

PHILIPPINE BIDDING DOCUMENTS

IMPROVEMENT OF NANGCAON FARM- TO-MARKET ROAD

Government of the Republic of the Philippines

OPOL 2023-034

**Sixth Edition
July 2020**

BIDDING DOCUMENTS



**REPUBLIC OF THE PHILIPPINES
PROVINCE OF MISAMIS ORIENTAL
MUNICIPALITY OF OPOL**

**IMPROVEMENT OF NANGCAON FARM-TO-MARKET ROAD
Opol, Misamis Oriental**

(RAPID Growth Project-RCU Opol, Misamis Oriental)

Preface

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

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

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

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

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

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

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

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Glossary of Terms, Abbreviations, and Acronyms

ABC – Approved Budget for the Contract.

ARCC – Allowable Range of Contract Cost.

BAC – Bids and Awards Committee.

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

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

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

BIR – Bureau of Internal Revenue.

BSP – Bangko Sentral ng Pilipinas.

CDA – Cooperative Development Authority.

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

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

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

CPI – Consumer Price Index.

DOLE – Department of Labor and Employment.

DTI – Department of Trade and Industry.

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

GFI – Government Financial Institution.

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

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

GOP – Government of the Philippines.

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

LGUs – Local Government Units.

NFCC – Net Financial Contracting Capacity.

NGA – National Government Agency.

PCAB – Philippine Contractors Accreditation Board.

PhilGEPS - Philippine Government Electronic Procurement System.

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

PSA – Philippine Statistics Authority.

SEC – Securities and Exchange Commission.

SLCC – Single Largest Completed Contract.

UN – United Nations.

Section I. Invitation to Bid



Republic of the Philippines
Province of Misamis Oriental
MUNICIPALITY OF OPOL



INVITATION TO BID FOR IMPROVEMENT OF NANGCAON FARM-TO-MARKET ROAD

1. The **Local Government Unit (LGU) of Opol, Misamis Oriental**, through the **Department of Trade and Industry - Rural Agro-enterprise Partnership for Inclusive Development and Growth (RAPID Growth)** intends to apply the sum of **Thirty Million Three Hundred Forty-Eight Thousand Five Hundred Eighty-One Pesos and 57/100 (Php 30,348,581.57)** being the Approved Budget for the Contract (ABC) to payments under the contract for **Improvement of Nangcaon Farm-To-Market Road / OPOL 2023-034**. Bids received in excess of the ABC shall be automatically rejected at bid opening.
2. The **LGU of Opol** now invites bids for the above Procurement Project. Completion of the Works is required within **one hundred sixty-five (165) calendar days upon receipt of the Notice to Proceed (NTP)**. 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 **LGU of Opol** and inspect the Bidding Documents at the address given below during **office hours from 8:00 AM to 5:00 PM on working days**.
5. A complete set of Bidding Documents may be acquired by interested bidders on **October 24, 2023 to November 20, 2023** from given address and website **and upon payment of the applicable fee for the Bidding Documents, pursuant to the latest Guidelines issued by the GPPB, in the amount of Twenty-Five Thousand Pesos (Php 25,000.00) and a Special Permit fee in the amount of One Thousand Pesos (Php 1,000.00) pursuant to the Revised Revenue Code of Opol, Misamis Oriental 2016**. The Procuring Entity shall allow the bidder to present its proof of payment for the fees **in person**.
6. The **LGU of Opol** will hold a Pre-Bid Conference on **November 6, 2023 at 10:00 am** at the **Bids and Awards Committee (BAC) Office**, 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 or before **November 20, 2023 at 8:30 AM**. Late bids shall not be accepted.
8. All bids must be accompanied by a bid security in any of the acceptable forms and in the amount stated in **ITB** Clause 16.
9. Bid opening shall be on **November 20, 2023 at 10:00 AM** at the given address below. Bids will be opened in the presence of the bidders' representatives who choose to attend the activity.
10. Pursuant to Sec. 7.05 (b) of the International Fund for Agricultural Development (IFAD) General Conditions for Agricultural Development Financing, bidders, suppliers, sub-contractors, and consultants are required to:
 - i. Allow full inspection by the Fund of all bid documentation and related records;
 - ii. Maintain all documents and records related to the bid or contract for three years after completion of the bid or contract; and
 - iii. Cooperate with agents or representatives of the Fund carrying out an audit or investigation.
11. The **LGU of Opol** 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.
12. For further information, please refer to:

EDGAR C. OLACO
Bids and Awards Committee (BAC) Office
Zone 3, Poblacion, Opol, Misamis Oriental 9016
lguopolbac.misor@gmail.com
0936-122-7460
<https://opolmisor.gov.ph>

13. You may visit the following websites:

For downloading of Bidding Documents:
<https://opolmisor.gov.ph/announcements/bids-and-awards/>

October 24, 2023

(Sgd.) EDGAR C. OLACO
BAC Chairperson

Section II. Instructions to Bidders

1. Scope of Bid

The Procuring Entity, **LGU of Opol** invites Bids for the **Improvement of Nangaon Farm-To-Market Road** with Project Identification Number **OPOL 2023-034**.

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 **FY 2023** in the amount of **Thirty Million Three Hundred Forty-Eight Thousand Five Hundred Eighty-One Pesos and 57/100 (Php 30,348,581.57)**.

2.2. The source of funding is:

DTI through RAPID Growth Project and LGU Opol

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; (a) climatic conditions; (b) 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.

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 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. In case of joint ventures, a valid special PCAB License, and registration for the type and cost of the contract for this Project, is required. 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) calendar days from the date of the opening of bids**. Any bid not accompanied by an acceptable bid security shall be rejected by the Procuring Entity as non-responsive.

16. Sealing and Marking of Bids

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

The Procuring Entity requests two (2) additional hard copies of the Bid, labeled as Copy 1 and Copy 2. However, failure of the Bidders to comply with the said request shall not be a ground for disqualification. The full instruction is stated in the **BDS**.

17. Deadline for Submission of Bids

The Bidders shall submit on the specified date and time and at its physical address 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 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

ITB Clause																									
5.2	For this purpose, contracts similar to the Project refer to contracts which have the same major categories of work, which shall be: Road Concreting with Drainage and Slope Protection Structures.																								
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10.3	No further instructions.																								
10.4	The key personnel must meet the required minimum years of experience set below: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Key Personnel</u></th> <th style="text-align: left;"><u>General Experience</u></th> <th style="text-align: left;"><u>Relevant Experience</u></th> </tr> </thead> <tbody> <tr> <td>Project Engineer</td> <td>Road Construction</td> <td>for at least 5 Years</td> </tr> <tr> <td>Materials Engineer</td> <td>Road Construction</td> <td>for at least 5 Years</td> </tr> <tr> <td>Construction Foreman</td> <td>Road Construction</td> <td>for at least 5 Years</td> </tr> <tr> <td>Safety and Health Officer</td> <td>Road Construction</td> <td>for at least 3 Years</td> </tr> </tbody> </table>	<u>Key Personnel</u>	<u>General Experience</u>	<u>Relevant Experience</u>	Project Engineer	Road Construction	for at least 5 Years	Materials Engineer	Road Construction	for at least 5 Years	Construction Foreman	Road Construction	for at least 5 Years	Safety and Health Officer	Road Construction	for at least 3 Years									
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12	Alternative Bids shall not be accepted.																								
15.1	The bid security shall be in the form of a notarized Bid Securing Declaration or any of the following forms and amounts: <p style="margin-left: 40px;">a. The amount of not less than Php 606,971.63 (<i>two percent of ABC</i>), if bid security is in cash, cashier's/manager's check, bank draft/guarantee or irrevocable letter of credit;</p> <p style="margin-left: 40px;">b. The amount of not less than Php 1,517,429.08 (<i>five percent of ABC</i>), if bid security is in Surety Bond (submit also a certification issued by the Insurance Commission Receipt(s) or Sales Invoice).</p>																								
16	Bidder must arrange each bid documents into sections with tabs properly labeled separating each document according to the provided checklist.																								

	<p>Bidders shall enclose their original eligibility and technical documents in one sealed envelope marked “ORIGINAL - TECHNICAL COMPONENT”, and the original of their financial component in another sealed envelope marked “ORIGINAL - FINANCIAL COMPONENT”, sealing them all in an outer envelope marked “ORIGINAL BID”.</p> <p>Each copy of the first and second envelopes shall be similarly sealed duly marking the inner envelopes as “COPY NO. ____ - TECHNICAL COMPONENT” and “COPY NO. ____ – FINANCIAL COMPONENT” and the outer envelope as “COPY NO. ____”, respectively. These envelopes containing the original and the two (2) copies shall then be enclosed in one single envelope.</p> <p>The original and the number of copies of the Bid shall be typed or written in ink and shall be signed by the Bidder or its duly authorized representative/s.</p> <p>All envelopes shall:</p> <ul style="list-style-type: none"> (a) contain the name of the contract to be bid in capital letters; (b) bear the name and address of the Bidder in capital letters; (c) be addressed to the Procuring Entity’s BAC, as follows: MR. EDGAR C. OLACO BAC Chairman, LGU Opol Bid and Awards Committee Office, Opol Municipal Hall Poblacion, Opol, Misamis Oriental (d) bear the specific identification of this bidding process; and (e) bear a warning “DO NOT OPEN BEFORE...” the date and time for the opening of bids.
19.2	Partial bids are not allowed.
20	<p>During Post-Qualification, bidders are to present original copies of the following:</p> <ul style="list-style-type: none"> (a) 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; (b) 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; (c) Tax clearance per E.O. No. 398, s. 2005, as finally reviewed and approved by the Bureau of Internal Revenue (BIR); (d) Philippine Contractors Accreditation Board (PCAB) License; and (e) 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.

21	<p>Additional contract documents relevant to the Project that may be required by existing laws and/or the Procuring Entity, such as construction schedule and S-curve, manpower schedule, construction methods, equipment utilization schedule, construction safety and health program approved by the DOLE, and other acceptable tools of project scheduling.</p> <p>Additional IFAD Provisions and Contract Self-certification Form (to be filled out and signed by the winning bidder/contractor as an integral part of the Contract). <i>Please see Annex I for Additional IFAD Provisions and Annex II for Contract Self-Certification Form on the last part of this bidding document.</i></p>
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Section IV. General Conditions of Contract

1. Scope of Contract

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

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

2. Sectional Completion of Works

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

3. Possession of Site

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

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

4. The Contractor's Obligations

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

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

5. Performance Security

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

6. Site Investigation Reports

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

7. Warranty

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

8. Liability of the Contractor

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

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

9. Termination for Other Causes

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

10. Dayworks

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

11. Program of Work

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

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

12. Instructions, Inspections and Audits

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

13. Advance Payment

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

14. Progress Payments

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

15. Operating and Maintenance Manuals

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

Section V. Special Conditions of Contract

GCC Clause	
2	No further instructions.
3.1	The Procuring Entity shall give full possession of all of the Site to the Contractor upon the Contractor's receipt of the Notice to Proceed (NTP).
6	No further instructions.
7.2	Five (5) years.
8	No further instructions.
10	Dayworks are applicable at the rate shown in the Contractor's original Bid.
11.1	The Contractor shall submit the Program of Work to the Procuring Entity's Representative within fourteen (14) calendar days of delivery from receipt of the Notice of Award.
11.2	The amount to be withheld for late submission of an updated Program of Work is 10% of the total contract cost.
13	The amount of the advance payment shall not exceed 15% of the total contract price and schedule of payment.
14	No further instructions.
15.1	The date by which operating and maintenance manuals are required is within fifteen (15) days from completion date. The date by which "as built" drawings are required is within fifteen (15) days from completion date.
15.2	The amount to be withheld for failing to produce "as built" drawings and/or operating and maintenance manuals by the date required is 2% of the total contract price.

Section VI. Specifications



Republic of the Philippines
Province of Misamis Oriental
MUNICIPALITY OF OPOL

MUNICIPAL ENGINEERING OFFICE
engineering.opol@yahoo.com



TECHNICAL SPECIFICATIONS

The Technical Specifications for the Works for this contract shall comprise the following:

- Part B. Other General Requirements
- Part C. Earthwork
- Part D. Sub-Base & Base Course
- Part E. Surface Course
- Part G. Drainage And Slope Protection Structures
- Part H. Miscellaneous Structures

Where items of construction work required under the contract are not covered by Other General Requirements or are of a specialist nature, then the materials, workmanship and method of measurement for such items shall comply with any relevant requirements within the particular specifications or otherwise be as approved by the Engineer.

