PHILIPPINE BIDDING DOCUMENTS

Construction of Additional Facilities at Municipal Garden

PID NO. 2022 - 116

Government of the Republic of the Philippines

Sixth Edition
July 2020

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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
Construction of Additional Facilities at Municipal Garden

1. The *Municipality of Compostela*, through the *Supplemental Budget No. 2 CY 2022* (*General Fund)* intends to apply the sum of *One Million One Hundred Forty Thousand Nine Hundred Seventy-Four Pesos and Thirty-Five Centavos (P1,140,974.35)* being the Approved Budget for the Contract (ABC) to payments under the contract for *Construction of Additional Facilities at Municipal Garden with Project Identification No. 2022-0116.* Bids received in excess of the ABC shall be automatically rejected at bid opening.

2. The Municipality of Compostela now invites bids for the above Procurement Project. Completion of the Works is required *90 calendar days.* Bidders should have completed a contract similar to the Project. The description of an eligible bidder is contained in the Bidding Documents, particularly, in Section II (Instructions to Bidders).

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

4. Interested bidders may obtain further information from Municipality of Compostela and inspect the Bidding Documents at the address given below from *8:00 a.m. to 5:00 p.m.*

5. A complete set of Bidding Documents may be acquired by interested bidders on ***October 10, 2022 to November 3, 2022*** from given address and website below *upon payment of the applicable fee for the Bidding Documents, pursuant to the latest Guidelines issued by the GPPB, in the amount of* ***Five Thousand Pesos (P5,000.00)***. The Procuring Entity shall allow the bidder to present its proof of payment for the fees ***presented in person***.

6. The Municipality of Compostela will hold a Pre-Bid Conference on ***October 18, 2022 at 1:30 p.m.*** at Office of the BAC, 2nd Floor, Municipal Hall Building, Dagohoy St., Purok 2, Poblacion, Compostela, Davao de Oro which shall be open to prospective bidders.

7. Bids must be duly received by the BAC Secretariat through manual submission at the office address as indicated below on ***November 3, 2022 at 1:00 p.m.*** Late bids shall not be accepted.

8. All bids must be accompanied by a bid security in any of the acceptable forms and in the amount stated in **ITB** Clause 16.

9. Bid opening shall be on ***November 3, 2022 at 1:30 p.m.*** at the given address below. Bids will be opened in the presence of the bidders' representatives who choose to attend the activity.

10. The *Municipality of Compostela* reserves the right to reject any and all bids, declare a failure of bidding, or not award the contract at any time prior to contract award in accordance with Sections 35.6 and 41 of the 2016 revised Implementing Rules and Regulations (IRR) of RA No. 9184, without thereby incurring any liability to the affected bidder or bidders.

11. For further information, please refer to:

    EDWARDFORD N. DAGATAN
    BAC Office
    2nd Floor, Municipal Hall Building, Dagohoy St., Purok 2,
    Poblacion, Compostela, Davao de Oro
    CP#: 0909-279-9827
    Email Add: compobacsec@gmail.com

12. You may visit ***www.philgeps.gov.ph*** and search for Municipality of Compostela for downloading of Bidding Documents.

October 10, 2022

(Sgd.)
LUCELIA L. PAQUEO
BAC Chairperson

Section II. Instructions to Bidders

1. Scope of Bid

The Procuring Entity, *Municipality of Compostela,* invites Bids for the *Construction of Additional Facilities at Municipal Garden* with Project Identification Number *2022-116.*

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

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

2. Funding Information

2.1. The GOP through the source of funding as indicated below for *CY 2022* in the amount of *One Million One Hundred Forty Thousand Nine Hundred Seventy-Four Pesos and Thirty-Five Centavos (P1,140,974.35).*

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

3. Bidding Requirements

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

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

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

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

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

5. Eligible Bidders

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

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

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

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

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

6. Origin of Associated Goods

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

7. Subcontracts

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

The Procuring Entity has prescribed that: ***Subcontracting is not allowed***.

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

8. Pre-Bid Conference

The Procuring Entity will hold a pre-bid conference for this Project on the specified date and time and either at its physical address at the *Office of the BAC, 2nd Floor, Municipal Hall Building, Dagohoy St., Purok 2, Poblacion, Compostela, Davao de Oro* as indicated in paragraph 6 of the **IB.**

9. Clarification and Amendment of Bidding Documents

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

10. Documents Comprising the Bid: Eligibility and Technical Components

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

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

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

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

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

11. Documents Comprising the Bid: Financial Component

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

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

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

12. Alternative Bids

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

13. Bid Prices

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

14. Bid and Payment Currencies

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

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

15. Bid Security

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

15.2. The Bid and bid security shall be valid until ***One Hundred Twenty (120) days***. Any bid not accompanied by an acceptable bid security shall be rejected by the Procuring Entity as non-responsive.

16. Sealing and Marking of Bids

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

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

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

17. Deadline for Submission of Bids

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

18. Opening and Preliminary Examination of Bids

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

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

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

19. Detailed Evaluation and Comparison of Bids

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

19.2. If the Project allows partial bids, all Bids and combinations of Bids as indicated in the **BDS** shall be received by the same deadline and opened and evaluated simultaneously so as to determine the Bid or combination of Bids offering the lowest calculated cost to the Procuring Entity. Bid Security as required by **ITB** Clause 15 shall be submitted for each contract (lot) separately.

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

20. Post Qualification

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

21. Signing of the Contract

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

Section III. Bid Data Sheet

Bid Data Sheet

<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:
CONCRETE WORKS/ CONCRETE PAVEMENT</td></tr>
<tr><td>7.1</td><td>Subcontracting is not allowed.</td></tr>
<tr><td>10.3</td><td>No further instruction.</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>5 years</td><td>3 years</td></tr>
<tr><td>Foreman</td><td>3 years</td><td>1 year</td></tr>
<tr><td>Mason</td><td>3 years</td><td>1 year</td></tr>
<tr><td>Welder</td><td>3 years</td><td>1 year</td></tr>
<tr><td>Electrician</td><td>3 years</td><td>1 year</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 Units</th></tr>
<tr><td>Backhoe</td><td></td><td>1</td></tr>
<tr><td>10W Dumptruck</td><td></td><td>1</td></tr>
</table></td></tr>
<tr><td>12</td><td>[Insert Value Engineering clause if allowed.]</td></tr>
<tr><td>15.1</td><td>The bid security shall be in the form of a Bid Securing Declaration or any of the following forms and amounts:

a. The amount of not less than P 22,819.49 [Two percent (2%) of ABC], if bid security is in cash, cashier’s/manager’s check, bank draft/guarantee or irrevocable letter of credit;

b. The amount of not less than P 57,048.72 [Five percent (5%) of ABC] if bid security is in Surety Bond.</td></tr>
<tr><td>19.2</td><td>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.</td></tr>
<tr><td>20</td><td>No further instructions.</td></tr>
<tr><td>21</td><td>Additional contract documents are the following: NONE</td></tr>
</table>

Section IV. General Conditions of Contract

1. Scope of Contract

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

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

2. Sectional Completion of Works

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

3. Possession of Site

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

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

4. The Contractor's Obligations

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

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

5. Performance Security

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

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

6. Site Investigation Reports

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

7. Warranty

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

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

8. Liability of the Contractor

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

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

9. Termination for Other Causes

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

10. Dayworks

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

11. Program of Work

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

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

12. Instructions, Inspections and Audits

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

13. Advance Payment

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

14. Progress Payments

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

15. Operating and Maintenance Manuals

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

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

Section V. Special Conditions of Contract

Special Conditions of Contract

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

Section VI. Specifications

CONSTRUCTION OF ADDITIONAL FACILITIES AT MUNICIPAL GARDEN

TECHNICALSPECIFICATIONS

INTRODUCTION

The Technical Specifications describe in detail the work to be executed, the character and quality of materials and workmanship and the specific responsibilities of the Contractor that are not covered by the Conditions of Contract. The Technical Specification shall be read in conjunction with the plans and other contract documents.

Pertinent notes appearing in the Contract Plans or Drawings shall also be considered as part and parcel of the technical specifications. Such notes shall take precedence over the DPWH Standard Specifications and the Supplemental 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 andother things to remain. The Contractor shall preserve all objects designated to remain. Pai ntrequired for cut or scarred surface of trees or shrubs selected for retention shall be an approved asphaltum base paint prepared especially for tree surgery. Clearing shall extend one (1) meter beyond the toe of the fill slopes or beyond rounding of cut slopes as the case maybe for the entire length of the project unless otherwise shown on the plans or as directed by the Engineer and provided it is within the right of way limits of the project, with the exception of trees under the jurisdiction of the Forest Management Bureau(FMB).

100.2.2 Clearing and Grubbing

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

(1) Removal of undisturbed stumps and roots and non perishable 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 non-perishable solid objects shall be cut off not more than 150 mm (6 inches) above the ground line or low water level.

(3) In areas to be rounded at the top of cut slopes, stumps shall be cut off flush with or below the surface of the final slope line.

(4) Grubbing of pits, channel changes and ditches will be required only to the depth necessitated by the proposed excavation within such areas.

(5) In areas covered by cogon/talahib, wild grass and other vegetations, top soil shall be cut to a maximum depth of 150 mm below the original ground surface or asdesignated by the Engineer, and disposed outside the clearing and grubbing limits as indicated in the typical roadway section.

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

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

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

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

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

Woody material may be disposed off by chipping. The wood chips may be used for mulch, slope erosion control or may be uniformly spread over selected areas as directed by theEngineer. Wood chips used as mulch for slope erosion control shall have a maximum thickness of 12 mm (1/2 inch) and faces not exceeding 3900 mm² (6 square inches) on any individual surface area. Wood chips not designated for use under other sections shall be spread

over the designated areas in layers not to exceed 75 mm (3 inches) loose thickness. Diseased trees shall be buried or disposed off as directed by the Engineer.

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

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

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

100.2.3 Individual Removal of Trees or Stumps

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

100.3 Method of Measurement

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

1. Area Basis. The work to be paid for shall be the number of hectares andfractions 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 Grubbinglump-sum item, no measurement of area will be made for such item.

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

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

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

100.4 Basis of Payment

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

Payment will be made under:

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

ITEM 103 Structure Excavation

103.1 Description

This Item shall consist of the necessary excavation for foundation of bridges, culverts, under drains, and other structures not otherwise provided for in the Specifications. Except as otherwise provided for pipe culverts, the backfilling of completed structures and the disposal of all excavated surplus materials, shall be in accordance with these Specifications and in reasonably close conformity with the Plans or as established by the Engineer. This Item shall include necessary diverting of live streams, bailing, pumping, draining, sheeting, bracing, and the necessary construction of cribs and cofferdams, and furnishing the materials therefore, and the subsequent removal of cribs and cofferdams and the placing of all necessary backfill. It shall also include the furnishing and placing of approved foundation fill material to replace unsuitable material encountered below the foundation elevation of structures. No allowance will be made for classification of different types of material encountered.

103.2 Construction Requirements103.2.1 Clearing and Grubbing

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

103.2.2 Excavation

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

Trenches or foundation pits for structures or structure footings shall be excavated to the lines and grades or elevations shown on the Plans or as staked by the Engineer. They shall be of sufficient size to permit the placing of structures or structure footings of the full width and

length shown. The elevations of the bottoms of footings, as shown on the Plans, shall be considered as approximate only and the Engineer may order, in writing, such changes in dimensions or elevations of footings as may be deemed necessary, to secure a satisfactory foundation.

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

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

(2) Structures other than pipe culverts. All rock or other hard foundation materialsshall be cleaned all loose materials, and cut to a firm surface, either level, stepped, or serrated as directed by the Engineer. All seams or crevices shall be cleaned and grouted. All loose and disintegrated rocks and thin strata shall be removed.

When the footing is to rest on material other than rock, excavation to final grade shall not be made until just before the footing is to be placed. When the foundation material is sofor mucky or otherwise unsuitable, as determined by the Engineer, the Contractor shall remove the unsuitable material and backfill with approved granular material. This foundation fill shall be placed and compacted in 150 mm (6inches) layers up to the foundation elevation.

When foundation piles are used, the excavation of each pit shall be completed before the piles are driven and any placing of foundation fill shall be done after the piles are driven. After the driving is completed, all loose and displaced materials shall be removed, leaving a smooth, solid bed to receive the footing.
(2) Pipe Culverts.The width of the pipe trench shall be sufficient to permit satisfactory jointing of the pipe and thorough tamping of the bedding material under and aroundthe pipe.

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

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

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

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

103.2.3 Utilization of Excavated Materials

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

103.2.4 Cofferdams

Suitable and practically watertight cofferdams shall be used wherever water-bearing strata are encountered above the elevation of the bottom of the excavation. If requested, the Contractor shall submit drawings showing his proposed method of cofferdam construction, as directed by the Engineer. Cofferdams or cribs for foundation construction shall in general, be carried well below the bottoms of the footings and shall be well braced and as nearly watertight as practicable. In general, the interior dimensions of cofferdams shall be such as to give sufficient clearance for the construction of forms and the inspection of their exteriors, and to permit pumping outside of the forms. Cofferdams or cribs which are tilted or moved laterally during the process of sinking shall be righted or enlarged so as to provide the necessary clearance. When conditions are encountered which, as determined by the Engineer, render it impracticable to dewater the foundation before placing the footing, the Engineer may require the construction of a concrete foundation seal of such dimensions as he may consider necessary, and of such thickness as to resist any possible uplift. The concrete for such seal shall beplaced as shown on the Plans or directed by the Engineer. The foundation shall then bedew atered and the footing placed. When weighted cribs are employed and the mass isutilized to overcome partially the hydrostatic pressure acting against the bottom of the foundation seal, special anchorage such as dowels or keys shall be provided to transfer the entire mass of the crib to the foundation seal. When a foundation seal is placed under water, the cofferdams shall be vented or ported at low water level as directed. Cofferdams shall be constructed so as to protect green concrete against damage from sudden rising of the stream and to prevent damage to the foundation by erosion. No timber or bracing shall be left in cofferdams or cribs in such a way as to extend into substructure masonry, without written permission from the Engineer. Any pumping that may be permitted from the interior of any foundation enclosure shall be done in such a manner as to preclude the possibility of any portion of the concrete material being carried away. Any pumping required during the placing of concrete, or for a period of at least 24 hours thereafter, shall be done from a suitable sump located outside the concrete forms. Pumping to dewater a sealed cofferdam shall not commence until the seal has set sufficiently to withstand the hydrostatic pressure. Unless otherwise provided, cofferdams or cribs, with all sheeting and bracing involved therewith, shall be removed by the Contractor after the completion of the substructure. Removal shall be effected in such manner as not to disturb or mar finished masonry.

103.2.5 Preservation of Channel

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

103.2.6 Backfill and Embankment for Structures Other Than Pipe Culverts

Excavated areas around structures shall be backfilled with free draining granular material approved by the Engineer and placed in horizontal layers not over 150 mm (6 inches) in thickness, to the level of the original ground surface. Each layer shall be moistened or dried as required and thoroughly compacted with mechanical tampers. In placing backfills or embankment, the material shall be placed simultaneously in so far as possible to approximately the same elevation on both sides of an abutment, pier, or wall. If conditions require placing backfill or embankment appreciably higher on one side than on the opposite side, the additional material on the higher side shall not be placed until the masonry has been in place for 14 days, or until tests made by the laboratory under the supervision of the Engineer establishes that the masonry has attained sufficient strength to withstand any pressure created by the methods used and materials placed without damage or strain beyond a safe factor. Backfill or embankment shall not be placed behind the walls of concrete culverts or abutments or rigid frame structures until the top slab is placed and cured. Backfill and embankment behind abutments held at the top by the superstructure, and behind the side walls of culverts, shall be carried up simultaneously behind opposite abutments or sidewalls. All embankments adjacent to structures shall be constructed in horizontal layers and compacted as prescribed in Subsection 104.3.3 except that mechanical tampers may be used for the required compaction. Special care shall be taken to prevent any wedging action against the structure and slopes bounding or within the areas to be filled shall be benched or serrated to prevent wedge action. The placing of embankment and the benching of slopes shall continue in such a manner that at all times there will be horizontal berm of thoroughly compacted material for a distance at least equal to the height of the abutment or wall to the backfilled against except insofar as undisturbed material obtrudes upon the area. Broken rock or coarse sand and gravel shall be provided for a drainage filter at weep holes as shown on the Plans.

103.2.7 Bedding, Backfill, and Embankment for Pipe Culverts

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

103.3 Method of Measurement

103.3.1 Structure Excavation

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

(1) The volume outside of vertical planes 450 mm (18 inches) outside of and parallel to the neat lines of footings and the inside walls of pipe and pipe-arch culverts at their widest horizontal dimensions.

(2) The volume of excavation for culvert and sections outside the vertical plane for culverts stipulated in (1) above.
(3) The volume outside of neat lines of under drains as shown on the Plans, and outside the limits of foundation fill as ordered by the Engineer.
(4) The volume included within the staked limits of the roadway excavation, contiguous channel changes, ditches, etc., for which payment is otherwise provided in the Specification.
(5) Volume of water or other liquid resulting from construction operations and which can be pumped or drained away.
(6) The volume of any excavation performed prior to the taking of elevations and measurements of the undisturbed ground.(7) the volume of any material rehandled, except that where the Plans indicate or the Engineer directs the excavation after embankment has been placed and except that when installation of pipe culverts by the imperfect trench method specified in Item500 is required, the volume of material re-excavated as directed will be included.(8) The volume of excavation for footings ordered at a depth more than 1.5 m (60inches) below the lowest elevation for such footings shown on the original Contract Plans, unless the Bill of Quantities contains a pay item for excavation ordered below the elevations shown on the Plans for individual footings.

103.3.2 Bridge Excavation

The volume of excavation, designated on the Plans or in the Special Provisions as "Bridge Excavation" will be measured as described below and will be kept separate for pay purposes from the excavation for all structures. The volume of bridge excavation to be paid shall be the vertical 450 mm (18 inches)outside of and parallel to the neat lines of the footing. The vertical planes shall constitute the vertical faces of the volume for pay quantities regardless of excavation inside or outside of these planes.

103.3.3 Foundation Fill

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

103.3.4 Shoring, Cribbing, and Related Work

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

103.3.5 Basis of Payment

The accepted quantities, measured as prescribed in Section 103.3, shall be paid for at the contract unit price for each of the particular pay items listed below that is included in the Billof Quantities. The payment shall constitute full compensation for the removal and disposal of

excavated materials including all labor, equipment, tools and incidentals necessary to complete the work prescribed in this Item, except as follows:
(1) Any excavation for footings ordered at a depth more than 1.5 m below the lowest elevation shown on the original Contract Plans will be paid for as provided in Part K, Measurement and Payment, unless a pay item for excavation ordered below Plan elevation appears in the Bill of Quantities.
(2) Concrete will be measured and paid for as provided under Item 405, Structural Concrete.

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

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

Payment will be made under:

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

ITEM 104 - EMBANKMENT

104.1 Description

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

104.2 Material Requirements

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

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

or rock.

Selected Borrow, for topping - soil of such gradation that all particles will pass a sieve with 75mm square opening and not more than 15 mass percent will pass the 0.075 mm (No.200) sieve, as determined by AASHTO T 11.The material shall have a plasticity index of not more than 6 as determined by AASl4TO T 90 and a liquid limit of not more than 30 as determined by AASHTO T 89.

2.Unsuitable Material - Material other than suitable materials such as:

a. Materials containing detrimental quantities of organic materials, such as grass, roots and sewerage.
b. Organic soils such as peat and muck.
c. Soils with liquid limit exceeding 80 and/or plasticity index exceeding 55.
d. Soils with a natural water content exceeding 100%.
e. Soils with very low natural density, 800 kg/m3 or lower.
f. Soils that cannot be properly compacted as determined by the Engineer.

104.3 Construction Requirements

104.3.1 General

Prior to construction of embankment, all necessary clearing and grubbing in that area shall have been performed in conformity with Item 100, Clearing and Grubbing. Embankment construction shall consist of constructing roadway embankments, including preparation of the areas upon which they are to be placed; the construction of dikes within or adjacent to the roadway; the placing and compacting of approved material within roadway areas where unsuitable material has been removed; and the placing and compacting of embankment material in holes, pits, and other depressions within the roadway area.

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

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

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

104.3.2 Methods of Construction

Where there is evidence of discrepancies on .the actual elevations and that shown on the Plans, a preconstruction survey referred to the

datum plane used in the approved Plan shall be undertaken by the Contractor under the control of the Engineer to serve as basis for the computation of the actual volume of the embankment materials.

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

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

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

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

water shall be accomplished through aeration by plowing, blading, discing, or other methods satisfactory to the Engineer.

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

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

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

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

Dumping and rolling areas shall be kept separate, and no lift shall be covered by another until compaction complies with the requirements of Subsection 104.3.3. Hauling and leveling equipment shall be so routed and distributed over each layer of the fill in such a manner as to make use of compaction effort afforded thereby and to minimize rutting and uneven compaction.

104.3.3 Compaction

Before commencing the formation of embankments, the Contractor shall submit in writing to the Engineer for approval his proposals for the compaction of each type of fill material to be used in the works. The proposals shall include the relationship between the types of compaction equipment, the number of passes required and the method of adjusting moisture content. The Contractor shall carry out full scale compaction trials on areas not less than 10 m wide and 50 m long as required by the Engineer and using his proposed procedures or such

amendments thereto as may be found necessary to satisfy the Engineer that all the specified requirements regarding compaction can be consistently achieved. Compaction trials with the main types of fill material to be used in the works shall be completed before work with the corresponding materials will be allowed to commence.

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

Earth

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

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

At least one group of three in-situ density tests shall be carried out for each 500 m^2 of each layer of compacted fill.

Rock

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

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

104.3.4 Protection of Roadbed During Construction

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

104.3.5 Protection of Structure

If embankment can be deposited on one-side only of abutments, wing walls, piers or culvert headwalls, care shall be taken that the area immediately adjacent to the structure is not compacted to the extent that it will cause overturning of, or excessive pressure against the structure.

When noted on the Plans, the fill adjacent to the end bent of a bridge shall not be placed higher than the bottom of the backfill of the bent until the superstructure is in place. When embankment is to be placed on both sides of a concrete wall or box type structure, operations shall be so conducted that the embankment is always at approximately the same elevation on both sides of the structure.

104.3.6 Rounding and Warping Slopes

Rounding-Except in solid rock, the tops and bottoms of all slopes, including the slopes of drainage ditches, shall be rounded as indicated on the Plans.

A layer of earth overlaying rock shall be rounded above the rock as done in earth slopes.

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

104.3.7· Finishing Roadbed and Slopes

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

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

104.3.8 Serrated Slopes

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

104.3.9 Earth Berms

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

Compacted Berm

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

Uncompacted Berm

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

104.4 Method of Measurement

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

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

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

104.5 Basis of Payment

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

Payment will be made under:

Pay Item Number	Description	Unit of Measurement
104 (1)	Embankment	Cubic Meter

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 requirementsshown on the Plans or as directed by the Engineer.

404.2 Material Requirements

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

404.3 Construction Requirements

404.3.1 Order List

Before materials are ordered, all order lists and bending diagrams shall be furnished by the Contractor, forapproval of the Engineer. The approved of order lists and bending diagrams by the Engineer shall in no wayrelieve the Contractor of responsibility for the correctness of such lists and diagrams. Any expense incidentto the revisions of materials furnished in accordance with such lists and diagrams to make them comply withthe Plans shall be borne by the Contractor.

404.3.2 Protection of Material

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

404.3.3 Bending

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

Bends and Hooks

Nominal diameter, (d), mm	Pin diameter (D)
10 to 20	6d
25 to 28	8d

32 and greater 10d

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

404.3.4 Placing and Fastening

All steel reinforcement shall be accurately placed in the position shown on the Plans and firmly held thereduring the placing and setting of the concrete. Bars shall be tied at all intersections except where spacing isless than 300 mm in each directions, in which case, alternate intersections shall be tied. Ties shall befastened on the inside.Distance from the forms shall be maintained by means of stays, blocks, ties, hangers, or other approvedsupports, so that it does not vary from the position indicated on the Plans by more than 6 mm. Blocks forholding reinforcement from contact with the forms shall be precast mortar blocks of approved shapes anddimensions. Layers of bars shall be separated by precast mortar blocks or by other equally suitable devices.The use of peebles, pieces of broken stone or brick, metal pipe and wooden blocks shall not be permitted.The minimum distance between bars shall be 40 mm. Reinforcement any member shall be placed, inspectedand approved by the Engineer before the concrete begins. Concrete placed in violation of this provision maybe rejected and removal may be required.

404.3.5 Splicing

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

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

Splice Grade 40 Grade 60 But not less thanTension 24 bar dia. 36 bar dia 300 mm
Compression 20 bar dia 24 bar dia 300 mmIn tapped splices, the bars shall be placed in contact and wired together. Lapped splices will not be permittedat locations where the concrete section is insufficient to provide minimum clear distance of one and one-third(1 1/3) the maximum size of coarse aggregate between the splice and the nearest adjacent bar. Welding of reinforcing steel shall be done only if detailed on the Plans or if authorized by the Engineer in writing. Spiralreinforcement shall be spliced by lapping at least one and a half turns or by butt welding unless otherwiseshown 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 completedstructure. No allowance will be made for tie-wires, separators, wire chairs and other material used infastening the reinforcing steel in place. No measurement or payment will be made for splices added by theContractor. When there is no item for reinforcing steel in the Bill of Quantities, costs will be considered asincidental to the other items (i.e. structural concrete, masonry, etc.) in the Bill of Quantities.

404.5 Basis of Payment

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

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
404 (1)	Reinforcing Steel (d)	Kilogram (kgs.)

ITEM 405 STRUCTURAL CONCRETE

405.1 Description

405.1.1 Scope of Work

This item shall consist of furnishing, bending, placing and finishing concrete in all structures exceptpavements in accordance with this Specification and conforming to the lines, grades, and dimensions shownon the Plans. Concrete shall consist of a mixture of Portland Cement, fine aggregate, course aggregate,admixture when specified or approved by the Engineer.

405.1.2 Classes and Uses of Concrete

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

Class A – All superstructures and heavily reinforced substructures. The important parts of the structureincluded 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 onlya small amount of reinforcement.

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

Class P – Pre-stressed concrete structures and members.
Seal – Concrete deposited in water.

405.2 Material Requirements

405.2.1 Portland Cement

It shall conform to all the requirements of Subsection 311.2.1

405.2.2 Fine Aggregate

It shall conform to all the requirements of Subsection 311.2.2.

405.2.3 Coarse Aggregate

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

Table 405.1- Grading Requirements for Coarse Aggregate

Standard (mm)	Alternate US Standard	Class A	Class B	Class C	Class D	Class Seal
63	2- ½"					
50	2"	100	100			
37.5	1- ½"	95- 100	-			
25	1"	-	35 -70	-	100	95 - 100
19.0	¾"	35-70	-	100	-	25 - 60
12.5	½"	-	10 - 30	90 – 100	-	25 - 60
9.5	3/8"	10 -30	-	40-70	20-55	-
4.75	No. 4	0- 5	0 - 5	0 – 15"	0 – 10"	0 – 10"

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

**405.2.4 Water**

It shall conform to all the requirements of Subsection 311.2.4.

**405.2.5 Reinforcing Steel**

It shall conform to all the requirements of Item 404, Reinforcing Steel and Item 710, Reinforcing Steel and Wire Rope. For Deformed Billet-Steel Bars (AASHTO M 31/ ASTM A615).

**405.2.5.1 Placing Reinforcement**

(1) General

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

(2) Splicing
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Splices shall be by lapping to develop the full strength of the bars unless otherwise indicated, the minimumsplice length shall be 40 times the bar diameter or the development length shown in Subsection 404.3.5,and Item 710, Reinforcing Steel-Splicing..

405.2.5.2 Admixtures

Admixtures shall conform to the requirements of Subsection 311.2.7.

