PHILIPPINE BIDDING DOCUMENTS

(As Harmonized with Development Partners)

Procurement of INFRASTRUCTURE PROJECTS for the FENCING OF HISTORICAL CORE (HISTORICAL CORE AND MANOR BOUNDARY)

Government of the Republic of the Philippines

Sixth Edition
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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

Invitation to Bid for
Fencing of Historical Core
(Historical Core and Manor Boundary)

1. The John Hay Management Corporation (JHMC), through the Corporate Operating Budget for CY 2020 intends to apply the sum of Seven Hundred Thousand Pesos (PhP700,000.00) being the Approved Budget for the Contract (ABC) to payments under the contract for Fencing of Historical Core (Historical Core and Manor Boundary) (Contract No. INFRA-04 2020). Bids received in excess of the ABC shall be automatically rejected at bid opening.

2. The JHMC now invites bids for the above Procurement Project. Completion of the Works required is Forty-Six (46) Calendar Days. Bidders should have completed a contract similar to the Project. The description of an eligible bidder is contained in the Bidding Documents, particularly, in Section II (Instructions to Bidders).

3. Bidding will be conducted through open competitive bidding procedures using non-discretionary "pass/fail" criterion as specified in the 2016 revised Implementing Rules and Regulations (IRR) of Republic Act (RA) No. 9184.

   JHMC allows the participation of prospective bidders through personal appearance or video conferencing. Bidders may submit their bids using the two (2) separate sealed bid envelopes system or **two (2) password-protected Bidding Documents in compressed archive folders, in case of electronic bid submission**, and which shall be submitted simultaneously. The first shall contain the technical component of the bid, including the eligibility requirements, and the second shall contain the financial component of the bid.

4. Interested bidders may obtain further information from John Hay Management Corporation (JHMC) and inspect the Bidding Documents at the address given below from 29 October 2020 from 10 A.M to 2 P.M., Monday to Friday.

5. A complete set of Bidding Documents may be acquired by interested bidders on 29 October 2020 from given address and website/s below and upon payment of the applicable fee for Bidding Documents, pursuant to the latest Guidelines issued by the GPPB, in the amount of Php 1,000.00. The Procuring Entity shall allow the bidder to present its proof of payment for the fees and may be presented in person, by facsimile, or through electronic means.

Interested bidders may personal pay for Bidding Documents at the Finance Department, Cottage 625, JHMC Office Complex, Camp John Hay, Baguio City. They may also pay via electronic fund transfer or direct bank deposit using the following deposit details:

Payee Name	John Hay Management Corporation
Depository Bank	Development Bank of the Philippines Session Road, Baguio City Branch
Account Number	0510-004308-031

For payments through electronic fund transfer or direct bank deposit, transfer confirmations or deposit slips must be emailed to **bac@jhmc.com.ph.** Official receipts will only be issued upon verification with JHMC's depository bank.

6. The JHMC will hold a Pre-Bid Conference[1] at 1:00 P.M. on 11 November 2020 at the JHMC Conference Room, Sheridan Drive, Camp John Hay, Baguio City and/or through videoconferencing/webcasting.

   The Pre-bid conference will be conducted in person or face-to-face through video conferencing. Prospective Bidders who opt for video conferencing must inform the BAC Secretariat of their intent through the electronic mail address listed below. The Pre-Bid Conference is open to prospective bidders but attendance shall not be mandatory.

7. Bids must be duly received by the BAC Secretariat through manual submission at the office address as indicated below on or before 12:00 N.N. on 25 November 2020. 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 at 1:00 P.M on 25 November, 2020 at the JHMC Conference Room, Sheridan Drive, Camp John Hay, Baguio City and/or through video conferencing. Bids will be opened in the presence of the bidders' representatives who choose to attend the activity.

10. In compliance with the health protocols against the COVID-19 Pandemic, JHMC is limiting the physical presence of participants for the Pre-bid conference and Bid Opening to ten (10) persons with one (1) representative from each prospective bidder. Selection of the ten (10) participants shall be based on the earliest time such a request was made. It is highly encouraged that other prospective bidders attend the Pre-Bid Conference and Bid Opening through video conferencing.

    Prospective Bidders who are confirmed to attend in person shall submit themselves to the DOH and /or LGU permits/passes and certificates.

[1] May be deleted in case the ABC is less than One Million Pesos (PhP1,000,000) where the Procuring Entity may not hold a pre-bid conference.

11. The JHMC 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:

    FLORENCE JOY MALLARE-ABAD
    Head, BAC Secretariat
    John Hay Management Corporation
    JHMC Office, Camp John Hay, Baguio City
    Telephone Number 074-424-5824
    E-mail: **bac@jhmc.com.ph**

13. You may visit the following websites:

    For downloading of Bidding Documents: www.jhmc.com.ph

    For online bid submission: bac@jhmc.com.ph

    29 October 2020

(sgd.) JANE THERESA G. TABALINGCOS
BAC Chairperson

Section II. Instructions to Bidders

1. Scope of Bid

The Procuring Entity, John Hay Management Corporation invites Bids for the "Fencing of Historical Core (Historical Core and Manor Boundary), with Project Identification Number *INFRA-04-2020.*

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 Corporate Operating Budget for CY 2020 in the amount of Seven Hundred Thousand Pesos (PhP700,000.00)

2.2. The source of funding is:

JHMC Corporate Operating Budget 2020.

3. Bidding Requirements

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

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

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

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

The Procuring Entity, as well as the Bidders and Contractors, shall observe the highest standard of ethics during the procurement and execution of the contract. They or through an agent shall not engage in corrupt, fraudulent, collusive, coercive, and

obstructive practices defined under Annex "I" of the 2016 revised IRR of RA No. 9184 or other integrity violations in competing for the Project.

5. Eligible Bidders

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

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

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

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

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

6. Origin of Associated Goods

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

7. Subcontracts

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

The Procuring Entity has prescribed that:

a. Subcontracting is not allowed.

7.1. The Bidder must submit together with its Bid the documentary requirements of the subcontractor(s) complying with the eligibility criterial stated in **ITB** Clause 5 in accordance with Section 23.4 of the 2016 revised IRR of RA No. 9184 pursuant to Section 23.1 thereof.

7.2. The Supplier may identify its subcontractor during the contract implementation stage. Subcontractors identified during the bidding may be changed during the

implementation of this Contract. Subcontractors must submit the documentary requirements under Section 23.1 of the 2016 revised IRR of RA No. 9184 and comply with the eligibility criteria specified in **ITB** Clause 5 to the implementing or end-user unit.

7.3. Subcontracting of any portion of the Project does not relieve the Contractor of any liability or obligation under the Contract. The Supplier will be responsible for the acts, defaults, and negligence of any subcontractor, its agents, servants, or workmen as fully as if these were the Contractor's own acts, defaults, or negligence, or those of its agents, servants, or workmen.

8. Pre-Bid Conference

The Procuring Entity will hold a pre-bid conference for this Project on the specified date and time and either at its physical address JHMC Conference Room, Sheridan Drive, Camp John Hay, Baguio City and/or through videoconferencing/webcasting as indicated in paragraph 6 of the **IB.**

9. Clarification and Amendment of Bidding Documents

Prospective bidders may request for clarification on and/or interpretation of any part of the Bidding Documents. Such requests must be in writing and received by the Procuring Entity, either at its given address or through electronic mail indicated in the **IB**, at least ten (10) calendar days before the deadline set for the submission and receipt of Bids.

10. Documents Comprising the Bid: Eligibility and Technical Components

10.1. The first envelope shall contain the eligibility and technical documents of the Bid as specified in **Section IX. Checklist of Technical and Financial Documents**.

10.2. If the eligibility requirements or statements, the bids, and all other documents for submission to the BAC are in foreign language other than English, it must be accompanied by a translation in English, which shall be authenticated by the appropriate Philippine foreign service establishment, post, or the equivalent office having jurisdiction over the foreign bidder's affairs in the Philippines. For Contracting Parties to the Apostille Convention, only the translated documents shall be authenticated through an apostille pursuant to GPPB Resolution No. 13-2019 dated 23 May 2019. The English translation shall govern, for purposes of interpretation of the bid.

10.3. A valid PCAB License is required, and in case of joint ventures, a valid special PCAB License, and registration for the type and cost of the contract for this Project. Any additional type of Contractor license or permit shall be indicated in the **BDS**.

10.4. A List of Contractor's key personnel (e.g., Project Manager, Project Engineers, Materials Engineers, and Foremen) assigned to the contract to be bid, with their complete qualification and experience data shall be provided. These key personnel must meet the required minimum years of experience set in the **BDS**.

10.5. A List of Contractor's major equipment units, which are owned, leased, and/or under purchase agreements, supported by proof of ownership, certification of availability of equipment from the equipment lessor/vendor for the duration of the project, as the case may be, must meet the minimum requirements for the contract set in the **BDS**.

11. Documents Comprising the Bid: Financial Component

11.1. The second bid envelope shall contain the financial documents for the Bid as specified in **Section IX. Checklist of Technical and Financial Documents**.

11.2. Any bid exceeding the ABC indicated in paragraph 1 of the **IB** shall not be accepted.

11.3. For Foreign-funded procurement, a ceiling may be applied to bid prices provided the conditions are met under Section 31.2 of the 2016 revised IRR of RA No. 9184.

12. Alternative Bids

Bidders shall submit offers that comply with the requirements of the Bidding Documents, including the basic technical design as indicated in the drawings and specifications. Unless there is a value engineering clause in the **BDS**, alternative Bids shall not be accepted.

13. Bid Prices

All bid prices for the given scope of work in the Project as awarded shall be considered as fixed prices, and therefore not subject to price escalation during contract implementation, except under extraordinary circumstances as determined by the NEDA and approved by the GPPB pursuant to the revised Guidelines for Contract Price Escalation guidelines.

14. Bid and Payment Currencies

14.1. Bid prices may be quoted in the local currency or tradeable currency accepted by the BSP at the discretion of the Bidder. However, for purposes of bid evaluation, Bids denominated in foreign currencies shall be converted to Philippine currency based on the exchange rate as published in the BSP reference rate bulletin on the day of the bid opening.

14.2. *Payment of the contract price shall be made in:*

a. Philippine Pesos.

15. Bid Security

15.1. The Bidder shall submit a Bid Securing Declaration or any form of Bid Security in the amount indicated in the **BDS**, which shall be not less than the percentage of the ABC in accordance with the schedule in the **BDS**.

15.2. The Bid and bid security shall be valid until One Hundred Twenty Days. Any bid not accompanied by an acceptable bid security shall be rejected by the Procuring Entity as non-responsive.

16. Sealing and Marking of Bids

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

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

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

17. Deadline for Submission of Bids

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

18. Opening and Preliminary Examination of Bids

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

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

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

19. Detailed Evaluation and Comparison of Bids

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

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

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

20. Post Qualification

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

21. Signing of the Contract

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

Section III. Bid Data Sheet

Bid Data Sheet

<table>
<tr><th>ITB Clause</th><th></th></tr>
<tr><td>5.2</td><td>For this purpose, contracts similar to the Project refer to contracts which have the same major categories of work, which shall be:
Construction of concrete/metal perimeter fence.</td></tr>
<tr><td>7.1</td><td>Sub-contracting is not allowed.</td></tr>
<tr><td>10.3</td><td>No further instructions.</td></tr>
<tr><td>10.4</td><td>The key personnel must meet the required minimum years of experience set below:
<table>
<tr><th>Key Personnel</th><th>General Experience</th><th>Relevant Experience</th></tr>
<tr><td>Project Engineer</td><td>Three (3) Years</td><td>General Construction and Engineering</td></tr>
<tr><td>Materials Engineer</td><td>Three (3) Years</td><td>General Construction and Engineering</td></tr>
<tr><td>Construction Safety and Health Officer</td><td>Three (3) Years</td><td>General Construction and Engineering</td></tr>
<tr><td>Foreman</td><td>Three (3) Years</td><td>General Construction and Engineering</td></tr>
</table></td></tr>
<tr><td>10.5</td><td>The minimum major equipment requirements are the following:
<table>
<tr><th>Equipment</th><th>Capacity</th><th>Number of Unit(s)</th></tr>
<tr><td>Cargo Truck</td><td>2-5 Tons</td><td>One (1)</td></tr>
<tr><td>Bar Cutter</td><td>25mm Max. rebar Ø (Grade 40), Single Phase</td><td>One (1)</td></tr>
<tr><td>Welding Machine</td><td>Electric Driven (500 Amp)</td><td>One (1)</td></tr>
<tr><td>One Bagger</td><td>4-6 ft³/min</td><td>One (1)</td></tr>
<tr><td>Concrete Vibrator</td><td>Flexible shaft type 2” Head Ø w/ 5 Amperes Gasoline drive unit</td><td>One (1)</td></tr>
<tr><td>Water Truck/Pump</td><td></td><td>One (1)</td></tr>
<tr><td>Speed Cutter</td><td></td><td>One (1)</td></tr>
<tr><td>Cutting Outfit</td><td></td><td>One (1)</td></tr>
</table></td></tr>
<tr><td>12</td><td>No further instructions.</td></tr>
<tr><td>15.1</td><td>The bid security shall be in the form of a Bid Securing Declaration or any of the following forms and amounts:
a. The amount of not less than Fourteen Thousand Pesos (PhP 14,000.00), if bid security is in cash, cashier’s/manager’s check, bank draft/guarantee or irrevocable letter of credit;</td></tr>
</table>

	b. The amount of not less than Thirty-Five Thousand Pesos (PhP 35,000.00) if bid security is in Surety Bond.
19.2	Partial bid is not allowed. The infrastructure project is packaged in a single lot and the lot shall not be divided into sub-lots for the purpose of bidding, evaluation, and contract award.
20	Applicable JHMC Regulatory Permits/Licenses/Fees
21	Additional contract documents relevant to the Project that may be required by existing laws and/or the Procuring Entity, such as construction schedule and S-curve, manpower schedule, construction methods, equipment utilization schedule, construction safety and health program approved by the DOLE, JHMC Construction Environment Management Plan (CEMP) and other acceptable tools of project scheduling.

Section IV. General Conditions of Contract

1. Scope of Contract

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

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

2. Sectional Completion of Works

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

3. Possession of Site

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

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

4. The Contractor's Obligations

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

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

5. Performance Security

5.1. Within ten (10) calendar days from receipt of the Notice of Award from the Procuring Entity but in no case later than the signing of the contract by both parties, the successful Bidder shall furnish the performance security in any of the forms prescribed in Section 39 of the 2016 revised IRR.

5.2. The Contractor, by entering into the Contract with the Procuring Entity, acknowledges the right of the Procuring Entity to institute action pursuant to RA No. 3688 against any subcontractor be they an individual, firm, partnership, corporation, or association supplying the Contractor with labor, materials and/or equipment for the performance of this Contract.

6. Site Investigation Reports

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

7. Warranty

7.1. In case the Contractor fails to undertake the repair works under Section 62.2.2 of the 2016 revised IRR, the Procuring Entity shall forfeit its performance security, subject its property(ies) to attachment or garnishment proceedings, and perpetually disqualify it from participating in any public bidding. All payables of the GOP in his favor shall be offset to recover the costs.

7.2. The warranty against Structural Defects/Failures, except that occasioned-on force majeure, shall cover the period from the date of issuance of the Certificate of Final Acceptance by the Procuring Entity. Specific duration of the warranty is found in the **SCC**.

8. Liability of the Contractor

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

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

9. Termination for Other Causes

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

10. Dayworks

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

11. Program of Work

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

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

12. Instructions, Inspections and Audits

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

13. Advance Payment

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

14. Progress Payments

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

15. Operating and Maintenance Manuals

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

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

Section V. Special Conditions of Contract

Special Conditions of Contract

GCC Clause	
2	Target date of completion is Forty-Six (46) Calendar Days upon the issuance of Notice to Proceed.
4.1	Upon issuance of Notice to Proceed.
6	The site investigation reports are: existing site conditions
7.2	In case of semi-permanent structures, such as buildings of types 1, 2, and 3 as classified under the National Building Code of the Philippines, concrete/asphalt roads, concrete river control, drainage, irrigation lined canals, river landing, deep wells, rock causeway, pedestrian overpass, and other similar semi-permanent structures: Five (5) years.
10	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 Five Calendar days from delivery of the Notice of Award.
11.2	The amount to be withheld for late submission of an updated Program of Work is One Thousand Pesos (Php1,000.00)
13	The amount of the advance payment is fifteen (15) percent to be released within 20 days from receipt of letter and other requirements.
14	No further instructions.
15.1	The date by which "as built" drawings are required is upon request for progress and final billings.
15.2	The amount to be withheld for failing to produce "as built" drawings by the date required is One Thousand Pesos (Php1,000.00) per day of non-submission.

Section VI. Specifications

1. SCOPE OF WORK FOR BIDDERS

1.1 To fabricate and install a perimeter fence from the Historical Core towards the Manor Boundary within the Camp John Hay Special Economic Zone, for security purposes and to ensure that fees are accordingly collected for proper maintenance, infrastructure and service improvement.

1.2 To impose required construction safety practices during the implementation of the project in compliance with the approved Occupational Safety and Health Program as established by the Department of Labor and Employment (DOLE).