PART B – OTHER GENERAL REQUIREMENTS

Item B.5 Project Billboard/Signboard

B.5.1 Description

This item shall consist of furnishing and installation of project billboard for all on-going projects being undertaken by the Local Government of Opol, Misamis Oriental for the information and guidance of the citizenry.

B.5.2 Material Requirements

The dimension shall be 8' x 8' or 2.44 m x 2.44 m tarpaulin with 2" x 3" x 10' Coco Lumber stand on concrete base, and 2" x 2" x 8' Coco Lumber frames. The design layout is reflected on the Detailed Engineering Plan.

B.5.3 Construction Requirements

- a. Two billboards shall be installed at the beginning (1 unit) and at the end (1 unit) of the project.
- b. Names and/or pictures of any personage should not appear in the billboards.
- c. No political billboards shall be allowed to be installed 100 meters before and 100 meters after all projects and in between the project limits or within the road right of way.

- d. Contractors are not allowed to place names of politicians on their equipment to carry political billboard on the equipment.

B.5.4 Method of Measurement

The method of measurement for this item shall be per complete billboard printing, and its framing and foundation can withstand strong wind pressure. The unit of measurement shall be in "Each".

B.5.5 Basis of Payment

The basis of payment for this item shall be based on B.5.4 unit of measurement, shall be paid for all the contract unit price which price and payment shall be in compensation for furnishing and installation of the billboard, framing and foundation, including all labor, equipment, tools and incidentals necessary to complete the work prescribed in this item.

Item B.7 (2) Occupational Safety and Health Program

B.7 (2).1 General

All security and health controls necessary for the execution of the works such as but not limited to, medical facilities, manpower safety gadgets, sanitary arrangements, explosives and fuel, temporary fencing, safety precautions and fire prevention, shall be established and maintained by the Contractor at his own expense. The Contractor shall make himself responsible for all security and health controls and shall submit to the Engineer for his approval, the organization and the regulations for these purposes.

B.7 (2).2 Site Security

The Contractor's warehouse and storage area shall be secured against unauthorized entry in a manner appropriate to its contents. The Contractor shall also provide watchmen as required.

B.7 (2).3 Sanitary Arrangement

The Contractor shall keep the site in a clean and sanitary condition and shall provide and maintain sanitary facilities for the use of persons employed in the works to the extent and in the manner and at such places as approved by the Engineer and by any local or other authorities concerned, and all persons connected with the works shall be obliged to use these sanitary facilities.

B.7 (2).4 Medical Facilities

The Contractor shall make his own arrangement for treatment of casualties on the site in conformity with the requirements of any duly constituted medical and sanitary authority. The contractor shall provide first aid units/stations, and shall be responsible for and bear all cost in connection with the first aid services including the use of ambulance of injured or sick employees transporting to the hospital. Such first aid services shall be provided to the employer, the Engineer, and to their employees at the site at no cost to them.

B.7 (2).5 Dangerous Materials

The Contractor shall convey, store and make use of all petroleum, acetylene carbide and other similar dangerous materials provided by them for use in or on the works in strict in accordance with the provision of the Laws, orders and Regulations that are in force at the site or that may be issued from time to time by the Government or employer.

B.7 (2).6 Precaution for Safety

The Contractor shall take all precautions against risk, loss of life or of injury to any person employed on the works or to employees of the employer and the engineer or to visitors or to persons having good and sufficient reasons to be about the works and shall properly safeguard the work to the satisfaction of the Engineer.

Where and when it is necessary, the Contractor shall furnish lighting facilities, signs and other safety facilities and services. The Contractor shall provide the workers, supervisors, engineers, and owner's and/or its representative the necessary safety gears at the site, e.g., safety shoes, safety helmets, safety belts, gloves, goggles, gas or dust mask, and uniforms.

The Contractor shall appoint a Safety Officer and hold periodical safety meetings with the Engineer and with his own supervisors and foremen. The Contractor shall report in writing twenty-four (24) hours to the Engineer all accidents involving the death of and/or injury to any person, resulting from the Contractor's operation.

B.7 (2).7 Fire Prevention

The Contractor shall take every precaution to prevent fire occurring on or about the site and shall provide firefighting equipment suitable and adequate in the opinion of the engineer, for ready use.

The Contractor shall diligently fight any fire which occurs on the site, wherever such fire may originate. In this regard, he shall employ all requisite equipment and manpower up to the limit of his equipment and manpower employed at the site, including the equipment and manpower of his subcontractors.

The cost incurred by the Contractor in complying with the obligation under this section shall be paid separately as prescribed in the priced Bill of Quantities.

Item B.9 Mobilization & Demobilization

Mobilization shall include transportation to the site of Contractor's plant, materials, equipment, employees, furnishings and temporary facilities.

Mobilization, as provided in these specifications, means preparatory work and operations, including, but not limited to, those necessary for the movement of necessary personnel, plant and equipment to the site.

Demobilization shall include dismantling and removal from the site of contractor's plant, materials, and equipment and all temporary facilities. It shall also include cleanup of the site after completion of the contract work as approved by the engineer and transportation from the site of contractor's employees.

The contractor shall furnish the Engineer with a resources schedule, showing in detail the sequence of proposed delivery to the site of Plant and equipment necessary to comply with the proposed construction program. The Contractor shall keep the engineer informed of the arrival of plat and equipment on the site.

B.9.1 Basis of Payment

The quantities determined as for at the appropriate contract unit price, for each of the particular pay item in the Bill of Quantities which price and payment shall constitute full compensation for furnishing and maintaining such items.

The Municipality will release 50 percent of the lump sum amount bid for Mobilization to the Contractor with the first payment estimate, but not sooner than 15 days after the start of work of the project site.

The remaining 50 percent of the lump sum will be paid upon certification by the Engineer that the demobilization of plant and equipment has been completed including site clean up to his satisfaction.

PART C – EARTHWORK

Item 100 (1) Clearing and Grubbing

100 (1).1 Description

This Item shall consist of clearing and grubbing, removal and disposal of all vegetation and debris as stipulated 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 specifications. The work shall also include the preservation from injury or defacement of all objects designated to remain.

100 (1).2 Construction Requirements

Clearing and Grubbing

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

100 (1).3 Method of Measurement

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 and filed staking by the engineer. Areas not within the clearing and grubbing limits shown on the Plan or not staked for clearing and rubbing will not be measured for payment.

100 (1).4 Basis of Payment

The accepted quantities, measured as prescribed in Section 100 (1).3, shall be paid for at the Contract unit 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 the unit of measurement as “Hectares (Ha)”.

Item 102 (2) Surplus Common Excavation

102 (2).1 Description

This Item shall consist of roadway and drainage and borrow excavation and the disposal of material in accordance with this Specification and in conformity with the lines, grades and dimensions shown on the Plans or established by the Engineer.

102 (2).2 Roadway Excavation

Roadway excavation will include excavation and grading for roadways, parking areas, intersections, approaches, slope rounding, benching, waterways and ditches; removal of unsuitable material from the roadbed and beneath embankment areas; and excavating selected material found in the roadway as ordered by the Engineer for specific use in the improvement. Roadway excavation will be classified as Common Excavation.

Common excavations shall consist of all excavation not included in the Bill of Quantities under “rock excavation” or other pay items.

102 (2).3 Construction Requirements

General

When there is evidence of discrepancies on the actual elevations and that shown on the Plans a pre-construction 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 excavated materials.

All excavations shall be finished to reasonably smooth and uniform surfaces. No materials shall be wasted without authority of the engineer. Excavation operations shall be conducted so that material outside of the limits of slopes will not be disturbed. Prior to excavation, all necessary clearing and grubbing in that area shall have been performed in accordance with Item 100, Clearing and Grubbing

102 (2).4 Method of Measurement

The cost of excavation of material which is incorporated in the Works or in other areas of fill shall be deemed to be included in the Items of work where the material is used.

Measurement of Unsuitable or surplus Material shall be the net volume in its original position.

For measurement purposes, surplus suitable material shall be calculated as the difference between the net volume of suitable material required to be used in embankment corrected by applying a shrinkage factor of 9 percent.

The Contractor shall be deemed to have included in the contract unit prices all costs of obtaining land for the disposal of unsuitable or surplus material.

102.4 Basis of Payment

The accepted quantities, measured as prescribed in Section 102 (2).4 shall be paid for at the contract unit price that are included in the Bill of Quantities, which price and payment shall be full compensation for the removal and disposal of excavated materials including labor, equipment, tools and incidentals necessary to complete the work prescribed in this item.

Payment will be made under the unit of measurement as “Cubic Meter”.

Item 103 (1)a Structure Excavation, Common Soil

103 (1)a.1 Description

This Item shall consist of the necessary excavation for foundation of bridge, 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 is 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 necessary construction of cribs and cofferdams and the placing of all necessary backfill.

It also includes 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 (1)a.2 Construction Requirements

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.

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.

Boulders, logs, and other objectionable materials encountered in excavation shall be removed.

After each excavation is completed, the Contractor shall notify the Engineer to that effect and no footing, bedding material or pipe culvert shall be placed until the Engineer has approved the depth of excavation and the character of the foundation material.

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 (1)a.3 Construction Requirements

All excavated materials, so far as suitable, shall be utilized as backfill or embankment. The surplus materials shall be disposed of 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 (1)a.5 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 (1)a.6 Structure Excavation

The volume of excavation to be paid for will be the number of cubic meters 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. 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 (1)a.7 Foundation Fill

The volume of foundation fill to be paid for will be the number of cubic meters 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 (1)a.8 Basis of Payment

The accepted quantities measured shall be paid for at the contract unit price 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.

Payment will be made under the unit of measurement as “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

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.

104.3 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 cost incidental to the work.

104.4 Construction Requirements

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.

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 surfaced 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. These 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 of 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.

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.

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.

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.

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.

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.

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 ditch line or roadway.

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.

104.5 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.

104.6 Basis of Payment

The accepted quantities, measured shall be paid for at the Contract unit price 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.

Payment will be made under the unit of measurement as “Cubic Meter”.

Item 105 (1)a Subgrade Preparation

105 (1)a.1 Description

This Item shall consist of the preparation of the subgrade for the support of overlying structural layers. It shall extend to full width of the roadway. Unless authorized by the engineer, subgrade preparation shall not be done unless the Contractor is able to start immediately the construction of the pavement structure.

105 (1)a.2 Material Requirements

Unless otherwise stated in the Contract and except when the subgrade is in rock cut, all materials below subgrade level to a depth 150 mm or to such greater depth as may be specified shall meet the requirements of Section 104.2, Selected Borrow for Topping.

Construction Requirements

Prior to commencing preparation of the subgrade, all culverts, cross drains, ducts and the like, ditches, drains and drainage outlets shall be compacted. Any work on the preparation of the subgrade shall not be started.

Subgrade Level Tolerances

The finished compacted surface of the subgrade shall conform to the allowable tolerances as specified hereunder:

Permitted variation from design LEVEL OF SURFACE	+	20 mm
Permitted SURFACE IRREGULARITY MEASURED BY 3-m STRAIGHT EDGE	-	30 mm
Permitted variation from design CROSSFALL OR CAMBER	+	0.5 %
Permitted variation from design LONGITUDINAL GRADE over 25 m length	±	0.1 %

Subgrade in Common Excavation

Unless otherwise specified, all materials below subgrade level in earth cuts to a depth 150 mm or other depth shown on the Plans or as directed by the Engineer shall be excavated. The material, if suitable, shall be set side for future use or, if unsuitable, shall be disposed off in accordance with the requirements of Subsection 102.2.9.

Where material has been removed from below subgrade level, the resulting surface shall be compacted to a depth of 150 mm and in accordance with other requirements of Subsection 104.3.3.

All materials immediately below subgrade level in earth cuts to a depth of 150 mm, or to such greater depth as may be specified, shall be compacted in accordance with the requirements of Subsection 104.3.3

Subgrade on Embankment

After the embankment has been completed, the full width shall be conditioned by removing any soft or other unstable material that will not be compacted properly. The resulting areas and all other low sections, holes, or depressions shall be brought to grade with suitable material. The entire roadbed shall be shaped and compacted to the requirements of Subsections 104.3.3. 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 cross-sections shown on the Plans.