405.2.5.3 Curing Materials

Curing materials shall conform to the requirements of Subsection 311.2.8.

ITEM 901 MASONRY WORKS

901.1 Description

The work includes all labor, materials, tools and equipment necessary to install concrete masonry and allappurtenant work in connection with the work as shown on the Drawings and Specifications.

901.2 Materials Requirements

Concrete masonry unit work of the type indicated shall be provided and shall be properly coordinated withthe work of their trades. The source of supply of materials, which will affect the appearance of the finishedwork, shall be changed after the work has started.

901.2.1 Concrete Hollow Blocks

Concrete hollow blocks shall be standard machine fabricated and shall have fine and even texture and welldefinededges. CHB shall conform to the requirements of ASTM Specifications C 90, grade with minimumcompressive strength of 2.45 MPa (350 psi) (average of 5 specimens). Samples shall be tested andsubmitted to the Engineer. Dimensions and tolerances shall be as individually specified on the Plans.

901.2.2 Mortar and Grout

Unless otherwise indicated on the Plans, masonry mortar shall be composed of one (1) part Portlandcement, and two (2) parts fine aggregate by volume to which hydrated lime has been added in an amountequal to ten (10) mass percent of the cement. For masonry walls not exceeding 1,8 m (1.6) in height, amortar composed of one (1) part masonry cement and two (2) parts fine aggregate by volume may be substituted for the above mixture of Portland cement, lime and fine aggregate. Grout shall be of the samematerials and proportion as mortar to which additional water shall be added to produce a consistency forpouring without segregation.Masonry cement shall conform to the requirements of AASHTO M 150 – 74 (ASTM C 91). Fine aggregateshall conform to the requirements of AASHTO M 45 (ASTM C 144). Water shall conform to the requirementsof Item 714, Water.

901.2.3 CHB Wall Reinforcement

1. Vertical and Horizontal Reinforcement

Unless otherwise specified, the vertical and horizontal reinforcements for CHB shall be 10mm diameterat 400 for all wall thick nesses. Lap splices shall be 300 mm long (minimum).

2. Lintel Beams

Unless noted otherwise, lintel beams to be used shall have a depth of 0.20 m and the thickness ofCHB wall, reinforced by 4 – 10 mm diameter with 10 mm diameter at 200 ties.Lintel beams shall be provided on top of CHB wall openings. It shall extend at least 0.30 m beyondeach opening.Stiffener beams (detail similar to lintel beam) shall be provided on top CHB partition walls notanchored to regular reinforced concrete beams/girders. Stiffener beams shall be provided for wallsexceeding 3 meters in height.

3. Dowels

Where CHB walls adjoin R.C. columns and beams provide dowels on R.C. column and beams prior topouring to match CHB wall reinforcement size and spacing. Dowels shall be 600 mm long unless notedotherwise.

4. Movement Gaps

Where the top of CHB wall adjoins a beam provide 50 mm gap to be filled with a soft material likestyrophor.Where the sides of a CHB wall adjoin a column provide 50 mm gap to be filled with soft material likestyropor. Rebars shall be retained for stability.

5. Anchors

Where columns and beams poured without the CHB wall dowels, provide 16 mm diameter expansion bolts tomatch CHB reinforcement spacing. These anchors shall be drilled and hammered in placed. No chipping offof concrete columns and beams is allowed unless otherwise permitted by the Engineer.

901.3 Construction Requirements

901.3.1 Laying Concrete Masonry Units

901.3.1.1 Workmanship

Units shall be set plumb and true to line with level horizontal joints. Hollow units shall be laid with full mortar coverage on horizontal and vertical face shells, and at least 50 percent of the cells shall be filled with grout,the cells containing vertical reinforcements to be among those to be filled up. All cells of CHB walls fromfooting up to at least the

ground floor level shall be filled up. Solid units shall be laid with full head and bed joints.Joints shall be uniform and approximately 10 mm wide unless otherwise indicated.Unless otherwise shown on the drawings, joints of exterior concrete masonry units that will be exposed andpainted shall be cut flush and tooled finished with a 6.5 mm dept "V" joint for horizontal joints. Vertical joints between the horizontal joints shall be tooled flush. Joints of interior concrete masonry units shall be cut flush,and the blocks shall be given a cement plaster finish except as otherwise shown on the Drawings. The minimumof cement plaster shall be 10 mm.

901.3.1.2 Setting Embedded Items

All anchor bolts and miscellaneous metalwork embedded in masonry shall be set in accordance with settingplans or instructions furnished by trades supplying the metalwork. Care shall be exercised to insure that allanchors are completely surrounded by grout.

901.3.1.3 Masonry Lintels

The Contractor shall provide properly shored supports for construction of masonry lintels for opening inwalls. Shoring shall not be removed for at least seven days after lintels are placed.

901.3.1.4 Placing Reinforcing Bars and Grouting

All reinforcing steel, except dowels in concrete, shall be accurately set in strict accordance with the Drawing sand the notes thereon. Vertical steel shall be secured firmly in place by means of frames or other suitabledevices. Horizontal steel may be placed as the work progresses. In any core containing reinforcement, thedistance between any masonry and the reinforcement shall be at least 12.7 mm (1/2 in) at all points. Themasonry contractor shall furnish all tiles, spacers and supports required to hold steel in position during grouting.Cores shall be grouted in lifts not exceeding 1.22 m (4 ft) in height. Grout shall be thoroughly rodded. Splices inreinforcing bars shall be lapped at a distance sufficient to develop the stress in the bar, but not less than 40 bar diameters. Concrete hollow blocks shall be laid with all cells completely grouted from the wall footing up to the ground level.The rest of the concrete hollow blocks above ground shall have at least 50 percent of the cells grouted,including those containing the vertical reinforcements.

901.3.1.5 Protection and Cleaning

Corners shall be protected from damage, with substantial board covers. Mortar or grout stains on masonrywork shall be removed immediately. Any masonry work showing stains from mortar or concrete, or grout atcompletion of work, shall be replaced or the entire masonry surface sandblasted to provide uniform approvedappearance. In cleaning the block, only stiff fiber brushes and wooden scrapers shall be used. Metalimplements or acids shall not be used for cleaning blocks. All imperfect joining,

nail holes, chipped edges ofcorners, and similar defects shall be corrected or replaced as directed.

901.4 Method of Measurement

All masonry works shall be measured in square meters installed complete with plastering, mortar and groutand installing reinforcing bars as shown on the drawing and prescribed in the specification.

901.5 Basis for Payments

The accepted quantities measured as prescribed in Sub-Section 901.4 shall be paid for at the appropriatecontract unit price for the pay item listed below as shown in the Bill of Quantities, which price and paymentshall be full compensation for furnishing all materials, including all form and false work; for mixing, placing, furnishing, and curing the concrete; and for all labor, materials, equipment, tools and incidentals to completethe item.

Payment shall be made under:

Pay Item No.	Description	Unit of Measurement
414 (1)	150 mm thick CHB Walls With Cement plaster finish	square meter (m2)
414 (2)	100 mm thick CHB Walls With Cement plaster finish	square meter (m2)

ITEM 903 – FORMWORKS AND FALSEWORKS

This Item covers fabrication, erection, and removal of forms and falseworks for cast-in-place concrete.

903.2 Material Requirements

Forms shall be constructed with metal or timber, for timber forms, it is important that the moisture content of the timber that will be used to make the formwork is between 15 to 20 percent. Low moisture content means the timber is very dry thus it can absorb moisture from the wet concrete resulting to swelling and bulging of timber and weak hardened concrete. Use of tough resin as wood coating is the treatment used to overcome the moisture problem in timber formworks though painting the wood with varnish is an alternative cheaper treatment. Forms for surfaces which will be exposed to view when construction is completed shall be prefabricated plywood panel forms, job-built plywood forms, or forms that are lined with plywood of fiber board.

For metal forms, it is important that the metal used as sheating should be free from rust and non-reactive to concrete or concrete containing calcium oxide. Plywood or lined forms will not be required for surfaces which are normally submerged or not ordinarily exposed to view. Other types of forms, such as steel or unlined wooden forms, may be

used for surface which are not restricted to plywood or lined forms, and may be used as backing for form linings. Forms are required above all extended footings.

903.3 Construction Requirements

903.3.1 General

Forms shall be fabricated, erected, and removed as specified herein and shall be of a type, size, shape, quality and strength to produce hardened concrete having the shape, lines and dimensions indicated on the drawings. The forms shall be true to line and grade in accordance with the tolerances as specified for cast-in-place concrete and shall be mortar tight and sufficiently rigid to resist deflection during concrete placement. The surface of forms shall be smooth and free from irregularities, dents, sags, and holes that would deface the finished surfaces.

The minimum thickness used for metal forms shall be 2.5mm or 3mm thick or of such thickness that the forms remain true to shape. For timber formworks plywood is used for sheating with a minimum thickness of 18 mm to 25 mm though the thickness of the plywood to be used will depend on the pressure that the wet concrete will put on the formwork. The design of formwork will specify the thickness of the plywood that will be incorporated in the project. All tie bars with bolts used in fastening forms should be countersunk to depth similar to the required concrete covering and patched with cement mortar. The use of approved internal steel ties or steel or plastic spacers shall be permitted. The fabricated spacer blocks shall have an embedded No. 16 G.I. Tie Wire with sufficient length to be attached to the reinforcing steel bars to hold the spacers in place after closure minimum wall thickness of 4 mm.

The design and construction of the formworks and falseworks shall be the responsibility of the Contractor and for approval of the Engineer. The Contractor shall employ competent professional engineering services to design forms to be approved by the Engineer and supervise the erection of all formworks needed for the completion of the project. All materials to be incorporated to the site shall be inspected and approved by the Engineer.

903.3.2 Fabrication and Erection

Formworks to be used shall conform to ACI 347 – Guide to Formwork for concrete. Forms shall be substantial and sufficiently tight to prevent leakage of mortar. Forms shall be braced or tied to maintain the desired position, shape, and alignment during and after concrete placement. Waters, studs, internal ties, and other form supports shall be sized and spaced so that proper working stresses are not exceeded. Joints in forms shall be bolted tightly and shall bear on solid construction. Forms shall be constructed so they can be removed without hammering, wedging, or prying against the concrete. Form ties shall be approved by the Engineer and shall be of the snap cone or she-bolt with cone type. The spacing of form ties shall be designed to withstand concrete pressures without bulging, spreading, or lifting of the forms. The forms shall produce finished surface that are from off-sets, ridges, waves, and concave or convex areas.

Forms to be reused shall be thoroughly cleaned and repaired. Split, frayed, delaminated, or otherwise damaged forms shall not be used. All form panels shall be placed in a neat,

symmetrical pattern with level and continuous horizontal joints. The Contractor shall place special attention on mating forms to previously placed walls so as to minimize steps or rough transitions. Form panels shall be of the largest practical size to minimize joints and to improve rigidly which is to be designed by the formworks engineer of the Contractor. For engineered wood, available panels sizes of 1.20 m x 2.70 m and 3.0 m x 2.40 m can be ordered. Beams and slabs supported by concrete columns shall be formed in a way that the column forms can be removed without disturbing the supports of the beams or slabs.

Wherever the top of a wall will be exposed to weathering, the forms on at least one side shall not extend above the top of the wall and shall be brought to true line and grade. At other locations, forms for concrete which is to be finished to a specified elevation, slope, or contour, shall be brought to a true line and grade, or a wooden guide strip shall be provided at the proper location on the forms so that the top surface can be finished with a screed or template. At horizontal construction joints in walls, the forms on one side shall not extend more than 7 m above the joints.

When necessary, temporary openings shall be provided at the bottom of column and wall forms and at other points in order to facilitate cleaning and inspection prior to concrete placement. Unless shown otherwise on the drawings, all salient corners and edges of beams, columns, walls, slabs, and curbs shall be provided with a 25 mm by 25 mm chamfer formed by a wood or metal chamfer strip.

Forms for exposed surfaces and all steel forms shall be coated with non-staining form release agent which shall be applied just prior to placement of steel reinforcement. After coating with industrial lubricants such as form oil, any surplus form release coating on the form surface shall be removed. Wood forms for unexposed surfaces may be thoroughly wetted with water in lieu of coating with industrial lubricant immediately before concrete placement, except in freezing weather form release coating shall be used. Should misalignment of forms or screeds, excessive deflection of forms, or displacement of reinforcement occur during concrete placement, immediate corrective measure shall be taken to ensure acceptable lines and surface to required dimensions and cross sections. If any forms bulge or show excessive deflection, in the opinion of the Engineer, the concrete shall be removed and the forms shall be rebuilt and strengthened.

903.3.3.2.1 Foundations for Formwork

Proper foundations on ground, such as mudsills, spread footings, or pile footings should be provided. If soil under mudsills is or may become incapable of supporting superimposed loads without appreciable settlement, it should be stabilized or other means of support should provided.

903.3.3 Safety

Forms must be strong and sound (made of good quality and durable materials) in order to carry the full load and side pressure from freshly placed concrete. To ensure that forms are safe, correctly designed and strong enough for the expected load, Occupational Safety and Health Administration (OSHA) regulations under Section 1926.703 Safety and Heath Regulations for Construction, American Concrete Institute

347 (ACI 347) – Guide to Formwork recommendations under Section 3.1 Safety Precautions in Construction and Section 3.2 Construction Practices and Workmanship, and local code requirements for formwork should be followed.

903.3.4 Delivery, Storage, Maintenance and Handling

Any formwork with steel components should be stored in a dry place. Avoid direct sunlight on timber forms. Store form materials and accessories above ground with a minimum height of 100 mm on framework or blocking without twist or bend, and shall be covered with a suitable waterproof of covering providing adequate air circulation and free from dirt, Store and handle form coating tp prevent contamination in accordance with manufacturer's recommendation. For maintenance of the forms, use stiff brush and clean water for the cleaning of forms. Use scrapers only as a last resort for maintenance purposes. Keep forms well-oiled tp prevent delamination of plywood or rusting of stell and always oil the edges.

903.3.5 Removal of Forms

Forms, false works and centering shall not be removed or disturbed until the concrete has attained sufficient strength to safely support all dead and live loads, or until the concrete has attained the minimum percentage of specified design strength listed in the Table below. Shoring beneath beams or slabs shall be left in place and reinforced as necessary to carry any construction equipment or materials placed thereon.

No forms shall be removed without the approval of the Engineer. In general and undernormal conditions, the Engineer will approve removal of forms after the following time has elapsed:

Description of Structural Member	Period of time	Minimum% of Design Strength
Walls, column and vertical sides of beams	1 to 2 days	70%
Beam soffits (props left under)	7 days	80%
Soffits of slabs (props left under)	3 days	70%
Removal of props to slabs: Soffits of slabs, for slabs spanning upto 4.5 m	7 days	70%
Removal of props to slabs: Soffits of slabs, for slabs spanning over 4.5 m	14 days	70%

Removal of props to beams and arches: Centering under girders, beam frames and arches spanning up to 6.0m	14 days	80%
Removal of props to beams and arches: Centering under girders, beam frames and arches spanning over 6.0m	21 days	80%

Order and method of removing formwork:

a. Shuttering forming the vertical faces of walls, beams and columns sides should be removed first as they bear no load but only retain the concrete.

b. Shuttering forming soffit of slabs should be removed next.

c. Shuttering forming soffit of beams, girders or other heavily loaded shuttering should be removed in the end.

Care shall be taken into consideration during form rem oval to avoid surface gouging, corner or edge breakage, or other damage to the concrete. Immediately after form removal, any damaged or imperfect work shall be repaired as specified by the Engineer.

903.3.5.1 Removal of Forms for Special Strucutres

In continuous structures, support should not be released in any span until the first and second adjoining spans on each side have reached the specified strength. For prestressed concrete construction, pre-tensioning and post-tensioning of strands, cables or roads can be done with or without side forms of the member in place. Bottom forms and supporting shores or falsework should remain in place until the member is capable of supporting its dead load and anticipated construction loads, as well as any formwork carried by the member. Side forms that remain in place during the transfer of pre-stressing force should be designed to allow for vertical and horizontal movements of the cast member during the pre-stressing operation. In all cases, the deflections of members due to pre-stressing force and the elastic deformation of forms or falsework should be considered in the design and removal of the forms. For reasons of safety, when using post-tensioned, cast-in-place elevated slabs, the contractor should be careful to ensure that supporting shores do not fall out due to lifting of the slab during tensioning. For large structures where the dead load of the member remains on the formwork during pre-stressing, displacement of the dead load toward end supports should be considered in the design of the forms and shoring, including sills or other foundation support.

For concrete structures with direct or indirect contact with sea water, sea water or brackish water shall not come in direct contact with concrete prior to the age in days indicated in the Table shown below.

Requirements for the Removal of Formwork for Concrete in Contact with Sea Water or Brackish Water	
Water Salinity (ppm dissolved salts) **(parts per million or mg/l of dissolved salts)**	**Days to Elapse prior to Salt Water Contact (days)**
0 to 10,000	Normal Curing
10,000 to 20,000	15
20,000 to 30,000	25
Over 30,000	30

903.3.6 Quality Control and Inspection

Materials and components used for formworks shall be examined for damage or excessive deterioration before use. Reuse of forms shall be allowed only if found suitable after necessary repairs. In case of timber forms, the inspection shall not only cover physical damages but also signs of attacks by decay, rot or insect attack or the development of splits. Reuse of job-built forms shall be permitted only when specifically approved by the Engineer.

The Contractor shall allow the Engineer to inspect the completed formwork and reinforcement, before carrying out any work, including fixing reinforcement adjacent to formwork and erecting formwork adjacent to reinforcement, which will make access to the formwork faces or reinforcement difficult. The Contractor shall inform the Engineer 24 hours before carrying out such work.

903.4 Method of Measurement

Forms installed for the forming of cast-in-place concrete in accordance to shop drawings and design calculations shall be measured in square meters (m^2) or when the contract stipulates that the payment for formworks and falseworks will be on lump sum basis, the pay item will include all materials and components used for fabrication, erection and removal of forms. The quantity to be paid for shall be the square meters of formwork used and accepted by the Engineer or the lump sum bid price in the Contract.

903.5 Basis of Payment

The quantity measured as prescribed above shall be paid for at the Contract Unit Price or lump sum price bid for the pay item listed below that is included in the Bill of Quantities. This unit price shall cover full compensation for all materials, labor, tools, equipment, and related services necessary for the design, construction and removal of formwork and falsework.

Properly supported members is required until the concrete is cured, set and hardened is also part of the Contract Unit Price.

Payment will be made under:

Pay item Number	Description	Unit of Measurement
903 (1)	Formworks and Falseworks	Lump Sum
903(2)	Formworks and Falseworks	Square Meter

ITEM 1001 STORM DRAINAGE AND SEWERAGE SYSTEM

1001.1 Description

This Item shall consist of furnishing all materials, equipments and labor for the complete installation of thestorm drainage system to include all pipings, gutters, canals, catch basins, junction boxes, handholes, manholes and other appurtenant structures, and sewerage system to include all sanitary sewer piping andseptic vault where no public sewer exist, from the building to the point of discharge.

1001.2 Material Requirements

1001.2.1 Materials for storm drainage system shall meet the requirements specified in the following

Standard specifications:

Portland Cement	ASTM C-150
Fine and Coarse Aggregate	ASTM C-33
Reinforcing Steel	ASTM A-615
Non-reinforced Concrete Pipes	ASTM C-14
Reinforce Concrete Pipes	ASTM C-76 (AASHTO M-86)
Cast Iron Pipes (for conductors and Downspout)	ASTM A-74
Galvanized Iron Pipes Schedule 40 (for conductors and Downspout)	ASTM A-120
Polyvinyl Chloride (PVC) (for conductors and Downspout)	ASTM 2729

Where the covers for catch basins, junction boxes, manholes and canals for grating are required same shall be made of wrought iron and of the dimensions as shown on the Plans.

1001.2.2

Material for sewerage system shall meet the requirements specified in the following standardspecifications:

Cast Iron Pipes and Fittings	ASTM A-74

Pig Lead (for securing And sealing joints)	ASTM B 29-77
Polyvinyl Chloride Pipes (PVC) And Fitting (where called in Plans)	ASTM D 1784
Solvent Cement (for securing PVC joints)	ASTM D 2564

Where PVC pipes and fittings are used, joints shall be secured with rubber "O" ring or solvent cement, as the case maybe. Oakum for joints in bell and spigot pipes shall be made from hemp fiber, braided or twisted and oil impregnated free from lumps, dirt and extraneous matter.

1001.3 Construction Requirements

1001.3.1 Installation of Pipes

Under no circumstances shall pipes shall be laid under water and when the trench condition or the weather isunsuitable for such work.

a. **Bedding**. Materials such as sand, sandy soil or any approved material shall be to provide a firmfoundation of uniform density. The bedding shall have the minimum thickness equivalent to one-fourth (1/4)of the pipe diameter.

b. **Laying of Pipes**. Proper facilities shall be provided for lowering and placing pipes into trenches inorder to prelude damage. Laying of pipes shall start upgrade with the spigot end of bell-and-spigot pipe, orthe tongue end of tongue-and groove pipe, positioned towards the direction alignments shown in the Plans.The spigots or tongues shall be adjusted in bells or grooves to provide uniform space around joints toreceive mortar. Blocking or wedging between spigot and bell or between tongue and groove to attain properspacing shall be allowed provided such blocking/wedging shall not interfere with the caulking; and shall notaffect the water tightness of the joint.

c. **Bell and Spigot Joint for Drain Pipe**. The first pipe shall be properly bedded at the required grade.Just below the spigot of the first unit, a sufficient space shall be provided for engaging the bell end of thesecond pipe.The spigot shall be carefully cleaned with a wet brush and the upper exterior portion applied with mortar tosuch a thickness as to bring the inner surfaces of the abutting pipes flush and even. The bell end of thesecond pipe shall be cleaned with a wet brush and uniformly matched with the spigot of the first pipe so thatthe sections are closely fitted. After the second pipe is laid, the remainder of the joint shall be fitted withmortar, and a bead shall be formed around the outside of the joints with sufficient amount of mortar. Theinside of the joints shall be wiped and finished smooth. The mortar head of the outside shall immediatelyprotected with a cover of wet burlap of wet earth for at least three (3) days for curing.

d. **Tongue and Groove Joint for Concrete Pipe**. The first pipe shall be properly bedded. A shallowexcavation shall be made underneath the joint and filled with mortar to provide a bed second pipe. Thetongue end of the first pipe shall be carefully cleaned with wet brush and soft mortar applied around theupper half of the tongue. After cleaning and positioning the second pipe close to the first, mortar shall beapplied around the lower half of the groove. With just

sufficient thrust, the second pipe shall be brought inclose contact with the first until mortar is squeezed out of the joint. Sufficient mortar shall be used to fill the
joint and to form a bead on the outside.

e. **Mortar for Joint**. Mortar shall be a mixture of Portland cement, sand and water mixed in the
proportion by volume of one part cement to two parts of clean sand with just sufficient amount of water forplasticity.

f. **Leaded Joints of cast-Iron Pipes**. Joints of cast-iron pipes shall be packed with braided or twistedoil impregnated hemp or oakum, properly caulked around the joint. The packing shall be at least 200 mm.below the rim of the hub or bell and this space shall be filled with molten pig lead in one continuous pouring.The "ring" of the pig lead formed around the joint shall be properly caulked by appropriate caulking tools torender the joint watertight.

1001.3.2 Concrete Structures

Concrete structures such as catch basins, canal gutters, junction boxes and manholes for the drainagesystem, and septic vault for sewerage system, shall be constructed in accordance with the Plans andSpecifications on Concrete Work.

1001.3.3 Sewer Connections and Clean-outs

a. The outlet of the septic vault shall be connected to the street drain or to other discharge point whereno sanitary sewer exists. Connection with the sanitary sewer shall not be made without the permission of theproper authorities, but shall be made in such a manner that any and all the service water, as well as houseand other liquid wastes, will flow to the sanitary sewer. Provided, that the isolated faucets used exclusivelyfor garden purposes may, in the discretion of the proper authorities, be allowed not to flow into the sanitarysewer.

b. Clean-outs or rodding holes consisting of cast iron extensions with long sweep elbow fittings shallbe provided at the ends of runs and at every change of directions. Clean-outs shall be capped with castbrass ferrules with threads and screwed-on removable brass plugs. Clean-outs extended outside the building
and raised to the level of finished grade shall be terminated with the same cast brass ferrule with brass plugset into a concrete slab shall be 150 mm. thick and 300 mm. square, finish flush with grade.

1001.3.4 Incidental Earthwork

Incidental earthwork for the storm drainage and sewerage systems, such as excavation and backfilling shallbe undertaken in accordance with applicable part of Excavation Filling and Grading.

1001.3.5 Inspection and Quality Control

Materials shall be inspected and accepted as to quality before same are installed. Pipings installed intrenches shall first be inspected, tested and approved by the Engineer before

these are covered orbackfilled. All defects/ leaks disclosed by the water test shall be remedied to the satisfaction of the Engineerand any extra cost shall be at the expense of the Contractor.

1001.4 Method of Measurement

Pipes, culverts, gutters, canals and gratings installed in place and accepted by the Engineer, shall bemeasured by the meter along their axes. Catch basins, junction boxes, manholes and septic vault shall bemeasured by the number of units constructed and accepted.

1001.5 Basis of Payment

The quantities as determined in sub-section 1001.4 shall be paid at the contract unit price for each of theItems which shall constitute full compensation for all materials, labor, tools and equipment and all otherincidentals necessary to complete the Item.

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
1001.2 (a)	Pipe and fittings (kind and size)	Linear Meter (Lm)
1001.2 (b)	Concrete Gutter	Linear Meter (Lm)
1001.2 (c)	Concrete canal	Linear Meter (Lm)
1001.2 (d)	W.I. Grating and Accessories	Linear Meter
1001.2 (e)	Catch basin	Each
1001.2 (f)	Junction Box	Each

ITEM 1002 PLUMBING

1002.1 Description

This Item shall consist of furnishing all materials, tools, equipments and fixtures required as shown on thePlans for the satisfactory performance of the entire plumbing system including installation in accordance withthe latest edition of the National Plumbing Code, and this Specification.

1002.2 Material Requirements

All piping materials, fixtures and appliances fitting accessories whether specifically mentioned or not butnecessary to complete this Item shall be furnished and installed.

1002.2.1 Water Supply Pipes and Fittings

a. Pipes and fitting materials shall be galvanized iron pipe schedule 40 conforming to specificationrequirements defined in ASTM A – 120 with threaded connection. Under roads where necessary shall besuitably protected as shown on the Plans.Fittings shall

be malleable iron Type II, galvanized iron conforming to specification requirements defined inASTM A 338

b. **Valves** for water supply shall be bronze body with threaded ends rated 21.0 kgf/cm square. Allvalves shall be gate valves unless otherwise specified. Gate valves shall have solid wedge body and discsconforming to specification requirements defined in ASTM B – 62. Globe valves shall have plug type discswith ferule threaded ends and bronze body.

c. **Unions** on ferrous pipe 50 mm in diameter and smaller shall be malleable iron.

d. Water Meter where required to be furnished by the Contractor shall be of the type tested and approved by MWSS or local water service provider.

1002.2.3 Approved Alternate Pipes and Fittings

Pipes and fitting for sanitary and potable water lines as approved alternate shall be Unplasticized Polyvinyl Chloride Pipes and Fittings (UPVC). Pipes and fittings shall be made of virgin materials conforming to specification requirements defined in ASTMD – 2241 and PNS 65 : 1986. Fittings shall be molded type and designed for solvent cement joint connectionfor water lines and rubber O-ring seal joint for sanitary lines.

1002.2.4 Septic Tank

The septic tank shall be provided as shown on the Plans including all pipe vents and fittings. The variousconstruction materials such as concrete masonry work shall conform to the corresponding Items of thisSpecifications. Inlet and outlet pipes shall conform to the latest edition of the National Plumbing Code.