1.3 To provide and maintain an accessible temporary field office/storage, portable toilets/latrines for workers and/or testing laboratory. The Contractor shall be held responsible for the maintenance and protection of all facilities to be provided during the duration of the Contract.

1.4 To conduct removal and proper disposal of structures and/or obstructions as indicated in the approved plans. All designated salvageable material shall be removed, without unnecessary damages, for safekeeping and turn-over to the end-user.

1.5 To properly and safely dispose all wastes generated during the construction phase.

1.6 To supervise or monitor the presence of the assigned Project Personnel (Project Engineer, Materials Engineer or Safety Officer) during project implementation.

1.7 To conduct site visits to familiarize with the on-site conditions and existing facilities.

1.8 To provide as-staked and as-built plans for the slope protection, one (1) set original CAD drawing in A3 size, one (1) additional copy, and electronic file of the following:

a. Actual layout of the fence.
b. Details of the constructed fence.
c. All other details of the project that may be required.

1.9 As-built plans shall indicate the details specified in Section 1.8 in any scale not less than 1:100 meters

1.10 To submit weekly accomplishment reports during the duration of the Contract.

1.11 To shoulder all costs for power and water utilities to be used during the implementation of the project.

1.12 The contractor shall be responsible for all tests and engineering services required by the Specifications. The cost for inspection or test not required by the specifications but which are required by JHMC, will be borne by JHMC.

1.13 All tests shall be performed by accredited testing facilities and approved by JHMC, and shall be in accordance with the current standards of the American Society for testing and materials, otherwise specified by JHMC. Two (2) copies of the test procedures including results shall be furnished to JHMC.

1.14 To immediately report to JHMC all unearthed hazardous materials, buried treasures or artifacts, and shall be coordinated by JHMC to the concerned

agencies for their appropriate action. All activities in area of concern shall cease until such time that the hazardous materials, treasures have been properly dealt with.

2. DPWH STANDARDS and SPECIFICATIONS

The scope of work shall be in conformity with of the DPWH standards and specifications.

ITEM 100 - CLEARING AND GRUBBING

100.1 Description

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

100.2 Construction Requirements

100.2.1 General

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

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

100.2.2 Clearing and Grubbing

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

(1) Removal of undisturbed stumps and roots and nonperishable solid objects with a minimum depth of one (1) meter below subgrade or slope of embankment will not be required.
(2) In areas outside of the grading limits of cut and embankment areas, stumps and nonperishable solid objects shall be cut off not more than 150 mm above the ground line or low water level.
(3) In areas to be rounded at the top of cut slopes, stumps shall be cut off flush with or below the surface of the final slope line.

(4) Grubbing of pits, channel changes and ditches will be required only to the depth necessitated by the proposed excavation within such areas.
(5) In areas covered by cogon/talahib, wild grass and other vegetations, top soil shall be cut to a maximum depth of 150 mm below the original ground surface or as designated by the Engineer, and disposed outside the clearing and grubbing limits as indicated in the typical roadway section.

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

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

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

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

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

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

All merchantable timber in the clearing area which has not been removed from the right of way prior to the beginning of construction, shall become the property of the Contractor, unless otherwise provided. Low hanging branches and unsound or unsightly branches on trees or shrubs designated to remain shall be trimmed as directed. Branches of trees extending over the roadbed shall be trimmed to give a clear height of 6 m above the roadbed surface. All trimming shall be done by skilled workmen and in accordance with good tree surgery practices.

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

100.2.3 Individual Removal of Trees or Stumps

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

100.3 Method of Measurement

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

1. Area Basis. The work to be paid for shall be the number of hectares and fractions thereof acceptably cleared and grubbed within the limits indicated on the Plans or as may be adjusted in field staking by the Engineer. Areas not within the clearing and grubbing limits shown on the Plans or not staked for clearing and grubbing will not be measured for payment.
2. Lump-Sum Basis. When the Bill of Quantities contains a Clearing and Grubbing lump-sum item, no measurement of area will be made for such item.
3. Individual Unit Basis (Selective Clearing). The diameter of trees will be measured at a height of 1.4 m above the ground. Trees less than 150mm in diameter will not be measured for payment.

ITEM 102 – EXCAVATION

102.1 Description

This Item shall consist of roadway 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.

102.1.1 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 "unclassified excavation", "rock excavation", "common excavation", or "muck excavation" as indicated in the Bill of Quantities and hereinafter described.

(1) Unclassified Excavation. Unclassified excavation shall consist of the excavation and disposal of all materials regardless of its nature, not classified and included in the Bill of Quantities under other pay items.

(2) Rock Excavation. Rock excavation shall consist of excavation of igneous, sedimentary and metamorphic rocks which cannot be excavated without blasting or the use of rippers, and all boulders or other detached stones each having a volume of 1 cubic meter or more as determined by physical measurements or visually by the Engineer.

(3) Common Excavation. Common excavations shall consist of all excavation not included in the Bill of Quantities under "rock excavation" or other pay items.

(4) Muck Excavation. Muck excavation shall consist of the removal and disposal of deposits of saturated or unsaturated mixtures of soils and organic matter not suitable for foundation materials regardless of moisture content.

102.1.2 Borrow Excavation

Borrow excavation shall consist of the excavation and utilization of approved materials required for the construction of embankments or for other portions of the work, and shall be obtained from approved sources, in accordance with Clause 61, Standard Specifications for Public Works and Highways, Volume I and the following:

(1) Borrow, Case 1

Borrow Case 1 will consist of material obtained from sources designated on the Plans or in the Special Provisions.

(2) Borrow, Case 2

Borrow Case 2 will consist of material obtained from sources provided by the Contractor. The material shall meet the quality requirements determined by the Engineer unless otherwise provided in the Contract.

102.2 Construction Requirements

102.2.1 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.

102.2.2 Conservation of Topsoil

Where provided for on the Plans or in the Special Provisions, suitable topsoil encountered in excavation and on areas where embankment is to be placed shall be removed to such extent and to such depth as the Engineer may direct. The removed topsoil shall be transported and deposited in storage piles at locations approved by the Engineer. The topsoil shall be completely removed to the required depth from any designated area prior to the beginning of regular excavation or embankment work in the area and shall be kept separate from other excavated materials for later use.

102.2.3 Utilization of Excavated Materials

All suitable materials removed from the excavation shall be used in the formation of the embankment, subgrade, shoulders, slopes, bedding, and backfill for structures, and for other purposes shown on the Plans or as directed.

The Engineer will designate as unsuitable those soils that cannot be properly compacted in embankments. All unsuitable materials shall be disposed off as shown on the Plans or as directed without delay to the Contractor.

Only approved materials shall be used in the construction of embankments and backfills.

All excess materials, including rock and boulders that cannot be used in embankments shall be disposed off as directed.

Materials encountered in the excavation and determined by the Engineer as suitable for topping, road finishing, slope protection, or other purposes shall be conserved and utilized as directed by the Engineer.

Borrow materials shall not be placed until after the readily accessible materials from roadway excavation has been placed in the fill, unless otherwise permitted or directed by the Engineer. If the Contractor places more borrow than is required and thereby causes a waste of excavation, the amount of such waste will be deducted from the borrow volume.

102.2.4 Prewatering

Excavation areas and borrow pits may be prewatered before excavating the material. When prewatering is used, the areas to be excavated shall be moistened to the full depth, from the surface to the bottom of the excavation. The water shall be controlled so that the excavated material will contain the proper moisture to permit compaction to the specified density with the use of standard compacting equipment. Prewatering shall be supplemented where necessary, by truck watenng units, to ensure that the embankment material contains the proper moisture at the time of compaction.

The Contractor shall provide drilling equipment capable of suitably checking the moisture penetration to the full depth of the excavation.

102.2.5 Presplitting

Unless otherwise provided in the Contract, rock excavation which requires drilling and shooting shall be presplit.

Presplitting to obtain faces in the rock and shale formations shall be performed by: (1) drilling holes at uniform intervals along the slope lines, (2) loading and stemming the holes with appropriate explosives and stemming material, and (3) detonating the holes simultaneously.

Prior to starting drilling operations for presplitting, the Contractor shall furnish the Engineer a plan outlining the position of all drill holes depth of drilling, type of explosives to be used, loading pattern and sequence of firing. The drilling and blasting plan is for record purposes only and. Will not absolve the Contractor of his responsibility for using proper driling and blasting procedures. Controlled blasting shall begin with a short test section of a length approved by the Engineer. The test section shall be presplit, production drilled and blasted and sufficient material excavated whereby the Engineer can determine if the Contractor's methods are satisfactory. The Engineer may order discontinuance of the presplitting when he determines that the materials encountered have become unsuitable for being presplit.

The holes shall be charged with explosives of the size, kind, strength, and at the spacing suitable for the formations being presplit, and with stemming material which passes a 9.5 mm standard sieve and which has the qualities for proper confinement of the explosives.

The finished presplit slope shall be reasonably uniform and free of loose rock. Variance from the true plane of the excavated backs lope shall not exceed 300 mm; however, localized irregularities or surface variations that do not constitute a safety hazard or an impairment to drainage courses or facilities will be permitted.

A maximum offset of 600 mm will be permitted for a construction working bench at the bottom of each lift for use in drilling the next lower presplitting pattern.

102.2.6 Excavation of Ditches, Gutters, etc.

All materials excavated from side ditches and gutters, channel changes, irrigation ditches, inlet and outlet ditches, toe ditches, furrow ditches and such other ditches as may be designated on the Plans or staked' by the Engineer, shall be utilized as provided in Subsection 102.2.3.

Ditches shall conform to the slope, grade, and shape of the required cross-section, with no projections of roots, stumps, rock, or similar matter. The Contractor shall maintain and keep open and free rom leaves, sticks, and other debris all ditches dug by him until final acceptance of the work.

Furrow ditches shall be formed by plowing a continuous furrow along the line staked by the Engineer. Methods other than plowing may be used if acceptable to the Engineer. The ditches shall be cleaned out by hand shovel work, by ditcher, or by some other Suitable method, throwing all loose materials on the downhill side so that the bottom of the finished ditch shall be approximately 450 mm below the crest of

the loose material piled on the downhill side. Hand finish will not be required, but the flow lines shall be in satisfactory shape to provide drainage without overflow.

102.2.7 Excavation of Roadbed Level

Rock shall be excavated to a depth of 150 mm below subgrade within the limits of the roadbed, and the excavation backfilled with material designated on the Plans or approved by the Engineer and compacted to the required density.

When excavation methods employed by the Contractor leave undrained pockets in the rock surface, the Contractor shall at his own expense, properly drain such depressions or when permitted by the Engineer fill the depressions with approved impermeable material.

Material below subgrade, other than solid rock shall be thoroughly scarified to a depth of 150 mm and the moisture content increased or reduced, as necessary, to bring the material throughout this 150 mm layer to the moisture content suitable for maximum compaction. This layer shall then be compacted in accordance with Subsection 104.3.3.

102.2.8 Borrow Areas

The Contractor shall notify the Engineer sufficiently in advance of opening any borrow areas so that cross-section elevations and measurements of the ground surface after stripping may be taken, and the borrow material can be tested before being used. Sufficient time for testing the borrow material shall be allowed.

All borrow areas shall be bladed and left in such shape as to permit accurate measurements after excavation has been completed. The Contractor shall not excavate beyond the dimensions and elevations established, and no material shall be removed prior to the staking out and cross-sectioning of the site. The finished borrow areas shall be approximately true to line and grade established and specified and shall be finished, as prescribed in Clause 61, Standard Specifications for Public Works and Highways, Volume 1. When necessary to remove fencing, the fencing shall be replaced in at least as good condition as it was originally. The Contractor shall be responsible for the confinement of livestock when a portion of the fence is removed.

102.2.9 Removal of Unsuitable Material

Where the Plans show the top portion of the roadbed to be selected topping, all unsuitable materials shall be excavated to the depth necessary for replacement of the selected topping to the required compacted thickness.

Where excavation to the finished graded section results in a subgrade or slopes of unsuitable soil, the Engineer may require the Contractor to remove the unsuitable material and backfill to the finished graded section with approved material. The Contractor shall conduct his operations in such a way that the Engineer can take the necessary cross-sectional measurements before the backfill is placed.

The excavation of muck shall be handled in a manner that will not permit the entrapment of muck within the backfill. The material used for backfilling up to the ground line or water level, whichever is higher, shall be rock or other suitable granular material selected from the roadway excavation, if available. If not available, suitable material shall be obtained from other approved sources. Unsuitable material removed shall be disposed off in designated areas shown on the Plans or approved by the Engineer.

102.3 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 or a swell factor in case of rock excavation, determined by laboratory tests to get its original volume measurement, and the net volume of suitable material from excavation In the original position. Separate pay items shall be provided for surplus common, unclassified and rock material.

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 102.3 shall be paid for at the contract unit price for each of the Pay Items listed below that is included in the Bill of Quantities which price and payment shall be full compensation for the removal and disposal of excavated materials including all labor, equipment, tools, and incidentals necessary to complete the work prescribed in this Item.

ITEM 404 – REINFORCING STEEL

404.1 Description

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

404.2 Material Requirements

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

404.3 Construction Requirements

404.3.1 Order Lists

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

404.3.2 Protection of Material

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

404.3.3 Bending

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

Nominal diameter,	Pin diameter
10 to 20	6d
25 to 28	8d
32 and greater	10d

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

404.3.4 Placing and Fastening

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

Distance from the forms shall be maintained by means of stays, blocks, ties, hangers, or other approved supports, so that it does not vary from the position indicated on the Plans by more than 6mm. Blocks for holding reinforcement from contact with the forms shall be precast mortar blocks of approved shapes and dimensions. Layers of bars shall be separated by precast mortar blocks or by other equally suitable devices. The use of pebbles, pieces of broken stone or brick, metal pipe and wooden blocks shall not be permitted. Unless otherwise shown on the Plans or required by the JHMC representative, the minimum distance between bars shall be 40mm. Reinforcement in any member shall be placed and then inspected and approved by the JHMC representative before the placing of concrete begins. Concrete placed in violation of this provision may be rejected and removal may be required. If fabric reinforcement is shipped in rolls, it shall be straightened before being placed. Bundled bars shall be tied together at not more than 1.8m intervals.

404.3.5 Splicing

All reinforcement shall be furnished in the full lengths indicated on the Plans. Splicing of bars except where shown on the Plans will not be permitted without the written approval of the JHMC representative. 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	Butnot less than
Tensi	24 bar dia	36 bar dia	300 mm
Comp	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 JHMC representative in writing. Spiral reinforcement shall be spliced by lapping at least one and a half turns or by butt welding unless otherwise shown on the Plans.

404.4 Method of Measurement

The quantity of reinforcing steel to be paid for will be the final quantity placed and accepted in the completed structure.

No allowance will be made for tie-wires, separators, wire chairs and other material used in fastening the reinforcing steel in place. If bars are substituted upon the Contractor's request and approved by the JHMC representative and as a result thereof more steel is used than specified, only the mass specified shall be measured for payment.

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

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

404.5 Basis of Payment

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

ITEM 405 – STRUCTURAL CONCRETE

405.1 Description

405.1.1 Scope

This Item shall consist of furnishing, bending, placing and finishing concrete in all structures except pavements in accordance with this Specification and conforming to the lines, grades, and dimensions shown on the Plans. Concrete shall consist of a mixture of Portland Cement, fine aggregate, coarse aggregate, admixture when specified, and water mixed in the proportions specified or approved by the JHMC representative.

405.1.2 Classes and Uses of Concrete

The classes of concrete will generally be used as follows:

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

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

405.2 Material Requirements

405.2.1 Portland Cement

It shall conform to all the requirements of Subsection 311.2.1.

405.2.2 Fine Aggregate

It shall conform to all the requirements of Subsection 311.2.2.

405.2.3 Coarse Aggregate

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

Table 405.1 – Grading Requirements for Coarse Aggregate

Sieve Designation		Mass Percent Passing				
Standard Mm	Alternate US Sieve	Class A	Class B	Class C	Class P	Class Seal
63	2-1/2”		100			
50	2”	100	95 – 100			
37.5	1-1/2”	95 – 100	-			100
25	1”	-	-		100	95 – 100
19.0	¾”	35 – 70	35 – 70	100	95 – 100	-
12.5	½”	-	-	90 – 100	-	25 – 60
9.5	3/8”	10 – 30	10 – 30	-	20 – 55	-
4.75	No.4	0 - 5	- 0 - 5	40 – 70 0 – 15*		0 – 10*

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

405.2.4 Water

It shall conform to the requirements of Subsection 311.2.4

405.2.5 Reinforcing Steel

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

405.2.11 Storage of Cement and Aggregates

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

405.3 Sampling and Testing of Structural Concrete

As work progresses, at least one (1) sample consisting of three (3) concrete cylinder test specimens, 150 x 300mm (6 x 12 inches), shall be taken from each seventy-five (75) cubic meters of each class of concrete or fraction thereof placed each day.

Compliance with the requirements of this Section shall be determined in accordance with the following standard methods of AASHTO:

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

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

Making and curing concrete compressive and flexural tests specimens in the field	T 23
Compressive strength of molded concrete Cylinders	T 22

405.4 Production Requirements

405.4.1 Proportioning and Strength of Structural Concrete

The concrete materials shall be proportioned in accordance with the requirements for each class of concrete as specified in Table 405.2, using the absolute volume method as outlined in the American Concrete Institute (ACI) Standard 211.1. "Recommended Practice for Selecting Proportions for Normal and Heavy weight Concrete". Other methods of proportioning may be employed in the mix design with prior approval of the JHMC representative. The mix shall either be designed or approved by the JHMC representative. A change in the source of materials during the progress of work may necessitate a new mix design.