Protection of Completed Work

The Contractor shall be required to protect and maintain at his own expense the entire work within the limits of his Contract in good condition satisfactory to the Engineer from the time he first started work until all work shall have been completed. Maintenance shall include repairing and recompacting ruts, ridges, soft spots and deteriorated sections of the subgrade caused by the traffic of the Contractor's vehicle/equipment or that of the public.

Templates and Straight-line Edges

The Contractor shall provide for use of the Engineer, approved templates and straight-edges in sufficient number to check the accuracy of the work, as provided in this Specification.

105.3 Method of Measurement

Measurement of Items for payment shall be provided only for:

1. The compaction of existing ground below subgrade level in cuts of common material as specified in Subsection 105.3.3.
2. The breaking up or scarifying, loosening, reshaping and recompacting of existing pavement as specified in Subsection 105.3.6. The quantity to be paid for shall be the area of the work specified to be carried out and accepted by the Engineer.
3. Payment for all work for the preparation of the subgrade, including shaping to the required levels and tolerances, other than as specified above shall be deemed to be included in the Pay Item for Embankment.

105.4 Basis of Payment

The accepted quantities, measured shall be paid for at the Contract unit price for each of the Pay Item 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.

Payment will be made under the unit of measurement in "Square Meter".

PART D – SUB-BASE AND BASECOURSE

Item 200 (1) Aggregate Subbase Course

200 (1).1 Description

This work shall consist of furnishing, placing and compacting an aggregate subbase course on a prepared subgrade in accordance with this specification and the lines, grades and cross-sections shown in the Plans, or as directed by the engineer.

200 (1).2 Material Requirements

Aggregate for subbase shall consist of hard, durable particles or fragments of crushed stone, crushed slag, or crushed or natural gravel or filler of natural or crushed sand or other finely divided mineral matter. The composite material shall be free from vegetable matter and lumps or balls or clay and shall be of such nature that it can be compacted readily to form a firm, stable subbase.

200 (1).3 Construction requirements

Placing

The aggregate subbase material shall be placed at a uniform mixture on prepared subgrade in quantity which will provide the required compacted thickness. When more than one layer is required, each layer shall be shaped and compacted before the succeeding layer is placed.

Method of Measurement

Aggregate subbase will be measured by the cubic meter (m³). The quantity to be paid for shall be design volume compacted in-place as shown on the plans, and accepted in the completed course. No allowance will be given for materials placed outside the design limits shown on the cross-section.

200 (1).4 Basis of Payment

Pay Item 200 Aggregate subbase course – cu.m.

PART E – SURFACE COURSE

Item 311 (1)b1 – Portland Cement Concrete Pavement (Unreinforced), Thk. = 0.20m., 14 Days @ 3000psi

Item 311 (1)b1.1 Description

This Item shall consist of pavement of Portland Cement Concrete, without reinforcement, constructed on the prepared base in accordance with the Specification and in conformity with lines, grades, thickness and typical cross-section shown on the Plans.

Item 311 (1)b1.2 Material Requirement

Portland Cement

It shall conform to the applicable requirements of Item 700 Hydraulic Cement. Portland Cement Type I meeting the requirements of AASHTO M 85 (ASTM C 150 M) – Standard Specification for Portland Cement, shall be used unless otherwise provided for in the Special provisions.

Portland-Pozzolan Cement Type IP meeting the requirements of AASHTO M 240 - Standard Specification for Blended Hydraulic / ASTM C 595 – Standard Test Method for Drying Shrinkage of Mortar Containing Hydraulic Cement, shall be allowed for use.

For both Portland Cement Type I and Portland-Pozzolan Cement Type IP, trial mixes shall be done and shall meet the specification requirements for concrete. The AASHTO/ASTM provisions pertinent to the uses of Portland-Pozzolan Cement Type IP shall be adopted.

Different brands or the same brands from different mills shall not be mixed nor shall they be used alternately unless the mix is approved by the Engineer.

Cement which for any reasons, has become partially set or which contains lumps of caked cement shall be rejected. Cement salvaged from discarded or used bags shall not be used.

Samples of Cement shall be obtained in accordance with AASHTO R 71 9ASTM C 183M)- Standard Practice for sampling and Amount of testing of Hydraulic Cement.

Fine Aggregate

It shall consist of natural sand, stone screenings or other inert materials with similar characteristics, or combination thereof, having hard, strong and durable particles. Fine aggregate from different sources of supply shall not be mixed or stored in the same pile nor used alternately in the same class of concrete without the approval of the Engineer

The fine aggregate shall be free from injurious amount of organic impurities. If subjected to the colorimetric test for organic impurities and a color darker than the standard id produced, it shall be rejected. However, when tested for the effect of organic impurities of strength of mortar by AASHTO T 71, the fine aggregate may be used if the relative strength at 7 and 28 days is not less than 98 mass percent.

Coarse Aggregate

It shall consist of crushed stone, gravel, blast furnace slag or other approved inert materials of similar characteristics, or combinations thereof, having hard, strong, durable pieces and free from any adherent coatings.

It shall have a mass percent of wear not exceeding 40 when tested AASHTO 96.

Only one grading specification shall be used from any one source.

Water

Water used in mixing, curing and other designated application shall be reasonably clean and free of oil, salt, acid, alkali, grass or other substances injurious to the finished product. Water will be tested in accordance with and shall meet the requirements of Item 714, Water. Water which is drinkable may be used without test.

Reinforcing Steel

It shall conform to the requirements of Item 404, Reinforcing Steel. Dowel and Tie Bars shall conform to the requirements of AADHTO M 31 or M 42, except that rail steel shall not be used for tie bars that are to be bent and re straightened during construction. Tie Bars Shall be deformed bars. Dowels shall be plain round bars, before delivery to the site of work, one-half of the length of each dowel shall be painted with one coat of approved lead or tar paint.

The sleeves for dowel bars shall be metal approved design to cover 50 mm (2 inches) plus or minus 5mm (1.4") of the dowel, with a closed end, and with a suitable stop to hold the end of the sleeve at least 25mm (1 inch) from the end of the dowel. Sleeves shall be of such design that they do not collapse during construction.

Joint Fillers

Poured joint fillers shall be mixed asphalt and mineral rubber filler conforming to the applicable requirements of Item 705, Joint Materials.

Proportioning, Consistency and Strength of Concrete

The Contractor shall prepare the design mix based on the absolute volume method as outlined in the ACI Standard 211.1.

The mix design shall be submitted to the Engineer for approval and shall be accompanied with certified test data from an approved laboratory demonstrating the adequacy of the mix design. A Change in the source of materials during the progress of work may necessitate a new design mix.

Test Specimens

As work progresses, at least one (1) set consisting of three (3) concrete beam test specimens, 150mm x 150mm x 525mm Or 900 mm shall be taken from each 330m³ of pavement, 230mm depth, or fraction thereof placed each day. Test specimens shall be made under the supervision of the Engineer, and the Contractor shall provide all concrete and other facilities necessary in making the test specimens and shall protect them from damage by construction operation. Cylinder samples shall not be used as substitute for determining the adequacy of the strength of concrete.

The beam shall be made, cured, and tested in accordance with AASHTO T 23 and T 97.

Curing

Immediately after the finishing operations have been completed and the concrete has sufficiently set, the entire surface of the newly placed concrete shall be cured in accordance with either one of the methods described herein. Failure to provide sufficient cover materials of whatever kind the Contractor may elect to use, or the lack of water to adequately take care of both curing and other requirements, shall be a cause for immediate suspension of concreting operations. The concrete shall not be left exposed for than ½ hour between stages of curing or during the curing period.

Removal of Form

After form for concrete shall remain in place undisturbed for not less than twenty-four (24) hours after concrete pouring. If the removal of forms, crowbars should be used in pulling out nails and pins.

Item 311 (1)b1.2 Basis of Payment

The accepted quantity, measured as prescribed shall be paid for at the contract unit price for Portland Cement Concrete Pavement, which price and payment shall be full compensation for preparation of roadbed and finishing of shoulders, unless other provided by the special provisions furnishing all materials, for mixing, placing, finishing and curing all concrete, for furnishing and placing all joint materials, for sawing weakened plane joints, for fitting the pre-fabricated center metal joint, for facilitating and controlling traffic and for furnishing all labor, equipment, tools and incidentals necessary to complete the item.

Payment will be made under the unit of measurement in “Square Meter”.

PART G. DRAINAGE AND SLOPE PROTECTION STRUCTURES

Item 404 (1)a Reinforcing Steel, Grade 40

Item 404 (1)a.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.

Item 404 (1)a.2 Material Requirements

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

Item 404 (1)a.3 Construction Requirements

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.

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.

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.

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 direction, 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.

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 min. lap	Grade 60 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.

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.

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 the unit of measurement in "Kilograms".

Item 405 (1)a3 Structural Concrete, Class A, 20.68mpa @ 28 Days

405 (1)a3.1 Description

Scope

This item shall consist of furnishing, blending, placing and finishing concrete in all structures except pavements in accordance with this specification and conforming to the lines, grades, and dimensions as shown on the Plans. Concrete shall consist of a mixture of Portland Cement, fine aggregates, coarse aggregate, admixtures when specified, and water mixed in the proportions specified or approved by the Engineer.

Classes and Uses of Concrete

Use Class A Mixture for all superstructure and heavily reinforced substructures such as slabs, beams, girders, columns, arch ribs, box culverts, reinforced abutments, retaining walls, reinforced footings as shown in plans.

405 (1)a3.2 Material Requirements

All material requirements shall conform to Section 405.2 of 2004 DPWH Blue Book.

405 (1)a3.3 Sampling and Testing of Structural Concrete

All sampling and testing of structural concrete shall conform to Section 405.3 of 2004 DPWH Blue Book.

405 (1)a3.4 Production Requirements

All production requirements shall conform to Section 405.3 of 2004 DPWH Blue Book.

405 (1)a3.5 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.

405.5 Basis of Payment

The accepted quantities, measured as prescribed in Section 405.5, shall be paid for at the contract unit price for the Pay Item 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.

The payment will be made under the unit of measurement in "Cubic Meter".

Item 500 (1)a3 Pipe Culverts, 910mm dia. Class II RCPC

Item 500 (1)a3.1 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.

Item 500 (1)a3.2 Material Requirements

All material requirements shall conform to Section 500.2 of 2004 DPWH Blue Book.

Item 500 (1)a3.3 Construction Requirements

All construction requirements shall conform to Section 500.3 of 2004 DPWH Blue Book.

Item 500 (1)a3.4 Method of Measurement

Conduit of the different types and sizes, both new and re-laid, will be measured by the linear meter 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.

Item 500 (1)a3.5 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.

All payment will be made under the unit of measurement in “Linear Meter”.

Item 506 (1) Stone Masonry

506 (1).1 Description

This item shall consist of stone masonry in minor structures, in headwalls for culverts, in retaining walls at the toe of slopes, and at other places called for on the plans.

506 (1).2 Material Requirements

Stone

The stone shall be clean, hard, and durable and shall be subject to the Engineer’s approval.

Sizes and Shapes – Unless other sizes are shown on the Plans, stones have a thickness of not less than 150 mm, and widths of not less than one and one-half times their respective thickness, and lengths of not less than one- and one-half times their respective widths. Each stone shall be of good shape and be free of depressions and projections that might weaken or prevent it from being properly bedded.

Dressing – The stone shall be dressed to remove any thin or weak portions. Face stones shall be dressed to provide bed and joint lines that do not vary more than 20 mm from the true lines and to ensure the meeting of bed and joint lines without the rounding of corners of the stones in excess of 30 mm in radius. Bed surfaces of the face stones shall be approximately normal to the face of the stones for about 80 mm and from this point may depart from a normal plane not to exceed 50 mm in 300 mm.

Finish for Exposed Faces – Face stones shall be pitched to the line along the beds and joints. The maximum projection of rock faces beyond the pitch lines shall not be more than 50 mm.

