PHILIPPINE BIDDING DOCUMENTS

(As Harmonized with Development Partners)

PROCUREMENT OF SANGLEY AIRPORT DEVELOPMENT PROJECT - PHASE II (CONSTRUCTION OF 2-UNITS HANGAR, CONSTRUCTION OF 2-UNITS PUMP STATION, SHEET PILING WORKS, SITE DEVELOPMENT (AIRSIDE STRIP), RECLAMATION WORKS AND OPEN DRAINAGE CANAL)

Government of the Republic of the Philippines

Bid No. 21-024-10 CHARLIE

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

SANGLEY AIRPORT DEVELOPMENT PROJECT - PHASE II (Construction of 2-Units Hangar, Construction of 2-Units Pump Station, Sheet Piling Works, Site Development (Airside Strip), Reclamation Works and Open Drainage Canal) Bid No. 21-024-10 CHARLIE

1. The Civil Aviation Authority of the Philippines through the GAA CY 2021 DOTr Downloaded Projects intends to apply the sum of **FOUR HUNDRED SIXTY MILLION SIX HUNDRED TEN THOUSAND THIRTY-EIGHT PESOS 04/100 (PHP 460,610,038.04)** being the Approved Budget for the Contract (ABC) to payments under the contract for **SANGLEY AIRPORT DEVELOPMENT PROJECT - PHASE II (Construction of 2-units Hangar, Construction of 2-units Pump Station, Sheet Piling Works, Site Development (Airside Strip), Reclamation Works and Open Drainage Canal) (Bid No. 21-024-10 CHARLIE).** Bids received in excess of the ABC shall be automatically rejected at bid opening.

2. The Civil Aviation Authority of the Philippines now invites bids for the above Procurement Project.

   Prospective Bidders should possess the following:

Technical Personnel	One (1) Project (Civil) Engineer One (1) Electrical Engineer One (1) Master Electrician One (1) Master Plumber One (1) Construction Foreman One (1) Safety and Health Officer
Equipment	One (1) Unit 20 Tonner Mobile Crane One (1) Unit Plate Compactor, 5hp One (1) Unit Improvised Batching Plant, (50cum) Two (2) Units Transit Mixer (5-7cu.m.) One (1) Unit Payloader (1.50cu.m.) One (1) Unit Concrete Boom Truck One (1) Unit 51-100kW, Generator Set One (1) Unit Electric Bar Cutter Two (2) Units Welding Machine, 200 amp One (1) Unit Truck Mounted Crane, 31-35 MT Two (2) Units Manlift up to 46ft ht. One (1) Unit Portable Welding Machine (10-200 Amp) Two (2) Units Vibro Hammer (Hydraulic Pile Driver) Two (2) Units Backhoe (0.80 m^3) with Mandrel Attachment

	Three (3) Units One bagger concrete mixer Three (3) Units Concrete Vibrator Two (2) Units Oxy-Acetylene Cutting Torch/Welding Outfit One (1) Unit Electric Bar Bender One (1) Unit Road Grader (135 hp) Three (3) Units Vibratory Single Smooth Drum Roller One (1) Unit Water Truck (1000 gals) One (1) Unit Crawler Crane, (36-40MT) One (1) Unit Backhoe w/ Breaker, 0.80 cu.m. One (1) Unit Air Compressor (356 - 450 cfm) Two (2) Units Jackhammer Two (2) Units Bulldozer, 165HP Two (2) Units Payloader, 1.5 cu.m. Six (6) Units Dump Truck, 12yd³
PCAB License	**Medium A – License Category B** *(Building & Industrial Plant)* **Large A – License Category AA** *(Road, Highway pavement, Railways, Airport, horizontal structures and Bridges)*

Completion of the Works is required **Three Hundred Sixty (360) Calendar Days (inclusive of thirty-eight (38) rainy/unworkable 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 BAC Office, CAAP Compound, MIA Road corner Ninoy Aquino Avenue, 1300 Pasay City, Metro Manila on **October 13, 2021 until deadline of submission of bid** and inspect the Bidding Documents at the address given below from 08:00 AM to 05:00 PM from MONDAY to FRIDAY.

5. A complete set of Bidding Documents may be acquired by interested bidders on **October 13, 2021 until deadline of submission of bid** from given address and website/s below and upon payment of the applicable fee for the Bidding Documents, pursuant to the latest Guidelines issued by the GPPB, in the amount of **Php 56,000.00 (inclusive of 12% VAT).** The Procuring Entity shall allow the bidder to present its proof of payment for the fees by presenting the official receipt in person.

6. The Civil Aviation Authority of the Philippines will hold a Pre-Bid Conference[1] on **October 20, 2021 @ 2:00PM** at CAAP Conference Room, CAAP Compound, MIA Road Ninoy Aquino Avenue, 1300 Pasay City, Metro and/or through videoconferencing/webcasting via Jitsi/Zoom/Google Meet, which shall be open to prospective bidders.

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

7. Bids must be duly received by the BAC Secretariat at the address below on or before **November 05, 2021 @ 2:00PM** at BAC Office, CAAP Compound, MIA Road corner Ninoy Aquino Avenue, 1300 Pasay City, Metro Manila. 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 05, 2021 @ 2:00PM** at the given address below and/or through Jitsi/Zoom/Google Meet. Bids will be opened in the presence of the bidders' representatives who choose to attend the activity.

10. The Civil Aviation Authority of the Philippines 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:

    DR. ROLLY T. BAYABAN, M.D.
    Head, BAC-Alpha Secretariat
    Civil Aviation Authority of the Philippines
    MIA Road corner Ninoy Aquino Avenue
    1300 Pasay City, Metro Manila
    Telephone number – (02) 944-2358
    www.caap.gov.ph

12. Bidding Documents may also be downloaded free of charge from the website of the Philippine Government Electronic Procurement System (PhilGEPS) and the website of the Procuring Entity, provided that bidders shall pay the applicable fee for the Bidding Documents not later than the submission of their bids.

October 13, 2021

CAPTAIN DONALDO A. MENDOZA
Chairperson, BAC – Charlie

Section II. Instructions to Bidders

1. Scope of Bid

The Procuring Entity, Civil Aviation Authority of the Philippines invites Bids for the **SANGLEY AIRPORT DEVELOPMENT PROJECT - PHASE II (CONSTRUCTION OF 2-UNITS HANGAR, CONSTRUCTION OF 2-UNITS PUMP STATION, SHEET PILING WORKS, SITE DEVELOPMENT (AIRSIDE STRIP), RECLAMATION WORKS AND OPEN DRAINAGE CANAL)**, with Project Identification Number: **Bid No. 21-024-10 CHARLIE**.

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 GAA CY 2021 DOTr Downloaded Projects in the amount of **FOUR HUNDRED SIXTY MILLION SIX HUNDRED TEN THOUSAND THIRTY-EIGHT PESOS 04/100 (PHP 460,610,038.04).**

2.2. The source of funding is:

a. GOCC and GFIs, the Corporate Operating Budget.

3. Bidding Requirements

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

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

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

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

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

5. Eligible Bidders

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

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

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

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

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

6. Origin of Associated Goods

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

7. Subcontracts

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

The Procuring Entity has prescribed that:

a. Subcontracting is not allowed.

7.1. *[If Procuring Entity has determined that subcontracting is allowed during the bidding , state:]* The Bidder must submit together with its Bid the documentary requirements of the subcontractor(s) complying with the eligibility criterial stated in **ITB** Clause 5 in accordance with Section 23.4 of the 2016 revised IRR of RA No. 9184 pursuant to Section 23.1 thereof.

7.2. *[If subcontracting is allowed during the contract implementation stage, state:]* The Supplier may identify its subcontractor during the contract implementation stage. Subcontractors identified during the bidding may be changed during the implementation of this Contract. Subcontractors must submit the documentary requirements under Section 23.1 of the 2016 revised IRR of RA No. 9184 and comply with the eligibility criteria specified in **ITB** Clause 5 to the implementing or end-user unit.

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

8. Pre-Bid Conference

The Procuring Entity will hold a pre-bid conference for this Project on the specified date and time and either at its physical address and/or through videoconferencing/webcasting} as indicated in paragraph 6 of the **IB.**

9. Clarification and Amendment of Bidding Documents

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

10. Documents Comprising the Bid: Eligibility and Technical Components

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

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

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

12. Alternative Bids

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

13. Bid Prices

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

14. Bid and Payment Currencies

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

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

a. Philippine Pesos.

15. Bid Security

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

15.2. The Bid and bid security shall be valid until *[indicate date]*. Any bid not accompanied by an acceptable bid security shall be rejected by the Procuring Entity as non-responsive.

16. Sealing and Marking of Bids

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

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

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

17. Deadline for Submission of Bids

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

18. Opening and Preliminary Examination of Bids

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

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

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

19. Detailed Evaluation and Comparison of Bids

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

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

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

20. Post Qualification

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

21. Signing of the Contract

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

Section III. Bid Data Sheet

Bid Data Sheet

<table>
<tr><th>ITB Clause</th><th></th></tr>
<tr><td>3.0</td><td>Certificate of Site Inspection (Annex “B” Form 1) duly signed by Mr. Monico B. Basallote, Airport Manager of Sangley Airport or his duly authorized representative, is required to be submitted.

This shall include all of the following documents as attachment to the Certificate of Site Inspection and shall form part of the bidder’s technical documents:

a) Copy of company ID of the person who conducted the site inspection;

b) Copy of the airport/facility visitor’s logbook; &

c) Picture of the proposed site including the personnel who conducted the site inspection together with the Airport Manager/Officer in Charge or his duly authorized representative.

Bids not complying with the above instruction shall be disqualified.</td></tr>
<tr><td>5.2</td><td>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.

For this purpose, contracts similar to the Project refer to contracts which have the same major categories of work, which shall be:

<table>
<tr><th>Category</th><th>ABC</th></tr>
<tr><td>1. Building Construction/ Improvement/ Rehabilitation/ Repair</td><td>116,314,793.22</td></tr>
<tr><td>2. Upgrading/ Improvement/ Rehabilitation/ Construction of Unpaved Road and/or Earthworks</td><td>342,009,158.09</td></tr>
</table>
</td></tr>
<tr><td>7.1</td><td>Subcontracting is not allowed.</td></tr>
</table>

10.1	Bidder shall submit all eligibility and technical documents as specified in **Section X. Checklist of Technical and Financial Documents:** **Class "A" Documents** <u>Legal Documents</u> 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 d. Tax clearance per E.O. No. 398, s. 2005, as finally reviewed and approved by the Bureau of Internal Revenue (BIR); and *In connection to GPPB Circular 07-2017 dated 31 July 2017, the bidder shall have the following options:* 1. *Submit the Certificate of PhilGEPS Registration and Platinum Membership including its Annex "A" in lieu of the uploaded Class "A" Eligibility Documents identified in Section 8.5.2 of the Revised Implementing Rules and Regulations of Republic Act 9184 (Revised IRR of RA 9184), provided that all Class "A" Eligibility Documents listed under the aforesaid Annex "A" are all uploaded and maintained current and updated in the PhilGEPS Registry.* 2. *Submit a combination of the PhilGEPS Registration and Platinum Membership including its Annex "A" and Class "A" Eligibility Documents identified in Section 8.5.2 of the Revised IRR of RA 9184.* ▪ *In the event that aforesaid Class "A" Eligibility Document(s) listed in the Annex "A" of the PhilGEPS Registration and Platinum Membership is/are reflected to be outdated, the bidder shall submit such current and updated Class "A" Eligibility Document(s).* 3. *Submit all the Class "A" Eligibility Documents only, provided that the PhilGEPS Registration and Platinum Membership shall be submitted as a Post-Qualification requirement in accordance with Section 34.2 of the Revised IRR of RA 9184.* <u>Technical Documents</u> e. Statement of the prospective bidder of all its ongoing government and private contracts, including contracts awarded but not yet started, if any,

	whether similar or not similar in nature and complexity to the contract to be bid. *(Annex "A" Form 1);* and f. Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid, except under conditions provided under the rules. *(Annex "A" Form 2);* and g. 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 Joint Resolution *(Annex "A" Form 3)*; and Required PCAB License for the project: 1. **Medium A – License Category B** (Building & Industrial Plant) 2. **Large A – License Category AA (***Road, Highway pavement, Railways, Airport, horizontal structures and Bridges)* h. 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 *(Annex "B" Form 2);* and i. Project Requirements, which shall include the following: 1. Organizational chart for the contract to be bid *(Annex "B" Form 3)*; and 2. 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 *(Annex "B" Form 4, 5a, 5b & 5c)*; and 3. 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 *(Annex "B" Form 6)*; and j. Original duly signed Omnibus Sworn Statement (OSS) *(Annex "B" Form 7)*; 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; and This shall include all of the following documents as attachment to the Omnibus Sworn Statement: 1. Certification, under oath, attesting that they have no pending case(s) against the Government, in addition to the eligibility requirements as prescribe under the 2016 Revise Implementing Rules and Regulation (R-IRR) of RA No. 9184; and

2. Legal Clearance to be issued by the CAAP Enforcement and Legal Service with respect to the non-pending cases of the prospective bidders against this Authority; and

3. Bid Bulletins (if applicable); and

k. **Certificate of Site Inspection** *(Annex "B" Form 1)* duly signed by **Mr. Monico B. Basallote, Airport Manager of Sangley Airport** or his duly authorized representative; and

This shall include all of the following documents as attachment to the Certificate of Site Inspection:

1. Copy of company ID of the person who conducted the site inspection; and

2. Copy of the airport/facility visitor's logbook; and

3. Picture of the proposed site including the personnel who conducted the site inspection together with the Airport Manager/Officer in Charge or his duly authorized representative: and

Financial Documents

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

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

Class "B" Documents

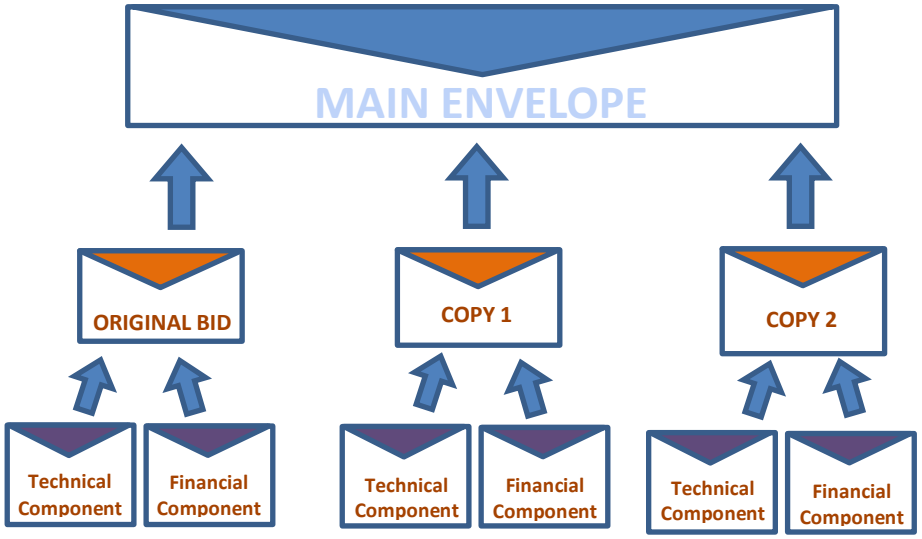
n. If applicable, duly signed joint venture agreement (JVA) in accordance with RA No. 4566 and its IRR in case the joint venture is already in existence; or duly notarized statements from all the potential joint venture partners stating that they will enter into and abide by the provisions of the JVA in the instance that the bid is successful.

Applicable CAAP BAC Standard Forms included in this PBD shall be complied in accordance with the prescribed forms under Section IX Bidding Forms – Annex "A" & "B".

Bids not complying with the above instruction shall be disqualified.

10.3	Valid PCAB License or Special PCAB License in case of Joint Ventures, and Registration *(Medium A License Category B for Building and Industrial Plant & Large A License Category AA for Road, Highway pavement, Railways, Airport, horizontal structures and Bridges*) for the type and cost of the contract to be bid. Bids not complying with the above instruction shall be disqualified.
10.4	The key personnel must meet the required minimum years of experience set below: Key Personnel: Project (Civil) Engineer; Electrical Engineer; Master Electrician; Master Plumber; Construction Foreman; Safety and Health Officer General Experience: Five (5) years in General Engineering Relevant Experience: Three (3) years in Building Construction/ Improvement/ Rehabilitation/ Repair; Upgrading/ Improvement/ Rehabilitation/ Construction of Unpaved Road and/or Earthworks Bids not complying with the above instruction shall be disqualified.
10.5	The minimum major equipment requirements are the following: One (1) Unit 20 Tonner Mobile Crane One (1) Unit Plate Compactor, 5hp One (1) Unit Improvised Batching Plant, (50cum) Two (2) Units Transit Mixer (5-7cu.m.) One (1) Unit Payloader (1.50cu.m.) One (1) Unit Concrete Boom Truck One (1) Unit 51-100kW, Generator Set One (1) Unit Electric Bar Cutter Two (2) Units Welding Machine, 200 amp One (1) Unit Truck Mounted Crane, 31-35 MT Two (2) Units Manlift up to 46ft ht. One (1) Unit Portable Welding Machine (10-200 Amp) Two (2) Units Vibro Hammer (Hydraulic Pile Driver) Two (2) Units Backhoe (0.80 m^3) with Mandrel Attachment Three (3) Units One bagger concrete mixer Three (3) Units Concrete Vibrator Two (2) Units Oxy-Acetylene Cutting Torch/Welding Outfit One (1) Unit Electric Bar Bender One (1) Unit Road Grader (135 hp) Three (3) Units Vibratory Single Smooth Drum Roller One (1) Unit Water Truck (1000 gals) One (1) Unit Crawler Crane, (36-40MT) One (1) Unit Backhoe w/ Breaker, 0.80 cu.m. One (1) Unit Air Compressor (356 - 450 cfm) Two (2) Units Jackhammer

	Two (2) Units Bulldozer, 165HP Two (2) Units Payloader, 1.5 cu.m. Six (6) Units Dump Truck, 12yd³ Bids not complying with the above instruction shall be disqualified.
11.1.	The second bid envelope shall contain the financial documents for the Bid as specified in **Section X. Checklist of Technical and Financial Documents**. This shall include the complete accomplishment of all of the following documents as stated and required under Section VIII of this PBD and shall form part of the bidder's financial documents: a) Original of duly signed and accomplished Financial Bid Form; and b) Bill of Quantities *(Annex "C" Form 1)*; and c) Summary of Bid Proposal *(Annex "C" Form 2)*; and d) Bill of Materials & Cost Estimates *(Annex "C" Form 3)*; and e) Summary Sheet indicating the Unit Prices of Construction Materials, Labor Rates, and Equipment Rentals used in coming up with the Bid *(Annex "C" Form 4, 5 & 6)*; and f) Cash Flow and Payment Schedule *(Annex "C" Form 7)* Modifications and/or alterations on the stated requirements in the financial document forms (BOQ, Summary of Bid Proposal & Bill of Materials & Cost Estimates) shall not be allowed. Applicable CAAP BAC Standard Forms included in this PBD shall be complied in accordance with the prescribed forms under Section IX Bidding Forms – Annex "C". Bids not complying with the above instruction shall be disqualified. **The discounts stated in the Financial Bid Form shall be computer written with the same font style and size as of the whole text of the said Form.** **Discounts that are either handwritten, type written or computer written in other font style and size shall not be considered.**
11.2	Bid exceeding the ABC of the project shall be disqualified.
12	No further instructions.
15.1	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 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 five percent (5%) of ABC if bid security is in Surety Bond.
16	1. Each and every page thereof shall be initialed/signed by the duly authorized representative/s of the Bidder. Submitted Eligibility, Technical and Financial documents shall be properly marked with index tabs (ear tab) and must be sequentially paginated in accurate order in the form i.e. "page 3 of 100". Page number of last page of the document (per envelope basis). Pagination should be sequential based on the entire span of the whole documents inside the envelope. Bids not complying with the above instructions shall be automatically disqualified. 2. Each Bidder shall submit **one (1)** original and **two (2)** copies of the first and second components of its bid. Sample Illustration of 10 envelope system:  ***Note:*** • ***Inside the Technical Component are the Legal, Technical & Financial Eligibility documents.***
19.2	Partial bid is not allowed. The infrastructure project is packaged in a single lot and the lot shall not be divided into sub-lots for the purpose of bidding, evaluation, and contract award.
20	The Bidder with the Lowest Calculated Bid (LCB) that complies with and is responsive to all the requirements and conditions shall submit its a) Latest income and business tax returns filed through the Electronic Filing and Payment System (EFPS); b) Business licenses and permits required by law (Registration Certificate,

	Mayor's Permit, Tax Clearance & PCAB License); c) Latest Audited Financial Statements; and d) Key personnel licenses Failure to submit any of the post-qualification requirements on time, or a finding against the veracity thereof, shall disqualify the bidder for award. Provided, that in the event that a finding against the veracity of any of the documents submitted is made, it shall cause the forfeiture of the Bid Security in accordance with Section 69 of the IRR of RA 9184.
21	The following relevant project documents are required to be submitted by the successful bidder who submitted the LCRB as part of the Contract Agreement during its signing: a) Construction schedule b) Bar Chart & S-curve c) PERT/CPM Network Diagram d) Manpower schedule e) Construction methods f) Equipment utilization schedule Construction safety & health programs approved by the Department of Labor & Employment **(SANGLEY AIRPORT DEVELOPMENT PROJECT - PHASE II (Construction of 2-units Hangar, Construction of 2-units Pump Station, Sheet Piling Works, Site Development (Airside Strip), Reclamation Works and Open Drainage Canal))**

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.
3.1	The **CIVIL AVIATION AUTHORITY OF THE PHILIPPINES** shall give possession of all parts of the Site to the Contractor upon receipt of the Notice to Proceed.
6	None.
7.2	In case of permanent structures, such as buildings of types 4 and 5 as classified under the National Building Code of the Philippines and other structures made of steel, iron, or concrete which comply with relevant structural codes (e.g., DPWH Standard Specifications), such as, but not limited to, steel/concrete bridges, flyovers, aircraft movement areas, ports, dams, tunnels, filtration and treatment plants, sewerage systems, power plants, transmission and communication towers, railway system, and other similar permanent structures: Fifteen (15) years.
10	No dayworks are applicable to the contract.
11.1	Not applicable
11.2	Not applicable
13	The amount of the advance payment shall not exceed 15% of the total contract price. However, as per Department of Transportation (DOTr) Policy, Procuring Entity will not give advance payment to contractors.
14	No further instructions.
15.1	The date by which operating and maintenance manuals are required is upon completion of the project The date by which "as built" drawings are required is upon completion of the project. PDF/AutoCAD File of the "as built" plans shall include as attachment to the required hard copy of the same upon completion of the project.
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 two percent (2.00%) of the Contract price.

Section VI. Specifications and Scope of Work

Name of Project	:	**SANGLEY AIRPORT DEVELOPMENT PROJECT - PHASE II (Construction of 2-units Hangar, Construction of 2-units Pump Station, Sheet Piling Works, Site Development (Airside Strip), Reclamation Works and Open Drainage Canal)**
Location	:	Brgy. San Antonio, Sangley Airport, Cavite
Duration	:	Three Hundred Sixty (360) Calendar Days (inclusive of thirty-eight (38) rainy/unworkable days)
Source of Funds	:	GAA CY 2021 DOTr Downloaded Projects

SCOPE OF WORK

The details of work are at best enumerated below, but be noted that the Contract includes all works and services although not specifically mentioned herein, but are needed to fully complete the Project:

The project covers the supply of labor, materials, tools/equipment's, and construction related permits necessary for **SANGLEY AIRPORT DEVELOPMENT PROJECT – Phase II** with the following scope of works which shall be done in accordance with the approved plans, specifications and provision of contract.

SPL-01 Mobilization/Demobilization

This work includes mobilization and demobilization of the contractor's personnel and equipment necessary for performing the work required under the contract.

a. Mobilization shall include all activities and associated costs for transportation of contractor's personnel, equipment, and establishment of offices, and other necessary facilities for the contractor's operations at the site.

b. Demobilization shall include the disassembly of offices and other facilities on the site, equipment, as well as the removal and hauling of debris and rubbish materials.

SPL-2 <u>TEMPORARY FACILITIES</u>

The following provisions must be delivered within seven (7) days upon receipt of the Notice to Proceed (NTP).

1.0 Staff House

This item covers the Contractor's provision of PMO Staff House with a minimum area of 250sq.m. on rental basis. The Facility shall be provided with air-con including the supply of kitchen utensils, gas and stove, beds and beddings, and dining sets for the exclusive use of CAAP/DOTr PMO in supervising the project. The Contractor shall be responsible for the payment of utility bills (water and electric) for the whole duration of the project

2.0 Service Vehicle

This covers the provision of one (1) service vehicle, brand new 4 x 2 pick-up at least 2019 model service vehicle with air-conditioned, manual transmission, power window, diesel; for the exclusive use of CAAP/DOTr Engineers supervising the project for the period of Three Hundred Sixty (360) Calendar Days. Service driver, insurance and maintenance for the said service shall be included under this item. Land Transportation Office (LTO) registration for the service vehicle will be provided by the Contractor.

The service vehicle including the Certificate of Registration and Official Receipt will be transferred and registered in the name of Civil Aviation Authority of the Philippines (CAAP) and will be turned over to the ADMS in good running condition after the completion of the Project.

The ADMS will then transport the said service vehicle to the CAAP Central Office and will utilize the same as the Service's Official Vehicle.

A. CONSTRUCTION OF 2-UNITS HANGAR

1.0 CIVIL/STRUCTURAL WORKS

1.01 Site Works

This item covers supply of materials, labor and equipment to finish the 690.00 m^3 excavation, 446.24 m^3 backfilling and 33.43 m^3 laying of G1 gravel bedding which conform to lines, grades and dimensions as indicated on the approved plans. The work shall be directed by the CAAP Project in Charge.

1.02 Concrete Works

This item covers supply of materials, labor and equipment to finish the concreting works with a total volume of 823.81 m^3 including the fabrication/ installation/ dismantling of rebar and formworks. The work shall conform to lines, grades and dimensions as indicated on the approved plans.

1.03 Masonry Works

This item covers supply of materials and labor to finish the laying of 945.04 m^2 - 6" CHB and 679.74 m^2 - 4" CHB including the fabrication/installation of reinforcing bars and plastering. This work shall conform to lines, grades and dimensions as indicated on the approved plans.

1.04 Steel Works

This item covers supply of materials, labor and equipment to finish the fabrication and installation of 285,492.41 kg of steel works including painting. This work shall conform to lines, grades and dimensions as indicated on the approved plans.

1.05 Moisture and Thermal Protection Works

This item covers supply of materials, labor and equipment to finish the installation of 3,183.22 m² roofing including gutter, ridge roll and flushing. This work shall conform to lines, grades and dimensions as indicated on the approved plans.

2.0 ARCHITECTURAL WORKS

2.01 Tile Works

This item covers supply of materials, labor and equipment to finish the tile works with a total coverage area of 647.72 m² and shall conform to lines, grades and dimensions as indicated on the approved plans.

2.02 Dry Wall Works

This item covers supply of materials and labor to finish the installation of dry wall works with a total coverage area of 2,717.38 m². The work shall conform to lines, grades and dimensions as indicated on the approved plans.

2.03 Painting Works

This item covers supply of materials and labor to finish the painting works with a total coverage area of 6,012.98 m². The work shall conform to lines, grades and dimensions as indicated on the approved plans.

2.04 Ceiling Works

This item covers supply of materials and labor to finish the installation of ceiling with a total coverage area 687.55 m². The work shall conform to lines, grades and dimensions as indicated on the approved plans.

2.05 Doors & Windows

This item covers supply and installation of 32 sets of doors & 52 sets of windows. The work shall conform to lines, grades and dimensions as indicated on the approved plans.

3.0 ELECTRICAL WORKS

3.01 Wires, Conduits and Boxes

This item covers supply of materials and labor to finish the installation of 13,928.00 li.m. of wires, conduits & boxes and shall conform to lines, grades and dimensions as indicated on the

approved plans. Testing and commissioning of materials shall be approved first by the Project-in-Charge before installation.

3.02 Lighting Fixtures and Wiring Devices

This item covers supply of materials and labor to finish the installation of 500 sets of lighting fixtures & wiring devices and shall conform to lines, grades and dimensions as indicated on the approved plans. Testing and commissioning of materials shall be approved first by the Project-in-Charge before installation.

3.03 Panel Board

This item covers supply of materials and labor to finish the installation of 16 assy of panel board and shall conform to lines, grades and dimensions as indicated on the approved plans. Testing and commissioning of materials shall be approved first by the Project-in-Charge before installation.

3.04 Feeder Wires and Conduits

This item covers supply of materials and labor to finish the installation of 3,373.00 li.m. of feeder wires & conduits and shall conform to lines, grades and dimensions as indicated on the approved plans. Testing and commissioning of materials shall be approved first by the Project-in-Charge before installation.

3.05 Transformer

This item covers supply of materials and labor to finish the installation of 2 sets of transformer and shall conform to lines, grades and dimensions as indicated on the approved plans. Testing and commissioning of materials shall be approved first by the Project-in-Charge before installation.

3.06 Termination and Accessories

This item covers supply of materials and labor to finish the installation of 30 pcs and shall conform to lines, grades and dimensions as indicated on the approved plans. Testing and commissioning of materials shall be approved first by the Project-in-Charge before installation.

4.0 MECHANICAL WORKS

4.01 Air-conditioning Units & Piping

This item covers supply of materials and labor to finish the installation of 2 sets of 7.0 HP / 5.0 TR Inverter Floor Standing Split Type Air-Conditioning Unit; & 8 sets of 4.0 HP / 3.0 TR Inverter Floor Standing Split Type Air-Conditioning Unit with complete standard accessories and shall conform to lines, grades and dimensions as indicated on the approved plans. Testing and commissioning of materials shall be approved first by the Project-in-Charge before installation.

4.02 Ventilation Works

This item covers supply of materials and labor to finish the installation of 8 sets Industrial Direct Driven Sidewall Propeller Type Exhaust Fan; 8 sets of Industrial Direct Driven Sidewall Propeller Type Supply Fan; 6 sets of 20" Industrial Wall Mounted Type Fan, 220-240 V, 60 Hz, 1 Ph; 22 sets of 12" Ceiling Mounted Type Exhaust Fan, 220-240 V, 60 Hz, 1 Ph; & 8 sets of 18" Ceiling Mounted Orbit Fan with complete standard accessories and shall conform to lines, grades and dimensions as indicated on the approved plans. Testing and commissioning of materials shall be approved first by the Project-in-Charge before installation.

4.03 Hangers and Support

This item covers supply of materials and labor to finish the installation of hangers & support with a total coverage area of 36.69 sq.m. and shall conform to lines, grades and dimensions as indicated on the approved plans.

5.0 PLUMBING WORKS

5.01 Site Works

This item covers supply of materials and labor to finish the 103.28 m^3 excavation, 45.25 m^3 backfill, 4.00 m^3 gravel bedding and 4.00 m^3 sand bedding. The work shall conform to lines, grades and dimensions as indicated on the approved plans.

5.02 Sewer Line System

This item covers supply of materials and labor to finish the installation of 146.24 li.m. PVC pipe series 1000 including fittings for sewer line and vent system. The work shall conform to lines, grades and dimensions as indicated on the approved plans.

5.03 Water Line System

This item covers supply of materials and labor to finish the installation of 185.28 li.m. PPR PN 20 pipe including fittings for water line system. The work shall conform to lines, grades and dimensions as indicated on the approved plans.

5.04 Storm Drain System

This item covers supply of materials and labor to finish the installation of 116.00 li.m. PVC pipe series 1000 including fittings for storm drain system. The work shall conform to lines, grades and dimensions as indicated on the approved plans.

5.05 Septic Tank, Catch Basin and Trench Drain

This item covers supply of materials, labor and equipment to finish the concreting of septic tank, catch basin and trench drain with a total volume of 27.50 m^3, including the installation/fabrication of rebar and formworks. The work shall conform to lines, grades and dimensions as indicated on the approved plans.

5.06 Fixtures and Accessories

This item covers supply of materials and labor to finish the installation of fixtures and accessories and shall conform to lines, grades and dimensions as indicated on the approved plans.

B. CONSTRUCTION OF 2-UNITS PUMP STATION

1.0 CIVIL/STRUCTURAL WORKS

1.01 Site Works

This item covers supply of materials, labor and equipment to finish the 101.81 m^3 excavation and 16.52 m^3 backfilling which conform to lines, grades and dimensions as indicated on the approved plans. The work shall be directed by the CAAP Project in Charge.

1.02 Concrete Works

This item covers supply of materials, labor and equipment to finish the concreting works of 2-units pump station and concrete water catchment with a total volume of 76.42 m^3 including the fabrication/ installation/ dismantling of rebar and formworks. The work shall conform to lines, grades and dimensions as indicated on the approved plans.

1.03 Masonry Works

This item covers supply of materials and labor to finish the masonry works with a total area of 61.24 sq.m. including the fabrication/ installation of rebar. The work shall conform to lines, grades and dimensions as indicated on the approved plans.

1.04 Waterproofing Works

This item covers supply of materials and labor to finish the waterproofing works with a total area of 56.00 sq.m. The work shall conform to lines, grades and dimensions as indicated on the approved plans.

2.0 ARCHITECTURAL WORKS

2.01 Painting Works

This item covers supply of materials, labor and equipment to finish the painting works with a total coverage area of 254.47 m² and shall conform to lines, grades and dimensions as indicated on the approved plans.

2.02 Doors & Windows

This item covers supply of materials, labor and equipment to finish the installation of 8 sets of steel door; & 6 sets of steel storm louver windows and shall conform to lines, grades and dimensions as indicated on the approved plans.

3.0 ELECTRICAL WORKS

3.01 Wire, Conduits and Boxes

This item covers supply of materials and labor to finish the installation of 798 li.m. of wires, conduits & boxes and shall conform to lines, grades and dimensions as indicated on the approved plans. Testing and commissioning of materials shall be approved first by the Project-in-Charge before installation.

3.02 Lighting Fixtures & Wiring Devices

This item covers supply of materials and labor to finish the installation of 38 sets of lighting fixtures & wiring devices and shall conform to lines, grades and dimensions as indicated on the approved plans. Testing and commissioning of materials shall be approved first by the Project-in-Charge before installation.

3.03 Panel Board

This item covers supply of materials and labor to finish the installation of 2 assy of panel board and shall conform to lines, grades and dimensions as indicated on the approved plans. Testing and commissioning of materials shall be approved first by the Project-in-Charge before installation.

3.04 Power Supply

This item covers supply of materials and labor to finish the installation of 2 sets of power supply and shall conform to lines, grades and dimensions as indicated on the approved plans. Testing and commissioning of materials shall be approved first by the Project-in-Charge before installation.

4.0 MECHANICAL WORKS

4.01 Diesel Engine Driven Water Pump and Pipings

This item covers supply of materials, labor and equipment to finish the installation of 12 sets of Diesel Engine Driven, Self-Priming Water Pump with controller, steel base, exhaust pipe, diesel fuel (full tank), clamp, hangers and other standard accessories. The pump shall have a flow capacity of 2,200 gal/min and shall conform to lines, grades and dimensions as indicated on the approved plans. Testing and commissioning of materials shall be approved first by the Project-in-Charge before installation.