The strength requirements for each class of concrete shall be as specified in Table 405.2.

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

Class Of Concrete	Minimum Cement Content Per m^3 kg (bag**)	Maximum Water/Cement Ratio kg/kg	Consistency Range in Slump mm (inch)	Designated Size of Coarse Aggregate Square Opening Std. mm	Minimum Compressive Strength of 150x300mm Concrete Cylinder Specimen at 28 days,
A	360 (9 bags)	0.53	50 – 100 (2 – 4)	37.5 – 4.75 (1-1/2" – No. 4)	20.7 (3000)
B	320 (8 bags)	0.58	50 – 100 (2 – 4)	50 – 4.75 (2" – No. 4)	16.5 (2400)
C	380 (9.5 bags)	0.55	100 max. (4 max.)	12.5 – 4.75 (1/2" – No. 4)	20.7 (3000)
P	440 (11 bags)	0.49	100 – 200 (4 - 8)	19.0 – 4.75 (3/4" – No. 4)	37.7 (5000)

* *The measured cement content shall be within plus or minus 2 mass percent of the design cement content.*

** *Based on 40 kg/bag*

405.4.2 Consistency

Concrete shall have a consistency such that it will be workable in the required position. It shall be of such a consistency that it will flow around reinforcing steel but individual particles of the coarse aggregate when isolated shall show a coating of mortar containing its proportionate amount of sand. The consistency of concrete shall be gauged by the ability of the equipment to properly place it and not by the difficulty in mixing and transporting. The quantity of mixing water shall be determined by the JHMC representative and shall not be varied without his consent. Concrete as dry as it is practical to place with the equipment specified shall be used.

405.4.4 Mixing and Delivery

Concrete shall be mixed at the site of construction. Mixing of concrete shall be in accordance with the appropriate requirements of AASHTO M 157.

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

Mixer having a rated capacity of less than a one-bag batch shall not be used. The volume of concrete mixed per batch shall not exceed the mixer's nominal capacity as shown on the manufacturer's standard rating plate on the mixer except that an overload up to 10 percent above the mixer's nominal capacity may be permitted, provided concrete test data for strength, segregation, and uniform consistency are satisfactory and provided no spillage of concrete takes place.

The mixer shall be operated at the drum speed as shown on the manufacturer's name plate on the mixer. Any concrete mixed less than the specified time shall be

discarded and disposed-off by the Contractor at his own expenses.

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

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

1. Mixing Concrete: General

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

All concrete shall be mixed in mechanically operated mixers. The auxiliary supply of concrete shall be sufficient to complete the casting of a section up to a construction joint that will meet the approval of the JHMC representative.

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

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

Materials shall be measured by weighing. The apparatus provided for weighing the aggregates and cement shall be suitably designed and constructed for this purpose.

The accuracy of all weighing devices except that for water shall be such that successive quantities can be measured to within one percent of the desired amounts. The water measuring device shall be accurate to plus or minus 0.5 mass percent. All measuring devices shall be subject to the approval of the JHMC representative. Scales and measuring devices shall be tested at the expense of the Contractor as frequently as the JHMC representative may deem necessary to insure their accuracy.

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

2. Mixing Concrete at Site

Concrete mixers may be of the revolving drum or the revolving blade type and the mixing drum or blades shall be operated uniformly at the mixing speed recommended by the manufacturer. The pick-up and throw-over blades of mixers shall be restored or replaced when any part or section is worn 20mm or more below the original height of the manufacturer's design. Mixers and agitators which have an accumulation of hard concrete or mortar shall not be used.

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

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

The batch shall be so charged into the mixer that some water will enter in advance of cement and aggregate. All water shall be in the drum by the end of the first quarter of the specified mixing time.

Cement shall be batched and charged into the mixer so that it will not result in loss of cement due to the effect of wind, or in accumulation of cement on surface of conveyors or hoppers, or in other conditions which reduce or vary the required quantity of cement in the concrete mixture.

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

All concrete shall be mixed for a period of not less than 1-1/2 minutes after all materials, including water, are in the mixer. During the period of mixing, the mixer shall operate at the speed for which it has been designed.

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

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

405.5 Method of Measurement

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

405.6 Basis of Payment

The accepted quantities, measured as prescribed in Section 405.5, shall be paid for at the contract unit price for each of the Pay Item listed below that is included in the Bill of Quantities.

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

ITEM 411 - PAINT

411.1 Description

This Item shall consist of furnishing and applying all paint materials including vehicles, pigments, pastes, driers, thinners and mixed paints for steel and wooden structures; sampling, testing and packing; preparation of the surface and application of paint to structures.

411.2 Materials Requirements

411.2.1 General

Paint, except aluminum paint, shall consist of pigments of the required fineness and composition ground to the desired consistency in linseed oil in a suitable grinding machine, to which shall be added additional oil, thinner and drier as required.

Aluminum paint shall consist of aluminum powder or paste of the required fineness and composition to which shall be added the specified amount of vehicle.

The paint shall be furnished for use in ready mixed, paste or powder form

All paints shall meet the following general requirements:

1. The paint shall show no excessive settling and shall easily redisperse with a paddle to a smooth, homogeneous state. The paint shall show no curdling, livering, caking or color separation and shall be free from lumps and skins.

2. The paint as received shall brush easily, possess good leveling properties and shall show no running or sagging when applied to a smooth vertical surface.

3. The paint shall dry to a smooth uniform finish, free from roughness grit, unevenness and other imperfections.

4. The paint shall not skin within 48 hours in a ¾ filled tightly closed container.

411.2.2 The paint shall conform to the requirements of the Specifications indicated as follows:

Ready Mixed Red Lead Paint	AASHTO M 72 and **PNS**
Aluminum Paint	Type I, II, Ill & IV MSHTO M 69 and PNS Typel&II
White & Tinted Ready Mixed Paint	MSHTO M 70
Foliage Green Bridge Paint	MSHTO M 67
Black Paint for Bridges and Timber Structures	MSHTO M 68
Basic Lead-Silica-Chromate Ready Mixed Primer Ready Mixed Aluminum Paint	MSHTO M 229 AASHTO M 260 and PNS

411.2.3 Drier

This Specification covers both straight oil drier (material free from resins and gums), and Japan drier (material containing varnish gums). The drier shall be composed of lead manganese or cobalt or a mixture of any of these elements, combined with a suitable fatty oil, with or without resins or gums, and mineral spirits or turpentine, or a mixture of these solvents. The drier shall conform to the following requirements:

1. Appearance - Free from sediment and suspended matter.

2. Flash Point- (Tag Close Up) Not less than 30°C.

3. Elasticity - The drier when flowed on metal and baked for 2 hours at 100°C shall have an elastic film.
4. Drying - It shall mix with pure raw linseed oil in the proportion of 1 volume of drier to 19 volume of oil without curdling and the resulting mixture when flowed on glass shall dry in not more than 18 hours.
5. Color - When mixed with pure, raw linseed oil in the proportion of 1 volume of drier to 8 volume of oil, the resulting mixture shall be darker than a solution of 6 grams of Potassium Dichromate in 13 cc of pure Sulfuric Acid (sp.gr. 1.84).

411.3 Construction Requirements

411.3.1 Proportion of Mixing

It is the intent of this Specification to provide a paint of proper brushing consistency, which will not run, steak or sag and which will have satisfactory drying qualities.

411.3.2 Aluminum Paint, Field Coats on Structural Steel

The paint shall be mixed in the proportion of 240 grams of aluminum powder or paste per liter of vehicle of long oil spar varnish. This makes a paint containing 21 percent pigment and 79 percent vehicle. The weighed amount of powder or paste shall be placed in a suitable mixing container and the measured volume of vehicle poured over it. The paste or powder shall be incorporated in the paint by vigorous stirring with a paddle. The powder or paste will readily disperse in the vehicle. Before removing any paint from the container, the paint shall be thoroughly stirred to insure a uniform mixture, and the paint shall be suitably stirred during use. The paint shall be mixed on the job and only enough for one day's use shall be mixed at one time.

When two field coats of aluminum paint are specified, the first coat shall be tinted with lampblack paste or Prussian blue paste in the quantity of 240 grams/liter of paint. The exact quantity used shall be sufficient to give a contrast in color which can be readily distinguished. When three field coats of aluminum paint are specified, the second coat shall be tinted.

411.3.3 Aluminum Paint, Field Coats on Creosoted Timber

The paint shall be mixed as specified for Aluminum Paint for Structural Steel except that the proportions shall be 270 grams of aluminum powder or paste to one liter of vehicle.

Other paint composition may be used when and as stipulated in the Special Provisions.

411.3.4 Containers and Markings

All paints shall be shipped to strong substantial containers plainly marked with the weight, color and volume in liters of the paint content, a true statement of the percentage composition of the pigment, the proportions of the pigment to vehicle, the name and address of the manufacturers, and the stencil of the authorized inspecting agency. Any package or container not so marked will not be accepted for use.

411.3.5 Sampling and Testing

Method of sampling shall be as follows:

1. One 20-liter can sample in original unopened container shall be obtained for 100 cans of the delivered material or 10% fraction thereof.

2. One 4-liter can sample in original unopened container shall be obtained for every 100 cans or fraction thereof of the delivered material.

Methods of testing will be in accordance with the applicable AASHTO or ASTM Methods.

411.3.6 Painting

The painting of structure shall include the proper preparation of the surface; the application, protection and drying of the paint coatings, the protection of the pedestrians, vehicular or other traffic upon or underneath the structures, the protection of all parts of the structure (both superstructure and substructure) against disfigurement by spatters, splashes and smirches of paint or of paint materials; and the supplying of all tools, tackle, scaffolding, labor, paint and materials necessary for the entire work.

Paint shall not be applied during rain, storms or when the air is misty, or when, in the opinion of the Engineer, conditions are otherwise unsatisfactory for the work. Paint shall not be applied upon damp surfaces or upon metal which has absorbed heat sufficient to cause the paint to blister and produce a pervious paint film.

No wide flat brush shall be used. All brushes preferably shall be either round or oval but if flat brushes are used, they shall not exceed 100 mm in width.

The paint when applied shall be so manipulated as to produce a uniform even coating in close contact with the surface being painted, and shall be worked into all corners and crevices.

On surfaces inaccessible to brushes, the paint shall be applied by spray gun or with sheepskin daubers specially constructed for the purposes.

Paint shall be thoroughly stirred, preferably by means of mechanical mixers, before being removed from the containers, and, to keep the pigments in suspension, shall be kept stirred while being applied.

When a paint gun is used, the equipment used shall be of an approved type and shall have provision for agitation of paint in the spray container. In the case of aluminum paint, the pressure used shall be only that necessary to secure adequate atomization. If in the opinion of the Engineer unsatisfactory results are obtained from the use of a spray gun, its use shall be discontinued and the painting completed by the use of brushes.

411.3.6.2 Painting Structural Steel

Surfaces of metals to be painted shall be thoroughly cleaned of rust , loose mill, scale, dirt, oil or grease, and other foreign substances. Unless cleaning is to be done by sandblasting , all weld areas, before cleaning is begun, shall be neutralized with a proper chemical, after which they shall be thoroughly rinsed with water. Cleaning may be by any of the following three methods:

1. Hand Cleaning

The removal of rust, scale and dirt shall be done by the use of metal brushes, scrapers, chisels, hammers or other effective means. Oil and grease shall be removed by the use of gasoline or benzene. Bristle or wood fiber brushes shall be used for removing loose dust.

2. Sandblasting

Sandblasting shall remove all scale and other substances down to the base metal. Special attention shall be given to the cleaning of corners and reentrant angles. Before painting, sand adhering to the steel in corners and elsewhere shall be removed. The cleaning shall be approved by the Engineer prior to any painting. The material shall be painted before the rust forms and not later than 2 hours after cleaning.

3. Flame Cleaning

Oil and grease shall be removed by washing with suitable solvent. Excess solvent shall be wiped from the work before proceeding with subsequent operation. The surface to be painted shall be cleaned and dehydrated (freed of occluded moisture) by the passage of oxyacetylene flames which have an oxygen to acetylene of at least one. The inner cones of these flames shall have a ratio length to port diameter of at least 8 and shall not be more than 4 mm center to center. The oxyacetylene flames shall be traversed over the surface of the steel in such manner and at such speed that the surface is dehydrated, and dirt, rust, loose scale, scale in the form of blisters or scabs , and similar foreign matter are freed by the rapid intense heating by the flames. The flames shall not be traversed so slowly that loose scale or other foreign matter is fused to the surface of the steel. The number, arrangement and manipulation of the flames shall be such that all parts of the surface are adequately cleaned and dehydrated. Promptly after the application of the flames, the surface of the steel shall be wire-brushed, hand scraped wherever necessary and then swept and dusted to remove all free materials and foreign particles. Compressed air shall not be used for this operation. Paint shall be applied promptly after the steel has been cleaned and while the temperature of the steel is still above that of the surrounding atmosphere, so that there will be no recondensation of moisture on the cleaned surfaces.

4. Shop Painting of Structural Steel

When all fabrication work is completed and has been tentatively accepted, all surfaces not painted before assembling shall be given two coats of Red Lead Shop Paint conforming to the requirements of this Specification. (The inside of top chords for trusses and laced members or inaccessible parts, except contact surfaces, may be painted before assembling). Shipping pieces shall not be located for shipment until thoroughly dry. No painting shall be done after loading the materials on transport vehicles.

Erection marks for field identifications of members shall be painted upon previously painted surfaces.

With the exception of abutting joints and base plates, machine-finished surface shall be coated, as soon as practicable after acceptance with a hot mixture of white lead and tallow before removal from the shop. The composition used for coating machine-finished surface shall be mixed in the following proportions:

Pure Tallow Pure White Lead	1,915 grams

5. Field Painting of Structural Steel

When the erection work is complete including riveting and straightening of bent metal; all adhering rust, scale, dirt, grease or other foreign material shall be removed as specified under cleaning of surfaces.

As soon as the Engineer has examined and approved all field rivets, the heads of such rivets and field bolts, all welds and any surfaces from which the shop coat of paint has become worn off or has otherwise become defective, shall be cleaned and thoroughly covered with one coat of shop coat paint.

When the paint applied for "touching up" rivet heads and abraded surfaces has become thoroughly dry, such field coats as called for shall be applied. In no case shall a succeeding coat be applied until the previous coat has dried throughout the full thickness of the film. All small cracks and cavities which were not sealed in water-tight manner by the first field coat shall be filled with a pasty mixture of red lead and linseed oil before the second field coat is applied.

The following provisions shall apply to the application of all field coats. To secure a maximum coating on edges of plates ors hapes, rivet heads and other parts subjected to special wear and attack, these parts shall first be stripped, followed immediately by the general painting of the whole surface, including the edges and rivet heads.

The application of the final coats shall be deferred until adjoining concrete work has been placed and finished. If concreting operations have damaged that paint, the surface shall be recleaned and repainted.

411.3.6.4 Painting Galvanized Surface

For the purpose of conditioning the surface of galvanized surfaces to be painted, the painting shall be deferred as long as possible in order that the surface may weather.

Before painting galvanized surfaces they shall be treated as follows:

1. In 4 liters of soft water, dissolve 60 ml of copper chloride, copper nitrate, and sal ammonia, then add 60 ml of commercial muriatic acid. This should be done in earthenware or glass vessel, never in tin or other metal receptacle. Apply the solution with a wide flat brush to the galvanized surface, when it will assume a

dark almost black color which on drying
becomes a grayish film.

2. The surfaces, when dry, may then be painted as described.

411.3.6.5 Repainting Existing Structures

When called for on the Plans or in the Special Provisions, existing structures shall be given the number and kind of coats of field paint as stipulated. The surface to be repainted shall be cleaned as specified under Subsection 411.3.6.2, Painting Structural Steel, with the added provisions that all dead or loose paint shall be removed by scraping, chipping, or brushing as may be necessary. Timber railings, name plates, planking and other interfering parts shall be removed before cleaning is begun and shall be replaced after the painting has been completed and the last coat has thoroughly dried. The application of the coat shall be as specified under Subsection 411.3.6.2, (5), Field Painting of Structural Steel.

411.4 Measurement and Payment

Painting shall not be measured and paid for separately, but the cost thereof shall be considered as included in the contract unit price of the Items where called for.

ITEM 604 - FENCING

604.1 Description

This Item shall consist of furnishing and constructing posts and barbed wire or chain link fences in accordance with the details and at the locations, shown on the Plans, or as required by the Engineer.

604.2 Material Requirement

604.2.1 Steel Post

Steel posts shall be of the sections and length as specified or as shown on the Plans. The posts shall be copper bearing steel and shall conform to the requirements of MSHTO M 183 for the grade specified.

604.2.2 Steel Reinforcement

Steel reinforcement for concrete posts shall be deformed steel bars conforming to the provisions of Item 404, Reinforcing Steel.

604.2.3 Hardwares

Nuts, bolts, washers and other associated hardware shall be galvanized after fabrication as specified in ASTM A 153.