Mortar

Cement, fine aggregate, and water shall conform to the respective requirements for those materials as specified under Item 405, Structural Concrete, except as to the grading of fine aggregate which shall all pass the 2.36 mm (No. 8) sieve, not less than 15 nor more than 40 percent shall pass the 0.3 mm (No. 50) sieve, and not more than 10 percent shall pass the 0.15 mm (No.100) sieve.

The mortar for the masonry shall be composed of one part of Portland Cement and two parts of fine aggregate by volume and sufficient water to make the mortar of such consistency that it can be handled easily and spread with a trowel. Mortar shall be mixed only in those quantities required for immediate use. Unless an approved mortar mixing machine is used, the fine aggregate and cement shall be mixed dry in a tight box until the mixture assumes a uniform color, after which, water shall be added as the mixing continues until the mortar attains the proper consistency. Mortar that is not used within 90 minutes after the water has been added shall be discarded. Retempering of mortar will not be permitted.

506.3 Construction Requirement

Selection and Placing

When the masonry is to be placed on a prepared foundation bed, the bed shall be firm and normal to, or in steps normal to, the face of the wall, and shall have been approved by the Engineer before any stone is placed.

Care shall be taken to prevent the bunching of small stone or stones of the same size. Large stones shall be used in the corners.

All stones shall be cleaned thoroughly and wetted immediately before being set, and the bed which is to receive them shall be cleaned and moistened before the mortar is spread. They shall be laid with their longest faces horizontal in full beds of mortar, and the joints shall be flushed with mortar.

The exposed faces of individual stones shall be parallel to the faces of the walls in which the stones are set.

The stones shall be so handled as not to jar displace the stones already set. Suitable equipment shall be provided for setting stones larger than those that can be handled by two men. The rolling or turning of stones on the walls will not be permitted. If a stone is loosened after the mortar has taken initial set, it shall be removed, the mortar cleaned off, and the stone relaid with fresh mortar.

Bed and Joints

Beds for face stones may vary from 20 mm to 50 mm in thickness. They shall not extend an unbroken line through more than 5 stones. Joints may vary from 20 mm to 50 mm in thickness. They shall not extend in an unbroken line through more than two stones. They may be at angles with the vertical from 00 to 450. Face stone shall bond at least 150 mm longitudinally and 50 mm vertically. At no place shall corners of four stones be adjacent to each other.

Cross beds for vertical faced walls shall be level, and for battered walls may vary from level to normal to the batter line of the face of the wall.

Headers

Headers shall be distributed uniformly throughout the walls of the structures so as to form at least one-fifth of the exposed faces. They shall be of such lengths as to extend from the front face of the wall into the backing of at least 300 mm. When a wall is 450 mm or less in thickness, the headers shall extend entirely from front to back face.

Backing

Backing shall be built mostly of large stones as shown in the approved Plans or as directed by the Engineer. The individual stones composing the backing and hearting shall be well bonded with the stones in the face wall and with each other. All openings and interstices in the backing shall be filled completely with mortar or with spalls surrounded completely by mortar.

Pointing

Both bed and vertical joints shall be finished as shown on the Plans or as directed by the Engineer. The mortar in joints on top of surface of masonry shall be crowned slightly at the center of the masonry to provide drainage.

Coping

Copings, if called for, shall be finished as shown on the Plans. Where copings are not called for, the top of the wall shall be finished with stones wide enough to cover the top of the wall from 450 mm to 1000 mm in length, and of random heights, with a minimum height of 150 mm. Stone shall be laid in such a manner that the top course is an integral part of the wall. The tops of top course of stone shall be pitched to line, in both vertical and horizontal planes.

Weepholes

It shall conform to the requirements of Item 504, Riprap and Grouted Riprap under Subsection 504.3.4, Weepholes.

Cleaning Exposed Faces

Immediately after being laid, and while the mortar is fresh, all face stones shall be thoroughly cleaned of mortar stains and shall be kept clean until the work is completed.

Curing

In hot or dry weather, the masonry shall be satisfactory protected from the sun and shall be kept wet for a period of at least three days after completion.

506.5 Method of Measurement

The quantity to be paid for shall be the number of cubic meters of stone masonry complete in place and accepted. Projections extending beyond the faces of the walls shall not be included. In computing the quantity for payment, the dimensions used shall be those shown on the Plans or ordered in writing by the Engineer. No deductions shall be made for weepholes, drain pipes or other openings of less than one square meter in area.

506.6 Basis of Payment

The quantity of masonry, determined as provided in Section 506.4, Method of Measurement, shall be paid for at the contract unit price per cubic meter for Stone Masonry, which price and payment shall be full compensation for furnishing and placing all materials, including mortar for masonry, for all necessary excavations, and for all labor, equipment, tools and incidentals necessary to complete the Item.

All payment will be made under the unit of measurement in “Cubic Meter”.

PART H – MISCELLANEOUS STRUCTURES

Item 605 (6)e1 Hazard Markers, 450mm X 600mm Chevron Signs

605 (6)e1.1 Description

This item shall consist of furnishing and installing chevron signs in accordance in this Specification and to the details shown on the Plans, or as required by the engineer.

605 (6)e1.2 Function

The chevron signs shall be used to guide drivers through a change in horizontal alignment of the road such as curves and less than sharp turns. Chevron signs shall also be used to supplement any of the advance warning signs, the horizontal alignment signs (W-types) or the standard guide posts and delineators.

605 (6)e1.3 Design

The chevron sign shall be a vertical angle. No border shall be used on the chevron sign.

The point of the arrow or chevron shall indicate the direction of travel. They shall be visible for at least 150 m to provide the road user with adequate time to react to the change in alignment. The minimum lateral offset of the chevron sign shall be 1.8 m from the edge of the pavement.

The chevron sign shall be installed on the outside of the curve, set up aligned with approaching traffic at right angle to the driver’s line of sight. Two-sided chevron signs maybe used on two-lane, two-way roads to guide drivers travelling in both directions.

It is recommended that the spacing of the chevron signs should allow the driver to see at least three (3) signs in view while negotiating the curve, until the change in alignment eliminates the need for the signs.

Chevron sign must be mounted clear of road side vegetation and clearly visible under headlight illumination by night. Chevrons should be installed 1.5 m above the ground in the rural areas and 2.2 m in the urban areas.

Recommended Spacing for Chevron Signs (from DPWH Blue Book) based on the DED.

Speed Limit (kph)	Radius (m)	Chevron Spacing (m)
≤20	≤60	12

The above spacing distances shall apply to points within the curve.

605 (6)e1.4 Type of Chevron Sign

Type	Typical Size	Application
HM-1A	450mm x 600mm	≤60 kph design speed with no visible problem

605 (6)e1.5 Material Requirements

Sign Panels

It shall conform of Subsection 605.2.1 Sign Panels of Item 605 – Road Sign, DPWH Standard Specifications, Volume II.

High Performance Reflective Sheeting

The reflective sheeting shall be weather resistant and show no appreciable cracking, blistering, crazing or dimensional change after two (2) years of unprotected outdoor exposure.

The reflective sheeting shall have high reflectivity normal to vehicle headlight dependent on the angle of incidence. The reflective material shall be sharp, no glare, and directed towards the light source of approved angle of incidence.

The reflective sheeting shall perform effectively for a minimum of seven (7) years from date of fabrication.

The reflective sheeting must retain at least 70% of its original brightness for regular and fluorescent sheeting respectively at the end of seven years. All chevron signs used for the road projects should be warranted by the sheeting manufacturer for above-stated performance.

Chevron signs shall be dated at the time of installation in order to initiate the 7-year performance warranty. A sign-dating sticker that indicates the manufacturer's name, material type/brand name with the month and year of installation should be placed at the back of the sign face.

The reflective sheeting shall consist of full cube micro-prismatic lens sheeting with an interlocking diamond seal pattern with pre-coated adhesive backing protected by a removable liner. The minimum reflective brightness value of reflective sheeting shall be in accordance with the following table.

Reflective Brightness of Traffic Signs Surfaces

	Observation Angle ² (Degrees)		
	0.2°	0.5°	1.0°
For -4° Entrance Angle¹			
White	570	400	120
Yellow	425	300	90
Red	114	80	24
Green	57	40	12
Blue	26	18	5.4
Fluorescent Yellow	340	240	72
Fluorescent Yellow Green	460	320	96
Fluorescent Orange	170	120	36
For 30° Entrance Angle¹			
White	215	150	45
Yellow	160	112	34
Red	43	30	9
Green	21	15	4.5
Blue	10	6.8	2
Fluorescent Yellow	130	90	27
Fluorescent Yellow Green	170	120	36
Fluorescent Orange	64	45	14
For 45° Entrance Angle¹			
White	100	50	25
Yellow	75	37	19
Red	20	10	5
Green	10	5	3
Blue	4.5	1.5	0.8
Fluorescent Yellow	60	30	15
Fluorescent Yellow Green	80	40	20
Fluorescent Orange	30	15	7

All units are expressed in terms of cd/luc/sq.m.

¹Entrance Angle – The angel from the illumination axis to the retro-reflector axis. The reflector axis is an axis perpendicular to the retro-reflective surface.

²Observation Angle – The angle between the illumination axis and observation axis.

605 (6)e1.6 Post and Attachments

It shall conform to the applicable requirements of Subsection 605.2.3, Post and Frames figure for typical/prescribed design of DPWH Standard Specifications, Volume II.

Post required for the erection of signs shall be made of galvanized steel pipes not less than 75mm (outside diameter) x 3.25mm thick.

Attachments shall provide for the positive and robust connection of signs to their mounting posts.

Nuts and Bolts

It shall conform to the requirements of Subsection 605.2.4, Nuts and Bolts, Item 605 – Road Sign, DPWH Standard Specifications, Volume II.

Concrete Foundation Blocks

It shall conform to the requirements of Subsection 605.2.5, Concrete Foundation Blocks, Item 605 – Road Sign, DPWH Standard Specifications, Volume II.

605 (6)e1.7 Construction Requirements

Excavation and Backfilling

It shall conform to the requirements of Subsection 605.3.1, Excavation and Backfilling, Item 605 – Road Sign, DPWH Standard Specifications, Volume II.

Erection of Post

It shall conform to the requirements of Subsection 605.3.2, Erection of Post, Item 605 – Road Sign, DPWH Standard Specifications, Volume II.

Sign Panel Installation

It shall conform to the requirements of Subsection 605.3.3 Panel Installation, Item 605 – Road Sign, DPWH Standard Specifications, Volume II.

605 (6)e1.8 Method of Measurement

The quantities of chevron signs shall be the number of such sign of the specified, including the necessary posts and supports, erected and accepted, in “each”.

605 (6)e1.1 Basis of Payment

Method of Measurement, shall be paid for at the contract unit price shown in the Bid Schedule which price and payment shall be full compensation for furnishing and installing chevron signs, for excavation, backfilling and construction of foundation blocks, and all the labor, equipment, tools and incidental necessary to complete the item.

Section VII. Drawings

See Attached Detailed Engineering Design

TECHNICAL SPECIFICATIONS

The Technical Specifications for the Works for this contract shall comprise the following:

- Part B. Other General Requirements
- Part C. Earthwork
- Part D. Sub-Base & Base Course
- Part E. Surface Course
- Part G. Drainage And Slope Protection Structures
- Part H. Miscellaneous Structures

Where items of construction work required under the contract are not covered by Other General Requirements or are of a specialist nature, then the materials, workmanship and method of measurement for such items shall comply with any relevant requirements within the particular specifications or otherwise be as approved by the Engineer.

PART B – OTHER GENERAL REQUIREMENTS

Item B.5 Project Billboard/Signboard

B.5.1 Description

This item shall consist of furnishing and installation of project billboard for all on-going projects being undertaken by the Local Government of Opol, Misamis Oriental for the information and guidance of the citizenry.

B.5.2 Material Requirements

The dimension shall be 8' x 8' or 2.44 m x 2.44 m tarpaulin with 2" x 3" x 10' Coco Lumber stand on concrete base, and 2" x 2" x 8' Coco Lumber frames. The design layout is reflected on the Detailed Engineering Plan.

B.5.3 Construction Requirements

- e. Two billboards shall be installed at the beginning (1 unit) and at the end (1 unit) of the project.
- f. Names and/or pictures of any personage should not appear in the billboards.
- g. No political billboards shall be allowed to be installed 100 meters before and 100 meters after all projects and in between the project limits or within the road right of way.
- h. Contractors are not allowed to place names of politicians on their equipment to carry political billboard on the equipment.