1002.2.5 Plumbing Fixtures and Fittings

All fittings and trimmings for fixtures shall be chromium-plated and polished brass unless otherwiseapproved. Exposed traps and supply pipes for fixtures shall be connected to the roughing-in, piping systemat the wall unless otherwise indicated on the Plans. Built –in fixtures shall be watertight with provision ofwater supply and drainage outlet, fittings and trap seal. Unless otherwise specified, all plumbing fixtures shallbe made of vitreous china complete with fittings.

a. Water closet shall be vitreous china, free standing toilet combination, round front outlet siphonicwashdown bowl with fitting extended rear self and closed coupled tank with cover complete with fittings andmounting accessories. Model make and color shall be submitted for approval prior to the delivery at jobsiteby the Engineer.

b. Lavatory shall be vitreous china, wall - hung with rear over flow and cast-in soap dishes, pockethanger with integral china brackets, complete with twin faucets, supply pipes, P-trap and mountingaccessories. Where indicated on the plans to be counter top model make and color shall be approved by theEngineer.

c. Urinal shall be china vitreous, wall-hung wash out urinal with extended shields and integral flushspreader, concealed wall hanger pockets 19 mm. top spud complete with fitting and mounting accessoriesmodel make and color shall be approved by the Engineer.

1002.2.6 Bathroom and Toilet Accessories

a. Shower head and fitting shall be movable cone type with excutcheon arm complete with stainlesssteel shower valve and control lever, all exposed surface to be chromium finish.

b. Grab bars shall be made of tubular stainless steel pipe provided with safety grip and mountingflange.

c. Floor drain shall be made of stainless steel beehive type measuring 100 mm. x 100 mm., and provided with detachable stainless strainer expanded metal lath type.

d. Toilet paper holder shall be vitreous china wall mounted. Color shall reconcile with the adjacentfixture and facing tile works.

f. Faucet(s) shall be made of stainless steel for internal used.

g. Hose-bib(s) shall be made of bronze cast finish.

1002.2.7 Special Plumbing Fixtures

a. Kitchen sink shall be made of stainless steel self rimming, single compartment complete with supply fittings, strainer traps, dual control lever and other accessories.

b. laboratory sink shall be made of cast iron metal with white porcelain finish with single compartment, flat rim ledge, 762 mm. x 533 mm. complete with supply fittings, strainer, trap and other accessories.

c. Scrub-up sink shall be made of cast iron metal with white porcelain finish measuring 610 mm. x 610mm. complete with supply fittings, strainer, trap and wall mounting accessories.

d. X-ray developing tank shall be made of cast iron white porcelain finish with three (3) compartment x-ray processing tank, drain plug, open standing drain, 19 mm. IPS inlet spud complete with stand and mounting accessories.

e. Squat bowl(s) shall be vitreous china, wash down squat bowl with integral foot treads, pail flushtype. Color, make and type to be approved by the Engineer.

f. Grease traps shall be made of cast bronze with detachable cover and mounting accessories.

1002.2.8 Roof Drains, Downspout, Overflow Pipes and Steel Gratings

The Contractor shall provide, fit and/or install necessary drains with strainers, where shown on the Plans. Each drain with strainer shall fit the size of the corresponding downspout (or roof leader) over which it is tobe installed and in conformity with the following schedule:

a. Scrupper drains (for balconies, parapet) shall be made of bronze base with flashing. Flange threaded outlet and convex with integral flashing clamp bolted to flange.

b. "Josam" type drains shall be made of bronze base semi-dome with large free area, flashing clampand integral gravel stopper. To be used at roof decks, canopies, gutters, and elsewhere indicatedon the Plans.

c. Downspouts when encased with concrete, unless otherwise shown on the Plans shall be polyvinylchloride (PVC). Whether indicated or specified to be cast iron or galvanized iron the same shallmeet the specification requirement as herein described.

d. Overflow pipes shall be made of galvanized iron pipe measuring at least 13 mm. diameter andspaced 200 mm. on center.

e. Steel grating shall be made of wrought iron metals of design on shop drawings approved and surfaces to be coated with shop finish.

1002.2.9 Fire Protection System

a. Fire hose cabinets shall be locally available consisting of 38 mm. diameter valve hose rack with nipple 30 mm. rubber lined hose cable with standing 4268 kg/cm square, nozzle 38 mm. Diameterbrass, chromium plated.

b. Fire stand pipe system shall consist of risers and hose valves. Pipe shall be extra strong black iron. Valves to be high grade cast bronze mounted with standing 79.40 kg. working pressure as indicated on the Plans.

c. Fire extinguisher shall be portable, suitable for Class A, B, C fires mounted inside cabinet. Cabinetshall be full flush mounting door with aluminum trim for glass plate, frame and box shall be made ofgauge 14 galvanized iron sheet with white interior and red exterior baked enamel finish over primerpaint. Cabinet to be wall mounted and size to be able to accommodate the defined components.

d. Yard Hydrant where shown on the Plans shall match the integrated Fire Department requirements.Outlet shall be single 63 mm. diameter gate valves with chain connected caps.

1002.2.10 Built-in Appliances

Built-in appliances such as urinal trough, lavatory and slope sink shall be made as indicated on the Plans, exposed surfaces to be tile wainscoating complete with fitting accessories required as practiced in thisspecialty trade.

1002.3 Construction Requirements

The Contractor before any installation work is started shall carefully examine the Plans and shall investigate actual structural and finishing work condition affecting all his work. Where actual condition necessitates a rearrangement of the approved pipe lay-out, the Contractor shall prepare Plan(s) of the proposed pipe layout for approval by the Engineer.

1002.3.1 Installation of Soil, Waste, Drain and Vent Pipes

a. All cast iron soil and drainage pipes shall be pitch 6 mm. per 300 mm. but in no case flatter than 3mm per 300 mm.

b. Horizontal lines shall be supported by well secured length heavy strap hangers. Vertical lines shall be secured strongly by hooks to the building frame and a suitable brackets or chairs shall beprovided at the floor from which they start.

c. All main vertical soil and waste stacks shall be extended full size to and above the roof line to act as vents, except otherwise indicated on the Plans.

d. Vent pipes in roof spaces shall be run as possible to underside of roof with horizontal piping pitched down to stacks without forming traps. Vertical vent pipes may be connected into one mainvent riser above the highest vented fixtures.

e. Where an end or circuit vent pipe from any fixtures is connected to an vent line serving other fixtures, the connection shall be at least 1.20 meter above the floor on which the fixtures are located.

f. Horizontal waste line receiving the discharge from two (2) of more fixtures shall be provided with end vents unless separate venting of fixtures is noted on the Plans.

g. All changes in pipe sizes on soil and waste lines shall be made with reducing fittings or recessedreducers. All changes in directions shall be made by appropriate use of 45 degrees wyes, halfwyes, long sweep quarter bends or elbows may be used in soil and waste lines where the change indirection of flow is from the horizontal to the vertical and on the discharge from waste closets.Where it becomes necessary to use short radius fittings in other locations the approval of theEngineer shall be obtained prior to installation of the same.

h. Cleanouts at the bottom of each soilstack, interior downspout and where else indicated shall be the same size as the pipe up to and including 102 mm., 152 mm., for larger pipes.

i. Vent pipe shall be flashed and made watertight at the roof with roof cement or approved equivalent. Flashing shall be turned down into pipes.

j. Each fixtures and place of equipment requiring connection to the drainage system except fixtures with continuous waste shall be equipped with a trap. Each trap shall be

placed as near to the fixtureas possible. Traps installed on threaded pipe shall be recessed drainage pattern.

k. Overhead horizontal runs of pipes shall be hung with adjustable wrought iron pipe hanger spaced not over 3.0 meters apart.

1002.3.2 Water Pipes, Fittings and Connections

All water pipings inside the building and underground, 100 mm. diameter and smaller shall be galvanizediron threaded pipe with malleable iron fittings.

a. The water piping shall be extended to all fixtures, outlets, and equipment from the gate valves installed in the branch near the riser.

b. The cold water system shall be installed with a fall towards a main shutoff valve and drain. Ends ofpipes and outlets shall be capped or plugged and left ready for future connections.

c. Mains and Branches

1. All pipes shall be cut accurately to measurements and shall be worked into place without springing or forcing. Care shall be taken so as not to weaken the structural portions of the building.

2. All piping above the ground shall be run parallel with the lines of the building unless Otherwise indicated on the Plans.

3. All service pipes, valves and fittings shall be kept at sufficient distance from other work to permit finished covering not less than 12.5 mm. from such work or from finished covering on the differentservice.

4. No water piping shall be buried in floors, unless specifically indicated on the Plans and approved by the Engineer.

5. Changes in pipes shall be made with reducing fittings.

d. Drain Cocks

1. Pipe drain indicated on the drawings shall consist of 12 mm. globe valve with renewable disc and installed at low points on the cold water piping so that all piping shall slope 100 mm. in 30.5 meters.

e. Threaded Pipe Joints

1. All pipes shall be reamed before threading. All screw joints shall be made with graphite and oil orwith an approved graphite compound applied to make threads only. Threads shall be full cut andnot more than three threads on the pipe shall remain exposed.

f. Expansion and Contraction of Pipes
Accessible contraction-expansion joints shall be made whenever necessary. Horizontal run of pipe over 15m. length shall be anchored to the wall to the supporting structure about midway on the run to forceexpansion and contraction equally toward the ends or as shown on the Plans.

g. Fire Standpipe System
Fire standpipe system shall consist of risers and hose valve. Pipe shall be extra strong black iron. Valves tube underwriter's approval high grade cast bronze mounted.

h. Valves and hose Bibs

1. Valves shall be provided on all supplied fixtures as herein specified.

2. The cold water connections to the domestic hot water heater shall be provided with gate valves and the return circulation connection shall have gate and a check valve.

3. All connection to domestic hot water heaters shall be equipped with unions between valve and tanks.

4. Valve shall not be installed with its stem below the horizontal. All valves shall be gate valves unless otherwise indicated on the Plans.

5. Valves up to and including 50 mm. diameter shall be threaded ends, rough bodies and finished trimmings, except those on chromium plated brass pipe.

6. Valves 63 mm. in diameter and larger shall have iron bodies, brass mounted and shall have eitherscrews or flange ends.

7. Hose bibs shall be made of brass with 12.5 mm inlet threads, hexagon shoulders and 19 mm. male.

1002.3.3 Fixtures, Equipment and fastenings

a. All fixtures and equipment shall be supported and fastened in a safe and satisfactory workmanship as practiced.

b. All fixtures, where required to be wall mounted on concrete or concrete hollow block wall, fasten with brass expansion bolts. Expansion bolts shall be 6 mm. diameter with 20 mm. threads to 25 mm. into solid concrete, fitted with loose tubing or sleeves of proper length to acquire extreme rigidity.

c. Insert shall be securely anchored and properly flushed into the walls. Insert shall be concealed and rigid.

d. Bolts and nuts shall be horizontal and exposed. It shall be provided with washers and chromium plate finish.

1002.3.4 Pipe hangers, Inserts and Supports

a. Pipe shall be wrought iron or malleable iron pipe spaced not more than 3 m. apart for horizontal runs or pipe, except hub and spigot soil pipe which shall have hanger spaced not more than 1.5m. apart located near the hub.

b. Chains, straps perforated turn-buckles or other approved means of adjustment except the turnbuckles may be omitted for hangers on soil or waste lines or individual toilet rooms to maintainstacks when spaced does not permit.

c. Trapeze hangers may be used in lieu of separate hangers on pipe running parallel to and close to its other.

d. Insert shall be cast steel and shall be of type to receive a machine bolt or nut after installation. Insert may be permitted adjustment of the bolts in one horizontal direction and shall be installedbefore pouring of concrete.

e. Wrought iron clamps or collars to support vertical runs of pipe shall be spaced not more than 6m. apart for as indicated on the Plans.

1002.3.5 Plates and Flashing

a. Plates to cover exposed pipes passing through floor finished walls or ceiling shall be filled with chromium plate cast iron or steel plates on ferrous pipes.

b. Plates shall be large enough to cover and close the hole around the area where pipe pass. It shallbe properly installed to insure permanence.

c. Roof area penetrated by vent pipe shall be rendered watertight by lead sheet flashing and counter flashing. It shall extend at least 150 mm. above the pipe and 300 mm. along the roof.

1002.3.6 Protection and Cleaning

a. During installation of fixtures and accessories and until final inspection and turn over, protect items with strippable plastic or other approved means to maintain fixtures in perfect conditions.

b. All exposed metal surfaces shall be polished clean and rigid of grease, dirt or other foreign materials upon completion.

c. Upon completion, thoroughly clean all fixtures and accessories to leave the work in polished condition.

1002.3.7 Inspection, Warranty Test and Disinfection

All pipes, fittings, traps, fixtures, appurtenances and equipment of the plumbing and drainage system shallbe inspected and approved by the Engineer to insure compliance with all requirements of all Codes andRegulations referred to in this Specification.

1002.3.7.1 Drainage System Test

a. The entire drainage and venting system shall have all necessary openings which can be plugged to permit entire system to be filled with water to the level of the highest stack vent above the roof.

b. The system shall hold this water for a full 30 minutes during which time there shall be no drop greater than 102 mm.

c. Where only the portion of the system is to be tested, the test shall be conducted in the same manner as described for the entire system except that a vertical stack 3.0 meter highest horizontalline to be tested may be installed and filled with water to maintain sufficient pressure or water pumpmay be used to supply the required pressure.

d. If and when the Engineer decides that an additional test is needed, such as air to smoke test on the drainage system, the Contractor shall perform such test without any additional cost.

1002.3.7.2 Water Test on System

a. Upon completion of the roughing-in and before connecting fixtures the entire cold water piping system shall be tested at a hydrostatic pressure 1 ½ times the expected working pressure in thesystem during operation and remained tight and leak-proofed.

b. Where piping system is to be concealed the piping system shall be separately in manner similar to that described for the entire system and in the presence of the Engineer or his duly designatedrepresentative.

1002.3.7.3 Defective Work

a. All defective materials replaced and tested will be repeated until satisfactory performance is attained.

b. Any material replaced for the satisfactory performance of the system made shall be at the expense of the Contractor.

c. Caulking of screwed joints or holes will be permitted.

1002.3.7.4 Disinfection

a. The entire water distribution system shall be thoroughly flushed and treated with chlorine before it is operated for public use.

b. Disinfection materials shall be liquid chlorine or hypochlorite and shall be introduced in a manner approved as practiced or approved by the Engineer into the water distribution system.

c. After a contact period of not less than sixteen (16) hours, heavily chlorinated water shall be flushed from the system with potable water.

d. Valves for the water distribution system shall be opened and closed several times during the sixteen (16) hours chlorination treatment is done.

1002.3.8 As-built Drawings

Upon completion of the work, the Contractor shall submit two (2) sets of prints with all as-built changes shown on the drawings in a neat workmanship manner. Such prints shall show changes or actual installationand conditions of the plumbing system in comparison with the original drawings.

1002.4 Method of Measurement

The work done under this Item shall be quantified per length and/ or number of units as provided in the Bill ofQuantities, tested and accepted to the satisfaction of the Engineer.

1002.5 Basis of Payment

The quantified Items, installed in place shall be the basis for payment, based from the unit bid price for whichprices and payments shall constitute full compensation including labor, materials and incidentals necessaryto complete this Item.

Payment shall be made:

Pay Item No	. Description	Unit of Measurement
1002 (a) and Fittings (size and sch)	Galvanized Iron Pipes	lengths
1002 (b) and Fittings (size and sch)	PVC Pipes	lengths
1002 (c)	Plumbing Fixtures	set
1002 (d)	Roof Drain with Strainer	set
1002 (e)	Fire Hose cabinet	set
1002 (f) (kgs.)with Cabinet	Fire Extinguisher Class A, B,C set	

ITEM 1003 CARPENTRY AND JOINERY WORKS

1003.1 Description

The work under this Item shall consist of furnishing all required materials, fabricated wood work, toolsequipment and labor and performing all operations necessary for the satisfactory completion of all carpentryand joinery works in strict accord with applicable drawings, details and this specifications.

1003.2 Material Requirements

1003.2.1 Lumber

Lumber of the different species herein specified for the various parts of the structure shall be well seasoned, sawn straight, sun dried or kiln dried and free from defects such as loose unsound knots, pitch pockets,sapwood, cracks and other imperfections impairing its strength, durability and appearance.

1003.2.1.1 Grade of Lumber and Usage

a. Stress grade is seasoned, closed-grained and high quality lumber of the specified specie free from defects and suitable for sustaining heavy loads.
Stress grade lumber shall be used for wooden structural members subject to heavy loads, and subfloor framing embedded or in contact with concrete or masonry.

b. Stress grade lumber of the specified specie is generally of high quality, of good appearance, withoutimperfections, and suitable for use without waste due to defects and suitable also for natural finish.Select grade lumber shall be used for flooring, sidings, facia and base boards, trims, mouldings,millwork, railings, stairs, cabinet work, shelvings, doors, windows and frames of openings.

c. Common grade lumber has minimum tight medium knot not larger than 25 mm. in diameter, with minimal imperfections, without sapwood, without decay, insect holes, and suitable for use withsome waste due to minor defects and suitable also for paint finish. Common grade lumber shall beused for light framework for wall partitions, ceiling joist and nailers.

1003.2.1.2 Lumber Species and Usage

Unless otherwise specified on the Plans, the following lumber species shall be used as indicated:
a. **Yacal**(stress grade) for structural member such as post, girders, girts, sleepers door and windowframes set or in contact with concrete or masonry.

b. **Guijo**(select grade) for door and window frames set in wooden framework, for stairs, for roof
framing supporting ceramic or cement tiles, floor joist and other wooden structural parts.

c. **Apitong**(common grade) for roof framing supporting light roofing materials such as galvanized iron,aluminum or PVC sheets, for wall framing, ceiling joist, hangers and nailers.

d. **Tanguile**(select grade) for doors and windows, facia and base boards, trims, mouldings, millwork,railings, stairs, cabinet work, shelvings, flooring and siding.

e. **Narra**(select grade) for stair railings, flooring boards, wall panels, base boards, trims, mouldings,cabinet work, mill work, doors and windows when indicated as such in the Plans.

f. **Dao** (select grade) for parts of the structure as enumerated under Section 1003.2.1.2 (e), whenindicated as such on the Plans.

1003.2.1.3 Moisture Content

Rough lumber for framing and siding boards shall be air-dried or sun-dried such that its moisture contentshall not exceed 22 percent. Dressed lumber for exterior and interior finishing, for doors and windows, millwork, cabinet work and flooring boards shall be kiln-dried and shall not have a moisture content in excess of14 percent at the time of installation in the structure.

1003.2.1.4 Substitution in Lumber Specie

Any lumber equally good for the purpose intended may be substituted for the specific kind subject to the priorapproval of the Engineer, provided the substitution shall be of equal or better specie acceptable to the Engineer. In case of substitution with better specie, no additional cost therefore shall be allowed to theContractor.

1003.2.2 Plyboard

Plyboard shall be good grade and made of laminated wood strips of uniform width and thickness boundedtogether with water resistant resin glue. The laminated core shall be finished both faces with select gradetanguile or red lauan veneers not less than 2 mm. thick similarly bonded to the core. The plyboard of not lessthan 19 mm. thick shall be free from defects such as split in veneer, buckling or warping.

1003.2.3 Plywood

Plywood shall conform to the requirements of the Philippine Trade Standards 631 – 02. Thickness of a single layer laminae shall not be less than 2 mm. The laminae shall be superimposed in layers with grains crossingat right angles in successive layers to produce stiffness. The face veneers shall be rotary cut from selectgrade timber. The laminae and face veneers shall be bonded with water resistant resin glue, hot pressed andpressure treated. Ordinary tanguile or red lauan plywood with good quality face veneers, 6 mm. thick shall be used for double walling and ceiling not exposed to moisture; waterproof or marine plywood shall be used forceiling exposed to moisture such as at toilets and eaves, ceiling to be finished with acrytex.

1003.2.4 Lawanit

Lawanit, when required per plans, shall be 6 mm. thick, tempered or oil impregnated for moisture/ waterresistance. Texture of lawanit shall be subject to the approval of the Engineer.

1003.2.5 Materials other than Lumber

1003.2.5.1 Plastic Sheet

When required for counter top, plastic sheet such as Formica shall not be less than 1.50 mm. thick and shallhave hard, durable and glossy surface resistant to stain, abrasion

and heat. Color and design shall be as selected from the manufacturer's standard and approved by the Engineer.

1003.2.5.2 Glue

Glue shall be from water resistant resins which, upon hardening, shall not dissolve nor lose its bond orholding power even when soaked with water for extended period.Glue in powder form be in sealed container and shall be without evidence of lumping or deterioration inquality.

1003.2.5.3 Fasteners

Nails, screw, bolts and straps shall be provided and used where suitable for fixing carpentry and joinery works. All fasteners shall be brand new and of adequate size to ensure rigidity of connections.

a. Nails of adequate size shall be steel wire, diamond-pointed, ribbed shank and bright finish.

b. Screws of adequate size shall be cadmium or brass plated steel with slotted head.

c. lag screws of adequate size, for anchoring heavy timber framing in concrete or masonry, shall be galvanized steel.

d. Bolts and nuts shall be of steel having a yield point of not less than 245 Mpa. Bolts shall have a square heads and provided with standard flat steel washers and hexagonal nuts. Threads shallconform to American coarse thread series. The threaded portion shall be long enough such that thenut can be tightened against the bolted members without any need for blocking. The bolt's threaded end shall be finished smooth for ease of engaging and turning of the nut.

e. Wrought iron straps or angles, when require in conjunction with bolts and lag screws to provide proper anchorage, shall be of the shape and size shown on the Plans.

1003.3 Construction Requirements

1003.3.1 Quality of Materials

All materials to be incorporated in the carpentry and joinery works shall be of the quality specified under Section 2. Before incorporation in work, all materials shall have been inspected/ accepted by the Engineer orhis authorized representative.

1003.3.2 Storage and Protection of Materials

Lumber and other materials shall be protected from dampness during and after delivery at the site. Materialsshall be delivered well in advance of actual need and in adequate quantity to prelude delay in the work.Lumber shall be piled in orderly stack at least 150

mm. above ground and at sheltered place where it will beof least obstruction to the work.

1003.3.3 Shop Drawings

Shop drawings complete with essential dimensions and details of construction, as may be required by theEngineer in connection with carpentry and joinery work, shall be submitted for approval before proceedingwith the work.

1003.3.4 Rough Carpentry

Rough carpentry covers timber structural framing for roof, flooring, siding, partition and ceiling.

a. Framing shall be stress grade or common grade lumber of the specie specified under Section.

b. Rough carpentry shall be done true to lines, levels and dimensions. It shall be squared, aligned,plumbed and well fitted at joints.

c. Trusses and other roof framing shall be assembled, fitted and set to exact location and slope indicated on the Plans.

d. Fasteners, connectors and anchors of appropriate type and number shall be provided and fittedwhere necessary.

e. Structural members shall not be cut, bored or notched for the passage of conduits or pipes withoutprior approval of the Engineer. Members damaged by such cutting or boring shall be reinforced bymeans of specifically formed and approved steel plates or shapes, otherwise, damaged structuralmembers shall be removed and replaced to the satisfaction of the Engineer.

f. Timber framing in contact with concrete or masonry shall be treated with termite-proofing solutionand after drying coated with bituminous paint.

1003.3.5 Finished Carpentry

Finished carpentry covers works on flooring, siding and ceiling board, stairs, cabinets, fabricated woodwork,millwork and trims

a. Framing lumber shall be select grade, free from defects and where exposed in finished work, shallbe selected for color and grain.

b. Joints of framing shall be tenoned, mortised or doweled where suitable, closely fitted and securedwith water resistant resins glue. Exterior joints shall be mitered and interior angles coped.

c. Panels shall be fitted, allow for contraction or expansion and insure that the panels remain in placewithout warping, splitting and opening of joints.

d. Plyboard shall be as specified under Section 1003.3.2.3 unless otherwise indicated on the Plans.

e. Plywood shall be specified under Section 1003.2.4.

f. Exposed edges of plywood or plywood for cabinets shall be provided with select garde hardwoodstrips, rabbetted as necessary, glued in place and secured with finishing nails. To prevent splitting,hardwood for trims shall be drilled before fastening with nails or screws.

g. Fabricated woodwork shall be done preferably at the shop. It shall be done true to details and
profiles indicated on the Plans. Where set against concrete or masonry, woodwork shall be installedwhen curing is completed

h. Exposed wood surfaces shall be free from disfiguring defects such as raised grains, stains, unevenplanning, sanding, tool marks and scratches. Exposed surfaces shall be machine or hand sanded toan even smooth surface, ready for finish.

1003.4 Method of Measurement

All carpentry actually installed shall be measured and determined by Subsections 1003.3.3 and 1003.3.5 asprovided in the Bill of Quantities accepted to the satisfaction of the Engineer.

1003.5 Basis of Payments

The Items measured and determines as provided in subsection 1003.4 shall be paid for at the unit bid pricewhich payment constitute full compensation of material, labor and incidentals necessary to complete thisitem.

Payment shall be made under:

Pay Item Number	Description	Unit of Measurement
1003 (a)	Rough carpentry (framing, Roof, flooring, partition, ceiling)	square meter
1003 (b)	Finished carpentry (cabinets,	square meter
cabinets, railings, etc.)		

ITEM 1004 HARDWARE

1004.1 Description

This Item shall consist of furnishing and installing all building hardware required to: (1) ensure rigidity ofjoints/ connections of the different parts of the structure; and (2) equip in a satisfactory operating conditionparts of the structure such as doors, windows, cabinets, lockers, drawers and other similar operating parts asindicated on the Plans and in accordance with this specifications.

1004.2 Material Requirements

1004.2.1.1 Rough Hardware

All rough hardware such as nails, screws, lag screws, bolts and other related fasteners required for carpentrywork shall be first class quality and locally available.

1004.2.2 Finishing Hardware

All finishing hardware consisting of locksets, latches, bolts and other devices, door closers, knobs, handles, hinges, and other similar hardware shall be first class quality available locally and conforming with thefollowing specification.

1004.2.2.1 Door Locksets

Door locks appropriate for particular functions shall be of durable construction, preferably the product of single reputable manufacturer for consistent quality and master keying.

1004.2.2.1.1

Cylindrical lockset for swing wood door shall of sturdy construction and knob design. The cylindrical caseshall be made of steel, zinc coated & dichromate dip. The knobs, latch, strike & pin tumbler assembly shallbe cast brass or bronze. The spring and spindle shall be steel, zinc coated. The pins and the key, shall beretracted by knob from either side except when the outside knob is locked by key in the outside knob or bythe turn / push button on the inside knob.

1004.2.2.1.2

Mortise lock for swing door shall have cast bronze latch bolt with steel compression spring, cast bronze deadbolt with hardened steel inserts, wrought bronze or brass knobs heavy gauge and cold formed steeloperation levers. The pin tumbler cylindrical assembly shall be cast bronze or brass and fitted with 5 springpressed nickel silver pins. Mortise lock used in conjunction with fire exit bolts shall have armored fronts.

1004.2.2.1.3

Unit of monolock for swing door shall be factory assembled in one piece, with knobs and escutcheons attached, ready for installation. All parts of unit lock shall be non-ferrous metal. Frame shall be one piececast bronze of extruded brass, front shall be flat for door 35 mm thick and believed for door 45 mm thick, andlatch bolt shall be pivoted swing type with minimum 26 mm throw. Cylinder shall be extruded brass with 5spring-pressed pins and keys shall be nickel silver.

1004.2.2.1.4

Dead lock for sliding door shall be mortise of surface mounted type to suit particular application.

1004.2.2.1.4.1

Mortise type dead lock shall have cast bronze case, front, latch bolts, strike and cylinder. Operation of deadbolt shall be by drop handles from either side. When locked by key from outside, or by thumb knob frominside, drop handle will not operate the dead bolt.