5.0 PLUMBING WORKS

5.01 Storm Drain

This item covers supply of materials and labor to finish the installation of 84 li.m. storm drain including construction of catch basin and shall conform to lines, grades and dimensions as indicated on the approved plans. Testing and commissioning of materials shall be approved first by the Project-in-Charge before installation.

C. SHEET PILING WORK

523(1) Polyvinyl Chloride (uPVC) Sheet Pile (furnished)

This item covers supply of materials of 774.70ln.m. Polyvinyl Chloride (uPVC) Sheet Pile (furnished). The works shall conform to lines, grades and dimensions as indicated on the approved plans. The work shall be directed by the CAAP Project in Charge.

523(2) Polyvinyl Chloride (uPVC) Sheet Pile (driven)

This item covers supply of labor and equipment to finish the 774.70ln.m. Polyvinyl Chloride (uPVC) Sheet Pile (driven). The works shall conform to lines, grades and dimensions as indicated on the approved plans. The work shall be directed by the CAAP Project in Charge.

1.00 Concrete Works

This item covers supply of materials, labor and equipment to finish the concreting works with a total volume of 441.19cu.m. including the fabrication/ installation/ dismantling of rebar and formworks. The work shall conform to lines, grades and dimensions as indicated on the approved plans.

2.00 Deadman's Anchorage (furnished)

This item covers supply of materials of 234ln.m. Deadman's Anchorage (furnished). The works shall conform to lines, grades and dimensions as indicated on the approved plans. The work shall be directed by the CAAP Project in Charge.

3.00 Deadman's Anchorage (driven)

This item covers supply of labor and equipment to finish the 234ln.m. Deadman's Anchorage (furnished). The works shall conform to lines, grades and dimensions as indicated on the approved plans. The work shall be directed by the CAAP Project in Charge.

4.00 Tension Rod and Accessories

This item covers supply of materials, labor and equipment to finish the installation of tension rod and accessories with a total weight of 25,072.48kgs. including the fabrication and installation. The work shall conform to lines, grades and dimensions as indicated on the approved plans.

D. SITE DEVELOPMENT (AIRSIDE STRIP)

ITEM P-101 (1) REMOVAL OF STRUCTURES & OBSTRUCTION

This item covers the clearing & grubbing of shrubs, grass and other forms of vegetation prior to placement of embankment materials. in accordance with the design grade, dimensions, cross-sections as shown on the approved plans. *(see attached plans for reference)*

- *Project Coverage* ***: Sta. 0+520 to Sta. 2+140.33*** *(offset 7.50m shoulder, along runway)*
- *Area* ***: 2,583.43 sq.m.***

ITEM P-152-4.2 CLEARING & GUBBING (STRIPPING)

This item covers the demolition of existing buildings affected by site development. *(see attached plans for reference)*

- *Project Coverage****: 4 - units Abandoned Armory/ Bunker***
- *Area* ***: 216,1523.68 sq.m.***

E. RECLAMATION WORKS

104 Embankment Works

This item covers supply of materials, labor and equipment to finish the embankment works with a total volume of 385,646.04 m³ including 95% compaction. The work shall conform to lines, grades and dimensions as indicated on the approved plans. The work shall be directed by the CAAP Project in Charge.

- **Project Coverage: From Sta. 0-240.00 to Sta. 0+460.00**

SPL 03 Hauling & Relocation of Armour Rocks

This item covers supply of labor and equipment to finish the hauling & relocation of armour rocks with a total volume of 13,983.60 m³ and shall conform to lines, grades and dimensions as indicated on the approved plans. The work shall be directed by the CAAP Project in Charge.

F. DRAINAGE WORKS

1.0 Civil/Structural Work

1.01 Site Works

This item covers supply of materials, labor and equipment to finish the 1,628.9 m^3 excavation and 163 m^3 laying of G1 gravel bedding which conform to lines, grades and dimensions as indicated on the approved plans. The work shall be directed by the CAAP Project in Charge.

1.02 Concrete Works

This item covers supply of materials, labor and equipment to finish the concreting of open drainage canal with a total volume of 432.29 m^3 and shall conform to lines, grades and dimensions as indicated on the approved plans. The work shall be directed by the CAAP Project in Charge.

1.03 Masonry Works

This item covers supply of materials and labor to finish the masonry work of open drainage canal with a total area of 1,503.60 sq.m. and shall conform to lines, grades and dimensions as indicated on the approved plans. The work shall be directed by the CAAP Project in Charge.

All Scopes of Work for the project must be in accordance with the approved Plans and Specifications. Quality and types of materials must be approved by the CAAP Project-in-Charge.

GENERAL PROVISIONS

Provisions for staff house, service vehicles, laptops, printers, cameras, plotters, furniture and other materials, devices and equipment under Special Item or Temporary Facilities shall not include OCM & CP.

The contractor shall be responsible in providing safety perimeter fence or security fences, personal protective equipment (PPE) for staffs and workers on site while construction is ongoing. Safety reports should be prepared regularly.

The contractor shall be responsible for all laboratory, material testing, building and safety permits and survey instruments necessary in the project implementation. These expenses shall be incorporated in the contractor's overhead cost and shall not be considered as pay item.

SPECIFICATIONS

Section 105 Mobilization

105-1 Description. This item shall consist of work and operations, but is not limited to, work and operations necessary for the movement of personnel, equipment, material and supplies to and from the project site for work on the project except as provided in the contract as separate pay items.

105-1.1 Posted notices. Prior to commencement of construction activities the Contractor must post the following documents in a prominent and accessible place where they may be easily viewed by all employees of the prime Contractor and by all employees of subcontractors engaged by the prime Contractor: Equal Employment Opportunity (EEO) Poster "Equal Employment Opportunity is the Law" in accordance with the Office of Federal Contract Compliance Programs Executive Order 11246, as amended; Davis Bacon Wage Poster (WH 1321) - DOL "Notice to All Employees" Poster; and Applicable Davis-Bacon Wage Rate Determination. These notices must remain posted until final acceptance of the work by the Owner.

****

The Owner may include additional posted notices as required by local and State law.

****

105-2 Basis of measurement and payment. Based upon the contract lump sum price for "Mobilization" partial payments will be allowed as follows:

a. With first pay request, 25%.

b. When 25% or more of the original contract is earned, an additional 25%.

c. When 50% or more of the original contract is earned, an additional 40%.

d. After Final Inspection, Staging area clean-up and delivery of all Project Closeout materials as required by 90-11, the final 10%.

****

Item Mobilization may be added to project at Owner's discretion. Rather than paying Contractor 100% of mobilization on first pay request, many Sponsors have found a payment schedule to be an effective way to reimburse Contractor for mobilization and demobilization. It is not required but it is recommended that the final 10% of this bid item not be paid until the Contractor has cleaned up the project staging area. The payment schedule can be altered, e.g., on small projects may not be appropriate to have more than two (2) payments.

****

END OF SECTION 105

Item P-101 Preparation/Removal of Existing Pavements

****

The Engineer may add or edit this item as necessary to address project requirements.

Coordinate modifications in accordance with Order 5300.1.

****

DESCRIPTION

101-1 This item shall consist of preparation of existing pavement surfaces for overlay, surface treatments, removal of existing pavement, and other miscellaneous items. The work shall be accomplished in accordance with these specifications and the applicable plans.

EQUIPMENT AND MATERIALS

101-2 All equipment and materials shall be specified here and in the following paragraphs or approved by the Resident Project Representative (RPR). The equipment shall not cause damage to the pavement to remain in place.

CONSTRUCTION

101-3.1 Removal of existing pavement.

The Contractor's removal operation shall be controlled to not damage adjacent pavement structure, and base material, cables, utility ducts, pipelines, or drainage structures which are to remain under the pavement.

a. Concrete pavement removal. Full depth saw cuts shall be made perpendicular to the slab surface. The Contractor shall saw through the full depth of the slab including any dowels at the joint, removing the pavement and installing new dowels as shown on the plans and per the specifications. Where the perimeter of the removal limits is not located on the joint and there are no dowels present, the perimeter shall be saw cut the full depth of the pavement. The pavement inside the saw cut shall be removed by methods which will not cause distress in the pavement which is to remain in place. If the material is to be wasted on the airport site, it shall be reduced to a maximum size of **[___]**. Concrete slabs that are damaged by under breaking shall be repaired or removed and replaced as directed by the RPR.

The edge of existing concrete pavement against which new pavement abuts shall be protected from damage at all times. Spall and underbreak repair shall be in accordance with the plans. Any underlaying material that is to remain in place, shall be recompacted and/or replaced as shown on the plans. Adjacent areas damaged during repair shall be repaired or replaced at the Contractor's expense.

****
**

Indicate repair details for spalls, underbreaks, and remaining underlaying materials on the plans.

Select the maximum size for materials wasted on the airport site.

****
**

b. Asphalt pavement removal. Asphalt pavement to be removed shall be cut to the full depth of the asphalt pavement around the perimeter of the area to be removed. If the material is to be **[** wasted on the airport site **] [** incorporated into embankment **]**, it shall be **[** broken to a maximum size of **[___]** inches (mm). **] [** meet the following gradation: **[___]**.

****
**

The pavement shall be removed so the joint for each layer of pavement replacement is offset 1 foot (30 cm) from the joint in the preceding layer. This does not apply if the removed pavement is to be replaced with concrete or soil.

The Engineer shall designate the maximum size or insert the gradation required.

****
**

c. Repair or removal of Base, Subbase, and/or Subgrade. All failed material including surface, base course, subbase course, and subgrade shall be removed and repaired as shown on the plans or as directed by the RPR. Materials and methods of construction shall comply with the applicable sections of these specifications. Any damage caused by Contractor's removal process shall be repaired at the Contractor's expense.

101-3.2 Preparation of joints and cracks prior to overlay/surface treatment. Remove all vegetation and debris from cracks to a minimum depth of 1 inch (25 mm). If extensive vegetation exists, treat the specific area with a concentrated solution of a water-based herbicide approved by the RPR. Fill all cracks greater than 1/4 inch (6 mm) wide) with a crack sealant **[** per ASTM D6690 **]**. The crack sealant, preparation, and application shall be compatible with the surface treatment/overlay to be used. To minimize contamination of the asphalt with the crack sealant, underfill the crack sealant a minimum of 1/8 inch (3 mm), not to exceed ¼ inch (6 mm). Any excess joint or crack sealer shall be removed from the pavement surface.

[Wider cracks (over 1-1/2 inch wide (38 mm)), along with soft or sunken spots, indicate that the pavement or the pavement base should be repaired or replaced as stated below.

Cracks and joints may be filled with a mixture of emulsified asphalt and aggregate. The aggregate shall consist of limestone, volcanic ash, sand, or other material that will cure to form a hard substance. The combined gradation shall be as shown in the following table.

Gradation

Sieve Size	Percent Passing
No. 4 (4.75 mm)	100
No. 8 (2.36 mm)	90-100
No. 16 (1.18 mm)	65-90
No. 30 (600 µm)	40-60
No. 50 (300 µm)	25-42
No. 100 (150 µm)	15-30
No. 200 (75 µm)	10-20

Up to 3% cement can be added to accelerate the set time. The mixture shall not contain more than 20% natural sand without approval in writing from the RPR.

The proportions of asphalt emulsion and aggregate shall be determined in the field and may be varied to facilitate construction requirements. Normally, these proportions will be approximately one part asphalt emulsion to five parts aggregate by volume. The material shall be poured or placed into the joints or cracks and compacted to form a voidless mass. The joint or crack shall be filled to within +0 to -1/8 inches (+0 to -3 mm) of the surface. Any material spilled outside the width of the joint shall be removed from the pavement surface prior to constructing the overlay. Where concrete overlays are to be constructed, only the excess joint material on the pavement surface and vegetation in the joints need to be removed. **]**

****

Then Engineer may also include the option for the emulsified asphalt and aggregate and allow the Contractor to use either option.

Guidance on crack repair materials and procedures is available in advisory circular (AC) 150/5380-6, Guidelines and Procedures for Maintenance of Airport Pavements.

****

101-3.3 Removal of Foreign Substances/contaminates prior to [overlay] [seal-coat] [remarking]. Removal of foreign substances/contaminates from existing pavement that will affect the bond of the new treatment shall consist of removal of rubber, fuel spills, oil, crack sealer, at least 90% of paint, and other foreign substances from the surface of the pavement. Areas that require removal are designated on the plans and as directed by the RPR in the field during construction.

[Chemicals **] [** high-pressure water **] [** heater scarifier (asphaltic concrete only) **] [** cold milling **] [** rotary grinding **] [** sandblasting **]** may be used. If chemicals are used, they shall comply with the state's environmental protection regulations. Removal methods used shall not cause major damage to the pavement, or to any structure or utility within or adjacent to the work area. Major damage is defined as changing the properties of the pavement, removal of asphalt causing the aggregate to ravel, or removing

pavement over 1/8 inch (3 mm) deep. If it is deemed by the RPR that damage to the existing pavement is caused by operational error, such as permitting the application method to dwell in one location for too long, the Contractor shall repair the damaged area without compensation and as directed by the RPR.

Removal of foreign substances shall not proceed until approved by the RPR. Water used for high-pressure water equipment shall be provided by the Contractor at the Contractor's expense. No material shall be deposited on the pavement shoulders. All wastes shall be disposed of in areas indicated in this specification or shown on the plans.

****

Designate the areas and methods for removal of foreign substances/contaminates on the project plans.

Select the method of paint and rubber removal and designate where the wastes will be disposed.

This specification shall not be used for removal of rubber deposits to improve skid resistance or obliterate traffic markings where a new overlay is not constructed.

Refer to AC 150/5320-12, Measurement, Construction, and Maintenance of Skid-Resistant Airport Pavement Surfaces, for guidance on removing contaminates.

****

101-3.4 Concrete spall or failed asphaltic concrete pavement repair.

a. Repair of concrete spalls in areas to be overlaid with asphalt. The Contractor shall repair all spalled concrete as shown on the plans or as directed by the RPR. The perimeter of the repair shall be saw cut a minimum of 2 inches (50 mm) outside the affected area and 2 inches (50 mm) deep. The deteriorated material shall be removed to a depth where the existing material is firm or cannot be easily removed with a geologist pick. The removed area shall be filled with asphalt mixture with aggregate sized appropriately for the depth of the patch. The material shall be compacted with equipment approved by the RPR until the material is dense and no movement or marks are visible. The material shall not be placed in lifts over 4 inches (100 mm) in depth. This method of repair applies only to pavement to be overlaid.

****

Asphalt mix pavement repair of concrete pavement should only be allowed to depths less than 1/3 of the PCC pavement thickness.

****

b. Asphalt pavement repair. The Contractor shall repair all spalled concrete as shown on the plans or as directed by the RPR. The failed areas shall be removed as specified in paragraph 101-3.1b. All failed material including surface, base course, subbase course, and subgrade shall be removed. Materials and methods of construction shall comply with the applicable sections of these specifications.

****
**

Designate the areas and methods for asphalt pavement repair on the project plans.

****
**

101-3.5 Cold milling. Milling shall be performed with a power-operated milling machine or grinder, capable of producing a uniform finished surface. The milling machine or grinder shall operate without tearing or gouging the underlaying surface. The milling machine or grinder shall be equipped with grade and slope controls, and a positive means of dust control. All millings shall be removed and disposed **[** off Airport property **] [** in areas designated on the plans **]**. If the Contractor mills or grinds deeper or wider than the plans specify, the Contractor shall replace the material removed with new material at the Contractor's Expense.

****
**

The Engineer must consider the overall weight of milling equipment proposed by the Contractor to ensure there is no damage to the existing pavements and pavement remaining after milling due to the weight of the equipment.

Sufficient information must be obtained to determine available pavement structure and prior construction lift thickness. The limits of milling must consider leaving or taking sufficient material to minimize the potential for delamination or the entire layer may require removal or consider full depth reclamation in lieu of cold milling. Delamination potential exist anytime cold milling depth is approximately equal to the layer placed.

****
**

a. Patching. The milling machine shall be capable of cutting a vertical edge without chipping or spalling the edges of the remaining pavement and it shall have a positive method of controlling the depth of cut. The RPR shall layout the area to be milled with a straightedge in increments of 1-foot (30 cm) widths. The area to be milled shall cover only the failed area. Any excessive area that is milled because the Contractor doesn't have the appropriate milling machine, or areas that are damaged because of his negligence, shall be repaired by the Contractor at the Contractor's Expense.

b. Profiling, grade correction, or surface correction. The milling machine shall have a minimum width of **[** 7 **]** feet (**[** 2 **]** m) and it shall be equipped with electronic grade control devices that will cut the surface to the grade specified. The tolerances shall be maintained within +0 inch and -1/4 inch (+0 mm and -6mm) of the specified grade. The machine must cut vertical edges and have a positive method of dust control. The machine must have the ability to **[** windrow the millings or cuttings **] [** remove the millings or cuttings from the pavement and load them into a truck **]**. All millings shall be removed and disposed of **[** off the airport **] [** in areas designated on the plans **]**.

c. Clean-up. The Contractor shall sweep the milled surface daily and immediately after the milling until all residual materials are removed from the pavement surface. Prior to paving, the Contractor shall wet down the milled pavement and thoroughly sweep and/or blow the surface to remove loose residual material. Waste materials shall be collected and removed from the pavement surface and adjacent areas by sweeping or vacuuming. Waste materials shall be removed and disposed **[** off Airport property **] [** in areas designated on the plans **]**.

101-3.6. Preparation of asphalt pavement surfaces prior to surface treatment. Existing asphalt pavements to be treated with a surface treatment shall be prepared as follows:

a. Patch asphalt pavement surfaces that have been softened by petroleum derivatives or have failed due to any other cause. Remove damaged pavement to the full depth of the damage and replace with new asphalt pavement similar to that of the existing pavement in accordance with paragraph 101-3.4b.

b. Repair joints and cracks in accordance with paragraph 101-3.2.

c. Remove oil or grease that has not penetrated the asphalt pavement by scrubbing with a detergent and washing thoroughly with clean water. After cleaning, treat these areas with an oil spot primer. **[___]**

****

Provide primer requirements if required.

****

d. Clean pavement surface immediately prior to placing the surface treatment so that it is free of dust, dirt, grease, vegetation, oil or any type of objectionable surface film.

101-3.7 Maintenance. The Contractor shall perform all maintenance work necessary to keep the pavement in a satisfactory condition until the full section is complete and accepted by the RPR. The surface shall be kept clean and free from foreign material. The pavement shall be properly drained at all times. If cleaning is necessary or if the pavement becomes disturbed, any work repairs necessary shall be performed at the Contractor's expense.

101-3.8 Preparation of Joints in Rigid Pavement prior to resealing. Prior to application of sealant material, clean and dry the joints of all scale, dirt, dust, old sealant, curing compound, moisture and other foreign matter. The Contractor shall demonstrate, in the presence of the RPR, that the method used cleans the joint and does not damage the joint.

101-3.8.1 Removal of Existing Joint Sealant. All existing joint sealants will be removed by plowing or use of hand tools. Any remaining sealant and or debris will be removed by use of wire brushes or other tools as necessary. Resaw joints removing no more than 1/16 inch (2 mm) from each joint face. Immediately after sawing, flush out joint with water and other tools as necessary to completely remove the slurry.

101-3.8.2 Cleaning prior to sealing. Immediately before sealing, joints shall be cleaned by removing any remaining laitance and other foreign material. Allow sufficient time to dry out joints prior to sealing. Joint surfaces will be surface-dry prior to installation of sealant.

101-3.8.3 Joint sealant. Joint material and installation will be in accordance with **[** Item P-605 **] [** Item P-604 **]**.

101-3.9 Preparation of Cracks in Flexible Pavement prior to sealing. Prior to application of sealant material, clean and dry the joints of all scale, dirt, dust, old sealant, curing compound, moisture and other foreign matter. The Contractor shall demonstrate, in the presence of the RPR, that the method used cleans the cracks and does not damage the pavement.

101-3.9.1 Preparation of Crack. Widen crack with **[** router **] [** random crack saw **]** by removing a minimum of 1/16 inch (2 mm) from each side of crack. Immediately before sealing, cracks will be blown out with a hot air lance combined with oil and water-free compressed air.

101-3.9.2 Removal of Existing Crack Sealant. Existing sealants will be removed by **[** routing **] [** random crack saw **]**. Following **[** routing **] [** sawing **]** any remaining debris will be removed by use of a hot lance combined with oil and water-free compressed air.

101-3.9.3 Crack Sealant. Crack sealant material and installation will be in accordance with **[** Item P-605 **]**.

101-3.9.4 Removal of Pipe and other Buried Structures.

a. Removal of Existing Pipe Material. [Remove the types of pipe as indicated on the plans. The pipe material shall be legally disposed of off-site in a timely manner following removal. Trenches shall be backfilled with material equal to or better in quality than adjacent embankment. Trenches under paved areas must be compacted to **[** 95% **]** of ASTM **[** D1557 **][** D698 **]. [** Not used. **]]**

b. Removal of Inlets/Manholes. [Where indicated on the plans or as directed by the RPR, inlets and/or manholes shall be removed and legally disposed of off-site in a timely fashion after removal. Excavations after removal shall be backfilled with material equal or better in quality than adjacent embankment. When under paved areas must be compacted to **[** 95% **]** of ASTM **[** D1557 **][** D698 **],** when outside of paved areas must be compacted to **[** 95% **]** of ASTM D698. **[** Not used. **]]**

c. Removal of **[___]**.

METHOD OF MEASUREMENT

[101-4.1 Lump sum. No separate measurement for payment will be made. The work covered by this section shall be considered as a subsidiary obligation of the Contractor and covered under the other contract items. **]**

[101-4.1 Pavement removal. The unit of measurement for pavement removal shall be the number of square yards (square meters) removed by the Contractor. Any pavement removed outside the limits of removal because the pavement was damaged by negligence on the part of the Contractor shall not be included in the measurement for payment. No direct measurement or payment shall be made for saw cutting. Saw cutting shall be incidental to pavement removal. Dowel bar installation shall be incidental to pavement removal.

101-4.2 Joint and crack repair. The unit of measurement for joint and crack repair shall be the linear foot (meter) of joint.

101-4.3 Removal of Foreign Substances/contaminates. The unit of measurement for foreign Substances/contaminates removal shall be the square foot (meter).

101-4.4 Spalled and failed asphalt pavement repair. The unit of measure for failed asphalt pavement repair shall be square foot (square meter).

101-4.5 Concrete Spall Repair. The unit of measure for concrete spall repair shall be the number of square feet (square meter). The location and average depth of the patch shall be determined and agreed upon by the RPR and the Contractor.

101-4.6 Cold milling. The unit of measure for cold milling shall be **[___]** inches of milling per square yard (square meter). The location

and average depth of the cold milling shall be as shown on the plans. If the initial cut does not correct the condition, the Contractor shall re-mill the area and will be paid for the total depth of milling. **]**

101-4.7 Removal of Pipe and other Buried Structures. [Not require. **][** The unit of measurement for removal of pipe and other buried structures will be **[** lump sum. No separate measurement for payment will be made. The work covered by this section shall be considered as a subsidiary obligation of the Contractor and covered under the other contract items. **][** made at the contract unit price for each completed and accepted item. This price shall be full compensation for all labor, equipment, tools, and incidentals necessary to complete this item in accordance with paragraph 101-3.9.4. **]]**

****

The Engineer shall select the applicable items above for each project and delete the others. Items such as cold milling may be specified multiple times.

****

BASIS OF PAYMENT

101-5.1 Payment. Payment shall be made at contract unit price for the unit of measurement as specified above. This price shall be full compensation for furnishing all materials and for all preparation, hauling, and placing of the material and for all labor, equipment, tools, and incidentals necessary to complete this item.

[Item P 101-5.1	Pavement Removal - **[** Lump sum **] [** per square yard (square meter) **]**
Item P 101-5.2	Joint and Crack Repair – per linear foot (meter0
Item P 101-5.3	Removal of Foreign Substances/contaminates – per square foot (square meter)
Item P-101-5.4	Spalled and Failed Asphalt Pavement Repair - per square foot (square meter)
Item P-101-5.5	Concrete Spall Repair - per square foot (square meter)
Item P-101-5.6	Cold Milling – per square yard (square meter) **]**
Item P-101-5.7	Removal of Pipe and other Buried Structures – **[** Lump sum **] [** per each **][** Not required. **]**

****

The Engineer shall coordinate paragraphs 101-4.1 and 101-5.1 for each project.

For a lump sum contract, replace paragraph 101-5.1 Payment with the following:

101-5.1 Payment. The work covered by this section shall be considered as a subsidiary obligation of the Contractor covered under the other contract items. No separate payment will be made. This shall be full compensation for furnishing all materials and for all preparation, hauling, and placing of the material and for all labor, equipment, tools, and incidentals necessary to complete this item.

****

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

Advisory Circulars (AC)

AC 150/5380-6	Guidelines and Procedures for Maintenance of Airport Pavements.

ASTM International (ASTM)

ASTM D6690	Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements

END OF ITEM P-101

Item P-151 Clearing and Grubbing

DESCRIPTION

151-1.1 This item shall consist of clearing or clearing and grubbing, including the disposal of materials, for all areas within the limits designated on the plans or as required by the Resident Project Representative (RPR).

a. Clearing shall consist of the cutting and removal of all trees, stumps, brush, logs, hedges, the removal of fences and other loose or projecting material from the designated areas. The grubbing of stumps and roots will not be required.

b. Clearing and grubbing shall consist of clearing the surface of the ground of the designated areas of all trees, stumps, down timber, logs, snags, brush, undergrowth, hedges, heavy growth of grass or weeds, fences, structures, debris, and rubbish of any nature, natural obstructions or such material which in the opinion of the RPR is unsuitable for the foundation of strips, pavements, or other required structures, including the grubbing of stumps, roots, matted roots, foundations, and the disposal from the project of all spoil materials resulting from clearing and grubbing.

c. Tree Removal. Tree Removal shall consist of the cutting and removal of isolated single trees or isolated groups of trees, and the grubbing of stumps and roots. The removal of all the

trees of this classification shall be in accordance with the requirements for the particular area being cleared.

CONSTRUCTION METHODS

151-2.1 General. The areas denoted on the plans to be **[** cleared **] [** cleared and grubbed **]** shall be staked on the ground by the **[** RPR **] [** Contractor as indicated on the plans **]**.

The removal of existing structures and utilities required to permit orderly progress of work shall be accomplished by local agencies, unless otherwise shown on the plans. Whenever a telephone pole, pipeline, conduit, sewer, roadway, or other utility is encountered and must be removed or relocated, the Contractor shall advise the RPR who will notify the proper local authority or owner to secure prompt action.

151-2.1.1 Disposal. All materials removed by clearing or by clearing and grubbing shall be disposed of **[** in the designated waste disposal area **] [** outside the Airport's limits at the Contractor's responsibility **] [** by burning **]**, except when otherwise directed by the RPR. **[** When burning of material is permitted, it shall be burned under the constant overseeing of a watchman to assure the surrounding vegetation and other adjacent property is not jeopardized. Burning shall be done in accordance with all applicable federal, state and local laws, ordinances, and regulations. The Contractor shall notify the agency having jurisdiction and obtain all approvals in writing before starting any burning operations. **]** As far as practicable, waste concrete and masonry shall be placed on slopes of embankments or channels. When embankments are constructed of such material, this material shall be placed in accordance with requirements for formation of embankments. Any broken concrete or masonry that cannot be used in construction and all other materials not considered suitable for use elsewhere, shall be disposed of by the Contractor. In no case, shall any discarded materials be left in windrows or piles adjacent to or within the airport limits. The manner and location of disposal of materials shall be subject to the approval of the RPR and shall not create an unsightly or objectionable view. When the Contractor is required to locate a disposal area outside the airport property limits, the Contractor shall obtain and file with the RPR permission in writing from the property owner for the use of private property for this purpose.

151-2.1.2 Blasting. [Blasting shall not be allowed. **] [** Blasting and explosive storage shall be in accordance with Section 70, paragraph 70-09 and all federal, state, and local safety regulations. Submit notice 15 days prior to starting work. Submit a Blasting Plan, prepared and sealed by a registered professional Engineer, that includes calculations for overpressure and debris hazard. Obtain written approval prior to performing any blasting and notify the RPR 24 hours prior to blasting. Include provisions for storing, handling and transporting explosives as well as for the blasting operations in the plan. The Contractor is responsible for damage caused by blasting operations. **]**

151-2.2 Clearing. The Contractor shall clear the staked or indicated area of all materials as indicated on the plans. Trees unavoidably falling outside the specified clearing limits must be cut up, removed, and disposed of in a satisfactory manner. To minimize damage to trees that are to be left standing, trees shall be felled toward the center of the area being cleared. The Contractor shall preserve and protect from injury all trees not to be removed. The trees, stumps, and brush shall be cut flush with the original ground surface. The grubbing of stumps and roots will not be required.

Fences shall be removed and disposed of as directed by the RPR. Fence wire shall be neatly rolled and the wire and posts stored on the airport if they are to be used again, or stored at a location designated by the RPR if the fence is to remain the property of a local owner or authority.

151-2.3 Clearing and grubbing. In areas designated to be cleared and grubbed, all stumps, roots, buried logs, brush, grass, and other unsatisfactory materials as indicated on the plans, shall be removed, except where embankments exceeding 3-1/2 feet (105 cm) in depth will be constructed outside of paved areas. For embankments constructed outside of paved areas, all unsatisfactory materials shall be removed, but sound trees, stumps, and brush can be cut off flush with the original ground and allowed to remain. Tap roots and other projections over 1-1/2 inches (38 mm) in diameter shall be grubbed out to a depth of at least 18 inches (0.5 m) below the finished subgrade or slope elevation.

Any buildings and miscellaneous structures that are shown on the plans to be removed shall be demolished or removed, and all materials shall be disposed of by removal from the site. The cost of removal is incidental to this item. The remaining or existing foundations, wells, cesspools, and like structures shall be destroyed by breaking down the materials of which the foundations, wells, cesspools, etc., are built to a depth at least 2 feet (60 cm) below the existing surrounding ground. Any broken concrete, blocks, or other objectionable material that cannot be used in backfill shall be removed and disposed of at the Contractor's expense. The holes or openings shall be backfilled with acceptable material and properly compacted.

All holes in embankment areas remaining after the grubbing operation shall have the sides of the holes flattened to facilitate filling with acceptable material and compacting as required in Item P-152. The same procedure shall be applied to all holes remaining after grubbing in areas where the depth of holes exceeds the depth of the proposed excavation.

****

Indicate extent of grading required after clearing, or clearing and grubbing, on the plans including any required surface tolerances.

****

METHOD OF MEASUREMENT

151-3.1 The quantities of clearing as shown by the limits on the plans shall be **[** the number of acres (square meters) or fractions thereof, **] [** per lump sum **]** of land specifically cleared.

151-3.2 The quantities of clearing and grubbing as shown by the limits on the plans shall be **[** the number of acres (square meters) or fractions thereof **] [** per lump sum **]** of land specifically cleared and grubbed.

151-3.3 The quantity of tree removal as shown on the plans shall be the **[** number of individual trees **] [** number of acres (square meters) or fractions thereof **] [** per lump sum **]** of land specifically cleared.

BASIS OF PAYMENT

151-4.1 Payment shall be made at the contract unit price **[** per acre (square meter) or fractions thereof **] [** per lump sum **]** for clearing. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item.

151-4.2 Payment shall be made at the contract unit price **[** per acre (square meter) **] [** per lump sum **]** for clearing and grubbing. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item.

151-4.3 Payment shall be made at the contract unit price **[** per number of individual trees **] [** per acre (square meter) **] [** per lump sum **]** for tree removal. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-151-4.1	Clearing – **[** per acre (square meter) or fractions thereof **] [** per lump sum **]**
Item P-151-4.2	Clearing and grubbing - **[** per acre (square meter) or fractions thereof **] [** per lump sum **]**
Item P-152-4.3	Tree Removal – **[** per number of individual trees **] [** per acre (square meter) or fractions thereof **] [** per lump sum **]**

Item P-152 Excavation, Subgrade, and Embankment

DESCRIPTION

152-1.1 This item covers excavation, disposal, placement, and compaction of all materials within the limits of the work required to construct safety areas, runways, taxiways, aprons, and intermediate areas as well as other areas for drainage, building construction, parking, or other purposes in accordance with these specifications and in conformity to the dimensions and typical sections shown on the plans.

152-1.2 Classification. All material excavated shall be classified as defined below:

a. Unclassified excavation. Unclassified excavation shall consist of the excavation and disposal of all material, regardless of its nature **[** which is not otherwise classified and paid for under one of the following items **]**.

[b. [___]

[Rock excavation. Rock excavation shall include all solid rock in ledges, in bedded deposits, in unstratified masses, and conglomerate deposits which are so firmly cemented they cannot be removed without blasting or using rippers. All boulders containing a volume of more than 1/2 cubic yard (0.4 m^3) will be classified as "rock excavation." **]**

[Muck excavation. Muck excavation shall consist of the removal and disposal of deposits or mixtures of soils and organic matter not suitable for foundation material. Muck shall include materials that will decay or produce subsidence in the embankment. It may consist of decaying stumps, roots, logs, humus, or other material not satisfactory for incorporation in the embankment. **]**

[Drainage excavation. Drainage excavation shall consist of all excavation made for the primary purpose of drainage and includes drainage ditches, such as intercepting, inlet or outlet ditches; temporary levee construction; or any other type as shown on the plans. **]**

[Borrow excavation. Borrow excavation shall consist of approved material required for the construction of embankments or for other portions of the work in excess of the quantity of usable material available from required excavations. Borrow material shall be obtained from areas designated by the Resident Project Representative (RPR) within the limits of the airport property but outside the normal limits of necessary grading, or from areas outside the airport boundaries. **]**

[Other.]]

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All material excavated shall be considered "unclassified" unless the Engineer specifies other classifications in the project specifications.

Add or delete the classifications not applicable for the project.

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152-1.3 Unsuitable excavation. Unsuitable material shall be disposed in designated waste areas as shown on the plans. Materials containing vegetable or organic matter, such as muck, peat, organic silt, or sod shall be considered unsuitable for use in embankment construction. Material suitable for topsoil may be used on the embankment slope when approved by the RPR.

CONSTRUCTION METHODS

152-2.1 General. Before beginning excavation, grading, and embankment operations in any area, the area shall be cleared or cleared and grubbed in accordance with Item P-151.

The suitability of material to be placed in embankments shall be subject to approval by the RPR. All unsuitable material shall be disposed of in waste areas as shown on the plans. All waste areas shall be graded to allow positive drainage of the area and adjacent areas. The surface elevation of waste areas shall be specified on the plans or approved by the RPR.

When the Contractor's excavating operations encounter artifacts of historical or archaeological significance, the operations shall be temporarily discontinued and the RPR notified per Section 70, paragraph 70-20. At the direction of the RPR, the Contractor shall excavate the site in such a manner as to preserve the artifacts encountered and allow for their removal. Such excavation will be paid for as extra work.

Areas outside the limits of the pavement areas where the top layer of soil has become compacted by hauling or other Contractor activities shall be scarified and disked to a depth of 4 inches (100 mm), to loosen and pulverize the soil. Stones or rock fragments larger than 4 inches (100 mm) in their greatest dimension will not be permitted in the top 6 inches (150 mm) of the subgrade.