B.5.4 Method of Measurement

The method of measurement for this item shall be per complete billboard printing, and its framing and foundation can withstand strong wind pressure. The unit of measurement shall be in "Each".

B.5.5 Basis of Payment

The basis of payment for this item shall be based on B.5.4 unit of measurement, shall be paid for all the contract unit price which price and payment shall be in compensation for furnishing and installation of the billboard, framing and foundation, including all labor, equipment, tools and incidentals necessary to complete the work prescribed in this item.

Item B.7 (2) Occupational Safety and Health Program

B.7 (2).1 General

All security and health controls necessary for the execution of the works such as but not limited to, medical facilities, manpower safety gadgets, sanitary arrangements, explosives and fuel, temporary fencing, safety precautions and fire prevention, shall be established and maintained by the Contractor at his own expense. The Contractor shall make himself responsible for all security and health controls and shall submit to the Engineer for his approval, the organization and the regulations for these purposes.

B.7 (2).2 Site Security

The Contractor's warehouse and storage area shall be secured against unauthorized entry in a manner appropriate to its contents. The Contractor shall also provide watchmen as required.

B.7 (2).3 Sanitary Arrangement

The Contractor shall keep the site in a clean and sanitary condition and shall provide and maintain sanitary facilities for the use of persons employed in the works to the extent and in the manner and at such places as approved by the Engineer and by any local or other authorities concerned, and all persons connected with the works shall be obliged to use these sanitary facilities.

B.7 (2).4 Medical Facilities

The Contractor shall make his own arrangement for treatment of casualties on the site in conformity with the requirements of any duly constituted medical and sanitary authority. The contractor shall provide first aid units/stations, and shall be responsible for and bear all cost in connection with the first aid services including the use of ambulance of injured or sick employees transporting to the hospital. Such first aid services shall be provided to the employer, the Engineer, and to their employees at the site at no cost to them.

B.7 (2).5 Dangerous Materials

The Contractor shall convey, store and make use of all petroleum, acetylene carbide and other similar dangerous materials provided by them for use in or on the works in strict in accordance with the provision of the Laws, orders and Regulations that are in force at the site or that may be issued from time to time by the Government or employer.

B.7 (2).6 Precaution for Safety

The Contractor shall take all precautions against risk, loss of life or of injury to any person employed on the works or to employees of the employer and the engineer or to visitors or to persons having good and sufficient reasons to be about the works and shall properly safeguard the work to the satisfaction of the Engineer.

Where and when it is necessary, the Contractor shall furnish lighting facilities, signs and other safety facilities and services. The Contractor shall provide the workers, supervisors, engineers, and owner's and/or its representative the necessary safety gears at the site, e.g., safety shoes, safety helmets, safety belts, gloves, goggles, gas or dust mask, and uniforms.

The Contractor shall appoint a Safety Officer and hold periodical safety meetings with the Engineer and with his own supervisors and foremen. The Contractor shall report in writing twenty-four (24) hours to the Engineer all accidents involving the death of and/or injury to any person, resulting from the Contractor's operation.

B.7 (2).7 Fire Prevention

The Contractor shall take every precaution to prevent fire occurring on or about the site and shall provide firefighting equipment suitable and adequate in the opinion of the engineer, for ready use.

The Contractor shall diligently fight any fire which occurs on the site, wherever such fire may originate. In this regard, he shall employ all requisite equipment and manpower up to the limit of his equipment and manpower employed at the site, including the equipment and manpower of his subcontractors.

The cost incurred by the Contractor in complying with the obligation under this section shall be paid separately as prescribed in the priced Bill of Quantities.

Item B.9 Mobilization & Demobilization

Mobilization shall include transportation to the site of Contractor's plant, materials, equipment, employees, furnishings and temporary facilities.

Mobilization, as provided in these specifications, means preparatory work and operations, including, but not limited to, those necessary for the movement of necessary personnel, plant and equipment to the site.

Demobilization shall include dismantling and removal from the site of contractor's plant, materials, and equipment and all temporary facilities.

It shall also include cleanup of the site after completion of the contract work as approved by the engineer and transportation from the site of contractor's employees.

The contractor shall furnish the Engineer with a resources schedule, showing in detail the sequence of proposed delivery to the site of Plant and equipment necessary to comply with the proposed construction program. The Contractor shall keep the engineer informed of the arrival of plat and equipment on the site.

B.9.1 Basis of Payment

The quantities determined as for at the appropriate contract unit price, for each of the particular pay item in the Bill of Quantities which price and payment shall constitute full compensation for furnishing and maintaining such items.

The Municipality will release 50 percent of the lump sum amount bid for Mobilization to the Contractor with the first payment estimate, but not sooner than 15 days after the start of work of the project site.

The remaining 50 percent of the lump sum will be paid upon certification by the Engineer that the demobilization of plant and equipment has been completed including site clean up to his satisfaction.

PART C – EARTHWORK

Item 100 (1) Clearing and Grubbing

100 (1).1 Description

This Item shall consist of clearing and grubbing, removal and disposal of all vegetation and debris as stipulated 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 specifications. The work shall also include the preservation from injury or defacement of all objects designated to remain.

100 (1).2 Construction Requirements

Clearing and Grubbing

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

100 (1).3 Method of Measurement

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 and filed staking by the engineer. Areas not within the clearing and grubbing limits shown on the Plan or not staked for clearing and grubbing will not be measured for payment.

100 (1).4 Basis of Payment

The accepted quantities, measured as prescribed in Section 100 (1).3, shall be paid for at the Contract unit 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 the unit of measurement as “Hectares (Ha)”.

Item 102 (2) Surplus Common Excavation

102 (2).1 Description

This Item shall consist of roadway and drainage and borrow excavation and the disposal of material in accordance with this Specification and in conformity with the lines, grades and dimensions shown on the Plans or established by the Engineer.

102 (2).2 Roadway Excavation

Roadway excavation will include excavation and grading for roadways, parking areas, intersections, approaches, slope rounding, benching, waterways and ditches; removal of unsuitable material from the roadbed and beneath embankment areas; and excavating selected material found in the roadway as ordered by the Engineer for specific use in the improvement. Roadway excavation will be classified as Common Excavation.

Common excavations shall consist of all excavation not included in the Bill of Quantities under “rock excavation” or other pay items.

102 (2).3 Construction Requirements

General

When there is evidence of discrepancies on the actual elevations and that shown on the Plans a pre-construction 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 excavated materials.

All excavations shall be finished to reasonably smooth and uniform surfaces. No materials shall be wasted without authority of the engineer. Excavation operations shall be conducted so that material outside of the limits of slopes will not be disturbed. Prior to excavation, all necessary clearing and grubbing in that area shall have been performed in accordance with Item 100, Clearing and Grubbing

102 (2).4 Method of Measurement

The cost of excavation of material which is incorporated in the Works or in other areas of fill shall be deemed to be included in the Items of work where the material is used.

Measurement of Unsuitable or surplus Material shall be the net volume in its original position.

For measurement purposes, surplus suitable material shall be calculated as the difference between the net volume of suitable material required to be used in embankment corrected by applying a shrinkage factor of 9 percent.

The Contractor shall be deemed to have included in the contract unit prices all costs of obtaining land for the disposal of unsuitable or surplus material.

102.4 Basis of Payment

The accepted quantities, measured as prescribed in Section 102 (2).4 shall be paid for at the contract unit price that are included in the Bill of Quantities, which price and payment shall be full compensation for the removal and disposal of excavated materials including labor, equipment, tools and incidentals necessary to complete the work prescribed in this item.

Payment will be made under the unit of measurement as “Cubic Meter”.

Item 103 (1)a Structure Excavation, Common Soil

103 (1)a.1 Description

This Item shall consist of the necessary excavation for foundation of bridge, 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 is 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 necessary construction of cribs and cofferdams and the placing of all necessary backfill.

It also includes 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 (1)a.2 Construction Requirements

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.

Excavation

4. 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.

Boulders, logs, and other objectionable materials encountered in excavation shall be removed.

After each excavation is completed, the Contractor shall notify the Engineer to that effect and no footing, bedding material or pipe culvert shall be placed until the Engineer has approved the depth of excavation and the character of the foundation material.

5. 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.

6. 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 (1)a.3 Construction Requirements

All excavated materials, so far as suitable, shall be utilized as backfill or embankment. The surplus materials shall be disposed of 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 (1)a.5 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 (1)a.6 Structure Excavation

The volume of excavation to be paid for will be the number of cubic meters 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:

6. 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.
7. The volume of excavation for culvert and sections outside the vertical plane for culverts stipulated in (1) above.
8. 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.
9. 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.

10. 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 (1)a.7 Foundation Fill

The volume of foundation fill to be paid for will be the number of cubic meters 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 (1)a.8 Basis of Payment

The accepted quantities measured shall be paid for at the contract unit price 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.

Payment will be made under the unit of measurement as “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

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.

104.3 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 cost incidental to the work.

104.4 Construction Requirements

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.

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 surfaced 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. These 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 of 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.

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.

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.

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.

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.

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.

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 ditch line or roadway.

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.

104.5 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.

104.6 Basis of Payment

The accepted quantities, measured shall be paid for at the Contract unit price 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.

Payment will be made under the unit of measurement as “Cubic Meter”.

Item 105 (1)a Subgrade Preparation

105 (1)a.1 Description

This Item shall consist of the preparation of the subgrade for the support of overlying structural layers. It shall extend to full width of the roadway. Unless authorized by the engineer, subgrade preparation shall not be done unless the Contractor is able to start immediately the construction of the pavement structure.

105 (1)a.2 Material Requirements

Unless otherwise stated in the Contract and except when the subgrade is in rock cut, all materials below subgrade level to a depth 150 mm or to such greater depth as may be specified shall meet the requirements of Section 104.2, Selected Borrow for Topping.

Construction Requirements

Prior to commencing preparation of the subgrade, all culverts, cross drains, ducts and the like, ditches, drains and drainage outlets shall be compacted. Any work on the preparation of the subgrade shall not be started.

Subgrade Level Tolerances

The finished compacted surface of the subgrade shall conform to the allowable tolerances as specified hereunder:

Permitted variation from design LEVEL OF SURFACE	+	20 mm
Permitted SURFACE IRREGULARITY MEASURED BY 3-m STRAIGHT EDGE	-	30 mm
Permitted variation from design CROSSFALL OR CAMBER	+	0.5 %
Permitted variation from design LONGITUDINAL GRADE over 25 m length	±	0.1 %

Subgrade in Common Excavation

Unless otherwise specified, all materials below subgrade level in earth cuts to a depth 150 mm or other depth shown on the Plans or as directed by the Engineer shall be excavated. The material, if suitable, shall be set side for future use or, if unsuitable, shall be disposed off in accordance with the requirements of Subsection 102.2.9.

Where material has been removed from below subgrade level, the resulting surface shall be compacted to a depth of 150 mm and in accordance with other requirements of Subsection 104.3.3.

All materials immediately below subgrade level in earth cuts to a depth of 150 mm, or to such greater depth as may be specified, shall be compacted in accordance with the requirements of Subsection 104.3.3

Subgrade on Embankment

After the embankment has been completed, the full width shall be conditioned by removing any soft or other unstable material that will not be compacted properly. The resulting areas and all other low sections, holes, or depressions shall be brought to grade with suitable material. The entire roadbed shall be shaped and compacted to the requirements of Subsections 104.3.3. 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 cross-sections shown on the Plans.

Protection of Completed Work

The Contractor shall be required to protect and maintain at his own expense the entire work within the limits of his Contract in good condition satisfactory to the Engineer from the time he first started work until all work shall have been completed. Maintenance shall include repairing and recompacting ruts, ridges, soft spots and deteriorated sections of the subgrade caused by the traffic of the Contractor's vehicle/equipment or that of the public.

Templates and Straight-line Edges

The Contractor shall provide for use of the Engineer, approved templates and straight-edges in sufficient number to check the accuracy of the work, as provided in this Specification.