1004.2.2.1.4.2

Surface type deadlock shall have cast bronze case, strike and cylinder. Interlocking vertical bolt shall behardened steel operated by key from outside and thumb turn from inside. Strike shall be angle type.

1004.2.2.1.5

Deadlock for swinging door shall be tubular design with mechanism made of heavy gauge cold-rolled steel, zinc coated and dischromated. Dead bolt strike and pin tumbler cylinder shall be bronze. Dead bolt, with atleast 25 mm throw, shall be operated by key from outside and thumb from inside.

1004.2.2.1.6

Lock for door of emergency / fire exit (panic hardware) shall be cast bronze or brass and heavy duty lockingdevice coupled with a horizontal crossbar. Latch shall be operated by key from outside and by crossbar frominside. Locking device shall be surface or mortise type suitable for a particular application. Inactive leaf ofdouble doors or emergency / fire exit shall be fitted with vertical road actuated by crossbars, such vertical rodproviding two point locking, bottom and overhead.

1004.2.2.1.7

Lock for drawers and cabinets shall be bronze or brass with latch operated by key through a pin-tumbler cylinder 22 mm in diameter. Back plate of the lock shall be provided with four screw holes for mounting.

1004.2.2.1.8

Hasplock, when required as indicated on the Plans shall be hinge hasp with integral padlock. The hinge haspshall be zinc coated wrought steel, 47.5 mm in width and 100 mm in length when closed. The integralpadlock shall be pin tumbler type with solid or laminated zinc-coated wrought steel case with hardened steelshackle securely attached to the draw bolt.

1004.2.2.2 Door Closers

a. All door closer shall be cast bronze provide with a key valve or cap valve for making necessary adjustment.

b. The following table shall serve as guide in determining door closer sixes.

Door Maximum Width	Size of Closer
0.76 m	Size 2
0.90 m	Size 3
1.07 m	Size 4
1.20 m	Size 5
1.37 m	Size 6

Use large size where unusual conditions exist.

1004.2.2.3 Hinge

Hinge unless otherwise indicated on the Plans shall be brass coated wrought iron steel for interior doors and wrought bronze for exterior doors with non-rising loose steel pins with button tips and mounting screws of thesame materials.

1004.2.2.4 Sliding Door Hardware

Sliding door hardware shall be four-wheel ball bearing trolley on overhead track. Track is of rolled steel formed steel or extruded aluminum. Bearing is of plan steel balls or steel rollers. Wheels shall be steel,brass, rubber or plastic as the case maybe.

1004.2.2.5 Miscellaneous Hardwares

1004.2.2.5.1 Flush Bolt
Flush / extension flush type bolt shall be made of stainless steel with proper suitable to the door specified.

1004.2.2.5.2 Barrel blots
Barrel blots shall be of wrought steel brass coated with an attachment of at least 4-screws.

1004.2.2.5.3 Door Pull and Push Silencer
Door pull and push plate shall be made of stainless steel with concealed attachments.

1004.2.2.5.4 Hook, Bumper and Silencer
Hook, bumper and silencer shall be made of extruded brass or bronze, dull chrome finish with at least 2screw attachments.

1004.2.2.5.5 Furnitures and Cabinets Hardware
Furniture and cabinet hardware line piano hinge, invisible hinge, floor pivot hinge, cabinet door cache, shallbe made from extruded brass or bronze with dull chrome finish, of sizes and type suited for use.

1004.2.2.5.6 Push Plate
Push plate for metal door shall be made of stainless steel with concealed attachment.

1004.3 Construction Requirements

1004.3.1 Submittals
The Contractor shall submit all necessary information to the Engineer prior to placing of order.

1004.3.1.1 Manufacturers data such as catalog for every hardware item to be furnished, showing allfinishes, sizes, catalog numbers and pictures, with all abbreviations fully explained shall be submitted asgeneral; information and reference.

1004.3.1.2 Hardware templates for fabricated doors and windows shall be furnished to each fabricatorto confirm that adequate provisions will be done for proper installation of the hardware.

1004.3.1.3 Operation and maintenance data shall be provided and submitted to the Procuring Entity showing all the hardware component part lists and maintenance instructions for each type supplied includingthe necessary wrenches of tools required.

1004.3.2 Packaging and Marking

1004.3.2. Each article shall be individually package in the manufacturers commercial carton / container properly marked or labeled so as to be readily identified and delivered to the project site in theoriginal manufacturers containers / package.

1004.3.2.2 All hardware shall be provided with fasteners necessary for the installation packed in thesame container with the Hardware.

1004.3.3 Storage and Protection
Hardware shall be properly stored in a dry and secured place. It shall be protected from damage at all timesprior to and after installation.

1004.3.4 Installation of Hardware

a. All hardware shall be installed in a neat workmanship manner following the manufacturers instruction manual to fit details as indicated on the Plans.

b. Except as indicated or specified otherwise, fasteners furnished with the hardware shall be used to fasten hardware in a place.

c. After installation works are completed the hardware shall be protected from paints, stains, blemishes and other damage until the work are properly turned over and accepted.

d. All hardware shall be properly checked and adjusted in the presence of the engineer and all hinges, locks, catches, bolts, pulls, closers and other miscellaneous items shall operate properly.

e. After hardware are properly checked and adjusted keys shall be properly identified with

key tags turned over to the Engineer.

1004.3.5 Keying

Locks shall be keyed in sets and subsets. Where locks are required by the owner to be keyed alike in onesystem furnish a total of 4 keys for each set.

1004.4 Method of Measurement

Work prescribed in this Section shall not be measured as follows:

(1) Cost incurred in furnishing the following Items such as ITEM 1003, Carpentry and Joinery, ITEM1004, Hardware; and shall not be measured and paid separately, same shall be deemed to beincluded in the cost of Items of work, as part of the Contractor‟s Bill of Quantities.

1004.5 Basis of Payment

The accomplished work item shall be paid for at the appropriate unit price of the particular pay item shown inthe Bill of Quantities which price and payment shall constitute full compensation for furnishing andmaintaining such items as provided in Subsection 1004.4.

ITEM 1007 ALUMINUM GLASS DOORS

1007.1 Description

This Item shall consist of furnishing all aluminum glass doors materials, labor, tools and equipment requiredin undertaking the proper installation as shown on the Plans and in accordance with this Specification.

1007.2 Material Requirements

1007.2.1 Frame and panel members shall be fabricated from extruded aluminum sections true to detailswith clean, straight, sharply defined profiles and free defects impairing strength or durability.Extruded aluminum sections shall conform to the specification requirements as defined inASTM B 211.

1007.2.2 Screws, nuts, washers, bolts, rivets and other miscellaneous fastening devices shall be madeof non-corrosive materials such as aluminum, stainless steel, etc.

1007.2.3 Hardware for fixing and locking devices shall be closely matched to the extruded aluminium section and adaptable to the type and method of opening.

1007.2.4 Vinyl weather strip shall be first class quality flexible vinyl forming an effective seal and withoutadverse deformation when installed.

1007.2.5 Pile weather strip shall be silicon treated and free from residual wetting agents and made ofsoft fine as wool, fur, etc.

1007.2.6 Glazing shall conform to the requirement specified in Item 1012, Glass and Glazing.

1007.3 Construction Requirements

For all assembly and fabrication works the cut ends shall be true and accurately jointed, free of burrs andrough edges. Cut-out recesses, mortising, grinding operation for hardwares shall be accurately made andproperly reinforced when necessary.

1007.3.1 Installation Procedure

1007.3.1.1 Main frame shall consist of head sill and jamb stiles specifically designed and machined tointerfit and to be joined at corners with self-threading screws.

1007.3.1.2 Frame sill shall be stepped and slope with offset weep holes foe efficient drainage to theexterior.

1007.3.1.3 Door shall be accurately joined at corners assembled and fixed rigidly to ensure weathertightness.

1007.3.1.4 Aluminum glass door and main frame shall be installed in a prepared opening to be set plumb,square, level and true to details.

1007.3.1.5 All joints between metal surface and masonry shall be fully caulked to ensure weathertightness.
1007.3.1.6 Sliding type door panel shall be equipped with concealed roller overhead tracks with bottomguide.

1007.3.1.7 Double action type door panel shall be equipped with heavy duty hinges that will control thedoor leaf in a close or open position.

1007.3.1.8 Weather strip shall be furnished on edges at the meeting stiles of doors.

1007.3.1.9 Where aluminum is to be in contact with steel concrete cinder, block, tile, plaster or othersimilar masonry construction the aluminum surface shall be back painted before erection with abituminous paint.

1007.3.2 Shop Finish
Exposed aluminum surfaces shall be electro type hard coats.

1007.3.3 Protection

a. All aluminum parts shall be protected adequately to ensure against damaged during transit and construction operations.

b. Aluminum parts in contact with steel members shall be properly insulated by a coat or zinc chromate primer applied to the steel or by application of bituminous paint.

1007.3.4 Cleaning

a. The Contractor does not only protect all entrance units during construction but also responsible for removal of protective materials and cleaning aluminum surfaces.

b. Aluminum shall be thoroughly cleaned with plain water with kerosene or gasoline and then wipe surfaces using clean cotton fabric. No abrasive cleaning agents shall be permitted.

1007.4 Method of Measurement

Aluminum glass door, fully equipped with fixing accessories and locking devices shall be measured in square
meters base on actual in place installed as shown on the Plans accepted to the satisfaction of the Engineer.

1007.5 Basis of Payment

The area in square meters of aluminum glass doors installed including main frame and ready for service asprovided in Item 1007.4 shall be the basis of payment based on the unit bid or contact unit price.

Pay Item	Number Description	Unit of Measurement
1007	Aluminum Glass door Sliding type, designated as D – on the schedule	square meter (sq.m.)

ITEM 1008 ALUMINUM GLASS WINDOWS

1008.1 Description

This Item shall consist of furnishing all aluminum glass window materials, labor, tools and equipmentrequired in undertaking the proper installation as shown on the Plans and in accordance with thisSpecification.

1008.2 Material Requirements

1008.2.1 Frame and panel members shall be fabricated from extruded aluminum section true to detailswith clean, straight, sharply defined profiles and free from defects impairing strength or
durability. Extruded aluminum section shall conform to the specification requirements defined in
ASTM B 211.

1008.2.2 Screws, nuts, washers, bolts, rivets and other miscellaneous fastening devices shall be madeof non-corrosive materials such as aluminum, stainless steel, etc.

1008.2.3 Hardware for fixing and locking devices shall be closely matched to the extruded aluminium section and adaptable to the type and method of opening.

1008.2.4 Weather strip shall be first class quality flexible vinyl forming an effective seal and withoutadverse deformation when installed.

1008.2.5 Glazing shall conform to the requirements specified in Item 1012.

1008.2.6 Pile weather strip shall be silicon treated and free from residual wetting agents made of softfine hair as on wool, fur, etc.

1008.3 Construction Requirements

For all assembly and fabrication works the cut end shall be true and accurate, free of burrs and rough edges.Cut-outs recesses, mortising and grinding operation for hardwares shall be accurately made and properlyreinforced.

1008.3.1 Installation Procedure

1008.3.1.1 Main frame shall consist of head, sill and jamb.

1008.3.1.2 Window sash

1008.3.1.3 Window panel shall be jointed at corners with miter and fixed rigidity to ensure weathertightness.

1008.3.1.4 Sliding windows shall be provided with nylon sheave. Sliding panels shall be suspended withconcealed roller overhead tracks with bottom guide pitch outward and slotted for completedrainage. The sliding panels shall be provided with interior handles. The locking device shall bespring loaded extruded latch that automatically engages special frame hips.
1008.3.1.5 Casement window type shall be provided with two hinges fabricated from extruded aluminium alloy. They shall open on stay arms having adjustable sliding friction shoes to control windowpanel operations. Locking device shall be one arm action handle for manual operations complete with strike plate.

1008.3.1.6 All joints between metal surface and masonry shall be fully caulked.

1008.3.1.7 Aluminum parts in contact with steel members shall be properly insulated by a coat of zincchromate, primer/ bituminous paint applied to the steel surface.

1008.3.1.8 Weather strip shall be furnished on edges at the meeting stiles.

1008.3.2 Shop Finish
Exposed aluminum surfaces shall be electrotype hard coats such as anodize, satin, etc.

1008.3.3 Protection
All aluminum parts shall be protected adequately to ensure against damage during transit and construction phase.

1008.3.4 Cleaning

1008.3.4.1 The Contractor does not only protect all entrance units during the construction phase but shallalso be responsible for removal of protective materials and cleaning the aluminum surfaceincluding glazing before work is accepted by the Engineer.

1008.3.4.2 Aluminum shall be thoroughly cleaned with kerosene or gasoline, diluted with water and thenwipe surface using clean cloth rugs.

1008.3.4.3 No abrasive cleaning materials shall be permitted in cleaning surface.

1008.4 Method of Measurement

Aluminum glass window fully equipped with fixing accessories and locking devices shall be measured insquare meters base on actually in place installed and accepted to the satisfaction of the Engineer.

1008.5 Basis of Payment
The area of aluminum glass doors in square meters ready for service as provided in the Bill of Quantitiesshall be the basis of payment based on the unit bid or contact unit price which price and payment constituteall materials, labor including incidentals.

Payment will be made under:

Pay Item Number	Description	Unit of Measurement
1008 (1)	Aluminum Awning Windows	square meter (m2)
1008 (2)	Aluminum Casement Windows	square meter (m2)

ITEM 1010 WOODEN DOORS

1010.1 Description

This Item shall consist of Furnishing all materials, hardware, plant, tools, labor and services necessary forcomplete fabrication and installation of wooden doors and window of the type and size as shown on thePlans and in accordance with the following specifications and applicable specifications under Item 1003 onCarpentry and Joinery Works.

1010.2 Material Requirements

1010.2.1 Lumber
Lumber of doors, window and jambs, and panels when required, shall be kiln-dried with moisture content ofnot more than 14% and shall be of the specie indicated on the Plans and/ or specified under Item 1003 onCarpentry and Joinery Works.

1010.2.2 Plywood

Plywood for veneer of solid core and hollow core flush doors shall be 3-ply, rotary cut, 6 mm. thick ordinaryplywood, Class B grade. Marine or waterproof plywood, rotary cut, 3-ply, 6 mm. thick shall be used for flushdoors at toilets and bathrooms or at places where these are exposed to moisture.

1010.2.3 Adhesive

Adhesive shall be water resistant resins and shall be non-staining.

1010.2.4 Glass

Glass for window panes shall be 3 mm. thick, smoked or industry type unless otherwise shown on the Plansor indicated in the Schedule of Doors and Windows.

1010.2.6 Hardware

Hardware shall be as specified under Item 1004 on Building Hardware.

1010.3 Construction Requirements

1010.3.1 Fabrication

Wooden doors and windows, including frames, shall be fabricated in accordance with the designs and sizeshown on the Plans. The fabricated products shall be finished square, smooth sanded and free from damageor warping.

a. Flush Type Hollow Core Doors
Flush type hollow core doors shall be adequately framed with stiles and top and bottom rails having a minimum thickness of 44 mm. and width of 75 mm. Two intermediate rails at least 44 mm. wide shall be provided for stiffness.The stiles and the top and bottom rails shall be rabbeted at least 10 mm. wide to receivethe 6 mm. thick plywood veneer. A lock block shall be provided at each stile, long enoughto connect to the two intermediate rails and at least 75 mm. wide for mounting the lockset.The plywood veneer shall be glued and nailed to the framing with 25 mm. long finishingnails space at not more than 150 mm. on centers.

b. Flush Type Solid Core Doors
Flush type solid core doors shall be fabricated in the same manner as the hollow core type except that spaces between stiles and rails shall be filled and fitted with wood blocks of the same specie and of uniform thickness thinner by about the thickness of the plywood veneers. The filler blocks shall be secured to either stiles or rails by nails. Stiles and rails of flush type doors shall be joined by means of blind mortise and tenon joint, tightly fitted, glued and locked with bamboo pin 5 mm. round.

c. Panel Doors
Stiles and rails of panel doors shall have a minimum thickness of 44 mm. and width of 140 mm.Rails minimum thickness of 44 mm and width of 140 mm. Rails shall be framed to stiles by
mortise and tenon joints. Rabbets or grooves of stiles and rails to receive panels shall be 6.5 mm. wide and 20 mm. deep. Integral mouldings formed on both faces of stiles and rails

framing the panels shall be true to shape and well defined. Intersections of mouldings shall be mitered and closely fitted.Panels of the same specie and having a minimum thickness of 20 mm. shall be bevelled around its edges up to a minimum width of 50 mm. both faces. The beveled edges shallclosely fit into the groove of stiles and rails, but free to move to prevent splitting whenshrinkage occurs.

1010.3.2 Installation

a. Frames shall be set plumb and square in concrete/ masonry work or framework of walls or partitions. Frames set in concrete or masonry shall be painted with hot asphalt at its contact surface and provided with two rows of common wire nails 100 mm. long for anchorage. The nails shall be staggered and spaced at 300 mm. on center along each row. Frame set in concrete shall be installed in place prior to concrete work.Frames set in masonry work may be installed after laying of hollow concrete blocks, bricks oradobe. Space between frames and masonry shall be fully filled with cement mortarproportioned 1:3.

b. Hinged Doors
Hinged doors, whether panel or flush type with standard height of 2100 mm. and width of not more than 900 mm. shall be hung with four loose-pin butt hinges, 100 mm. x 100 mm. Swing out exterior doors shall be hung with four fast-pin butt hinges. Two hinges shall be fitted 150 mm. from top and bottom edge of door. The other two hinges shall be fitted at third points between top and bottom hinges. Care should be taken to ensure that the hinges are fitted such that their pins are aligned for ease of pin insertion and smoothness of operation. For added smoothness pins should be lightly greased. Hammering of hinges to attain proper alignment shall not be allowed.For wider and heavier doors such as narra panel doors, an additional hinge shall be fitted 100mm. below the top hinge to counteract the door tilting action.Mounting screws shall be screwed in place in their entire length, not forced into place byhammering. Hammering of screw into place shall not be permitted.

c. Lock Installation
Locks of doors shall be fitted at the same height, centered 1000 mm. above the finished floor level. Locks shall be installed in conformity with the templates and instructions supplied with locksets. Holes for mounting locks shall be properly formed to provide snug fit and rigid attachment of the locks to the doors. Strike plates shall be fitted on the door frame in true alignment with the lock latch.

1010.4 Method of Measurement

Frames of doors and windows shall be measured and paid for on the basis of number of sets completelyinstalled and accepted by the Engineer.Doors and windows shall be measured and for based on the number of square meters or set involved in thecompleted and accepted installation. Payment per square meter shall include cost of required hardware andall incidental expenses, but exclusive of locks for doors. Locks shall be paid for per set completely installed.

1010.5 Basis of Payment

The different pay items under Wooden Doors and Windows shall be designated the following number,description and unit of measure.

Payment shall be made under;

Pay Item Number	Description	Unit of Measurement
1010 (a)	Doors (Flush or Panel)	set
1010 (b)	Door Locks	set

ITEM 1011 – ROLLING UP DOORS

1011.1 Description

This item shall consist of furnishing all plant, labor, tools, equipment and rolling up door required as shown on the Plans and in accordance with this Specification.

1011.2 Material Requirements

Rolling up door shall be surfaced mounted type designed for exterior service opening as indicated on the Plans. Component parts shall conform with the following material specifications:

1. Curtain – shall be manufactured of interlocking curved or flat slats, rolled from galvanized and bonderized steel, aluminum or stainless steel as the case maybe. Slats shall be of size and thickness to withstand 0.957 KPawindload.

Curtain is composed of:

a) Interlocking slats shall roll up on a drum supported at head of opening on brackets and shall be balanced by helical springs.
b) Endlocks – shall be malleable iron riveted to each ends of slats. These are called continuous when they reinforce both ends of all slats, alternate when every other slat.
c) Bottom bar – shall be manufactured from two equal sized angles, minimum 3 mm thick bolted back to back with appropriate half slat at lowest edge of curtain. In addition, exterior door shall have compressible and replaceable rubber or vinyl weather seal attached to bottom rail.

2. Counter balance barrel assembly – shall include spring barrel which serves as load carrying beam encases counter balance mechanism and provide axis around curtain coils. Asit arises barrel rings are involute shapes of malleable iron to assure proper counter balance for all points of travel. Oil tempered torsion type counter balance springs are wound from heat treated steel, to provide accuracy in balancing door.

3. Hood – shall be manufactured from 0.60 mm thick (minimum) galvanized sheet metal, flanged at top for attachment to header and flanged at bottom to provide longitudinal stiffness. Hood shall enclose curtain coil and counter balance mechanism.

4. Brackets – shall be made of precisely formed plate with permanently sealed ball bearings,designed to enclose end of the curtain coil and provide support for counter balance pipe at each end.

5. Guides – shall be fabricated from structural steel angles or precision roll formed channels and angles. Especially adaptable for doors exposed to heavy wind pressure.Designed with groove depths varying from 50 mm to 150 mm depending upon the width of the door, and set cut from the face of the wall to facilitate the travel of the curtain.

1011.3 Construction Requirements

Doors shall be mechanically operated and with provision for manual operation by means of hand chain. Accessories needed for the satisfactory performance of the door shall be built-in with the unit.

1011.3.1 Erection/Installation

a) Set and install structural steel angels properly aligned, plumb, level, square true to profile section and rigidly anchored with adjacent concrete surface walls.
b) Allow all adjacent items of work to be completed before any installation work is started except the installation of structural steel angels.
c) Assemble rolling up doors in accordance with the manufacturer's instruction manual or as indicated in the shop drawing approved.
d) All anchors and insets for guide, brackets and other accessories shall be located accurately.

1011.3.2 Locking Devices

Curtain shall be located at each end of bottom bar by concealed slide bolts which shall engage a lock wedge in each guide. A plunger type cylinder lock is provide as standard equipment.

1011.3.3 Warranty

Upon completion and before final acceptance of the equipment; the Contractor shall furnish the DPWH/Owner a written guaranty stating that the rolling up door equipment and accessories are free from defects. The guaranty shall be for the period of one (1) year from the date of final acceptance of the work. Any part of the equipment that becomes defective during the term of the guaranty shall be replaced and made good by the Contractor at his own expense a manner satisfactory to the DPWH/Owner.

1011.3.4 Method of Measurement

The work executed under this item shall be measured by actual units of rolling up door installed at jobsite complete and ready for service. The computed unit shall bear type o materials and area of opening covered and shall be accepted by the Engineer.

1011.3.5 Basis of Payment

The accepted work qualified and provided in the Bill of Quantities shall be paid for at the unit Bid price which constitutes full compensation for furnishing all materials, labor, tools, equipment and other incidentals necessary to complete this Item.

Payment shall be made under:

Pay Item Number	Description	Unit of Measurement Measurement
1011 (a)	Rolling up door (indicate Metal door size and type of Curtain slats)	unit/set

ITEM 1014 PREPAINTED METAL SHEETS

1014.1 Description

This item shall consist of furnishing all prepainted metal sheet, materials, tools and equipment, plantincluding labor required in undertaking the proper installation complete as show on the Plans and inaccordance with this Specification.

1014.2 Material Requirements

All material metal sheet and roofing accessories shall be oven baked painted true to profiles indicated on thePlans.

1014.2.1 Pre-Painted Roofing Sheets

Pre-painted roofing sheets shall be fabricated from cold rolled galvanized iron sheets specially temperedsteel for extra strength and durability. It shall conform to the material requirements defined in PNS 67:1985.Profile section in identifying the architectural moulded rib to be used are as follows: regular corrugatedQuad-rib, Tri-wave, Rib-wide, twin-rib, etc. Desired color shall be subject to the approval of theArchitect/Engineer.

1014.2.2

Gutters, Valleys, Flashing Hip and Ridge roll shall be fabricated from gauge 24 (.600 mm thick) cold-rolledplain galvanized iron sheets specially tempered steel. Profile section shall be as indicated on the Plans.

1014.2.3

Fastening hardware shall be of galvanized iron straps and rivets. G.I. straps are of .55 mm thick x 16 mm wide x 267 mm long (gauge 26 x 5/8" x 10-1/2") and standard rivets.

1014.2.4

Base metal thickness shall correspond to the following gauge designation available locally as follows:

a) Base Metal Thickness	Designated Gauge
.400 mm thick	Gauge 28
.500 mm thick	Gauge 26
.600 mm thick	Gauge 24
.800 mm thick	Gauge 22

b) Protective Coatings	Thickness
1. Zinc	34.4 microns (244 gm/m2)
2. Paint coatings	
Top coat	15.20 microns
Bottom coat	6.8 microns

c) Overall thickness with protective coats
.400 mm .428-451 mm
.500 mm .532-651 mm
.600 mm .638-651 mm

d) Length of roofing sheets – available in cut to length long span length up to 18.29 meters.

e) Special length and thickness are available by arrangements.

1014.3 Construction Requirements

Before any installation work is commenced, the Contractor shall ascertain that the top face of the purlins arein proper alignment. Correct the alignment as necessary in order to have the top faces of the purlins on aneven plane.

1014.3.1 Handling/Lifting/Positioning of Sheets

Sheets shall be handled carefully to prevent damage to the paint coating. Lift all sheets packs on to the roofframe with the overlapping down-turned edge facing towards the side of the roof where installation willcommence, otherwise sheets will have to be turned end-to-end during installation.

1014.3.2 Installation Process

1. Start roofing installation by placing the first sheet in position with the downturned edge in line with otherbuilding elements and fastened to supports as recommended.

2. Place the downturned edge of the next sheet over the edge of the first sheet, to provide side lap and holdthe side lap firmly in place. Continue the same procedure for subsequent sheets until the whole roofingarea is covered and/or (Adopt installation procedure provided in the instruction manual for each type ofArchitectural molded rib profile section.)

3. For walling applications follows the procedure for roofing. Allow a minimum end of 100 mm (4") for verticalwalling.

1014.3.2 Gutters, Valleys, Flashing ridge and Hip rolls

Gutters, valleys, flashing ridge and hip rolls be fastened where indicated on the Plans by self-tapping screwsor galvanized iron straps and rivets.

1014.3.3 End Laps

In case handling or transport consideration requires to use two or more end lapped sheets to provide fulllength coverage for the roof run, install each line of sheets from bottom to top or form eave line to apex ofroof framing. Provide 150 mm minimum end lap.

1014.3.4 Anchorage/Fastening

1. Prepainted steel roofing sheets shall be fastened to the wood purlins with standard length G.I. straps andrivets.

2. For steel frame up to 4.5 mm thick use self drilling screw No. 12 by 35 mm long hexagonal head withneoprene washer.

3. For steel support up to 5 mm thick or more use thread cutting screw No. 12 by 40 mm long hexagonalhead with neoprene washer.

4. Side lap fastener use self drilling screw No. 10 by 16 mm long hexagonal head with neoprene washer.

5. Valley fastened to lumber and for walling use self-drilling wood screw No. 12 by 25 mm long hexagonalhead with neoprene washer.

6. Valleys fastened to steel supports use self drilling screws, hexagonal head with neoprene washer. Drillsize is 5 mm diameter.

1014.3.5 Cutting of Sheets

In cutting prepainted steel roofing sheets and accessories to place the already installed or laid in position,the area around holes or cuts shall be masked to shield the paint from hot fillings.

1014.3.6 Storage and Protection

Prepainted steel roofing. Walling products and accessories should be delivered to the jobsite in strappe bundles. Sheets and/or bundles shall be neatly stacked in the ground and it left in the open it shall beprotected by covering the stack materials with loose tarpaulin.

1014.4 Method of Measurement

The work done under this item shall be measured by actual area covered or installed with prepainted steel roofing and/or walling in square meters and accepted to the satisfaction of the Engineer/Architect.