If it is necessary to interrupt existing surface drainage, sewers or under-drainage, conduits, utilities, or similar underground structures, the Contractor shall be responsible for and shall take all necessary precautions to preserve them or provide temporary services. When such facilities are encountered, the Contractor shall notify the RPR, who shall arrange for their removal if necessary. The Contractor, at their own expense, shall satisfactorily repair or pay the cost of all damage to such facilities or structures that may result from any of the Contractor's operations during the period of the contract.

a. Blasting. [Blasting shall not be allowed. **] [** Blasting will be permitted as directed by the RPR and in accordance with the following:

Blasting will be permitted only when proper precautions are taken for the safety of all persons, work, and property. All damage done to the work or property shall be repaired by the Contractor. The cost of repair is incidental to this item. All operations of the Contractor in connection with the transportation, storage, and use of explosives shall conform to all federal, state and local regulations and explosive manufacturers' instructions, with applicable approved permits reviewed by the RPR. Any approval will not relieve the Contractor of their responsibility in blasting operations.

Where blasting is approved, the Contractor shall employ a vibration consultant, approved by the RPR, to advise on explosive charge weights per delay and to analyze records from seismograph recordings. The seismograph shall be capable of producing a permanent record of the three components of the motion in terms of particle velocity, and in addition shall be capable of internal dynamic calibration.

In each distinct blasting area, where pertinent factors affecting blast vibrations and their effects in the area remain the same, the Contractor shall submit a blasting plan of the initial blasts to the RPR for approval. This plan must consist of hole size, depth, spacing, burden, type of explosives, type of delay sequence, maximum amount of explosive on any one delay period,

depth of rock, and depth of overburden if any. The maximum explosive charge weights per delay included in the plan shall not be increased without the approval of the RPR.

The Contractor shall keep a record of each blast: its date, time and location; the amount of explosives used, maximum explosive charge weight per delay period, and, where necessary, seismograph records identified by instrument number and location.

Blasting and explosive storage shall be in accordance with Section 70, paragraph 70-09 and all federal, state, and local safety regulations.

These records shall be made available to the RPR on a monthly basis or in tabulated form at other times as required. **]**

152-2.2 Excavation. No excavation shall be started until the work has been staked out by the Contractor and the RPR has obtained from the Contractor, the survey notes of the elevations and measurements of the ground surface. The Contractor and RPR shall agree that the original ground lines shown on the original topographic mapping are accurate, or agree to any adjustments made to the original ground lines.

[Digital terrain model (DTM) files of the existing surfaces, finished surfaces and other various surfaces were used to develop the design plans.

[Volumetric quantities were calculated by comparing DTM files of the applicable design surfaces and generating Triangle Volume Reports. Electronic copies of DTM files and a paper copy of the original topographic map will be issued to the successful bidder. **]**

[Volumetric quantities were calculated using design cross sections which were created for this project using the DTM files of the applicable design surfaces and generating End Area Volume Reports. Paper copies of design cross sections and a paper copy of the original topographic map will be issued to the successful bidder. **]**

Existing grades on the design cross sections or DTM's, where they do not match the locations of actual spot elevations shown on the topographic map, were developed by computer interpolation from those spot elevations. Prior to disturbing original grade, Contractor shall verify the accuracy of the existing ground surface by verifying spot elevations at the same locations where original field survey data was obtained as indicated on the topographic map. Contractor shall recognize that, due to the interpolation process, the actual ground surface at any particular location may differ somewhat from the interpolated surface shown on the design cross sections or obtained from the DTM's. Contractor's verification of original ground surface, however, shall be limited to verification of spot elevations as indicated herein, and no adjustments will be made to the original ground surface unless the Contractor demonstrates that spot elevations shown are incorrect. For this purpose, spot elevations which are within **[** 0.1 foot (30 mm) **]** of the stated elevations for ground surfaces, or within **[** 0.04 foot (12 mm) **]** for hard surfaces (pavements, buildings, foundations, structures, etc.) shall be considered "no change". Only deviations in excess of these will be considered for adjustment of the original ground surface. If Contractor's verification identifies discrepancies in the topographic map, Contractor shall notify the RPR in writing at least **[** two weeks **]** before disturbance of existing grade to allow sufficient time to verify the submitted information and make adjustments to the design cross sections or DTM's. Disturbance of existing grade in any area shall constitute acceptance by the Contractor of the accuracy of the original elevations shown on the topographic map for that area. **]**

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Delete bracketed DTM paragraphs if DTM not used.

**********All areas to be excavated shall be stripped of vegetation and topsoil. Topsoil shall be stockpiled for future use in areas designated on the plans or by the RPR. All suitable excavated material shall be used in the formation of embankment, subgrade, or other purposes **as** shown on the plans. All unsuitable material shall be disposed of as shown on the plans.

The grade shall be maintained so that the surface is well drained at all times.

When the volume of the excavation exceeds that required to construct the embankments to the grades as indicated on the plans, the excess shall be used to grade the areas of ultimate development or disposed as directed by the RPR. When the volume of excavation is not sufficient for constructing the embankments to the grades indicated, the deficiency shall be obtained from borrow areas.

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During the design phase, perform subsurface investigations to identify existing subsurface conditions to minimize the potential for unforeseen conditions arising during excavation such as the need for dewatering or removal of unsuitable materials.

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a. Selective grading. When selective grading is indicated on the plans, the more suitable material designated by the RPR shall be used in constructing the embankment or in capping the pavement subgrade. If, at the time of excavation, it is not possible to place this material in its final location, it shall be stockpiled in approved areas until it can be placed. The more suitable material shall then be placed and compacted as specified. Selective grading shall be considered incidental to the work involved. The cost of stockpiling and placing the material shall be included in the various pay items of work involved.

b. Undercutting. Rock, shale, hardpan, loose rock, boulders, or other material unsatisfactory for safety areas, subgrades, roads, shoulders, or any areas intended for turf shall be excavated to a minimum depth of 12 inches (300 mm) below the subgrade or to the depth specified by the RPR. Muck, peat, matted roots, or other yielding material, unsatisfactory for subgrade foundation, shall be removed to the depth specified. Unsuitable materials shall be **[** disposed of at locations shown on the plans. **] [** disposed off the airport. The cost is incidental to this item. **]** This excavated material shall be paid for at the contract unit price per cubic yard (per cubic meter) for **[___]**. The excavated area shall be backfilled with suitable material obtained from the grading operations or borrow areas and compacted to specified densities. The necessary backfill will constitute a part of the embankment. Where rock cuts are made, backfill with select material. Any pockets created in the rock surface shall be drained in accordance with the details shown on the plans. Undercutting will be paid as **[** unclassified excavation **] [** rock excavation **]**.

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The Engineer shall specify the appropriate class of excavation. If rock or muck excavation is not included under paragraph 152-1.2, unclassified excavation should be specified.

The plans shall show details for draining pockets created in rock cuts.

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c. Over-break. Over-break, including slides, is that portion of any material displaced or loosened beyond the finished work as planned or authorized by the RPR. All over-break shall be graded or removed by the Contractor and disposed of as directed by the RPR. The RPR shall determine if the displacement of such material was unavoidable and their own decision shall be final. Payment will not be made for the removal and disposal of over-break that the RPR determines as avoidable. Unavoidable over-break will be classified as "Unclassified Excavation."

d. Removal of utilities. The removal of existing structures and utilities required to permit the orderly progress of work will be accomplished **[** by someone other than the Contractor **] [** by the Contractor as indicated on the plans **]**. All existing foundations shall be excavated at least 2 feet (60 cm) below the top of subgrade or as indicated on the plans, and the material disposed of as directed by the RPR. All foundations thus excavated shall be backfilled with suitable material and compacted as specified for embankment or as shown on the plans.

152-2.3 Borrow excavation. [Borrow areas are not required. **] [** Borrow areas within the airport property are indicated on the plans. Borrow excavation shall be made only at these designated locations and within the horizontal and vertical limits as staked or as directed by the RPR. All unsuitable material shall be disposed of by the Contractor as shown on the plans. All borrow pits shall be opened to expose the various strata of acceptable material to allow obtaining a uniform product. Borrow areas shall be drained and left in a neat, presentable condition with all slopes dressed uniformly. Borrow areas shall not create a hazardous wildlife attractant. **[___]]**

[There are no borrow sources within the boundaries of the airport property. The Contractor shall locate and obtain borrow sources, subject to the approval of the RPR. The Contractor shall notify the RPR at least **[** 15 **]** days prior to beginning the excavation so necessary measurements and tests can be made by the RPR. All borrow pits shall be opened to expose the various strata of acceptable material to allow obtaining a uniform product. Borrow areas shall be drained and left in a neat, presentable condition with all slopes dressed uniformly. Borrow areas shall not create a hazardous wildlife attractant. **[___]]**

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For on-site borrow areas, the Engineer must determine the acceptability of the borrow material before identifying the area on the plans.

For off-site borrow areas obtained by the Contractor, the RPR must determine the acceptability of the borrow material before its use on the project.

Address hazardous wildlife attractants when opening borrow sites on or near an airport. Add references and sources addressing standing water, permitting, approvals, and zoning. Reference AC 150/5200-33, Hazardous Wildlife Attractants on or near Airports.

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152-2.4 Drainage excavation. Drainage excavation shall consist of excavating drainage ditches including intercepting, inlet, or outlet ditches; or other types as shown on the plans. The

work shall be performed in sequence with the other construction. Ditches shall be constructed prior to starting adjacent excavation operations. All satisfactory material shall be placed in embankment fills; unsuitable material shall be placed in designated waste areas or as directed by the RPR. All necessary work shall be performed true to final line, elevation, and cross-section. The Contractor shall maintain ditches constructed on the project to the required cross-section and shall keep them free of debris or obstructions until the project is accepted.

152-2.5 Preparation of cut areas or areas where existing pavement has been removed. In those areas on which a subbase or base course is to be placed, the top **[** 12 inches (300 mm) **]** of subgrade shall be compacted to not less than **[** 100 % **]** of maximum density for non-cohesive soils, and **[** 95% **]** of maximum density for cohesive soils as determined by ASTM **[___]**. As used in this specification, "non-cohesive" shall mean those soils having a plasticity index (PI) of less than 3 as determined by ASTM D4318.

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For subgrade under flexible and rigid pavements, the Engineer shall specify the required compaction depth and density as determined from the geotechnical report and the FAARFIELD Airport Pavement Design compaction recommendations. The current version of FAARFIELD is available at: www.faa.gov/airports/engineering/design_software/

Specify ASTM D698 for areas designated for aircraft with gross weights of 60,000 pounds (27200 kg) or less and ASTM D1557 for areas designated for aircraft with gross weights greater than 60,000 pounds (27200 kg).

For soils with expansive characteristics, the maximum density should be determined in accordance with ASTM D698 regardless of aircraft weight.

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152-2.6 Preparation of embankment area. All sod and vegetative matter shall be removed from the surface upon which the embankment is to be placed. The cleared surface shall be broken up by plowing or scarifying to a minimum depth of 6 inches (150 mm) and shall then be compacted per paragraph 152-2.10.

Sloped surfaces steeper than one (1) vertical to four (4) horizontal shall be plowed, stepped, benched, or broken up so that the fill material will bond with the existing material. When the subgrade is part fill and part excavation or natural ground, the excavated or natural ground portion shall be scarified to a depth of 12 inches (300 mm) and compacted as specified for the adjacent fill.

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The Engineer shall include benching details on the plans based on the type of material, degree of consolidation of the material, and the degree of homogeneity of the material. The minimum width of the bench shall be sufficient to accommodate construction equipment.

The Engineer should consider the consolidation of embankments over 4 feet (1.2 m) and consider installation of monitoring equipment such as settlement plates and inclinometers for deep fills.

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No direct payment shall be made for the work performed under this section. The necessary clearing and grubbing and the quantity of excavation removed will be paid for under the respective items of work.

152-2.7 Control Strip. The first half-day of construction of subgrade and/or embankment shall be considered as a control strip for the Contractor to demonstrate, in the presence of the RPR, that the materials, equipment, and construction processes meet the requirements of this specification. The sequence and manner of rolling necessary to obtain specified density requirements shall be determined. The maximum compacted thickness may be increased to a maximum of 12 inches (300 mm) upon the Contractor's demonstration that approved equipment and operations will uniformly compact the lift to the specified density. The RPR must witness this demonstration and approve the lift thickness prior to full production.

Control strips that do not meet specification requirements shall be reworked, re-compacted, or removed and replaced at the Contractor's expense. Full operations shall not begin until the control strip has been accepted by the RPR. The Contractor shall use the same equipment, materials, and construction methods for the remainder of construction, unless adjustments made by the Contractor are approved in advance by the RPR.

152-2.8 Formation of embankments. The material shall be constructed in lifts as established in the control strip, but not less than 6 inches (150 mm) nor more than 12 inches (300 mm) of compacted thickness.

When more than one lift is required to establish the layer thickness shown on the plans, the construction procedure described here shall apply to each lift. No lift shall be covered by subsequent lifts until tests verify that compaction requirements have been met. The Contractor shall rework, re-compact and retest any material placed which does not meet the specifications.

The lifts shall be placed, to produce a soil structure as shown on the typical cross-section or as directed by the RPR. Materials such as brush, hedge, roots, stumps, grass and other organic matter, shall not be incorporated or buried in the embankment.

Earthwork operations shall be suspended at any time when satisfactory results cannot be obtained due to rain, freezing, or other unsatisfactory weather conditions in the field. Frozen material shall not be placed in the embankment nor shall embankment be placed upon frozen material. Material shall not be placed on surfaces that are muddy, frozen, or contain frost. The Contractor shall drag, blade, or slope the embankment to provide surface drainage at all times.

The material in each lift shall be within ±2% of optimum moisture content before rolling to obtain the prescribed compaction. The material shall be moistened or aerated as necessary to achieve a uniform moisture content throughout the lift. Natural drying may be accelerated by blending in dry material or manipulation alone to increase the rate of evaporation.

The Contractor shall make the necessary corrections and adjustments in methods, materials or moisture content to achieve the specified embankment density.

The [RPR][contractor] will take samples of excavated materials which will be used in embankment for testing and develop a Moisture-Density Relations of Soils Report (Proctor) in accordance with **[** ASTM D698 **] [** D 1557 **]**. A new Proctor shall be developed for each soil type based on visual classification.

Density tests will be taken by the [RPR][contractor] for every **[** 3,000 **]** square yards of compacted embankment for each lift which is required to be compacted, or other appropriate frequencies as determined by the RPR.

If the material has greater than 30% retained on the 3/4-inch (19.0 mm) sieve, follow AASHTO T-180 Annex Correction of maximum dry density and optimum moisture for oversized particles.

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It is recommended that density tests be made for each 3,000 square yards (2500 square meters) of material placed per lift. Testing frequency should be determined by the Geotechnical Engineer. The Engineer may specify other frequencies as appropriate to the job size. If necessary to apply special controls to the moisture content of the soil during or after compaction to ensure strength because of the presence of expansive soils or other unusually sensitive soils), the Engineer must specify the appropriate moisture content. The moisture limitations shall be specified using acceptable moisture ranges as determined by ASTM D698 or ASTM D1557. Refer to FAA RD-76-66, Design and Construction of Airport Pavements on Expansive Soils, for additional guidance.

If the material has greater than 30% retained on the 3/4-inch (19.0 mm) sieve, follow the methods in the ASTM D698 or D1557; or AASHTO T180 Annex for correction of maximum dry density and optimum moisture for oversized particles.

If nuclear density machines are to be used for density determination, the machines shall be calibrated in accordance with ASTM D6938.

Include testing frequencies per square yard for density and moisture acceptance tests.

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Rolling operations shall be continued until the embankment is compacted to not less than **[** 100% **]** of maximum density for non-cohesive soils, and **[** 95% **]** of maximum density for cohesive soils as determined by ASTM **[___]**. Under all areas to be paved, the embankments shall be compacted to a depth of **[___]** and to a density of not less than **[___]** percent of the maximum density as determined by ASTM **[___]**. As used in this specification, "non-cohesive" shall mean those soils having a plasticity index (PI) of less than 3 as determined by ASTM D4318.

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For subgrade under flexible and rigid pavements, the Engineer shall specify the required compaction depth and density as determined from the geotechnical report and the FAARFIELD Airport Pavement Design compaction recommendations. The current version of FAARFIELD is available at: www.faa.gov/airports/engineering/design_software/

Specify ASTM D698 for areas designated for aircraft with gross weights of 60,000 pounds (27200 kg) or less and ASTM D1557 for areas designated for aircraft with gross weights greater than 60,000 pounds (27200 kg).

For soils with expansive characteristics, the maximum density should be determined in accordance with ASTM D698 regardless of aircraft weight.

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On all areas outside of the pavement areas, no compaction will be required on the top **[** 4 inches (100 mm) **]** which shall be prepared for a seedbed in accordance with **[** Item T-901 **]** **[** T-906 **]**.

The in-place field density shall be determined in accordance with [ASTM D1556] [ASTM 6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938.]. The [RPR shall perform all density tests] [Contractor's laboratory shall perform all density tests in the RPR's presence and provide the test results upon completion to the RPR for acceptance]. If the specified density is not attained, the area represented by the test or as designated by the RPR shall be reworked and/or re-compacted and additional random tests made. This procedure shall be followed until the specified density is reached.

Compaction areas shall be kept separate, and no lift shall be covered by another lift until the proper density is obtained.

During construction of the embankment, the Contractor shall route all construction equipment evenly over the entire width of the embankment as each lift is placed. Lift placement shall begin in the deepest portion of the embankment fill. As placement progresses, the lifts shall be constructed approximately parallel to the finished pavement grade line.

When rock, concrete pavement, asphalt pavement, and other embankment material are excavated at approximately the same time as the subgrade, the material shall be incorporated into the outer portion of the embankment and the subgrade material shall be incorporated under the future paved areas. Stones, fragmentary rock, and recycled pavement larger than 4 inches (100 mm) in their greatest dimensions will not be allowed in the top 12 inches (300 mm) of the subgrade. Rockfill shall be brought up in lifts as specified or as directed by the RPR and the finer material shall be used to fill the voids forming a dense, compact mass. Rock, cement concrete pavement, asphalt pavement, and other embankment material shall not be disposed of except at places and in the manner designated on the plans or by the RPR.

When the excavated material consists predominantly of rock fragments of such size that the material cannot be placed in lifts of the prescribed thickness without crushing, pulverizing or further breaking down the pieces, such material may be placed in the embankment as directed in lifts not exceeding 2 feet (60 cm) in thickness. Each lift shall be leveled and smoothed with suitable equipment by distribution of spalls and finer fragments of rock. The lift shall not be constructed above an elevation 4 feet (1.2 m) below the finished subgrade.

[There will be no separate measurement of payment for compacted embankment. All costs incidental to placing in lifts, compacting, discing, watering, mixing, sloping, and other operations necessary for construction of embankments will be included in the contract price for excavation, borrow, or other items. **] [** Payment for compacted embankment will be made under embankment in-place and no payment will be made for excavation, borrow, or other items. **]**

152-2.9 Proof rolling. [Not Used **]** The purpose of proof rolling the subgrade is to identify any weak areas in the subgrade and not for compaction of the subgrade. **[** Before start of embankment, **] [** and **] [** After compaction is completed, **]** the subgrade area shall be proof rolled with a **[[** 20 ton (18.1 metric ton) **]** Tandem axle Dual Wheel Dump Truck loaded to the legal limit with tires inflated to **[** 80/100/150 psi (0.551 MPa/0.689 MPa/1.034 MPa) **]] [[___]** ton Proof Roller with tires spaced not more than 32 inches (0.8 m) on-center with tires inflated to **[** 100/125/150 psi (0.689 MPa/0.861 MPa/1.034 MPa) **]]** in the presence of the RPR. Apply a minimum of **[___]** coverage, or as specified by the RPR, under pavement areas. A coverage is defined as the application of one tire print over the designated area. Soft areas of subgrade that deflect more than 1 inch (25 mm) or show permanent deformation greater than 1 inch (25 mm) shall be removed and replaced with suitable material or reworked to conform to the moisture content and compaction requirements in accordance with these specifications. Removal and replacement of soft areas is incidental to this item.

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The Engineer shall select the proof-rolling method and number of coverages.

Drawings should be checked to ensure that any supplementary information required by this paragraph has been shown and that there is no conflict between the drawings and the specifications.

When proof rolling not used, delete all text from Paragraph 152-2.9 and insert Not Used.

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152-2.10 Compaction requirements. The subgrade under areas to be paved shall be compacted to a depth of **[** 12 inches (300 mm) **]** and to a density of not less than **[** 100 **]** percent of the maximum dry density as determined by ASTM **[** D1557 **] [** D698 **]**. The subgrade in areas outside the limits of the pavement areas shall be compacted to a depth of **[** 12 inches (300 mm) **]** and to a density of not less than **[** 95 **]** percent of the maximum density as determined by ASTM **[** D698 **]**.

The material to be compacted shall be within ±2% of optimum moisture content before being rolled to obtain the prescribed compaction (except for expansive soils). When the material has greater than 30 percent retained on the ¾ inch (19.0 mm) sieve, follow the **[** methods in **[** ASTM D698 **] [** ASTM D1557 **]] [** procedures in AASHTO T180 Annex for correction of maximum dry density and optimum moisture for oversized particles. **]** Tests for moisture content and compaction will be taken at a minimum of **[___]** S.Y. of subgrade. All quality assurance testing shall be done by **[** the RPR. **] [** the Contractor’s laboratory in the presence of the RPR, and density test results shall be furnished upon completion to the RPR for acceptance determination. **]**

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The Engineer shall specify the required compaction depths and densities as determined from FAARFIELD Airport Pavement Design Report. The current version of FAARFIELD is available at: https://www.faa.gov/airports/engineering/design_software/

The Engineer shall specify ASTM D698 for areas designated for aircraft with gross weights of 60,000 pounds (27200 kg) or less, and ASTM D1557 for areas designated for aircraft with gross weights greater than 60,000 pounds (27200 kg).

If the material has greater than 30% retained on the 3/4-inch (19.0 mm) sieve, follow the methods in the ASTM D698 or D1557; or AASHTO T180 Annex for correction of maximum dry density and optimum moisture for oversized particles.

Include testing frequencies per square yard (square meter) for density and moisture acceptance tests.

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The in-place field density shall be determined in accordance with **[** ASTM D1556 **]** **[** ASTM D6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938 within 12 months prior to its use on this contract. The gage shall be field standardized daily. **]**

Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

If the specified density is not attained, the entire lot shall be reworked and/or re-compacted and additional random tests made. This procedure shall be followed until the specified density is reached.

All cut-and-fill slopes shall be uniformly dressed to the slope, cross-section, and alignment shown on the plans or as directed by the RPR and the finished subgrade shall be maintained.

152-2.11 Finishing and protection of subgrade. Finishing and protection of the subgrade is incidental to this item. Grading and compacting of the subgrade shall be performed so that it will drain readily. All low areas, holes or depressions in the subgrade shall be brought to grade. Scarifying, blading, rolling and other methods shall be performed to provide a thoroughly compacted subgrade shaped to the lines and grades shown on the plans. All ruts or rough places that develop in the completed subgrade shall be graded, re-compacted, and retested. The Contractor shall protect the subgrade from damage and limit hauling over the finished subgrade to only traffic essential for construction purposes.

The Contractor shall maintain the completed course in satisfactory condition throughout placement of subsequent layers. No subbase, base, or surface course shall be placed on the subgrade until the subgrade has been accepted by the RPR.

152-2.12 Haul. All hauling will be considered a necessary and incidental part of the work. The Contractor shall include the cost in the contract unit price for the pay of items of work involved. No payment will be made separately or directly for hauling on any part of the work.

The Contractor's equipment shall not cause damage to any excavated surface, compacted lift or to the subgrade as a result of hauling operations. Any damage caused as a result of the Contractor's hauling operations shall be repaired at the Contractor's expense.

The Contractor shall be responsible for providing, maintaining and removing any haul roads or routes within or outside of the work area, and shall return the affected areas to their former condition, unless otherwise authorized in writing by the Owner. No separate payment will be made for any work or materials associated with providing, maintaining and removing haul roads or routes.

152-2.13 Surface Tolerances. In those areas on which a subbase or base course is to be placed, the surface shall be tested for smoothness and accuracy of grade and crown. Any portion lacking the required smoothness or failing in accuracy of grade or crown shall be scarified to a depth of at least 3 inches (75 mm), reshaped and re-compacted to grade until the required smoothness and accuracy are obtained and approved by the RPR. The Contractor shall perform all final smoothness and grade checks in the presence of the RPR. Any deviation in surface tolerances shall be corrected by the Contractor at the Contractor's expense.

a. Smoothness. The finished surface shall not vary more than +/- ½ inch (12 mm) when tested with a 12-foot (3.7-m) straightedge applied parallel with and at right angles to the centerline. The straightedge shall be moved continuously forward at half the length of the 12-foot (3.7-m) straightedge for the full length of each line on a 50-foot (15-m) grid.

b. Grade. The grade and crown shall be measured on a 50-foot (15-m) grid and shall be within +/-0.05 feet (15 mm) of the specified grade.

On safety areas, turfed areas and other designated areas within the grading limits where no subbase or base is to placed, grade shall not vary more than 0.10 feet (30 mm) from specified grade. Any deviation in excess of this amount shall be corrected by loosening, adding or removing materials, and reshaping.

152-2.14 Topsoil. When topsoil is specified or required as shown on the plans or under Item T-905, it shall be salvaged from stripping or other grading operations. The topsoil shall meet the requirements of Item T-905. If, at the time of excavation or stripping, the topsoil cannot be placed in its final section of finished construction, the material shall be stockpiled at approved locations. Stockpiles shall be located as shown on the plans and the approved CSPP, and shall not be placed on areas that subsequently will require any excavation or embankment fill. If, in the judgment of the RPR, it is practical to place the salvaged topsoil at the time of excavation or stripping, the material shall be placed in its final position without stockpiling or further re-handling.

****

Refer to AC 150/5370-2, Operational Safety on Airports During Construction when developing the Construction Safety and Phasing Plan (CSPP).

****

Upon completion of grading operations, stockpiled topsoil shall be handled and placed as shown on the plans and as required in Item T-905. Topsoil shall be paid for as provided in Item T-905. No direct payment will be made for topsoil under Item P-152.

METHOD OF MEASUREMENT

152-3.1 Measurement for payment specified by the cubic yard (cubic meter) shall be computed by the **[** average end areas of design cross sections **] [** the comparison of digital terrain model (DTM) surfaces **]** for computation of neat line design quantities **]**. The end area is that bound by the original ground line established by field cross-sections and the final theoretical pay line established by cross-sections shown on the plans, subject to verification by the RPR.

****

> **The Engineer may edit method of volume calculations. The method of calculating volumes must meet or exceed the accuracy of the average end area method. The method of field verification should be described and must meet or exceed what is currently specified for the average end area method.**

****

152-3.1 [The quantity of **[** unclassified **] [** rock **] [** muck **] [** drainage **]** excavation to be paid for shall be the number of cubic yards (cubic meters) measured in its original position. Measurement shall not include the quantity of materials excavated without authorization beyond normal slope lines, or the quantity of material used for purposes other than those directed. **]**

[152-3.2 The quantity of embankment in place shall be the number of cubic yards (cubic meters) measured in its final position. **]**

[152-3.3 [Stockpiled material shall be paid for on the basis of the number of cubic yards (cubic meters) measured in the stockpiled position. **] [** Stockpiled material shall not be measured for payment in the stockpiled position. **]]**

BASIS OF PAYMENT

152-4.1 [Unclassified excavation **] [** Rock Excavation **] [** Muck Excavation **] [** Drainage Excavation **] [** Stockpiled Material **]** payment shall be made at the contract unit price per cubic yard (cubic meter). This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

[152-4.2 For embankment in place, payment shall be made at the contract unit price per cubic yard (cubic meter). This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item. **]**

[152-4.3 Stockpiled material shall be paid for on the basis of the number of cubic yards (cubic meters) measured in the stockpiled position. **]**

Payment will be made under:

[Item P-152-4.1 **[[** Unclassified **] [** Rock **] [** Muck **] [** Drainage **] [** Excavation **] [** Stockpiled material **]]** - per cubic yard (cubic meter) **]**

[Item P-152-4.2 Embankment in place - per cubic yard (cubic meter) **]**

[Item P-152-4.3 Stockpiled material – per cubic yard (cubic meter) **]**

1. CIVIL / STRUCTURAL WORKS

1.1. EXCAVATION, FILLING AND GRADING

SCOPE OF WORK

The work under this section of the Specifications consists of furnishing all items, materials, equipment, labor, plants, appliances, methods and all operations that may be necessary, and incidentals to complete excavation, filling, back-filling and grading in accordance with the Plans, and schedule if any, and subject to the terms and conditions of the Contract.

A. EXCAVATION

The Contractor shall make all necessary excavation for foundations to establish grades indicated on drawings without extra compensation including all other excavations required and necessary for the proper prosecution of the work.

1. Cut slope for permanent excavations shall not be steeper than 1-1/2 horizontal to one vertical, and slopes for permanent fills shall not be steeper than 2 horizontal to one vertical unless a substantiating data which justify steeper slopes are submitted.

2. Deviation from the foregoing limitations for slopes shall be permitted only upon presentation of a soil investigation report acceptable to the supervising Engineer.

3. Trim the excavation to the required depth, lines and grades and other incidental excavations to level up the footing plus compacting tamping which are included in the building contract.
4. The materials to be excavated shall include any rock, earth and other materials of any nature and description encountered in obtaining the indicated lines and grades.

5. If the required safe bearing power of the soil is not obtained at the excavations shall be continued until such safe bearing power is reached.

6. Piers and walls shall be lengthened accordingly and likewise, the footings shall be revised to suit the new conditions for which the Contractor shall be paid at the unit price bid for concrete work.

7. No fill or other surcharge loads shall be placed adjacent to any building or structure unless such building or structure is capable of withstanding the addition loads caused by the fill or surcharges.

8. Footings or foundations which may be affected by the excavation shall be underpinned adequately, or otherwise, protected against settlement and/or against lateral movement.

9. Fills to be used to support the foundations shall be placed in accordance with accepted engineering practices. A soil investigation report and a report of satisfactory placement of fill, both, shall be acceptable to the supervising Architect or Engineer.

10. Additional payment for excavation will be computed per unit bid price and/or at established unit price for same as follows:

EXCAVATION, FILLING AND GRADING

a) All materials of every nature and description, which in the Owner's opinion will require the use of air operated hammers, wedging, or drilling and blasting.

b) For additional excavation to safe-bearing power soil as required in 5 based upon work required between indicated grades and authorized grades.

B. UNAUTHORIZED EXCAVATION

1. Where existing surface levels are lower than the sub-grade levels required for work, or where excess or authorized excavation takes place beyond the indicated lines and grades, the contractor shall fill the indicated line and grade at his expense under the following conditions.

2. Where the footings and foundations occur, use concrete fill of the same class as specified for footings and foundations.

3. Where slabs occur, use well compacted sand and gravel fill.

C. EXCAVATION OMITTED

1. When the nature of the soil is such that good-bearing or safe-bearing is found to exist at higher grades than the sub-grade levels indicated on the Plan, the supervising Architect or Engineer may decide to stop the excavation work at those higher grades.

2. Should the Owner so decide, it will be ordered in writing. This will be subject to reduction in the contract price in favor of the Owner at Unit Price Bid and or at established price based upon measurements taken between authorized higher grades and grades indicated on drawings. The same is true for omitted filling due to change of grade.

3. Footing shall not be placed on fill.

D. PROTECTION, PUMPING AND MAINTENANCE

1. The Contractor shall at all times protect the excavations and trenches from damages of rain water, spring water, backing of drains, and all other water.

2. He shall provide and operate all pumps or other equipment necessary to drain and keep excavations, pits, trenches and the entire sub-grade area free of water under any circumstances and contingencies that may arise.

3. He shall build all necessary enclosures, construct and maintain temporary drainage for this purpose. He shall provide all shoring, bracing and sheathing as required for safety, or necessary to support adjoining walls, walks, soils, streets, buildings, fences, and the like and for prosecution of the work, all these to be removed when work is completed, and or required by the Owner.

E. BLASTING

F. INSPECTION

No pouring of concrete shall be done by the Contractor unless the bearing surfaces has been inspected and approved by the Owner, and the authority to proceed has been received by the contractor.

G. DRAINAGE SYSTEM AT SITE

The Contractor shall provide, construct and maintain for the duration of the work, drainage system of the site approved and or as directed by the supervising Architect or Engineer.

H. UTILITIES

1. The Contractor shall protect and maintain all conduits, drains, sewer pipes and other utility services that are to remain on the property or in the building, or in the site, where required for the proper execution of the work.

2. The Contractor shall notify all corporations, companies, individuals, or the other authorities concerned with the above conduits, drains, water and sewer pipes, running to the property of the site, and protect relocate, remove, cap or discontinue all pipes, sewer, and other utility services, which interfere with the excavation in accordance with instruction and requirements of the above notified parties.

I. FILLING AND GRADING

1. All excavations shall be back-filled immediately as work permits after concrete walls and piers have attained full design strength and or as the Owner’s Engineer directs.

2. After the forms have been removed from the footings, walls and piers, the materials taken from excavations (free from waste and objectionable matter) shall be used for back-filling around them.

3. These filling materials shall be made in layers not to exceed 15 centimeters and thoroughly tamped before the next fill is placed. Excess excavated materials shall be placed and spread on the immediate premises as directed by the supervising Engineer, provided, however, that the Contractor shall not be required to remove such materials more than 50 meters from the building line.

4. Open tile drains around the building if any, shall be covered with crushed rock or gravel for a depth of 30 cm. and the same shall be graded from course to fine.

5. Open tile drains under floor slab (where so indicated on drawings) shall be covered with broken stones or gravel up to the bottom of the slab.

6. In spaces where slabs rest on ground, or on earth-fill as specified in paragraph 2, shall be labeled and accurately graded with 10 cm. thick of gravel and sand, and tamped thoroughly before concrete pouring is done.

7. All exterior grades shall be formed in accordance with the drawings and specifications, taking into account the requirements for landscaping work, if any, and giving due allowances for the top soil depth.

8. The Contractor shall grade the area included within clearing lines as defined "Clearing" under the General Conditions, and all such grading work should be included in the building Contract without extra or additional cost. Banks of graded areas shall have a slope of 3.8 cm. horizontal to one vertical distance.

9. Extra grading (cut or fill) beyond the ___meters and or due to change of grade shall be paid at the unit price bid for the same.

J. TOP SOIL STRIPPING AND SPREADING

For use when topsoil is salvaged for landscaping work.

1. Topsoil stripping operations shall start from the areas affected by the construction to limits indicated by the Owner and or as specified.

2. Topsoil shall be stripped to varying depths as approved by the Architect, but not beyond topsoil strata.

3. Topsoil shall be stripped by approved methods and stored where it will not interfere with the work.

4. This topsoil shall be evenly spreaded to the true contours and raked to even, smooth surfaces ready for seeding and planting.

K. TEMPORARY EASEMENT

The Contractor shall obtain the consent of adjoining property owners regarding the need for temporary easements or any other manner of physical encroachment at his own expense.

L. PAVEMENT

The Contractor shall restore, without extra cost to the Government, any street pavements, concrete sidewalks and curb, and similar public structures that may be opened, removed or demolished in the performance of work under this Section in the manner prescribed by authorities having jurisdiction.