105.3 Method of Measurement

Measurement of Items for payment shall be provided only for:

4. The compaction of existing ground below subgrade level in cuts of common material as specified in Subsection 105.3.3.
5. The breaking up or scarifying, loosening, reshaping and recompacting of existing pavement as specified in Subsection 105.3.6. The quantity to be paid for shall be the area of the work specified to be carried out and accepted by the Engineer.
6. Payment for all work for the preparation of the subgrade, including shaping to the required levels and tolerances, other than as specified above shall be deemed to be included in the Pay Item for Embankment.

105.4 Basis of Payment

The accepted quantities, measured shall be paid for at the Contract unit price for each of the Pay Item 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.

Payment will be made under the unit of measurement in “Square Meter”.

PART D – SUB-BASE AND BASECOURSE

Item 200 (1) Aggregate Subbase Course

200 (1).1 Description

This work shall consist of furnishing, placing and compacting an aggregate subbase course on a prepared subgrade in accordance with this specification and the lines, grades and cross-sections shown in the Plans, or as directed by the engineer.

200 (1).2 Material Requirements

Aggregate for subbase shall consist of hard, durable particles or fragments of crushed stone, crushed slag, or crushed or natural gravel or filler of natural or crushed sand or other finely divided mineral matter. The composite material shall be free from vegetable matter and lumps or balls or clay and shall be of such nature that it can be compacted readily to form a firm, stable subbase.

200 (1).3 Construction requirements

Placing

The aggregate subbase material shall be placed at a uniform mixture on prepared subgrade in quantity which will provide the required compacted thickness. When more than one layer is required, each layer shall be shaped and compacted before the succeeding layer is placed.

Method of Measurement

Aggregate subbase will be measured by the cubic meter (m³). The quantity to be paid for shall be design volume compacted in-place as shown on the plans, and accepted in the completed course. No allowance will be given for materials placed outside the design limits shown on the cross-section.

200 (1).4 Basis of Payment

Pay Item 200 Aggregate subbase course – cu.m.

PART E – SURFACE COURSE

Item 311 (1)b1 – Portland Cement Concrete Pavement (Unreinforced), Thk. = 0.20m., 14 Days @ 3000psi

Item 311 (1)b1.1 Description

This Item shall consist of pavement of Portland Cement Concrete, without reinforcement, constructed on the prepared base in accordance with the Specification and in conformity with lines, grades, thickness and typical cross-section shown on the Plans.

Item 311 (1)b1.2 Material Requirement

Portland Cement

It shall conform to the applicable requirements of Item 700 Hydraulic Cement. Portland Cement Type I meeting the requirements of AASHTO M 85 (ASTM C 150 M) – Standard Specification for Portland Cement, shall be used unless otherwise provided for in the Special provisions.

Portland-Pozzolan Cement Type IP meeting the requirements of AASHTO M 240 - Standard Specification for Blended Hydraulic / ASTM C 595 – Standard Test Method for Drying Shrinkage of Mortar Containing Hydraulic Cement, shall be allowed for use.

For both Portland Cement Type I and Portland-Pozzolan Cement Type IP, trial mixes shall be done and shall meet the specification requirements for concrete. The AASHTO/ASTM provisions pertinent to the uses of Portland-Pozzolan Cement Type IP shall be adopted.

Different brands or the same brands from different mills shall not be mixed nor shall they used alternately unless the mix is approved by the Engineer.

Cement which for any reasons, has become partially set or which contains lumps of caked cement shall be rejected. Cement salvaged from discarded or used bags shall not be used.

Samples of Cement shall be obtained in accordance with AASHTO R 71 9(ASTM C 183M)- Standard Practice for sampling and Amount of testing of Hydraulic Cement.

Fine Aggregate

It shall consist of natural sand, stone screenings or other inert materials with similar characteristics, or combination thereof, having hard, strong and durable particles. Fine aggregate from different sources of supply shall not be mixed or stored in the same pile nor used alternately in the same class of concrete without the approval of the Engineer

The fine aggregate shall be free from injurious amount of organic impurities. If subjected to the colorimetric test for organic impurities and a color darker than the standard id produced, it shall be rejected. However, when tested for the effect of organic impurities of strength of mortar by AASHTO T 71, the fine aggregate may be used if the relative strength at 7 and 28 days is not less than 98 mass percent.

Coarse Aggregate

It shall consist of crushed stone, gravel, blast furnace slag or other approved inert materials of similar characteristics, or combinations thereof, having hard, strong, durable pieces and free from any adherent coatings.

It shall have a mass percent of wear not exceeding 40 when tested AASHTO 96.

Only one grading specification shall be used from any one source.

Water

Water used in mixing, curing and other designated application shall be reasonably clean and free of oil, salt, acid, alkali, grass or other substances injurious to the finished product. Water will be tested in accordance with and shall meet the requirements of Item 714, Water. Water which is drinkable may be used without test.

Reinforcing Steel

It shall conform to the requirements of Item 404, Reinforcing Steel. Dowel and Tie Bars shall conform to the requirements of AADHTO M 31 or M 42, except that rail steel shall not be used for tie bars that are to be bent and re straightened during construction. Tie Bars shall be deformed bars. Dowels shall be plain round bars, before delivery to the site of work, one-half of the length of each dowel shall be painted with one coat of approved lead or tar paint.

The sleeves for dowel bars shall be metal approved design to cover 50 mm (2 inches) plus or minus 5mm (1.4") of the dowel, with a closed end, and with a suitable stop to hold the end of the sleeve at least 25mm (1 inch) from the end of the dowel. Sleeves shall be of such design that they do not collapse during construction.

Joint Fillers

Poured joint fillers shall be mixed asphalt and mineral rubber filler conforming to the applicable requirements of Item 705, Joint Materials.

Proportioning, Consistency and Strength of Concrete

The Contractor shall prepare the design mix based on the absolute volume method as outlined in the ACI Standard 211.1.

The mix design shall be submitted to the Engineer for approval and shall be accompanied with certified test data from an approved laboratory demonstrating the adequacy of the mix design. A Change in the source of materials during the progress of work may necessitate a new design mix.

Test Specimens

As work progresses, at least one (1) set consisting of three (3) concrete beam test specimens, 150mm x 150mm x 525mm Or 900 mm shall be taken from each 330m³ of pavement, 230mm depth, or fraction thereof placed each day. Test specimens shall be made under the supervision of the Engineer, and the Contractor shall provide all concrete and other facilities necessary in making the test specimens and shall protect them from damage by construction operation. Cylinder samples shall not be used as substitute for determining the adequacy of the strength of concrete.

The beam shall be made, cured, and tested in accordance with AASHTO T 23 and T 97.

Curing

Immediately after the finishing operations have been completed and the concrete has sufficiently set, the entire surface of the newly placed concrete shall be cured in accordance with either one of the methods described herein. Failure to provide sufficient cover materials of whatever kind the Contractor may elect to use, or the lack of water to adequately take care of both curing and other requirements, shall be a cause for immediate suspension of concreting operations. The concrete shall not be left exposed for more than ½ hour between stages of curing or during the curing period.

Removal of Form

After form for concrete shall remain in place undisturbed for not less than twenty-four (24) hours after concrete pouring. If the removal of forms, crowbars should be used in pulling out nails and pins.

Item 311 (1)b1.2 Basis of Payment

The accepted quantity, measured as prescribed shall be paid for at the contract unit price for Portland Cement Concrete Pavement, which price and payment shall be full compensation for preparation of roadbed and finishing of shoulders, unless otherwise provided by the special provisions furnishing all materials, for mixing, placing, finishing and curing all concrete, for furnishing and placing all joint materials, for sawing weakened plane joints, for fitting the pre-fabricated center metal joint, for facilitating and controlling traffic and for furnishing all labor, equipment, tools and incidentals necessary to complete the item.

Payment will be made under the unit of measurement in "Square Meter".

PART G. DRAINAGE AND SLOPE PROTECTION STRUCTURES

Item 404 (1)a Reinforcing Steel, Grade 40

Item 404 (1)a.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.

Item 404 (1)a.2 Material Requirements

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

Item 404 (1)a.3 Construction Requirements

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.

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.

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.

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 direction, 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.

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 min. lap	Grade 60 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.

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.

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 the unit of measurement in “Kilograms”.

Item 405 (1)a3 Structural Concrete, Class A, 20.68mpa @ 28 Days

405 (1)a3.1 Description

Scope

This item shall consist of furnishing, blending, placing and finishing concrete in all structures except pavements in accordance with this specification and conforming to the lines, grades, and dimensions as shown on the Plans. Concrete shall consist of a mixture of Portland Cement, fine aggregates, coarse aggregate, admixtures when specified, and water mixed in the proportions specified or approved by the Engineer.

Classes and Uses of Concrete

Use Class A Mixture for all superstructure and heavily reinforced substructures such as slabs, beams, girders, columns, arch ribs, box culverts, reinforced abutments, retaining walls, reinforced footings as shown in plans.

405 (1)a3.2 Material Requirements

All material requirements shall conform to Section 405.2 of 2004 DPWH Blue Book.

405 (1)a3.3 Sampling and Testing of Structural Concrete

All sampling and testing of structural concrete shall conform to Section 405.3 of 2004 DPWH Blue Book.

405 (1)a3.4 Production Requirements

All production requirements shall conform to Section 405.3 of 2004 DPWH Blue Book.

405 (1)a3.5 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.

405.5 Basis of Payment

The accepted quantities, measured as prescribed in Section 405.5, shall be paid for at the contract unit price for the Pay Item 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.

The payment will be made under the unit of measurement in “Cubic Meter”.

Item 500 (1)a3 Pipe Culverts, 910mm dia. Class II RCPC

Item 500 (1)a3.1 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.

Item 500 (1)a3.2 Material Requirements

All material requirements shall conform to Section 500.2 of 2004 DPWH Blue Book.

Item 500 (1)a3.3 Construction Requirements

All construction requirements shall conform to Section 500.3 of 2004 DPWH Blue Book.

Item 500 (1)a3.4 Method of Measurement

Conduit of the different types and sizes, both new and re-laid, will be measured by the linear meter 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:

4. 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.

5. 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.
6. 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.

Item 500 (1)a3.5 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.

All payment will be made under the unit of measurement in “Linear Meter”.

Item 506 (1) Stone Masonry

506 (1).1 Description

This item shall consist of stone masonry in minor structures, in headwalls for culverts, in retaining walls at the toe of slopes, and at other places called for on the plans.

506 (1).2 Material Requirements

Stone

The stone shall be clean, hard, and durable and shall be subject to the Engineer’s approval.

Sizes and Shapes – Unless other sizes are shown on the Plans, stones have a thickness of not less than 150 mm, and widths of not less than one and one-half times their respective thickness, and lengths of not less than one- and one-half times their respective widths. Each stone shall be of good shape and be free of depressions and projections that might weaken or prevent it from being properly bedded.

Dressing – The stone shall be dressed to remove any thin or weak portions. Face stones shall be dressed to provide bed and joint lines that do not vary more than 20 mm from the true lines and to ensure the meeting of bed and joint lines without the rounding of corners of the stones in excess of 30 mm in radius. Bed surfaces of the face stones shall be approximately normal to the face of the stones for about 80 mm and from this point may depart from a normal plane not to exceed 50 mm in 300 mm.

Finish for Exposed Faces – Face stones shall be pitched to the line along the beds and joints. The maximum projection of rock faces beyond the pitch lines shall not be more than 50 mm.

Mortar

Cement, fine aggregate, and water shall conform to the respective requirements for those materials as specified under Item 405, Structural Concrete, except as to the grading of fine aggregate which shall all pass the 2.36 mm (No. 8) sieve, not less than 15 nor more than 40 percent shall pass the 0.3 mm (No. 50) sieve, and not more than 10 percent shall pass the 0.15 mm (No.100) sieve.

The mortar for the masonry shall be composed of one part of Portland Cement and two parts of fine aggregate by volume and sufficient water to make the mortar of such consistency that it can be handled easily and spread with a trowel. Mortar shall be mixed only in those quantities required for immediate use. Unless an approved mortar mixing machine is used, the fine aggregate and cement shall be mixed dry in a tight box until the mixture assumes a uniform color, after which, water shall be added as the mixing continues until the mortar attains the proper consistency. Mortar that is not used within 90 minutes after the water has been added shall be discarded. Retempering of mortar will not be permitted.

