbestos cement pipe for culverts and storm drains                         | AASHTO M 217 |

Joint Mortar – Joint mortar for concrete pipes shall consist of 1 part, by volume of Portland Cement and two (2) parts of approved sand with water as necessary to obtain the required consistency.

Portland Cement and sand shall conform to the requirements of Item 405, Structural Concrete. Mortar shall be used within 30 minutes after its preparation.

|                |              |
|----------------|--------------|
| Rubber gaskets | AASHTO M 198 |
|----------------|--------------|

Oakum – Oakum for joints in bell and spigot pipes shall be made from hemp (Cannavis Sativa) line or Benares Sunn fiber or from a combination of these fibers. The oakum shall be thoroughly corded and finished and practically free from lumps, dirt and extraneous matter.

|                                   |              |
|-----------------------------------|--------------|
| Hot poured joint sealing compound | AASHTO M 173 |
|-----------------------------------|--------------|

Bedding material shall conform to the requirements of Subsection 500.3.2, Bedding.

Backfill material shall conform to the requirements of Subsection 500.3.6, Backfilling.

When the location of manufacturing plants allow, the plants will be inspected periodically for compliance with specified manufacturing methods, and material samples will be obtained for laboratory testing for compliance with materials quality requirements. This shall be the basis for acceptance of manufacturing lots as to quality.

Prior to and during incorporation of materials in the work, these materials will be subjected to the latest inspection and approval of the Engineer.

### **500.3 Construction Requirements**

### **500.3.1 Trenches Excavation**

Trenches shall be excavated in accordance with the requirement of Item 103, Structure Excavation, to a width sufficient to allow for proper jointing of the conduit and thorough compaction of the bedding and backfill materials under and around the conduit. Where feasible, trench wall shall be vertical.

The completed trench bottom shall be firm for its full length and width. Where required, in the case of crop drains, the trench shall have a longitudinal camber of the magnitude specified.

When so specified on the Plans, the excavation for conduits placed in embankment fill, shall be made after the embankment has been completed to the specified or directed height above the designed grade of the conduit.

### **500.3.2 Bedding**

The bedding shall conform to one of the classes specified. When no bedding class is specified, the requirements for Class C bedding shall apply.

Class A bedding shall consist of a continuous concrete cradle conforming to the plan details. Class B bedding shall consist of bedding the conduit to a depth of not less than 30 percent of the vertical outside diameter of the conduit. The minimum thickness of bedding material beneath the pipe shall be 100 mm. The bedding material shall be sand or selected sandy soil all of which passes a 9.5 mm sieve and not more than 10 percent of which passes a 0.075 mm sieve. The layer of the bedding material shall be shaped to fit the conduit for at least 15 percent of its total height. Recesses in the trench bottom shall be shaped to accommodate the bell when bell and spigot type conduit is used.

Class C bedding shall consist of bedding the conduit to a depth of not less than 10 percent of its total height. The foundation surface, completed in accordance with Item 103, Structure Excavation, shall be shaped to fit the conduit and shall have recesses shaped to receive the bells, if any.

For flexible pipe, the bed shall be roughly shaped and a bedding blanket of sand or fine granular material as specified above shall be provided as follows:

| Pipe Corrugation Depth | Minimum Bedding Depth |
|------------------------|-----------------------|
| 10 mm                  | 25 mm                 |
| 25 mm                  | 50 mm                 |
| 50 mm                  | 75 mm                 |

For large diameter structural plate pipes the shaped bed need not exceed the width of bottom plate.

### **500.3.3 Laying Conduit**



The conduit laying shall begin at the downstream end of the conduit line. The lower segment of the conduit shall be in contact with the shaped bedding throughout its full length. Bell or groove ends of rigid conduits and outside circumferential laps of flexible conduits shall be placed facing upstream. Flexible conduit shall be placed with longitudinal laps or seams at the sides.

Paved or partially-lined conduit shall be laid such that the longitudinal center line of the paved segment coincides with the flow line. Elliptical and elliptically reinforced conduits shall be placed with the major axis within 5 degrees of a vertical plane through the longitudinal axis of the conduit.

#### **500.3.4 Jointing Conduit**

Rigid conduits may either be of bell and spigot or tongue and groove design unless another type is specified. The method of joining conduit sections shall be such that the ends are fully entered and the inner surfaces are reasonably flush and even.

Joints shall be made with (a) Portland Cement mortar, (b) Portland Cement grout, (c) rubber gaskets, (d) oakum and mortar, (e) oakum and joint compound, (f) plastic sealing compound, or by a combination of these types, or any other type, as may be specified. Mortar joints shall be made with an excess of mortar to form a continuous bead around the outside of the conduit and finished smooth on the inside. For grouted joints, molds or runners shall be used to retain the poured grout. Rubber ring gaskets shall be installed so as to form a flexible water-tight seal. Where oakum is used, the joint shall be called with this material and then sealed with the specified material.

When Portland Cement mixtures are used, the completed joints shall be protected against rapid drying by any suitable covering material.

Flexible conduits shall be firmly joined by coupling bands.

Conduits shall be inspected before any backfill is placed. Any pipe found to be out of alignment, unduly settled, or damaged shall be taken up and relaid or replaced.

#### **500.3.5 Field Strutting**

When required by the Plans, vertical diameter of round flexible conduit shall be increased 5 percent by shop elongation or by means of jacks applied after the entire line of conduit has been installed on the bending but before backfilling. The vertical elongation shall be maintained by means of sills and struts or by horizontal ties shall be used on paved invert pipe.

Ties and struts shall be 300 mm in place until the embankment is completed and compacted, unless otherwise shown on the Plans.

These construction specifications shall also apply in the case of relaid conduits. In addition, all conduits salvaged for relaying shall be cleaned of all foreign materials prior to reinstallation.

#### **500.3.6 Backfilling**

Materials for backfilling on each side of the conduit for the full trench width and to an elevation of 300 mm above the top of the conduit shall be fine, readily compactible soil or granular material selected from excavation or from a source of the Contractor's choice, and shall not contain stones that would be retained on a 50 mm sieve, chunks of highly plastic clay, or other objectionable material. Granular backfill material shall have not less than 95 percent passing a 12.5 mm sieve and not less than 95 percent retained on a 4.75 mm sieve. Oversized material, if present, shall be removed at the source of the material, except as directed by the Engineer. When the top of the conduit is flushed with or below the top of the trench, backfill material shall be placed at or near optimum moisture content and compacted in layers not exceeding 150 mm (compacted) on both sides to an elevation 300 mm above the top of the conduit. Care shall be exercised to thoroughly compact the backfill under the haunches of the conduit. The backfill shall be brought up evenly on both sides of the conduit for the full required length. Except where negative projecting embankment-type installation is specified, the backfill material shall be placed and compacted for the full depth of the trench.