1014.5 Basis of Payment

The area of pre-painted steel roofing and/or walling in square meters as provided in Section 1014 shall be paid for at the bid or contract unit price which payment shall constitute full compensation including labor, materials, tools and incidents necessary to complete this item. Payment shall be made under:

Pay Item Number	Description	Unit of Measurement
1014 (a)	Prepainted metal sheets	m^2

ITEM 1016 WATERPROOFING

1016.1 Description

This item shall consist of furnishing all waterproofing materials, labor, tools, equipment and other facilitiesand undertaking the proper installation works required as shown on the Plans and in accordance with thisSpecification.

1016.2 Material Requirements

1016.2.1 Cement-base Waterproofing

Cement –base waterproofing powder mix shall be cement-base, aggregate type, heavy duty, water-proofcoating for reinforced concrete surface and masonry exposed to water. The aggregates are graded andsized so as to mesh perfectly and are selected for purity, hardness, strength and are non-metallic. Whenmixed with other ingredients are free flowing, water-proof coatings that possesses strength durability anddensity.

1016.2.1.2 Additive Binders

Additive binders shall be of special formulation of acrylic polymers and modifiers in liquid form used asadditive with cement-base powder mix that improves adhesion and mechanical properties.

1016.2.1.3 Water

Water shall be clean, clear and potable.

1016.2.2 Membrane Waterproofing

1016.2.2.1 Primer

Primer shall be of asphalt cold applied, free from water and other foreign matters, and shall conform to thespecifications requirement defined in ASTM D-41.

1016.2.2.2 Built-up Membrane

Built-up membrane shall be made of smoothly woven fibers that are impervious to acid, heat, dampness andtotting. It should permit complete penetration of asphalt compound or bituminous coating in the woven glassfiber.

1016.2.2.4 Mopping Materials

a) Type A soft adhesive self-sealing asphalt for structure below ground level.

b) Type B where asphalt is not exposed on temperature exceeding 51.7 celcius for structure above groundlevel.

c) Type C where asphalt is exposed on vertical surface in direct sunlight or above temperature of 51.7celcius structure above ground level.

1016.2.3 Hydrolithic Waterproofing

a) Hydrolithic waterproofing mix shall be heavy cement-based coating compatible to reinforced concretewall. It must prevent built-up of water vapor which causes blistering, flaking and peeling of paints films.

b) Material must thoroughly fill and seal pores and voids that it can be used against water pressure on theinterior surface of walls below grade.

1016.3 Construction Requirements

Roof decks, balconies, toilet and bathrooms, gutters, parapet walls and other areas indicated on the plans tobe waterproof shall first be rendered with cement-based waterproofing before any type of waterproofing isapplied.

1016.3.1 Surface Preparation

1016.3.1.1 Concrete surface to be applied with waterproofing shall be structurally sound, clean and free ofdirt, loose mortar particles, paints films oil, protective coats, efflorescence laitance, etc.

1016.3.1.2
All defects shall be properly corrected and carefully formed to provide a smooth surface that is free of marksand properly cured prior to application works.

1016.3.1.3

Inside corners where vertical and horizontal structure meet shall be provided with cants measuring 50 mm by50 mm or rounded at corners a minimum of 50 mm radius.

a) Concrete slabs shall be properly graded to drain rainwater. Provide a minimum pitch of 1 on 100 tosatisfactorily drain rainwater freely into the drainage lines, gutters and downspouts.

b) Drainage connections and weepholes shall be set to permit the free flow of water.

c) Any expansion and contraction joints shall be cleaned, primed, fitted with a backing rod and caulkedwith sealant.

d) Provide reglets of about 40 mm deep by 40 mm wide and 250 mm above floor finish along walls orparapets for the termination of the membrane.

e) Prepared surfaces shall be cured and kept wet by sprinkling with water at regular intervals for a period ofat least three days and allow surfaces to actually set within seven days.

f) Ensure that he prepared surfaces has completely set and all defects repaired.

g) When there is reasonable doubt as to the presence of moisture in the surfaces to be applied withmembrane expose that same direct to sunlight for another 2 days or heat all suspected area using blowtorch.

1016.3.2 Preformed or Built-up Membrane

1016.3.2.1 Application Procedure

a) Prior to application of membrane concrete surfaces should be sound and cured without the use ofcuring compound. Apply a coat of concrete neutralizer to remove oil dirts and other contaminants.

b) Apply asphalt primer at the rate of one gallon per 100 square feet evenly by spraying or by paint brush.

c) Application shall be done one direction strip by and overlapping each other to assure uniform thickness.

d) Allow primer to dry until it is ready to receive next coat or layer as specified in the manufacturinginstructional manual.

e) As soon as primer coating is workable, lay a single layer of preformed or built-up membrane smoothlyfree from irregularities and folds.

f) Lay preformed or built-up membrane conforming to size and shape of the surface area to be covered.

g) Carefully lay side and end laps in order to assure an even thickness throughout the whole surface areato be covered.

h) When the whole surface area is completely covered apply a single coat of asphalt primer at the rate of 3to 4 gallons per 100 square feet.

i) Meshes of treated woven glass fibers shall not be completely closed or sealed by the primer coat, butshall sufficiently open to allow successive moppings of the ply material to seep through.

j) Cover ply not more than the minimum amount of surfacing necessary to prevent sticking on ply.

k) After application surface shall be uniformly smooth, free from irregularities folds and knots.

l) Repeat the procedure until 5 piles has been satisfactorily installed or as many layers required orspecified in the Plans.

m) Where weather disturbance interrupt the work and exposing the membrane to moisture remove the layerexposed to moisture and repeat procedure until completion of the process.

1016.3.2.2 Protective Coating

a) Where laying of the built-up or preformed membrane conforms with the number of plies required asshown on the plans lay a mixture or sand mastic in the proportion of one part asphalt or bituminousmaterial and four parts coarse screened sand by volume, with a steel trowel at an average of 3 mm.thick over the surface of membrane.

b) Then at the rate of one gallon per 100 square feet, apply aluminum heat reflecting finish thoroughly overthe dried sand mastic coating.

1016.3.2.3 Metal Cap Flashing

a) Provide cap flashing gauge 24 plain G.I. where shown on the Plans.

b) Where cap flashing is connected to preformed lock in through-wall form upper edge of cap flashing toengage in preformed lock. Mallets lock down tight to provide a spring action against base flashing.

c) Then at the rate of gallon per 100 square feet, apply aluminum heat reflecting finish thoroughly over thedried sand mastic coating.

d) Where cap flashing is terminated in raked joints or in prepared masonry or stone reglet fasten flashing with wedge every 12 inches and fill reglet on vertical surfaces continuous with plastic

cement and fill reglet on vertical surfaces continuous with plastic cement and on horizontal surfaces, continuous withmolten lead.

1016.6.3.3 Membrane Waterproofing Cement Topping

a) Provide concrete cement topping of at least 50 mm. thick on the membrane after 5 days whereprotective coatings has been applied.

b) Concrete cement topping should be class "A" with 9 mm. pea gravel and preferably provided with 2-way6 mm. diameter temperature steel bars.

1016.3.4 Liquid Waterproofing as Membrane

Before any coat of liquid waterproofing is applied concrete cement surface shall conform with therequirement defined in Sub-section 1017.3.1.1.

1016.3.4.1 Application Procedure

a) Prior to application of membrane concrete surfaces should be sound and cured without the use of curingcompound. Apply a coat of concrete neutralizer to removed oil, dirt and other contaminants.

b) Apply a primer coat of elastomeric coating standard of the manufacturer at the rate of 1/3 gallon per 9.28meter square (100 square feet) over the surface area to be applied.

c) After the primer coat has dried penetrating and sealing the concrete surface areas coated apply 25 drymills of coating at the rate of one gallon per 100 square meters for 3 coatings on the same concretesurface areas coated with liquid waterproofing.

d) The concrete surface areas coated shall be allowed to dry in twenty fours if relative humidity is above4.44 Celsius.

e) Liquid waterproofing membrane may be applied by paint brush, airless spray, notched trowel, sequegeeor roller preferably 20-25 mills maximum thickness each wet coat.

1016.3.4.2 Precaution

a) Liquid waterproofing membrane should not be applied unless the ambient temperature is 4.44 Celsius orhigher and should not proceed during inclement weather condition.

b) Extra care shall be observed by persons doing the application works especially those that have skinsensitiveness must wear gloves while applying the liquid waterproofing. The liquid water-proofingmembrane compound is highly combustible.

1016.3.5 Protection of Membrane Waterproofing Surfaces in General

a) Concrete topping in situation where it is desirable to have a bond between membrane waterproofing andtopped slab it is recommended that the concrete topping be placed as the membrane dries, usually 48hours after final coat is applied.

b) If a bond is not required, the membrane should be protected with asphalt asbestos board or asphalt feltpaper such time as topping or concrete covering is applied. Prior to topping or placing concrete coveringthe membrane shall be inspected and initiate repair work where necessary.

c) Exposed membrane surfaces at concrete gutters and areas not frequently disturbed may be allowed.
d) Membrane waterproofing at basement shall be covered and protected by installing tightly butted asphaltimpregnated protection boards with a minimum thickness of 6 mm. and preferably 12 mm. on horizontalareas.All projections and pipes must be protected with asbestos cloth approximately 6 mm. thick. Install thebituminous paving with extra care to avoid damage, lift or curl the underlying protection boards.

1016.4 Method of Measurement

This Item shall be measured in square meters for areas actually rendered with membrane waterproofing andnumber of packages for integrally waterproofed areas accepted to the satisfaction of the Engineer.

1016.5 Basis of Payment

The accepted quantities, measured as prescribed in Section 1016.4 shall be paid for at the Contract unitprice for integral and membrane waterproofing work which price and payment shall be full compensation forfurnishing and applying integral and membrane waterproofing materials including the use of equipment andtools, labor and incidentals necessary to complete the work.
Payment will be made under:

Pay Item number	Description	Unit of Measurement
1016 (a)	Cement-base waterproofing	m2
1016 (b)	Liquid waterproofing	m2
1016 (c)	Built-up & Preformed membrane	m2

ITEM 1018 CERAMIC TILES

1018.1 Description

1018.1. Scope of Work

This section covers all works required in connection with wall and floor finishes on concrete surfaces inaccordance with this Specification and as shown in the Plans.

1018.2 Material Requirement

1018.2.1 Tile Works

(1) Floor Tiles
Tiles shall be standard grade, unglazed vitrified tiles, and 6 mm thick. Color and pattern shall be as specified inthe drawings or as approved by the Engineer.

(2) Ceramic Tiles
It shall be of the standard good quality grade, gloss smooth finish; color, texture and size code should be strictlyadhered as shown in the Plans.

(3) Tile Adhesive
Tile adhesive (tile bonding agent) shall be used as the dry set mortar to install tiles on walls and floorsemploying the thin-set method conforming to ANSI A108.1b

1018.2.2 Storage and Delivery of Material

Cement and lime shall be stored off the ground under watertight cover, and away from damp walls and surfacesuntil ready for use. Damaged or deteriorated materials shall be removed from the premises immediately.Manufactured materials shall be delivered in the original unbroken packages or containers that are labelled plainly with the manufacturer's names and brand. Container for tiles shall be grade-sealed. Materials shall behandled in a manner that will prevent the intrusion of deleterious materials that will affect its quality andappearance.

1018.3 Construction Requirements

1018.3.1 Tile works

(1) General
The work consist of furnishing all materials, labor and performing all operations in connection with tile finishing offloors and walls, complete including mortar beds for the tile. Tilework shall not be started until roughing-ins forplumbing and electrical work has been completed and tested. The work of all other trades in the area where thework is to be done shall be protected from damage in a workmanship manner as directed by the Engineer.

(2) Mortar for Tiles
A scratch coat for wall tile shall be ABC or approved equivalent. Scratch coat shall have a minimum thickness of9 mm. The buttering mortar for setting wall tiles and mortar setting bed for floor tiles shall have the samematerial as that of scratch coat.

(3) Floor Tiling

a) Preparation of Surfaces
Before tile is applied with a dry-set mortar bed, the structural floor shall be tested for levelness or uniformity ofslope by flooding it with water. Areas with water ponds shall be filled, leveled and retested before the setting bedis applied. The slab shall be soaked thoroughly with clean water on the day before the setting bed is applied. Immediately preceding the application of the setting bed, the slab shall again be wetted thoroughly but no freewater shall be permitted to remain on the surface. A skim coat of ABC cement mortar shall then be applied notmore than 1.5 mm thick. The mortar shall be spread until its surface

is true and even, and thoroughlycompacted, either level or sloped uniformly for drainage, where required. A setting bed, asfar as can becovered with the tile before the mortar shall have reached its initial set, must beplaced in one(1) operation, butin the event that more setting mortar has been placed thancan be covered, the unfinished portion shall beremoved and cut back to a clean leveled edge.

(b) Installation of Floor Tile
All tiles shall be soaked in clean water to a minimum of one (1) hour before they are installed. Absorptivemounted tile shall be damped by placing tile on a wetted cloth in a shallow pan before installing. Before the initialset has taken place in the setting bed, a skim of ABC cement mortar .75 mm to 1.5 mm thick, shall be trowelledor brushed over the setting. The tiles shall then be pressed firmly upon the setting bed, and carefully tapped into themortar until true and even with the place of the finished floor base. Tapping and leveling shall be completedwithin one (1) hour after placing tiles. Borders and defined lines shall be laid before the field or body of the floor.Where floor drain is provided, the floor shall be sloped properly to the drains. Cutting of tiles, where necessary,shall be done along the outer edges of tile against trim, base, thresholds, pipes, built-in fixtures, and similarsurfaces and shall be geared and joined carefully. Tiles shall be secured firmly in place, and loose tiles or tilessounding hollow shall be removed and replaced to the satisfaction of the Engineer. All lines shall be keptstraight, parallel and true and all finished surface brought to true and even planes.

(4) Jointing

Joints shall be parallel and uniform in width, plumb, level and in alignment. End joints in broken-joint shall bemade, as far as practicable, on the center line of the adjoining tiles. Joint widths shall be uniform and measuredto accommodate the tiles in the given spaces with a minimum cutting.

(5) Grouting

Grouting shall be done as soon as the mortar beds have sufficiently set. All cement shall be Portland cement,colored or white, as required. Where light colored mortar is required in joints, amixture of white cement andnon-fading mineral oxide shall be used to produce the desired colors. The quantity of mineral oxides shall notexceed 10% of the volume of cement in any case.
(6) Cleaning

Upon completion of grouting, the tile shall be thoroughly cleaned and maintained in this condition untilcompletion of the contract.

1018.4 Method of Measurement

The finished area to be paid for under this item shall be measured by the number of square meter of unglazedfloor tile laid and accepted in accordance with the plans and specifications to the satisfaction of the Engineer.

1018.5 Basis of Payment

The accepted quantities measured as stipulated in Sub-Section 8.4.1, Method of Measurement, shall be paidfor at the contract unit price for each of the particular pay item listed below, which price and payment shall be fullcompensation for furnishing and placing all materials, labor, equipment, tools and incidentals necessary tocomplete each work item.

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
1018.2 (1a)	Unglazed Floor tiles	Square Meter
1018.2 (1b)	Wall tiles	Square Meter

ITEM 1027 CEMENT PLASTER FINISH

1027.1 Description

This Item shall consist of furnishing all cement plaster materials, labor, tools and equipment required inundertaking cement plaster finish as shown on the Plans and in accordance with this Specification.

1027.2 Material Requirements

Manufactured materials shall be delivered in the manufacturer‟s original unbroken packages or containerswhich are labeled plainly with the manufacturer‟s name and trademark.

1027.2.1 **Cement**
Portland cement shall conform with the requirements as defined in Item 700 – Hydraulic Cement.

1027.2.2 **Hydrated Lime**

Hydrated lime shall conform with the requirements as defined in Item 701 – Hydrated Lime.

1027.2.3 **Fine Aggregates**

Fine aggregates shall be clean, washed sharp river sand and free from dirt, clay, organic matter or otherdeleterious substances. Sand derived from crushed gravel or stone may be used with the Engineer'sapproval but in no case shall such sand be derived from stone unsuitable for use as coarse aggregates.

1027.3 Construction Requirements

1027.3.1 **Mixture**

a) Mortar mixture for brown coat shall be freshly prepared and uniformly mixed in the proportion by volumeof one (1) part Portland Cement, three (3) parts sand and one fourth (1/4) part hydrated lime.

b) Finish coat shall be pure Portland cement properly graded conforming to the requirements of Item 700,Hydraulic Cement and mixed with water to approved consistency and plasticity.

1027.3.2 **Surface Preparation**

a) After removal of formworks reinforced concrete surfaces shall be roughened to improve adhesion ofcement plaster.

b) Surfaces to receive cement plaster shall be cleaned of all projections, dust, loose particles, grease andbond breakers. Before any application of brown coat is commenced all surfaces that are to be plasteredshall be wetted thoroughly with clean water to produce a uniformly moist condition.

1027.3.3 **Application**

a) Brown coat mortar mix shall be applied with sufficient pressure starting from the lower portion of thesurface to fill the grooved and to prevent air pockets in the reinforced concrete/ masonry work and avoidmortar mix drooping. The brown coat shall be lightly broomed/ or scratch before surface had properly setand allowed to cure.

b) Finish coat shall not be applied until after the brown coat has seasoned for seven days and correctivemeasures had been done by the Contractor on surfaces that are defective. Just before the application ofthe finish coat, the brown coat surface shall be evenly moistened with potable water. Finish coat shall befloated first to a true and even surface, then trowel in a manner that will force the mixture to penetrate intothe brown coat. Surfaces applied with finish coat shall then be smooth with paper in a circular motion toremove trowel marks, checks and blemishes. All cement plaster finish shall be 10 mm. thick minimum, onvertical concrete and/ or masonry walls.Whenever indicated on the Plans to be "simulated red brick finish", the Contractor shall render brick designon plaster surface before brown coat had properly set and then allowed to dry. Cement plaster shall not beapplied directly to:

a) Concrete or masonry surface that had been coated with bituminous compound and,

b) Surfaces that had been painted or previously plastered.

1027.3.4 Workmanship

Cement plaster finish shall be true to details and plumbed. Finish surface shall have no visible junctionmarks where one (1) day's work adjoins the other. Where directed by the Engineer or shown on the Plansvertical and horizontal groove joints shall be 25 mm wide and 10 mm deep.

1027.4 Method of Measurement

All cement plaster finish shall not be measured in square meters or part thereof for work actually completedin the building.

1027.5 Basis of Payment

The work quantified and determined as provided in the Bill of Quantities shall be paid for at the Contract Unitprice which price constitutes full compensation including labor, materials, tools and equipment andincidentals necessary to complete this Item.

Payment will be made under:

Pay Item No.	Description	Unit of Measurement
1027 (a)	Cement plaster finish	Square Meter (m2)
1027 (b)	Simulated red brick (Wall)	Square Meter (m2)

ITEM 1032 PAINTING, VARNISHING AND OTHER RELATED WORKS

1032.1 Description

This Item shall consist of furnishing all paint materials, varnish and other related products, labor, tolls,equipment and plant required in undertaking the proper application on painting, varnishing and related worksindicated on the Plans and in accordance with this Specification.

1032.2 Material Requirements

1032.2.1 Paint materials

All types of paint material, varnish and other related product shall be subject to random test as to materialcomposition by the Bureau of Research and Standard, DPWH or the National Institute of Science andTechnology. (Use the following approved and tested brand name: Boysen, Davies, Dutch Boy, Fuller OBrien, or any approved equal).

1032.2.2 Tinting Colors

Tinting color shall be first grade quality, pigment ground in alkyd resin that disperses and mixes easily withpaint to produce the color desired. Use the same brand of paint and tinting color to effect good paint body.

1032.2.3 Concrete Neutralizer

Concrete neutralizer shall be first grade quality concentrate diluted with clean water and applied as surfaceconditioner of new interior and exterior walls thus improving paint adhesion and durability.

1032.2.4 Silicon Water Repellant

Silicon water repellant shall be transparent water shield especially formulated to repel rain and moisture onexterior masonry surfaces.

1032.2.5 Patching Compound

Patching compound shall be fine powder type material like calciumine that can be mixed into puttyconsistency, with oil base primers and paints to fill minor surface dents and imperfections.

1032.2.6 Varnish

Varnish shall be homogeneous solution of resin, drying oil, drier and solvent. It shall be extremely durableclear coating, highly resistant to wear and tear without cracking, peeling, whitening, spotting, etc. Withminimum loss of gloss for a maximum period of time.

1032.2.7 Lacquer

Lacquer shall be any type of organic coating that dries rapidly and solely by evaporation of the solvent.Typical solvent are acetates, alcohols and ketones. Although lacquers were generally based onintrecellulose, manufacturers currently use, vinyl resins, plasticizers and reacted drying oils to improve adhesion and elasticity.

1032.2.8 Shellac

Shellac shall be a solution of refined lac resin in denatured alcohol, it dries by evaporation of the alcohol. Theresin is generally furnished in orange and bleached grades.

1032.2.9 Sanding Sealer

Sanding sealer shall be quick drying lacquer, formulated to provide quick dry, good holdout of succeedingcoats, and containing sanding agents such as zinc stearate to allow dry sanding of sealer.

1032.10 Glazing Putty

Glazing putty shall be alkayd-type product for filling minor surface unevenness.

1032.2.11 Natural Wood Paste Filler

Wood paste filler shall be quality filler for filling and sealing open grain of interior wood. It shall produce alevel finish for following coats of paint varnish/lacquer and other related products.

1032.2.12 Schedule

Exterior Finishes

a) Plain cement plastered finish to be painted — 3 coats Acrylic base masonry paint
b) Concrete exposed aggregate and/or or toll finish — 1 coat water repellent
c) Ferrous metal — 1 coat primer and 2 coats enamel paint
d) Galvanized metal — 1 coat zinc chromate primer and 2 coats Portland cement paint
e) Wood painted finish — 3 coats oil based paint
f) Wood varnished finish — Varnish water repellent

Interior Finishes

a) Plain cement plastered finish to painted — 3 coats Acrylic base masonry paint
b) Concrete exposed aggregate and/or tool — Clean surface finish
c) Ferrous metal — 1 coat primer and 2 coats enamel paint
d) Woodwork sea-mist — 3 coats of 3 parts thinner 1 part lacquer
e) Wood varnish — 1st coat, of one part sanding sealer to one part solvent 2nd coat of 2/3 sanding sealer to 1/3 solvent.
f) Wood painted finish — 3 coats of oil base paint
g) Ceiling boards textured finish — 1 coat oil based paint allow to dry then patch surfaces unevenness and apply textured paint coat.

1032.3 Construction Requirements

The Contractor prior to commencement of the painting, varnishing and related work shall examine thesurfaces to be applied in order not to jeopardize the quality and appearances of the painting varnishing andrelated works.

1032.3.1 Surface Preparation

All surfaces shall be in proper condition to receive the finish. Woodworks shall be hand-sanded smooth anddusted clean. All knot-holes pitch pockets or sappy portions shall be sealed with natural wood filler. Nailholes, cracks or defects shall be carefully puttied after the first coat, matching the color of paint.Interior woodworks shall be sandpapered between coats. Cracks holes of imperfections in plaster shall befilled with patching compound and smoothed off to match adjoining surfaces.Concrete and masonry surfaces shall be coated with concrete neutralizer and allowed to dry before anypainting primer coat is applied. When surface is dried apply first coating. Hairline cracks and unevennessshall be patched and sealed with approved putty or patching compound. After all defects are corrected applythe finish coats as specified on the Plans (color scheme approved).Metal shall be clean, dry and free from millscale and rust. Remove all grease and oils from surfaces. Wash,unprimed galvanized metal with etching solution and allow it to dry. Where required to prime coat surfacewith red lead primer same shall be approved by the Engineer.

In addition the Contractor shall undertake the following:

1. Voids, cracks, nick etc. will be repaired with proper patching material and finished flushed withsurrounding surfaces.

2. Marred or damaged shop coats on metal shall be spot primed with appropriate metal primer.

3. Painting and varnishing works shall not be commenced when it is too hot or cold.

4. Allow appropriate ventilation during application and drying period.

5. All hardware will be fitted and removed or protected prior to painting and varnishing works.

1032.3.2 Application

Paints when applied by brush shall become non-fluid, thick enough to lay down as adequate film of wetpaint. Brush marks shall flawed out after application of paint.Paints made for application by roller must be similar to brushing paint. It must be non-sticky when thinned tospraying viscosity so that it will break up easily droplets.Paint is atomized by high pressure pumping rather than broken up by the large volume of air mixed with it.This procedure changes the required properties of the paint.

1032.3.3 Mixing and Thinning

At the time of application paint shall show no sign of deterioration. Paint shall be thoroughly stirred, strainedand kept at a uniform consistency during application. Paints of different manufacture shall not be mixedtogether. When thinning is necessary, this may be done immediately prior to application in accordance withthe manufacture's directions, but not in excess of 1 pint of suitable thinner per gallon of the paint.

1032.3.4 Storage

All material to be used under this item shall be stored in a single place to be designated by the Engineer andsuch place shall be kept neat and clean at all time. Necessary precaution to avoid fire must be observed byremoving oily rags, waste, etc. at the end of the daily work.

1032.3.5 Cleaning

All cloths and cotton waste which constitute fire hazards shall be placed in metal containers or destroyed atthe end of daily works. Upon completion of daily work, all staging, scaffolding and paint containers shall beremoved. Paint drips, oil, or stains on adjacent surfaces shall be removed and the entire job left clean andacceptable to the Engineer.

1032.3.6 Workmanship in General

a) All paints shall be evenly applied. Coats shall be of proper consistency and well brushed out so as toshow a minimum of brush marks.

b) All coats shall be thoroughly dry before the succeeding coat is applied.

c) Where surfaces are not fully covered or cannot be satisfactorily finished in the number of coatsspecified such preparatory coats and subsequent coats as may be required shall be applied to attain thedesired evenness of surface without extra cost to the owner.

d) Where surface is not in proper condition to receive the coat the Engineer shall be notified immediately.Work on the questioned portion(s) shall not start until clearance be proceed is ordered by the Engineer.

e) Hardware, lighting fixture and other similar items shall be removed or protected during the paintingvarnishing and related work operations and re-installed after completion of the work.

1032.3.7 Procedure for Sea-Mist Finish

a) Depress wood grain by steel brush and sand surface lightly.

b) Apply sanding sealer.

c) Apply two coats of industrial lacquer paint.

d) Spray last coat of industrial lacquer paint mixed with sanding sealer.

e) Apply wood paste filler thinned with turpentine or paint thinner into the wood surface.

f) Spray flat or gloss lacquer whichever is specified.

1032.3.8 Procedure for Varnish Finish

a) Sand surface thoroughly.

b) Putty all cracks and other wood imperfections with wood paste filler.

c) Apply oil stain.

d) Apply lacquer sanding.

e) Sand surface along the grain.

f) Spray three (3) coats of clear dead flat lacquer.

g) Polish surface coated using cloth pad.

h) Spray gloss lacquer or flat lacquer whichever is desired or specified.

1032.3.9 Procedure for Ducco Finish

a) Sand surface thoroughly.

b) Apply primer surface white or gray by brush or spray.

c) Apply lacquer spot putty in thin coat. Allow each coat to become thoroughly dry before applying nextcoat.

d) Apply primer surfaces and then allow to dry in two (2) hours before applying the next coat.

e) Apply the coat of flat tone semi-gloss enamel as per color scheme submitted and approved by theEngineer.

1032.4 Method of Measurement

The areas of concrete, wood and metal surfaces applied with varnish, paint and other related coatingmaterials shall be measured in square meters as desired and accepted to the satisfaction of the Engineer.

1032.5 Basis of Payment

The accepted work shall be paid at the unit bid price, which price and payment constitute full compensationfor furnishing all materials, labor, equipment, tools and other incidental necessary to complete this Item.