506.3 Construction Requirement

Selection and Placing

When the masonry is to be placed on a prepared foundation bed, the bed shall be firm and normal to, or in steps normal to, the face of the wall, and shall have been approved by the Engineer before any stone is placed.

Care shall be taken to prevent the bunching of small stone or stones of the same size. Large stones shall be used in the corners.

All stones shall be cleaned thoroughly and wetted immediately before being set, and the bed which is to receive them shall be cleaned and moistened before the mortar is spread. They shall be laid with their longest faces horizontal in full beds of mortar, and the joints shall be flushed with mortar.

The exposed faces of individual stones shall be parallel to the faces of the walls in which the stones are set.

The stones shall be so handled as not to jar displace the stones already set. Suitable equipment shall be provided for setting stones larger than those that can be handled by two men. The rolling or turning of stones on the walls will not be permitted.

If a stone is loosened after the mortar has taken initial set, it shall be removed, the mortar cleaned off, and the stone relaid with fresh mortar.

Bed and Joints

Beds for face stones may vary from 20 mm to 50 mm in thickness. They shall not extend an unbroken line through more than 5 stones. Joints may vary from 20 mm to 50 mm in thickness. They shall not extend in an unbroken line through more than two stones. They may be at angles with the vertical from 00 to 450. Face stone shall bond at least 150 mm longitudinally and 50 mm vertically. At no place shall corners of four stones be adjacent to each other.

Cross beds for vertical faced walls shall be level, and for battered walls may vary from level to normal to the batter line of the face of the wall.

Headers

Headers shall be distributed uniformly throughout the walls of the structures so as to form at least one-fifth of the exposed faces. They shall be of such lengths as to extend from the front face of the wall into the backing of at least 300 mm. When a wall is 450 mm or less in thickness, the headers shall extend entirely from front to back face.

Backing

Backing shall be built mostly of large stones as shown in the approved Plans or as directed by the Engineer. The individual stones composing the backing and hearting shall be well bonded with the stones in the face wall and with each other. All openings and interstices in the backing shall be filled completely with mortar or with spalls surrounded completely by mortar.

Pointing

Both bed and vertical joints shall be finished as shown on the Plans or as directed by the Engineer. The mortar in joints on top of surface of masonry shall be crowned slightly at the center of the masonry to provide drainage.

Coping

Copings, if called for, shall be finished as shown on the Plans. Where copings are not called for, the top of the wall shall be finished with stones wide enough to cover the top of the wall from 450 mm to 1000 mm in length, and of random heights, with a minimum height of 150 mm. Stone shall be laid in such a manner that the top course is an integral part of the wall. The tops of top course of stone shall be pitched to line, in both vertical and horizontal planes.

Weepholes

It shall conform to the requirements of Item 504, Riprap and Grouted Riprap under Subsection 504.3.4, Weepholes.

Cleaning Exposed Faces

Immediately after being laid, and while the mortar is fresh, all face stones shall be thoroughly cleaned of mortar stains and shall be kept clean until the work is completed.

Curing

In hot or dry weather, the masonry shall be satisfactory protected from the sun and shall be kept wet for a period of at least three days after completion.

506.5 Method of Measurement

The quantity to be paid for shall be the number of cubic meters of stone masonry complete in place and accepted. Projections extending beyond the faces of the walls shall not be included. In computing the quantity for payment, the dimensions used shall be those shown on the Plans or ordered in writing by the Engineer. No deductions shall be made for weepholes, drain pipes or other openings of less than one square meter in area.

506.6 Basis of Payment

The quantity of masonry, determined as provided in Section 506.4, Method of Measurement, shall be paid for at the contract unit price per cubic meter for Stone Masonry, which price and payment shall be full compensation for furnishing and placing all materials, including mortar for masonry, for all necessary excavations, and for all labor, equipment, tools and incidentals necessary to complete the Item.

All payment will be made under the unit of measurement in "Cubic Meter".

PART H – MISCELLANEOUS STRUCTURES

Item 605 (6)e1 Hazard Markers, 450mm X 600mm Chevron Signs

605 (6)e1.1 Description

This item shall consist of furnishing and installing chevron signs in accordance in this Specification and to the details shown on the Plans, or as required by the engineer.

605 (6)e1.2 Function

The chevron signs shall be used to guide drivers through a change in horizontal alignment of the road such as curves and less than sharp turns. Chevron signs shall also be used to supplement any of the advance warning signs, the horizontal alignment signs (W-types) or the standard guide posts and delineators.

605 (6)e1.3 Design

The chevron sign shall be a vertical angle. No border shall be used on the chevron sign.

The point of the arrow or chevron shall indicate the direction of travel.

They shall be visible for at least 150 m to provide the road user with adequate time to react to the change in alignment. The minimum lateral offset of the chevron sign shall be 1.8 m from the edge of the pavement.

The chevron sign shall be install on the outside of the curve, set up aligned with approaching traffic at right angle to the driver’s line of sight. Two-sided chevron signs maybe used on two-lane, two-way roads to guide drivers travelling in both directions.

It is recommended that the spacing of the chevron signs should allow the driver to see at least three (3) signs in view while negotiating the curve, until the change in alignment eliminates the need for the signs.

Chevron sign must be mounted clear of road side vegetation and clearly visible under headlight illumination by night. Chevrons should be installed 1.5 m above the ground in the rural areas and 2.2 m in the urban areas.

Recommended Spacing for Chevron Signs (from DPWH Blue Book) based on the DED.

Speed Limit (kph)	Radius (m)	Chevron Spacing (m)
≤20	≤60	12

The above spacing distances shall apply to points within the curve.

605 (6)e1.4 Type of Chevron Sign

Type	Typical Size	Application
HM-1A	450mm x 600mm	≤60 kph design speed with no visible problem

605 (6)e1.5 Material Requirements

Sign Panels

It shall conform of Subsection 605.2.1 Sign Panels of Item 605 – Road Sign, DPWH Standard Specifications, Volume II.

High Performance Reflective Sheeting

The reflective sheeting shall be weather resistant and show no appreciable cracking, blistering, crazing or dimensional change after two (2) years of unprotected outdoor exposure.

The reflective sheeting shall have high reflectivity normal to vehicle headlight dependent on the angle of incidence. The reflective material shall be sharp, no glare, and directed towards the light source of approved angle of incidence.

The reflective sheeting shall perform effectively for a minimum of seven (7) years from date of fabrication.

The reflective sheeting must retain at least 70% of its original brightness for regular and fluorescent sheeting respectively at the end of seven years. All chevron signs used for the road projects should be warranted by the sheeting manufacturer for above-stated performance.

Chevron signs shall be dated at the time of installation in order to initiate the 7-year performance warranty. A sign-dating sticker that indicates the manufacturer's name, material type/brand name with the month and year of installation should be placed at the back of the sign face.

The reflective sheeting shall consist of full cube micro-prismatic lens sheeting with an interlocking diamond seal pattern with pre-coated adhesive backing protected by a removable liner. The minimum reflective brightness value of reflective sheeting shall be in accordance with the following table.

Reflective Brightness of Traffic Signs Surfaces

	Observation Angle ² (Degrees)		
	0.2°	0.5°	1.0°
For -4° Entrance Angle¹			
White	570	400	120
Yellow	425	300	90
Red	114	80	24
Green	57	40	12
Blue	26	18	5.4
Fluorescent Yellow	340	240	72
Fluorescent Yellow Green	460	320	96
Fluorescent Orange	170	120	36
For 30° Entrance Angle¹			
White	215	150	45
Yellow	160	112	34
Red	43	30	9
Green	21	15	4.5
Blue	10	6.8	2
Fluorescent Yellow	130	90	27
Fluorescent Yellow Green	170	120	36
Fluorescent Orange	64	45	14
For 45° Entrance Angle¹			
White	100	50	25
Yellow	75	37	19
Red	20	10	5
Green	10	5	3
Blue	4.5	1.5	0.8
Fluorescent Yellow	60	30	15
Fluorescent Yellow Green	80	40	20
Fluorescent Orange	30	15	7

All units are expressed in terms of cd/luc/sq.m.

¹Entrance Angle – The angle from the illumination axis to the retro-reflector axis. The reflector axis is an axis perpendicular to the retro-reflective surface.

²Observation Angle – The angle between the illumination axis and observation axis.

605 (6)e1.6 Post and Attachments

It shall conform to the applicable requirements of Subsection 605.2.3, Post and Frames figure for typical/prescribed design of DPWH Standard Specifications, Volume II.

Post required for the erection of signs shall be made of galvanized steel pipes not less than 75mm (outside diameter) x 3.25mm thick.

Attachments shall provide for the positive and robust connection of signs to their mounting posts.

Nuts and Bolts

It shall conform to the requirements of Subsection 605.2.4, Nuts and Bolts, Item 605 – Road Sign, DPWH Standard Specifications, Volume II.

Concrete Foundation Blocks

It shall conform to the requirements of Subsection 605.2.5, Concrete Foundation Blocks, Item 605 – Road Sign, DPWH Standard Specifications, Volume II.

605 (6)e1.7 Construction Requirements

Excavation and Backfilling

It shall conform to the requirements of Subsection 605.3.1, Excavation and Backfilling, Item 605 – Road Sign, DPWH Standard Specifications, Volume II.

Erection of Post

It shall conform to the requirements of Subsection 605.3.2, Erection of Post, Item 605 – Road Sign, DPWH Standard Specifications, Volume II.

Sign Panel Installation

It shall conform to the requirements of Subsection 605.3.3 Panel Installation, Item 605 – Road Sign, DPWH Standard Specifications, Volume II.

605 (6)e1.8 Method of Measurement

The quantities of chevron signs shall be the number of such sign of the specified, including the necessary posts and supports, erected and accepted, in “each”.

605 (6)e1.1 Basis of Payment

Method of Measurement, shall be paid for at the contract unit price shown in the Bid Schedule which price and payment shall be full compensation for furnishing and installing chevron signs, for excavation, backfilling and construction of foundation blocks, and all the labor, equipment, tools and incidental necessary to complete the item.

Section VIII. Bill of Quantities



**Republic of the Philippines
Province of Misamis Oriental
MUNICIPALITY OF OPOL**

CONTRACT NAME: Improvement of Nangcaon Farm-To-Market Road
Location of the Contract: Nangcaon Opol, Misamis Oriental
Project Duration: 165 days
Approved Budget for the Contract: Php 30,348,581.57

BILL OF QUANTITIES

UNIT	QTY	ITEM NO.	ITEM DESCRIPTION	UNIT COST	AMOUNT
			PART B. OTHER GENERAL REQUIREMENTS		
each	2.00	B.5	Project Billboard/Sign Board		
L.s.	1.00	B.9	Mobilization/Demobilization		
L.s.	1.00	B.7 (2)	Occupational Safety and Health Program		
			PART C. EARTHWORK		
Lin.m.	7.00	101 (4)a3	Removal Of Actual Structure/ Obstruction, 910 mm Ø RCPC		
Ha	0.339	100(1)	Clearing And Grubbing		
Cu.m.	10,917.15	102 (2)	Surplus Common Excavation		
Cu.m.	963.50	103 (1)a	Structure Excavation, Common Soil		
cu.m.	7,311.90	104	Embankment		
sq.m.	11,020.10	105 (1)a	Subgrade Preparation		
TOTAL AMOUNT (IN WORDS)					

Submitted by:

Signature over Printed Name of Bidder/Representative

Position

Name of Company/Firm

Date

Section VIII. Bill of Quantities



**Republic of the Philippines
Province of Misamis Oriental
MUNICIPALITY OF OPOL**

CONTRACT NAME: Improvement of Nangcaon Farm-To-Market Road
Location of the Contract: Nangcaon Opol, Misamis Oriental
Project Duration: 165 days
Approved Budget for the Contract: Php 30,348,581.57