When the top of the conduit is above the top of the trench, backfill shall be placed at or near optimum moisture content and compacted in layers not exceeding 300 mm (compacted) and shall be brought up evenly on both sides of the conduit for its full length to an elevation 300 mm above the top of the conduit. The width of the backfill on each side of the conduit for the portion above the top of the trench shall be equal to twice the diameter of the conduit or 3.5 m, whichever is less. The backfill material used in the trench section and the portion above the top of the trench for a distance on each side of the conduit equal to the horizontal inside diameter and to 300 mm above the top of the conduit shall conform to the requirements for backfill materials in this Subsection. The remainder of the backfill shall consist of materials from excavation and borrow that is suitable for embankment construction.

Compaction to the density specified in Item 104, Embankment, shall be achieved by use of mechanical tampers or by rolling.

All conduits after being bedded and backfill as specified in this Subsection shall be protected by one metre cover of fill before heavy equipment is permitted to cross during construction of the roadway.

### **500.3.7 Imperfect Trench**

Under this method, for rigid conduit, the embankment shall be completed as described in Subsection 500.3.6, Backfilling, to a height above the conduit equal to the vertical outside diameter of the conduit plus 300 mm. A trench equal in width to the outside horizontal diameter of the conduit and to the length shown on the plans or as directed by the Engineer shall then be excavated to within 300 mm of the top of the conduit, trench walls being as nearly vertical as possible. The trench shall be loosely filled with highly compressible soil. Construction of embankment above shall then proceed in a normal manner.

### **500.4 Method of Measurement**

Conduit of the different types and sizes, both new and relaid, will be measured by the **linear metre in place**. Conduit with sloped or skewed ends will be measured along the invert. Each section will be measured by the number of units installed.

Branch connection and elbows will be included in the length measurement for conduit, or they may be measured by the number of units installed.

Class B bedding material placed and approved shall be measured by the cubic metre in place.

When the Bid Schedule contains an estimated quantity for “Furnishing and Placing Backfill Material, Pipe Culvert”, the quantity to be paid for will be the number of cubic metre complete in place and accepted, measured in final position between limits as follows:

1. Measurement shall include backfill material in the trench up to the top of the original ground line but will not include any material placed outside of vertical planes 450 mm up outside of and parallel to the inside wall of pipe at its widest horizontal dimension.
2. When the original ground line is less than 300 mm above the top of the pipe, the measurement will also include the placing of all backfill materials, above the original ground line adjacent to the pipe for a height of 300 mm above the top of pipe and for a distance on each side of the pipe not greater than the widest horizontal dimension of the pipe.
3. The measurement shall include the placing of backfill material in all trenches of the imperfect trench method. Materials re-excavated for imperfect trench construction will be measured for payment under Item 103, Structure Excavation.

#### **500.5 Basis of Payment**

The accepted quantities of conduit, determined as provided in Section 500.4, Method of Measurement, shall be paid for at the contract unit price per linear meter for the conduit of the types and sizes specified complete in place. End sections and, when so specified, branch connections and elbows, shall be paid for at the contract unit price per piece for the kind and size specified complete in place.

Excavation for culverts and storm drains, including excavation below flow line grade and for imperfect trench, shall be measured and paid for as provided in Item 103, Structure Excavation.

Concrete for Class A bedding will be paid for under Item 405, Structural Concrete.

When the Bid Schedule does not contain as estimated quantity for “Furnishing and Placing Backfill Material, Pipe Culvert” payment for placing backfill material around pipe culverts will be considered as included in the payment for excavation of the backfill material.

Payment will be made under:

| Payment Item Number | Description                    | Unit of Measurement |
|---------------------|--------------------------------|---------------------|
| 500 (1)             | Pipe Culverts, - mm<br>Class - | Linear Meter        |
| 500 (2)             | Storm Drain, - mm<br>Class -   | Linear Meter        |

**DPWH Standard Specification for  
Item 1046 – Masonry Works**

**1046.1 Description**

This Item shall consist of furnishing of all necessary materials, tools, equipment and labor necessary to complete the execution of the masonry works using Concrete Hollow Blocks and Louver Blocks as shown on the Plans and herein specified.

**1046.2 Material Requirements**

**1046.2.1 Hydraulic Cement**

Hydraulic Cement shall conform to the applicable requirements of Item 700, Hydraulic Cement.

**1046.2.2 Aggregates**

Aggregates shall conform to the applicable requirements of Item 405, Structural Concrete.

**1046.2.3 Water**

Water shall conform to the applicable requirements of Item 714, Water.

**1045.2.4 Reinforcing Steel**

Reinforcing steel shall conform to the applicable requirements of Item 710, Reinforcing Steel and Wire Rope.

**1046.2.5 Mortar**

Mortar shall consist of sand, cement and water conforming to the requirements of Item 405, Structural Concrete, mixed in the proportion of one (1) part cement to three parts sand by volume, and sufficient water to obtain the required consistency.

**1046. 2.6 Concrete Hollow Blocks and Louver Blocks**

Width, height and length of concrete hollow blocks and louver blocks shall be  $\pm 3.20\text{mm}$  from the specified dimension shown on the Plans.

**1046.2.6.1 Load-Bearing Concrete Hollow Blocks**

Load-bearing concrete hollow blocks shall conform to the physical requirements of the Tables below as prescribed on ASTM C 90, Standard Specifications for Load-bearing Concrete Masonry Units.

**Table 1046.1 Minimum Thickness of Face Shells and Webs**

| Nominal Width (W) of Units, mm | Face Shell Thickness ( $t_s$ ), min., mm | Web Thickness ( $t_w$ ) |                                             |
|--------------------------------|------------------------------------------|-------------------------|---------------------------------------------|
|                                |                                          | Webs, min., mm          | Equivalent Web Thickness, min., mm/linear m |
| 76.2 and 102                   | 19                                       | 19                      | 136                                         |
| 152                            | 25                                       | 25                      | 188                                         |
| 203                            | 32                                       | 25                      | 188                                         |
| 254 and greater                | 32                                       | 29                      | 209                                         |

**Table 1046.2 Strength, Absorption, and Density Classification Requirements**

| Density Classification | Oven-Dry Density of Concrete, $kg/m^3$ | Maximum Water Absorption, $kg/m^3$ |                  | Minimum Net Area Compressive Strength, MPa (Psi) |                  |
|------------------------|----------------------------------------|------------------------------------|------------------|--------------------------------------------------|------------------|
|                        | Average of 3 Units                     | Average of 3 Units                 | Individual Units | Average of 3 Units                               | Individual Units |
| Lightweight            | Less than 1680                         | 288                                | 320              | 13.1 (1900)                                      | 11.7 (1700)      |
| Medium Weight          | 1680 to less than 2000                 | 240                                | 272              | 13.1 (1900)                                      | 11.7 (1700)      |
| Normal Weight          | 2000 or more                           | 208                                | 240              | 13.1 (1900)                                      | 11.7 (1700)      |

**1046.2.6.2 Non-load bearing Concrete Hollow Blocks and Louver Blocks**

Non-load bearing concrete hollow blocks shall be clearly marked to prevent their use as load bearing units.