604.3 Construction Requirements

The Contractor shall perform such clearing and grubbing as may be necessary to construct the fence to the required grade and alignment. Fence shall generally follow the contour of the ground. Grading shall be performed where necessary to provide a neat appearance.

Gates shall be constructed as shown on the Plans

604.3.1 Erection of Post

The post shall be erected vertically in position inside the formwork of the foundation block prior to the placing of concrete and shall be adequately supported by bracing to prevent movement of the post during the placing and setting of the concrete. The posts shall be erected to the height and location shown on the Plans, or as ordered by
the Engineer.

604.1 Method of Measurement

The quantity to be paid for shall be the number of linear meters measured center to center of posts of fencing erected in place and
accepted.

604.2 Basis of Payment

The quantity, as determined in Section 604.4, Method of Measurement, shall be paid for the contract price per unit of measurement respectively for each of the particular items listed below and as shown in the Bid Schedule, which price and payment shall be full compensation for furnishing and placing all materials and for all labor, equipment, tools and incidentals necessary to complete the Item

ITEM 807- SITE DEVELOPMENT

807.1 Description

This Item shall consist of furnishing and installation as per approved Plans of the complete site development work consisting of excavation, turfing, planting, mowing, carpentry works, plumbing, electrical works, delivery of materials and other labor necessary for the completion of the project.

807.2 Material and Construction Requirements
807.2.1 Softscape Specification
807.2.1.1 Turfing
807.2.1.1.1 Preparation

The areas to be turfed shall be completely cleared of all builders' debris, large stones and other obstructions.

The planting area shall be cultivated to an average depth of 150mm. Where the ground is clay, hardpan, sun baked earth or other impervious materials, it shall be ploughed or scarified to a minimum depth of 150mm to reduce to granular material of sizes not exceeding 75mm.

The ground shall be later finished by lightly rolling with roller not exceeding 136 kgs in weight. Rolling shall only be done when the formation is dry.

807.2.1.1.2 Trimming and Levelling

Before spreading the top soil the ground of filled earth must be trimmed and levelled. In case of banks, the edge must be trimmed off to a curve to allow the grass to be cut with a motor mower.

807.2.1.1.3 Turfing Existing Ground

Where existing ground is to be turfed, mounds shall be levelled and depressions, holes, channels, etc., shall be filled-in to the general level of the area or to the levels shown on the Plans.

807.2.1.1.4 Garden Soil (Top Soil)

The top soil is to be selected vegetable garden soil, free from roots, weeds and any unnecessary hard granular material. Top soil shall be spread and levelled over the whole area to be turfed to form an even layer of 50 mm (consolidated thickness). The Contractor shall submit a sample of the top soil to the Architect/ Engineer for approval before application.

807.2.2. Softscape Maintenance

807.2.3. Nursing and Watering

It is the Contractor's responsibility to ensure that the grass is properly nursed and tended until fully established, including watering as necessary during dry periods. Any grass which fails to flourish shall be replaced at the Contractor's expense until the grassess survive independently.

807.2.4. Weeding

Keep all planting areas free from weeds and undesirable grasses, by a method and by materials approved/ permitted by the Architect/ Engineer.

807.2.5. Planting

Plant holes shall be excavated at a minimum of twice the size of the volume of the pot size specified in the Plans.

Plants shall be provided with the following characteristics:

a) Large healthy root systems, with no evidence of root curl, restriction or damage;
b) Vigorous, well established, free from disease and pests, of good form consistent with the species or variety; and

c) Hardened off, not soft or forced, and suitable for planting in the natural climatic conditions prevailing at the site.

Trees which, unless required to be multi-stemmed, have a single leading shoot shall be provided.

At least one plant shall be labelled of each species or variety in a batch using a durable, readable tag.

Planting shall be carried out on the same day that plants are delivered to the site. Plants shall not be planted in unsuitable weather conditions such as extreme heat, cold, wind or rain. In other than sandy soils, excavation shall be suspended when the soil is wet.

Plants shall be watered thoroughly before planting and immediately after planting.

807.2.6. Completion of Planting

Maintenance manual shall be provided which includes notes and specifications of all landscape and irrigation work and recommendations for on-going maintenance work.

807.2.7.Plant Establishment

The planted areas shall be maintained for a minimum of 13 weeks from the time of practical completion. Damaged, stolen or vandalized stock shall be replaced as required and at the expense of the Contractor. For all other work including irrigation and hardworks, the contractual provisions for defects liability period shall apply.

807.2.8.Trees and Shrubs

Specifications for the trees and shrubs to be used in the project shall be specified in detail in the Plans. The Architect/ Engineer shall inspect whether the delivered trees and shrubs are approved based on physical features and the capacity of the trees and shrubs to survive after planting.

Specifications and procedures for establishing trees and shrubs shall be submitted by the Contractor prior to planting. Fertilization, mulching, staking, establishment and irrigation shall be indicated on the procedures.

807.2.9.Fences

807.2.10 Steel Fences

Steel fence materials (such as angular, tubular and rod/ rectangular steel bars) shall conform to the applicable requirements of PNS 49 and ASTM A 36 • Standard Specification for Carbon Structural Steel.

807.3 Method of Measurements

All the units installed shall be measured and determined by the number of units approved by and ready for service as provided in the Bill of Materials and Quantities accepted to the satisfaction of the Architect/ Engineer.

807.4 Basis of Payment

The items measured and determined as provided in subsection 807.3 - Method of Measurements shall be paid for at the unit bid price which payment constitute full compensation of materials, labor, and incidentals necessary to complete this Item.

DPWH STANDARD SPECIFICATION AND MINIMUM TEST REQUIREMENTS

TABLE OF CONTENT

Sample is **50kg** for Routinary Test, Moisture Density Relation and CBR and **20kg** for Classification, 1 Laboratory Compaction Test

5 For every **2500 cu.m or fraction thereof**, Material passing 19mm (3/4") sieve shall have a soaked CBR **= 80% min** obtain at MDD

6 Filler shall be free from hard lumps and **not more than 15%** retain on 4.75mm (no.4)

7 Required thickness when compacted is **150mm max. per one layer**, At least one group of three in situ FDT should be conducted in Trial Section for about **500 sq.m or fraction thereof** per material or procedure, Result of compaction shall have **100% MDD min.** (FDT result)

202 Crushed Aggregate Base Course

1 Sample Test for grading and plasticity test (for every **300 cu.m or fraction thereof**)
- A Fraction passing the 0.075 (no.200) sieve < 2/3 fraction passing 0.425mm (No.40)
- B Fraction passing 0.425mm (no.40) shall have **LL = 25% max, PI = 6% max**

2 For every **1500 cu.m or fraction thereof**, 1 Laboratory Compaction Test and coarse portion retain on a.2.00 mm (no.10) sieve shall have a mass percent of wear (abrasion loss)**45% max** by Los Angeles Abrasion Test, **not less than 50%** mass shall have at least 1 fracture face, Sample is 50kg for Routinary Test, Moisture Density Relation and CBR and **20kg** for Classification, 1 Laboratory Compaction Test

5 Material passing 19mm (3/4") sieve shall have a soaked CBR **= 80% min** obtain at MDD

6 Filler shall be free from hard lumps and **not more than 15%** retain on 4.75mm (no.4)

7 Result of compaction shall have **100% MDD** min.

8 Trial Section for about **500 sq.m** per material or procedure

203 Lime Stabilized Roadmix Aggregate Base Course

1 Sample Test for grading and plasticity test (for every **300 cu.m or fraction thereof**)
- A Soil Aggregate Fraction passing **4.75mm (no.4)** shall have **PI = 4% to 10% only**
- B 1 Laboratory Compaction Test (Proctor Test)
- C Unconfined Compression Test (UCT) molded and compacted **must not be less than 2.1 Mpa (300psi) at 100% MDD**
- D Mixture passing 19mm (3/4") sieve shall have a soaked CBR **= 100% min** obtain at MDD

2 Soil Aggregate. For every **1500 cu.m or fraction thereof,mass percent of wear (abrasion loss) 50% max** Sample is 50kg for Routinary Test, Moisture Density Relation and CBR and 20kg for Classification, 1 Laboratory Compaction Test

3 **Lime 3% to 12%** mass percent of dry soil

4 For every **150m or fraction thereof** and @ **150mm** layer compacted depth
- A **100% min** MDD must be attain (FDT)
- B 1 Thickness Determination

5 For every **100t or fraction thereof, 1 Quality Test** should be conducted

6 If lime slurry is employed the typical ratio is **1 tonne lime to 2 cu.m water**

7 Curing Period (at least **5 days** of protection)
Different Methods
- A maintain moist condition by **sprinkling water**
- B cover **50mm** of sand or earth and maintain moist condition
- C apply on surface **asphalt membrane** of the type and qty approved by the Engr.
- D apply on surface **liquid membrane curing compund** of the type and qty approved by the Engr.

8 Trial Section must be at **least 2 weeks** before actual execution of work

9 Trial Section for about **500 sq.m** per material or procedure

204 Portland Cement Stabilized Aggregate Base Course

1 Sample Test for grading and plasticity test (for every **300 cu.m or fraction thereof**)
- A Soil Aggregate Fraction passing **4.75mm (no.4)** shall have **PI = 4% to 10% only**
- B 1 Laboratory Compaction Test (Proctor Test)
- C Unconfined Compression Test (UCT) molded and compacted **must not be less than 2.1 Mpa (300psi) at 100% MDD**
- D Mixture passing 19mm (3/4") sieve shall have a soaked CBR **= 100% min** obtain at MDD

2 Soil Aggregate. For every **1500 cu.m or fraction thereof,mass percent of wear (abrasion loss) 50% max** Sample is **50kg** for Routinary Test, Moisture Density Relation and CBR and **20kg** for Classification

3 **Cement. 6% to 10%** mass percent of dry soil

4 For every **150m or fraction thereof** and @ **150mm** layer compacted depth
- A **100% min** MDD must be attain (FDT)
- B 1 Thickness Determination

5 For every **2000 bags or fraction thereof** of cement, **1 (10kg) Quality Test** should be conducted

5 If portland cement slurry is employed the typical ratio is **1 tonne portland cement to 2 cu.m water**

7 Curing Period (at least **5 days** of protection)
Different Methods
- A maintain moist condition by **sprinkling water**
- B cover **50mm** of sand or earth and maintain moist condition
- C apply on surface **asphalt membrane** of the type and qty approved by the Engr.
- D apply on surface **liquid membrane curing compund** of the type and qty approved by the Engr.

8 Trial Section must be at **least 2 weeks** before actual execution of work

9 Trial Section for about **500 sq.m** per material or procedure

205 Asphalt Stabilized Aggregate Base Course

1 Sample Test for grading and plasticity test (for every **300 cu.m or fraction thereof**)

- A Soil Aggregate Fraction passing **4.75mm (no.4)** shall have **PI = 4% to 10% only**
- B 1 Laboratory Compaction Test (Proctor Test)
- C Unconfined Compression Test (UCT) molded and compacted **must not be less than 2.1 Mpa (300psi)** at **100% MDD**
- D Mixture passing 19mm (3/4") sieve shall have a soaked CBR **= 100% min** obtain at MDD

2 Soil Aggregate. For every **1500 cu.m or fraction thereof,mass percent of wear (abrasion loss) 50% max** Sample is **50kg** for Routinary Test, Moisture Density Relation and CBR and **20kg** for Classification

3 Asphaltic Material
- A shall be **Anionic or Cationic Emulsified Asphalt**
- B **4% to 7%** mass percent of dry soil

4 For every **150m or fraction thereof** and **@ 150mm** layer compacted depth
- A **100% min** MDD must be attain (FDT)
- B 1 Thickness Determination

5 For every **40t or 200drums or fraction thereof** of emulsified asphalt, **1 Quality Test (5 liters)** should be conducted

6 Trial Section for about **500 sq.m** per material or procedure

206 Portland Cement Treated Plant Mix Base Course

1 Sample Test for grading and plasticity test (for every **300 cu.m or fraction thereof)**
- A Soil Aggregate Fraction passing **4.75mm (no.4)** shall have **PI = 4% to 10% only**
- B 1 Laboratory Compaction Test (Proctor Test)
- C Unconfined Compression Test (UCT) molded and compacted **must not be less than 2.1 Mpa (300psi)** at **100% MDD**
- D Mixture passing 19mm (3/4") sieve shall have a soaked CBR **= 100% min** obtain at MDD

2 Soil Aggregate. For every **1500 cu.m or fraction thereof,mass percent of wear (abrasion loss) 50% max** Sample is **50kg** for Routinary Test, Moisture Density Relation and CBR and **20kg** for Classification

3 **Cement. 6% to 10%** mass percent of dry soil

4 For every **150m or fraction thereof** and **@ 150mm** layer compacted depth
- A **100% min** MDD must be attain (FDT)
- B 1 Thickness Determination

5 For every **2000 bags or fraction thereof** of cement, **1 Quality Test (10 kgs.)** should be conducted
Trial Section must be at **least 2 weeks** before actual execution of work

6 Method
- A **Travel Plant Method**
- A.1 Soil Aggregate shall be pulverized until **at least 80%** pass 4.75mm (no.4) except for gravel & stone
- A.2 **Any Material** Retained on 50mm (2") sieve shall be removed
- A.3 **Max 2hrs.** Shall be permitted for wet mixing, lay down and finishing
- B **Central Plant Method**

7 no more than **60mins.** Elapsed from the start of mixing and the time start of compaction

8 Curing Compund.. **Bituminous Curing Seal,** applied **0.5 L/m^2 to 1 L/m^2** of surface, maintain **at least 5 days**

207 Aggregate Stockpile

Part E SURFACE COURSE

Item No.

300 Surface Aggregate Course

1 Sample Test for grading and plasticity test (for every **300 cu.m or fraction thereof)**
- A Fraction passing the 0.075 (no.200) sieve < 2/3 fraction passing 0.425mm (No.40)
- B Fraction passing 0.425mm (no.40) shall have **LL = 35% max, PI = range from 4% to 9%**

2 For every **1500 cu.m or fraction thereof**, Sample is **50kg** for Routinary Test, Moisture Density Relation and CBR and 20kg for Classification
- A 1 Laboratory Compaction Test (Proctor Test)
- B The coarse portion retain on a.2.00 mm (no.10) sieve shall have a**mass percent of wear 45% max** by Los Angeles Abrasion Test

3 Required thickness when compacted is **150mm max. per one layer**, At least one group of three in situ FDT should be conducted in Trial Section for about **500 sq.m or fraction thereof** per material or procedure, Result of compaction shall have **100% MDD min.** (FDT result)

4 When crushed aggregate is used,
- A For every 1500 cu.m or fraction thereof, 50% min of particle retain on 4.75mm (no.4) shall have at least 1 fractured face
- B Soak CBR value at MDD, **25%min** for gravel surface course and **80%min** for crushed aggregate surface course

301 Bituminous Prime Coat

1 Definition. Application of low viscosity cutback to an absoerbent surface. It is used only on untreated base prior to placement of asphalt pavement.

2 Material shall either be **Rapid Curing (RC)** or **Medium Curing (MC)** Cut-Back Asphalt

3 Equipment used must be a pressure distributor w/ cap. **1000 lit. min.** w/ a heating device attached to a tank able to heat up to 150 $^{\circ}$C

4 Bituminous Material shall be applied **1 to 2 liters per sq.m**

5 It shall be left undisturbed at least **24 hours.**

6 Conduct 1 **(5 liters)** Quality Test for every **40t or 200 drums or fraction thereof**

7 It shall be applied only to dry surface or slightly moist. Also applied for newly pavement as in on top of well graded and compacted base course

DPWH STANDARD SPECIFICATION AND MINIMUM TEST REQUIREMENTS

TABLE OF CONTENT

302 Bituminous Tack Coat

1. Tack coat serve as a **bonding** b/n the new asphalt to the existing one. Tack coat is applied on existing asphalt or concrete pavement. The new asphalt can be laid when the coat is already **sticky.**
2. Material shall either be **Rapid Curing (RC) Cut-Back Asphalt** or **Emulsified Asphalt** (Cationic or Anionic)
3. Bituminous Material shall be applied **0.2 to 0.7 liters per sq.m**
4. Conduct 1 **(5 liters)** Quality Test for every **40t or 200 drums or fraction thereof**

303 Bituminous Seal Coat

1. Serve as a **preservation** of asphalt **original color, protect from the sunlight and water**. This may also be used in existing bituminous surface with or w/o application of **aggregates.**
2.