BILL OF QUANTITIES

UNIT	QTY	ITEM NO.	ITEM DESCRIPTION	UNIT COST	AMOUNT
			PART D. SUB-BASE & BASE COURSE		
cu.m.	2,930.62	200 (1)	Aggregate Sub - Base Course		
			PART E. SURFACE COURSE		
sq.m.	7,503.00	311 (1)b1	Portland Cement Concrete Pavement (Unreinforced), THK. = 0.20M., 14 DAYS @ 3000 PSI		
			PART G. DRAINAGE AND SLOPE PROTECTION STRUCTURES		
kg.	3,876.59	404 (1)a	Reinforcing Steel, Grade 40		
cu.m.	54.43	405 (1)a3	Structural Concrete, Class A, 20.68Mpa @ 28 days		
Lin.m.	84.00	500 (1)a3	Pipe Culverts, 910 mm Ø CLASS II RCPC		
cu.m.	1,558.16	506 (1)	Stone Masonry		
			PART H. MISCELLANEOUS STRUCTURES		
each	12.00	605 (6)e1	Hazard Markers, 450mmx600mm Chevron Signs		
TOTAL AMOUNT (IN WORDS)					

Submitted by:

Signature over Printed Name of Bidder/Representative

Position

Name of Company/Firm

Date

Section IX. Checklist of Technical and Financial Documents

I. TECHNICAL COMPONENT ENVELOPE	
<i>Class “A” Documents</i>	
<u><i>Legal Documents</i></u>	
<input type="checkbox"/>	(a) Special Power of Attorney (SPA), if the prospective bidder is represented by a duly authorized representative; <u>and</u>
<input type="checkbox"/>	(b) Valid and updated PhilGEPS Registration Certificate (Platinum Membership) (all pages including Annex A) in accordance with Section 8.5.2 of the Revised IRR as amended by GPPB Resolution No. 15-2021; <u>and</u>
<u><i>Technical Documents</i></u>	
<input type="checkbox"/>	(c) Statement of the 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 shall be supported by documents such as Notice of Award and/or Contract Agreement and/or Notice to Proceed issued for the contract; <u>and</u>
<input type="checkbox"/>	(d) Statement of the bidder’s Single Largest Completed Contract (SLCC) similar to the contract to be bid, except under conditions provided for in Section 23.4.2.4. And shall be supported by the Notice of Award and/or Notice to Proceed, Project Owner’s Certificate of Final Acceptance issued by the Owner other than the Contractor or the Constructors Performance Evaluation System (CPES) Final Rating, which must be at least satisfactory. In case of contracts with the private sector, an equivalent document shall be submitted; <u>and</u>
<input type="checkbox"/>	(e) Special PCAB License in case of Joint Ventures; <u>and</u> registration for the type and cost of the contract to be bid; <u>and</u>
<input type="checkbox"/>	(f) Original copy of Bid Security, which shall be in the form of a notarized Bid Securing Declaration, or any of the following forms and amounts: i. The amount of not less than 2% of ABC, if Bid Security is in cash, cashier’s/manager’s check, bank draft/guarantee or irrevocable letter of credit; or ii. The amount of not less than 5% of ABC, if Bid Security is in Surety Bond (submit also a certification issued by the Insurance Commission Receipt(s) or Sales Invoice); <u>and</u>
	(g) Project Requirements, which shall include the following:
<input type="checkbox"/>	i. Organizational chart for the contract to be bid;
<input type="checkbox"/>	ii. List of contractor’s key personnel (<i>e.g.</i> Project Engineers, Materials Engineers, and Foremen), to be assigned to the contract to be bid, with

	their complete qualification and experience data;
<input type="checkbox"/>	iii. List of contractor's major equipment units, which are owned, leased, and/or under purchase agreements, supported by proof of ownership or certification of availability of equipment from the equipment lessor/vendor for the duration of the project, as the case may be; and
<input type="checkbox"/>	(h) a. 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. b. Bidder self-certification form (IFAD template). This Self-Certification Form is to be completed by the Bidder. The Bidder shall submit the completed form together with the Bid/Proposal to the procuring entity. The form is accessible here: https://drive.google.com/drive/folders/1CNzr--w_JDnxHeCqnnjNcWc-_AQ4XicC?usp=share_link ; and
	(i) Certificate of Actual Site Inspection issued by the Opol Municipal Engineering Office (MEO); and
<i>Financial Documents</i>	
<input type="checkbox"/>	(j) The prospective bidder's computation of Net Financial Contracting Capacity (NFCC) in accordance with Section 23.4.2.6 of the 2016 Revised IRR of RA 9184; and
<i>Class "B" Documents</i>	
<input type="checkbox"/>	(k) 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	
<input type="checkbox"/>	(l) Original of duly signed and accomplished Financial Bid Form; and
<i>Other documentary requirements under RA No. 9184</i>	
<input type="checkbox"/>	(m) Original of duly signed Bid Prices in the Bill of Quantities (to be presented together with the bidding documents); and
<input type="checkbox"/>	(n) 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
<input type="checkbox"/>	(o) Cash Flow by Quarter or payment schedule.

Annex I. Self-Certification Form

This Self-Certification Form is to be completed by the Bidder. The Bidder shall submit the completed form together with the Bid/Proposal to the **Bids and Awards Committee – LGU Opol, Misamis Oriental**, email address: **lguopolbac.misor@gmail.com**. Instructions for completing this form are provided below.

Full Legal Name of Bidder:	
Full Legal Name of Bidder's Legal Representative and position:	
Title of Procurement:	
Date:	

I hereby certify that I am the authorized representative of [**Name of the Bidder**], as well as that the information provided above is true and accurate in all material respects and understand that any material misstatement, misrepresentation or failure to provide the information requested in this certification may result in sanctions and remedies, including the permanent ineligibility to participate in IFAD-financed and/or IFAD-managed activities and operations, in accordance with the IFAD Procurement Guidelines, the IFAD Procurement Handbook and other applicable IFAD policies and procedures, including **IFAD's Policy on Preventing Fraud and Corruption in its Activities and Operations** (accessible at www.ifad.org/anticorruption_policy).

Authorized Signature: _____ **Date:** _____

Printed Name of Signatory: _____

- The Bidder certifies that itself, its proprietor(s), Agents, Sub-Consultants, Sub-Contractors, Consortium and Joint Venture partners have **NOT** engaged in fraudulent, corrupt, collusive, coercive or obstructive practices in connection with the present procurement process.
- The Bidder certifies that itself, its proprietor(s), Agents, Sub-Consultants, Sub-Contractors, Consortium and Joint Venture partners are **NOT** subject to a criminal conviction, administrative sanctions and/or temporary suspensions for engaging in fraudulent, corrupt, collusive, coercive or obstructive practices.
- The Bidder certifies that itself, its proprietor(s), Agents, Sub-Consultants, Sub-Contractors, Consortium and Joint Venture partners are **NOT** subject to a debarment recognized under the Agreement for Mutual Enforcement of Debarment Decisions (the "Cross-Debarment Agreement")¹.
- The Bidder certifies that itself, its proprietor(s), Agents, Sub-Consultants, Sub-Contractors, Consortium and Joint Venture partners have no actual or potential conflicts of interest² that could impact their capacity to serve the best interest of the **LGU Opol, Misamis Oriental** and/or the Fund.
- The Bidder certifies that **NO** gratuities, fees, commissions, gifts or anything else of value have been paid or exchanged or are to be paid or exchanged with respect to the present bidding process.

OR

- [To be completed only if previous box was not checked]**
The Bidder declares that the following gratuities, fees, commissions, gifts or anything else of value have been exchanged, paid or are to be exchanged or paid with respect to the present bidding process:
 - [Name of Recipient/Address/Date/Reason/Amount]
 - [Name of Recipient/Address/Date/Reason/Amount]
 - [Name of Recipient/Address/Date/Reason/Amount]

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INSTRUCTIONS FOR COMPLETING THE SELF-CERTIFICATION FORM

The Bidder shall verify that its itself, its proprietor(s), Agents, Sub-Consultants, Sub-Contractors, Consortium and Joint Venture partners are **NOT** subject to a debarment that meets the requirement for recognition under the Agreement for Mutual Enforcement of Debarment Decisions (the "Cross-Debarment Agreement").

The Bidder shall perform the following procedures to verify that itself, its proprietor(s), Agents, Sub-Consultants, Sub-Contractors, Consortium and Joint Venture partners are **NOT** listed on the World Bank Listing of Ineligible Firms and Individuals (accessible at: <https://www.worldbank.org/en/projects-operations/procurement/debarred-firms>) on the grounds of "Cross-Debarment".

The World Bank Listing of Ineligible Firms and Individuals is a searchable database that returns a positive or negative search results page upon submission of a name to be searched, in order to document the eligibility.

The Bidder should print out, date, and attach the results page(s) to the Self-Certification Form, which should read, "No Matching Records found".

If an adverse record(s) has/have been found – i.e. the results page(s) shows one or more individuals or entities, including the Bidder itself are ineligible on the grounds of "Cross-Debarment" – and the Bidder believes the finding is a "false positive", they should immediately notify the **LGU Opol, Misamis Oriental**.

Annex II. Self-Certification Form (Contract)

In satisfaction of Section B of the Additional Provisions at Annex X of the Contract, this Self-Certification Form is to be completed by the Contractor. The Contractor shall submit the completed form together with the signed Contract Agreement to the **Municipality of Opol, Misamis Oriental**. Instructions for completing this form are provided below.

Full Legal Name of Contractor:	
Full Legal Name of Contractor's Legal Representative and position:	
Full Name and Number of Contract:	
Project with which Contract was Signed:	
Country:	
Date:	

I hereby certify that I am the authorized representative of [**Name of the Contractor**], as well as that the information provided herein is true and accurate in all material respects and understand that any material misstatement, misrepresentation or failure to provide the information requested in this self-certification may result in sanctions and remedies, including the suspension or termination of the contract between the Contractor and the **Municipality of Opol, Misamis Oriental**, as well as the permanent ineligibility to participate in IFAD-financed and/or IFAD-managed activities and operations, in accordance with the IFAD Procurement Guidelines, the IFAD Procurement Handbook and other applicable IFAD policies and procedures, including **IFAD's Policy on Preventing Fraud and Corruption in its Activities and Operations** (accessible at www.ifad.org/anticorruption_policy) and its **Policy on Preventing and Responding to Sexual Harassment, Sexual Exploitation and Abuse** (accessible at <https://www.ifad.org/en/document-detail/asset/40738506>).

Authorized Signature: _____ **Date:** _____

Printed Name of Signatory: _____

- The Contractor certifies that itself, including its director(s), partner(s), proprietor(s), Key personnel, Agents, Sub-Consultants, Sub-Contractors, Consortium and Joint Venture partners have **NOT** engaged in fraudulent, corrupt, collusive, coercive or obstructive practices, in connection with the present procurement process and this Contract.
- The Contractor certifies that itself, including its director(s), partner(s), proprietor(s), Key personnel, Agents, Sub-Consultants, Sub-Contractors, Consortium and Joint Venture partners are **NOT** subject to a criminal conviction, administrative sanctions and/or temporary suspensions for engaging in fraudulent, corrupt, collusive, coercive or obstructive practices.
- The Contractor certifies that itself, including its director(s), partner(s), proprietor(s), Key personnel, Agents, Sub-Consultants, Sub-Contractors, Consortium and Joint Venture partners are **NOT** subject to a debarment recognized under the Agreement for Mutual Enforcement of Debarment Decisions.
- The Contractor certifies that itself, including its director(s), partner(s), proprietor(s), Key personnel, Agents, Sub-Consultants, Sub-Contractors, Consortium and Joint Venture partners have **NO** actual or potential conflict of interest³ that could impact their capacity to serve the best interest of the Fund.
- The Contractor certifies that its director(s), proprietor(s), and personnel, and the personnel of its Agents, Sub-Consultants, Sub-Contractors, Consortium and Joint Venture partners are **NOT** subject to a criminal conviction, administrative sanctions or investigations for incidents of Sexual Harassment and Sexual Exploitation and Abuse.
- The Contractor certifies that **NO** gratuities, fees, commissions, gifts or anything else of value, other than those shown in the bid, have been paid or exchanged or are to be paid or exchanged with respect to the present procurement process and this Contract.

OR

- [To be completed only if the previous box was not checked]**
The Contractor declares that the following gratuities, fees, commissions, gifts or anything else of value have been exchanged, paid or are to be exchanged or paid with respect to the present procurement process and this Contract:
 - [Name of Recipient/Address/Date/Reason/Amount]
 - [Name of Recipient/Address/Date/Reason/Amount]
 -
- The Contractor acknowledges and accepts to notify the **Municipality of Opol, Misamis Oriental** in the event of any material change in connection with this Self-Certification Form throughout the duration of the Contract.