- a. **Type I, Moisture-Controlled Units** – Units shall conform to the requirements of Tables 1046.3, 1046.4 and 1046.5.
- b. **Type II, Non-moisture-Controlled Units** – Units designated as Type II shall conform to the requirements of Table 1046.4.

**Table 1046.3 Weight Classification**

| Weight Classification | Oven-Dry Density of Concrete, $kg/m^3$ |
|-----------------------|----------------------------------------|
| Lightweight           | Less than 1680                         |
| Medium Weight         | 1680 to less than 2000                 |
| Normal Weight         | 2000 or more                           |

**Table 1046.4 Strength Requirements**

|                 | Compressive Strength (average net area min.,) MPa (Psi) |
|-----------------|---------------------------------------------------------|
| Average 3 Units | 4.14 (600)                                              |
| Individual Unit | 3.45 (500)                                              |

**Table 1046.5 Moisture-Content Requirements for Type I Units**

| Total Linear Drying Shrinkage, % | Moisture Content, max, % of Total Absorption (Average of 3 Units) |                           |                   |
|----------------------------------|-------------------------------------------------------------------|---------------------------|-------------------|
|                                  | Humidity Conditions at Job Site of Point of Use                   |                           |                   |
|                                  | Humid <sup>B</sup>                                                | Intermediate <sup>C</sup> | Arid <sup>D</sup> |
| Less than 0.03                   | 45                                                                | 40                        | 35                |
| 0.03 to less than 0.045          | 40                                                                | 35                        | 30                |
| 0.045 to 0.065, max              | 35                                                                | 30                        | 25                |

Note: <sup>B</sup> Mean annual relative humidity above 75%  
<sup>C</sup> Mean annual relative humidity 50 to 75%  
<sup>D</sup> Mean annual relative humidity less than 50%

#### 1046.2.7 Other Constituents

Air-entraining agents, coloring pigments, integral water repellents, finely ground silica, and other constituents, shall be previously established as suitable for use in concrete masonry and shall conform to applicable ASTM standards or shall be shown by test or experience not to be detrimental to the durability of the concrete masonry units or any material customarily used in masonry construction.

#### 1046.3 Construction Requirements

##### 1046.3.1 Mixing

Concrete shall be mixed well using the proportion specified by the Engineer. Hand mixing shall be done, using shovels, on a level concrete slab or steel plate. Mix aggregate and cement until the color is uniform. Spread the mixture out, sprinkle water over the surface and mix. Continue with this process until the right amount of water has been mixed in. Mixture shall be free from impurities such as dirt and grass.

If batch mixer is used, accurate timing and measuring devices shall be observed as per manufacturer's recommendation.

##### 1046.3.2 Moulding

Hand operated machines shall be used as manufacturer's recommendation.

The mould of a powered machine should be filled until six (6) to eight (8) cycles of compaction are required to bring the compacting head to its stops.

Demoulding or removal of the mould shall be done carefully so that the fresh blocks are not damaged. Fresh blocks shall be protected from rain with plastic sheets or any suitable covering during the first day and from the drying effects of the sun and wind until curing starts.

##### 1046.3.3 Curing

After being removed from the mold, the Concrete Hollow Blocks (CHB) and Louver Blocks shall be covered with a plastic sheet or tarpaulin and kept damp and shaded for at least seven (7) days in order to effectively cure. This can be achieved by continually spraying them with water or keeping them under water in tanks.

#### **1046.3.4 Installation**

1. All masonry work shall be laid true to line, level, plumb and neat in accordance with the Plans.
2. Units shall be cut accurately to fit all plumbing ducts, opening for electrical works, and all holes shall be neatly patched.
3. No construction support shall be attached to the wall except where specifically permitted by the Engineer.
4. Masonry unit shall be sound, dry, clean and free from cracks when placed in the structure.
5. Proper masonry units shall be used to provide for all window, doors, bond beams, lintels, plasters etc., with a minimum of unit cutting.
6. Where masonry units cutting is necessary, all cuts shall be neat and true to line.
7. Units shall be placed while the mortar is soft and plastic. Any unit disturbed to the extent that the initial bond is broken after initial positioning shall be removed and re-laid in fresh mortar.
8. Mortar should not be spread too far ahead of units, as it will stiffen and lose plasticity, especially in hot weather. Mortar that has stiffened should not be used. ASTM C 270 requires that mortar be used within 2½ hours of initial mixing.

#### **1046.3.5 Reinforcement for Concrete Hollow Blocks**

Reinforcement shall be done in accordance with the structural plans as to size, spacing and other requirements of Item 404 – Reinforcing Steel under Section 404.3 – Construction Requirement.

Reinforcement shall be clean and free from loose, rust, scales and any coatings that will reduce bond.

#### **1046.3.6 Finish and Appearance**

1. All units shall be sound and free of cracks or other defects that interfere with the proper placement of the unit or significantly impair the strength or permanence of the construction. Minor cracks, incidental to the usual method of manufacture or minor chipping resulting from customary methods of handling in shipment and delivery, are not grounds for rejection.
2. Where units are to be used in exposed wall construction, the face or faces that are to be exposed shall not show chips or cracks, not otherwise permitted, or other imperfections when viewed from a distance of not less than 6.1 m under diffused lighting.
  - a. Five percent of a shipment containing chips, not larger than 25.4 mm in any dimension, or cracks not wider than 0.5 mm and not longer than 25% of the nominal height of the unit, is permitted.

3. The color and texture of units shall be specified by the purchaser. The finished surfaces that will be exposed in place shall conform to an approved sample, consisting of not less than four (4) units, representing the range of texture and color permitted.
4. A shipment shall not contain more than 5% of units, including broken unit that do not meet the requirements of the above provisions.

**1046.3.7 Sampling and Testing for Concrete Hollow Blocks and Louvers**

Method of Sampling for Quality Test shall be as follows:

1. One (1) Quality Test for every 10,000 units or fraction thereof.
2. Six (6) specimens to be submitted for one (1) quality test in which three (3) specimens for Compression Test and the remaining three (3) for Moisture Content and Water Absorption.