M. PROTECTION OF TREES

The Contractor shall protect trees indicated to remain in place by boxing them, by using guys and the like, and or as indicated by the supervising Architect or Engineer.

N. PROTECTION OF ADJOINING PROPERTY

The Contractor shall protect the excavation to be made below existing grade line so that the soil of adjoining property will not cave-in or settle and shall defray the cost of underpinning or extending the foundation of buildings on adjoining properties.

1. Before starting the excavation, the Contractor shall notify in writing the owners of the adjoining buildings not less than 10 days before such excavation is to be made and that the adjoining building will be protected by him.

2. The Owners of the adjoining properties shall be given access to the excavation for the purpose of verifying if their properties are sufficiently protected by the contractor making the excavation.

3. In case there is a party wall along a lot-line of the premises where an excavation is being made, the contractor at his expense preserve such party wall in as safe a condition as it was before the excavation was commenced and shall, when necessary, underpin and support the same by adequate methods.

4. Guards or fences shall be provided along open sides of excavation except that, in the discretion of the Engineer such guards or fence may be omitted from any side or sides other than those adjacent to streets or public passageways.

1.2.CONCRETE WORKS

A. PLAIN AND REINFORCED CONCRETE

SCOPE OF WORK

This Item shall consist furnishing, placing and furnishing concrete in buildings and related structures, flood control and drainage, and water supply structures in accordance with this Specifications and conforming to the lines, grades, and dimensions shown on the Plans.

GENERAL REQUIREMENTS

1. **Acronyms**

   The following acronyms for applicable standards/ publications are referred to this Specification:

   ASTM – American Society for Testing Materials
   ACI – American Concrete Institute
   POI – Pre Stressed Concrete Institute
   AWS – American Welding Society
   AISC – American Institute of Steel Construction

2. **Standard Specifications and Codes**

   The work covered by this Section unless otherwise specified or detailed, shall be governed by the Building Code requirements for Reinforced Concrete (ACI 318), Standard Code for Arc and Gas Welding Society. The latest edition of all standards Specifications or Codes will be used.

3. **Coordination**

   The concrete work shall be coordinated with the work of other trades allow reasonable time to set sleeves, inserts and other accessories which must be in position before concrete bases and pads of mechanical equipment shall be placed to comply with approved shop drawings for the equipment.

4. **Workmanship**

   The Contractor shall be responsible for any additional cost which may result from concrete surfaces which are not finished to the required profile or elevation.

5. **Samples**

   The Contractor shall submit samples of cement and aggregates proposed for use in the concrete work for approval, enumerating names, sources and description of materials.

MATERIAL REQUIREMENTS

1. Portland Cement

a) Portland cement shall conform to the requirements of ASTM C-150 Type for normal Portland cement; Type-III for Highly Early Strength Portland Cement.

b) Cement shall be any standard commercial brand in 40 kilograms per bag such as: Filipinas, Union, Republic Apo or other locally available equivalent.

2. Fine Aggregates

Sand shall be clean, hard coarse river sand or crushed sand free from injurious amount of clay loam and vegetable matter and shall conform to ASTM C-33 or C330.

3. Coarse Aggregate

Gravel shall be river run gravel or broken stones. The maximum size shall be 1/5 of the nearest dimension between sides of forms of the concrete, or ¾ of the minimum clear spacing between reinforcing bars, or between re-bars and forms whichever is smaller.

4. Mixing Water

Water used in mixing concrete shall be clean and free from injurious amounts of oils, acids, alkali, organic materials or other deleterious substances.

5. Admixture

All air-entertaining admixtures if used shall conform to ASTM C-260. Water reducing admixtures, retarding admixtures, and water reducing and accelerating admixtures, if used, shall conform to the requirements of ASTM C-494.

STORAGE OF MATERIALS

1. Cement and Aggregates shall be stored in such a manner as to prevent their deterioration or the intrusion of foreign matter

2. Cement shall be stored, immediately upon arrival on the site of the work, in substantial waterproof bodegas, with a floor raised from the ground sufficiently high to be free from dampness. Aggregates shall be stored in such manner as to avoid the inclusion of foreign matter.

PLAIN CONCRETE

General Requirements

1. Plain Concrete, other than fill, shall have a minimum ultimate compressive strength at 28 days of 140 kilograms per square centimeter or 2,000 pounds per square inch and material proportioning, and placing shall conform to the requirement of this section.

2. Concrete made with lightweight aggregate may be used with strengths less than 140 kg. per square centimeter if it has been shown by tests or experience have sufficient strength and durability.

3. The thickness of plain concrete walls may be 5 centimeters (2 inches) less than the required by 6.17 for plain masonry wall but in no case less than 18 centimeters and the ratio of unsupported height or length whichever is the lesser to thickness shall not be greater than 22.

4. Concrete shall consist of Portland Cement, fine aggregates, water, and where specified, Admixtures, proportioned mixed place, cured and finished as hereinafter specified.

5. The following special types of concrete shall be used where indicated on the detailed drawings or as specified.

    a) Lean Concrete
    b) Concrete with integral waterproofing
    c) Highly early strength concrete may be used subject to the approval of the supervising Architect or Engineer.

6. All provisions of the Specifications shall apply the seven (7) day compressive strength equal to the 28 day strength required for normal concrete. Admixture used in concrete shall be produced by a reputable manufacturer and used in accordance with the manufacturer's printed directions.

    a) **Plasticizing Admixture** – Concrete admixture shall be free from chlorides and shall conform to ASTM C-494-651. The admixtures shall be used in all concrete mixtures in accordance with the manufacturer's specifications.

    b) **Calcium Chloride** – shall not be used under any circumstances.

PROPORTIONING OF CONCRETE

1. The Contractor shall employ, at his own expense, an approved testing, laboratory which shall design the mix for each type of concrete required by the Specifications and drawings to obtain strength as determined at least 15% higher than required. Strength requirements shall be as noted on the drawings.

2. The adequacy of the mix design shall be verified by a test on a minimum of 6 cylinders, 3 tested at 7 days; 3 at 28 days, in accordance with ASTM C-192 and G-3 and by Slump Tests in accordance with ASTM C-143.

3. The testing laboratory shall submit 5 copies of the mix design and the test results to the Owner or his duly authorized representative for approval before any concrete is placed.

4. If any time during construction, the concrete resulting from the approved mix design proves to be unsatisfactory for the reason such as too much water, lack of sufficient plasticity to prevent segregation, honeycomb, etc. or insufficient strength, the Contractor shall immediately notify the testing laboratory and the supervising Engineer.

5. The laboratory shall modify the design, subject to approval by the supervising Architect or Engineer until a satisfactory concrete is obtained.

6. **Stone concrete** – Minimum compressive cylinder strength of concrete fc' at 28 days area as follows:

    a) Fc' 27.58 Mpa for suspended beam, slab and columns
    b) Fc' 20.68 Mpa for footings and walls.

7. The **Water Content** shall not exceed 28 liters per 40 kilograms per bag cement, and the slump test shall not exceed 10 cm. in all cases unless otherwise changed by the supervising Architect or Engineer.

8. **Lean Concrete** – Lean concrete mix to be designated to produce concrete with 28 day strength of 13.79 Mpa, slump and size shall be subjected to approval depending where it is mixed.

DETERMINING CONCRETE PROPORTIONS
CONCRETE PROPORTIONS AND CONSISTENCY

1. The proportions of aggregate to cement for any concrete shall be such as to produce a mixture which will work readily into the corners and angles of the form and around reinforcement without permitting the materials to segregate or excess free from water to collect on the surface.

2. The methods of measuring concrete materials shall be such that the proportions can be accurately controlled and easily checked at any time during the work.

CONCRETE TEST

1. **Testing Laboratory**

a) The Contractor shall employ at his own expenses, an approved Testing Laboratory which may shall make compression and Slum Tests and immediately submit 5 copies of the test reports to the supervising Architect or Engineer.

b) Ready mixed concrete companies may use their own laboratories provided that testing is done with the supervision of the Owner or his authorized representatives.

2. **Compression Slump Test**

Compression and Slump Tests shall be made every 50 cubic meters of concrete or fraction thereof; but not less than 1 set of tests shall be made from any one batch of concrete and all 3 tests shall be made from the same batch.

3. **Compression Tests**

Make 3 standards 15 cm x 30 cm. cylinder and tests in accordance with ASTM C-31 and C-39. The one (1) cylinder at the age of 28 days and one (1) cylinder in reserve for 56 days test. If the 28 days test does not meet the requirements, make additional cylinder as required to check strength of concrete in the construction. These cylinders are to be cured in the field in the same manner as to the concrete in the construction is cured.

4. **Slump Test**

For each representative quantity of concrete mentioned above, two slump tests shall be made in accordance with ASTM C-143.

5. **Test Report**

The testing laboratory shall submit 4 copies of its test cylinder reports which are to include, as far as applicable, the following information:

a) Location of the structure where the concrete is used, design number, concrete design strength, type and manufacturer of Portland cement.

b) Amount of any Admixtures used, Slump Tests, date of sampling, cylinder application number, days cured in the field, and days cured in laboratory.

c) Age at the time of testing, crushing stress, type of failure, who made the cylinders, who shipped the cylinders to the laboratory and whether concrete strength meets the specifications.

6. Inspection of Batch Plant Operation

Inspection on a "Spot Check" basis required to insure the concrete delivery to the job complies with the Specifications and the design mix. The testing laboratory shall provide this service as directed by the Owner's supervising Engineer.

7. Additional Tests

If, in the opinion of the supervising Engineer, based on cylinder strengths below specifications requirements or visual defects, concrete of poor quality has been placed, additional tests shall be made as directed by the Owner at the expense of the Contractor. Test may be Compression Test on core cylinder per ASTM C-42, and or Lead Tests as cut-lined in ACI 318, Section 202, or as specified.

MIXING CONCRETE

The mixing and measuring equipment shall be approved by the supervising Architect or Engineer. Unless otherwise authorized, concrete shall be machine mixed at the site or by ready-mixed concrete.

1. Site Mixed Concrete

Provide a batch mixer type equipped with accurate timing and measuring devices and operate in accordance with the manufacturer's recommendations:

2. Mixing Time

a) For each batch, after all solid materials are placed inside the mixing drum, and water is introduced before ¼ of the mixing time has elapsed, shall not be less than 1 minute for mixers having a capacity of one (1) cubic meter or a fraction thereof for additional concrete.

b) The concrete mixer shall revolve at no less than 14 or more than 20 revolutions per revolutions per minute. Speed greater than 20 revolutions per minute and less than 14 revolutionary per minute are usually found to be unsatisfactory.

READY MIXED CONCRETE

1. All ready mixed concrete shall conform to the requirements of ASTM C-94, placed in forms within one (1) hour after adding water or not more than ½ hours if a retarder is used. It shall be kept constantly agitated during the transit period.

2. Pouring of concrete should not be started until after the forms and reinforcement for the whole unit are properly laid and installed, cleaned, inspected and approved.

3. Construction joints shall be rough-in and clean thoroughly before any pouring starts. Wet and slush surface with cement mortar.

HANDLING AND PLACING CONCRETE

1. Immediately after the concrete is mixed, it shall be conveyed by the approved push cart or buggies to designated locations, and carefully deposited in such manner as to prevent the separation of ingredient or displacement of the reinforcements.

2. Keep temporary runways built in such a manner that runway supports will not bear upon reinforcement of fresh concrete. Conveying or hauling of concrete by the use of long inclined chutes or pipes shall not be permitted.

3. Dumping concrete into carts or buggies with a free fall of more than one (1) meter will not be permitted. Hardened splashes or accumulation of concrete on forms or reinforcements shall be removed before the work continues.

4. When placing more than 1.50 meters high, it shall be deposited through sheet metal or other approved conveyors.

5. As for practicability, the conveyers shall be kept full of concrete during the placing and their lower ends shall be kept buried in the newly placed concrete.

6. After the initial set of the concrete, the forms shall be jarred, and no strain' shall be placed on the ends of the projecting reinforcing bars. Foundation shall be free from water during concreting and construction joints shall be determined by the supervising Architect or Engineer.

7. Concrete in columns shall be placed in one continuous pouring operation and allowed to set 12 hours before caps are placed. Likewise, concrete in beams and slabs in superstructures shall be poured in one operation.

RE-TAMPERING

The contractor shall mix only such quantities that are required for immediate use. Mixture which has developed initial setting shall not be used. Concrete which has partially hardened shall not be re-tampered for use.

CURING AND PROTECTION

1. All concrete work shall be protected from drying out after removal of forms by covering with waterproof paper, polyethylene sheeting burlap, with a coating of approved membrane curing compound having a moisture retention equal 90% based on ATM C-309 and C-156, applied in accordance with the manufacturer's instruction for use

2. Membrane curing compound shall not be used where the floor hardener, membrane waterproofing, damp-proofing, resilient floor tile or other floor or wall covering set in

adhesive, concrete-fill or setting beds, paint, plaster or other applied finishing or surfaces treatment are to be subsequently applied.

3. Wet burlap as often as required to keep concrete wet throughout each day for as period of at least 7 days where normal Portland cement is used and 3 days where high early strength cement is used.

METAL REINFORCEMENT

1. Steel Bars

a) Reinforcing bars shall conform to ASTM Specifications A-615. All mild steel for columns, shear wall, footings and footing beams shall be high grade deformed 413.7 Mpa.

b) For 10 mm and smaller bars use intermediate grade deformed bars. Fy = 275.8 Mpa

c) If reinforcing bars are to be welded, these specifications shall be supplemented by requirements assuring satisfactory weld ability.

d) Bar and rod mats for concrete reinforcement shall conform to ASTM Specifications A-184 and Wires for concrete reinforcement shall conform to ASTM A-82 Specifications.

e) Welded wire fabric for concrete reinforcement shall conform to ASTM A-185 except that the weld shear strength requirements shall be extended to include a wire size differential up to and including six gauges.

f) Wire and strand shall conform to ASTM A-416. Structural steel shall conform to ASTM A-26 and Steel pipe for composite column shall conform to ASTM Specification A-377.

2. Accessories

Provide bar supports and other accessories necessary to hold reinforcing bars in the proper positions while concrete is being placed. Bar supports which come in contact with forms for concrete exposed to view in the finished structure shall be galvanized or stainless subject to approval.

3. Mill Certificate and Test

a) The Contractor shall furnish 2 copies of the manufacturer’s certificate of mill tests al reinforcing steel.

b) The Contractor shall, employ at his own expense an approved testing laboratory which shall conduct testing of all reinforcement sizes of each bulk under the supervision of the supervising Architect or Engineer.

4. Shop Drawing

a) Each reinforcing steel detail and placement drawings shall be submitted for approval. Any material fabricated before the final approval of the shop drawings will be done at the Contractor's risk, but no material shall be installed until final approval of the "Shop Drawings".

b) All shop drawings shall be in accordance with the Manual Standard Practice for Detailing Reinforced Concrete Structure ACT-315.

5. Labeling

Bars shall be properly labeled with weatherproof tags to facilitate identification.

PLACING OF REINFORECEMENT

1. All reinforcement shall be placed according to the approved drawings. The Contractor shall provide sufficient bar supports, ties, anchors and other accessories to hold all bars securely in place.

2. Unless detailed on drawings, all stirrup shall be held in place by bar spacer. Reinforcing steel shall be cleaned of oil, grease, scale, rust or other coatings which will impair bond.

3. All bars shall be bent cold

4. All welded spices shall be done by certified welders having welder's certificate and shall be submitted and approved by the supervising Architect or Engineer before any welding works shall be started.

5. The welding of bars shall conform to AWS D -12.1 Recommended Practices for Welding Reinforcing Steel.

STORAGE OF MATERIALS

Reinforcing steel bars shall be stored on supports above the ground level properly covered with roof or plastic materials for protection from direct effect of moisture and the considerable delay in use.

FORMS

General Conditions

1. Forms shall conform to the shape, lines and dimensions shown on the drawings. They shall be substantial and designed to resist the pressure and weight of the concrete.

2. Forms shall be properly tied and braced or shored so as to maintain their position and shape. Forms shall be sufficiently tight and strong to prevent leakage of mortar.

3. Where required by the Owner, Shop drawings of formwork, shall be submitted for approval before fabrication and erection of such formwork.

4. Provide temporary openings where necessary to facilitate cleaning and inspection before depositing concrete.

5. Before construction, all form materials are subject to approval. The type of form used shall be in accordance with the finish requirements as specified or as shown on the detailed drawings.

6. Forming shall start at the first floor level with new materials. Forms for exposed concrete may be reused only if the surface has not absorbed moisture and has not splintered, warped or peeled, subject to the approval of the supervising Architect or Engineer.

7. Forms shall be coated with non-staining form oil before setting reinforcement. The form oil shall not contain chemical that will impair the strength of the concrete.

8. Side forms of footings may be omitted and concrete be placed against the next excavation only when approved by the supervising Architect or Engineer.

9. All exposed corners shall be square. Extra care shall be exercised while stripping the forms. Corners shall be protected against chipping or other damages that may be caused by the working force.

10. Removal of forms or shoring is subject to approval by the supervising Architect or Engineer, and under no circumstances shall bottom form and shoring be removed until after the members have acquired sufficient strength to support their weight and the load thereon. Forms shall main in place for a minimum time as follows:

    Columns, shear and bearing walls --------- 3 days
    Stairs (bottom forms) ---------- 21 days
    Beams and Slabs (bottom form) --------- 21 days

OTHER FORMS

Exposed exterior surfaces of building where Architectural finishing is required and as shown on detailed drawings, the following conditions shall be observed:

1. Forms shall be designed and constructed to facilitate early removal without damage to exposed surfaces of the concrete, free of offsets, and square corners true to lines and profiles as detailed.

2. Form ties will not be permitted through forms for surfaces which will be exposed. Formworks shall not be used twice unless otherwise approved by the supervising Architect or Engineer.

3. Exposed and Interior Surfaces treated plywood forms or moisture resistant plywood shall be laid vertically or horizontally in large are with joints so arranged and treated properly as required to provide smooth concrete surfaces.

FORMWORK ACCESSORIES

Form ties shall be submitted for approval. It shall be so designed as to leave no metal closer than 19 mm to the surface of the concrete or to leave a hole greater than 22mm in diameter on the face of the concrete.

FINISHING OF FORMED SURFACE

Remove forms and form tie ends then fill holes with 1:2 Portland cement mortar mixed to match the concrete. All defective areas below grade line not exposed to view shall be patched with Portland cement mortar mixed to match the concrete mixture as directed by the supervising Architect or Engineer.

1. *Exposed Exterior surfaces of the building where special finish is indicated* – Concrete shall be placed and finished as herein before specified and as required to provide eve dense surface of uniform color, free from marks, aggregate, pockets, honeycomb or other imperfections so that after treatment of the finished surfaces will not be required.

2. Any concrete which is not formed on level of alignment, or shows defective surfaces shall be considered as not conforming with the expense of the Contractor, unless the Owner or his authorized representative grants permission to patch or otherwise correct the defective areas.

3. Permission to patch any such area shall not be a waiver of the right of the Owner to require complete removal of the defective works.

4. *Exposed Interior Finishes* – patch all defective areas and remove all fins, form joint marks, rough spots and other defects by rubbing with a suitable tools until such defects and rough areas are completely removes and surfaces free from imperfections so as to produce dense, smooth, uniform finish with desired texture and design.

5. Silicone water repellent shall be applied to all exterior exposed concrete surfaces above grade which are not to be painted.

INSERT, SLEEVE AND SIMILAR ITEMS

1. All required flashing, reglets, seal, masonry ties, anchors, wood locks, nailing strips, ground, inserts, wire hangers, sleeves, drains, guard angles, (*insert for elevator guide supports where required)*, provisions for floor hinges boxes, and concealed overhead door closer and al items specified, as furnished under this and other sections of the Specifications shall be in their final position at time concrete is placed and shall be properly located, accurately positioned and built-in to the construction and maintained securely in place.

2. Insert on hangers for ceiling construction specified under the plastering section shall be located only in bottom of concrete ribs or other concrete members crossed such ceiling construction.

3. Sleeves shall not be installed in beams, ribs, or column, except upon formal approval of the Architect or Engineer.

4. All stone-cut and V-cut lines, Sunk fillets, and the like, on concrete wall surface shall be integrated into the concrete with the corresponding removable mould on the forms before the concrete is poured and shall be finished straight and clean-cut in accordance with the size and shape as shown on full size details.

FINISHING OF SLAB

1. Finish floor and roof slabs shall be level plane surfaces unless otherwise specified on the drawings, with a tolerance of 3 mm in 3.0 meters. Surfaces shall be slope towards the drains as required.

2. Resilient flooring, Ceramic Tile or Marble, base slabs which are to receive these finishes or other finished requiring “Thin-Set” installation shall be floated and toweled with a steel trowel to provide a smooth surface as required to receive the flooring.

3. For roofing membrane waterproofing, the working processes is the same as that for Resilient Flooring except steel troweling which may be omitted.

4. Exposed concrete finish surface where no finishing applied as called for on the drawings shall be finished with a steel trowel as required to produce a hard, dense finish free from surface imperfections.

5. Dry materials should not be used on the surface to be finished. Apply hardener and sealer in accordance with the manufacturer’s printed instructions.

WATERTIGHT CONCRETE

1. All waterproofing on deck wherever called for in the plan shall be guaranteed to be absolutely water proofed and free from leaking for a period of two (2) years.

2. Should any leakage develop in these areas, they shall be made waterproof by approved waterproofing methods and materials and this shall be repeated if necessary until all leaks has been stopped.

3. Guarantee shall extend for a full two years after the last leak has stopped

4. All pipes or piping under slabs must be completed before the slabs are poured.

CONCRETE FLOORS ON FILL

Concrete floor and steps on fill shall be laid on a prepared foundation which shall be placed as follows:

1. Earth or sand fill shall be laid to a uniform grade as shown on the detailed drawings; fill shall be placed in layers not to exceed 15 centimeters thick, for each layer being thoroughly wetted and rolled or tampered.

2. Earth or sand fill shall be made as soon as the concrete of the walls and foundations has set sufficiently to permit the filing load and pressure. On top of this fill shall be placed 10 cm. layer of gravel which shall be rolled or tampered.

3. All of these sand and gravel foundations specified above shall be kept wet for at least 30 days after rolling or tamping so as to allow settlement before the floors are placed.

4. Concrete floors shall be laid in alternate strips about one (1) meter in width by 6 meters minimum length, but following pattern shown on drawings. The construction joints shall coincide with the groove in case such items are called for in the cement finish. After the concrete has set, the form shall be removed and the remaining strips, laid.

5. All concrete shall be of such consistency as to require a tamping to bring the water to the surface. Tampering shall be done mechanically.

6. Concrete floor and steps on fill or in ground shall be reinforced if indicated in the drawings. The size and spacing of the reinforcing steel shall be in accordance with the drawing of Specifications.

HANDLING AND PLACING OF CONCRETE

Concrete during and immediately after depositing, shall be thoroughly compacted. The compaction shall be done by mechanical vibration subject to the following provisions:

1. The vibration shall be internal unless special authorization of the other method is given by the supervising Architect or Engineer or as provided herein.

2. Vibrators shall be of a type and design approved by the supervising Engineer. They shall be capable of transmitting vibration to the concrete at frequencies of not less than 4,500 impulses per minute.

3. The intensity of vibration shall be as such as to visibly affect a mass of concrete of 25 mm, slope over a radius of at least 50 centimeters.

4. The Contractor shall provide a sufficient number of vibrators to properly compact each batch immediately after it is placed in the forms.

5. Vibrations shall be applied at the point of deposit and in the area of freshly deposited concrete. The vibrator shall be inserted into and withdrawn from the concrete slowly and gradually.

6. The vibration shall be sufficient duration and intensity to compact the concrete thoroughly but shall not be continued so as to cause segregation. Vibration shall not be continued at any one point to the extent that localized areas of grout are formed.

7. Vibrators shall be thoroughly manipulated so as to work the concrete around the reinforcement and embedded fixtures and into the corners and angles of the forms.

8. Application of vibrators shall be at points uniformly spaced and not farther apart than twice the radius over which the vibration is visibly affected.

9. Vibration shall not be applied directly or through the reinforcement sections of layers of concrete which have hardened to a degree that the concrete ceases to be plastic under vibration.

10. It shall not be used to make concrete flow in the form over distances so great as to cause segregation and vibration shall not be used to transport concrete.

GRADATION OF AGGREGATES

1. Fine and Coarse aggregates used in concrete, shall be tested in accordance with the requirements of the *"Standard Specifications for Concrete Aggregates"* ASTM 033-67m with a minimum frequency of one (1) set of 6 and one (1) set of 7 test per 1,000 cubic meter source, as follows:

2. At least one sample of fine and coarse aggregates used in concrete shall be tested in accordance with the requirements of the *"Standard Specifications for Concrete Aggregates"* ASTM 033-67 grading as follows:

Coarse Aggregates

Specific …….. Grading
Gravity ……... Soundness
Absorption ……. Abrasion
Material finer than No. 200 sieve

Fine Aggregates

Grading ……Absorption
Soundness…….Organic Impurities
Material Finer than No. 200 sieve
Mortar strength, 7 days
Specific Gravity

Coarse Aggregates (percent passing)

38 mm sieve …… 100%
25 mm sieve …… 95-100
13 mm sieve …… 25-50
No. 4 sieve …….. 0-10
No. 8 sieve …….. 0-5

Fine Aggregates (percent passing)

9 mm sieve ……. 100%
No. 1 sieve ……. 90-100
No. 8 sieve ……. 80-95
No. 16 sieve ….. 50-85
No. 30 sieve ….. 30-70
No. 50 sieve ….. 10-45
No. 100 sieve ….. 0-10

3. Aggregates failing to meet these specifications, but which have been shown by approved laboratory tests to produce concrete of the required quality may be used where authorized by the Architect or Engineer.

4. Aggregates shall be quarried or washed in fresh water and shall contain no more than one twentieth 1/20 of (1%) percent salt by weight.

STORAGE OF MATERIALS

1. Portland Cement

a) Cement delivered in bags shall be stored immediately upon receipt at the work site in a weather proof structure which shall be air tight as practicable with suitable wooden floors which shall be elevated above the ground at a distance sufficient enough to prevent the absorption of moisture.

b) Bags shall have guaranteed constant cement content and shall be provided with proper labels showing the number of consignment and the date of site delivery.

c) The bag shall be stacked close together to reduce circulation of air but should not be stacked against outside walls but in such a way that they will be easily accessible for inspection and testing and shall be used in the order of their delivery.

d) Cement that has been in storage longer than six months will be tested by standard mortar tested or other tests as deemed necessary by the Owner to determine its suitability and such cement shall not be used without the express approval of the Owner.

e) Bags shall not be stored to a height greater than two (2) meters. All cement must be free from lumps or evident for deterioration.

f) Cement delivered in bulk shall be stored in properly designated elevated airtight and waterproofed silos or bins, provided at the Contractor's expense. The silos shall be adequate in size to ensure continuity of work at all times.

g) The site shall be kept perfectly dry. Bag cement shall be transported closed and effectively protected from weather by adequate coverings. Bulk cement shall be transported in closed container.

2. Aggregates

a) All aggregates shall be stored in bunkers provided with proper floors or tightly laid wood planes sheet metals, or other hard and clean surface. Fine and coarse aggregates of different sizes shall be stored in separate bunkers or piles in such a manner as to prevent aggregation, inclusion and contamination by dirt and other injurious foreign materials.

b) Stockpiles of coarse aggregate shall be built in horizontal layers not exceeding 1.20 meters in depth to minimize segregation. Should the coarse aggregate become segregated, it should be re-mixed to conform to the grading requirements given herein before.

3. Reinforcing Steel Bars

Reinforcing steel bars shall be transported and stored at the site in such a way as to prevent damage or deterioration of the steel by rust or coating with grease, oil, dirt and other objectionable materials. Storage shall be in separate piles or racks so as to avoid confusion or loose of identification after bundle are broken.

REBAR SPACING AND COVER

1. Reinforcing Bars

   Reinforcing bars shall be fixed one to the other by means of adequate steel wire ties to form rigid reinforcement cages or nets. The reinforcement shall be fixed in the form by approved concrete distance blocks, space bars, links and stirrups, and all to be provided at the Contractor's expense. Reinforcing bars shall be spaced according to the approved working drawings and the distance between bars shall not be less than those recommended in ACI-318.

2. Concrete Cover

   The concrete to the gutter reinforcing bars shall be those recommended in ACI 318, unless otherwise specifically indicated on the drawings.

3. Anchorage Length

   Plain bars shall be provided with end hook unless otherwise specified. The lengths of the anchorage of reinforcing bars shall be at least those recommended in ACI 318

4. Splices

   Splices in bars shall be avoided as far as possible and shall be staggered in any one structural member. They shall conform to the recommendations in ACI 318. In no case shall splices be made at critical points of maximum stress.

PATCHING

1. Immediately after the forms have been removed and work has been examined by the Owner, and his permission given, all loose materials shall be removed.
2. All holes, stone pockets and other surfaces which were in contact with forms treated with cement retarding materials shall be removed with wire brush or other approved method until a rough bonding surface of exposed aggregate is obtained.

3. Any surface considered by the supervising Engineer to be insufficiently roughened shall be further roughened by an approved mechanical means. Surfaces shall be thoroughly washed down with water.

4. Honey combed and other defective areas must be chipped out to solid concrete, the edge cut as straight as possible and at right angles to the surface of slightly undercut to provide a key at the edge of the patch.

5. Shallow patches may be filled with mortar similar to that used in the concrete. This should be placed in layers not more than 12 mm thick and each layer given a scratch finish to improve bond with the succeeding layer.

CONSTRUCTION JOINTS

1. Once started, concreting shall be continued without interruption and shall only be stopped at properly indicated and prepared construction joints.

2. The position of construction joints shall be decided in advance so that the amount of concrete required to be placed at any one time does not exceed the capacity of the mixing plant.

3. In all cases where the positions of construction joints have not been indicated on the drawings, they must be approved by the Architect or Engineer.

4. Except where inclined joints are specified, all joints shall be formed to vertical or horizontal planes. Vertical joints shall be formed against a properly constructed stop-board.

5. As a general rule, joints in columns shall be made as near as possible to a beam haunching and joint in beams and slabs shall be made at positions shown on the drawings.

6. Construction joints shall be wire-brushed while the concrete is still green, roughened or hacked to expose the aggregate across the whole area of the joint.

7. Before fresh concrete is placed, the roughened surface shall be swept clean of all loose materials, thoroughly wetted and covered with a 12 mm thick layer of mortar composed of cement and sand in the same ratio as the cement and sand in the concrete mix.

8. Special care shall be taken to ensure that the first layer of fresh concrete is thoroughly rammed against the existing layer.

9. The cost of all measures necessary to form construction joints, whether shown on the Drawings or not, shall be deemed to be included in the Contractor’s rates for concrete.

B. CONCRETE MASONRY

GENERAL CONDITIONS

The concrete masonry Contractor shall examine all drawings, specifications and all conditions that has relations and may affect his work and performance in the execution the Contract.

Where any deviation on the Plans and Specifications is to be made, the Owner shall be notified and his written approval shall be obtained before proceeding with the work.

SCOPE OF WORK

The work covered by this Item shall include the following:

1. Furnishing of all necessary materials, tools, equipment, labor, and appliances necessary to complete the execution of the concrete masonry work as shown on the drawings and herein specified.

2. All preparations for masonry work necessary to receive and adjoin other work, including provisions for inserts and attachment as noted in the plans and specifications which shall be installed under the terms of work.

3. Coordination with all other trades in laying out and execution of the concrete masonry work. Giving the work his personal supervision and keeping a competent foreman on the job at all times.

4. Arranging for adequate bracing, forming and shoring required in conjunction with and in the course of constructing the concrete masonry although not provided for under other sections.

5. Furnishing of all reinforcing steel for concrete masonry work and their placement including those not provided for under other sections but necessary for proper prosecution of the work.

6. Arranging for the necessary storage space and protection for materials at the job site.

7. Providing assistance and facilities for all inspections by the Owner or his authorized representatives as required in the course of execution of the work.

8. Arranging for furnishing test specimens and samples of materials as may be required.

MATERIAL REQUIREMENTS

The following materials to be used under this section of the specifications shall conform to the concrete masonry standards as indicated.

1. Cement to conform with ASTM C-150

2. Sand or fine aggregate shall be clear, sharp and well graded, and free from injurious amount of dust, lumps, shale, alkali, surface coatings and organic matter.

3. Lime: Hydrated lime shall conform with ASTM C-207

4. Quicklime shall conform with ASTM C-5 Specifications. Quicklime shall be slaked and then screened through a 16 mesh sleeve.

5. After slaking, screening and before using, it shall be stored and protected for not less than 10 days. The resulting product shall weigh not less than 1330 kilogram per cubic meter.

6. Hollow load bearing masonry units shall be type I Class A or B unit conforming with ASTM C-90-70 and the Philippine Bureau of Standard No. 15-2, series of 1979.

7. Solid load bearing masonry units shall be class a units conforming to ASTM C-145. All load bearing masonry units shall have a minimum compressive strength of not less than 5.5 Mpa (800 psi) based on 5 individual units when tested in accordance with the methods set forth in ASTM C-140-70 or as tested by the Bureau of Research and Standard, DPWH.

8. Masonry units shall have been cured for not less than 14 days if steamed-cured, or 28 days if air-cured when placed in the structure.

CONCRETE HOLLOW BLOCKS

1. For walls and partitions shown on the detailed drawings requiring concrete hollow blocks, the Contractor either uses of concrete or ceramic hollow blocks upon approval of the Architect or Engineer.

2. The load bearing of hollow blocks shall have a minimum compressive strength of 6.89 Mpa (1000 psi) computed from the average of five (5) units based on the average gross area, and a minimum of 5.41 Mpa (800 psi) for the individual unit respectively, all based on gross area.

Visual Inspection

All units shall be sound and free from cracks or other defects that would interfere with the proper placing of the unit or impair the strength or permanence of the construction.

Sampling of Specimen

In sampling blocks for the strength, absorption and moisture content determination, ten (10) individual units shall be selected from each lot of 10,000 units or fraction thereof and 20 individual units from each lot of more than 10,000 units.

Sampling

For lots of more than 10,000 units, 10 individual units shall be selected from each 50,000 units or fraction thereof, contained in the lot. For non-bearing type of CHB, no sampling for test shall be required for less than 500 units to be used in the job.

Testing

Units shall be tested in accordance with the standard method of testing Masonry units of the American Society of Testing Materials ASTM designation C-140 and or by the Bureau of Materials and Quality Control, DPWH. No blocks shall be used unless results of tests are known and duly approved by the supervising Architect or Engineer.

Reinforcement

All units shall be laid with a mortar composed of one part Portland cement and three parts of sand. Reinforcement shall be done in accordance with the structural plans as to size, spacing and other requirements.

MORTAR AND GROUT

Cement to be used for mortar and grout shall be: Type 1, 2, 3 or type 4 Portland cement conforming to ASTM C-150

1. Plastic cement shall have less than 12% of the total volume in approved types of plastic agents and shall conform to all the requirements for Portland cement per ASTM C-150, except the limitations in insoluble residue, air entrainment, and addition subsequent to calciration.

2. Mortar shall be freshly prepared and uniformly mixed in the proportion of 1 part Portland cement ¼ part maximum line putty or hydrated lime, loose sand not less than 1-1/2 and not more than 3 times the sum of the volume of cement and lime used, and shall conform to ASTM C-270.