	Type 1	Type 2	Type 3
Bituminous Material, L/sq.m	0.2 - 0.5	0.5 - 1	0.85 - 1.5
Cover Aggregate, kg/sq.m	none	5 - 10	8 - 14

3. Bituminous Material shall be Asphalt Cement, Penetration Grade **120-150**, and Cut-back Asphalt (Rapid Curing or Medium Curing)
4. Cover Aggregate for Type 2 consist of **sand and fine aggregate** while Type 3 consist of **crushed stone, crushed gravel or crushed slag**
5. **Cover Aggregate. 75 cu.m or 200t or fraction thereof,** 1 grading test. For abrasion test, shall have a mass percen of wear (abrasion loss) **40%max**
6. If crushed slag is used in cover aggregate the density must be **960 kg/cu.m (60 lbs/ cu.ft.)** min.
7. Seal coat shall be applied **10 days min.** on compacted bituminous, except if instructed by the Engineer
8. Bituminous Material shall be applied by pressure distributor at the rate of **0.9 to 1.8 lit/sq.m** for asphalt cement and **1.5 to 3.0 lit/sq.m** for cut-back asphalt
9. Cover Aggregate shall be spread at the rate of **0.004 to 0.007 cu.m/sq.m**
10. For bituminous material, **40t or 200 drums** or fraction thereof, **1 (5 liters) quality test** shoul be conducted

304 Bituminous Surface Treatment

1. Single Surface Treatment (SST) - single application of bituminous material and single spread of aggregate
   Double Surface Treatment (SST) - double application of bituminous material and single spread of aggregate
2. Bulk Specific Gravity of aggregates must be **2.55 to 2.75**, If not met proportionate correction must conduct until it reaches 2.65
5. If crushed slag is used in cover aggregate the density must be **960 kg/cu.m (60 lbs/ cu.ft.)** min.
6. Asphaltic Material shall be applied at **least 24 hours** after surface had been prime coated
7. **Cut-back asphalt or asphalt cement** shall be applied on dry surface, while **Emulsified Asphalt** on moist surface
8. Spray should commence if road temperature is **20 °C min.**
9. Sprayed surface must be covered immediately by aggregate **2 minutes max.**
10. Until the asphaltic has not set yet vehicles must only travel at a speed of **40km/hr.max** and all all vehicles must not be allowed to turn around
11. For Aggregates
    - A For every **75 cu.m or 200t or fraction thereof,** 1 Grading test
    - B For every **1500 cu.m or fraction thereof**, should have a mass percent of wear (abrasion loss) **40%max.** When crushed gravel is used, **50% min** of particle retain on 4.75mm (no.4) shall have at **least 1 fracture face,** Sample is **50kg** for Routinary Test, Moisture Density Relation and CBR and **20kg** for Classification
12. For Bituminous Material
    - A When using cut-back asphalt, asphalt cement or emulsified asphalt - **1.58 to 2.04 L/sq.m**
    - B One quality test for **40t or 200 drums or fraction thereof**

305 Bituminous Penetration Macadam Pavement - consists of placing one or more aggregate and one or more bituminous material followed by a seal coat w/ cover aggregate

1. Bulk Specific Gravity of aggregates must be **2.55 to 2.75**, If not met proportionate correction must conduct until it reaches **2.65**
2. bituminous material shall be made only when aggregate is dry and atmospheric temp. in the shade is **15 °C min**
3. prior to application of bituminous material the aggregate layer will be tested by the Engineer using a **3m straight edge** at selected location, variation shall not exceed **10mm max**
4. For Aggregates
    - A For every **75 cu.m or 200t or fraction thereof,** 1 Grading test
    - B For every **1500 cu.m or fraction thereof**, should have a mass percent of wear (abrasion loss) **40%max.** When crushed gravel is used, **50% min** of particle retain on 4.75mm (no.4) shall have at **least 1 fracture face.** When crushed gravel is subjected to five cycles of sodium sulfate soundness test, the weight shall **12%max** (soundness loss), Sample is **50kg** for Routinary Test, Moisture Density Relation and CBR and for Classification
    - C If crushed slag is used in aggregate the density must be **1120 kg/cu.m (70 lbs/ cu.ft.)** min.
5. For Bituminous Material
    - A Quantity **7.20 to 11.00 L/sq.m**
    - B One **(5 liters)** quality test for **40t or 200 drums or fraction thereof**

306 Bituminous Road Mix Surface Course (Mixed in Place Construction)

1. Procedure. The aggregate should be place first to the surface the spray the bituminous material (either cutback asp or emulsified asphalt). Spraying may be done in **150°C to 200°C.** Then initial roll using pneumatic roller with a force **80 psi.** Final rolling is done by **three wheel or tandem type steel wheel roller (temp of 220 to 225°C),** travelling **5km per hour not less. than 10 tons** to eliminate roller marks and a minimun of **95 mass percent** of the density at

laboratory compacted. **Rolling is done from the side toward the center,** so the asphalt will be confined in the pavement and not spread toward the shoulder. An area of **500 sq.m** is to be prepared as trial section for asphalt pavement. The surface of the asphalt pavement will be allowed a toleranceof **6mm** using **3m straight edge.** When tar is used **66 to 107°C** temperature is maintained during construction.

2 Any salvaged aggregate appearing in the surface of lay down and finishing appearing not passing **37.5mm (1 1/2")** sieve shall be removed.

3 Bituminous material on the basis of dry aggregate, **4.5% to 7%** mass percent when using cut-back asphalt and **6% to 10%** mass percent when using emulsified asphalt.

4 During mixing operation, **0.5% to 1%** mass percent of hydrated lime, dry aggregate basis, shall be added lower percentage limit is applicable to aggregate which are predominantly calcareous.

5 When the compacted thickness of the roadmix surface is to be **more than 50mm (2")**, the mixture shall be spread and compacted **two 2 layers**

6 For Aggregates
- A For every **75 cu.m or 200t or fraction thereof,** 1 Grading test
- B For every **1500 cu.m or fraction thereof**, should have a mass percent of wear (abrasion loss) **40%max.** When crushed gravel is used, **50% min** of particle retain on 4.75mm (no.4) shall have at **least 1 fractured face.** When crushed gravel is subjected to five cycles of sodium sulfate soundness test, the weight shall be **12% max** (soundness loss), Sample is **50kg** for Routinary Test, Moisture Density Relation and CBR and **20k** for Classification

7 For Bituminous Material
- A **4.5% to 7%** mass percent of dry soil aggregate if using cutback asphalt
- B **6% to 10%** mass percent of dry soil aggregate if using emulsified asphalt
- C One **(5 liters)** quality test for **40t or 200 drums or fraction thereof**

307 Bituminous Plant Mix Surface Course General

1 The bituminous mixture shall be composed of **aggregate, mineral filler, hydrated lime, and bituminous material**

2 At **least three weeks** prior to production, Contractor shall submit a job-mix formula for Egineer' approval.

3 Job Mix Formula consists of single values for
- A percentage of aggregate in each sieve
- B percentage of bituminous material to be added
- C temperature of mixture delilvered on the road
- D kind and percentage of additive to be used
- E kind and percentage of mineral filler to be used

4 All mixture furnished for the project shall conform within the range of tolerances
- A passing no. 4 and larger sieve ± 7%
- B passing no. 8 to no.100 sieve ± 4%
- C passing no. 200 sieve ± 2%
- D bituminous material ± 0.4%
- E temperature of mixture ± 10°C

5 For aggregates
- A For every **75 cu.m or 200t or fraction thereof, 1 grading test** and **PI = 4.0% max**
- B For every **1500 cu.m or fraction thereof**, should have a mass percent of wear (abrasion loss) **40%max.** When crushed gravel is used, **50% min** of particle retain on 4.75mm (no.4) shall have at **least 1 fractured face.** When crushed gravel is subjected to five cycles of sodium sulfate soundness test, the weight shall be **12% max** (soundness loss),Sample is **50kg** for Routinary Test, Moisture Density Relation and CBR and **20k** for Classification

6 For Bituminous Material
- A Proportion of bituminous material, on the basis of dry aggregate, shall be from **5% to 8%** mass percent
- B One **(5 liters)** quality test for **40t or 200 drums or fraction thereof**
- C 2 types of **bitumen** that are commonly used are **tar** (viscous liquid obtain from distillation of coal or wood) and **petroleum asphalt** (are products of the distillation of crude oil). (**3 major petroleum asphalt** produced is asphalt cement, emulsified asphalt, and cutback asphalt)
- D commonly used bituminous material is **Asphalt Cement (AC). Asphalt cement** is also called **hot asphalt.** Asphalt cement is **refined asphalt** or **combination of refined asphalt and flux oil**

7 For Hydrated Lime
- A For every **100t or fraction thereof,** conduct 1 grading test and 1 plasticity test
- B During mixing operation, **0.5% to 1%** mass percent of hydrated lime, dry aggregate basis, shall be added lower percentage limit is applicable to aggregate which are predominantly calcareous.

8 During mixture, for every **75 cu.m or 130mt** or fraction thereof
- A The mixture shall have a minimum compressive strength of **1.4 Mpa (200psi)**
- B The mixture shall have a mass percent air voids with the range of **3 to 5**
- C For aggregates having maximum size over **25mm (1")** cylindrical sample will be modified to use **150mm x 150mm (6"x6")**
- D **97% min.** of density laboratory compacted specimen must be obtained
- E The **Index of Retained Strength** of the mixture **is 70% min.**

9 During construction. The correct temperature of the mixture shall be place as measured in the truck prior to dumping is **107°C**. But if Tar is used the temperature is **66°C to 107°C.** To attain required **density,** the **compaction** should be done when the mixture **is still hot and workable.** In order to determine the number of passes that would attain the required density, **trial section** must be conducted. **Temperature** must be control during mixing and compaction, it is a great significance in the strength of resulting pavement. Then **initial roll using pneumatic roller (not less than ten tons)** with a force of **80 psi. Final rolling** is done by **three wheel or tandem type steel wheel roller (temp. must be 220 to225°C), travelling 5km per hour not less. than 10 tons** to eliminate roller marks. **Rolling is done from the side toward the center**, so the asphalt will be confined in the pavement and not spread

toward the shoulder.

10 For acceptance of the finished pavement,sample shall be at **least 150mm x 150mm** (square section when using saw or **100mm diameter** full depth when using core drill. **At least one, but not more than 3 samples** shall be taken duri the day's operation. If no core sample were taken during the day's operation, core sample should be taken for every **100 L.M. per lane**, degree of compaction should be **95% min** lab density

11 No acceptance should be made on finish pavement unless **core test for thickness determination** is conducted, exc for **Barangay Roads** which is allowed to waive test.

12 The cored sample should not be accepted if the deficiency in the density is **more than 2%**

13 Tolerance for pavement thickness is **-5mm max**, averaging of cored samples for density and thickness is not permitte Additional layer shall be permitted to meet thickness with a minimum of **50mm (2")**

14 For surface tolerance, using **3m straight edge** test the variation should **not exceed 6mm**

15 Properties of Bituminous Pavement. 1) **Stability** - resistance to deformation or displacement due to an imposed load. 2) **Durability** - resistance to disintegration or deterioration due to action of water, traffic, and climate change. 3) **Flexibility** - ability to adjust itself to the settlement or to bend slightly without cracking.4) **Fatigue Resistance** - Ability to withstand repeated flexing cause by passage wheel loads, 5) **Skid Resistance** - ability to resist slipping or skidding of vehicles tires, 6) **Workability** - ease w/ which paving mixture may placed and compacted

16 The recommended thickness to be overlay is **75mm to 125mm (3" to 5")**

17 During Delivery of mixed bituminous material, a thermometer should be place at a depth of **6"**

18 In molding specimen the temperature must be **134±10°C**

19 Air voids = (theoretical max density - bulk density of compacted Marshall specimen) / theoretical maximum density the requirement is **3% to 5%** air voids.

20 Voids in mineral aggregates = (100 - bulk density of compacted Marshall specimen) / bulk specific gravity of compos aggregates

21 Voids filled with asphalt = (voids in mineral aggregate - air voids) / voids in mineral aggregate x 100

308 Cold Asphalt Plant Mix

1 Shall be composed of **coarse mineral aggregate, fine mineral aggregate, mineral fillers and chemically bonding bitumen.** These are plant mix either **dense or open graded**, which may be spread at normal **atmospheric temperature**

2 At **least three weeks** prior to production, Contractor shall submit a job-mix formula for Egineer' approval.

3 Job Mix Formula consists of single values for
- A percentage of mineral aggregate in each sieve
- B percentage of chemically bonding bitumen material to be added
- C temperature of mixture delivered on the road
- D kind and percentage of additive to be used
- E kind and percentage of mineral filler to be used

4 For aggregates
- A For every **75 cu.m or 200t or fraction thereof, 1 grading test** and **PI = 4.0% max**
- B For every **1500 cu.m or fraction thereof**, should have a mass percent of wear (abrasion loss) **40%max.** When crushed gravel is used, **50% min** of particle retain on 4.75mm (no.4) shall have at **least 1 fractured face.** When crushed gravel is subjected to five cycles of sodium sulfate soundness test, the weight shall be **12% max** (soundness loss), Sample is **50kg** for Routinary Test, Moisture Density Relation and CBR and **2** for Classification

5 Bituminous material on the basis of dry aggregate, **4.5% to 7%** mass percent when using cut-back asphalt and **6% to 10%** mass percent when using emulsified asphalt. One **(5 liters)** quality test for **40t or 200 drums or fraction** thereof. (Note: cold mix is either with **cutback asphalt** or **emulsified asphalt**)

6 During mixture, for every 75 cu.m or 130t or fraction thereof
- A The mixture shall have a minimum compressive strength of **1.4 Mpa (200psi)**
- B The mixture shall have a mass percent air voids with the range of **3 to 5**
- C For aggregates having **maximum size over 25mm (1")** cylindrical sample will be modified to use 150mm 150mm (6"x6")
- D **97% min.** of density laboratory compacted specimen must be obtained

7 For Hydrated Lime
- A For every **100t or fraction thereof,** conduct 1 grading test and 1 plasticity test
- B During mixing operation, **0.5% to 1%** mass percent of hydrated lime, dry aggregate basis, shall be added lower percentage limit is applicable to aggregate which are predominantly calcareous.

8 For acceptance of the finished pavement, sample shall be at **least 150mm x 150mm (square section) using saw o 100mm diameter full depth** using core drill. **At least one, but not more than 3 samples** shall be taken during the day's operation. If no core sample were taken during the day's operation, core sample should be taken for every **100 L** per lane, degree of compaction should be **97% min** lab density

9 Asphalt surface mixture shall not be place if the temperature of base course is below **10°C (50°F)**

309 Bituminous Plant Mix (Stockpile Maintenance Mixture)

1 composed of bituminous stockpile maintenance mixture (such as **aggregate, mineral filler, hydrated lime,** and **bituminous material**)

2 If crushed slag is used in aggregate the density must be **1120 kg/cu.m (70 lbs/ cu.ft.)** min.

3 For aggregates
- A For every **75 cu.m or 200t or fraction thereof, 1 grading test** and **PI = 4.0% max**
- B For every **1500 cu.m or fraction thereof**, should have a mass percent of wear (abrasion loss) **40%max.** When crushed gravel is used, **50% min** of particle retain on 4.75mm (no.4) shall have at **least 1 fractured face.** When crushed gravel is subjected to five cycles of sodium sulfate soundness test, the weight shall be **12% max** (soundness loss). Combined aggragate after going through the drier, shall have a sand equivale value of **not less than 40%** (Sand Equivalent Test). Sample is **50kg** for Routinary Test, Moisture Density

Relation and CBR and **20kg** for Classification

4 For Bituminous Material
   - A Quantity **4 to 10 mass %** of total mix. Upper limit may be raised when using absorptive aggregate.
   - B One **(5 liters)** quality test for **40t or 200 drums or fraction thereof**

5 During mixture, for every 75 cu.m or 130t or fraction thereof
   - A The mixture shall have a minimum compressive strength of **1.4 Mpa (200psi)**
   - B The mixture shall have a mass percent air voids with the range of **3 to 5**
   - C For aggregates having maximum size over **25mm (1")** cylindrical sample will be modified to use **150mm x 150mm (6"x6")**
   - D **97% min.** of density laboratory compacted specimen must be obtained

6 For Hydrated Lime
   - A For every **100t or fraction thereof,** conduct 1 grading test and 1 plasticity test
   - B During mixing operation, **0.5% to 1%** mass percent of hydrated lime, dry aggregate basis, shall be added lower percentage limit is applicable to aggregate which are predominantly calcareous.

7 For acceptance of the finished pavement, sample shall be at **least 150mm x 150mm** (square section using saw) **or 100mm** diameter full depth when using core drill. **At least one, but not more than 3 samples** shall be taken during the day's operation. If no core sample were taken during the day's operation, core sample should be taken for every **100 L.M. per lane**, degree of compaction should be **95% min** lab density

310 Bituminous Concrete Surface Course

1 Same as in Item 307 (Bituminous Plant Mix Surface Course - general) except testing of from aggregate (fracture face)

2 In definition it is a combination of **aggregates** that are uniformly mixed and **coated with asphalt cement.** This must be **spread and compacted** while in a **heated condition.**

311 Portland Cement Concrete Pavement

1 Cement
   - A Sampling for every **2000 bags** or fraction thereof subjected for 1 **(10kg)** Quality Test
   - B Cement which become partialy set or which contain lumps of caked will be rejected
   - C Shall be conform to Item **700 (Hydraulic Cement)**. Type of cement used in DPWH infrastructure as indicated in the blue book is **Portland Cement Type 1**.However, **Portland Pozzolan Cement Type IP** meeting the requirements of **AASHTO M240/ASTM C S95** can be allowed.