Units shall be tested in accordance with ASTM C 140, Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units and ASTM C 426, Standard Test Method for Linear Drying Shrinkage of Concrete Masonry Units.

**1046.3.8 Storage and Handling of Masonry Works**

The blocks shall be stored in such a way as to avoid contact with moisture at site. They shall be stock-piled on planks or other supports free from contact with ground and covered to protect against wetting. The block shall be handled with care and damaged units shall be rejected.

**1046.4 Method of Measurement**

The work to be paid for under this Item shall be the number of square meters of masonry units that are satisfactorily accepted and completed.

**1046.5 Basis of Payment**

The accepted quantity, measured as prescribed in Section 1046.4, Method of Measurement shall be paid for at the contract unit price for Masonry Works which price and payment shall include the cost of furnishing all labor, materials and equipment necessary to complete the work.

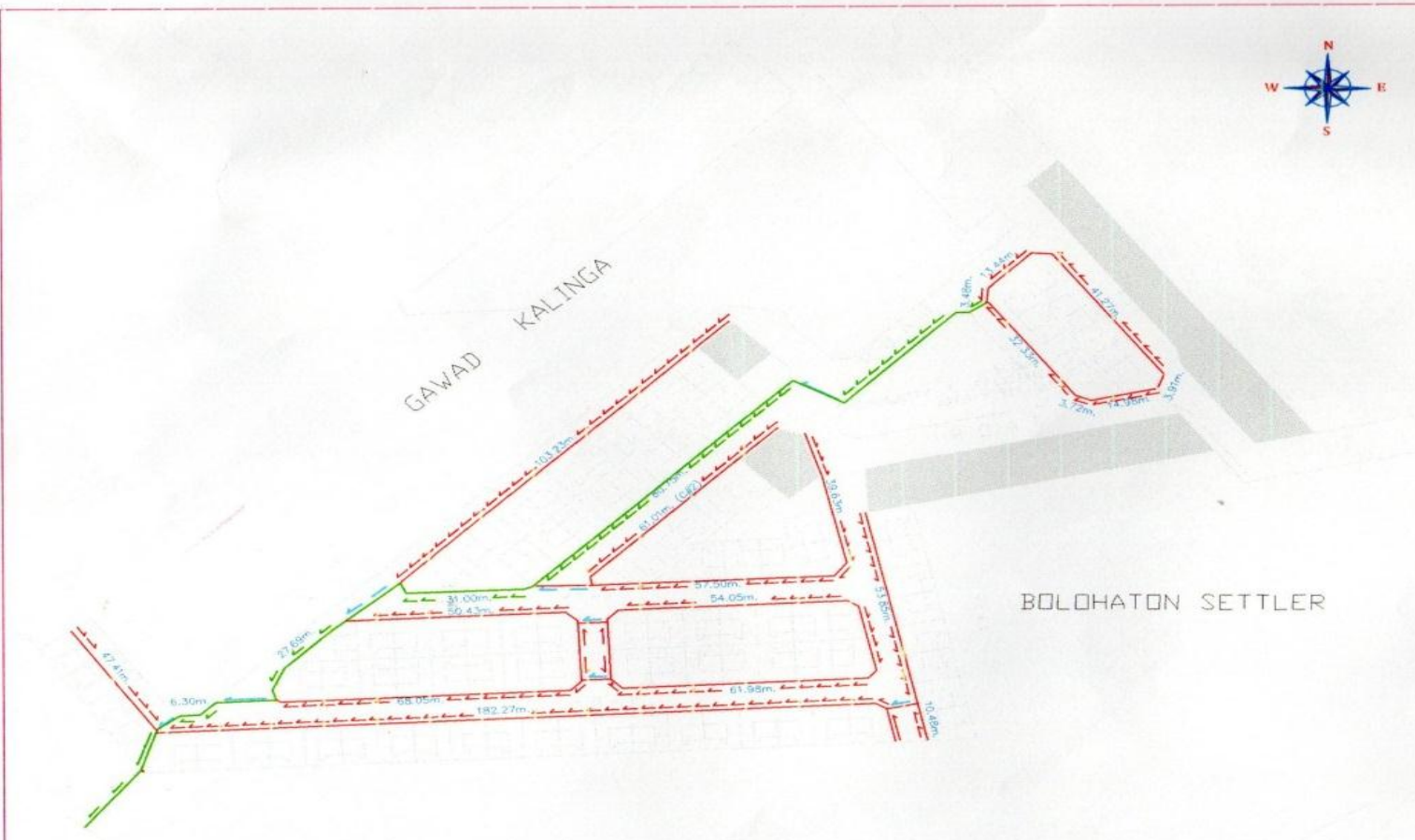
Payment will be made under:

| <b>Pay Item Number</b> | <b>Description</b>                                         | <b>Unit of Measurement</b> |
|------------------------|------------------------------------------------------------|----------------------------|
| 1046 (1) a             | CHB Load-Bearing (including Reinforcing Steel), 100 mm     | Square Meter               |
| 1046 (1) b             | CHB Non-Load Bearing (including Reinforcing Steel), 150 mm | Square Meter               |
| 1046 (2) a             | CHB Load-Bearing (including Reinforcing Steel), 100 mm     | Square Meter               |
| 1046 (2) b             | CHB Non-Load Bearing (including Reinforcing Steel), 150 mm | Square Meter               |
| 1046 (3)               | Louver Block                                               | Square Meter               |



## ***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.]*




LOCATION MAP

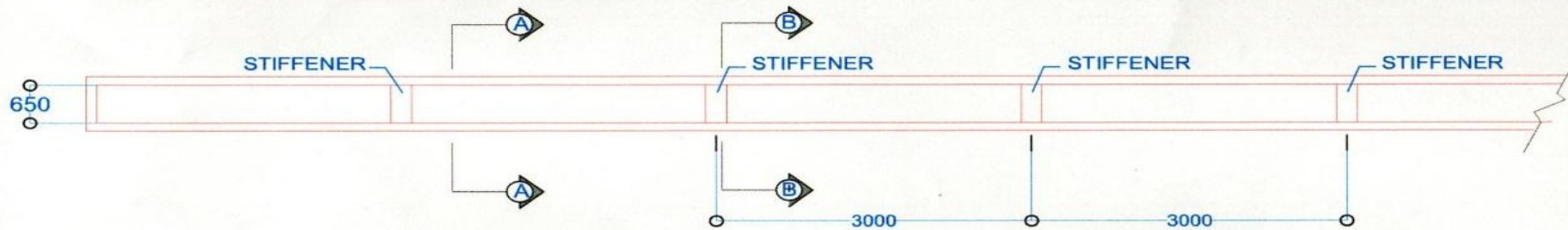
INDEX SHEETS:

- P1 : KEY MAP  
LOCATION MAP  
INDEX OF SHEETS
- P2 : SITE DEVELOPMENT PLAN
- P3 : CONCRETE DRAINAGE DETAIL  
FOR CANAL # 1
- P4 : CONCRETE DRAINAGE DETAIL  
FOR CANAL # 2

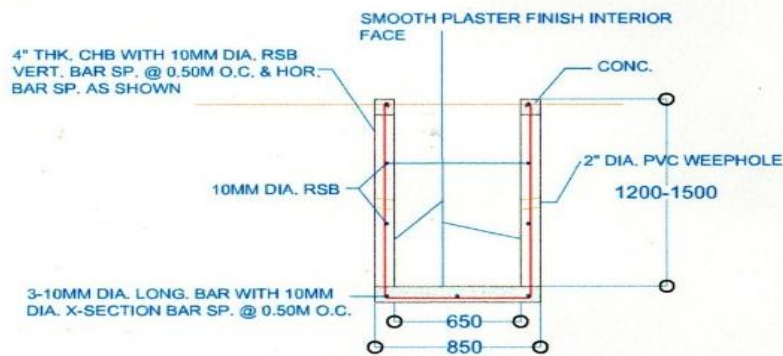
KEY MAP (BOLOHATON SETTLER)  
SCALE 1:1000M

|                                                                                                                                                                                                                                                   |                                                                                                |                                                                                         |                                                                                                         |                                                                                                                 |                                                                                     |                                                                      |                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------|------------------------------|
|  <p>REPUBLIC OF THE PHILIPPINES<br/>PROVINCE OF DAVAO DE ORO<br/>MUNICIPALITY OF COMPOSTELA<br/>OFFICE OF THE MUNICIPAL ENGINEER<br/>AND BUILDING OFFICIAL</p> | <p>PROJECT TITLE:<br/>CONSTRUCTION OF CONCRETE<br/>CANAL @ BOLOHATON SETTLER'S<br/>VILLAGE</p> | <p>PREPARED BY:<br/><i>Anthony M. Veloz</i><br/>ANTHONY M. VELOZ<br/>Instrument Man</p> | <p>CHECKED &amp; REVIEWED BY:<br/><i>Leonilo D. Cavan</i><br/>LEONILO D. CAVAN, CE<br/>Engineer III</p> | <p>RECOMMENDING APPROVAL:<br/><i>Felicitia A. Detros</i><br/>FELICITIA A. DETROS, CE<br/>Municipal Engineer</p> | <p>APPROVED BY:<br/><i>Levi S. Ebdao</i><br/>LEVI S. EBDAAO<br/>Municipal Mayor</p> | <p>SHEET CONTENTS:<br/>LOCATION MAP<br/>KEY MAP<br/>INDEX SHEETS</p> | <p>SHEET NO.<br/>1<br/>4</p> |
|                                                                                                                                                                                                                                                   | <p>Location:<br/>PUROK 13, OSMENA,<br/>COMPOSTELA, DAVA DE ORO</p>                             |                                                                                         |                                                                                                         |                                                                                                                 |                                                                                     |                                                                      |                              |

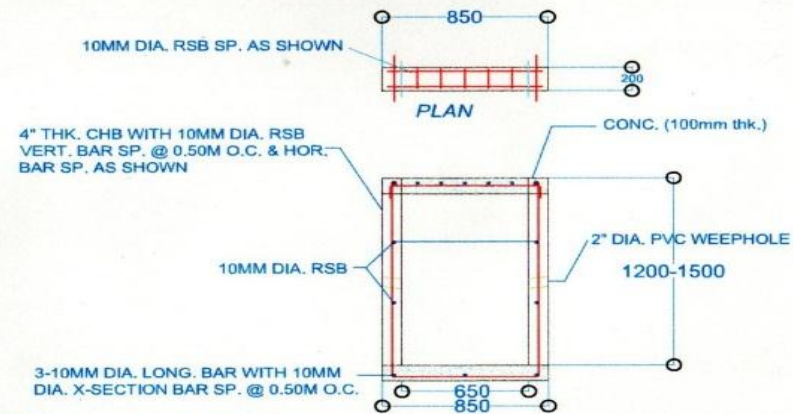




**PLAN**  
N T S



**SECTION 'A-A'**  
SCALE 1/200



**SECTION 'B-B'**  
SCALE 1/200

**DETAIL OF CONCRETE DRAINAGE CANAL#1**



REPUBLIC OF THE PHILIPPINES  
PROVINCE OF DAVAQ DE ORO  
MUNICIPALITY OF COMPOSTELA  
OFFICE OF THE MUNICIPAL ENGINEER  
AND BUILDING OFFICIAL

PROJECT TITLE:  
CONSTRUCTION OF CONCRETE  
CANAL @ BOLOHATON SETTLER'S  
VILLAGE  
Location:  
PUROK 13, OSMEÑA,  
COMPOSTELA, DAVA DE ORO