3. Grout for pouring shall be of fluid consistency and mixed in the proportion by volume: 1 part Portland cement, 2-1/2 part minimum to 3 parts maximum damp loose sand where the grout space is less than 7.5 cm in its least dimension.

4. Grout for pouring shall be fluid consistency and mixed in the ratio by volumes; 1 part Portland cement, 2 parts minimum to 3 parts maximum damp loose sand, 2 parts coarse aggregate where the grout space is not more than 7.5 cm. in its least dimension.

5. Grout for pumping shall be fluid consistency and shall have not less than 7 bags of cement in each cubic meter of grout. Not mix design shall be approved by the supervising Engineer.

6. Fluid consistency shall mean; as fluid as possible for pouring without segregation of the constituent parts.

7. Aggregate for mortar shall conform to ASTM C-144.

8. Aggregate for grout shall conform to ASTM C-404

ADMIXTURE

1. The used of admixtures shall not be permitted in mortar or grout unless substantiating data is submitted to and approved by the supervising Architect or Engineer.

2. The use of Admixtures shall not be permitted in mortar without reducing lime content

3. Insert coloring pigments may be added but not to exceed 6% by weight of the cement.

4. The use of uncontrolled fire clay, dirt and other deleterious materials is prohibited.

5. Water to be used shall be fresh, clean and free from deleterious quantities of acids alkali and organic materials.

REINFORCING STEEL

1. The minimum requirements for deformed steel bars shall conform to ASTM A-305.

2. Wire reinforcement shall also conform with ASTM A-82.

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

CONSTRUCTION

1. Workmanship

a) Masonry work shall not be started when the horizontal and vertical alignment of the foundation has a maximum total error of 25 mm OR 2.5 centimeters.

b) All masonry work shall be laid true to line, level, plumb and neat in accordance with the plans and to the satisfaction of the Owner.

c) Units shall be cut accurately to fit all plumbing ducts, openings electrical works, etc. and all holes shall be neatly patched.

d) Extra care shall be taken to prevent visible grout mortar stain.

e) No construction supports shall be attached to the wall except where specifically permitted by the supervising Architect or Engineer.

2. Masonry Unit

a) Masonry unit shall be sound, dry, clean and free from cracks when placed in the structure.

b) All masonry units shall be stored on the job and kept off the ground and protected from the elements of weather.

c) Wetting the units shall not be permitted except when hot dry weather exists causing the units to be warm to the touch, and then the surface only may be wetted with a light fog spray.

d) Proper masonry units shall be used to provide for all window, doors, bond beams, lintels, plasters, etc., with a minimum of unit cutting.

e) Where a masonry unit cutting is necessary, all cuts shall be neat and true line.

f) Mixing of Mortar and Grout Mortar shall be mixed by placing ½ of the water and sand in the operating mixer, then add the cement, lime and the remainder of the sand and water.

g) Mortar should be re-tampered with water as required to maintain high plasticity. Re-tampering on mortar boards shall be done only by adding water within a basin formed with mortar and the mortar re-worked into the water.

h) Any mortar which is unused after 1 – ½ hours from the initial mixing time shall not be used.

i) After all ingredients are in the batch mixer, they shall be mechanically mixed for not less than 3 minutes. Hand mixing shall not be employed unless specifically approved.

3. Bonding

Concrete masonry units shall be laid with the thicker edge of the core up to provide a wider mortar bed.

a) Both face core and ends of all blocks should receive a full bed of mortar.

b) Cross web should be mortared.

c) For bonding masonry to the foundation, the top surface of the concrete foundation shall be clean with laitance removed and aggregate exposed before masonry construction can be started.
d) Where no bond pattern is shown, the wall shall be laid up in straight, uniform coarse with regular running bond.

e) Intersecting masonry walls and partitions shall be bounded by the use of steel ties at 60 centimeter on.

4. Reinforcement

When the foundation dowel does not line up with a vertical core, it shall not be sloped more than one horizontal in six vertical.

a) Dowels shall be grouted into a core in vertical alignment, even though it is an adjacent cell to the vertical wall.

b) Reinforcing bars shall be straight except for bends around corners and where bends or hooks are detailed the plans.

c) Reinforcing steel shall be lapped 30 bar diameters minimum where spliced bars shall be separated by one bar diameter or wired together.

d) Vertical bars shall be held in position at the top and bottom and at intervals not exceeding 192 diameter of the reinforcement.

e) Horizontal reinforcing bars shall be laid on the webs of the units on continuous masonry courses, consisting of bond-beam or channel units, and shall be solidly grouted in place.

f) Vertical reinforcing steel shall have a minimum clearance of 6 mm from the masonry, and not less than one bar diameter between bars.

g) Wire reinforcement shall be completely embedded in mortar or grout. Joints with wire reinforcement shall be at least twice the thickness of the wire.

h) Wire reinforcement shall be lapped at least 16 cm. at slices and shall contain at least one cross wire of each piece of reinforcement in the lapped distance.

5. Grouting

Reinforcing steel shall be secured in place and inspected before grouting starts.

a) Mortar dropping should be kept out of the grout space.

b) All grout shall be puddle or vibrated in place

c) Vertical cells to be filled with grout shall have vertical alignment to maintain a continuous unobstructed core space.

d) Cells containing reinforcement shall be solidly filled with grout and pours shall be stopped 3.8 centimeters below the top of a course to form a key at pour joints.

e) Grouting of beams over openings shall be done in continuous operation.

f) The tops of unfilled cell columns under a horizontal masonry beam shall be covered with metal latch or special units used to confine the front fill to the beam section.

g) All bolts, anchors, or inserts in the wall shall be solidly grouted in place.

h) Spaces around metal door frame and other built-in items shall be filled solidly with grout of mortar.

REJECTION

In case the shipment fails to conform to the specified requirements, the Contractor may sort it, and new specimen shall be selected by the Owner or his supervising Engineer from the retained lot and tested at the expense of the Contractor. In case the second set of specimens fails to conform to the test requirements, the entire lot shall be rejected.

C. MASONRY FINISH

CONSTRUCTION REQUIREMENTS

1. Curing

The granolithic topping shall be cured at least 6 days before grinding or until such time when it has set sufficiently hard to permit machine grinding or rubbing with coarse sandstone grit without disclosing any surface aggregate.

2. Surfacing

a) After curing all granolithic topping, surfaces shall be wetted and grinded with electric grinding machine to a smooth and even surface.

b) Where it is not possible to use electric grinding machine, surface shall be hard-rubbed manually using No. 24 abrasive grit stone rubbing after which a light grouting of white Portland cement paste of creamy consistency as the matrix used in the topping.

c) Grout shall remain on the surface until the time of final grinding and cleaning.

3. **Finishing**

    a) Allow at least 72 hours after the granolithic surface have been grouted before removing the grout coat, cleaning and fine stone grinding by electric grinding machine using no coarser than No. 80 abrasive grit.

    b) Final grinding or rubbing of granolithic marble surface shall remove scratches and produce a true plane surface of uniform color and texture without objectionable irregularities of any description as that of the approved samples.

    c) *Cleaning, Waxing and Polishing.* Upon completion of final grading or rubbing of granolithic marble the Contractor shall apply two coats of natural wax penetrating type. Surface shall be allowed to dry and polished.

MEASUREMENT AND PAYMENT

1. All granolithic marble finish indicated on the Plans and described herein shall be measured in square and lineal meter or part thereof for work completed and accepted to the satisfaction of the supervising Architect or Engineer.

2. The quantified area determined in the preceding section and provided in the Bill of Quantities shall be paid for at the Unit Bid or Contract Unit Price

(A) PEA GRAVEL WASHOUT FINISH

GENERAL CONDITIONS

The Contractor shall furnish all materials, equipment, labor, and tools required in undertaking the proper application of pea gravel washout finish as shown on the Plans and in accordance with this Specifications.

A-1 MATERIAL REQUIREMENTS

a) **Pea-Gravel** – pie-gravel specie shall be of well graded sizes consisting of 4 mm to 8 mm round variation wash river gravel.

b) **Cement** – Portland cement shall conform to the Specification requirements of Hydraulic Cement. Use only one brand of cement throughout the pea-gravel washout finish mix.

A-2 CONSTRUCTION REQUIREMENTS

a) All pea-gravel washout finish shall be done by men experienced and qualified to do this particular type of trade.

b) The Contractor shall submit at least two (2) samples to the supervising Architect or Engineer for approval measuring 30 cm. x 30 cm. showing its color, texture and design patterns.

1. Surface Preparation

a) Walks, ramps, driveways and elsewhere indicated on the Plans as pea-gravel washout finish shall be properly sloped and rendered under bed.

b) The under-bed mixture shall be spread to bring mortar under-bed to a level of 16 mm below the finish floor line.

c) For concrete masonry walls, columns, etc., the surface to be applied shall be first rendered a scratch coat and made true to plane, leveled plumbed and squared then allowed to cure for seven (7) days

2. Mixture and Proportion

a) Pea gravel washout mix shall consist of one part Portland cement and two parts pea-gravel measured by volume or a proportion equivalent to 1:2.

b) Mixtures shall be in approved containers to ensure that the specified materials are controlled and accurately measured. Mixture measured by shovel or shovel counts will not be permitted.

c) Unless specified otherwise, pea-gravel washout mix shall be in the proportion by volume in approved mixing machines or mortar boxes.

d) The aggregates introduced and mixed in such a manner that the materials will be uniformly distributed throughout the mass.

e) A sufficient amount of water shall be added gradually and the mass further mixed until a mortar plasticity necessary for the purpose intended is obtained.

f) Mortar boxes, pans, etc., where mixtures are mixed shall be kept clean and free from debris or dried mortar.

3. Application

a) Before work is started, the slope for drainage should be properly done and provided in the prepared under-bed.

b) Concrete setting bed must be sufficiently rough and all loose particles or anything which will diminish bond shall be thoroughly cleaned off.

c) The concrete under-bed must be kept wet for at least four (4) hours before the pea-gravel mix is applied.

d) Pea-gravel mix shall be applied with pressure to obtain solid adhesion to the under-bed and setting bed.

e) The finish surface shall be firmly, evenly, and monolithically applied.

f) When the surface applied with pea-gravel mix has sufficiently set, the cement paste shall be removed by use of sponge or water spraying equipment used in this specially trade in order to expose the pea-gravel quarter face but still intact.

4. Curing, Cleaning and Finishing

As soon as possible as the pea-gravel are exposed to desire appearance the surface shall be covered with damp burlap other approved covers. At the proper time when surface are semi-dry and stable allowing the applied surface to cure.

5. Protection

a) For proper curing, keep the pea-gravel washed finish moistened for a period of at least seven (7) days by thoroughly wetting the surface three (3) times a day and protecting it from the strong rays of the sun with burlap or layer of sand.

b) Upon completion of the work and the surface has completely seasoned, wash with clean water and brush thoroughly to produce a clean and sparkling appearance and protected until work has been accepted.

A-3 METHOD OF MEASUREMENT

All works done under this Item shall be measured in square meter or linear meter or part thereof for work completed and accepted to the satisfaction of the supervising Architect.

A-4 BASIS OF PAYMENT

The quantity determined in the Method of Measurement shall be paid for at the unit price bid or contract unit price as stated in the Bill of Quantities, which price constitute full compensation including labor and materials, tools and incidentals to complete this item.

(B) BUSH HAMMERED FINISH

GENERAL CONDITIONS

1. The Contractor shall furnish all materials, tools, plant, equipment and labor and other facilities and undertaking the proper application of Bush Hammered finish complete required as shown on the Plans and in accordance with this Specifications.

2. The Contractor shall submit for approval samples of each applied finish 30 cm. x 30 cm. of different shades to the Architect. Approved samples shall be kept for future reference.

B-1 MATERIAL REQUIREMENTS

1. Cement

Cement shall be ordinary gray Portland cement conforming to the specification requirement for Hydraulic cement. One (1) brand of Portland cement shall be used throughout the plaster mortar mix.

2. Adobe Aggregate

Adobe aggregate shall be crushed and pulverized to an approved graded size improving its mixing ability as coarse aggregate.

B-2 CONSTRUCTION REQUIREMENTS

1. Surface Preparation

Wall surfaces to be rendered with bush hammered finish shall be scratching coated with plaster cement mortar and be made true to plane plumbed and squared. The scratch coat must be properly cured within seven days.

2. Adobe Mortar Mixture

Adobe plaster shall be a mixture of Portland cement, crushed and pulverized graded adobe stones. It shall be uniformly mixed in the proportion by volume of one part Portland cement and two parts adobe aggregates or 1:2 proportions.

3. Application

a) Before any application work is commended, all wood moulds for horizontal and vertical groove joints shall be first established and set. The scratch coast has to be seasoned for 7 days

b) Surfaces to be applied with adobe plaster mortar shall be thoroughly moistened with fog spray.

c) Adobe plaster mortar shall be floated to a true and even surface. It may also be floated / troweled to a hard fluted surface with series of grooves also known as corduroy finish.

d) As soon as the plastered surface is hard enough to react hammering, the surface by hammering with an ax or hatchet leaving or exposing the natural appearance of the aggregate composition of mortar mixture.

4. Workmanship

a) Bush hammered finish shall be level, plumbed squared and true to a tolerance of 3 mm in 3.0 meters without caves, cracks, blisters, pits, crazing, discolorations, projection or other imperfections.

b) Plastering work shall be formed carefully around angles, contours and cants. Special care shall be taken to prevent sagging and consequent dropping of applications.

c) There shall be no junction marks in the finish where one day work adjoins another.

5. Curing and Protection

Upon completion of the work all surfaces shall be cleaned with steel brush and water to remove loose particles leaving the cleaned surfaces in its natural appearance. When cleaned surfaces dries spray a coat of water repellant.

B-3 METHODS OF MEASUREMENT

Bush hammered finish shall be measure in square meter area and linear meter actually done completed and accepted to the satisfaction of the supervising Architect.

B-4 BASIS OF PAYMENT

The work quantified and determined in the preceding section or as provided in the Bill of Quantities shall be paid for at the Contract unit bid price which payment constitute full compensation including labor, materials and other incidentals necessary to complete this Item.

(C) PEBBLE WASHOUT FINISH

GENERAL CONDITIONS

The Contractor shall furnish all materials, labor tools, and equipment required in undertaking proper application of pebble washout finish as shown on the Plans and in accordance with this Specifications.

C-1 MATERIAL REQUIREMENTS

a) Pebble

Pebble shall be well graded stones sized ranging from No.4 to No. 10 rounded shape.

b) Cement

Cement shall be Portland type hydraulic cement gray or whit specie depending on the tone or color scheme approved. Colored cement shall be powder type pigmented used to the desired shade and color of finish.

C-2 CONSTRUCTION REQUIREMENTS

All pebble washout finish shall be done by men experienced and qualified to do this particular type of trade. The contractor shall submit at least two samples for each type of pebble washout finish to the Architect or Engineer for approval showing its color, texture and design patterns.

1. Surface Preparation

a) Surface to receive pebble washout finish shall be clean of all projection, dust, loose particles and foreign matters.

b) It shall be thoroughly wetted with clean water before application of scratch coat mortar. When the surface has sufficiently set, scratch with hard broom.

2. Mixture

a) Pebble finish mortar mixture shall consist of one part Portland cement and two parts pebble measured by volume or a proportion equivalent to 1:2

b) Mixtures shall be in approved containers to ensure that the specified materials are controlled accurately measured.

c) Mixtures measured by shovel or shovel counts will not be permitted. Unless specified otherwise, pebble washout mix shall be in the proportion by volume in approved mixing machines or mortar boxes.

d) The aggregate introduced and mixed shall be in such a manner that the materials will be uniformly distributed throughout the mass.

e) A sufficient amount of water shall be added gradually and the mass further mixed until a mortar plasticity necessary for the purpose intended is obtained.

f) Mortar boxes, pans etc., where mixtures are mixed shall be keep clean and free from debris or dried mortar.

3. Application

a) Before any application work started, the Contractor shall established all wood molding for vertical and horizontal groove lines after the scratch coat has seasoned for seven days in the case of masonry wall or concrete columns, beams and parapets etc.

b) In the case of finish flooring application and the like the slope of drainage shall be properly provided and design pattern properly placed.

c) The proposed under-bed shall be done to a level of 16 mm below the finish floor line to accommodate the pebble washout mix.

d) The prepared surface to receive the pebble washout mix shall be kept damp for at least 4 hours before the application work is started

e) Pebble washout finish mix shall be applied with pressure to obtain solid adhesion to the prepared surface. The applied surface shall be firm, even and monolithically applied, then allowed to set initially.

f) When the applied surface has initially set to withstand the removal of the cement paste, spray evenly by spray apparatus to washout the cement paste on the outer surface so that the pebbles are partly exposed or,

g) By means of paint brush of foam and water, or by means of spraying washing down the cement paste leaving the pebbles partially exposed in their natural texture appearance.

4. Workmanship

a) Pebble washout shall be leveled, plumbed, squared and true to line within a tolerance of 3 mm in 3.0 meters without caves cracks, blisters, pits, crazing, discoloration, projections or other imperfection.

b) There shall be no visible junction marks in the finish surface where one day work adjoins another.

c) Where required by the supervising Architect or Engineer, provide vertical and or horizontal groove joints.

5. **Curing and Protection**

a) When the pebble washout surface has finally set the surface shall be kept wet or moist for at least 6 days.

b) After all other trade have been completed the pebbles washout finish surfaces shall be saturated with diluted hydrochloric acid and cleaned with steel brush

c) Allow the clean surface to dry then apply a coat of silicon water repellant to protect the natural physical appearance of the pebble washout finish.

C-3 MEASUREMENT AND PAYMENT

1. Pebble washout finish shall be measure in square meters, lineal meters or part thereof for work actually completed and accepted to the satisfaction of the supervising Architect or Engineer.

2. The work done under this Item as provided in the Bill of Quantities shall be paid for at the Contract Unit Bid which price and payments constitute full compensation including materials and labor and incidentals necessary to complete this Item.

(D) CEMENT PLASTER

GENERAL CONDITONS

The Contractor shall furnish all cement plaster materials, labor, tools and equipment required in undertaking cement plaster finish as shown on the Plans and in accordance with this Specifications.

D-1 MATERIAL REQUIREMENTS

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

1. **Cement**. Cement shall be Portland Hydraulic Cement of any approved brand.

2. **Hydrated Lime** shall conform with the requirements as defined in Hydraulic Cement of any approved brand.

3. **Fine Aggregates**. Fine aggregates (sand) shall be clean, washed and sharp river sand, free from dirt, clay, organic matter or other deleterious substances

Sand derived from crushed gravel or stone may be used with the supervising Architect or Engineer's approval but in no case, shall such sand be derived from stone unsuitable for use as coarse aggregates.

D-2 CONSTRUCTION REQUIREMENTS

1. Mixture

a) Mortar mixture for brown coat shall be freshly prepared and uniformly mixed in the proportion by volume of one 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 and mixed with water to approved consistency and plasticity.

2. Surface Preparation

a) After removal of forms, reinforced concrete surfaces shall be roughened to improve adhesion of the cement plaster.

b) Surfaces to receive cement plaster shall be cleaned of all projections, dust, loose particles, grease and bond breakers.

c) Before any application of brown coat is started, all surfaces that are to be plastered shall be wetted thoroughly with clean water to produce a uniformly moist condition.

d) Brown coat mortar mix shall be applied with sufficient pressure starting from the lower portion of the surface to fill the grooved and to prevent air pockets in the reinforced concrete/masonry work and avoid mortar mix dropping.

e) The brown coat shall be lightly broomed or scratch before surface has properly set and allowed to cure.

f) Finish coat shall not be applied until after the brown coat has seasoned for 7 days and corrective measures had been done by the Contractor on surfaces that are defective.

g) Just before the application of the finish coat, the brown coat surface shall be evenly moistened with clean water.

h) Finish coat shall be floated first to a true and even surface, and then troweled in a manner that will force mixture to penetrate into the brown coat.

i) Surfaces applied with finish coat shall then be smooth with paper or foam in a vertical motion to remove trowel marks, checks and blemishes.

j) All cement plaster finish shall be 10 mm thick minimum on vertical concrete and or masonry walls.

Wherever indicated on the Plans to be *"Simulated Red Brick Finish,* the Contractor shall render brick design on plaster surface before brown coat had properly set and then allowed to dry.

Cement shall not be directly applied to:

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

b) Surface that had been painted or previously plastered.

3. Workmanship

a) Cement plaster finish shall be true to details and plumbed. Finish surface shall have no visible junction marks where one day's work adjoins the other.

b) Where directed by the Architect or Engineer or as shown on the Plans vertical and horizontal groove joints shall be 25 mm wide and 10 mm depth.

D-3 MEASUREMENT AND PAYMENT

1. All cement plaster finish shall be measured in square meters or part thereof for work actually completed in the building.

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

(E) PLAIN CEMENT PLASTER FINISH

GENERAL CONDITIONS

The Contractor shall furnish all materials, tools, equipment and labor required in undertaking the proper application of plain cement plaster finish as provided where plastering is noted the drawings and schedules. Plastering work shall be properly coordinated with the work of other trades.

1. The work of other trades shall be adequately from damages during the plastering operations. Finishing work shall be protected with a covering of heavy craft, waterproof paper or other approved protective covering with lapped and sealed joints.

2. Scaffolding shall be amply strong, well braced, tied securely and inspected regularly. Overloading of scaffolding will not be permitted.

E-1 MATERIAL REQUIREMENTS

1. Portland Cement shall conform with the standard specifications of the ASTM 1-150, type-I, latest edition.

2. Hydrated lime shall conform with the standard specification of the ASTM C-6, latest edition.

3. Sand shall be hard, sharp, well washed, siliceous, clean and free from deleterious material.

4. Water shall be fresh, clean and free from organic matter, acids and alkali.

E-2 DELIVERY, STORAGE AND HANDLING

Manufactured materials shall be delivered with unbroken packages or containers which are plainly labeled with the manufacturer's name and brand. All cement materials shall be kept dry until ready for use.

They shall be stored off ground, under cover and away from sweating walls and other damp surfaces.

E-3 MIXTURE

1. Plaster materials, specified on a volume basis, shall be measured accurately in approved containers that will insure the specified proportion.

2. Measuring materials with shovels or shovel count will not be permitted

3. Mortar for brown coat shall be mixed in the proportion by volume of 1 part Portland cement 3 parts sand, an 1/4 part hydrated lime

4. Mortar for finish coat shall be the same as specified for brown coats, except that the proportions of sand shall be increased to not more than 4 parts.

E-4 APPLICATION

1. All surfaces to receive plaster shall be cleaned of all projections, dust, loose particles, grease bond breakers and other foreign matter.

2. Plaster shall not be applied directly to concrete of masonry surfaces that have been painted or previously plastered.

3. Before the plastering work is started, masonry surfaces shall be wetted thoroughly with a fog spray of clean water to produce a uniformly moist condition.

4. Brown coat – shall be applied with sufficient pressure to fill the grooves in hollow block or concrete to prevent air pockets and secure a good bond.

5. The brown coat shall be lightly scratched and broomed. Each coat of cement plaster shall be kept moist for 48 hours after application and then allowed to dry.

6. Finish coat – shall not be applied until after the brown coat has seasoned for 7 days.

    a) Dust before the application of the finish coat.

    b) The brown coat shall again be evenly moistened with a fog spray

    c) The finish coat shall be floated first to a true and even surface then troweled in a manner that will force the sand particles down into the plaster.

    d) Plastered surfaces shall be smooth and free from rough areas, troweled marks, checks and blemishes.

    e) Thickness of the plaster shall be 10 mm (3/8") to 12 mm (½") on vertical concrete and on masonry

E-5 WORKMANSHIP

Plaster work shall be finished level, plumb, square and true to line within a tolerance of 3 mm (1/8") in 3.00 meters without waves, cracks, blisters, pits, crazing, discolorations, projection and other imperfections.

1. Plaster work shall be formed carefully around angles, contours, and well- up to screeds.

2. Special care shall be taken to prevent sagging and consequent dropping of mortar during applications.

3. There shall be no visible junction marks in the final coat where on day work adjoins the other.

E-6 PATCHING, PAINTING AND CLEANING

1. Upon completion of the building, and when directed, all loose, cracked, damage or defective parts shall be cut out and re-plastered in a satisfactory and approved workmanlike manner.

2. All painting and patching of plastered surfaces and plaster work abutting or adjoining any other finish work, shall be done in a neat and workmanlike manner.

3. Plaster drops or spatter shall be removed from all surfaces. Exposed plastered surfaces shall be left in a clean, unblemished condition ready to receive paint or other finish.

4. After the work has done, all protective coverings of cement finishes shall be removed from the floors. All rubbish and debris shall be removed from the building.

1.3. STRUCTURAL STEEL

SCOPE OF WORK

The scope of work under this section consists of furnishing of all materials, labor, tools, equipment, and performance of all operations relative to the fabrication, delivery to site, erection and painting of structural steel trusses and purlins as shown on the plans.

A. DESIGN CONDITIONS

1. All structural work shall in accordance with AISC Specification for the Design, Fabrication and Erection of Structural and steel for buildings.

2. Materials , and parts necessary to complete each item through such work which is not shown or specified shall be included, such as miscellaneous bolts, anchor, supports, braces and connections etc.

3. Shop drawings as well as erection drawings shall be prepared and submitted by the contractor to the supervising Architect or Engineer for approval before any fabrication is made.

B. SHOP DRAWINGS

1. Shop drawings giving complete information necessary for the fabrication of the component parts of the structure, including the location, type and size of all rivets, bolts and welds, shall clearly distinguish between shop and field rivets, bolts and welds.

2. Shop drawings shall be made on conformly with the best modern practice and with due regard to speed and economy in fabrication and erection.

C. MATERIALS

1. All structural steel shapes and plates shall conform to ASTM A-36.

2. Light-gauge Cold-formed Structural Steel shall conform to pertinent specifications of the American Iron and Steel Institute (AISI).

3. Machine bolts shall conform to ASTM A-307. Each bolt shall be provided with standard nuts and washers.

4. Anchor Bolts – shall conform to ASTM A-141.

5. Cross Bracing with Turnbuckles shall conform to ASTM A-307.

6. Welding Electrodes – shall conform to AWS A-5.1 or A-5.5, E 70 Electrodes.

D. FABRICATION

1. Field fabrication shall be kept to a minimum. And shop fabrication shall be employed to the greatest extent possible with members shop fabricated as practicable with a minimum requirement for field connections.

2. Welding, shearing, gas cutting, chipping and all other works involved in the fabrication of structural steel shall be done with accuracy and of the highest quality of workmanship, within the allowable tolerance prescribed in the AISC specifications.

E. WELDING

1. The technique, appearance and quality of welds and the method of correcting defective work shall conform to the applicable provisions of "*Workmanship of the Standard Code for Welding in Building Construction of the American Welding Society"*

2. Welding of structural members in shop and on field, shall be done only by certified and experienced welder.

3. Surfaces to be welded shall be free from loose side, rust, grease, paint and other foreign materials that will impair the soundness of the weld.

4. Temporary weld and assembly attachments shall be kept to a minimum. All temporary attachment that are welded, shall be removed by a flame torch above the parent metal surface and ground to smooth surface by power grinding.

5. Note shall be made on the Plans and on the shop drawings of those joints or groups of joints in which it is especially important for the welding sequence and technique of welding to be controlled carefully, to minimize welding under restraint, and to avoid undue distortion.

6. Weld length called on the Plans and on the shop drawings shall be the net effective length.

F. CONNECTION AND HOLES

Connections shall be as shown in the drawings and shall develop the full capacity of the members.

1. Surfaces or joints prepared for welded or high strength bolted connections shall comply with the cleanliness requirements of all joints surfaces and contact surfaces within friction types joints as specified in “Bolted parts” of the AUSC Specifications.

2. Holes shall be punched or drilled at right angles to the surface of the metals and shall not be enlarged by burning.

3. Holes shall be clean-cut without rugged edges. Outside burrs resulting from drilling or reaming operations shall be removed with a tool which reaches a 1.588 mm level around the bolt holes.

G. QUALITY CONTROL PROCEDURES

1. Quality control shall be practiced by the Fabricator to assure high quality in the work. In addition to the Fabricator’s quality control procedures, materials and workmanship shall be subject to Inspection by qualified inspectors representing the Owner.

2. Fabricator shall cooperate harmoniously with the inspector to avoid interpretation in the work, when correction will be needed.

H. REJECTION

1. Materials or workmanship not in reasonable conformance with the provisions of this Specification shall be rejected at any time during the progress of the work.

2. The Fabricator shall receive of all reports made by the Inspector authorized by the Owner and/or his supervising Architect or Engineer.

I. ERECTION

1. The steel structures shall be erected plumb and true to line and grade. Bracings and supports shall be introduced whenever necessary to take care of all the loads to which the structure may be subjected. Such bracings shall be left in place as long as may be required for safety.
2.
3. Base plates and bearing plates shall be supported on steel wedges until the supported members shall have been aligned and plumb, following which the entire bearing are shall be grouted solid with non-shrink cement.

J. MARKING

1. Shop fabricated members shall be marked prior to delivery to facilitate the erection of the members.

2. Markings shall be listed and given description and copies of which shall be furnished to the Owner.

3. Markings shall be neatly painted on the members with a distinctive color of enamel paint.

K. SHOP PAINTING

1. Steel works to be encased in concrete shall not be painted. All other steel works shall be given one coat of shop paint of red lead primer, applied thoroughly and evenly to dry surfaces, which have been cleaned, by brush, spray roller coating, floor coating or dipping at the selection of the Fabricator.

2. Steel work prior to painting and after inspection and approval shall be cleaned of loose mil scale, loose rust, weld slag or flux deposit, dirt and other foreign materials.

3. Oil and grease shall be removed by solvent. Parts of the steel work which shall be fielded, welded or connected shall not be painted. All steel work specified to have no shop paint shall likewise be thoroughly cleaned.

L. FIELD PAINTING

All the steel work after complete erection, shall be field painted with the type and color specified in the section of painting of this Specifications. Painting shall not be done on any steel surface that is thoroughly clean and dry.

1.4.ROOFFING WORKS

CORRUGATED METAL ROOFING
PRE-PAINTED METAL SHEET

SCOPE OF WORK

This Item consist of furnishing all pre-painted metal sheet materials, tools and equipment, plant including labor required in undertaking the proper installation and complete as shown on the Plans and in accordance with the Specifications.

A. MATERIAL REQUIREMENTS

All Pre-Painted metal sheet and roofing accessories shall be oven baked painted true to profiles indicated on the Plans.

Pre-painted roofing sheets shall be fabricated from cold rolled galvanized iron sheets specially tempered steel 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 is: Regular corrugated Quad-rib, Tri-wave, Rig-wide, Twin rib, etc. Desired color shall be subject to the approval of the Architect.

1. Gutters, valleys, Flashings, Hips and Ridge roll shall be fabricated from gauge 24 (6 mm) thick cold rolled plain galvanized iron sheets specially tempered steel. Profile section shall be as indicated on the Plans.

2. Fastening hardware shall be of galvanized iron straps and rivets. G.I. straps are of .50 mm thick x 16 mm gauge 26 and standard G.I. rivets.

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

Base Metal Thickness	Designated Gauge
.40 mm thick	Gauge 28
.50 mm thick	Gauge 26
.60 mm thick	Gauge 24
.80 mm thick	Gauge 22

Length of roof sheets available in cut from 5 feet to 12') long. Long span length up to 8 meters. Special length by arrangements.

B. CONSTRUCTION REQUIREMENTS

1. Before any installation begins, the Contractor shall ascertain that the top face of the purlins is in proper alignment.

2. Correct the alignment as necessary in order to have the top faces of the purlins on an even plane.

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

4. Start roofing installation by placing the first sheet in position with the down turned edge in line with other building elements and fastened to supports as recommended.

5. Place the down-turned edge of the next sheet over the edge of the first sheet, to provide side lap and hold the side lap firmly in place. Continue the same procedure for the subsequent sheets until the whole roofing area is covered and or adopt installation procedure provided in the instruction manual for each type of molded rib profile.

6. For walling applications follow the procedure for roofing but allow a minimum end lap of 10 cm. for vertical walling.

7. **End Lap.** In case handling or transport consideration requires to use two or more end lapped sheets to provide full length coverage for the roof run, install each line of sheets from bottom to top or from eave line apex roof framing. Provide 15 cm. minimum end lap.

8. **Anchorage.** Pre-painted steel roofing sheets shall be fastened to the wood purlins with standard length G.I. straps and rivets.

9. For Steel Frame up to 4.5 mm thick, use self-drilling screw No.12 by 4.0 cm long hexagonal head with neoprene washer.

10. For Steel Support up to 5 mm thick or more, use threaded cutting screw No. 12 by 4.0 cm long hexagonal head with neoprene washer.

11. For side lap fastener use self drills screw No. 10 by 1.6 cm. long hexagonal head with neoprene washer.

12. Valley fastened to lumber and for walling, use self drilling wood screw No. 12 by 2.5 cm. long hexagonal head with neoprene washer.

13. Valley fastened to steel supports, use self drilling screws, hexagonal head with neoprene washer, drill size is 5 mm diameter.

14. In cutting pre-painted steel sheets to place the exposed color side down, cutting shall be carried out on the ground and not over the top of other painted roofing product.

15. Power cutting or drilling to be done or carried pot on pre-painted products already installed or laid in position, the area around holes or cuts shall be masked to shield the paint from hot fillings.

16. Storage and Protection. Pre-painted steel roofing, walling products and accessories should be delivered to the job site in strapped bundles.

17. Sheets and or bundles shall be neatly stacked in the ground and if left in the open it shall be protected by covering the stack materials with loose tarpaulin.

C. MEASUREMENT AND PAYMENT

1. The work done under this item shall be measured by actual are covered or installed with pre-painted steel roofing and or walling in square meters and accepted to the satisfaction of the Architect or Engineer.

2. The area of pre-painted steel roofing and or walling in square meters shall be paid for at the Unit Bid Price or contract unit price which payment shall constitute full payment including labor, materials, tools and incidentals necessary to complete the work.

CLAY ROOF TILES

SCOPE OF WORK

This Item consist of furnishing all plant, labor tools, equipment and clay roof tiles required to complete the roofing as shown on the Plans in accordance with this Specifications.

A. MATERIAL REQUIREMENTS

1. Clay Roof Tiles

Clay tiles shall be manufactured from red clay specie molded to custom pile patterns. It shall be kiln dried to improve natural aesthetic appearance and resistance to erosion and withstand any climate condition in the tropics. Where required and indicated to be glazed, color shall be approved by the Architect.

2. Sheating

a) Corrugated G. I. sub-roofing shall be 0.5 mm thick long span. Plywood sheating when used instead of G.I. shall be 12 mm thick marine plywood treated with two piles of felt paper asphalt impregnated.

b) Wood Batten shall be 2.5 cm. x 5.0 cm. pressure treated lumber properly laid to fit clay roof tiles and accessories as indicated on the Plans.

c) Fasteners shall be non-corrosive materials. Nails shall have large head sufficient length to give 19 mm penetration on wood batten and # 16 tie wires to be copper or brass as the case may be.

B. CONSTRUCTION REQUIREMENTS

1. Before the work is started, the Contractor shall secure approved roof framing Plan and determine or evaluate actual site condition.