2 **For fine aggregates.** Beach sand should not be allowed without the approval of the Engineer. It shall not contain more than **3% mass percent** of material passing 0.075mm (no.200) nor more than **1% mass percent** of clay lumps or shale. If subjected to 5 cycle of sodium sulfate soundness test, the weighted loss shall not exceed **10 mass percent.** If subjected to colorimatic test for organic impurities and a **color darker** than the standard is produced, it shall be rejected.However, when tested for the effect of organic impurities of strength of mortar, it may be used if the relative strength at **7 and 28 days** is **95% min.** Sampling of aggregates should be for every **75 cu.m or fraction thereof.**

3 For coarse aggregate. The material should not contain more than **1 mass percent** passing 0.075mm (no.200) sieve, not more than **0.25 mass percent** of clay lumps, nor not more than **3.5 mass percent** of soft fragments.If subjected to 5 cycle of sodium sulfate soundness test, the weighted loss shall not exceed **12 mass percent.** It shall have a mass percent of wear **40% max.** If slag is used, density shall be **1120 kg/cu.m (70 lbs/cu.ft) min.** (same item in 309-Bituminous Plant Mix Stockpilie Maintenance Mixture and 305-Bituminous Penetration Macadam Pavement) Sampling of aggregates should be for every **75 cu.m or fraction thereof.**

4 Drinkable water no need for test

5 In reinforcing steel, tie bars should be **deformed bars** and **dowels** (use as load transfer) should be **plain round bars**. Before delivery to the sight of work one half of the length of each dowel shall be painted with **one coat of approved lead, thin film of bitumen or tar paint**. For every **10,000kgs** or fraction thereof for each size, conduct 1 (**1m** sample) Quality Test (tension, bending, and chemical analysis)

6 Concrete
   - A Fly ash can be used as **20% partial** replacement of Portland Cement in concrete mix
   - B It is the intent of this Specification to require at least **364kg (9 bags)** of cement per cu.m to meet min. strength req.
   - C Concrete slump requires **40 to 75mm (1 1/2" to 3")** if not vibrated or **10 to 40mm (1/2" to 1 1/2")** if vibrated Flexural strength not less than **3.8 Mpa (550 psi)** when tested by **third point method** or **4.5 Mpa (650psi)** on **mid-point method** at 14 days. Compressive strength of **24.1 Mpa (3500 psi)** for cores taken at 14 days
   - D Vibrators shall operate at a frequency of **8,300 to 9,600 impulse per minute** and in no case shall the vibrator be operated longer than **15 seconds** in one location. Over vibration will result to **segregation** of aggregate.
   - E Batch concrete weight shall have the tolerance of **1%** of cement and **2%** of aggregates
   - F Concrete temperature during hot weather shall not exceed **90°F (32°C)**
   - G Concrete not in place within **90 min.** from the time of mixing shall not be used.
   - H When concrete shall be placed adjoining previously constructed lane and mechanical equipment will be operated on the existing lane, that previously constructed shall have attained strength for **14 day concrete.** If only finishing equipment is carried on the existing lane, paving in adjoining lane may be permitted after **3 days.**
   - I For test specimen, as work progresses, at **least one set consisting of three concrete beam** shall be taken, **150mm x 150mm x 525mm or 900mm** shall be taken from each **330 sq.m. 230mm depth or fraction thereof** place nor volume of concrete not more than **75 cu.m.**
   - J Concrete layed shall not be left exposed for more than **1/2 hour** of curing period (Curing period of **72 hrs (3days)**)
   - K Removal of forms is permitted **24hrs min.**after concrete pouring
   - L The strength level of concrete will be satisfactory if the average of the **3 sample equal** or exceed specified strength and no individual strength test result is deficient by more than **15% of specified strength**. If not meet the stated requirement, core test can be conducted w/ **3 sample obtained** and the result of the **average of three** specimen is equal to at **least 85%** of the required strength and no single sample is **less than 75%** of

required strength.

20 If strength specimen does not meet requirement and it is not advisable to obtain cores due to structural considerati Adjustment of price should be conducted due to deficiency:

Deficiency in strength of Concrete Specimens (%)	**Percent (%) of Contract Price Allowed**
Less than 5	100
5 to less than 10	80
10 to less than 15	70
15 to less than 20	60
20 to less than 25	50
25 or more	0

15 In surface test using **3m straight edge**, areas showing high spot more than **3mm but not exceeding 12mm** shall b grind.Any area or section so removed shall not be less than **1.5m in length**.

16 Seal joint should be place below pavement surface approximately **6mm**

21 Opening to traffic. Pavement will be open unless it met the specified minimum strength requirement or if test is not conducted, it can be opened **14 days min.**

22 No acceptance should be made on finish pavement unless **core test for thickness determination** is conducted, e for Barangay Roads which is allowed to waive test. A core specimen for thikness determination shall have a diamet of at least **100mm (4")**. A core specimen for compressive strength determination the dia. of core specimen must be at **least 2 times** the max. size of coarse aggregates

23 **Tie Bar** is placed perpendicular to **logitudinal joint** and not to be painted.

24 **Transverse Contraction Joint** also called **Weakened plane joint** is constructed usually every **4.5m**, the depth of **joint should not be less than 50mm and not more than 6mm** width. Sawing of this joint commence as soon as t concrete has hardened sufficiently, usually within **24 hrs.**

25 **Transverse Construction Joint** is also called **cold joint,** constructed when there is an interruption of **more than 30min** in concreting operations. No cold joint shall be constructed within **1.50m** of an expansion joint, contraction jo or plane of weakness.

26 Corrugation produce in the surface shall be uniform in appearance and not more than **1.5mm** in depth

27 Coring for thickness determination. The completed pavement is accepted on a lot basis. A lot shall be considered a **1000 lm.** For single lane and **500 lm** For two lanes. (Note: if the next length of lane is at **least 1/2** of the nominal len it is considered also another lot. Other areas such as entrance cross over, ramps, etc is considered 1 lot. Each lot will be divided to **5 equal segment** and **one core** will be obtain at each segment. When the measurement of **any core** is less than the specified thickness by more than **25mm** additional core will be taken at **less than 5m intervals** parallel to the center line in each direction from the affected location. Obtaining a core will stopped until cored sample is not deficient by **25mm thk.**

28 In evaluating a core sample, it is divided into **9 measurement**, **one at the center and the other 8 divided in equa portion**.When one measurement exceed the specified thickness by **more than 5mm** it will be considered as specif thickness **plus 5mm**. When one measurement is less than the specified thickness by more than **25mm** it shall not included in the average. Then average the **5 cored** sample.

29

Deficiency in average thickness per lot (mm)	**Percent (%) of Contract Price Allowed**
0 - 5	100
6 - 10	95
11 - 15	85
16 - 20	70
21 - 25	50
more than 25	remove and replace (NP)

30 Mixing time for concrete at mixing plant shall not be less than **50 sec.** but not greater than **90** seconds

31 In transporting concrete the time elapsed from the time water added to the mix until the concrete deposited in place must **not exceed 45min** if hauled by **non agitating** trucks and **90min** when hauled in **truck mixers of truck agita**

32 **Steel forms** are prescribed to be used in concrete pavement construction.

Part F BRIDGE CONSTRUCTION

Item No.

400 Piling

1 Piling not part of the structure shall be removed or cut at **least 300mm** below the bottom of the footing.

2 For concrete piles. Concrete shall be **class "C" with a slump of 6"-8" (150mm to 200mm)** self compacting mix.

3 For precast concrete piles. Removal of forms is permitted **24hrs min.** after concrete pouring. Piles shall not be move until the test indicates that the concrete attained a compressive strength of at least **80%** of required strength and sh not be transported or driven until required strength has attained. If testing is not available, piles shall not be moved **14 days after casting** and shall not be transported or driven prior to **28 days after casting**. If high early strength i used piles should not be moved, transported or driven prior to **7 days of casting.**

4 Timber Piles. The heads of untreated piles should be treated with **2 coats hot creosote oil or other approved preservatives.** The weight of the **gravity hammer** to be use in piling **is 2,000 kg.**

401 Railing

402 Timber Structures

1 For using preservatives, **creosote oil ot creosote petroleum oil** blend shall be use.When timber is intended for marine use creosote petroleum oil shall not be used.

2 The minimum penetration of the preservatives to the surface of the timber **is 20mm**

3 The Engineer shall be notified at **least 10 days** prior to the treatment process (application of preservatives)

4 Lumber is well seasoned if the moisture content contains **12% to 18%**

DPWH STANDARD SPECIFICATION AND MINIMUM TEST REQUIREMENTS

TABLE OF CONTENT

403 Metal Structures

404 Reinforcing Steel Bars

1 For every **10,000kgs or fraction thereof** for each size, conduct 1 **(1m sample)** Quality Test (tension, bending, and chemical analysis)

2 Minimum distance for Lap Splice for reinforcing bars

Splice Type	Grade 40	Grade 60	But not less than
Tension	24 bar dia	36 bar dia	300mm
Compression	20 bar dia	24 bar dia.	300mm

405 Structural Concrete

1 Classes and Uses of Concrete

Class A all superstructure and heavily reinforced substructures
Class B footings, pedestals, unreinforced or small amount of reinforcement
Class C thin reinforced section, railing, precast R.C piles
Class P Prestressed concrete structure
Seal concrete deposited in water.

2 Sampling of cement **2000 bags or fraction thereof**, conduct 1 **(10kg.)** Quality Test infrastructure as indicated in the blue book is **Portland Cement Type 1** (portland cement is a cement which has cementitious effect).

3 For test specimen, at least one set of three samples, **150mm x 300mm (6" x 12")** shall be taken from each **75 cu.m** fraction thereof place each day and must not represent not more than **75 cu.m**

4

Class of Concrete	Min. Cement Content (bag or kg)/cu.m)		Min Strength Req.	Range in Slum
Class A	9 bags	360 kg.	20.7Mpa or 3000psi	50-100mm (2" - 4")
Class B	8 bags	320 kg.	16.5Mpa or 2400psi	50-100mm (2" - 4")
Class C	9.5 bags	380 kg.	20.7Mpa or 3000psi	50-100mm (2" - 4")
Class P	11 bags	440 kg.	37.7Mpa or 5000psi	100mm max (4"max
Seal	9.5 bags	380 kg.	20.7Mpa or 3000psi	100 to 200mm (4" t

based on 40 kg / bag

5 For Aggregates

A Washed aggregates must be drained at least **12 hrs**. prior to batching
B For fine and coarse aggregate sampling shall be **75 cu.m or fraction thereof** for 1 Grading Test

6 Testing of rebars, for every **10,000kgs or fraction thereof** for each size, conduct 1 **(1m)** Quality Test (tension, bend and chemical analysis)

7 For admixture, it shall be measured with an accuracy of **± 3%**, the use of **calcium chloride** as an admixture is not permitted.

8 The interval of delivery of batched concrete shall not exceed **30 min.** interval during casting. Exceptional cases may consider when using volumetric which requires less than 75 cu.m per day pouring.

9 Mixing time for concrete at mixing plant shall not be less than **50 sec.** but not greater than **90** seconds

10 In transporting concrete the time elapsed from the time water added to the mix until the concrete deposited in place must **not exceed 45min** if hauled by **non agitating** trucks and **90min** when hauled in **truck mixers of truck agitat** (required revolution for truck mixers is **4 to 6 rpm**)

11 If there is a need to add water to the concrete mix in order to increase workability after the initial time of mixing, it sha be permitted **not exceeding 45min.** (provided not to exceed slump and water cement ratio)

12 **Design of concrete mix** specified in the blue book is based on **Absolute Volume Method**

13 **Removal of forms**

	min time	min % design strength
centering under girder, beam frames or arches	14 days	0.60%
floor slab	14 days	0.70%
walls	1 day	0.70%
columns	2 days	0.70%
sides of beams and all vertical surfaces	1 day	0.70%

14 Limit for water cement ratio ranges from **0.50 to 0.60**

15 Concrete that is properly vibrated has a higher strength result than that of not thoroughly consolidated by **20% to 25**

406 Prestressed Structural Concrete

1 For wire strand. 1 Quality Test for every **20t or fraction thereof**

2 Concrete strength of at least 28 Mpa should be attained prior to tensioning of the prestressing reinforcement unless otherwise specified.

407 Concrete Structure

408 Steel Bridge

409 Welded Structure

410 Treated and Untreated Timber

411 Paint

1 Sampling. **One 20-L or one 4-L** can or every for every **100 can or fraction thereof**

2 Paint use in concrete pavement is **thermoplastic** while in asphalt pavement is **reflectorized**

3 The insoluble powdered solid mixture of paint is called **pigments.** Pigments having **high refractive indices** are classified as **prime.** Then **colored pigment** use as **primer for metallic surface** is called **red lead.**

4 The most common popular **dry oil paint is** called **linseed oil paint**
5 A volatile solvent use to reduce consistency of paint is **thinner**

412 Elastomeric Bearing Pad

413 Pre molded joint filler for concrete paving

Part G DRAINAGE AND SLOPE PROTECTION STRUCTURES

Item No.

500 Pipe Culvert and Storm Drain

1 Joint Mortar for concrete pipes should consist of **1 part Portland Cement and 2 part sand**. Mortar shall be used wit **30 mins** after its preparation.
2 Sampling of Pipes. **1** pipe for every **50pcs**. (for strength, absorption, dimension test)
3 Alternative test on no. 2. Concrete Sample 1 set consisting of three cylinder sample for **not more than 25pcs** cast an 1 Inspection report on casted pipe for not more than **25 pcs.**
4 Test for cement and aggregates same as Item 405 (Structural Concrete)
5 Storm pipe shall be embedded below the finished grade line **not less than 0.60m**
6 **Minimum** spacing of hoop rebars on RCP is **86mm,** w/ net protective covering **of 25mm (1")**

501 Underdrain

502 Catch Basin, Inlet and Manholes

1 Same as Item 405 (Structural Concrete), **Class A**

503 Steel Grating w/ Frame

504 Reconditioning and Cleaning of Existing Drainage

505 Riprap and Grouted Riprap

1 Classes of Stones used:
Class A ranging from a minimum of 15kg to max 25kg. With at leat 50% weighing more than 20kg.
Class B ranging from a minimum of 30kg to max 70kg. With at leat 50% weighing more than 50kg.
Class C ranging from a minimum of 60kg to max 100kg. With at leat 50% weighing more than 80kg
Class D ranging from a minimum of 100kg to max 200kg. With at leat 50% weighing more than 150kg.
2 Mortar mixed shall be **one part** cement , and **three parts** sand and applied a minimum thickness of **20mm** between stones
3 Spacing of weepholes shall **not be more than 2m** and must be in staggered manner with a diameter of at **least 50m**
4 Placement of stone is perpendicular to the slope
5 Quantity. For cement **3 bags/cu.m** of riprap, For fine aggregates: **0.17 cu.m/cu.m** of riprap

506 Stone Masonry

1 Mortar for masonry shall consists of **one part** portland cement and **two part** fine aggregates
2 Mortar that is not used within **90min**. After the water has been added shall be discarded.
3 Placement of stone is parallel to the slope.
4 Quantity. For cement **2 bags/cu.m** of riprap, For fine aggregates: **0.17 cu.m/cu.m** of riprap

507 Rubble Concrete

1 Stones to be used shall be more than **0.015 cu.m** and not less than **75%** of the total volume of rock embankment
2 Concrete shall be Class "B"
3 In no case shall vibrator be operated longer than **10 seconds.**
4 After removal of forms if there is a voids or honeycomb spot shall be filled with **one part** cement and **two parts** sand.
5 Spacing of weepholes shall **not be more than 2m** and must be in staggered manner with a diameter of at **least 50m**
6 minimum thickness of rubble concrete is **12" or 300mm.**

508 Hand Laid Rock Embankment

1 Stones to be used shall be more than **0.015 cu.m** and not less than **75%** of the total volume of rock embankment

509 Sheet Piles

510 Concrete Slope Protection

1 Concrete shall be class "B"

511 Gabions and Matresses

1 Filter cloth shall consist of **70%** polypropylene and **30%** polyethylene

Part H MISCELLANEOUS STRUCTURES

Part I MATERIAL DETAIL

Other Minimum Requirements for Submission of Samples

	Materials	Minimum Test Requirement	Minimum Quantity of Sample
1	Asphalt Mix	for every 130t or fraction thereof	20 kg
2	Aggregates	for every 1500cu.m or fraction thereof	

	a. coarse aggregate		70 kg	
	b. fine aggregates		50 kg	
3	CHB	for every 10,000 units or fraction thereof	6 units	3 units for compression 3 units for moisture

Classification of CHB:

A) Load Bearing CHB - thickness ranges **6" to 8"** or more, **capable of carrying** superimposed load aside from its own weight