PREPARED BY:  
*Anthony M. Velaz*  
ANTHONY M. VELAZ  
Instrument Man

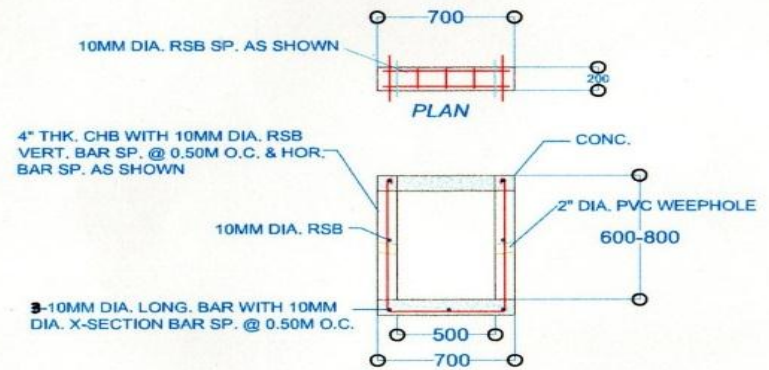
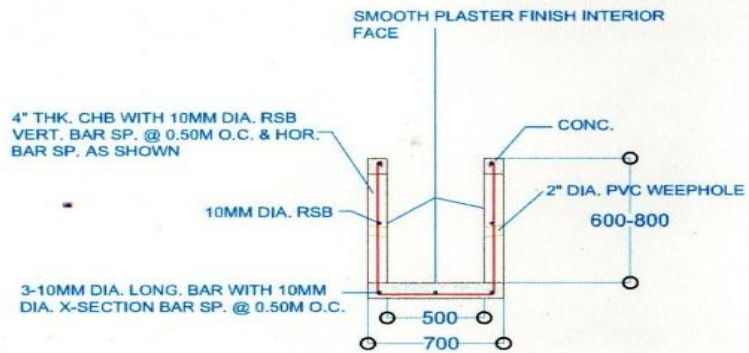
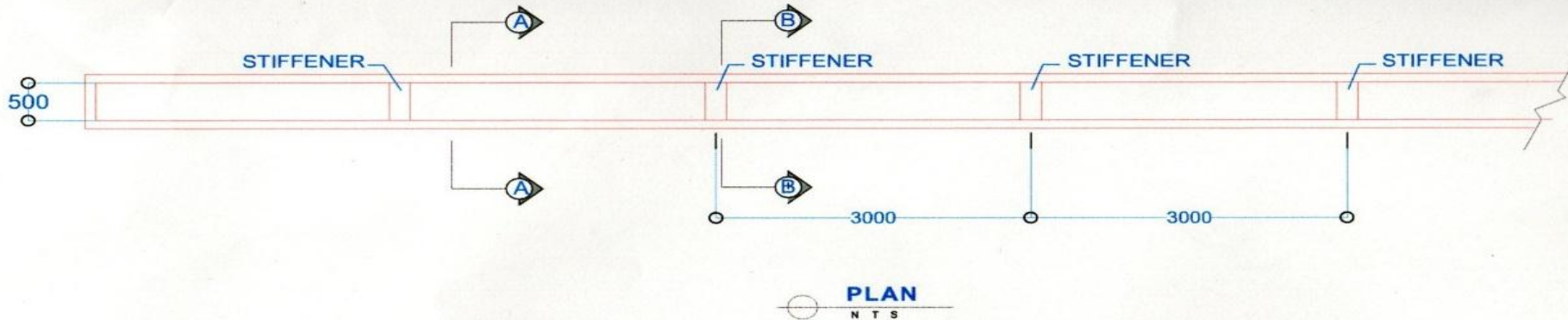
CHECKED & REVIEWED BY:  
*Leoniolo D. Cavan*  
LEONILO D. CAVAN, CE  
Engineer III

RECOMMENDING APPROVAL:  
*Felicitas Deyros*  
FELICITAS DEYROS, CE  
Municipal Engineer

APPROVED BY:  
*Levi S. Ebdao*  
LEVI S. EBDQAO  
Municipal Mayor

SHEET CONTENTS:  
CONCRETE DRAINAGE DETAIL  
FOR CANAL #1

SHEET NO.  
3  
4



DETAIL OF CONCRETE DRAINAGE FOR CANAL # 2



REPUBLIC OF THE PHILIPPINES  
PROVINCE OF DAVAG DE ORO  
MUNICIPALITY OF COMPOSTELA  
OFFICE OF THE MUNICIPAL ENGINEER  
AND BUILDING OFFICIAL

PROJECT TITLE:  
CONSTRUCTION OF CONCRETE  
CANAL @ BOLOHATON SETTLER'S  
VILLAGE  
Location:  
PUROK 13, OSMEÑA,  
COMPOSTELA, DAVA DE ORO

PREPARED BY:  
*Anthony M. Veluz*  
ANTHONY M. VELUZ  
Instrument Man

CHECKED & REVIEWED BY:  
*Leoniolo O. Cavan*  
LEONILO O. CAVAN, CE  
Engineer III

RECOMMENDING APPROVAL:  
*Feliciano D. Torres*  
FELICIANO D. TORRES, CE  
Municipal Engineer

APPROVED BY:  
*Levi S. Ebdao*  
LEVI S. EBDAG  
Municipal Mayor

SHEET CONTENTS:  
CONCRETE DRAINAGE DETAIL  
FOR CANAL # 2

SHEET NO.

4  
4

## *Section VIII. Bill of Quantities*

**Project Title: Construction of Concrete Drainage Canal at Bolohaton Settler's Village**  
**ABC (Php): 4,750,000.00**

| Project Title: <i>Construction of Concrete Drainage Canal at Bolohaton Settler's Village</i> |                                             |          |       |                                    |                                     |
|----------------------------------------------------------------------------------------------|---------------------------------------------|----------|-------|------------------------------------|-------------------------------------|
| ABC (Php): <b>4,750,000.00</b>                                                               |                                             |          |       |                                    |                                     |
| Item No.                                                                                     | Description of Works                        | Quantity | Unit  | Unit Price<br>(In words & figures) | Total Price<br>(In words & figures) |
| 1.                                                                                           | SPL-1 -MOBILIZATION/<br>DEMOBILIZATION      | 1        | LOT   |                                    |                                     |
| 2.                                                                                           | 103(1) - STRUCTURE<br>EXCAVATION            | 1,030    | CU.M. |                                    |                                     |
| 3.                                                                                           | 104 - EMBANKMENT                            | 189      | CU.M. |                                    |                                     |
| 4.                                                                                           | 404(1) - REINFORCING<br>STEEL BAR, GRADE 40 | 6,725    | KGS.  |                                    |                                     |
| 5.                                                                                           | 405(1) - STRUCTURAL<br>CONCRETE CLASS "A"   | 124      | CU.M. |                                    |                                     |
| 6.                                                                                           | 500(1) B - PIPE CULVERT,<br>24" DIA.        | 77       | L.M.  |                                    |                                     |
| 7.                                                                                           | 1046 - MASONRY WORKS                        | 1,924    | SQ.M. |                                    |                                     |
| 8.                                                                                           | SPL - 2 - SIGNAGE &<br>WARNING DEVICE       | 1        | LOT   |                                    |                                     |
| <b>GRAND TOTAL (In words and Figures)</b>                                                    |                                             |          |       |                                    |                                     |

Note: Total cost of line item includes cost of Contractor's Profit, VAT Tax, others

|                |                      |      |
|----------------|----------------------|------|
| Name of Bidder | Authorized Signatory | Date |
|----------------|----------------------|------|

***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);  
**or**
- (b) Registration certificate from Securities and Exchange Commission (SEC), Department of Trade and Industry (DTI) for sole proprietorship, or Cooperative Development Authority (CDA) for cooperatives or its equivalent document;  
**and**
- (c) Mayor’s or Business permit issued by the city or municipality where the principal place of business of the prospective bidder is located, or the equivalent document for Exclusive Economic Zones or Areas;  
**and**
- (e) Tax clearance per E.O. No. 398, s. 2005, as finally reviewed and approved by the Bureau of Internal Revenue (BIR).