2. In case modification is necessary, the Contractor shall submit shop drawings to the supervising Architect or Engineer.

3. Batten roof shall be installed in straight lines, level squared and firm. It may rest on sheeting and anchored rigidly by means of galvanized iron straps gauge 24 thick riveted on sheating, or nailed on top chord or jack rafter when it rests on plywood sheating.

4. The top chord or jack rafter shall have at least a minimum roof pitch of 25 degrees.

5. Plywood sheating shall be overlaid with two piles of felt paper, asphalt impregnated to control moisture. The batten shall be spaced to fit the clay roof tiles and accessories.

6. Gutter and valleys shall be set in place before wood battens are installed. Use gauge 24 plain galvanized iron sheet molded true to profile section indicated on the plans or as directed by the supervising Architect or Engineer.

7. For clay tiles on concrete roof slab provide and install pressure treated lumber 25 mm x 50 mm or metal strips properly aligned, level squared and firm.

8. Apply waterproofing on the slab surface to control moisture by cold process.

9. Laying of tiles shall start at the lower layer from right to left. See to it that the left anchorage of tile is placed near or close to hip truss as much as possible.

10. Continue to the next layer of clay roof tiles following the same procedure

11. After all clay roof tiles are laid out, mark the clay roof tiles at hips and valleys which are to be cut using straight edge or string as guide.

12. Where tiles join a hip stringer, provide waterproof elastic cement. Cement hip roll and ridge in lap and fasten with nails or tie wires as specified.

13. Fill voids at hip starters and ridge ends with mortar, color to match the tile.

14. Remove all debris and clean roof are for service.

C. METHODS OD MEASUREMENT

This item shall be measured by actual roof area laid with clay roof tiles and accessories in square meters or part thereof, for work completed and accepted to the satisfaction of the Architect.

D. BASIS OF PAYMENT

The accepted work quantified and provided in the Bill of Quantities shall be paid for at the Unit Bid Price which constitute full payment for furnishing all materials, labor, tools, equipment and other incidentals necessary to complete this item.

ROOF DRAINAGE

SCOPE OF WORK

This Item shall consist if furnishing all items, articles plant equipment, labor and materials and performing all methods necessary or required for the complete installation of all roof drains with strainers in accordance with all applicable drawings as shown on the approved plans and the provisions of this Specifications

A. GENERAL CONDITIONS

1. Performing all operations or methods necessary and required for the complete installation of all Roof Drains with strainers, including connections to downspout, in accordance with all applicable drawings and details, and subject to the terms and conditions of the contract.

2. Should there be any conflict between the sizes of roof drains and downspout, the size of the latter shall govern.

3. The size of any roof drain with strainer shall follow the diameter of the corresponding roof leader or downspout to be installed.

B. CONSTRUCTION REQUIREMENTS

1. Drainage

a) The contractor shall provide, fit or install all necessary drains with strainers where so shown or indicated on plans and or where the supervising Engineer directs.

b) Each drain with strainers shall fit the size of the corresponding downspouts or conductor over which is to be installed and in accordance with the following schedule.

c) Over each downspouts of cast iron body lacquer finish low "Dome" roof drain (rough brass strainer) 45 threaded outlet or side outlet respectively, secured to caming ring by screws.

2. Drain and Over flow Pipes

a) Concrete roof gutters or any other work which catches drains or collect rain water shall be provided with adequate drain overflow, pipes, one inch in diameter pipe spaced at 2.00 meters on centers and or as specified.

b) Weep holes, where so indicated on plans, of the size and spacing shown, shall be provided by the contractor to allow the free flow of water to drain from one level over lower level or to outside all in accordance with the detailed drawings.

3. Downspout

a) All conductors or downspout encased in concrete unless otherwise shown in drawings shall be PVc pipe as specified in plans. Size of downspout shall be as shown or indicated on plans.

b) Downspout of all floor drains indicated on reinforced concrete gutters shall be 75 mm in diameter except where specified other use and each shall branch from the adjacent main downspout if any as shown on plans.

c) Any drain with strainers of approved quality, locally made, in accordance with full size details may be substituted subject to the written approval of the supervising Architect or Engineer.

d) Should the series and type number specified herein be not suitable to a particular location due to concrete space limitations, any adaptation of the series specified of the same size, body material and finish may be substituted, subject to the approval of the supervising Architect or Engineer.

e) Any other drain shown but not specified herein and necessary to leave the work complete, shall be provided and installed by the contractor suitable to the service required and fitted to the concrete limitations at the point of installation, based on or similar as specified herein or as directed by the supervising Architect or Engineer.

C. MEASUREMENT AND PAYMENT

1. All roof drains strainers actually installed shall be measured and determined by the number of pieces or units ready for service as provided in the Bill of Quantities accepted to the satisfaction of the supervising Architect or Engineer.

2. The Item measured and determined shall be paid for at the Unit Bid Price which payment constitute full compensation of materials, labor and incidentals necessary to complete this Item.

1.5. WATERPROOFING

SCOPE OF WORK

This Item shall consist of furnishing all materials, labor, tools, equipment, plant and other facilities required as shown on the Plans and undertaking the proper application of integral and membrane waterproofing complete in accordance with this Specifications.

A. MATERIAL REQUIREMENTS

1. Integral Waterproofing

Integral waterproofing compound shall be cementitious powder pre-mix admixture or water base surface coat conforming with the standard Specifications set by the Bureau of Product Standards, Department of Trade and Industry.

2. Membrane Waterproofing

Membrane waterproofing shall be Osmo-seal powder; Liquid Elastomeric or Epoxy Solvent less waterproofing compound formulated for extra flexibility and resiliency to give lasting waterproof effect.

B. CONSTRUCTION REQUIREMENTS

1. Concrete mixture for decks, balconies, toilet and bathrooms, gutters, parapets, canopies and other areas indicated on the Plans to be integrally waterproofed shall be blended with integral waterproofing compound.

2. Only a minimum quantity of clean water shall be used in the concrete mixture to be sufficiently plastic and to obtain enough workability in placing concrete.

3. Concrete surface to be applied with membrane waterproofing shall have been integrally waterproofed, thoroughly set, dry, clean and free from foreign matters.

4. Surface shall be topped and plastered with double strength integral waterproofing compound pre-mix admixture of screened mixture: 1 part Portland cement, 3 parts clean and sharp sand and 2 packages integral waterproofing compound steel trowelled to smooth surface finish.

5. Concrete slab shall be properly graded to drain rainwater. A minimum pitch of 1 percent is satisfactory to drain water freely into the drain lines.

6. Drainage connection and weep-holes shall be set up to permit the free flow of water.

7. Any expansion and contraction joints shall be cleaned, primed, fitted with a backing rod and caulked with sealant.

8. Prepared surfaces shall be cured and kept wet by sprinkling water at regular intervals for a period of at least 3 days when smooth surface finish have actually set.

9. Allow cured surfaces to dry and remove all dust, dirt, debris and oil.

10. All lose areas shall be refitted and well secured. Repair cracks, breaks and open seams. Where required or as directed in the membrane waterproofing product instruction manual, prepared surface shall be prime coated.

C. APPLICATION PROCEDURES

1. Prior to application, concrete surface shall be sound and cured without the use of curing compound.

2. Apply a coat of neutralizer to remove oil, dirt, and other contaminants.

3. Apply a coat of concrete primer on surfaces to be installed with membrane self-sealing type when required or as directed in the product instruction manual.

4. Stir thoroughly each container of membrane waterproofing before use.

5. Apply a coat of membrane waterproofing by brush, airless spray, notched trowel, squeegee or roller preferably 15 to 20 mils maximum thickness of wet coat.

6. Three applications is recommended and each coat is allowed a minimum of 24 hours curing time between each coat or as recommended in the product manufacturer's instruction manual.

7. Application of membrane waterproofing coat should not commence unless the ambient temperature is 4.44^0 C or higher and shall not proceed during inclement weather condition.

8. The waterproofing compound is combustible. Extra care shall be observed by persons having skin sensitiveness to wear protective gloves while applying.

D. PROTECTION OF MEMBRANE WATERPROOFING SURFACES

1. To have a bond between the membrane waterproofing and the slab, concrete topping shall be placed as the membrane dries after 48 hours of application.

2. If a bond is not required, the membrane shall be protected with asphalt asbestos board or asphalt felt paper until such time as topping and concrete covering is applied.

3. Prior topping or placing concrete cover, inspect the membrane for any damage and repair work as required.

4. Exposed membrane surfaces at basement shall be covered and protected by installing tightly butted asphalt impregnated protection boards with a minimum thickness of 6 mm and 12 m on all horizontal areas.

5. Use asphalt impregnated joint boards along all walls and cove areas.

E. MEASUREMENT AND PAYMENT

1. Integral and membrane waterproofing works rendered under this Item shall be measured in square meters for areas actually waterproofed as provided in the Bill of Quantities and accepted to the Owner satisfaction.

2. The areas provided with integral and membrane waterproofing measured in accordance with the preceding section shall be paid for at the Unit Bid Price which price and payment constitute full compensation for furnishing all materials, tools equipment, labor and incidentals necessary to complete this Item.

2. ARCHITECTURAL WORKS

2.1 CARPENTRY AND JOINERY WORKS

SCOPE OF WORK

The work to be done under this Item consist of furnishing all required materials, fabricated woodwork, tools, equipment and labor and performing all operations necessary for the satisfactory completion of all carpentry and joinery works in strict accord with applicable drawings, details and these Specifications.

A. MATERIAL REQUIREMENTS

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 and unsound knots, pitch, pockets, sapwood, cracks and other imperfections impairing its strength, durability and appearance.

2. Grades of Lumber and Usage

a) **Stress grade lumber** is seasoned, close-grained and high quality lumber of the specified specie, free from defects and suitable for sustaining heavy load.

b) Stress grade limber shall be used for wooden structural members subject to heavy loads, and for sub-floor framing imbedded or in contact with concrete and masonry.

c) **Select grade lumber** of the specified specie is generally of high quality of good appearance, without waste due to defects and suitable also for natural finish.

d) Select grade lumber shall be used for flooring, sidings, fascia and base boards, trims, molding, millwork, railings, stairs, cabinet work, shelves, doors, windows and frame of openings.

e) **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 with some waste due to minor defects and suitable also for paint finish.

f) Common grade lumber shall be used for light framework for walls and partitions, ceiling joists and nailers.

3. 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 posts, girders, girts, sleeper door and window frames set or in contact with concrete or masonry.

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

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

d) Tanguile (*select grade*) for doors and windows, fascia and base boards, trims, mouldings, mill work, railings, stairs, cabinet work, shelves, floorings and sidings.

e) Narra (*select grade*) for stair railings, flooring boards, cabinet, work millwork, doors and windows when indicated as such in the plans.

f) Dao (*selected grade*) for parts of the structure as enumerated or when indicated in the plan.

4. Moisture Content

a) Rough Lumber for framing and siding boards shall be air-dried or sun-dried such that its moisture content shall not exceed 22 percent.

b) Dressed lumber for exterior and interior finishing for doors and windows, millwork, cabinet work and flooring boards shall be kiln dried having no moisture content in excess of 14 percent at the time of its installation.

5. Substitution in Lumber Specie

a) Any lumber equally good for purpose intended may be substituted for the specified kind subject to the prior approval of the supervising Architect or Engineer. Provided that the substitution shall be have equal or better specie acceptable to the supervising Architect.

b) In case of substitution with better specie, no additional cost therefore shall be allowed to the Contractor.

6. Plywood

Plywood shall be of good grade and made of laminated wood strips bonded together with water resistant resin glue.

a) The laminated glue core shall be finished both faces with select grade tan guile, red lauan veneers or equivalent not less than 2mm thick, similarly bonded to the core.

b) The plywood of not less than 19 mm thick shall be free from defects such as split in veneer, buckling or warping and shall conform to the requirements of the Philippine Trade Standard 631-02

c) Thickness of a single layer of laminae shall not be less than 2m. The laminae shall be superimposed in layers with grains crossing at right angles in successive layers to produce stiffness.

d) The face veneers shall be rotary cut from selected grade timber. The laminae and face veneers shall be bonded with water resistant resin glue, hot pressed and pressure treated.

e) Ordinary tan guile, red lauan, palosapis, or equivalent grade with good quality face veneers, 6 mm thick shall be used for double walling and ceiling not exposed to moisture.

f) Waterproof or marine plywood shall be used for ceiling exposed to moisture such as at toilets and eaves, and ceiling to be finished with acrytex.

7. Lawanit or Hardiflex

a) Lawanit or Hardiflex when required in the plan shall be 6 mm and 8 mm thick respectively, tempered or oil impregnated for moisture/ water resistance.

b) Texture of Lawanit or Hardiflex shall be subject to the approval of the supervising Architect or Engineer.

8. Materials Other than Lumber

a) Plastic Sheet

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

and . Color and design shall be as selected from the manufacturer's standard and approval by the supervising Architect or Engineer.

b) Glue

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

c) 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.

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

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

Lag Screw of adequate size, for anchoring heavy timber framing in concrete or masonry, shall be galvanized steel.

Bolts and nuts shall be of steel having a yield point of not less than 245 Mpa. Bolts shall have square heads and provided with standard flat steel washers and hexagonal nuts and provided with standard flat steel washers and hexagonal nuts.

Threads shall conform to American coarse thread series. The threaded portion shall be long enough such that the nut can be tightened against the bolted members without any need for blocking.

Wrought Iron Straps or Angles, when required in conjunction with bolts or lag screws to provide proper anchorage shall be of the shape and size shown on Plans.

B. CONSTRUCTION REQUIREMENTS

1. Quality of Materials

All materials to be incorporated in the carpentry and joinery works shall be of approved quality as specified. Before using all materials shall have been inspected and accepted by the supervising Architect or Engineer.

2. Storage and Protection of Materials

a) Lumber and other materials shall be protected from dampness during and after delivery at the site.

b) Materials shall be delivered well in advance of actual need and in adequate quantity to preclude delay in the work.
c) Lumber shall be piled in orderly stack at least 15.0 cm. above the ground and at sheltered place where it will be of least obstruction to work.

3. Shop Drawing

Complete Shop Drawings with essential dimensions and details of construction, as may be required by the supervising Architect or Engineer in connection with carpentry and joinery work, shall be submitted for approval before proceeding with the work.

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

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

c) Fasteners, connectors and anchors of appropriate type, size and number shall be provided and fitted where necessary.

d) Members damaged by such cutting or boring shall be reinforced by means of specifically formed and approved steel plates or shapes. Otherwise, damaged structural members shall be remove and replaced to the satisfaction of the Architect or Engineer.

e) Timber framing in contact with concrete or masonry shall be treated with termite proofing solution and after drying coated with bituminous paint.

5. Finished Carpentry

Finished carpentry covers work on flooring, siding and ceiling boards, stairs, cabinets, fabricated woodwork, millwork and trims.

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

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

c) Panels shall be fitted to allow for construction or expansion and insure that the panels remain in place without warping, splitting and opening of joints.
d) Exposed edges of plywood or plywood for cabinets shall provided with selected grade hardwood strips, rabbetted as necessary, glued in place and secured with finishing nail. To prevent splitting, hardwood for trims shall be drilled before fastening with nails or screws.

e) Fabricated woodwork shall be done preferably at the shop. It shall be done true to details and profiles indicated on the Plans.

f) Where set against concrete or masonry, woodwork shall be installed after curing is completed.

g) Exposed wood surfaces shall be free from disfiguring defects such as raised grains, stains, uneven planning, sanding, tool marks and scratches.

h) Exposed surfaces shall be machine or hand sanded to an even smooth surface, ready for finish.

6. Fasteners

a) Nails shall not be driven closer together than one half their length unless driven in bored holes, or closer to the edge of the timber than one quarter their length.

b) Nails shall penetrate by at least half their length into the timber farthest from the head. End distance, edge distance and spacing of nails shall be such as to avoid splitting of the wood.

c) Lag Screw shall be set into pre-bored lead holes and not driven. The lead hole for the hank shall have the same diameter as the shank and the same depth as the unthreaded portion of the shank.

d) The lead hole for the threaded portion shall have the same diameter equal to about 75% of the diameter of the shank and the same length as the threaded portion.

e) Lengths of bolts shall be enough to extend through the nut and an allowance for nut tightening.

f) Bolts shall be set into drill holes suitably sized enough for snug fit.

7. Pressure Treated Lumber and Plywood.

a) Lumber, plywood and ply board specified a treated with wood preservative shall be pressure treated with water borne preservatives as Wolman Salt, Boliden Salt or Tanalith H-R.

b) Pressure treatment shall meet the standards set by the American Wood Preservers Association per publication C 2-77, or the Philippines Trade Standards PTS 243-02.00 as to penetration and amount of chemicals retained in the treated lumber.

c) Final retention of chemicals in the wood shall be a minimum of 5.6 kg/m3.

d) Pressure treated lumber shall be accompanied by a certification of pressure treatment from the wood preserving plant as to the pressure treatment, sizes and quantity of wood treated.

e) Notwithstanding the presentation of said certification, the supervising Architect or Engineer may require physical inspection and undertake borings to ascertain penetration of preservative into the wood.

f) Each boring should show penetration of not less than 2.5 centimeters.

8. Rat Proofing

a) Enclosed hollow spaces between wooden flooring and ceiling and between double sidings or partitions shall be made rat proof in accordance with Department of Health Requirements

b) Hollow space between wooden flooring and ceiling shall be rendered rat-proof by laying continuous strips of galvanized iron sheet or 10 mm wire mesh, about 25 cm. wide and centered along floor plates or sills of partitions and exterior walls.

c) The rat proofing strips shall be sandwiched between floor joists/plates and sills of partitions or sidings. The strips shall be nailed to the top of joists as well as to underside of sills and floor boards.

d) This part of the rat proofing man be omitted whenever it is clear than an equally effective protection is provided by concrete or tile floors or by the upper surface of reinforced concrete or steel directly supporting the sidings.

e) all exterior openings between adjoining floor joist and girders or beam that might give rats direct access into the hollow space inside, shall when not closed by fascia board or the like, be covered with strips of the same rat proofing material or sufficient size to close entirely the opening in question.

f) Double sidings or partitions as well as furred posts are made rat proof by lining the inner face of the board or panel sheeting with continuous vertical strips of the aforementioned rat proofing material up to height of at least 30 cm from the base of the partition, siding or furred post. The lower edge of the pat proofing sheet shall be in contact with floor throughout its entire length.

9. Measurement and Payment

a) Carpentry and Joinery Work shall be measured per complete item supplied, installed and accepted.

b) Payment shall be based on the measured quantity of each completed item and the Unit Bid Price as quoted in the Bid Proposal.

c) Such unit bid price shall be inclusive of all plant, materials, labor, overhead, profit and other incidental expenses in connection with the finished work.

d) Structural timber framework for roofing, flooring, partition and siding shall be measured on the basis of lumber board feet involved and paid for based on the quoted bid price per board foot. Such bid price shall be inclusive fasteners needed to complete the framework.

e) Flooring and siding boards, base and fascia boards, solid panels, stairs, handrails and trim shall be measured on the basis of number of board feet involved and paid for based on the corresponding quoted unit bid price per board foot.

f) Double walling for partitions and sidings shall be measured on the basis of the area involved in square meters and paid for based on the quoted unit bid price per square meter.

g) Ceiling boards shall be measured based on the area involved in square meters. Payment shall be based on the quoted unit bid price per square meter. Such unit bid price shall be inclusive of the cost of nailers, hangers and fasteners.

h) Cabinets shall be measured based on the number of units completed, installed and accepted. Payment shall be based on the number of units completed and the unit bid price per unit.

i) Incidental work for the main items on carpentry and joinery work such wood preservation, rat proofing and any other items necessary to complete the work but not specifically mentioned in the Bill of Quantities contained in the Bid Proposal shall be deemed to be covered by the unit or lump sum prices quoted for the other items of work listed in said Bill of Quantities

Pay item Number	Description	Unit of Measure
Item – 1	Structural timber framework	Bd. Ft.
Item – 2	flooring, and siding boards, Base and fascia board shall Panels, stair, handrails and trims	Bd. Ft.

Item – 3 ---------- Double walling ---------- Sq. M.
Item – 4 ---------- Ceiling Boards ---------- Sq. M.
Item – 5 ---------- Cabinets ---------- Each

2.2 HARDWARE

SCOPE OF WORK

This Item shall consist of furnishing and installing all building hardware required to ensure rigidity of joints or connections of the different parts of the structure such as door, windows, cabinets, lockers, drawers and other similar operating parts as indicated on the plans in accordance with this Specifications.

A. GENERAL CONDITIONS

1. The contractor shall provide all rough hardware required for the completion of the work, including nails, spikes, bolts, log screws, etc., and shall provide and fit in place all finishing hardware hereinafter specified – put on in the most improved manner with screws to match the finish.

2. The contractor shall provide and fit in place all hardware not herein specifically mentioned but necessary to leave the work complete. All such hardware should there be any, shall conform in every respect to the balance of the hardware herein specified.

3. Finishing hardware, suitable to the service required to fully equip in the most satisfactory operative condition, for all doors, windows transom sashes, screen doors and windows, closet, built-in cabinets counters, drawers, lockers and other operating members throughout the project shall be furnished and installed or fitted by the Contractor.

4. Where the exact types of hardware specified are not adoptable to the finishing, shape or size of members requiring the hardware, suitable types having as applicable the same operation and quality as the corresponding individual types specified shall be furnished.

B. MATERIAL REQUIREMENTS

1. Rough Hardware

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

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 the following Specifications.

a) Door Locksets

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

b) Door Closer

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

ii. The following table shall serve as guide in determining door closer sizes.

Door Maximum Width	Size of Closer
76 cm.	Size 2
90 cm.	Size 3
107 cm.	Size 4
120 cm.	Size 5
137 cm.	Size 6

Use larger size where unusual conditions exist.

c) Hinge

Hinge unless otherwise indicated on the Plans shall be rass 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 the same materials.

d) Sliding Door Hardware

i. Track is of rolled steel formed or extruded aluminum.

ii. Bearing is of plain steel balls or steel rollers

iii. Wheels to be steel, brass, rubber or plastic as the case maybe.

e) Make

i. The plate numbers herein given designates the quality and style as to the type, design, operation, materials and finish of hardware designated.

ii. Any other hardware equally good, may be substituted only in cases of urgent necessity and subject to the written approval of the supervising Architect or Engineer.

f) Finish

Unless otherwise shown or specified on the plans, exposed surfaces shall have the following Standard Finishes.

i. *Polished, bright brass or Bronze.* Bronze surfaces exposed on exterior of building not specified to have US 26 finish.

ii. *US 26 polished chromium plated over nickel or brass.* Brass or bronze surfaces exposed on toilets, lavatory and shower rooms and all others in the interior of the building.

iii. *USP Prime coated for painting.* Ferrous metal surfaces unless zinc coated.

g) Fastenings

Fastenings of suitable size, quality and type shall be provided to secure hardware in position. Machine screws and expansion shields shall be provided for securing items of hardware concrete, brick tile or masonry instead of wood screws.

h) Exposed Items of Hardware

i. After hardware has been properly fitted, all exposed items such as knobs platers, pulls, locks, etc., shall be removed until final coat of painters finish has been applied, and then hardware installed.

ii. Other items of hardware, unless to be painted over that are not to be removed before painting shall be properly marked or completely covered until final coat of painter's finish has been applied, after which such protective shall be removed.

C. PLACING ORDER OF HARDWARE

1. The contractor shall place his order for all hardware early in order to avoid delay in the job.

2. No request for extension of time shall be entertained by the Owner due to this delay an

3. No substitution of hardware shall be allowed due to negligence of contractor on this matter.

D. CONSTRUCTION REQUIREMENTS

1. Door Knobs, and Latch Strikes

a) All lock and latch strikes shall be installed in door frames at the same height from the floor.

b) Door knobs shall be located so that the center of the knob in 95 centimeters from the finished floor and or as directed by the supervising Architect or Engineer.

2. Butt Hinges

a) Each panel of hinged doors shall be hung on two butts for doors 1.50 m. or less in height.

b) Three butts, over 1.50 m. high and not over 2.10 m. four butts above 2.10 m, in height.

c) Doors of a greater height than 2.10 m. unless otherwise specified shall be hung on additional one butt for each 65 centimeters or fraction thereof.

d) Where the size of the butt hinges is not sufficient to allow door to clear door trim in open position, same shall be increased.

3. Counters, Shelves, Cabinets, Lockers, etc.

a) Other hardware not covered by previous specifications for all wooden counters, shelves, cabinets, drawers, cabinet doors, closet doors, cupboard, or wall cabinets, glass showcases, storage shelves, work tables, lockers and all other woodwork and interior finishing of similar nature indicated on plans are included in this contract.

b) It shall be done in accordance with detail drawings and full size details which shall be requested by the Contractor from the supervising Architect or Engineer, well ahead of their installation.

c) The Contractor shall furnish and install all necessary hardware for all the above work, complete and suitable to the service required to fully equip then in very satisfactory of the Specifications and the applicable drawings.

d) All modifications in hardware required by reason of construction indicated, shall be made to provide specific operative functional requirements.

e) All hinges that are needed shall be steel brass plated and of the size suitable for the purpose. Use Hager, Stanley, Kwikset or Corbin or an approved equivalent.

f) All necessary hardware for all woodwork specified above such as bolts, automatic catches, cylinder locks, drawer pulls, cabinet and closet door pull knots, push or cover plates, strikes, holder, indicators, push or pull bars, drawer locks, etc., shall be cast bronze or brass chromium finished in accordance with the specifications.

g) Their sizes shall be suitable for the purpose approved by the Owner or in accordance with those shown and specified in the full size details.

h) Schedule of all hardware to be purchased by the Contractor shall be submitted first to the supervising Architect or Engineer for approval before ordering them.

i) All hardware shall be brought to the job in original package. Samples shall accompany schedules.

4. Butt Hinges Make

For all doors on Butt Hinges, unless otherwise specified use button stop butts, Hager, Sanley, Kwikset or approved equivalent highly polished and plated with non raising pin for door opening outside.

5. Bar Doors

Provide and fit a set "Lawson Universal" gravity pivot type hinges No. 4604 nickel polished finish for each bar door in all toilet rooms. Approved equivalent, locally made of this type will be acceptable.

6. Cabinet Door Catch and Pull

a) Each cabinet door sash shall be provided with a door pull, Corbin No. 4347, extruded brass, chrome finish, or approved equivalent.

b) Cabinet doors with locks shall be provided with elbow-catches, Corbin No. 01623 cast bronze or approved equal on the inactive sash.

c) Cabinet doors not provided with locks shall be provided and fitted with fraction catches.

d) Siding cabinet doors shall be provided with drawer pulls of the flush type, cast brass or bronze.

7. Drawer Pull and Locks

a) Each drawer shall be provided with pulls of the type specified for cabinet doors.

b) The contractor shall provide and set complete, ready for operation, one pin tumbler cylinder lock of the medium of standard type, for each door in accordance with the schedule below.

c) U.S. Standard finishes as specified shall apply to all locks used "*Russwin, Yale, Corbin, Weiser, Schlage"* Standard type, of the approved equivalent.

d) The trade mark and plate numbers given herein are to designate only the quality, type, operation, materials and style or design required.

e) Schedule of Lockets: (in this Item, specify the name of door lock as to the brand, serial number, color and what particular door is to be installed such as:main door, bed room, toilet, etc.)

8. Master Key and Grand Master Key

a) All door lock shall be Master keyed as stated on the above schedule of lockset and grand master keying for the whole building.

b) Before placing the purchase order for door locks, it shall comply with the manufacturers requirements regarding the master keying for the locks.

c) The keying for this project shall be in accordance with the requirement of the Owner:

Supply of Keys:

D- 1 Grand Master Key ---------- 6 each
D-2 Master Key ---------- 3 each
D-3 Keys for each lock ---------- 3 each

As specification writer, you can make your own specification as to the number, quality and type. This is only a guide on how you will prepare your specifications.

d) Other doors not included in this schedule, but necessary to leave the works complete, shall be provided and fitted complete, by the Contractor with one lockset suitable to the service required and depending under which type and finish of each door lock, shall be classified by the Architect or Engineer.

2.3 ALUMINUM GLASS DOORS AND WINDOWS

DOORS

SCOPE OF WORK

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

A. MATERIAL REQUIREMENTS FOR DOOR

1. Frames and panel members shall be furnished from extruded aluminum sections true to details with clean, straight, sharply defined profiles and free from defects impairing strength, durability and appearance.

2. Extruded aluminum sections shall conform to the specification requirements of ASTM B-211.

3. Screws, nuts, washers, bolts, rivets and other miscellaneous fastening devices shall be made of non-corrosive material such as aluminum and stainless steel.

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

5. Vinyl weather strip shall be first class quality flexible vinyl forming an effective seal and without adverse deformation when installed.

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

7. Glazing shall conform to the requirement specified in Item Glass and Glazing Specifications.

B. CONSTRUCTION REQUIREMENTS

1. For all assembly and fabrication works, the cut ends shall be true to line and accurately joined, free of burrs and rough edges.

2. Cut-out recesses, mortising, grinding operation for hardware shall be accurately made and properly reinforced when necessary.

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

4. Frame sill shall be stepped and sloped with offset weep holes for efficient drainage to the exterior.

5. Door panel shall be accurately joined at corners assembled and fixed rigidly to the exterior.

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

7. All joints between metal surface and masonry shall be fully caulked to ensure weather tightness.

8. Sliding type door panel shall be equipped with concealed roller overhead tracks with bottom guide.

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

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

11. Where aluminum is to be in contact with steel, concrete, cinder, block, tile, plaster or other similar masonry construction, the aluminum surface shall be back painted before erection with a bituminous paint.

12. Exposed aluminum surface shall be electro type hard coats.

13. 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 of zinc chromate primer applied to the steel or by application of bituminous paint.

14. Cleaning

a) The Contractor shall protect all entrance units during construction and shall be responsible for removal of protection materials and cleaning of all 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.

C. MEASUREMENT AND PAYMENT

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

2. The area in square meters of aluminum glass doors installed including main frame and ready for service as provided in this Specifications shall be the basis of payment based on the Unit Bid Price or Contract Price.

WINDOWS

SCOPE OF WORK

The scope of work under this item is the same as that of Aluminum Glass Doors and also the Material and construction Requirements of Section 11-1 and 11-2 of this chapter respectively.

A. MATERIAL REQUIREMENTS

1. Window Panel

Window Panel shall be connected at corners which miter joint fixed rigidly to ensure weather tightness.

2. Sliding Windows

a) Sliding windows shall be provided with nylon sheave.

b) Sliding panels shall be suspended with concealed roller overhead tracks with bottom guide pitch outward and slotted for complete drainage.

c) The sliding panels shall be provided with interior handles.

d) The locking devices shall be a spring loaded extruded latch that automatically engages special frame hips.

3. Casement Window

a) Casement window type shall be provided with two hinges fabricated from extruded aluminum alloy. They shall open on stay arms having adjustable sliding friction shoes to control window panel operations.

b) Locking device shall be one arm action handle for manual operations complete with strike plate.

c) All joints between metal surface and masonry shall be fully and neatly caulked.

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

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

f) Exposed aluminum surfaces shall be electrotype hard coats such as anodize, satin, etc.

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

4. Cleaning

a) The Contractor does not only protect all entrance units during the construction phase but shall also be responsible for removal of protective materials cleaning the aluminum surface including glazing before work is accepted by the supervising Architect or Engineer.

b) Aluminum shall be thoroughly cleaned with kerosene or gasolines diluted with water and then wipe surface using clean cloth rugs.

c) No abrasive cleaning materials shall be permitted in cleaning aluminum surfaces.

B. MEASUREMENT AND PAYMENT

1. Aluminum glass window fully equipped with fixing accessories and locking devices shall be measured in square meters actually installed in place and accepted to the satisfaction of the supervising Architect or Engineer.

2. The area of aluminum glass window in square meters ready for service as provided in the Bill of Quantities shall be the basis of payment based on the Unit Bid Price which price and payment.

GLASS AND GLAZING

SCOPE OF WORK

This Item consists of furnishing all glass and glazing materials, labor, tools, plant and equipment required in undertaking the proper installation as shown on the Plans and in accordance with this Specifications.

1. MATERIAL REQUIREMENTS

All glass and glazing shall be delivered at jobsite with labels affixed indicating quality, make, type and thickness. Each glass in glazed position shall resist a design pressure of 244 kilograms per square meter.

1. Plate Glass

Plate glass shall be manufactured from float glass that is mechanically rounded and polished and sealed with a coating of silver and a uniform film of electrolytic copper plating, then applied with protective coating of paint to seal our moisture from the silver. Use where good vision is required.

2. Float Glass

These basic types of glass shall be manufactured by floating continuous ribbon of molten glass into a bath of molten tin where it is reheated to obtain a flat fire polished finish and annealed slowly to produce a transparent float glass eliminating grinding and polishing.

Variation of these basic types is:

Graded AA – Intended for use were superior quality is required.

Grade A – Intended for selected glazing.

Grade B –Intended for general glazing.

Greenhouse quality – Intended for greenhouse glazing where quality is not very important.

3. Glazing Materials

a) Glazing materials for glass installation may be:

i. Bulk compound such as mastic that are elastic and non skinning compound.

ii. Putties – wood sash putty, or metal sash quality.

iii. Sealant – shall be chemically compatible with setting blocks, edge blocks and sealing tapes.

b) Performed Sealant such as:

i. Synthetic polymer – shall be base sealant that is resilient or non-resilient type.

ii. Performed Gasket – shall be compression or structural type.

c) Setting and Edge Blocks shall be made of lead or neoprene, chemically compatible with sealant.

d) Accessories like glazing clips, shims spacer strips etc. shall be made from non-corroding metal accessories.

4. Schedule of Glass and Mirrors

a) Use 5.6 mm (7/32") thick sheet glass locally manufactured clear quality for the following: *(unless otherwise indicated on the Plans as frosted).*

i. Aluminum windows and doors, notwithstanding plate glass indicated elsewhere.

ii. Jalousie window glass salts.

iii. Fixed glass louvers.

iv. Glass panels for partitions and counter door panels, if any.

v. Sliding glass doors for cabinets.

b) All glass panels for cabinets, except sliding doors shall be clear glass of locally manufactured float glass quality, 4.7 mm (3/16") thick.

c) They shall be clear, except where indicated on the Plans as frosted, diffused or opaque. Same shall be used for wooden sashes.

d) Unless otherwise noted, clear glass that are locally manufactured shall be used for steel windows.

Use 3.1 mm – 1/8" thick for areas exceeding .60 m^2
Use 4.7 mm thick for areas exceeding .60 m^2

e) All comfort rooms whether shown or not, the Contractor shall provide and fit securely in place at the most convenient height above each lavatory one mirror, made from local glazing quality polished plate glass 6 mm thick with beveled edges and brass chromium

plated frame 12 mm thick waterproof tanguile marine plywood backing, all in accordance with full size details. Sizes are as follows:

i. Over single lavatories - - - 60 cm. x 75 cm

ii. For two lavatories - - - - - 120 cm. x 75 cm

iii. For three lavatories - - - - 180 cm. x 75 cm

2. CONSTRUCTION REQUIREMENTS

a) Safety precaution and procedure shall be observed in determining the sizes and in providing the required clearances by measuring the actual opening to receive the glass.

b) Movable items or parts shall be kept in a closed and locked position until after the glazing compound has thoroughly set.

c) All glass sheets shall be bedded, back puttied, secured in place and face puttied. Secure glass in aluminum frame with non-corrosive clips except where glazing bead are required.

d) Apply putty in a uniformly straight lines, with accurately formed bevels and clean cut corners, then remove excess putty from glass frames.

e) Set glass in hollow metal doors and in metal frames of interior partitions in felt channel insets or bedded in putty to prevent any rattle.

i. Secure glass in wood doors and wooden frames in putty glazing stops.

ii. Secure stops on doors with screws.

f) Glass breakage caused in executing that work or by faulty installation shall be replaced by the Contractor without extra cost.

g) Improperly installed glass which does not fully meet the requirements of its grade, will not be accepted and shall be replaced without extra cost.

h) The contractor shall provide and install complete set ready or use mirrors in all comfort rooms and elsewhere shown the Plans. The size and location for each mirror shall be as indicated on the Plans or as directed by the Architect.