Payment will be made under:

Pay Item Number	Description	Unit of Measurement
1032 (a)	Painting works	square meter (sq.m.)
1032 (b)	Varnishing	square meter (sq.m.)
1032 (c)	Sea-mist Finish	square meter (sq.m.)
1032 (d)	Ducco Finish	square meter (sq.m.)
1032 (e)	Texture Finish	square meter (sq.m.)

PART E ELECTRICAL WORKS

ITEM 1100 CONDUITS, BOXES & FITTINGS

1100.1 Description

This Item shall consist of the furnishing and installation of the complete conduit work consisting of electricalconduits; conduit boxes such as junction boxes, utility boxes, octagonal and square boxes; conduit fittings
such as couplings, locknuts and bushing and other electrical materials needed to complete the conduitroughing-in works.

1100.2 Material Requirements

All materials shall be brand new and shall be of the approved type meeting all the requirements of thePhilippine Electrical Code and bearing the Philippine Standard Agency (PSA) mark. The electrical materialsto be used shall be of the standard products of the manufacturers regularly engaged in the production ofequipment and materials required for this project and shall be the manufacturer's latest standard design thatcomplies with the specification requirements. The Contractor shall submit for approval a completedescription of all materials and equipment to be used before commencing the work. The descriptions shallinclude catalogue numbers, illustrations, diagrams, dimensional data, etc., as required to describe fully the materials.

Conduits

(a) Rigid Steel Conduit shall be electrical metal tubing (EMT) conduit, hot dip galvanized, conforming to ANSI Standard C80.1, or "American Standard Specifications for Steel Conduit, zinccoated" unless shown otherwise in the drawings. The conduit fittings and covers shall be galvanized, threaded, or cadmium plated, grey iron or malleable iron castings. Composite rubbergasket shall be provided in all openings requiring covers. Outlets and pull boxes shall be of thesizes and types shown in the Plan.

(b) Rigid PVC Conduit shall be NEMA TC2, type EPC-PVC and shall be schedule 40. Enamel coated steel conduits and conduits with rough inner surfaces are not acceptable.
Conduit Boxes and FittingsAll conduit boxes and fittings shall be Code gauge steel and galvanized. Outlet boxes and fittingsshall be galvanized pressed steel of standard make. In general, outlet boxes shall be at least 100mm. square or octagonal, 53 mm. deep and 16 mm. minimum gauge.

1100.3 Construction Requirement

All works throughout shall be executed in the best practice in a workmanlike manner by qualified andexperienced electricians under the immediate supervision of a duly licensed Electrical Engineer.

Conduits

Conduits should be cut square with hacksaw and ends reamed. Running or non-tapered threads shall not be used. Each run of conduit between boxes or equipment shall be electrically continuous.Threads shall conform to the American Standard for tapered pipe threads. In making bends onlyconduit bending apparatus will be used. The use of a pipe tee or vise for bending conduits shall notbe permitted. Conduits entering slip holes in boxes shall be secured with a locknut on each side ofthe box wall and terminated with a bushing.

All joints between lengths of conduits and threaded connections to boxes, fittings and equipmentenclosures shall be made watertight. Conduits shall be sloped towards drain points. Conduits shallbe rigidly supported and braced to avoid shifting during placement of concrete. Conduits extendingout of floors, walls, or beams shall be at right angles to the surfaces.
Spacing of conduits shall be such as to permit the flow of concrete between them. A minimumspacing of not less than 5 cm. shall be maintained, except where conduits enter boxes. Where
conduits are placed in two or more layers or rows, the conduits in the upper or inner layers shall beplaced directly over or behind the lower or outer layers, respectively.
Conduits terminating at the face of concrete for initial or future extensions as exposed runs shall beterminated with plugged couplings set flush with the floor, ceilings or wall. Galvanized iron plugsshall be provided for conduits, which are to be extended in the future. Where it is not practical toemploy flush couplings, the conduit ends shall be suitably boxed or otherwise protected andplugged.Conduits running in floors and terminating at motors or other equipment mounted on concretebases shall be brought up to the equipment within the concrete base wherever possible. Conduitboxes shall be flush with the finished wall with covers and openings easily accessible. TheContractor shall remove and reset all boxes not properly installed or shifted out of line duringconcreting to the satisfaction of the Engineer.

Conduit Boxes & FittingsEach outlet in the drawing or raceway system shall be provided with an outlet box to suit theconditions encountered. Boxes for exposed work or in wet locations shall be of the cast metal typehaving threaded hubs. Boxes for concealed work shall be the cadmium-plated or zinc-coated sheetmetal type. Each box shall have sufficient volume to accommodate the number of conductorsentering the box.. Boxes shall not be less than 50 mm deep unless shallower boxes are required bystructural conditions that are specifically approved by the Engineer.

Ceiling and bracket outlet boxesshall not be less than 100 mm octagonal except that smaller boxes may be used where required bythe particular fixtures to be installed. Switch and receptacle boxes shall be approximately 100 mm x 50 mm x 50 mm. Telephone outlets shall be 100 mm square except that 100 mm x 54 mm x 40 mmboxes may be used where only one raceway enter the outlet. Boxes installed in concealed locations
shall be set flush with the finished surfaces and shall be provided with the proper extension rings orplaster covers where required.

Boxes shall be installed in a rigid and satisfactory manner and shallbe supported by bar hangers in frame construction, or shall be fastened directly with wood screwson wood. Location of outlets shown on the drawings are approximates; the Contractor shall studythe building plans in relation to the spaces and equipment surrounding each outlet so that thelighting fixtures are symmetrically located according to the room layout. When necessary, with theapproval of the Consultant, outlets shall be relocated to avoid interference with mechanicalequipment or structural features.

Conduit Boxes & FittingsProvide conduit boxes for pulling and splicing wires and outlet boxes for installation of wiringdevices.As a rule, provide junction boxes or pull boxes in all runs greater than 30 meters in length, forhorizontal runs. For other lengths, provide boxes as required for splices or pulling. Pull boxes shallbe installed in conspicuous but accessible locations.Support boxes independently of conduits entering by means of bolts, red hangers or other suitablemeans.Conduit boxes shall be installed plumb and securely fastened. They shall

be set flush with thesurface of the structure in which they are installed where conduits are run concealed.

All convenience and wall switch outlet boxes for concealed conduit work shall be deep, rectangularflush type boxes. Four inch octagonal flush type boxes shall be used for all ceiling light outlets and shall be of the deep type where three or more conduits connect to a single box Floor mounted outlet boxes required shall be waterproof type with flush brass floor plate and brassbell nozzle.All boxes shall be painted with anti-rust red lead paint after installation. All conduits shall be fittedwith approved standard galvanized bushing and locknuts where they enter cabinets and conduitboxes.Junction and pull boxes of code gauge steel shall be provided as indicated or as required tofacilitate the pulling of wires and cables.

1100.4 Method of Measurement

The work under this Item are inclusive in Item 1101 (Wires and Wiring Devices) and shall be measured eitherby lengths, pieces, pairs, lot and actually placed and installed as shown on the Plans.

1100.6 General Specifications

The work to be done under this division of specifications consist of the fabrication, furnishing, delivery andinstallation, complete in all details of the electrical work, at the subject premises and all work materialsincidental to the proper completion of the installation, except those portions of the work which are expresslystated to be done by other fields. All works shall be done in accordance with the rules and regulations andwith the specifications.

1100.7 Specifications on:

1. Lightning Fixtures and Lamp

All lightning fixtures and lamps of type and sizes as specified and listed on the Lighting Fixture

Schedule and shall be furnished and installed complete. Incandescent lamps shall be inside frostedlamp, 230 volts, and wattage as indicated. All Fluorescent lamps shall be 40 watt, pre-heat type,rapid start, cool white color characteristics and shall have complete high frequency electronicballast, 230 volt.Fixtures are designated by letters and illustrations shall be indicative of the general type desiredand shall not restrict selection to fixtures of any particular manufacturer. Fixtures of similar designand equivalent light distribution and brightness characteristics having equal finish and quality maybe acceptable but subject to the approval of the Engineer.

2. Material Requirements

All materials to be used shall conform to the BPS specification

3. Construction Requirements

All grounding system installation shall be executed in accordance with the approved plans.

Grounding system shall include building perimeter ground wires, ground rods, clamps, connectors,ground wells and ground wire taps as shown in the approved design.

1100.8 Auxiliary Systems

All auxiliary systems such as telephone and intercom system, time clock system, fire alarm system andpublic address/paging system installations shall be done in accordance with the approved design.All materials to be used shall conform to the Bureau of Product Standards (BPS) specifications.

1100.9 Important requirement regarding supervision of the work and submission of certificate of completion. All wiring installation herein shall be done under the direct supervision of a licensed ElectricalEngineer at the expense of the Contractor. The Contractor shall submit the request for the Clearance toProceed duly approved by the owner's representative.

1100.10 Test and Guarantee

Upon completion of the electrical construction work, the Contractor shall provide all test equipment andpersonnel and to submit written copies of all test results. The Contractor shall guarantee the electricalinstallation are done and in accordance with the approved Plans and specification. The Contractor shallguarantee that the electrical system are free from all grounds from all defective workmanship and materialsand will remain so for a period of one year from date and acceptance of works. Any defect shall be remediedby the Contractor at his own expense.

ITEM 1101 WIRES AND WIRING DEVICES

1101.1 Description

This Item shall consist of the furnishing and installation of all wires and wiring devices consisting of electricalwires and cables, wall switches, convenience receptacles, heavy duty receptacles and other devices shownon the approved Plans but not mentioned in this Specification.

1101.2 Material Requirements

Wires and cables shall be of the approved type meeting all the requirements of the Philippine Electrical Codeand bearing the PSA mark unless specified or indicated otherwise, all power and lighting conductor shall beinsulated for 600 Volts. All wires shall be copper, soft drawn and annealed, smooth and cylindrical form andshall be centrally located inside the insulation.

All wiring devices shall be standard product of reputableelectrical manufacturers. Wall switches shall be rated at least 10A, 250 Volts and shall be spring operated,

flush, tumbler type. Duplex convenience receptacles shall be rated at least 15A, 250 Volts, flush, parallel slotsingle heavy duty receptacles shall be rated at least 20 A, 250 Volts, wire, flush, polarize type.Conductors in conduits shall be moisture and heat-resistant rubber or thermoplastic insulated. In drylocations, wires and cables shall be type THW for sizes 8 mm. and smaller and type THW or THHN for sizes14 sq. mm. and larger. In damp or wet locations as defined by the Philippine Electric Code, wires and cablesshall be type THW. All conductors shall have 600 volts insulation unless otherwise specified in the drawings.Wire shall be stranded copper for 5.5 mm. diameter and larger sizes. Wires for the telephone and signalling systems shall be twisted telephone wires, thermoplastic insulated. The number and sizes shall be asspecified in the drawings.

1101.3 Construction Requirements

Conductors of wires shall not be drawn in conduit until after the cement plaster is dry and the conduits arethoroughly cleaned and free from dirt and moisture. In drawing wires into conduits, sufficient slack shall beallowed to permit easy connection for fixtures, switches, receptacles and other wiring devices without the useof additional splice:

All conductors of convenience outlets and lighting branch circuit home runs shall be wired with a minimum of3.5 mm. in size. Circuit homeruns to panel boards shall not be smaller than 3.5 mm. but a homerun to panel board more than 30 meters shall not be smaller than 5.5 mm. No conductor shall be less than 2 mm. in size.All wires of 14 mm. and larger in size shall be connected to panel and apparatus by means of approved typelugs or connectors of the solderless type, sufficiently large enough to enclose all strands of the conductorsand securely fasten. They shall not loosen under vibration of normal strain.All joints, taps and splices on wires larger than 14 mm. shall be made of suitable solderless connectors of the approved type and size. They shall be taped with rubber and PVC tapes providing insulation no less thanthat of the conductors.

No splices or joints shall be permitted in either feeder or branch conductors except within outlet boxes oraccessible junction boxes (pull boxes). All joints in branch circuit wiring shall be made mechanically andelectrically secured by approved splicing devices taped with rubber and PVC tapes in a manner which willmake their insulation as that of the conductor.All wall switches and receptacle shall be fitted with standard bakelite face plate covers. Device plate for flush

mounting shall be installed with all four edges in continuous contract finished wall surfaces without the use ofcoiled wire or similar devices. Plaster fillings will not be permitted. Plate installed in wet locations shall begasketed. When more than one switch or device is indicated in a single location gang plate shall be used.

1101.3.1 Quality Assurance Provisions

All installation shall be completed on or before final acceptance of the project including the tests andcommissioning. Equipment shall be demonstrated to operate in accordance with the

requirements of thisspecification. The Contractor shall furnish all instruments, tools and personnel required for the tests. As anexception to requirements that may be stated elsewhere in the contract agreement, the Engineer shall begiven five (5) working days notice prior to each test. All defects disclosed as a result of such test that are dueto the Contractor and shall be remedied to the satisfaction of the Engineer.

(a) Devices subject to Manual Operation

Each device subject to manual operation shall be tested five (5) times demonstrating satisfactory operation each time.

(b) Test on 600 Volts Wiring

Test of all 600 volts wiring to verify that no circuits or accidental grounds exist. Perform insulation resistancetest on all wiring using an instrument which apply a voltage of approximately 500 volts to provide a directreading of resistance; minimum resistance shall be 250,000 ohms that the resistance to ground is notexcessive. Test each ground rod for resistance to ground before making any connections to the rod, then tie

entire grounding system together and test for resistance to ground. Make resistance measurements innormally dry weather condition, not less than 48 hours after rainfall. Submit written results of each test to theEngineer and indicate the locations of the rod as well as the resistance and soil conditions at the time of themeasurements were made.

1101.4 Method of Measurement

The work under this Item shall be measured either by meters, rolls, pieces, set, actually placed and installedas shown on the Plans.

1101.5 Basis of Payment

All work performed and measured and as provided for in his Bill of Quantities shall be paid for at the Unit Bidor contract unit price which payment shall constitute full compensation including labor, materials, tools andincidentals necessary to complete this Item.

Payment shall be made under:

Pay Item Number	Description	Unit of Measurement
1101 (1)	Electric wire (size), conduits with Fittings	meter
1101 (2)	Single pole tumbler switch	set
1101 (3)	Two-gang Tumbler switch	set

1101 (4) Three-gang Tumbler switch set

1101 (5) Three-way tumbler switch set

1101 (6) Duplex convenience outlet set

1101 (7) Heavy duty convenience receptacle set

1101 (8) Standard Telephone outlet Bakelite cover set

1101 (9) Window type air conditioning Outlet 3-prong polarized type set

1101 (10) Bare copper wire meters

1101 (11) Grounding clamp for electric wire pieces

1101 (12) Messenger wire meters

1101 (13) Guy wire meters

1101 (14) Vibrating bell set

1101 (15) Traffic Light Control Panel set

1101 (16) Traffic Light metal enclosures Complete with red & green light provided with reflectors & 152 mm diameter vibrating bell set

1101 (17) Service entrance assembly with Reinforced concrete Pedestal pole with anchor bolt set

1101 (18) Meter base assembly exposed rigid RCP with weather cap & grounding rod copper weld 20 mm. diameter x 3 m.set

1101 (19) Apitong or approved equal Creosoted wood pole of std. length with anchor rod & log set

ITEM 1102 POWER LOAD CENTER, SWITCHGEAR AND PANELBOARDS

1102.1 Description

This Item shall consist of the furnishing and installation of the power load center unit substation or low voltage switchgear and distribution panel boards at the location shown or the approved Plans complete with transformer, circuit breakers, cabinets and all accessories, completely wired and ready for service.

1102.2 Material Requirements

All materials shall be brand new and shall be of the approved type. It shall conform with the requirements ofthe Philippine Electrical Code and shall bear the Philippine Standard Agency (PSA) mark.

Power Load Center Unit Substation

The Contractor shall furnish and install as indoor-type Power Load center Unit Substation at the

location shown on the approved Plans if required. It shall be totally metal-enclosed, dead front andshall consist of the following coordinated component parts:

High Voltage primary Section

High voltage primary incoming line section consisting of the following parts and related accessories:

e) One (1) Air-filled interrupter Switch, 2-position (open-close) installed in a suitable air filled metalenclosure and shall have sufficient interrupting capacity to carry the electrical load. It shall beprovided with key interlock with the cubicle for the power fuses to prevent access to the fusesunless the switch is open.

f) Three (3) power fuses mounted in separate compartments within the switch housing and

accessible by a hinged door.

g) One (1) set of high voltage potheads or 3-conductor cables or three single conductor cables.

h) Lighting arresters shall be installed at the high voltage cubicle if required.

Items (a) and (b) above could be substituted with a power circuit breaker with the correct rating andcapacity.

Transformer Section

The transformer section shall consist of a power transformer with ratings and capacities as shownon the Plans. It shall be oil liquid-filled non-flammable type and designed in accordance with thelatest applicable standards.

The transformers shall be provided with four(4) approximately 2 ½ % rated KVA taps on the primarywindings in most cases one (1) above and three (3) below rated primary voltage and shall bechanged by means of externally gang-operated manual tap changer only when the transformer isde-energized. Tap changing under load is acceptable if transformer has been so designed.

The following accessories shall be provided with the transformer, namely: drain pad, top filter pressconnection, lifting lugs, diagrammatic nameplate, relief valve, thermometer and other necessaryrelated accessories.

The high voltage and low voltage bushings and transition flange shall be properly coordinated forfield connection to the incoming line section and low voltage switchboard section, respectively.

Low-Voltage Switchboard Section

The low-voltage switchboard shall be standard modular-unitized units, metal-built, dead front, safety type construction and shall consist of the following:

e) Switchboard Housing

The housing shall be heavy gauge steel sheet, dead front type, gray enamel finish, complete withframe supports, steel bracings, steel sheet panelboard, removable rear plates, copper busbars, andall other necessary accessories to ensure sufficient mechanical strength and safety. It shall beprovided with grounding bolts and clamps.

f) Secondary Metering Section

The secondary metering section shall consist of one (1) ammeter, AC, Indicating type; one voltmeter, AC, Indicating Type, one (1) ammeter transfer switch for 3-phase; one (1) voltmeter transfer switch for 3-phase; and current transformers of suitable rating and capacity.

The abovementioned instruments shall be installed in one compartment above the main breaker and shall be complete with all necessary accessories completely wired, ready for use.

g) Main Circuit Breaker

The main circuit breaker shall be draw-out type, manually or electrically operated, manual trip bottom, magnetic tripping devices, adjustable time overcurrent protection and instantaneous shortcircuit trip and all necessary accessories to ensure safe and efficient operation.

h) Feeder Circuit Breakers

There shall be as many feeder breakers as are shown on the single line diagram or schematic riserdiagram and schedule of loads and computations on the Plans. The circuit breaker shall be drawnout or molded case as required. The circuit breakers shall each have sufficient interrupting capacityand shall be manually operated complete with trip devices and all

necessary accessories to insuresafe and efficient operation. The number, ratings, capacities of the feeder branch circuit breakersshall be shown on the approved Plans.

Circuit breakers shall each be of the indicating type, providing "ON" – "OFF" and "TRIP" positions ofthe operating handles and shall each be provided with nameplate for branch circuit designation. Thecircuit breaker shall be so designed that an overload or short on one pole automatically causes allpoles to open.

Low-Voltage Switchgear (**For projects requiring low-voltage Switchgear only**)

The Contractor shall furnish and install a low-voltage switchgear at the location shown on the Plans.It shall be metal-clad, dead front, free standing, safety type construction and shall have copper busbars of sufficient size, braced to resist allowable Root Mean Square (RMS) symmetrical shortcircuit stresses, and all necessary accessories.The low-voltage switchgear shall consist of the switchgear housing, secondary metering, mainbreaker and feeder branch circuit breakers and all necessary accessories, completely wired, readyfor service.

Grounding System

All non-current carrying metallic parts like conduits, cabinets and equipment frames shall be properly grounded in accordance with the Philippine Electrical Code, latest edition.

The size of the ground rods and ground wires shall be as shown on the approved Plans. The ground resistance shall not be more than 5 ohms.

Panel boards and cabinets

Panel boards shall conform to the schedule of panel boards as shown on the approved Plans withrespect to supply characteristics, rating of main lugs or main circuit breaker, number and ratingsand capabilities of branch circuit breakers.

Panel boards shall consist of a factory completed dead front assembly mounted in an inclosing flushtype cabinet consisting of code gauge 14 (2.0 mm thick) galvanized sheet steel box with trim anddoor. Each door shall be provided with catch lock and two (2) keys. Panel boards shall be provided with directories and shall be printed to indicate load served by each circuit.

Panel board cabinets and trims shall be suitable for the type of mounting shown on the approved Plans. The inside and outside of panel board cabinets and trims shall be factory painted with one rust-proofing primer coat and two finish shop coats of pearl gray enamel paint.

Main and branch circuit breakers for panel boards shall have the rating, capacity and number of poles as shown on the approved Plans. Breakers shall be thermal magnetic type. Multiple breakershall be of the common trip type having a single operating handle. For 50-ampere breaker or less, itmay consist of single-pole breaker permanently assembled at the factory into a multi-pole unit.

1102.3 Construction Requirements

The Contractor shall install the Power Load center Unit Substation or Low-Voltage Switchgear and panel boards at the locations shown on the approved Plans.

Standard panels and cabinets shall be used and assembled on the job. All panels shall be of dead frontconstruction furnished with trims for flush or surface mounting as required.

1102.4 Method of Measurement

The work under this Item shall be measured either by set and pieces actually placed and installed as shownon the approved Plans.

1102.5 Basis of Payment

All works performed and measured and as provided for in the Bill of Quantities shall be paid for the Unit Bidor Contract Unit Price which payment shall constitute full compensation including labor, materials, tools andincidentals necessary to complete this Item.

Payment shall be made under:

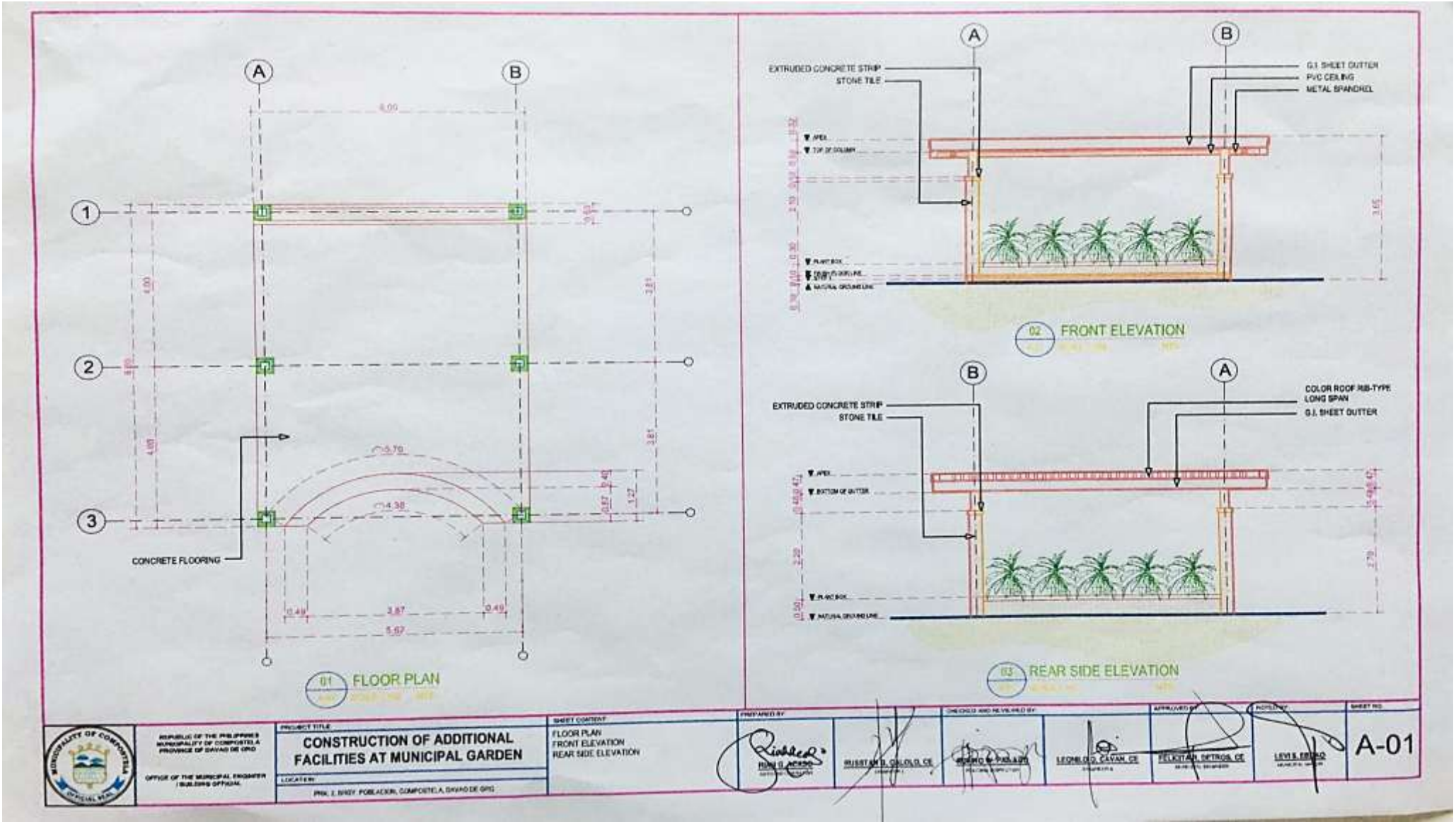
Pay Item Number	Description	Unit of Measurement
1102 (1)	Panelboard (circuit breaker type)	set
1102 (2)	Panelboard (Safety Switch type)	set
1102 (3)	Low-Voltage Switchgear (LVS) Complete with metering devices And accessories	set
1102 (4)	Power Fuses	pieces
1102 (5)	Lighting Arrester	pieces
1102 (6)	Air Break Switch	set
1102 (7)	Enclosed ACB NEMA Type I	set
1102 (8)	Enclosed ACB NEMA Type 3R	set
1102 (9)	Automatic Transfer Switch	set
1102 (10)	Manual Transfer Switch w/out fuses	pieces
1102 (11)	Motor Controller	set