#### Technical Documents

- (f) Statement of the prospective bidder of all its ongoing government and private contracts, including contracts awarded but not yet started, if any, whether similar or not similar in nature and complexity to the contract to be bid; **and**
- (g) Statement of the bidder’s Single Largest Completed Contract (SLCC) similar to the contract to be bid, except under conditions provided under the rules; **and**
- (h) Philippine Contractors Accreditation Board (PCAB) License;  
**or**  
Special PCAB License in case of Joint Ventures;  
**and** registration for the type and cost of the contract to be bid; **and**
- (i) Original copy of Bid Security. If in the form of a Surety Bond, submit also a certification issued by the Insurance Commission;  
**or**  
Original copy of Notarized Bid Securing Declaration; **and**
- (j) Project Requirements, which shall include the following:
  - a. Organizational chart for the contract to be bid;
  - b. List of contractor’s key personnel (*e.g.*, Project Manager, Project Engineers, Materials Engineers, and Foremen), to be assigned to the contract to be bid, with their complete qualification and experience data;
  - c. List of contractor’s major equipment units, which are owned, leased, and/or under purchase agreements, supported by proof of ownership or certification of availability of equipment from the equipment lessor/vendor for the duration of the project, as the case may be;
  - d. Affidavit of Site Inspection;
  - e. Construction schedule and S-curve;
  - f. Manpower schedule;
  - g. Construction methods;
  - h. Equipment utilization schedule;



- i. Construction Safety and Health Program approved by DOLE – to be submitted on the first billing;
- j. PERT/CPM **and**
- (k) Original duly signed Omnibus Sworn Statement (OSS); **and** if applicable, Original Notarized Secretary’s Certificate in case of a corporation, partnership, or cooperative; or Original Special Power of Attorney of all members of the joint venture giving full power and authority to its officer to sign the OSS and do acts to represent the Bidder.
- (l) Mayor’s Permit (Municipality of Compostela)
- (m) Bidder’s Fee (Official Receipt)

Financial Documents

- (n) The prospective bidder’s audited financial statements, showing, among others, the prospective bidder’s total and current assets and liabilities, stamped “received” by the BIR or its duly accredited and authorized institutions, for the preceding calendar year which should not be earlier than two (2) years from the date of bid submission; **and**
- (o) The prospective bidder’s computation of Net Financial Contracting Capacity (NFCC).

**Class “B” Documents**

- (p) 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**

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

Other documentary requirements under RA No. 9184

- (r) Original of duly signed Bid Prices in the Bill of Quantities; **and**
- (s) 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**
- (t) Cash Flow by Quarter.

# **Bidding Forms**

## Bid Form for the Procurement of Infrastructure Projects

---

### BID FORM

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

Project Identification No. : \_\_\_\_\_

To: *[name and address of Procuring Entity]*

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

- a. We have no reservation to the PBDs, including the Supplemental or Bid Bulletins, for the Procurement Project: *[insert name of contract]*;
- b. We offer to execute the Works for this Contract in accordance with the PBDs;
- c. The total price of our Bid in words and figures, excluding any discounts offered below is: *[insert information]*;
- d. The discounts offered and the methodology for their application are: *[insert information]*;
- e. The total bid price includes the cost of all taxes, such as, but not limited to: *[specify the applicable taxes, e.g. (i) value added tax (VAT), (ii) income tax, (iii) local taxes, and (iv) other fiscal levies and duties]*, which are itemized herein and reflected in the detailed estimates,
- f. Our Bid shall be valid within the a period stated in the PBDs, and it shall remain binding upon us at any time before the expiration of that period;
- g. If our Bid is accepted, we commit to obtain a Performance Security in the amount of *[insert percentage amount]* percent of the Contract Price for the due performance of the Contract, or a Performance Securing Declaration in lieu of the the allowable forms of Performance Security, subject to the terms and conditions of issued GPPB guidelines for this purpose;
- h. We are not participating, as Bidders, in more than one Bid in this bidding process, other than alternative offers in accordance with the Bidding Documents;
- i. We understand that this Bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal Contract is prepared and executed; and
- j. We understand that you are not bound to accept the Lowest Calculated Bid or any other Bid that you may receive.

- k. We likewise certify/confirm that the undersigned, is the duly authorized representative of the bidder, and granted full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for the [Name of Project] of the [Name of the Procuring Entity].
- l. We acknowledge that failure to sign each and every page of this Bid Form, including the Bill of Quantities, shall be a ground for the rejection of our bid.

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

Legal Capacity: \_\_\_\_\_

Signature: \_\_\_\_\_

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

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

**STATEMENT OF THE BIDDER OF ALL ITS ONGOING GOVERNMENT AND PRIVATE CONTRACTS, INCLUDING CONTRACTS AWARDED BUT NOT YET STARTED**

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

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

| Name of Contract         | Date of Contract | Contract Duration | Owner's Name & Address | Nature of Work | Contractor's Role |                    | Total Contract Value at Award | Estimated Completion Time | Estimated Contract Value at Completion | % of Accomplish-ments |        | Value of Outstanding Works |
|--------------------------|------------------|-------------------|------------------------|----------------|-------------------|--------------------|-------------------------------|---------------------------|----------------------------------------|-----------------------|--------|----------------------------|
|                          |                  |                   |                        |                | Description       | % of Participation |                               |                           |                                        | Planned               | Actual |                            |
| <u><b>GOVERNMENT</b></u> |                  |                   |                        |                |                   |                    |                               |                           |                                        |                       |        |                            |
|                          |                  |                   |                        |                |                   |                    |                               |                           |                                        |                       |        |                            |
|                          |                  |                   |                        |                |                   |                    |                               |                           |                                        |                       |        |                            |
| <u><b>PRIVATE</b></u>    |                  |                   |                        |                |                   |                    |                               |                           |                                        |                       |        |                            |
|                          |                  |                   |                        |                |                   |                    |                               |                           |                                        |                       |        |                            |
|                          |                  |                   |                        |                |                   |                    |                               |                           |                                        |                       |        |                            |
|                          |                  |                   |                        |                |                   |                    |                               |                           |                                        |                       |        |                            |
|                          |                  |                   |                        |                |                   |                    |                               |                           |                                        | <b>TOTAL</b>          |        |                            |

Note: This statement shall be supported with:

1. Notice of Award
2. Contract Agreement

Submitted by: \_\_\_\_\_  
Printed Name and Signature

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

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

**STATEMENT OF SINGLE LARGEST COMPLETED CONTRACTS (SLCC)**

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

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

| Name of Contract  | Date of Contract | Contract Duration | Owner's Name & Address | Nature of Work | Contractor's Role |                    | Total Contract Value at Award | Date of Completion Time | Total Contract Value at Completion |
|-------------------|------------------|-------------------|------------------------|----------------|-------------------|--------------------|-------------------------------|-------------------------|------------------------------------|
|                   |                  |                   |                        |                | Description       | % of Participation |                               |                         |                                    |
| <u>Government</u> |                  |                   |                        |                |                   |                    |                               |                         |                                    |
|                   |                  |                   |                        |                |                   |                    |                               |                         |                                    |
|                   |                  |                   |                        |                |                   |                    |                               |                         |                                    |
| <u>Private</u>    |                  |                   |                        |                |                   |                    |                               |                         |                                    |
|                   |                  |                   |                        |                |                   |                    |                               |                         |                                    |
|                   |                  |                   |                        |                |                   |                    |                               |                         |                                    |

Note: This statement shall be supported with:

1. Notice of Award and/or Notice to Proceed
2. Contract Agreement
3. Certificate of Final Acceptance or Constructors Performance Evaluation System (CPES) of at least satisfactory rating.