1. Workmanship

a) All glass shall be accurately cut to fit openings and set with equal bearing on the entire width of plane.

b) Putty shall be neatly run in straight lines parallel with inside of glazing rebate.

c) Corners shall be carefully made. All excess putty shall be removed and surfaces left clean.

d) Apply a thin layer of putty to rebate and set glass.

e) Place spring wire or angle glazing clips and run face putty. Remove excess putty from other side flush with edge of rebate.

2. Cleaning

Clean all glass both sides after putty has been applied completely. Do not disturb edge of putty with scraper. At completion of work leave glass and glazing works free from cracks and rattles and clean on both sides.

3. Samples

The Contractor shall submit for approval duplicate sample (15 cm. x 25 cm.) of each type of glass bearing manufacturer's label and a can of each type of putty.

C. MEASUREMENT AND PAYMENT

1. This Item shall be measured by actual area of glass sheets installed respective of the quality type and thickness in square meters.

2. The quantified unit of measurement shall be those accepted to the satisfaction of the Owner.

3. The quantities as measured shall be paid for the Unit Bid Price which payment constitute full compensation for all glass and glazing materials, labor and other facilities, and incidentals necessary to complete the work.

2.4 TILES

VINYL FLOOR TILES

SCOPE OF WORK

This item shall consist of furnishing all vinyl tiles and fitting accessories, adhesive materials, labor, tools, equipment and the satisfactory performance in undertaking the proper installation of vinyl tile flooring as shown on the Plans and in accordance with this Specifications.

A. MATERIAL REQUIREMENTS

1. Vinyl Tiles

Vinyl tiles shall be of first grade quality measuring 30 x 30 cm. x 3 mm thick, fully homogeneous, flexible, resilient and resistant to alkali moisture, grease and oil. The color and design pattern of vinyl tile shall be uniformly distributed throughout the thickness of the tile.

2. Adhesive

Adhesive shall be best suited for tropical application and compatible with the vinyl to be installed.

3. Seal Polish

Seal polish shall be plastic emulsion suited for the particular type of floor as recommended by the vinyl tile manufacturer.

B. CONSTRUCTION REQUIREMENTS

1. Installation

Installation of the tiles shall not commence until the work of other trade, including painting has been completed.

a) The contractor shall carefully examine all surfaces over which the tiles are to be set.

b) Floor surfaces that are to receive vinyl tile shall be clean, thoroughly dry; smooth; firm and sound; free from oil, paint, wax, dirt, and any other damaging materials.

2. Tile Laying Design

a) The tile design shall be indicated on Plans and in the colors selected and approved by the Architect for each area.

b) All joints shall be parallel to wall lines except otherwise indicated on plan.

c) Where line patterns of tile run perpendicular to lines of other tiles, they shall be laid truly at right angles.

3. Adhesive

a) Adhesive shall be applied in accordance with the adhesive manufacturer’s printed directions unless specified or directed otherwise.

b) Smoking, the use of open flames, and other sources of ignitions are strictly prohibited in the area where solvent containing adhesives are being used or laid.

4. Application of the Tiles

a) Start in the center of the room or work area and work from the center towards the edges.

b) Keep tile lines and joints square, symmetrical, tight and even and keep each floor in a true, level plane, except where indicated as sloped.

c) Vary edge width as necessary to maintain full size tiles in the field but no edge tile shall be less than one half the field tile size, except where irregular shaped rooms make it impossible.

5. Cutting

a) Cut vinyl floor tile to fit around all permanent fixtures, pipes and outlets.

b) Cut edges, fit and scribe to walls and partition after flooring has been applied.

6. Edge Strips

a) Provide edging strips where flooring terminates at points higher at doorways where thresholds are provided.

b) Edge strip shall be extruded aluminum butt type and beveled at exposed edges.

c) The top surface of the metal strips shall be finished flush with the tiles.

d) Secure strips at the end and between at about 20 cm. apart with screws.

e) Submit samples of metal strips for approval before application and installation.

7. Cleaning and Waxing

After the vinyl tiles and accessories are laid and set, it shall be cleaner as recommended by the manufacturer and a coat of approved seal polish.

8. Protection

After the floor has been waxed, they shall be carefully protected against damage, either with heavy building paper or by keeping traffic off the floors until the area is ready for use.

C. MEASUREMENT AND PAYMENT

1. All works performed under this section shall be measured in square meters/linear meters or actual number of vinyl floor tiles installed completes with accessories and ready for service.

2. The actual area in square or linear meters or number of quantities shall be the basis of payment based on the Unit Bid or Contract Unit Price.

CERAMIC TILES

SCOPE OF WORK

This Item shall consist of furnishing all Ceramic Tiles and cementitious materials, tools and equipment including labor required in undertaking the proper installation of walls and floor tiles as shown on the Plans and in accordance with these Specifications.

A. MATERIAL REQUIREMENTS

1. Ceramic Tiles

a) Ceramic Tiles and trims shall be made of clay, or a mixture of clay and other materials which is called the body of the tile classified by ASTM C-242 as to their degree of water absorption.

b) Ceramic Tiles and trims are manufactured either by dust pressed process or by plastic in which the clays are made plastic by mixing with water, shaped by extrusion or in molds and then fired.

2. Glazed Tiles and Trim

a) Glazed tiles and trims shall have an impervious face of ceramic materials fused on to the body of the tiles and trims.

b) The glazed surface may be clear white or colored depending on the color scheme approved by the Architect.

c) Standard glaze may be bright (glossy) semi-matte (less glossy) matte (dull) or crystalline (mottled and textured) good resistance to abrasion.

d) Glazed tiles shall be used for walls. Crystalline glazed tiles may be used for floors provided that these are used as light duty floors.

3. Unglazed Tiles and Trims

a) Unglazed tiles shall be hard dense tile of homogeneous composition. Its color and characteristics are determined by the materials used in the body, the method of manufacture and the thermal treatment. Unless otherwise specified, used unglazed tiles for all floors as indicated on the Plan.

b) Trims are manufactured to match wall tile color, texture and to coordinate with it in dimension.

c) These are shaped in various ceramic trim units such as caps, bases, coves, bull-nose, corners, angles, etc. that are necessary for edging or making a transition between intersecting surfaces.

B. CONSTRUCTION REQUIREMENTS

Tile work shall not be started until roughing-ins for plumbing, electrical and other trades have been completed and tested. The work of all other trades shall be protected from any kind damages.

1. Surface Preparation

a) Mortar mix for scratch coat and setting bed shall consist of one part Portland cement ¼ part lime and 3 parts sand by volume.

b) Surface to receive tile must be level, true to elevation, dry, free from dirt, oil and other kinds of ointments.

c) Allow at least seven days curing of scratch coat and setting bed. Installation work shall not be allowed to proceed until satisfactory conditions are corrected.

d) Thoroughly dampen surfaces of masonry or concrete before scratch coat is applied.

e) On masonry surface apply first a thin coat with pressure, then bring it out sufficiently to compensate for the major irregularities of the surface to a thickness not less than 10 mm at any point.

f) Evenly rake the scratch coat to provide good mechanical key before the mortar mix has fully hardened.

2. Installation of Ceramic Glazed Wall Tiles

Ceramic tiles shall be soaked in cleaned water prior to installation for a minimum of one hour.

a) Determine and mark layout of ceramic tiles as to joint location, position of trims and fixtures so as to minimize cutting less than one half size of the tile.

b) Thoroughly dampen surface of wall but not to saturate the surface.

c) Apply a bond coat mix with consistency of cream paste 1.5 mm thick to the wall surface or to the back of the tile to be laid.

d) Lay the tiles true to profile then exert pressure and tamp tile surface before the bond coat mix has initially set.

e) Continue with the next full tile to be laid and pressed firmly upon the setting bed tamped until flush and in place of the other tiles.

f) Intersections and returns shall be formed accurately using the appropriate trim.

g) All lines shall be kept straight and true to profiles, plumbed and internal corners rounded using the appropriate trims.

3. Installation of Vitrified Unglazed Floor Tiles

a) Before tile is laid to the floor, surface shall be tested for levelness or uniformity of slope by flooding it with water. Area where water ponds are filled and leveled, shall be tested again before the setting bed is applied.

b) Establish the lines of borders and center of the walls at the field work in both directions to permit the pattern to be laid with a minimum cutting of tiles.

c) Clean concrete sub-floor then moisten but do not soak. Then, sprinkle dry cement over the surface and spread the mortar on the setting bed.

d) Apply and spread mortar mix for setting bed and tamp to assure good bond over the entire area to be laid with tile.

e) Pitch floor to drain as shown on Plans or as directed by the Architect or Engineer.

f) Allow the setting bed to set sufficiently, then spread a bond coat over the surface and lay the tile.

4. Grouting and Pointing

a) Before grouting joints, tiles shall have been laid in place for at least 24 hours. Grouting mortar shall be white Portland cement or blended with pigments to acquire the color appropriate for the ceramic tiles.

b) Grouting mortar shall be applied over the tile by float or squeegee stroked diagonally across the joints.

c) Remove excess mortar with a wet sponge stroked diagonally or in a circular motion after 12-15 minutes.

d) Follow with a barely damp or dry sponge to remove remaining haze while smoothing all grouted joints.

5. Cleaning

a) Clean ceramic tiles surface thoroughly as possible upon completion of grouting.

b) Remove all grout haze observing tile manufacturer's instructions as to the use of acid or chemical cleaners.

c) Rinse tile thoroughly with clean water before and using chemical cleaners.

d) Polish surface of tile with soft cloth.

6. Protection

a) Apply a protective coat of neutral cleanser solution diluted with water in the proportion of 1.4 or one liter cleanser concentrate to one gallon of water.

b) In addition, cover tile flooring with heavy duty non-staining construction paper, taped in place.

c) Just before final acceptance of the work, remove paper and rinse the protective coat of neutral cleaner from the tile surface.

d) Don not let protective paper get torn or removed.

C. MEASUREMENT AND PAYMENT

1. All works performed under this Item shall be measured in square meters for areas actually laid with ceramic tiles and accepted to the satisfaction of the Architect or Engineer.

2. Ceramic tile work determined and provided in the Bill of Quantities shall be paid for based on the Unit Bid Price which price and payment constitute full compensation for furnishing all materials, tools, equipment and other incidentals necessary to complete this Item.

2.5 PAINTING AND VARNISHING

SCOPE OF WORK

This item shall consist of furnishing paints, enamels, varnishes and other products to be used including labor, tools and equipment required as shown on the Plans and in accordance with this Specification.

A. MATERIAL REQUIREMENTS

1. All paint materials shall meet the requirements of the Standard Specifications of the Standardization Committee on supplies.

2. All paint materials shall be delivered on the job site in their original containers with labels and seals unbroken.

3. Manufacture or brand of painting materials to be used shall either be Dutch Boy, Davies, Boysen or any equivalent approved by the designing Architect.

    a) Kind of Paint
    b) Tinting Color
    c) Patching Compound
    d) Natural Wood Paste Filler
    e) Wood Stain
    f) Varnish
    g) Lacquer
    h) Sanding Sealer
    i) Glazing Putty
    j) Concrete Neutralizer
    k) Silicon Water Repellant

B. CONSTRUCTION REQUIREMENTS

The Contractor prior to commencement of the work shall examine the surfaces to be applied with paints, enamels, varnishes, lacquers, sanding sealers and other related products in order not to jeopardize the quality and appearance of painting or finishing work.

1. SURFACE PREPARATION

a) Surface Examination.
b) Preparation
c) Interior Woodwork
d) Plaster or Masonry
e) Metals
f) Concrete and Brick Surface

g) Cleaning Methods
    i. Sun blasting – there are 3 general methods in used in sun blasting:

        Conventional Dry Sandblasting
        Vacuum Sandblasting
        Wet Sandblasting

    ii. Wire Brushing and Scraping
    iii. Power Tools
    iv. Water Blasting
    v. Acid-etching
    vi. Paint Remover
    vii. Alkali Cleaning

h) Surface Conditioning
i) Application
j) Workmanship
k) Mixing and Thinning
l) Storage
m) Cleaning

C. MEASUREMENT AND PAYMENT

1. The quantity to be paid shall be total area in Square Meters of the various concrete, word and metal surfaces painted complete as shown on the Plans as specified and accepted by the Architect or Engineer.

2. The accepted work shall be paid at the Unit Bid Price, which price and payment shall constitute full compensation for furnishing all materials, equipment, labor, tools and incidentals necessary to complete this Item.

3. ELECTRICAL

SCOPE OF WORK

The work under this Division consist of furnishing all materials, equipment, tools, labor and all other services necessary to complete and make ready for operation the Electrical Power and Lightning System described below and or indicated in the Electrical Plans in accordance with the latest edition of the Philippine Electrical Code and this Specifications and General Conditions of the Contract.

A. CONSTRUCTION REQUIREMENTS

1. Furnishing and installation of underground service entrance, conduits and conductors, and all items required by local utility power company's policy, rules and regulations.

2. Furnishing and installation of panel boards at location indicated on the plan and electrical riser layout, including all accessories required.

3. Furnishing and installation of feeder and branch circuit conductors with the necessary conduits, approved type of fittings and devices as indicated in the electrical plans.

4. Furnishing and installation of all types of utilization devices, outlets and wall switches with properly installed cover plate.

5. Furnishing of all lighting fixtures, conduits, including service entrance duct, terminal cabinet and utility boxes.

B. CODES, REGULATIONS AND STANDARDS

1. The installation and equipment shall conform to good engineering practices and in particular comply with the requirements laid down in the following documents or its equivalent which are mandatory and modified only by specific agreement.

   Philippine Electrical Code - - - - - - - - - - PEC
   Underwriter's Laboratory, Inc - - - - - - - - UL
   National Electric Manufacturers
   Association - NEMA
   Local Utility Power Company - - - - - - - - - LUPC

2. In addition to the requirements of these Codes and the Utility Power Company's requirements, local government regulations and suppliers Specifications if any, shall be followed.

C. DRAWING AND SPECIFICATIONS

1. The drawings and Specifications are meant to be complementary to each other, and what is called for by one shall be binding as if called for both.

2. Any apparent conflict between the drawings and specifications, and any controversial or unclear points in either shall be referred to the supervising Architect or Engineer for final interpretation and decisions.

3. On one copy of the plans, have a record showing all deviations that happened during the construction

4. Upon completion of work as described herein, the Contractor at his own expense shall furnish the Owner 6 copies of the "As Built" plan for future references and maintenance purposes.

D. CORRELATION OF WORK

1. The Electrical Contractor shall confer with the General Contractor and Architect to determine how and where his work fits with that of other crafts, after familiarizing himself with the plans and specifications.

2. This shall be done at the beginning of construction. Should there be any existing doubts at any point, ruling shall be secured from the supervising Architect or Engineer who shall be given time to inspect the work covering this point and to prepare a detail in the form of drawings and written instructions as required.

E. PERMITS AND INSPECTION

1. The Contractor shall obtain at his own expense, all the necessary permits and certificate of Electrical Inspection from the proper government authorities required for both the performance of his work involved and the proper operation of the system upon completion of the work.

2. The Contractor shall at his expense, reproduce the electrical plans for his work to the necessary requirements as required by the government authorities concerned in issuing permits and Certificate of Electrical Inspection.

F. EXAMINATION OF PREMISES

1. Prospective bidder is required to examine the architectural, structural, and electrical plans of the project, to visit the site and carefully take note of all the conditions thereat to have personal informed under which the electrical work is to be done.

2. No allowance will subsequently be made in his behalf of any error on his part. He will be deemed to have done this before submitting his proposal and no subsequent claims on the ground of inadequate or inaccurate information will be entertained.

G. LAYOUT OF WORK

1. Electrical system layout indicated on the drawings are generally diagrammatic and the location of outlets, devices, apparatus and equipment are only approximate.

2. The exact routing of conduits, location of outlets, devices apparatus and equipment shall be governed by structural and architectural conditions and limitations.

3. For the exact location, consult the supervising Architect or Engineer. This does not mean to permit redesigning of the systems. All outlets are to be interconnected as indicated in the drawings.

4. The Owner reserves the right to make any reasonable change in location of outlet and equipment prior to rough-in, without involving additional expense.

5. The Contractor shall be responsible and pay changes for cutting and patching for piping lines where sleeves or slots were not installed or where incorrectly located.

H. MATERIAL AND WORKMANSHIP

1. All materials to be installed shall be unused, brand new and shall conform with the standards of the Underwriters Laboratories, Inc. in every case where such a standard has been established for the particular type of materials to be used.

2. Only skilled workmen using proper tools and equipment shall be employed during the entire course of installation work.

3. All workmanship shall be of the best practices of the trade involved. The same job foreman shall be assigned and maintained at the job site during the entire course of the job.

I. UNDERGROUND SERVICE ENTRANCE

1. The Electrical Contractor shall furnish and install 220 volt current rating, 3- Phase line underground service entrance connection.

2. The service entrance conductors shall be thermoplastic type THW standard copper conductors, stranded, whose number and size are indicated on the plans and electrical riser diagram.

3. The underground service entrance shall be laid at least 60 cm. below the finish grade line and shall be installed to make the joints entirely watertight.

4. The conductor shall then be encased with concrete at least 8 centimeters thick.

J. SERVICE METERING FACILITIES

1. The Contractor shall furnish and install a concrete pedestal pole size 30 cm x 30 cm x 5.50 m in the location shown in the plan and electrical diagram including line accessories and hardware in accordance with the local power company's standards.

2. It shall be the duty of the Contractor to request the local power company to install a proper type and size of service metering instruments and all other necessary accessories, materials, equipment, devices and fittings.

K. PANEL BOARDS

1. The Contractor shall furnish and install the necessary panel boards multi-breaker type including the breakers as indicated in the drawings.

2. Circuit breakers shall be tropical of the magnetic thermal type with ratings and number of poles as indicated in the drawings.

3. All panel boards to be used shall be flush mounted when located in areas that are visible to the general public and may be surface mounted when located in machine room or areas where they are not visible to the public.

4. All panel boards shall be set plumb and symmetrical with the surrounding objects. Panel boards shall be installed in a perfectly fit cabinet of appropriate size provided with a stop in-door trim and good quality cylinder lock.

L. CONDUIT WORK

1. Standard PVC conduit pipe system is required for this project.

2. Conduit runs shall be concealed in drop ceiling and or embedded in concrete structure where concealment is not possible.

3. No conduit of less than 15 mm normal diameter shall be installed for this project. Two or more conduits shall not be installed in lieu of a larger size.

4. Conduit run shall be continuous from outlet and no running thread shall be in any conduit run. Conduit shall be cut square and properly reamed.

5. All joints shall be screwed enter knockouts of conduit boxes, pull boxes, panels and cabinet squarely. Lock-nuts shall be screwed tight to insure continuity of raceway grounding.

6. Bonds and offset shall be avoided where possible, but where necessary it shall be made with approved conduit bending apparatus.

7. Conduits which have been deformed or crushed in any manner should not be installed.

8. The Contractor shall plug with lead or closed with approved pipe caps the ends of all conduit boxes so as to prevent the entrance of white ants and dirt within the conduit system.

9. This lead or cap shall be placed that can be easily removed when so desired and at the same time serve the purpose intended.

10. Pull wire shall be inserted in the empty ducts before they are closed with lead or caps and shall be left therein for future use.

11. When not shown on the plans, conduit sizes shall correspond to the conduit sizes on tables of the Philippine Electrical Code latest edition.

M. FEEDERS AND FEEDER DUCTS

1. Feeder shall be laid out in accordance with the on-line diagram shown in the drawings.

2. Unless otherwise specified or shown on the drawings, type THW wires shall be used for feeder runs. The wires and conduit shown in the drawings shall be the minimum size to be used for feeder runs.

N. WIRING METHODS

1. Wiring for all systems shall be type THW or TW conductors using plastic conduit pipes. Other types of conductor shall be as indicated in the drawings.

2. Conduit shall be embedded in columns, walls and toppings of floors slabs to allow flush connection and lighting system which may be exposed between joints in case a drop ceiling is installed.

3. Proper fittings shall be provided at ends of conduits.

4. All conduit and conduit fittings shall be PVC and shall conform with the U.S. Underwriter’s Laboratories Inc. Standard and Codes.

5. The minimum size of conduit to be used shall be 13 mm diameter. Sizes larger than 13 mm diameter shall be indicated in the drawings.

6. Smallest size of conductor to be used shall be 2.0 mm^2 type TW or THW. TW wire shall be indicated in the drawings.

7. Circuit homeruns for lighting shall be 3.5 mm^2 and 5.5 mm^2 for the power or otherwise indicated on the plans.

8. All splices, tape and junctions for all systems using conductor up to 14 mm^2 shall be accomplished by using electrical friction of rubber shapes.

9. Proper type of connections shall be employed to accommodate all splices and solder less type terminals to be used for connection to Busbar.

10. Taps and splices shall be properly protected with both plastic and friction electrical tapes to proper insulation and protection for 600 volts.

11. Wiring from ceiling outlets to lighting fixtures recessed in dropped ceilings shall be done using type TW conductors in RS or PVc conduits.

12. Proper size of boxes shall be used for switch and outlet receptacles

13. Necessary fittings such as bushing, locknuts and antishort fiber bushing shall be used at proper places required.\

14. When not shown on the Plans, conduit sizes shall correspond to the conduit sizes as prescribed in the Philippine Electrical Code table for “Size of Conduit Pipes”.

O. OUTLETS AND SWITCHES

1. All boxes for outlets and switches shall be PVC or galvanized iron approved products of reputable manufacturers.

2. Enamel coating used in lieu of zinc coating shall not be permitted.

3. All ceiling outlet boxes intended for lighting outlets shall be of the 10 cm. octagonal box larger boxes when required shall be 5.3 cm deep.

4. Convenience and wall switch outlet boxes shall be of the 10 cm by 5.3 rectangular deep flush type or 100 square cm junction box with gang raised cover as required to accommodate the wires therein.

5. All junction boxes, pull boxes and blank boxes shall be fitted with standard flat metal or plastic box cover.

6. All boxes including junction and pull boxes shall be of sufficient size to provide free space for all conductors enclosed in the box, in addition to the fittings such as switch mechanism and receptacles that may be placed therein.

P. WALL SWITHCES AND RECEPTACLES

1. Suitable single pole, two-gang, three-gang and three-way switches of the flush tumbler type and receptacles with proper Bakelite cover plates shall be furnished and installed as indicated in the drawings.

2. Wall switches intended to control lights on the 230 volts system shall be rated 15 amp. 250 volts.

3. Convenience outlets shall be flushed duplex type rated 20 amperes 230 volts 60 Hz, AC.

Q. GROUNDING INSTALLATION

1. The Contractor shall furnish and install all ground cables, connection ground rods and all other materials required to provide a permanent effective grounding system.

2. Grounding, in general, shall conform with the provisions of the National Electrical Code and as recommended by the equipment manufacturer.

3. All enclosures for electrical equipment regardless of voltage shall be grounded, including metal frames of switchboard, motors, generators and steel poles. Each shall be grounded in a separate grounding system.

4. Grounding cables shall be bare, copper suitable size and of approved type. Ground rods shall be copper clad steel with diameter of 16 mm and length of 2.0 m.

5. Ground clamps shall be of high compression, solderless cast design frame of high copper alloy bronze with minimum thickness of 4.7 mm and hardware made from silicon bronze.

6. The clamps shall be of a shape and size to fit the points of application and type of conection to be made from cable to rod, pipe and curved or flat surfaces.

R. LIGHTING OUTLETS

All ceiling outlets shall be 10 cm x 5 cm octagonal boxes. Connection from fixtures to boxes shall be accomplished by using type TW conductors on a flexible conduit.

S. LIGHTING FIXTURES

All lighting fixtures shall be furnished and installation by the contractor. They shall be as shown on the drawings or specified on the schedule of lighting fixtures. For other details as to the types and model, consult the Architect or the Engineer.

T. TEST AND GUARANTEE

1. The Contractor shall furnish all apparatus to be used in making tests of all wiring system for shorts and grounds after the electrical work is completed.

2. The Contractor guarantees all work installed under the Contract to be free from all defects for a period of one year after acceptance of the works.

3. The Contractor also agree to repair and make good at his own expense any and all defects which may develop in his work during the time if said defects arise due to poor workmanship.

U. POWER LOAD CENTER

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

1. Material Requirements

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

2. Power Load Center Unit Substation

The contractor shall furnish and install an 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 and shall consist of the following coordinated component parts. High Voltage Primary incoming line section consisting of the following parts and related accessories.

a) One air filled Interrupter Switch, 2- position (open-close) installed in a suitable air filled metal enclosure and shall have sufficient interrupting capacity to carry the electrical load. It shall provided with key interlock with the cubicle for the power fuses to prevent access to the fuse unless the switch is open.

b) Three power fuses mounted in separate compartments within the switch housing and accessible by hinged door.

c) One set of high voltage potheads or 3-conductor cable or three single conductor cables.

d) Lightning arresters shall be installed at the high voltage cubicle if required.

Note: Item 1 and 2 could be substituted with a power circuit breaker with the correct rating and capacity.

3. Transformer Section

a) The Transformer section shall consist of a power transformer with ratings and capacities as shown on the Plans.

b) It shall be oil liquid filled non-flammable type and designed in accordance with the latest applicable standards.

c) The transformers shall be provided with 4 approximately 2.5% rated KVA taps on the primary winding in most cases above and 3 below rated primary voltage to be changed by means of externally gang-operated manual tap changer only when the transformer is deenergized.

d) The following accessories shall be provided with the transformer, namely: drain valve, sampling, sampling device, filling connection, oil liquid level gauge, ground pad, top filter press connection, lifting lugs diagrammatic nameplate relief valve, thermometer and other necessary related accessories.

e) The high voltage and low voltage bushing and transition flange shall be properly coordinated to field connection to the incoming line section and low voltage switchboard section, respectively.

4. The 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.

Switchboard Housing
Secondary Metering Sections
Main Circuit Breaker
Feeder Circuit Breakers
Low Voltage Switchgear
Grounding System
Panel Board and Cabinets

V. CONSTRUCTION REQUIREMENTS

The Contractor shall install the Power Load Center Unit Sub-station or Low Voltage Switchgear and Panel boards at the locations shown on the approved Plan.

W. METHODS OF MEASUREMENT

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

4. MECHANICAL

4.1 AIR CONDITIONINING

REFREGIRATION SYSTEM

SCOPE OF WORK

This Item shall consist of furnishing and installation of air conditioning, refrigeration and ventilation systems, inclusive of necessary electrical connections, ductworks, grilles, pipes and condensate drains and all other necessary accessories, ready for service.

A. MATERIAL REQUIREMENTS

The types, sizes, capacities, quantities and power characteristics of the compressor, evaporator, condenser water pump shall be as specified or as shown on the Plans.

1. Refrigerant Pipes

a) Refrigerant pipes shall be copper tubing, type L or K or black steel pipe, Schedule 40 for size of 10 cm diameter and smaller. Pipes over 10 cm diameter shall be black steel pipe schedule 40.

b) Black steel pipe shall be standard seamless, lap-welded or electric resistant welded for size 50 mm diameter and larger, screw type for size 38 mm diameter and smaller, fitting for copper tubing shall be cast bronze fitting designed expressly for bracing.

2. Pipes for Cooling Water

a) Chilled and condenser cooling water pipes shall be black steel pipe Schedule 40.

b) Pipes and fittings for size 50 mm diameter and smaller shall be screwed type. Pipes and fittings for 62 mm diameter and larger shall be welded or flanged type.

3. Pipe Insulation

a) Pipe insulation shall be pre-formed fiberglass or its equivalent. The insulating material shall be covered with 10 mm x 13 mm thick of polyethylene film which shall be overlapped not less than 50 mm.

b) Pipe insulation shall be adequately protected at point of support by means of suitable metal shield avoid damage from compression.

c) Insulated pipes, valves and fittings located outdoors shall be provided with metal jackets.

4. Duct Works

Duct shall be galvanized steel sheet of not less than the following gauges:

a) No. 26 for 300 mm wide and smaller
b) No. 24 for 350 mm to 750 mm wide.
c) No. 22 for 775 mm to 1500 mm wide
d) No. 20 for 1525 mm to 2250 mm wide.
e) No. 18 for 2275 mm to 2500 mm or larger
f) For aluminum sheets use one gauge higher.

Joints and Stiffeners of duct using slip joints shall be as follows:

a) 300 mm wide and smaller, without bracing.
b) 325 mm to 750 mm wide, brace with 25 mm x 25 mm x 3 mm steel angles.
c) 774 mm to 1500 mm, brace with 31 x 31 x 3 mm steel angles.
d) 1525 mm up, brace with 38 x 38 x 3 mm steel angles.

Stiffeners shall be located not more than 12.0 cm. from each joint.

5. Duct Work Insulation

a) The application insulation materials shall be rigid board made of styropor or equivalent 25 mm thick for ground and top floor, 13 mm thick for intermediate floor.

b) Galvanized metal bands shall be secured and spaced 30.0 cm minimum center to center distance and corners protected with galvanized metal angles.

6. Diffusers

a) The type, shape, capacity, size and location shall be as shown in the Plans. Diffusers shall be complete with frame and gasket, equalizing deflector and volume control as indicated or specified and shall have factory-applied prime coat of paint.

b) Samples of supply and return air diffusers shall be submitted for approval before mass fabrication and installation.

7. Dampers

a) Dampers shall be of same materials as duct, at least one gauge thicker and in accessible location complete with locking device for adjusting and locking damper in position.

b) Where necessary, splitters, butterflies and louvers damper deflecting vanes for control of air volume and direction and for balancing system shall be provided whether or not they are indicated on the Plans.

8. Fire Damper

a) Main duct shall be provided with proper fire dampers of fusible link actuated type.

b) Access door shall be provided in ductwork for renewal of fusible link and to reset damper.

9. Equivalent Foundation

a) Foundation shall be provided and shall conform to the recommendation of the manufacturer of the equipment. Equipment shall be leveled on foundation by means of jacks or steel wedges.

b) All spaces between equipment bases and concrete foundation shall be filled with cement mortar.

10. Electrical Works

a) Power supply shall be provided by the Contractor at the pull box installed inside the machine room and shall furnish and install the main circuit breaker and starter with suitable ratings and capacities, conduits, wirings, fittings, devices and all other equipment and electrical installation of the system.

b) All electrical works shall comply with the latest edition of the Philippine Electrical Code, with the applicable ordinance of the local government and all the rules and requirements of the local power company.

B. CONSTRUCTION REQUIREMENTS

a) The air conditionings system shall be entirely automatic in operation and shall not require the presence of an attendant except for periodic inspection for lubrication.

b) All equipment and materials shall be inspected upon delivery and shall be tested after installation.

c) Piping shall not be buried, concealed or insulated until it has been inspected, tested and approved.

d) Walls, floors and other parts of the building and equipment damaged by contractor in the prosecution of this mechanical work shall be replaced and restored to its original conditions as shown on the Plans.

1. Operating Tests

a) Refrigerating equipment shall be tested for 8 hours per day for 3 consecutive days or longer when so directed, under the supervisions of manufacturer's qualified and authorized representative, who will make necessary adjustments and instruct designated plant operating personnel for each operation maintenance of refrigerating equipment and controls.

b) Operating test of complete air conditioning system shall be 6 hours minimum for each system. Test of air flow, temperature and humidity shall be made to demonstrate that each unit complies with the requirements of the Plans and Specifications.

2. Guarantee and Service

All equipment, materials and workmanship shall be guaranteed for a period of one year from the date of acceptance at any time within the period of guarantee and upon notification; the Contractor shall repair and rectify the deficiencies, including replacement of parts or entire unit.

3. Miscellaneous

a) The Owner shall be provided with 3 bound copies of "As-Built" diagrams, shop drawings, part lists, serial number and inventory of equipment including manufacturer's operating and maintenance manuals.

b) All standard tools and equipment shall be furnished for proper and regular maintenance of installed equipment.

C. MEASUREMENT AND PAYMENT

1. The work under this Item shall be measured either by set, price, length, square meter actually placed and installed as shown on the Plans.

2. Compressor, condenser and evaporator shall be measured by set, grilles, diffusers and valve by piece, pipe by length, duct and insulation by square meter.

3. All work performed and measured shall be paid for the Unit Bid or Contract Price which payment constitute full compensation including labor, materials, tools and incidentals necessary to complete this item.

4.2 WATER PUMPING SYSTEM

SCOPE OF WORK

This Item consist of furnishing and installation of water pumping system, inclusive of all piping and pipe fitting connections, valves, controls, electrical wirings, tanks and all accessories ready for service in accordance with the approved Plans and Specifications.

A. MATERIAL REQUIREMENTS

1. Water Pump

The type, size, capacity, location, quantity and power characteristics shall be as specified or shown on the Plans.

2. Overhead Tank

Overhead tank shall be provided with manholes, cover, drain pipes, distribution pipe outlet, overflow pipes and air vent.

3. Pneumatic Tank

Tank shall be designed for twice the maximum total dynamic pressure required and shall have the following accessories.

a) Suitable pressure switch to stop pump if pressure required is attained.

b) Air volume control device to maintain correct air volume inside the tank.

c) Pressure relief valve should be installed on top of the tank.

d) Electrode to be connected in the motor pump control to control the water level.

e) Air compressor shall be provided for tank of 3.785 liters to maintain air pressure inside the tank.

4. Pipes and Fittings

All piping 10 cm and larger shall be welded or flanged while smaller sizes shall be screwed.

5. Valves

A gate valve followed by a check valve shall be placed between discharge of pump and tank to prevent back flow of water when pump is in stop.

B. CONSTRUCTION REQUIREMENTS

Exposed piping shall be provided with concrete saddle or steel clamps or hangers to secure them firmly to the building structures. Pipe threads shall be lubricated by white lead, red lead, Teflon tape or other approved lubrication before tightening.

C. MEASUREMENT AND PAYMENT

The work under this item shall be measured either by set, length and piece actually placed as indicated on the Plans Equivalent shall be measured by set, pipes by length, valves and fittings by piece.

4.3 AUTOMATIC WATER SPRINKLER

SCOPE OF WORK

This Item shall consist of furnishing and installation of Automatic Water Sprinkler System, inclusive of all piping and pipe fitting connections, valves, controls, electrical wiring connection and all other accessories ready for service in accordance with the Plans and Specifications.