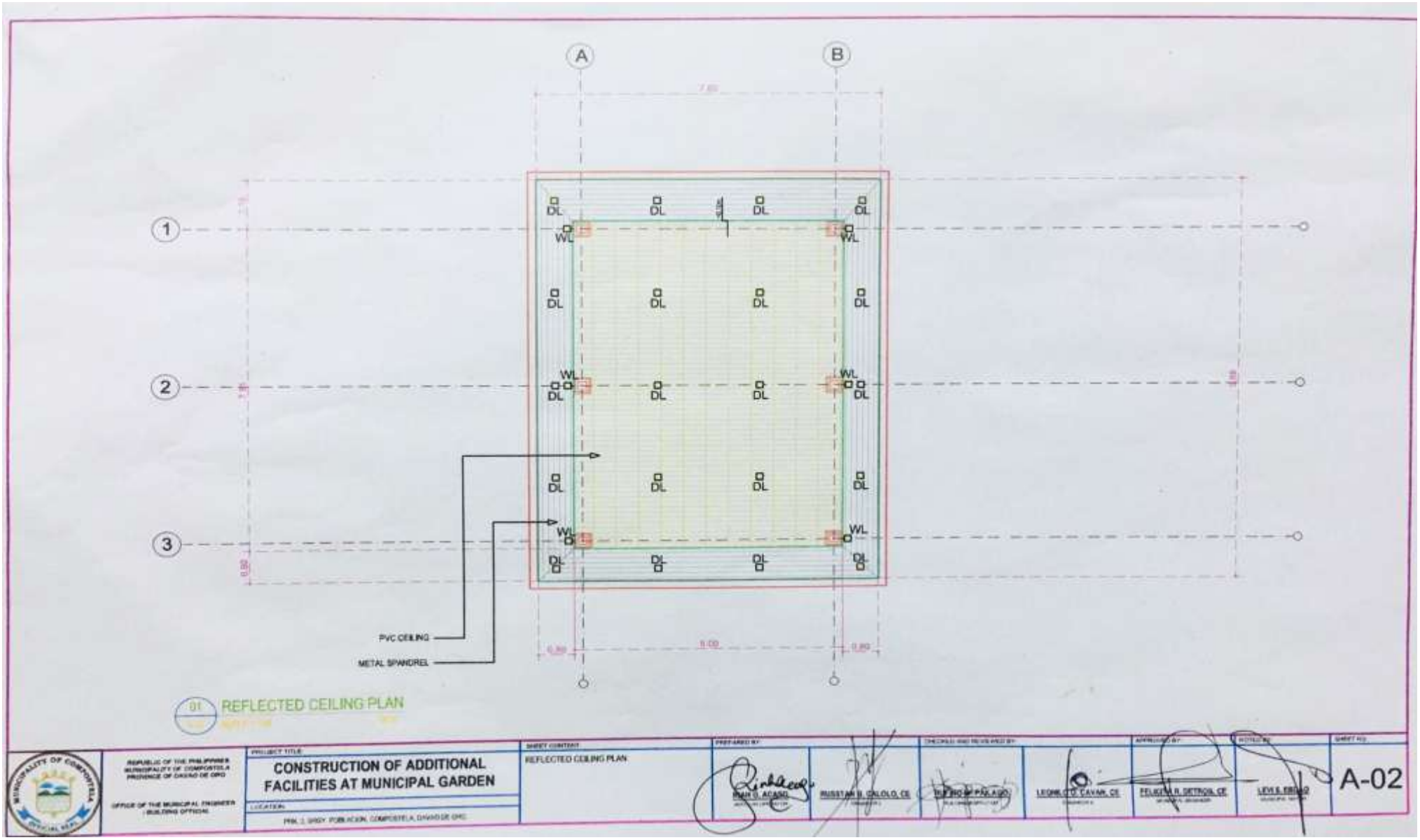
Section VII. Drawings

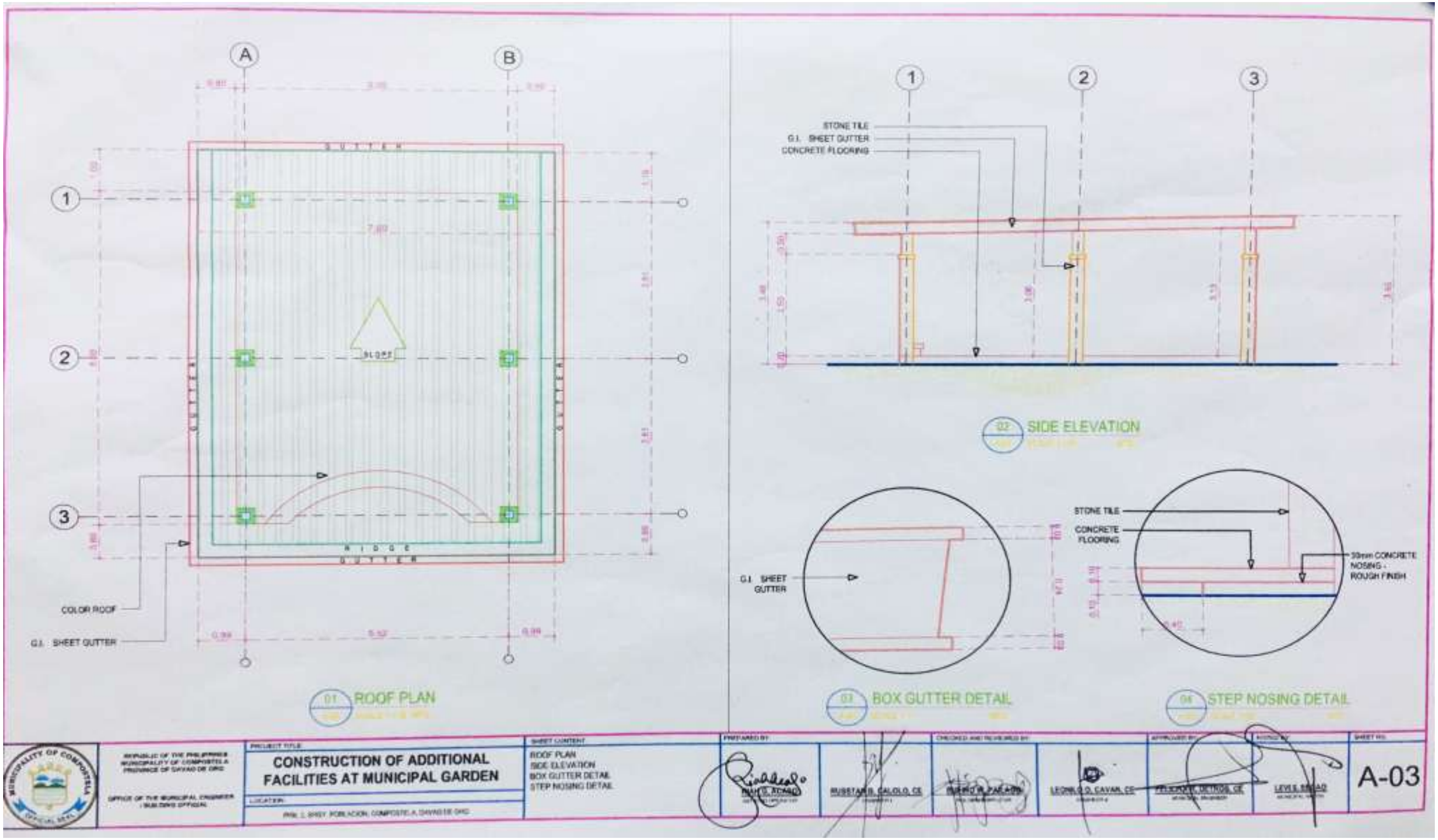
[Insert here a list of Drawings. The actual Drawings, including site plans, should be attached to this section, or annexed in a separate folder.]

CONSTRUCTION OF ADDITIONAL FACILITIES AT MUNICIPAL GARDEN

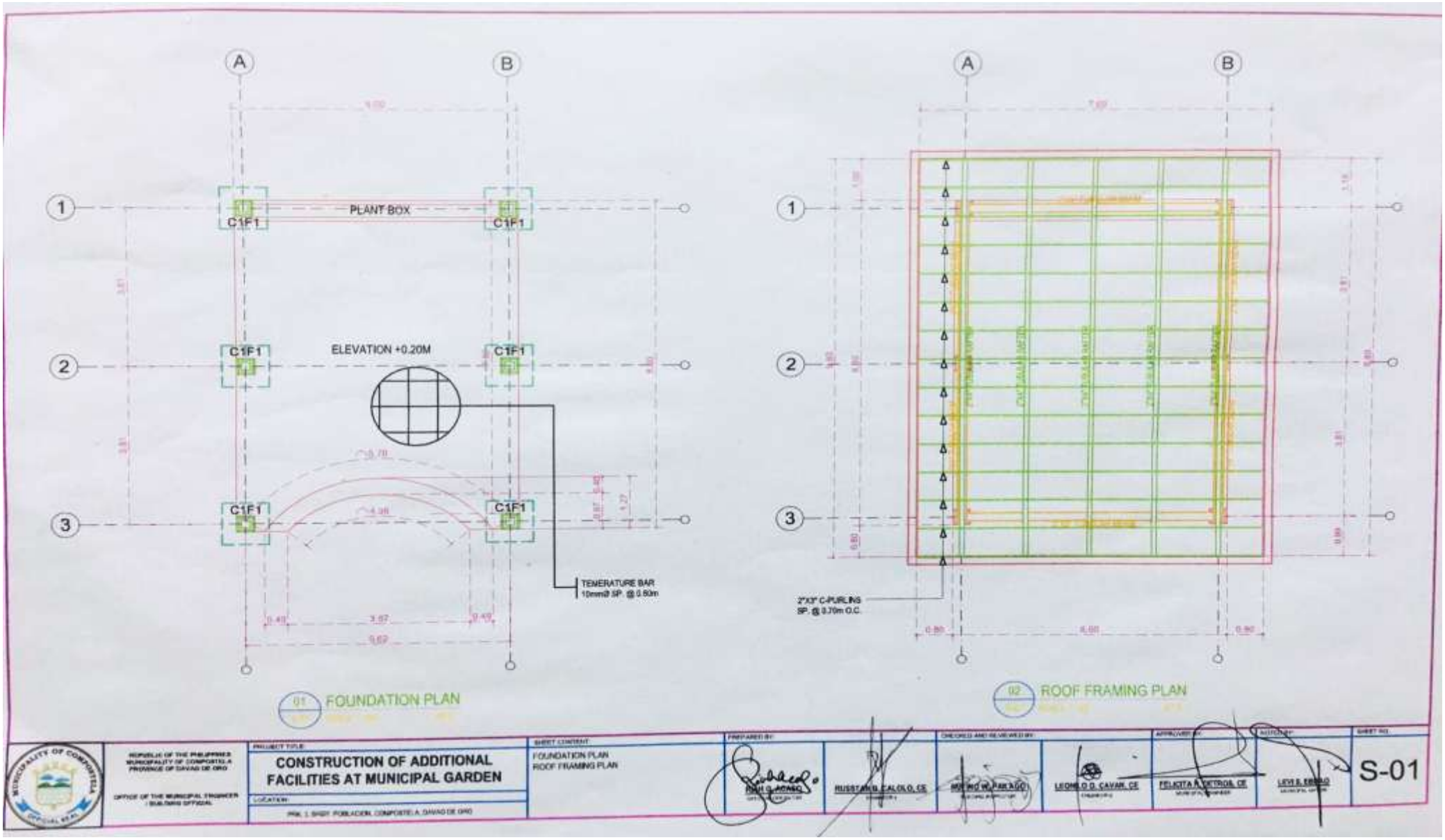
PRK. 2, BRGY. POBLACION, COMPOSTELA, DAVAO DE ORO

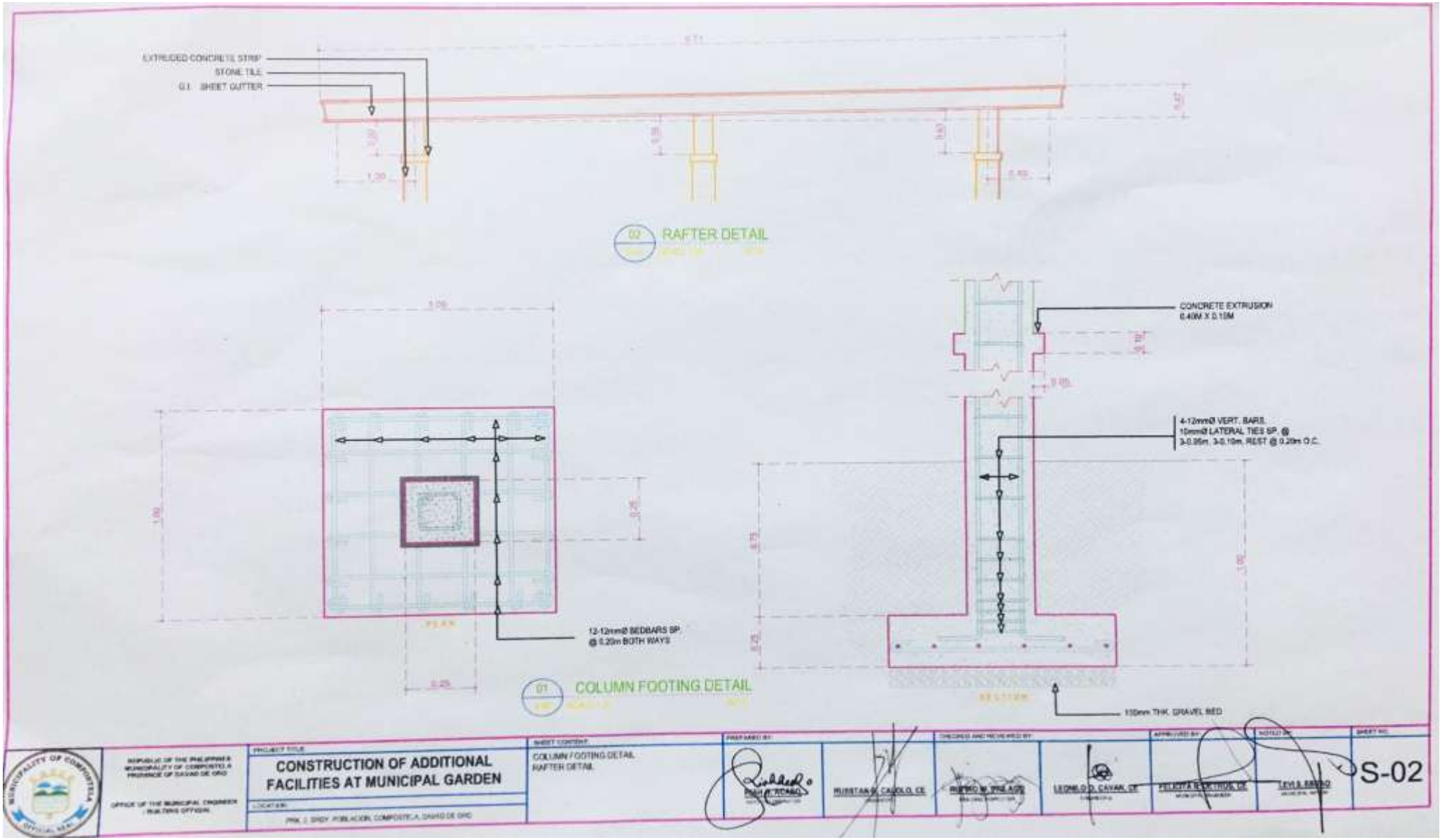

A
B
1
2
3
CONCRETE FLOORING
01 FLOOR PLAN
EXTRUDED CONCRETE STRIP
STONE TILE
G.I SHEET GUTTER
PVC CEILING
METAL BRANDREL
02 FRONT ELEVATION
COLOR ROOF RIB-TYPE
LONG SPAN
G.I. SHEET GUTTER
03 REAR SIDE ELEVATION
REPUBLIC OF THE PHILIPPINES
MUNICIPALITY OF COMPOSTELA
PROVINCE OF DAVAO DE ORO
OFFICE OF THE MUNICIPAL ENGINEER
BUILDING OFFICIAL
PROJECT TITLE
CONSTRUCTION OF ADDITIONAL FACILITIES AT MUNICIPAL GARDEN
LOCATION
SHEET CONTENT
FLOOR PLAN
FRONT ELEVATION
REAR SIDE ELEVATION
PREPARED BY
RUSSTAM D. GALOLO, CE
LEONELO D. CAVAN, CE
FELICITAS D. PITROS, CE
LEVI S. EBRO
SHEET NO.
A-01

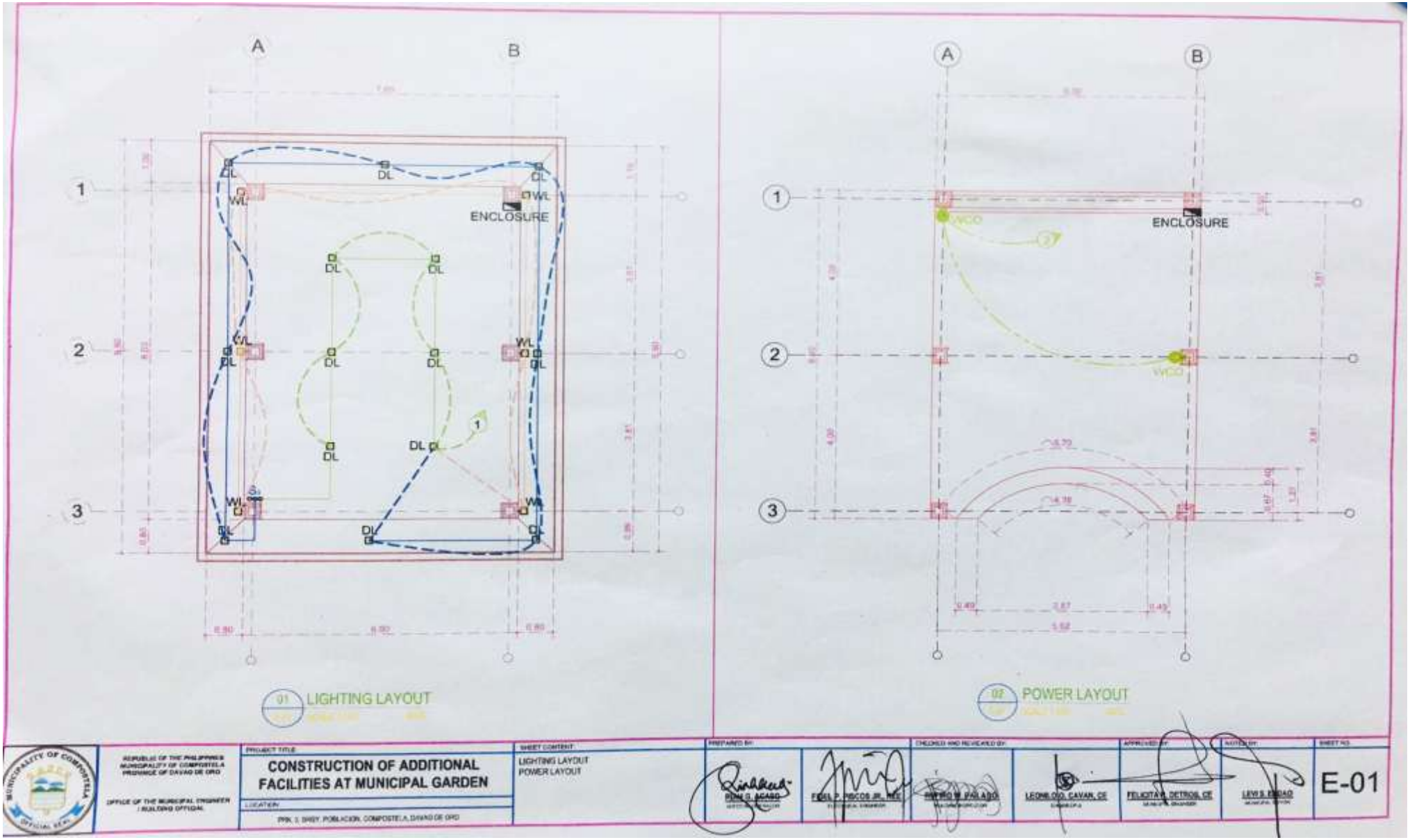

A
B
1
2
3
DL
WL
PVC CEILING
METAL SPANDREL
01 REFLECTED CEILING PLAN
REPUBLIC OF THE PHILIPPINES
MUNICIPALITY OF COMPOSTELA
PROVINCE OF DAVAO DE ORO
OFFICE OF THE MUNICIPAL ENGINEER
BUILDING OFFICIAL
PROJECT TITLE
CONSTRUCTION OF ADDITIONAL FACILITIES AT MUNICIPAL GARDEN
LOCATION
SHEET CONTENT
REFLECTED CEILING PLAN
PREPARED BY
RUSSTAN B. CALOLO, CE
LEONILO V. CAVAN, CE
FELICITAS R. DETROS, CE
SHEET NO.
A-02



ROOF PLAN
GUTTER
RIDGE
SLOPE
COLOR ROOF
G.I. SHEET GUTTER
SIDE ELEVATION
STONE TILE
G.I. SHEET GUTTER
CONCRETE FLOORING
BOX GUTTER DETAIL
G.I. SHEET GUTTER
STEP NOSING DETAIL
STONE TILE
CONCRETE FLOORING
30mm CONCRETE NOSING - ROUGH FINISH
REPUBLIC OF THE PHILIPPINES
MUNICIPALITY OF COMPOSTELA
PROVINCE OF DAVAO DE ORO
OFFICE OF THE MUNICIPAL ENGINEER / BUILDING OFFICIAL
PROJECT TITLE
CONSTRUCTION OF ADDITIONAL FACILITIES AT MUNICIPAL GARDEN
LOCATION
SHEET CONTENT
ROOF PLAN
SIDE ELEVATION
BOX GUTTER DETAIL
STEP NOSING DETAIL
PREPARED BY
CHECKED AND REVIEWED BY
APPROVED BY
SHEET NO.
A-03


A
B
1
2
3
C1F1
PLANT BOX
ELEVATION +0.20M
TEMERATURE BAR
10mm@ SP. @ 0.80m
2"X3" C-PURLINS
SP. @ 0.70m O.C.
01 FOUNDATION PLAN
02 ROOF FRAMING PLAN
REPUBLIC OF THE PHILIPPINES
MUNICIPALITY OF COMPOSTELA
PROVINCE OF DAVAO DE ORO
OFFICE OF THE MUNICIPAL ENGINEER
PROJECT TITLE
CONSTRUCTION OF ADDITIONAL FACILITIES AT MUNICIPAL GARDEN
LOCATION
SHEET CONTENT
FOUNDATION PLAN
ROOF FRAMING PLAN
PREPARED BY:
RUSSTAN B. CALOLO, CE
CHECKED AND REVIEWED BY:
LEONILO D. CAVAR, CE
APPROVED BY:
FELICITA A. CETROS, CE
NOTED BY:
SHEET NO.
S-01


EXTRUDED CONCRETE STRIP
STONE TILE
G.I. SHEET GUTTER
02 RAFTER DETAIL
CONCRETE EXTRUSION
0.40M X 0.15M
4-12mmØ VERT. BARS.
10mmØ LATERAL TIES SP. @
3-0.05m, 3-0.10m, REST @ 0.20m O.C.
12-12mmØ BEDBARS SP.
@ 0.20m BOTH WAYS
PLAN
SECTION
01 COLUMN FOOTING DETAIL
100mm THK. GRAVEL BED
REPUBLIC OF THE PHILIPPINES
MUNICIPALITY OF COMPOSTELA
PROVINCE OF DAVAO DE ORO
OFFICE OF THE MUNICIPAL ENGINEER
BUILDING OFFICIAL
PROJECT TITLE
CONSTRUCTION OF ADDITIONAL FACILITIES AT MUNICIPAL GARDEN
LOCATION
PRK. 2, BRGY. POBLACION, COMPOSTELA, DAVAO DE ORO
SHEET CONTENT
COLUMN FOOTING DETAIL
RAFTER DETAIL
PREPARED BY:
MUSTAFA M. CAUDLO, CE
CHECKED AND REVIEWED BY:
LEONILO D. CAYAK, JR.
APPROVED BY:
NOTED BY:
SHEET NO.
S-02


A
B
1
2
3
DL
WL
ENCLOSURE
WCO
01 LIGHTING LAYOUT
02 POWER LAYOUT
REPUBLIC OF THE PHILIPPINES
MUNICIPALITY OF COMPOSTELA
PROVINCE OF DAVAO DE ORO
OFFICE OF THE MUNICIPAL ENGINEER / BUILDING OFFICIAL
PROJECT TITLE
CONSTRUCTION OF ADDITIONAL FACILITIES AT MUNICIPAL GARDEN
LOCATION
SHEET CONTENT
LIGHTING LAYOUT
POWER LAYOUT
PREPARED BY:
CHECKED AND REVIEWED BY:
APPROVED BY:
AUTHORIZED BY:
LEONILDO CAVAN, CE
FELICITAS DETROS, CE
SHEET NO.
E-01

COMPUTATION

AMPACITY OF MAIN SERVICE CONDUCTOR AND MAIN CIRCUIT BREAKER DETERMINE THE TOTAL CURRENT LOAD :

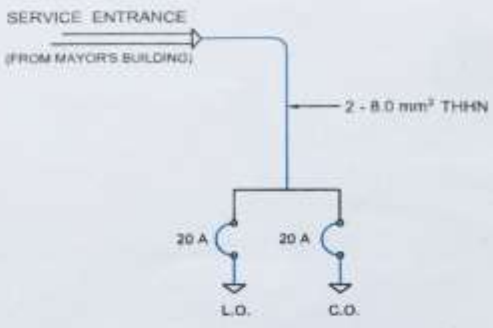
1.	LIGHTING OUTLET, LED	20 X 20W =	400 W
2.	CONVENIENCE OUTLET	2 X 180 =	360 W
	TOTAL		760 W

FULL LOAD CURRENT, I_{FL}:

$$I_{FL} = \frac{760\ W}{230} = 3.30\ \text{AMPERES}$$

USE :

1. 2 - 8.0 mm^2 THHN COPPER WIRE MAIN FEEDER LINE
2. 30 A, 2P, 250 V MAIN CIRCUIT BREAKER
3. 25 MM Ø CONDUIT PIPE



RISER DIAGRAM
NTS

SCHEDULE OF LOADS: PB

CIRCUIT NO.	DESCRIPTION	QTY.	TOTAL LOAD, VA	VOLTAGE, VOLTS	CURRENT, AMPERE	BREAKER SIZE, AT	BREAKER TYPE	WIRE SIZE	CONDUIT SIZE
1	20W LED LIGHT	20	400	230	1.74	15	MCB	2-2.0mm² THHN	20mm dia. PVC
2	CONVENIENCE OUTLET	2	360	230	1.57	20	MCB	2-3.5mm² THHN	20mm dia. PVC
	TOTAL CONNECTED LOAD		760						

GENERAL NOTES AND SPECIFICATIONS

ALL ELECTRICAL INSTALLATION WORKS HEREIN SHALL BE DONE IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS, THE APPLICABLE PROVISIONS OF THE LATEST EDITION OF THE PHILIPPINE ELECTRICAL CODE, THE RULES AND REGULATIONS OF THE LOCAL ENFORCING AUTHORITY AND THE REQUIREMENTS OF THE LOCAL POWER AND TELEPHONE COMPANIES.

THE ELECTRIC SERVICE VOLTAGE SHALL BE 1-PHASE, 3 WIRE, 240 V, 60 HZ.

THE ELECTRICAL WIRING INSTALLATION SHALL BE DONE IN RIGID METAL CONDUITS. FLEXIBLE CONDUITS SHALL BE USED WHERE REQUIRED.

MINIMUM SIZE FOR ALL CONDUITS SHALL BE 20mmØ ELECTRICAL TRADE SIZE FOR METAL CONDUITS.

ALL WIRE SHALL BE COPPER AND THERMOPLASTIC INSULATED TYPE "THHN" OR "THW" UNLESS OTHERWISE INDICATED.

THE CONTRACTOR SHALL VERIFY AND ORIENT THE ACTUAL LOCATION OF SERVICE ENTRANCE FOR CONNECTION TO THE POWER SUPPLY.

ALL SERVICE ENTRANCE EQUIPMENT, SWITCHES, PANELBOARDS, LIGHTING FIXTURE AND ALL NON-CURRENT CARRYING METAL PARTS SHALL BE PROPERLY GROUNDED IN ACCORDANCE WITH THE LATEST EDITION OF THE PHILIPPINE ELECTRICAL CODE.

ALL FEEDERS SHALL BE INSTALLED AS INDICATED ON PLANS BRANCH CKT. HOMERUN WIRES SHALL BE INSTALLED IN INDIVIDUAL HOMERUN CONDUITS.

ALL MATERIALS TO BE USED AND THE EQUIPMENT TO BE INSTALLED SHALL BE BRAND NEW AND MUST BE OF THE APPROVED TYPE FOR THE PARTICULAR LOCATION AND PURPOSE INTENDED.

ALL FLUORESCENT LAMP FIXTURES SHALL HAVE HIGH POWER FACTOR AND RAPID START BALLAST AND LAMPS SHALL BE WHITE DAYLIGHT THROUGHOUT.

THE MOUNTING HEIGHTS OF WIRING DEVICES SHALL BE AS FOLLOWS:

A.) LIGHT SWITCHES	1400MM ABOVE FLOOR FINISH
B.) CONVENIENCE OUTLETS	400MM ABOVE FLOOR FINISH OR AS REQUIRED
C.) TELEPHONE OUTLETS	300MM ABOVE FLOOR FINISH OR AS REQUIRED
D.) PANELBOARDS AND CABINETS	1400MM ABOVE FLOOR FINISH AT CENTER OR AS REQUIRED

PROVIDE PULL WIRES IN ALL SPARE DUCTS AND EMPTY CONDUITS.