Submitted by: \_\_\_\_\_

Printed Name and Signature

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

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

## NFCC COMPUTATION

- A. Summary of the Applicant Supplier's/Distributor's/Manufacturer's assets and liabilities on the basis of the attached income tax return and audited financial statement, stamped "RECEIVED" by the Bureau of Internal Revenue or BIR authorized collecting agent, for the immediately preceding year and a certified copy of Schedule of Fixed Assets particularly the list of construction equipment.

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

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

NFCC = [(Current Asset – Current Liabilities) (15)] minus value of all outstanding works under ongoing contracts including awarded contracts yet to be started

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

Submitted by:

\_\_\_\_\_  
Name of Supplier / Distributor / Manufacturer

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

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

## **Bid Securing Declaration Form**

*[shall be submitted with the Bid if bidder opts to provide this form of bid security]*

---

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

### **BID SECURING DECLARATION** **Project Identification No.: *[Insert number]***

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

I/We, the undersigned, declare that:

1. I/We understand that, according to your conditions, bids must be supported by a Bid Security, which may be in the form of a Bid Securing Declaration.
2. I/We accept that: (a) I/we will be automatically disqualified from bidding for any procurement contract with any procuring entity for a period of two (2) years upon receipt of your Blacklisting Order; and, (b) I/we will pay the applicable fine provided under Section 6 of the Guidelines on the Use of Bid Securing Declaration, within fifteen (15) days from receipt of the written demand by the procuring entity for the commission of acts resulting to the enforcement of the bid securing declaration under Sections 23.1(b), 34.2, 40.1 and 69.1, except 69.1(f), of the IRR of RA No. 9184; without prejudice to other legal action the government may undertake.
3. I/We understand that this Bid Securing Declaration shall cease to be valid on the following circumstances:
  - a. Upon expiration of the bid validity period, or any extension thereof pursuant to your request;
  - b. I am/we are declared ineligible or post-disqualified upon receipt of your notice to such effect, and (i) I/we failed to timely file a request for reconsideration or (ii) I/we filed a waiver to avail of said right; and
  - c. I am/we are declared the bidder with the Lowest Calculated Responsive Bid, and I/we have furnished the performance security and signed the Contract.

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

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

*[Insert signatory's legal capacity]*

Affiant



**Jurat**

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

## Omnibus Sworn Statement (Revised)

*[shall be submitted with the Bid]*

---

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

### AFFIDAVIT

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

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

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

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

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

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

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

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

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

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

6. *[Select one, delete the rest:]*  
*[If a sole proprietorship:]* The owner or sole proprietor is not related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;
- [If a partnership or cooperative:]* None of the officers and members of *[Name of Bidder]* is related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;
- [If a corporation or joint venture:]* None of the officers, directors, and controlling stockholders of *[Name of Bidder]* is related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;
7. *[Name of Bidder]* complies with existing labor laws and standards; and
8. *[Name of Bidder]* is aware of and has undertaken the responsibilities as a Bidder in compliance with the Philippine Bidding Documents, which includes:
- a. Carefully examining all of the Bidding Documents;
  - b. Acknowledging all conditions, local or otherwise, affecting the implementation of the Contract;
  - c. Making an estimate of the facilities available and needed for the contract to be bid, if any; and
  - d. Inquiring or securing Supplemental/Bid Bulletin(s) issued for the *[Name of the Project]*.
9. *[Name of Bidder]* did not give or pay directly or indirectly, any commission, amount, fee, or any form of consideration, pecuniary or otherwise, to any person or official, personnel or representative of the government in relation to any procurement project or activity.
- 10. In case advance payment was made or given, failure to perform or deliver any of the obligations and undertakings in the contract shall be sufficient grounds to constitute criminal liability for Swindling (Estafa) or the commission of fraud with unfaithfulness or abuse of confidence through misappropriating or converting any payment received by a person or entity under an obligation involving the duty to deliver certain goods or services, to the prejudice of the public and the government of the Philippines pursuant to Article 315 of Act No. 3815 s. 1930, as amended, or the Revised Penal Code.**

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

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

*[Insert signatory's legal capacity]*

Affiant

**[Jurat]**

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

**FOR YOUR INFORMATION!**  
**BIDDERS/SUPPLIERS/CONTRACTOR'S**

**ARTICLE 17 – PERMIT FEE FOR PRIVATE CONTRACTORS**

**Section 85 – DEFINITION OF TERMS**

- (A) **“CONTRACTOR”** – includes persons, natural or juridical, not subject to professional tax under Section 139 of the Local Government Code, whose activity consist essentially of the sale of all kinds of goods or services for a fee, regardless of whether or not the performance of the service calls for the exercise or use of the physical or mental faculties of such contractor or his/her employees or supplier, manufacturer of heavy or light equipment and the likes.

**SECTION 86 – TAX ON BUSINESS SITUATED OUTSIDE THE MUNICIPALITY**

A tax shall be imposed to any person or entity whose business is situated outside the Municipality after participating a public bidding or other modality of procurement have been awarded the contract subject to the existing tax schedule promulgated for the purpose and the nature of business as defined herein.

The total contract cost shown in the Purchase Order and or Contract Agreement shall be the amount subject to tax. Corresponding deduction shall be made for each transaction and for any and all voucher made as payment of obligation incurred after full delivery of goods and services and acceptance thereof.

**SECTION 87 – IMPOSITION OF CONTRACTOR PERMIT FEE**

That any individual, person, company, corporation or having juridical entity shall secure necessary permit and **shall pay a Contractor Permit Fee of One Percent (1%) based on the Project Cost.**

**SECTION 88 – TIME OF PAYMENT**

The fee is imposed shall be payable before issuance of Notice to Proceed or Notice of Award or shall be made before the commencement of the work.

***As per 2022 Revised Omnibus Revenue Code of the Municipality of Compostela***