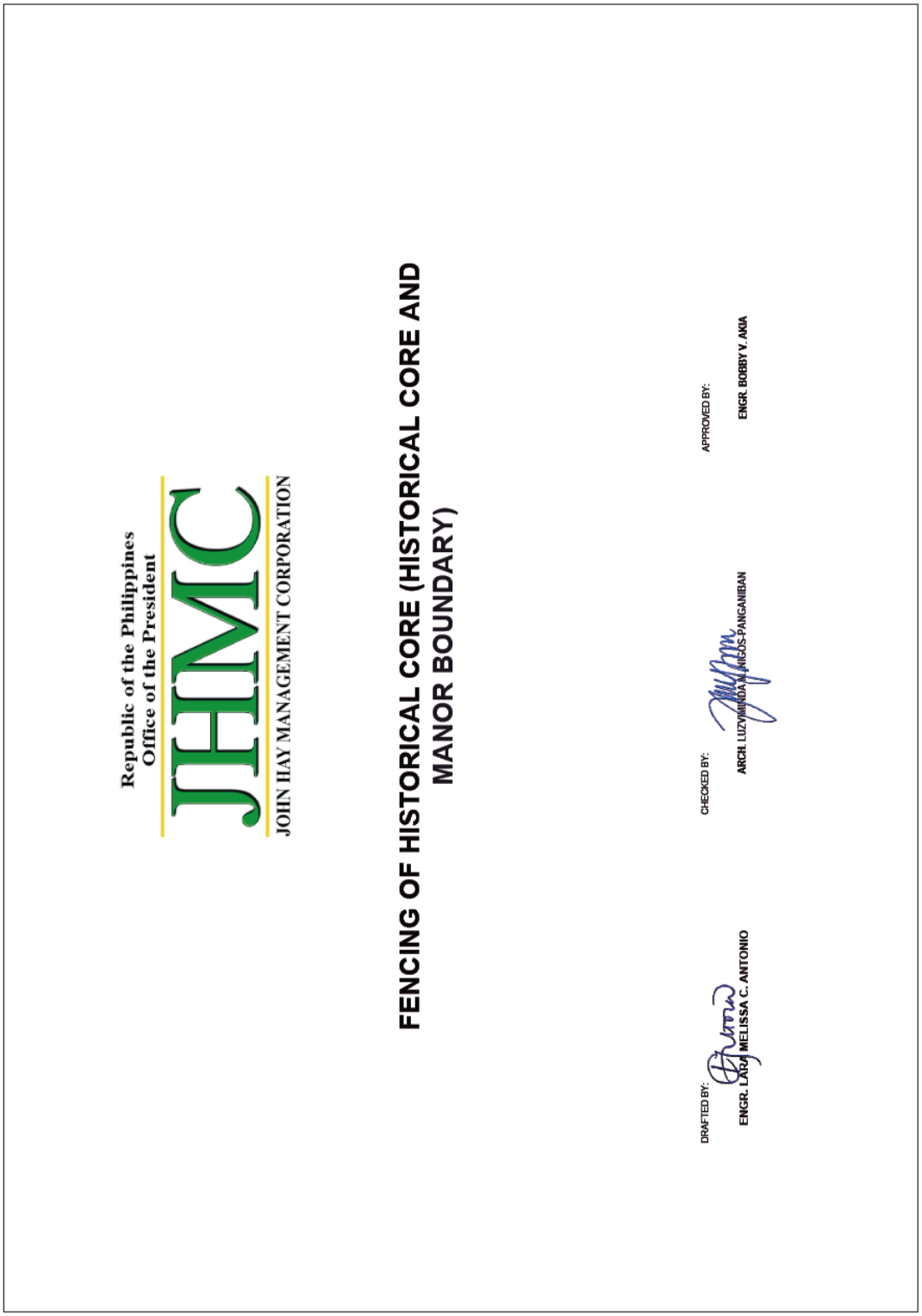
B) Non Load Bearing CHB - thickness ranges **3" to 4"**, which are **not capable of carrying** load and carrying just their own weight.

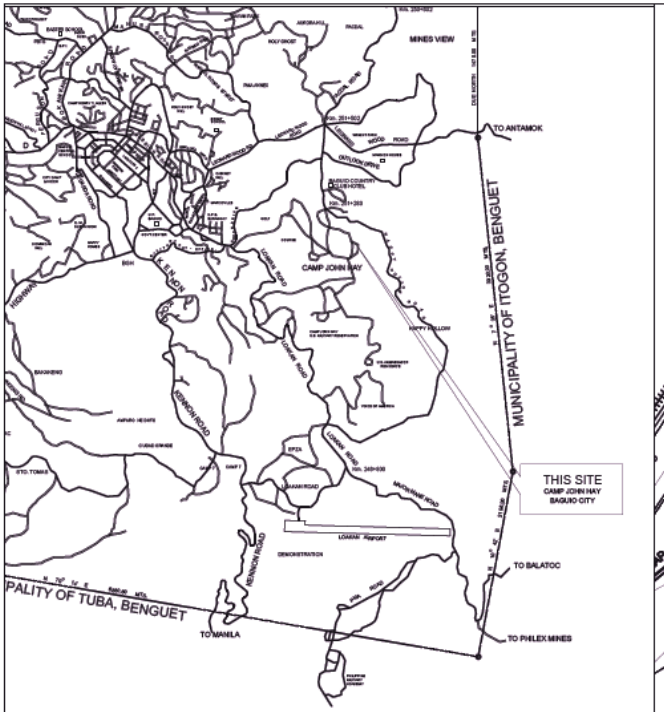
Strength Requirement:	**For Load Bearing**	**For Non Load Bearing**
Individual	500psi min.	500psi min
Average	1000psi min.	600psi min
Absorption	240kg/cum max	240kg/cum max
Moisture Content	45% max	45% max

4	Steel Sheet (galvanized)	for every 1,000 sheets or fraction thereof	1 sheet	

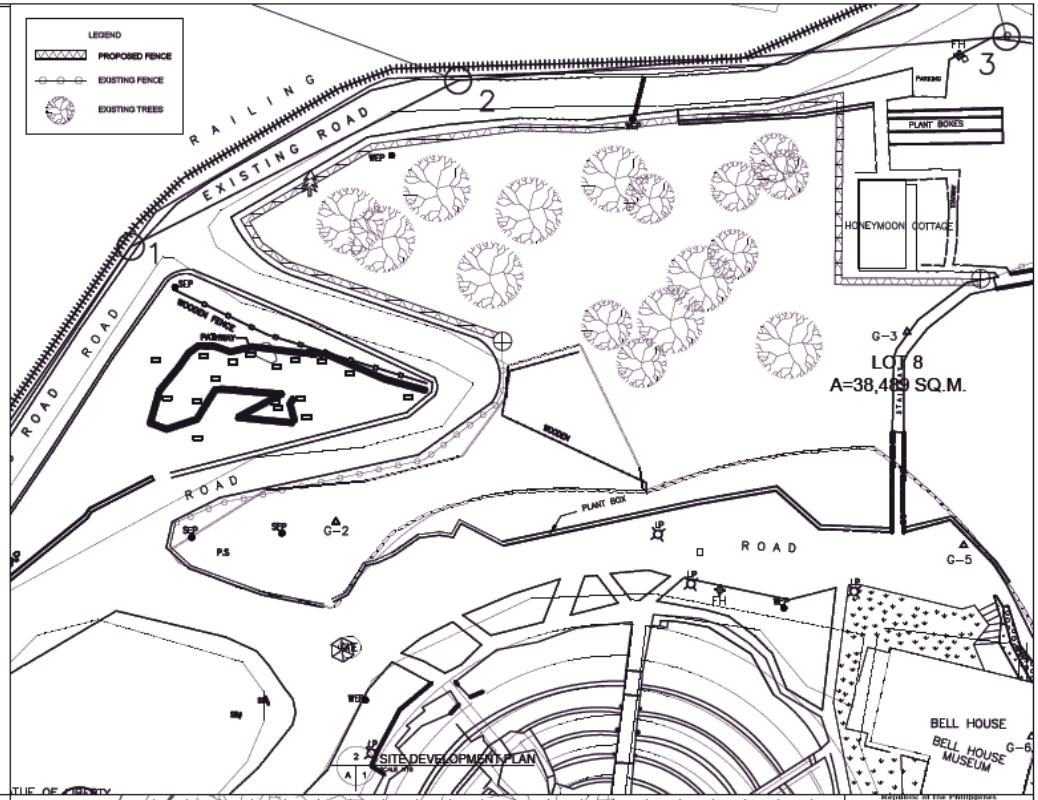
(Note: minimum lapping for GI sheet is **2 1/2 corrugations**, galvanized iron sheet is tested for **1)thickness and dimension** and **2) zinc coating)**

Section VII. Drawings





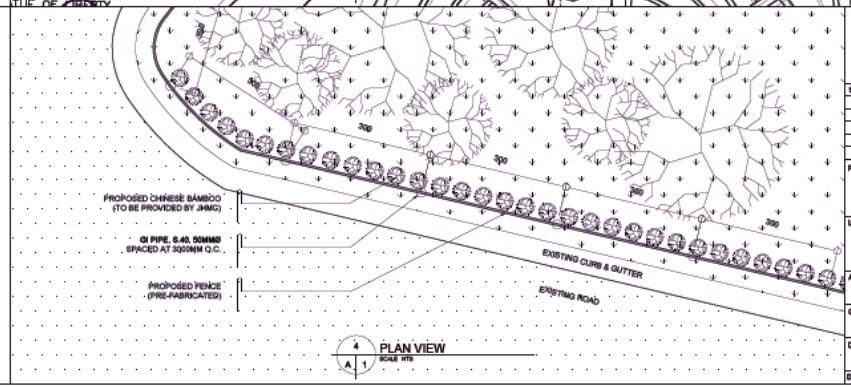
1 A1 VICINITY MAP
SCALE NTS



2 A1 SITE DEVELOPMENT PLAN
SCALE NTS

ITEM NO.	DESCRIPTION	QTY	UNIT
B.7(1)	OCCUPATIONAL SAFETY AND HEALTH PROGRAM	1.53	Month
B.9	MOBILIZATION/DEMOBILIZATION	1.00	l.s.
100(2)	CLEARING AND GRUBBING	1.00	l.s.
102(2)	SURPLUS COMMON EXCAVATION	0.69	cu.m.
404(1)a	REINFORCING STEEL (GRADE 40)	40.66	kg
405(1)a3	STRUCTURAL CONCRETE (CLASS A, 20.68MPA, 30 DAYS)	1.00	cu.m.
411(2)	PAINT	149.00	sq.m.
604	FENCING	205.00	l.m.
807(2)	SITE DEVELOPMENT (SOFTSCAPE)	1.00	l.s.

3 A1 SUMMARY OF QUANTITIES
SCALE NTS



4 A1 PLAN VIEW
SCALE NTS

Republic of the Philippines
Office of the President

JHMC
JOHN HAY MANAGEMENT CORPORATION

SHEET CONTENT:
VICINITY MAP
SUMMARY OF QUANTITIES
SITE DEVELOPMENT PLAN
PLAN VIEW

PROJECT TITLE:
FENCING OF THE HISTORICAL CORE (HISTORICAL CORE AND MANOR BOUNDARY)

LOCATION OF PROJECT:
CAMP JOHN HAY, BAGUIO CITY

APPROVED BY:
ENGR. BOBBY V. AKOL

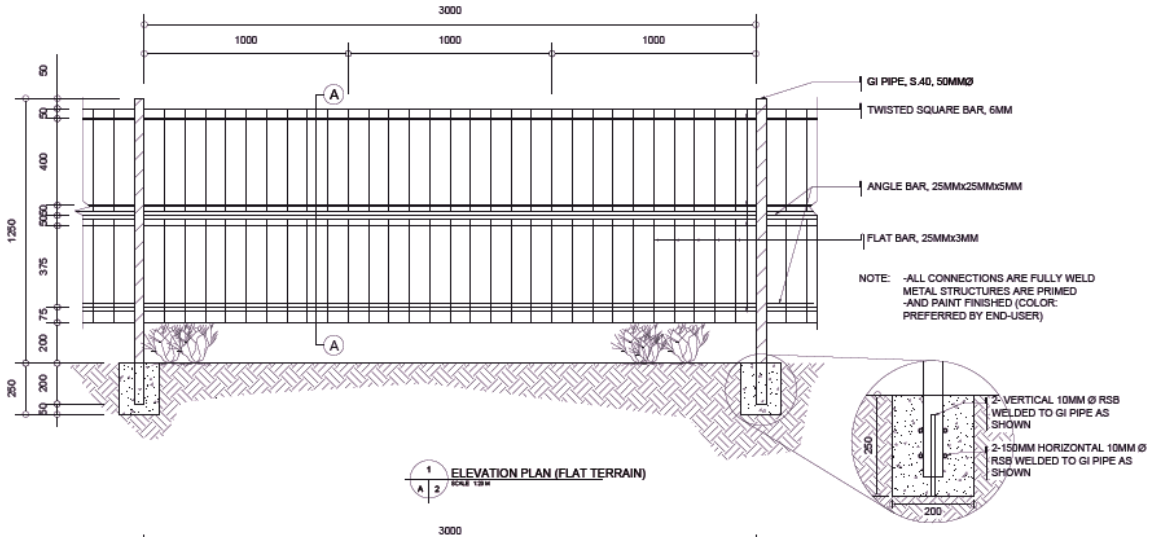
CHECKED BY:
ARCH. LUZVIMINDA M. [illegible]

DRAFTED BY:
ENGR. LARA MELISSA C. ANTONIO

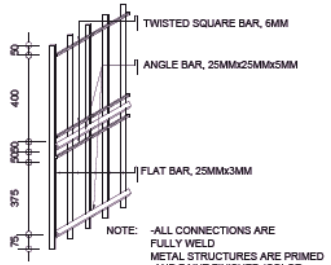
A1

DATE: 16 OCTOBER 2020

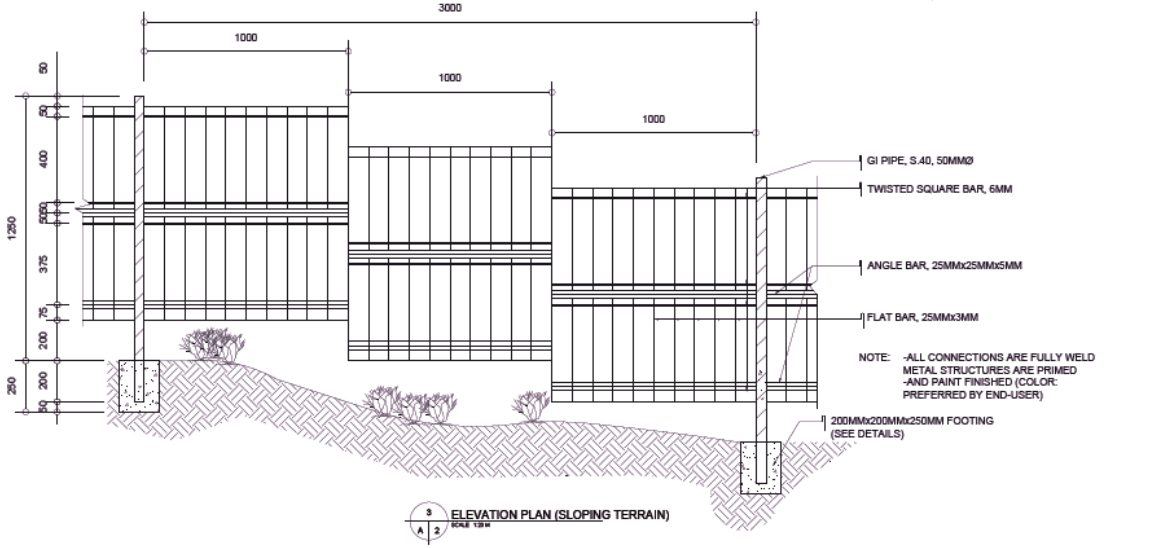
PAGE: 1/2



1 / A 2 ELEVATION PLAN (FLAT TERRAIN)
SCALE 1:20 M



2 / A 2 SECTION DETAIL AT "A"
SCALE 1:20 M



3 / A 2 ELEVATION PLAN (SLOPING TERRAIN)
SCALE 1:20 M

Republic of the Philippines
Office of the President
JHMC
JOHN HAY MANAGEMENT CORPORATION

SHEET CONTENT:
ELEVATION PLAN (FLAT TERRAIN)
ELEVATION PLAN (SLOPING TERRAIN)
SECTION DETAIL AT "A"

PROJECT TITLE
FENCING OF THE HISTORICAL CORE (HISTORICAL CORE AND MANOR BOUNDARY)

LOCATION OF PROJECT:
CAMP JOHN HAY, BAGUIO CITY

APPROVED BY:
ENGR. BOBBY V. AKIA

CHECKED BY:
ARCH. LUZVIMINDA M. WAGS-PANGANIBAN

DRAFTED BY:
ENGR. LARA MESSINA C. ANTONIO

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DATE: 16 OCTOBER 2020

PAGE: 2/2

Section VIII. Bill of Quantities

BILL OF QUANTITIES

ITEM NO.	SCOPE OF WORKS TO BE DONE	UNIT	QTY.	UNIT COST	TOTAL
B.7(1)	OCCUPATIONAL SAFETY AND HEALTH PROGRAM	Month	1.53		
B.9	MOBILIZATION/DEMOBILIZATION	l.s.	1.00		
100(2)	CLEARING AND GRUBBING	l.s.	1.00		
102(2)	SURPLUS COMMIN EXCAVATION	cu.m.	0.69		
404(1)a	REINFORCING STEEL (GRADE 40)	kg	40.66		
405(1)a3	STRUCTURAL CONCRETE (CLASS A, 20.68MPA, 30 DAYS)	cu.m.	1.00		
411(2)	PAINT	sq.m.	149.00		
604	FENCING	l.m.	205.00		
807(2)	SITE DEVELOPMENT (SOFTSCAPE)	l.s.	1.00		
BID AMOUNT					

Name: _____
In the capacity of: _____
Signed: _____
Duly authorized to sign the Bid for and on behalf of: _____
Date: _____