REPUBLIC OF THE PHILIPPINES
MUNICIPALITY OF COMPOSTELA
PROVINCE OF DAVAO DE ORO

OFFICE OF THE MUNICIPAL ENGINEER / BUILDING OFFICIAL

PROJECT TITLE: **CONSTRUCTION OF ADDITIONAL FACILITIES AT MUNICIPAL GARDEN**

LOCATION:

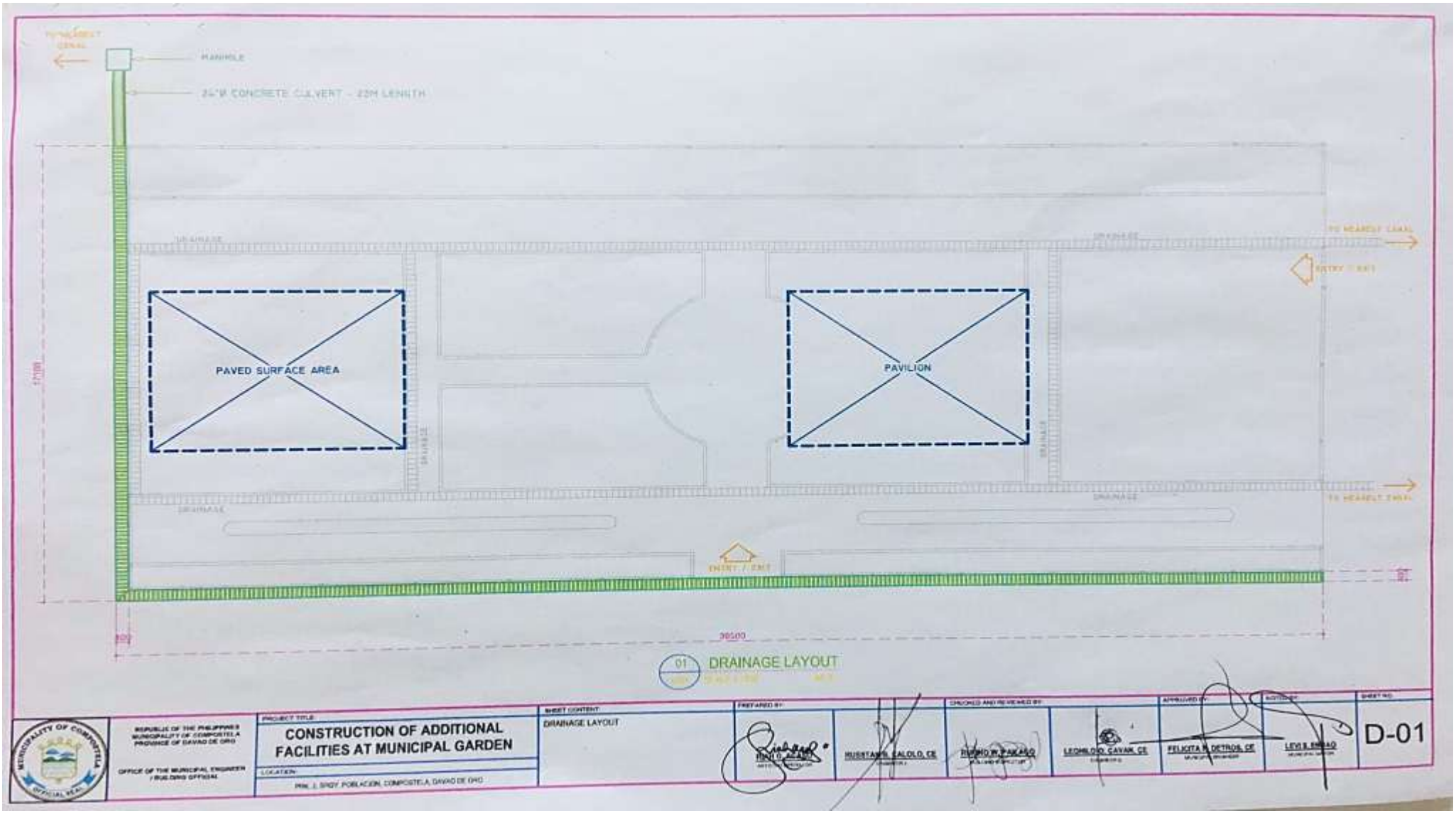
SHEET CONTENT: GENERAL NOTES AND SPECIFICATIONS, SCHEDULE OF LOADS, COMPUTATIONS, RISER DIAGRAM

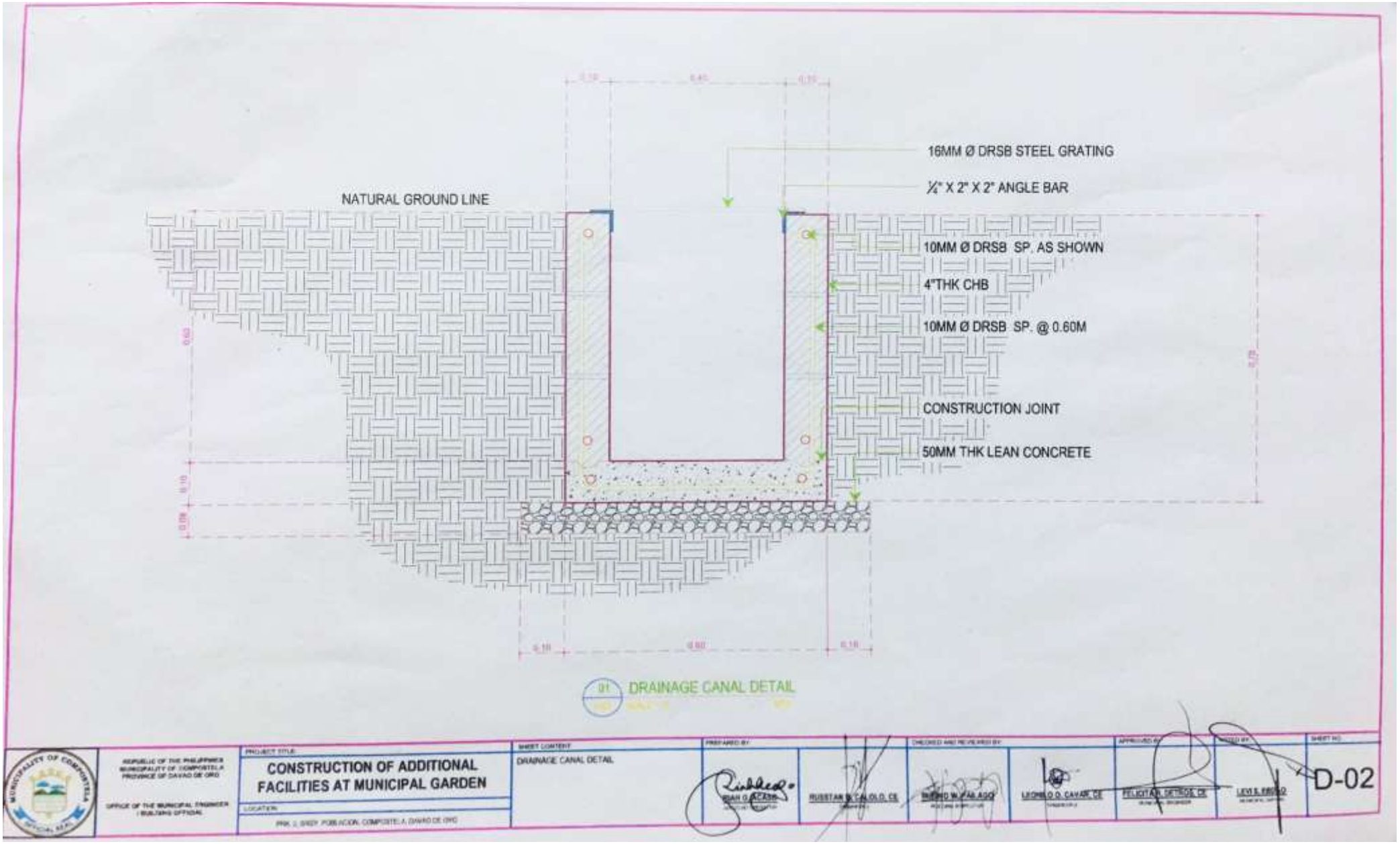
PREPARED BY:

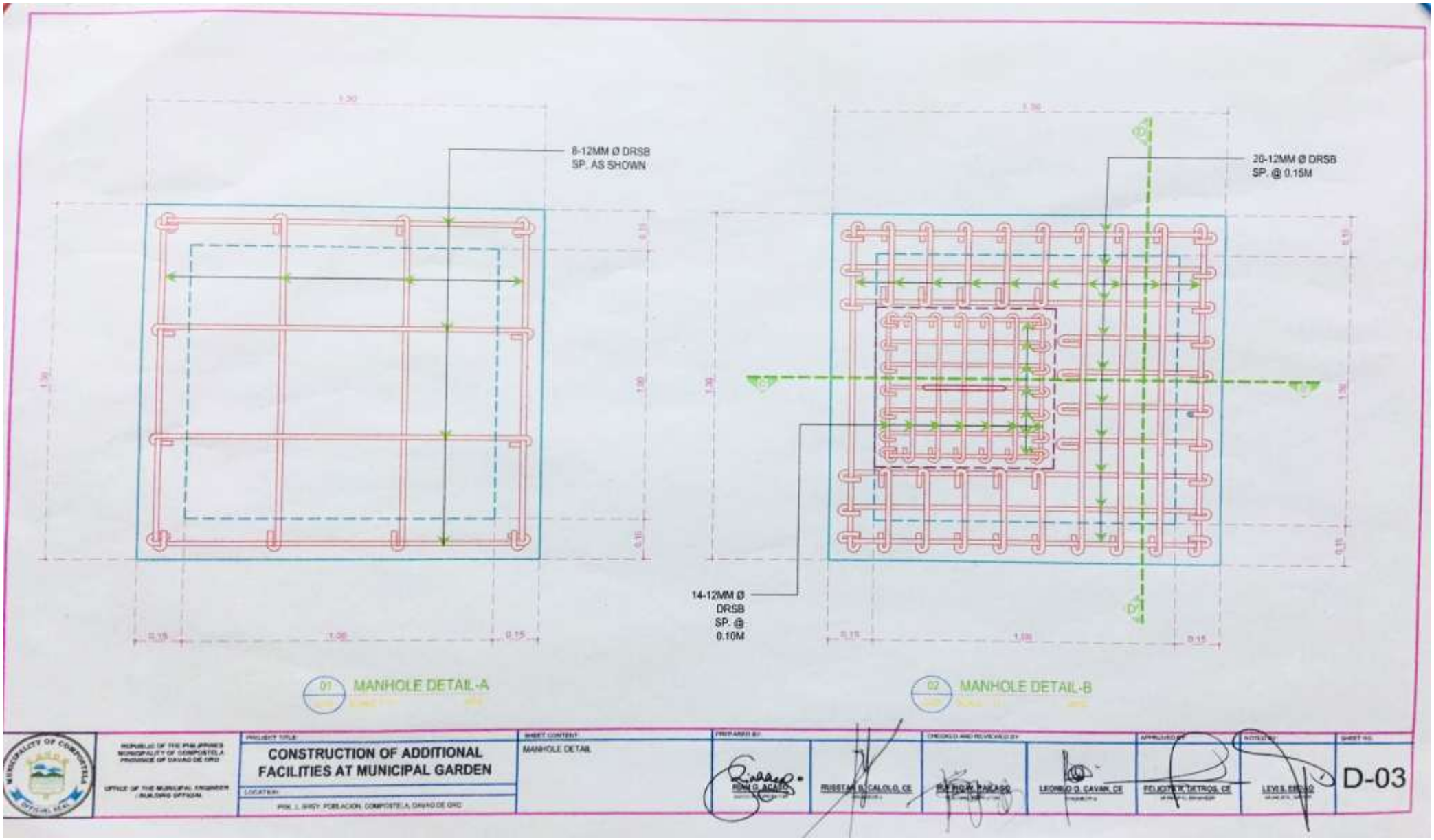
CHECKED AND REVIEWED BY: LEONILDO CAVAN, CE

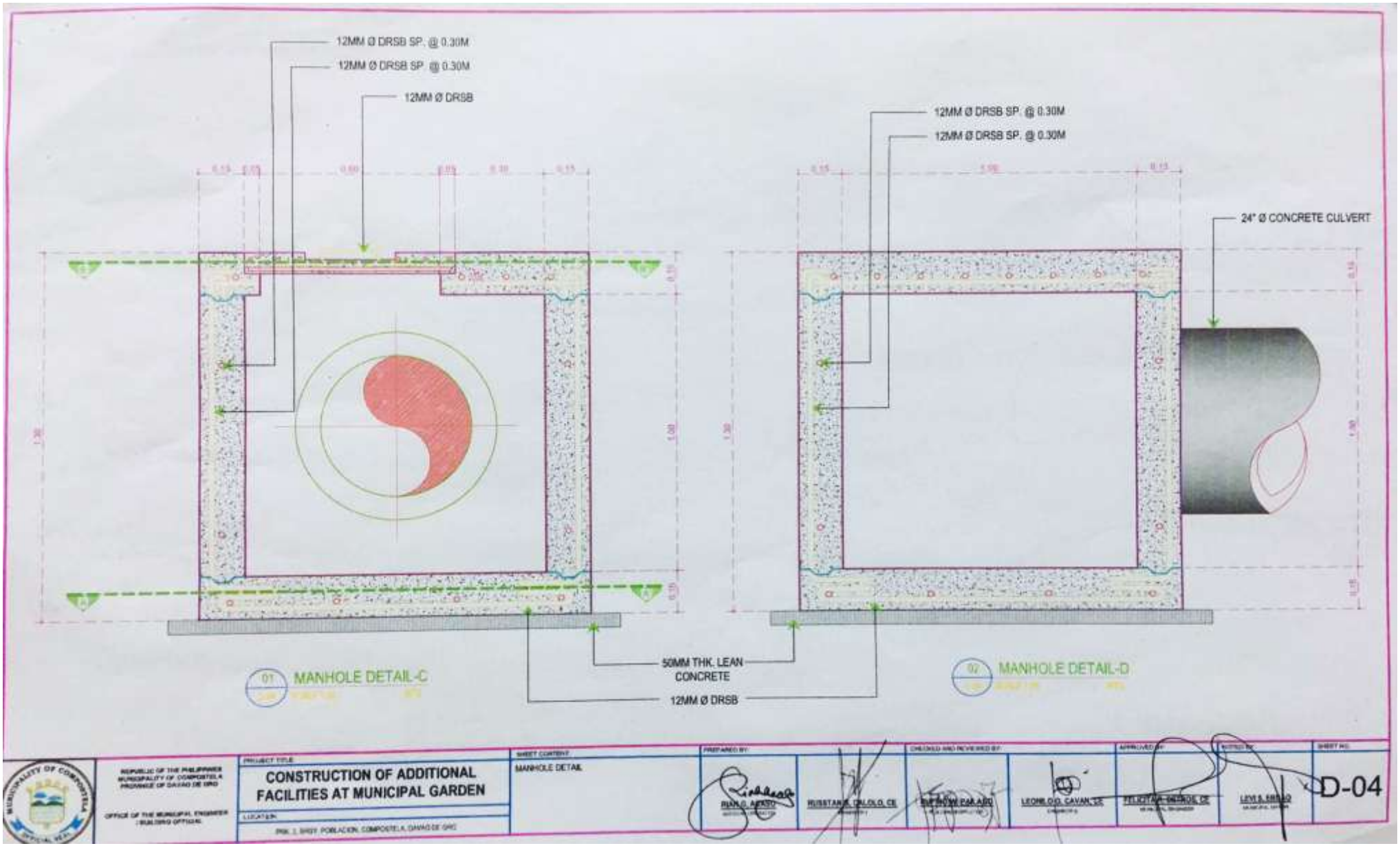
APPROVED BY:

SHEET NO.: E-02


MANHOLE
24"Ø CONCRETE CULVERT - 23M LENGTH
PAVED SURFACE AREA
PAVILION
DRAINAGE
TO NEARBY CANAL
ENTRY / EXIT
30500
01 DRAINAGE LAYOUT
REPUBLIC OF THE PHILIPPINES
MUNICIPALITY OF COMPOSTELA
PROVINCE OF DAVAO DE ORO
OFFICE OF THE MUNICIPAL ENGINEER
/ BUILDING OFFICIAL
PROJECT TITLE:
CONSTRUCTION OF ADDITIONAL FACILITIES AT MUNICIPAL GARDEN
LOCATION:
PRK. 2, SRDY. POBLACION, COMPOSTELA, DAVAO DE ORO
SHEET CONTENT:
DRAINAGE LAYOUT
PREPARED BY:
HUSTAMIN LALOLO, CE
CHECKED AND REVIEWED BY:
LEONILDO CAYAK, CE
APPROVED BY:
FELICITA R. DETROS, OIC
NOTED BY:
LEVI S. BINGAO
SHEET NO:
D-01


16MM Ø DRSB STEEL GRATING
½" X 2" X 2" ANGLE BAR
NATURAL GROUND LINE
10MM Ø DRS8 SP. AS SHOWN
4"THK CHB
10MM Ø DRSB SP. @ 0.60M
CONSTRUCTION JOINT
50MM THK LEAN CONCRETE
01 DRAINAGE CANAL DETAIL
REPUBLIC OF THE PHILIPPINES
MUNICIPALITY OF COMPOSTELA
PROVINCE OF DAVAO DE ORO
OFFICE OF THE MUNICIPAL ENGINEER
/ BUILDING OFFICIAL
PROJECT TITLE:
CONSTRUCTION OF ADDITIONAL FACILITIES AT MUNICIPAL GARDEN
LOCATION:
SHEET CONTENT:
DRAINAGE CANAL DETAIL
PREPARED BY:
CHECKED AND REVIEWED BY:
APPROVED BY:
SHEET NO.
D-02


8-12MM Ø DRSB
SP. AS SHOWN
20-12MM Ø DRSB
SP. @ 0.15M
14-12MM Ø
DRSB
SP. @
0.10M
01 MANHOLE DETAIL-A
02 MANHOLE DETAIL-B
REPUBLIC OF THE PHILIPPINES
MUNICIPALITY OF COMPOSTELA
PROVINCE OF DAVAO DE ORO
OFFICE OF THE MUNICIPAL ENGINEER
/BUILDING OFFICIAL
PROJECT TITLE
CONSTRUCTION OF ADDITIONAL
FACILITIES AT MUNICIPAL GARDEN
LOCATION
SHEET CONTENT
MANHOLE DETAIL
PREPARED BY:
RIAN O. ACAIN
RUSSTAM B. CALOLO, CE
CHECKED AND REVIEWED BY:
RAYMOW PARCASO
LEONILO O. CAVAN, CE
APPROVED BY:
FELICITO M. TETROS, CE
NOTED BY:
LEVI S. BRIGO
SHEET NO.
D-03


12MM Ø DRSB SP. @ 0.30M
12MM Ø DRSB SP. @ 0.30M
12MM Ø DRSB
12MM Ø DRSB SP. @ 0.30M
12MM Ø DRSB SP. @ 0.30M
24" Ø CONCRETE CULVERT
50MM THK. LEAN CONCRETE
12MM Ø DRSB
01 MANHOLE DETAIL-C
02 MANHOLE DETAIL-D
REPUBLIC OF THE PHILIPPINES
MUNICIPALITY OF COMPOSTELA
PROVINCE OF DAVAO DE ORO
OFFICE OF THE MUNICIPAL ENGINEER / BUILDING OFFICIAL
PROJECT TITLE
CONSTRUCTION OF ADDITIONAL FACILITIES AT MUNICIPAL GARDEN
LOCATION
SHEET CONTENT
MANHOLE DETAIL
PREPARED BY:
RUSSTAN B. DALOLO, CE
CHECKED AND REVIEWED BY:
LEONILO D. CAVAN, JR.
APPROVED BY:
NOTED BY:
LEVI S. ERRAO
SHEET NO.
D-04

Section VIII. Bill of Quantities

Project Title: ***Construction of Additional Facilities at Municipal Garden***
ABC (Php): ***1,140,974.35***

Project Title: ***Construction of Additional Facilities at Municipal Garden***					
ABC (Php): ***1,140,974.35***					
Item No.	Description of Works	Quantity	Unit	Unit Price (In words & figures)	Total Price (In words & figures)
1.	I. SITE WORKS	122.48	SQ.M.		
2.	II. CONCRETE WORKS	17.41	CU.M.		
3.	III. REINFORCING STEEL WORKS	386.84	KGS.		
4.	IV. MASONRY WORKS	76.96	SQ.M.		
5.	V. STRUCTURAL AND FABRICATED STEEL WORKS	1	LOT		
6.	VI. ROOFING WORKS	74.56	SQ.M.		
7.	VII. ELECTRICAL WORKS	1	LOT		
8.	VIII. CEILING WORKS	74.48	SQ.M.		
9.	IX. PAINTING WORKS	1	LOT		
10.	X. TILE WORKS	22.7	SQ.M.		
11.	XI. CARPENTRY WORKS	1,174.9	BD.FT.		
12.	XII. PIPE CULVERT EXCAVATION AND INSTALLATION	23	LN.M.		
GRAND TOTAL (In words and Figures)					

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

_____	_____	_____
Name of Bidder	Authorized Signatory	Date

Section IX. Checklist of Technical and Financial Documents

Checklist of Technical and Financial Documents

I. TECHNICAL COMPONENT ENVELOPE

Class "A" Documents

Legal Documents

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

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

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

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

Technical Documents

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

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

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

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

(j) Project Requirements, which shall include the following:
   a. Organizational chart for the contract to be bid;
   b. List of contractor's key personnel (*e.g.*, Project Manager, Project Engineers, Materials Engineers, and Foremen), to be assigned to the contract to be bid, with their complete qualification and experience data;
   c. List of contractor's major equipment units, which are owned, leased, and/or under purchase agreements, supported by proof of ownership or certification of availability of equipment from the equipment lessor/vendor for the duration of the project, as the case may be;
   d. Affidavit of Site Inspection;
   e. Construction schedule and S-curve;
   f. Manpower schedule;
   g. Construction methods;
   h. Equipment utilization schedule;

i. Construction Safety and Health Program approved by the DOLE;
j. PERT/CPM **and**

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

(l) Mayor's Permit (Municipality of Compostela)

(m) Bidder's Fee (Official Receipt)

Financial Documents

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

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

Class "B" Documents

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

II. FINANCIAL COMPONENT ENVELOPE

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

Other documentary requirements under RA No. 9184

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

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

(t) Cash Flow by Quarter.

Bidding Forms

BID FORM

Date : _____

Project Identification No. : _____

To: [name and address of Procuring Entity]

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

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

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

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

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

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

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

g. If our Bid is accepted, we commit to obtain a Performance Security in the amount of *[insert percentage amount]* percent of the Contract Price for the due performance of the Contract, or a Performance Securing Declaration in lieu of the the allowable forms of Performance Security, subject to the terms and conditions of issued GPPB guidelines for this purpose;

h. We are not participating, as Bidders, in more than one Bid in this bidding process, other than alternative offers in accordance with the Bidding Documents;

i. We understand that this Bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal Contract is prepared and executed; and

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

k. We likewise certify/confirm that the undersigned, is the duly authorized representative of the bidder, and granted full power and authority to do, execute and

perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for the [Name of Project] of the [Name of the Procuring Entity*]*.

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

Name: _____

Legal Capacity: _____

Signature: _____

Duly authorized to sign the Bid for and behalf of: _____

Date: _____

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

Business Name: _____

Business Address: _____

Name of Contract	Date of Contract	Contract Duration	Owner's Name & Address	Nature of Work	Contractor's Role		Total Contract Value at Award	Estimated Comple-tion Time	Estimated Contract Value at Comple-tion	% of Accomplish-ments		Value of Outstanding Works
					Descrip-tion	% of Participa-tion				Planned	Actual	
GOVERNMENT												
PRIVATE												
										TOTAL		

Note: This statement shall be supported with:

1. Notice of Award
2. Contract Agreement

Submitted by: _____
Printed Name and Signature

Designation: _____

Date: _____

STATEMENT OF SINGLE LARGEST COMPLETED CONTRACTS (SLCC)

Business Name: _____

Business Address: _____

Name of Contract	Date of Contract	Contract Duration	Owner's Name & Address	Nature of Work	Contractor's Role		Total Contract Value at Award	Date of Completion Time	Total Contract Value at Completion
					Description	% of Participa-tion			
Government									
Private									

Note: This statement shall be supported with:

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

Submitted by: _____

Printed Name and Signature

Designation: _____

Date: _____

NFCC COMPUTATION

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

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

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

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

NFCC = P _____

Submitted by:

_____
Name of Supplier / Distributor / Manufacturer

_____
Signature of Authorized Representative
Date : _____

Bid Securing Declaration Form

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

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

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

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

I/We, the undersigned, declare that:

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

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

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

[Jurat]

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

Omnibus Sworn Statement (Revised)

[shall be submitted with the Bid]

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

AFFIDAVIT

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

1. *[Select one, delete the other:]*
   [If a sole proprietorship:] I am the sole proprietor or authorized representative of [Name of Bidder] with office address at [address of Bidder];
   [If a partnership, corporation, cooperative, or joint venture:] I am the duly authorized and designated representative of [Name of Bidder] with office address at [address of Bidder];

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

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

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

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

6. *[Select one, delete the rest:]*
   [If a sole proprietorship:] The owner or sole proprietor is not related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

   [If a partnership or cooperative:] None of the officers and members of *[Name of Bidder]* is related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

   [If a corporation or joint venture:] None of the officers, directors, and controlling stockholders of *[Name of Bidder]* is related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

7. *[Name of Bidder]* complies with existing labor laws and standards; and

8. *[Name of Bidder]* is aware of and has undertaken the responsibilities as a Bidder in compliance with the Philippine Bidding Documents, which includes:

   a. Carefully examining all of the Bidding Documents;
   b. Acknowledging all conditions, local or otherwise, affecting the implementation of the Contract;
   c. Making an estimate of the facilities available and needed for the contract to be bid, if any; and
   d. Inquiring or securing Supplemental/Bid Bulletin(s) issued for the *[Name of the Project]*.

9. *[Name of Bidder]* did not give or pay directly or indirectly, any commission, amount, fee, or any form of consideration, pecuniary or otherwise, to any person or official, personnel or representative of the government in relation to any procurement project or activity.

10. **In case advance payment was made or given, failure to perform or deliver any of the obligations and undertakings in the contract shall be sufficient grounds to constitute criminal liability for Swindling (Estafa) or the commission of fraud with unfaithfulness or abuse of confidence through misappropriating or converting any payment received by a person or entity under an obligation involving the duty to deliver certain goods or services, to the prejudice of the public and the government of the Philippines pursuant to Article 315 of Act No. 3815 s. 1930, as amended, or the Revised Penal Code.**

IN WITNESS WHEREOF, I have hereunto set my hand this __ day of ___, 20__ at _____, Philippines.

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

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

FOR YOUR INFORMATION!

BIDDERS/SUPPLIERS/CONTRACTOR'S

ARTICLE 17 – PERMIT FEE FOR PRIVATE CONTRACTORS

Section 85 – DEFINITION OF TERMS

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

SECTION 86 – TAX ON BUSINESS SITUATED OUTSIDE THE MUNICIPALITY

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

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

SECTION 87 – IMPOSITION OF CONTRACTOR PERMIT FEE

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

SECTION 88 – TIME OF PAYMENT

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

As per 2022 Revised Omnibus Revenue Code of the Municipality of Compostela.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Government Procurement Policy Board