Item B.7(1) : Occupational Safety and Health Program **Qty = 1.53** ***Month***

1. MATERIALS							
Qty	*Unit*	*Description*	*Unit Cost*				*Amount*
374.17	man-day	Safety Gloves	per	man-day	=		P
374.17	man-day	Safety Shoes	per	man-day	=		P
374.17	man-day	Safety Helmet	per	man-day	=		P
710.60	man-day	Safety Vest	per	man-day	=		P
						Sub - Total	P

2. LABOR						
Qty	*Description*	*Rate*	*No. of Hrs*			*Amount*
1	Part Time Safety Practitioner	per hr	for		hrs =	P
1	First Aider	per hr	for		hrs =	P
					Sub - Total	P

3. EQUIPMENT RENTAL					
Qty	*Description*	*Operated Rate*	*No. of Hrs*		*Amount*
					P
				Sub - Total	P

A. DIRECT COST			P
B. INDIRECT COST			P
OCM		P	
Contractor's Profit		P	
VAT	12%	P	
TOTAL ITEM COST			***P***
Unit Cost			***P***

Item B.9 : Mobilization/Demobilization **Qty = 1.00** *Ls.*

1. MATERIALS							
Qty	*Unit*	*Description*	*Unit Cost*				*Amount*
						Sub - Total	P

2. LABOR						
Qty	*Description*	*Rate*	*No. of Hrs*			*Amount*
					Sub - Total	P

3. EQUIPMENT RENTAL						
Qty	*Description*	*Operated Rate*	*No. of Hrs*			*Amount*
1	Cargo Truck (2-5 mt)	per hr	for		hrs	P
						P
					Sub - Total	P

A. DIRECT COST			P
B. INDIRECT COST			P
OCM		P	
Contractor's Profit		P	
VAT	12%	P	
TOTAL ITEM COST			***P***
Unit Cost			***P***

Item 100(2) : Clearing and Grubbing **Qty = 1.00** *l.s.*

1. MATERIALS				
Qty	*Unit*	*Description*	*Unit Cost*	*Amount*
			Sub - Total	P

2. LABOR						
Qty	*Description*	*Rate*		*No. of Hrs*		*Amount*
1	Foreman		per hr	for	hrs =	P
1	Skilled		per hr	for	hrs =	P
2	Unskilled		per hr	for	hrs =	P
					Sub - Total	P

3. EQUIPMENT RENTAL				
Qty	*Description*	*Operated Rate*	*No. of Hrs*	*Amount*
	Minor tools			P
				P
			Sub - Total	P

A. DIRECT COST			P
B. INDIRECT COST			P
OCM		P	
Contractor's Profit		P	
VAT	12%	P	
TOTAL ITEM COST			***P***
Unit Cost			***P***

Item 102(2) : Surplus Common Excavation **Qty = 0.69** *cu.m.*

1. MATERIALS				
Qty	*Unit*	*Description*	*Unit Cost*	*Amount*
			Sub - Total	P

2. LABOR						
Qty	*Description*	*Rate*		*No. of Hrs*		*Amount*
1	Foreman		per hr	for	hrs =	P
6	Unskilled		per hr	for	hrs =	P
					Sub - Total	P

3. EQUIPMENT RENTAL				
Qty	*Description*	*Operated Rate*	*No. of Hrs*	*Amount*
	Minor tools			P
				P
			Sub - Total	P

A. DIRECT COST			P
B. INDIRECT COST			P
OCM		P	
Contractor's Profit		P	
VAT	12%	P	
TOTAL ITEM COST			***P***
Unit Cost			***P***

Item 404(1)a : Reinforcing Steel (Grade 40) **Qty = 40.66 kg**

1	MATERIALS						
Qty	*Unit*	*Description*	*Unit Cost*				*Amount*
1.00	kg	GI Tie Wire Ga.16	per	kg	=		P
43.00	kg	RSB (w/ 5% wastage)	per	kg	=		P
						Sub - Total	P

2.	LABOR					
Qty	*Description*	*Rate*	*No. of Hrs*			*Amount*
1	Foreman	per hr	for		hrs =	P
2	Welder	per hr	for		hrs =	P
4	Unskilled	per hr	for		hrs =	P
					Sub - Total	P

3.	EQUIPMENT RENTAL					
Qty	*Description*	*Operated Rate*	*No. of Hrs*			*Amount*
1	Service/Cargo Truck (5 tons)	per hr	for		hrs =	P
1	Bar Cutter	per hr	for		hrs =	P
1	Welding Machine	per hr	for		hrs =	P
	Minor Tools					P
					Sub - Total	P

A. DIRECT COST				P
B. INDIRECT COST				P
OCM		P		
Contractor's Profit		P		
VAT	12%	P		
TOTAL ITEM COST				***P***
Unit Cost				***P***

Item 405(1)a3 : Structural Concrete (Class A, 20.68Mpa, 30 days) **Qty = 1.00 cu.m.**

1	MATERIALS						
Qty	*Unit*	*Description*	*Unit Cost*				*Amount*
18.00	bd.ft.	Good Lumber	per	bd.ft.	=		P
1.00	pcs.	1/2" Marine Plywood	per	pcs.	=		P
1.00	kg.	Assorted CWN	per	kg.	=		
10.00	bag	Cement	per	bag	=		
1.00	cu.m.	Sand	per	cu.m.	=		
1.00	cu.m.	Gravel	per	cu.m.	=		
						Sub - Total	P

2.	LABOR					
Qty	*Description*	*Rate*	*No. of Hrs*			*Amount*
	Installation & Removal of Forms					
2	Skilled	per hr	for		hrs =	P
4	Unskilled	per hr	for		hrs =	P
	Pouring of Concrete					
1	Foreman	per hr	for		hrs =	P
2	Skilled	per hr	for		hrs =	P
4	Unskilled	per hr	for		hrs =	P
					Sub - Total	P

3.	EQUIPMENT RENTAL						
Qty	*Description*	*Operated Rate*		*No. of Hrs*			*Amount*
1	One Bagger Mixer	per hr	for		hrs =		P
1	Concrete Vibrator	per hr	for		hrs =		P
1	Water Truck/ Pump (1000 gal)	per hr	for		hrs =		P
	Minor Tools						P
						Sub - Total	P

A. DIRECT COST			P
B. INDIRECT COST			P
OCM			
Contractor's Profit			
VAT	12%	P	
TOTAL ITEM COST			***P***
Unit Cost			***P***

em 411(2) : **Paint** **Qty = 149.00** *sq.m.*

1	MATERIALS						
Qty	*Unit*	*Description*	*Unit Cost*				*Amount*
11.00	gal	Quick Dry Enamel (2 coats)	per	gal	=		P
5.00	gal	Paint Thinner	per	gal	=		P
10.00	pcs	Paint Brush (2")	per	pcs	=		P
10.00	pcs	Steel Brush	per	pcs	=		P
15.00	pcs	Sand Paper	per	pcs	=		P
		Miscellaneous					P
						Sub - Total	P

2.	LABOR						
Qty	*Description*	*Rate*		*No. of Hrs*			*Amount*
1	Foreman	per hr	for		hrs =		P
1	Skilled	per hr	for		hrs =		P
4	Unskilled	per hr	for		hrs =		P
						Sub - Total	P

3.	EQUIPMENT RENTAL						
Qty	*Description*	*Operated Rate*		*No. of Hrs*			*Amount*
	Minor Tools						P
						Sub - Total	P

A. DIRECT COST			P
B. INDIRECT COST			P
OCM		P	
Contractor's Profit		P	
VAT	12%	P	
TOTAL ITEM COST			***P***
Unit Cost			***P***

Item 604 : Fencing **Qty = 205.00** *Lm.*

1 MATERIALS

Qty	*Unit*	*Description*	*Unit Cost*			*Amount*
18.00	pc.	GI Pipe, sch.40, 50mm	per	pc.	=	P
69.00	pc.	GI Cap, 50mm	per	pc.	=	P
171.36	kg.	Twisted Square Bar, 6mm	per	kg.	=	P
942.48	kg.	Angle Bar, 25mm x 25mm x 5mm	per	kg.	=	P
1,203.60	kg.	Flat Bar, 25mm x 3mm	per	kg.	=	P
2.00	set	Oxy/Acetylene	per	set	=	P
44.00	kg.	Welding Rod	per	kg.	=	P
6.00	gal	Red Lead Primer	per	gal	=	P
				Sub - Total		P

2. LABOR

Qty	*Description*	*Rate*	*No. of Hrs*		*Amount*
1	Foreman	per hr	for	=	P
2	Skilled	per hr	for	=	P
4	Unskilled	per hr	for	=	P
				Sub - Total	P

3. EQUIPMENT RENTAL

Qty	*Description*	*Operated Rate*	*No. of Hrs*		*Amount*
1	Welding Machine	per hr	for	hrs =	P
1	Speed Cutter	per hr	for	hrs =	P
1	Cutting Outfit	per hr	for	hrs =	P
				Sub - Total	P

A. DIRECT COST			P
B. INDIRECT COST			P
OCM		P	
Contractor's Profit		P	
VAT	12%	P	
TOTAL ITEM COST			***P***
Unit Cost			***P***

Item 807(2) : Site Development (Softscape) **Qty = 1.00** *Ls.*

1 MATERIALS

Qty	*Unit*	*Description*	*Unit Cost*			*Amount*
102.50	pc.	Chinese Bamboo	per	pc.	=	P
		(To be provided by JHMC)				
				Sub - Total		P

2. LABOR

Qty	*Description*	*Rate*	*No. of Hrs*		*Amount*
2	Unskilled	per hr	for	=	P
				Sub - Total	P

3. EQUIPMENT RENTAL

Qty	*Description*	*Operated Rate*	*No. of Hrs*	*Amount*
	Minor Tools			P
			Sub - Total	P

A. DIRECT COST			P
B. INDIRECT COST			P
OCM		P	
Contractor's Profit		P	
VAT	12%	P	
TOTAL ITEM COST			***P***
Unit Cost			***P***

ANNEX "A"

GUIDELINES IN PREPARING THE DETAILED UNIT PRICE ANALYSIS (DUPA)

1. All items of work to be used in preparing the DUPA shall be consistent with the design, plans and specifications prepared by JHMC.
2. For uniformity in the preparation of the Financial Proposal, the DUPA shall be an integral part of the Bidding Documents.
3. All bids shall be composed of the Direct Cost and Indirect Cost.
   - 3.1. DIRECT COST.
     - 3.1.1. MATERIAL COST. Cost of materials to be used in doing the work item called for, which shall include, among others, the following:
       - 3.1.1.1. Cost at source, including processing, crushing, stockpiling, loading, royalties, local taxes, construction and/or maintenance of haul roads, etc.
       - 3.1.1.2. Expenses for hauling to project site.
       - 3.1.1.3. Handling expenses.
       - 3.1.1.4. Storage expenses.
       - 3.1.1.5. Allowance for waste and/or losses.
     - 3.1.2. LABOR COST.
       - 3.1.2.1. Salaries and wages, as authorized by the Department of Labor and Employment.
       - 3.1.2.2. Fringe benefits, such as vacation and sick leaves, benefits under the Workmen's Compensation Act, SSS contributions, allowances, 13th month pay, bonuses, etc.
     - 3.1.3. EQUIPMENT EXPENSES.
       - 3.1.3.1. Rental rates of equipment shall be based on the prevailing "Association of Carriers and Equipment Lessors, (ACEL) Inc." approved for use by the DPWH-CAR. Rental rates of equipment not indicated in the ACEL booklet shall be taken from the rental rates used by the proponent. The make, model and capacity of the equipment should be indicated in the detailed unit cost analysis.
       - 3.1.3.2. Mobilization and demobilization shall be treated as a separate pay item. It shall be computed based on the equipment requirements of the project stipulated in the bidder's proposal.
   - 3.2. INDIRECT COST.
     - 3.2.1. Overhead.
       - 3.2.1.1. Cost to cover power and water consumption and office supplies.
       - 3.2.1.2. Premium on Contractor's All Risk Insurance (CARI).
       - 3.2.2. Contingencies. These includes expenses for coordination meetings, ground breaking, inauguration ceremonies and other unforeseen events.
     - 3.2.3. Miscellaneous Expenses. Expenses for laboratory tests for quality control.
     - 3.2.4. Contractor's Profit.

Notes:

1. All sub-items under the General Requirements shall not be subjected to OCM mark-up.
2. The following items under the General Requirements shall not be subjected to Contractor's profit mark-up:
   a) Mobilization and Demobilization; and
   b) Permits and clearances

ANNEX "B"

Project Name: **Fencing of Historical Core (Historical Core and Manor Boundary)**

Location: JHSEZ, Camp John Hay Baguio City

DETAILED UNIT PRICE ANALYSIS

Item No. 1	General Requirements	Quantity	Unit	Unit Price	Amount
1.1	Mobilization/Demobilization	1	Lot		

Direct Cost: (a+b+c)	
Indirect Cost:	
Contractor's Profit (Except Items 2.1 and 2.6)	
Withholding Taxes	
Sub-Total 1: (Sum of Direct and Indirect Cost)	

Item No. 2	Item Description					
	Sub-Item					
2.1	Description		Unit of Measure:			
a.	Labor		No. of Personnel	Daily Rate	No. of Working Days	Amount
	xxxxxxxx		xx	xxxx.xx	xx	xxxx
					Total Labor Cost:	xxxx
b.	Equipment		No. of Unit/s	Daily Rate	No. of Working Days	Amount
	xxxxxxxx		xx	xxxx.xx	xx	xxxx
					Total Equipment Rentals:	xxxx
c.	Materials		Quantity	Unit	Unit Price	Amount
	xxxxxxxx		xx	xxxx.xx	xx	xxxx
					Total Material Cost:	xxxx

Direct Cost: (a+b+c)	
Indirect Cost:	
Overhead	
Contingencies	
Miscellaneous	
Contractor's Profit	
Withholding Taxes	
Sub-Total 2.1: (Sum of Direct and Indirect Cost)	

2.2	Sub-Item Description		Unit of Measure:			
a.	Labor		No. of Personnel	Daily Rate	No. of Working Days	Amount
	xxxxxxxx		xx	xxxx.xx	xx	xxxx
					Total Labor Cost:	xxxx
b.	Equipment		No. of Unit/s	Daily Rate	No. of Working Days	Amount
	xxxxxxxx		xx	xxxx.xx	xx	xxxx
					Total Equipment Rentals:	xxxx
c.	Materials		Quantity	Unit	Unit Price	Amount
	Materials		Quantity	Unit	Unit Price	Amount
	xxxxxxxx		xx	xxxx.xx	xx	xxxx
					Total Material Cost:	xxxx
		Direct Cost: (a+b+c)				
		Indirect Cost:				
		Overhead				
		Contingencies				
		Miscellaneous				
		Contractor's Profit				
		Withholding Taxes				
		Sub-Total 2.2: (Sum of Direct and Indirect Cost)				
					Item 2. Total Cost:	
					Item 2.Unit Cost:	

Project Name: **Fencing of Historical Core (Historical Core and Manor Boundary)**

Location: JHSEZ, Camp John Hay, Baguio City

ANNEX "C"

DUPA Summary

Item No.	Item Description	Unit	Quantity	Direct Cost				Indirect Cost						Item Cost	Unit Cost	Percent
				Labor	Equipment	Materials	Total	Overhead	Contingencies	Miscellaneous	ontractor's Pro	ithholding Tax	Total			
1	#REF!															
2	General Requirements															
3	xxxxx															
4	xxxxx															
5	xxxxx															
6	xxxxx															
7	xxxxx															
8	xxxxx															
9	xxxxx															
10	xxxxx															
11	xxxxx															
12	xxxxx															

	Amount	Percent
Total Direct Cost:		
a. Labor		
b. Equipment		
c. Materials		
Total Indirect Cost:		
a. Overhead		
b. Contingencies		
c. Miscellaneous		
d. .Contractor's Profit		
e. Withholding Taxes		
Total Bid Amount:		

Section IX. Checklist of Technical and Financial Documents

Checklist of Technical and Financial Documents

I. TECHNICAL COMPONENT ENVELOPE

Class "A" Documents

Legal Documents

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

or

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

and

☐ (c) Mayor's or Business permit issued by the city or municipality where the principal place of business of the prospective bidder is located, or the equivalent document for Exclusive Economic Zones or Areas;

and

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

Technical Documents

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

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

☐ (h) Philippine Contractors Accreditation Board (PCAB) License;

or

Special PCAB License in case of Joint Ventures;

and registration for the type and cost of the contract to be bid; **and**

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

or

Original copy of Notarized Bid Securing Declaration; **and**

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

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

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

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

☐ (k) Original duly signed Omnibus Sworn Statement (OSS);

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

Financial Documents

☐ (l) The prospective bidder's audited financial statements, showing, among others, the prospective bidder's total and current assets and liabilities, stamped "received" by the BIR or its duly accredited and authorized institutions, for the preceding calendar year which should not be earlier than two (2) years from the date of bid submission; **and**

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

Class "B" Documents

☐ (n) If applicable, duly signed joint venture agreement (JVA) in accordance with RA No. 4566 and its IRR in case the joint venture is already in existence;

or

duly notarized statements from all the potential joint venture partners stating that they will enter into and abide by the provisions of the JVA in the instance that the bid is successful.

II. FINANCIAL COMPONENT ENVELOPE

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

Other documentary requirements under RA No. 9184

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

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

☐ (r) Cash Flow by Quarter.


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