A. MATERIAL REQUIREMENTS

1. Fire Pump

a) The type, size, capacity and quantity and power characteristics shall be specified or as shown on the Plans.

b) The fire pump shall be diesel engine driven and capable of delivering a minimum of residual pressure of 103 kPa at the top-most and remotest sprinkler.

c) The pump unit shall be supplied with relief valve, suction gauge and discharge pressure gauge. The diesel engine shall be designed specifically intended for an automatic water sprinkler protection system.

d) A drop in system pressure due to the operation of one sprinkler pressure shall be triggered a series of automatic operations that will result in the instantaneous operation of the engine to drive the fire pump with the aid of a battery automatic controller.

e) The required accessories are:
Tachnometer
Oil Pressure gauge
Temperature gauge and control panel

f) A diesel fuel day tank shall be provided to supply the engine for a minimum of 2 hours running time.

g) The fuel storage tank shall be asphalt coated with necessary piping and fittings for connection.

2. Jockey Pump

Jockey pump shall be electric motor driven, 220 v. 3-phase, 60 hertz Power connection. The capacity to be supplied shall not less than that indicated on the Plans.

3. Sprinkler Head

a) Type-spray unit, pendant and upright unit
b) Flow capacity, 83 LPM per head
c) Pressure Rating
d) Residual pressure – 103 kPa minimum
e) Maximum pressure – 1035 kPa
f) Temperature rating – fusing at 57.5^0 C to 74^0 C

g) Finish – chrome-pendant-chrome or brass upright
h) Pipe thread – 13 mm nominal
i) Stock of extra heads and tools required

4. Alarm Check Valve and Fire Alarm System

a) The alarm assembly shall be constructed and installed that any flow of water from the sprinkler system equal to or greater than that from the single automatic head shall result in an audible and visual signed in the vicinity of the building.

b) The alarm apparatus shall be substantially supported and so located and installed that all parts shall be readily accessible for inspection, removal and repair.

c) The actual water flow, through the use of a test connection, shall be employed to test the operation of the sprinkler alarm units as a whole.

d) An approved identification sigh shall be installed near the outdoor alarm device in a conspicuous positions.

5. Alarm and Supervisory System

The alarm and supervisory system of the automatic water sprinkler shall include the monitoring of the following:

a) Water flow switch of each floor of the building
b) Fire pump and jockey pump running condition and power supplies.
c) Level of water in the reservoir
d) Control valves

The water flow switches on each floor of the building shall be connected to the fire alarm system and annunciator in such a manner that the operation of any sprinkler system will activate the fire alarm system, with the location of the operating water flow switch simultaneously indicated in the annunciator panel.

6. Pipes and Fittings

a) Pipes shall be Black Iron Schedule 40
b) Screw fitting shall be used for inside piping
c) Welding and touch cutting shall not be allowed
d) Piping shall be painted with metal primer and red enamel paint.

7. Siamese Twin

The Siamese twin shall be 64 x 64 x 102 mm, 90^{o} C female coupling national standard thread, swivel type, with protective coupling cap and joint lug.

8. Pipe Hangers

Pipe hangers shall be steel bars 3 mm minimum thickness, with corrosion protection.

a) *Anchorage in concrete* – expansion shield preferably be used in a horizontal position in the sides of concrete beams.

b) *Expansion shield in vertical position.*When pipes 1—mm and larger are supported entirely by expansion shield in the vertical position, the supports shall be spaced not more than 3.0 meters apart.

c) For pipe running through concrete beams use sleeves at least 2 sizes larger than the piping.

B. CONSTRUCTION REQUIREMETNS

1. Acceptance Tests

a) System operation and maintenance chart shall be submitted to the Owner upon completion of the Contract. This shall include the locations of control valves and care of the new equipment.

b) Marked instructions and identifications sign boars shall be made of NO. 14 gauge black iron sheet with baked enamel finish paint and letter instructions are shown on the Plans

c) Sign boards shall be mounted on the equipment or wall nearest the equipment easy identification and reading.

d) Additional sign boards as may be required and not specified herewith shall be furnished at no extra cost.

2. Conduct of Tests

a) Test shall be by the Sprinkle System conducted in the presence of an inspector or authority having jurisdiction.

b) Flushing of Underground Connections to remove foreign materials which may have entered the piping during installation of same as required before sprinkler piping is connected.

c) Hydraulic Test shall be conducted as follows:

i. **The Pressure** - all systems, including piping shall be tested hydrostatically at no less than 1378 kPa pressure for 2 hours or at 345 kPa in excess of the maximum static pressure when the maximum static pressure is in excess of 1033 kPa.

ii. **Operating Test** – all control valves shall be fully closed and opened under water pressure to insure proper operation. Use clean, non-corrosive water.

iii. **Fire Department Connection** – piping between the check valve in the fire department inlet pipe and the outside connection shall be tested the same as the balance of the system.

d) *Tests of Drainage Facilities* – Test of the drainage facilities shall be made while the control valve is wide open. The main drain valve shall be opened and remain open until the system pressure stabilizes.

e) *Test Certificate* – Upon completion of work, inspection and tests made by the Contractor and witnessed by the Owner's representative. A test certificate shall be filled out and signed by both representatives.

C. MAINTENANCE SERVICE

1. The Contractor shall provide free of charge, maintenance service of the system for a period of at least one year reckoned from the date of acceptance of the work.

2. Upon completion of the work and after all tests, the services of one or more qualified engineers shall be provided by the Contractor for a period of not less than 5 working days to instruct and train the representative of the Owner in the operation and maintenance of the fire protection system.

Guarantee and Service

All equipment, materials, and workmanship shall be guaranteed for a period of 1 year from the date of acceptance at any time within the period of guarantee and upon notification, the Contractor shall repair and rectify and deficiencies, including replacement of parts or entire units.

5. PLUMBING

SCOPE OF WORK

This Item shall consist of furnishing all materials, tools equipment and fixtures required as shown on the Plans for the satisfactory performance of the entire pluming system including installation in accordance with the latest edition of the National Plumbing Code, and these Specifications.

A. MATERIAL REQUIREMENTS

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

1. Plastic Pipes

a) Unless otherwise specified or shown on drawings all tube pipes to be use in this project shall be plastic or synthetic materials.

b) For rigid type of connections, the following shall be used: Polyvinyl Chloride (PVC); Chlorinated Polyvinyl Chloride (CPVC); Unplasticized Polyvinyl Chloride (uPVC); Acrylonitrile Butadiene Styrene (ABS); Polypropylene (PP) and Styrene Rubber Plastic (SR).

c) For flexible connections either of the following shall be used: Polyethylene (PE) and Polybutylene (PB).

d) The PE and PB tubes are in coil form available up to 150 meters long in coil form shall be used for underground water connections.

e) Plastic pipe shall be of quality made by reputable manufacturers free from defects, and shall be true, smooth and cylindrical, their inner and outer surfaces being as nearly concentric, their inner and outer surfaces being as nearly concentric as practicable.

f) They shall be in all aspect, sound and perfectly molded free from laps, pin holes or other imperfections and shall be neatly dressed with its end finished reasonably square to their axes.

g) Pipes and fittings for sanitary and potable water lines as approved alternate shall be unplasticized Polyvinyl Chloride Pipes and fittings (Upvc)

h) Pipes and fittings shall be made of virgin materials conforming to Specification requirements defined in ASTM D-2241 and PS 65: 1986.

i) Fittings shall be molded type and designed for solvent cement joint connection for water lines and rubber O-ring seal joint for sanitary lines.

2. Septic Tank

a) The septic tank shall be provided as shown on the Plans including all pipe vents and fittings.

b) Various construction materials such as concrete masonry work shall conform to the corresponding Items of this Specification.

c) Inlet and outlet pipes shall conform to the latest edition of the National Plumbing Code.

3. Plumbing Fixtures and Fittings

a) All fittings and trimmings for fixtures shall be chromium plated and polished brass unless otherwise approved.

b) Exposed traps and supply pipes for fixtures shall be connected to the roughing-in, piping system at the wall unless otherwise indicated on the Plans.

c) Built in fixtures shall be watertight with provision of water supply and drainage outlet, fittings and trap seal.

d) Unless otherwise specified, all plumbing fixtures shall be made of vitreous china complete with fittings.

4. Bathroom and Toilet Accessories

a) Shower head and fitting shall be movable, cone type with excutcheon arm complete with stainless steel 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 mounting flange.

c) Floor drains shall be made of stainless steel beehive type, measuring 10 cm x 10 cm. 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 adjacent fixture and facing tiles.

e) Soap holder shall be vitreous china wall mounted. Color shall reconcile with the adjacent tile works.

f) Faucets shall be made of stainless steel for interior use.

g) Hose bibs shall be made of bronze cast finish.

5. 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 edge, 75 x 53 cm. complete with supply fittings, strainer, trap ad other accessories,

c) Scrub up sink shall be made of cast iron white porcelain finish with 3 compartment X – ray processing tank, drain plug, open sanding drain 19 mm inlet spud complete with stand and mounting accessories.

d) Built in appliances such as urinal, lavatory and slope sink shall be installed as indicated on the Plans. Exposed surfaces to be tile wainscoating complete with fitting accessories required as practiced in this specialty trade.

e) Squat Bowl(s) shall be vitreous china, wash down with integral foot treads, pail flush type. Color, make and type to be approved by the designing Architect.

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

6. Roof Drains, Overflow Pipes and Steel Grating

a) The Contractor shall provide fit and or install necessary drains with strainers where shown on the Plans.

b) Each drain with strainer shall fit the size of the corresponding downspout or roof leader over which it is to be installed and in conformity with the following schedule.

7. Fire Protection System

a) Fire house cabinets shall be locally available consisting of 38 mm diameter valve hose rack 30 mm nipple rubber hose cable with square nozzle 38 mm diameter brass, chromium plated.

b) Fire Standpipe system shall consists of risers and hose valves. Standpipe shall be extra strong black iron.

c) Valves to be used shall be high grade cast bronze mounted with standing 79.40 kg. working pressure.
d) Fire extinguisher shall be portable, suitable for Class A, B, C, fires, mounted inside the cabinet. Cabinet shall be full flush mounting door with aluminum trim for glass plate.

e) Frame and box shall be made of gauge 14 galvanized iron sheets with white interior and red exterior baked enamel finish over the well prepared primer.

f) Cabinet shall be wall mounted and size to accommodate the defined components.

g) 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.

h) Built in appliances such as urinal, lavatory and slope sink shall be installed as indicated on the Plans. Exposed surfaces to be tile wainscoting complete with fitting accessories required as practiced in this specialty trade.

B. CONSTRUCTION REQUIREMENTS

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

1. Installation of Soil, Waste, Drain and Vent Pipes

a) **Soil Pipe** – all soil and drainage pipes shall be sloped at 2% or 2 cm. per 1.0 meter run but in no case flatter than one (1%) percent.

b) **Horizontal lines** shall be supported by well secured heavy strap hangers.

c) **Vertical lines** shall be secured strongly by hooks to the building frame a suitable brackets or chairs shall be provided at the floor from which they start.

d) 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.

e) **Vent Pipes** in roof spaces shall be run as close as possible to underside of roof with horizontal piping slope down to stacks without forming traps. Vertical vent pipes may be connected into one main vent riser above the highest vented fixtures.

f) Where an end or circuit vent pipe from any fixtures is connected to a vent line serving other fixtures, the connections shall be at least 120 cm. above the floor on which the fixtures are located.

g) Horizontal waste line receiving the discharge from two or more fixtures shall be provided with end vents unless separate venting of fixtures is note 1 on the Plan.

h) All changes in pipe sizes such as soil and waste lines shall be made with reducing fittings or recessed reducers.

i) All changes in directions shall be made by appropriate use of 45^0 degrees Y; half Y; long sweep; quarter bends or elbows for soil and waste lines where the change in direction of flow is form the horizontal to the vertical and discharges from water closet.

j) Where it is becomes necessary to use short radius fittings in other locations, the approval of the supervising Architect or Engineer shall be obtained prior to installation of said fittings.

k) **Cleanouts** at the bottom of each soil stack, waste stack, interior downspout, and where else indicated shall be the same size as the pipe lines.

l) **Vent pipes** shall be flashed and made water tight at the roof with ferrule as the pipe lines.

m) **Trap** – Each fixtures and place of equipment requiring connection to the drainage system except fixtures and continuous water shall be equipped with a trap. Each trap shall be placed as near to the fixtures as possible.

2. Water Pipes, Fittings and Connections

a) The water supply 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 slope towards a main shutoff valve and drain. Ends of pipe and outlets shall be capped or plugged and left ready for future connections.

c) All pipes shall be cut accurately to measurements and shall be worked into place without springing or forcing.

d) All piping above the ground shall be run parallel with the lines of the building unless otherwise indicated on the Plan.

e) All service pipes, valves and fittings shall be kept at sufficient distance from other work to permit finished covering not less than 12 mm from such work or from finished covering on the different service.

f) No water piping shall be buried in floors, unless specifically indicated on the Plan. Changes in pipe directions shall be made with reducing fittings.

g) 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 10 cm in 30 meters.

h) All pipes to be threaded shall be reamed before threading. All screw joints shall be made with graphite and oil or with an approved graphite compound applied to make threads only.

3. Fire Standpipe System

Fire standpipe system shall consist of risers and hose valve. Standpipe shall be extra strong black iron. Valves shall be of high grade cast bronze quality approved by the Underwriter's specifications.

4. Valves and Hose Bibs

Valves shall be provided in all supplied fixture as herein specified.

a) 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 check valve.

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

c) Valve shall not be installed with its stem below the horizontal elevation. All valves shall be gate valves unless otherwise indicated on the plans.

d) Valves up to 50 mm diameter shall be threaded ends, rough bodies and finish trimmings, except those on chromium plated brass pipe.

e) Valves 63 mm in diameter and larger shall have iron bodies, brass mounted and shall have either screws or flange ends.

f) Hose bibs shall be made of brass with 12 mm inlet threads hexagonal shoulders and 19 mm male.

5. Fixtures, Equipment and Fastening

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

b) All fixtures required to be wall mounted on concrete or concrete hollow block wall shall be fasten with brass expansion bolts.

c) Expansion bolts shall be 6 mm diameter with 20 mm threads into solid concrete, fitted with tubing sleeves of proper length to acquire extreme rigidity.

d) Inserts shall be rigidly secured, anchored and properly concealed and flushed into the walls.

e) Bolts and nuts shall be horizontally mounted and exposed. It shall be provided with washers and chromium plate finish.

6. Pipe Hangers, Inserts and Supports

a) Pipe hangers shall be wrought iron malleable iron pipe spaced not more than 1.50 meters apart for horizontal runs of pipe.

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

c) Trapeze hangers may be used in lieu of separate hangers on pipe running parallel to and closed to each other.

d) Inserts shall be cast steel of the type to receive machine bolt or nut after installation. Insert permit adjustment of the bolts in one horizontal direction and shall be installed before the pouring of concrete.

e) Wrought iron clamps or collars to support vertical runs of pipe shall be spaced not more than 3.0 m apart or as indicated on the Plan.

7. Plates and Flashing

a) Plates to cover exposed pipes passing through floor finished, walls, or ceiling shall be fitted with chromium plated cast brass plates or chromium plated cast iron or steel plates on ferrous pipes.

b) Plates shall be large enough to cover and close the hole around the area where pipes passes. It shall be properly installed to insure permanence.

c) Roof areas penetrated by vent pipes shall be rendered water tight by lead sheet flashing and counter flashing. It shall extend at least 15 cm. above the pipe and 30 cm along the roof.

8. Protection and Cleaning

a) During installation of fixtures and accessories and until final acceptance, fixtures shall not be protected with strippable plastic or other approved means to maintain fixtures in perfect conditions.

b) All exposed metal surface shall be polished clean and free of grease, dirt or other foreign materials after the completion.

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

9. Inspection, Warranty Test and Disinfection

All pipes, fittings, traps, fixtures, appurtenances and equipment of the plumbing and drainage system shall be inspected and approved by the supervising Architect or Engineer to assure compliance with all requirements of applicable Codes and Regulations referred to in these Specifications.

10. Drainage System Test

a) The entire drainage and venting system shall have all the necessary openings which can be plugged to permit the 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 10 mm.

c) Where only a portion of the system is to be tested, the test shall be conducted in the same manner as described for the entire system.

d) If and when the Architect or 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.

11. Water Test on System

a) Upon completion of the rough-in and before connecting fixtures, the entire cold water piping system shall be tested at a hydrostatic pressure 1-1/2 times the expected working pressure in the system 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 Architect or Engineer or his duly designated representative.

12. Defective Work

a) All defective work, 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 not be permitted.

13. Disinfection

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

b) Disinfection materials shall be liquid Chlorine or Hypochlorite and shall be introduced in a manner approved as practiced for water distribution system.

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

d) Valves for the water distribution system shall be opened and closed several times during the 16 hours Chlorination treatment period.

14. As-Built Drawings

a) Upon completion of the work, the Contractor shall submit two sets of prints with all As-Built changes shown on the drawings in a neat workmanship manner.

b) Such points shall show changes or actual installation and conditions of the plumbing system in comparison with the original drawings.

ITEM 509 – SHEET PILES

509.1 Description

This shall consist of furnishing, driving and cutting off of sheet piling covered by this Specification.

509.2 Material Requirements

509.2.1 Timber Sheet Piles

The timber, unless otherwise definitely noted on the Plans or in the Special Provisions, may consist of any species which will satisfactorily stand driving. It shall be sawn or hewn with square corners and shall be free from worm holes, loose knots, wing shakes, decay or unsound portions or other defects which might impair its strength or tightness.

509.2.2 Concrete Sheet Piles

Concrete, reinforcement, and manufacture of concrete sheet piles shall conform to the requirements of Item 400, Piling, Subsection 400.2.3, Concrete Piles.

509.2.3 Steel Sheet Piles

Steel sheet piles shall be of the type, weight and Section Modulus indicated on the Plans or Special Provisions, and shall conform to the requirement of Item 400, Piling, Subsection 400.2.7, Sheet Piles, Painting shall conform to the requirements for Item 411, Paint, Subsection 411.6.2, Painting Structural Steel.

509.3 Construction Requirements

Sheet piles shall be driven to elevation shown on the Plans or as directed by the Engineer. Where impractical to drive to plan elevation due to subsurface conditions, the driving of piles may be stopped at a higher elevation with the written permission of the Engineer. However, before granting such permission, the Engineer shall ascertain that the Contractor has adequate equipment for the required driving and that the piles can be driven to the plan elevation with the proper use of this equipment.

The top of the piling shall be driven or cut-off to a straight line at the elevation indicated on the Plans.

The requirements governing the installation of sheet piling shall conform in general to those governing bearing piles as set forth under Item 400, Piling.

509.4 Method of Measurement

Sheet piling will be measured by the linear meter of sheet piling as shown on the Plans or as directed in writing by the Engineer, complete in place and accepted. However, measurement of piling which has been delivered to plan length and cannot be driven according to plan or directed elevation because of subsurface condition shall be measured as if driven to that elevations.

509.5 Basis of Payment

Payment of steel piles as determined in Section 509.4, Method of Measurement, shall be made at the contract unit price per linear meter. Such payment shall be considered full compensation for furnishing all materials, labor, equipment, tools, paint, bolts, wales and incidentals necessary to complete the Item.

Payment will be made under:

Pay Item Number	Description	Unit of Measurement
509 (a)	Sheet Piles (Timber)	Linear Meter
509 (b)	Sheet Piles (Steel) Sheet Piles (Concrete)	Linear Meter
509 (c)		Linear Meter

Section VII. Drawings

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

Section VIII. Bill of Quantities

Bill of Quantities, Summary of Bid Proposal & Detailed Estimate should be submitted together with the Annex "C" Form 4 to 7 in pages 283 to 286.

Non-attachment of Annex "C" Form 1 to 7 shall be automatically disqualified.

{ATTACH COMPANY LETTERHEAD/LOGO}

B I L L O F Q U A N T I T I E S

PROJECT: SANGLEY AIRPORT DEVELOPMENT PROJECT - PHASE II
LOCATION: Brgy. San Antonio, Sangley Airport, Cavite

ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	UNIT PRICE (Pesos)	AMOUNT (Pesos)
SPL 1	**MOBILIZATION & DEMOBILIZATION**	1.00	lot		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
SPL-02	**TEMPORARY FACILITIES**	1.00	lot		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
A.	**CONSTRUCTION OF 2-UNITS HANGAR**				
1.00	**Civil/Structural Works**				
1.01	Site Works	1,169.67	cu.m		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
1.02	Concrete Works	823.81	cu.m		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
1.03	Masonry Works	1,624.78	sq.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				

1.04	Steel Works	285,492.41	kgs		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
1.05	Moisture and Thermal Protection Works	3,183.22	sq.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
2.00	**Architectural Works**				
2.01	Tile Works	647.72	sq.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
2.02	Drywall Works	2,717.38	sq.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
2.03	Painting Works	6,012.98	sq.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
2.04	Ceiling Works	687.55	sq.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
2.05	Doors & Windows	84.00	sets		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				

3.00	**Electrical Works**				
3.01	Wires, Conduits and Boxes	13,928.00	lm		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
3.02	Lighting Fixtures and Wiring Devices	500.00	sets		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
3.03	Panel Board	16.00	assy		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
3.04	Feeder Wires and Conduits	3,373.00	lm		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
3.05	Transformer	2.00	sets		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
3.06	Termination Accessories	30.00	pcs		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
4.00	**Mechanical Works**				
4.01	Air Conditioning Unit and Pipings	10.00	sets		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				

4.02	Ventilation Equipment and Exhaust Duct	52.00	sets		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
4.03	Hangers and Support	36.69	sq.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
5.00	**Plumbing Works**				
5.01	Site Works	148.53	cu.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
5.02	Sewer Line System	146.24	li.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
5.03	Waterline System	185.28	li.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
5.04	Storm Drainage System	116.00	li.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
5.05	Septic Tank, Catch Basin and Trench Drain	27.50	cu.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				

5.06	Fixtures and Accessories	1.00	lot		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
B.	**CONSTRUCTION OF 2-UNITS PUMP STATION**				
1.00	**Civil/Structural Works**				
1.01	Site Works	118.33	cu.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
1.02	Concrete Works	76.42	cu.m		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
1.03	Masonry Works	61.24	sq.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
1.04	Waterproofing Works	56.00	sq.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
2.00	**Architectural Works**				
2.01	Painting Works	254.47	sq.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
2.02	Doors & Windows	14.00	sets		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				

3.00	**Electrical Works**				
3.01	Wires, Conduits and Boxes	798.00	lm		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
3.02	Lighting Fixtures and Wiring Devices	38.00	sets		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
3.03	Panel Board	2.00	assy		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
3.04	Power Supply	2.00	sets		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
4.00	**Mechanical Works**				
4.01	Diesel Engine Driven Water Pump and Pipings	12.00	sets		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
5.00	**Plumbing Works**				
5.01	Storm Drain	84.00	li.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
C.	**SHEET PILING WORKS**				
523(1)	Polyvinyl Chloride (uPVC)Sheet Pile (furnished)	21,624.00	ln.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				

523(2)	Polyvinyl Chloride (uPVC)Sheet Pile (driven)	21,624.00	ln.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
1.00	Concrete Works	441.19	cu.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
2.00	Deadman's Anchorage (furnished)	234.00	ln.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
3.00	Deadman's Anchorage (driven)	234.00	ln.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
4.00	Tension Rod and Accessories	25,072.48	kgs.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
D.	**SITE DEVELOPMENT (AIRSIDE STRIP)**				
P-101(1)	Removal of Structure & Obstruction	2,583.43	sq.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
P-152-4.2	Clearing & Grubbing (Stripping)	216,152.68	sq.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				

E.	**RECLAMATION WORKS**				
104	Embankment Works	197,767.20	cu.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
SPL-3	Hauling & Relocation of Rocks	14,677.63	cu.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
F.	**DRAINAGE WORKS**				
1.00	**Civil/Structural Works**				
1.01	Site Works	1,791.90	cu.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
1.02	Concreting Works	432.29	cu.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
1.03	Masonry Works	1,503.60	sq.m.		
	Pesos_____ Amount in Words _____ _____and_____ _____ _____ centavos				
TOTAL AMOUNT					

TOTAL BID AMOUNT (Php) _____

TOTAL BID AMOUNT IN WORDS _____

_____

_____

Signature: _____
Printed Name: _____
Position: _____
Name Company: _____
Date: _____

{ATTACH COMPANY LETTERHEAD/LOGO}

SUMMARY OF BID PROPOSAL

PROJECT: SANGLEY AIRPORT DEVELOPMENT PROJECT - PHASE II
LOCATION: Brgy. San Antonio, Sangley Airport, Cavite

ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	ESTIMATED DIRECT COST	MARK-UPS IN PERCENT		TOTAL MARK-UP		VAT	TOTAL INDIRECT COST	TOTAL COST	UNIT COST
					OCM	Profit	%	VALUE				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9) (5) x (8)	(10) 5%[(5) + (9)]	(11) (9) + (10)	(12) (5) + (11)	(13) (12)/(3)
SPL 1	**MOBILIZATION & DEMOBILIZATION**	1.00	lot									
SPL-02	**TEMPORARY FACILITIES**	1.00	lot									
A.	**CONSTRUCTION OF 2-UNITS HANGAR**											
1.00	**Civil/Structural Works**											
1.01	Site Works	1,169.67	cu.m									
1.02	Concrete Works	823.81	cu.m									
1.03	Masonry Works	1,624.78	sq.m.									
1.04	Steel Works	285,492.41	kgs									
1.05	Moisture and Thermal Protection Works	3,183.22	sq.m.									
2.00	**Architectural Works**											
2.01	Tile Works	647.72	sq.m.									
2.02	Drywall Works	2,717.38	sq.m.									
2.03	Painting Works	6,012.98	sq.m.									
2.04	Ceiling Works	687.55	sq.m.									
2.05	Doors & Windows	84.00	sets									
3.00	**Electrical Works**											
3.01	Wires, Conduits and Boxes	13,928.00	lm									
3.02	Lighting Fixtures and Wiring Devices	500.00	sets									
3.03	Panel Board	16.00	assy									
3.04	Feeder Wires and Conduits	3,373.00	lm									
3.05	Transformer	2.00	sets									
3.06	Termination Accessories	30.00	pcs									
4.00	**Mechanical Works**											
4.01	Air Conditioning Unit and Pipings	10.00	sets									
4.02	Ventilation Equipment and Exhaust Duct	52.00	sets									
4.03	Hangers and Support	36.69	sq.m.									
5.00	**Plumbing Works**											
5.01	Site Works	148.53	cu.m.									
5.02	Sewer Line System	146.24	li.m.									
5.03	Waterline System	185.28	li.m.									
5.04	Storm Drainage System	116.00	li.m.									
5.05	Septic Tank, Catch Basin and Trench Drain	27.50	cu.m.									
5.06	Fixtures and Accessories	1.00	lot									
B.	**CONSTRUCTION OF 2-UNITS PUMP STATION**											
1.00	**Civil/Structural Works**											
1.01	Site Works	118.33	cu.m.									
1.02	Concrete Works	76.42	cu.m									
1.03	Masonry Works	61.24	sq.m.									
1.04	Waterproofing Works	56.00	sq.m.									

2.00	**Architectural Works**											
2.01	Painting Works	254.47	sq.m.									
2.02	Doors & Windows	14.00	sets									
3.00	**Electrical Works**											
3.01	Wires, Conduits and Boxes	798.00	lm									
3.02	Lighting Fixtures and Wiring Devices	38.00	sets									
3.03	Panel Board	2.00	assy									
3.04	Power Supply	2.00	sets									
4.00	**Mechanical Works**											
4.01	Diesel Engine Driven Water Pump and Pipings	12.00	sets									
5.00	**Plumbing Works**											
5.01	Storm Drain	84.00	li.m.									
C.	**SHEET PILING WORKS**											
523(1)	Polyvinyl Chloride (uPVC)Sheet Pile (furnished)	21,624.00	ln.m.									
523(2)	Polyvinyl Chloride (uPVC)Sheet Pile (driven)	21,624.00	ln.m.									
1.00	Concrete Works	441.19	cu.m.									
2.00	Deadman's Anchorage (furnished)	234.00	ln.m.									
3.00	Deadman's Anchorage (driven)	234.00	ln.m.									
4.00	Tension Rod and Accessories	25,072.48	kgs.									
D.	**SITE DEVELOPMENT (AIRSIDE STRIP)**											
P-101(1)	Removal of Structure & Obstruction	2,583.43	sq.m.									
P-152-4.2	Clearing & Grubbing (Stripping)	216,152.68	sq.m.									
E.	**RECLAMATION WORKS**											
104	Embankment Works	197,767.20	cu.m.									
SPL-3	Hauling & Relocation of Rocks	14,677.63	cu.m.									
F.	**DRAINAGE WORKS**											
1.00	**Civil/Structural Works**											
1.01	Site Works	1,791.90	cu.m.									
1.02	Concreting Works	432.29	cu.m.									
1.03	Masonry Works	1,503.60	sq.m.									
TOTAL AMOUNT												

Submitted by:

Signature: _____
Printed Name: _____
Position: _____
Name Company: _____
Date: _____

NAME OF PROJECT :	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**				
LOCATION :	Brgy. San Antonio, Sangley Airport				
				QUANTITY	UNIT
SUBJECT :	**Bill of Materials & Cost Estimate**			1.00	lot
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
SPL-01	**Mobilization and Demobilization**				
C	**Equipment**	# of EQPT	DUR. (DAYS)	RATE/DAY	
	Backhoe Crawler, 0.80 cu.m. ; Plate Compactor 5hp; One Bagger	1.00	lot		
	Concrete Mixer; Concrete Vibrator; Welding Machine,200 amp;				
	Cutting Torch with Gauge/Welding Outfit;				
	Payloader(1.5 cu.m.)LX80-2C, Dumptruck(10cu.m.); H-Frame (1 set-				
	2pcs frame (1.2x1.7m), 2 pcs cross brace, 4 pcs joint pin); Catwalk				
	(G.I.) 0.50x1.80m, 51-100kW; Generator Set, 51-100kW; Truck Mounted Crane,				
	31-35 mt; Electric Bar Cutter; Welding Machine 200 amp; Bulldozer, 165 hp;				
	Backhoe w/ Breaker, 0.80 cu.m.; Air Compressor (356-450 cfm); Jackhammer;				
	Vibro Hammer (Hydraulic Pile Driver); Electric Bar Bender;				
	Road Grader (135 hp); Vibratory Single Smooth Drum Roller; Water Truck (1000 gals)		Equipment Cost	. . . . .	
C	**TOTAL EQUIPMENT COST**				
D	**TOTAL DIRECT COST**				
	I N D I R E C T C O S T S				
1. OCM (0% of TDC)					
2. CONTRACTOR's PROFIT (0% of TDC)					
E. TOTAL OCM & CONTRACTOR's PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (E + F), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
SUBJECT	**:**	**Bill of Materials & Cost Estimate**		**QUANTITY**	**UNIT**
				1.00	lot
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
SPL-2	**TEMPORARY FACILITIES**				
A	**Materials**				
	Rental of Staff House	12.00	mos.		
			Material Cost	. . . . .	
C	**Equipment**				
	Service Vehicle (Rent to own)	360.00	Days		
			Equipment Cost	. . . . .	
A	**TOTAL MATERIAL COST**				
B	**TOTAL EQUIPMENT COST**				
C	**TOTAL DIRECT COST**				
	I N D I R E C T C O S T S				
1. OCM (0% of TDC)					
2. CONTRACTOR's PROFIT (0% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (B + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF TWO(2) UNITS HANGAR**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		1,169.67	cu.m.
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
1.00	**CIVIL/STRUCTURAL WORKS**				
1.01	**Site Works**				
	Excavation (690.0 cu.m.)				
	Backfill (446.24 cu.m.)				
A	**Materials**				
	G1, Gravel Base		cu.m.		
	Coco Lumber		bd.ft		
	CWN Lumber		kgs		
	Nylon Spool		roll		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Construction Foreman				
	Common Worker				
			Labor Cost	. . . . .	
C	**Equipment**	QTY.	DUR. (DAYS)	RATE/DAY	
	Backhoe (0.80 cu.m.)				
	Dumptruck(10 cu.m.)				
	Payloader(1.5 cu.m.)				
	Plate Compactor, 5hp				
			Equipment Cost	. . . . .	

A	**Total Material Cost**			
B	**Total Labor Cost**			
C	**Total Equipment Cost**			
D	**Total Direct Cost**			
	INDIRECT COSTS			
1. OCM (0% - 8% of TDC)				
2. CONTRACTOR's PROFIT (0% - 8% of TDC)				
E. TOTAL OCM & PROFIT				
F. VALUE ADDED TAX, (VAT)		5.0%	of (D + E)	
G. TOTAL ESTIMATED INDIRECT COST (F + E), P				
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit				
TOTAL ESTIMATED COST (D + G), P				
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit				

NAME OF PROJECT		:	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION		:	**CONSTRUCTION OF TWO(2) UNITS HANGAR**			
LOCATION		:	Brgy. San Antonio, Sangley Airport			
					QUANTITY	UNIT
SUBJECT :			**Bill of Materials & Cost Estimate**		823.81	cu.m
ITEM	DESCRIPTION		QUANTITY	UNIT	UNIT COST	AMOUNT
1.00	**CIVIL/STRUCTURAL WORKS**					
1.02	**Concrete Works**					
A	**Materials**					
	Portland Cement, 40kg/bag			bags		
	Sand			cu.m		
	3/4" Crushed Gravel			cu.m		
	25mmø x 6m DRSB			pcs		
	16mmø x 6m DRSB			pcs		
	12mmø x 6m DRSB			pcs		
	10mmø x 6m DRSB			pcs		
	Tiewire #16			kgs		
	Coco Lumber			bd.ft		
	1/2"x4'x8' Ord. Plywood			pcs		
	CWN assorted			kgs		
				Material Cost	. . . . .	
B	**Labor**		QTY.	DUR. (DAYS)	RATE/DAY	
	Construction Foreman					
	Skilled Worker					
	Common Worker					
				Labor Cost	. . . . .	
C	**Equipment**		QTY.	DUR. (DAYS)	RATE/DAY	
	Improvised Batching Plant, (50cum)					
	Transit Mixer (5-7cu.m.)					
	Water Truck (1000 gal)					
	Payloader (1.50cu.m.)					
	Concrete Boom Truck					
	Concrete Vibrator					
	51-100kW, Generator Set					
	Electric Bar Cutter					
				Equipment Cost	. . . . .	
A	**Total Material Cost**					
B	**Total Labor Cost**					
C	**Total Equipment Cost**					
D	**Total Direct Cost**					
	INDIRECT COSTS					
1. OCM (0% - 8% of TDC)						
2. CONTRACTOR's PROFIT (0% - 8% of TDC)						
E. TOTAL OCM & PROFIT						
F. VALUE ADDED TAX, (VAT)		5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P						
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit						
TOTAL ESTIMATED COST (D + G), P						
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit						

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF TWO(2) UNITS HANGAR**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		1,624.78	sq.m.
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
1.00	**CIVIL/STRUCTURAL WORKS**				
1.03	**Masonry Works** *(including Plastering)*				
A	**Materials**				
	6" CHB		pcs		
	4" CHB		pcs		
	Portland Cement. 40kg/bag		bags		
	Sand		cu.m		
	10mmø x 6m DRSB		pcs		
	#16 Tiewire		kgs		
	1/2"x4'x8' Ord. Plywood		pcs		
	CWN assorted		kgs		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Construction Foreman				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
D	**Total Direct Cost**				
	I N D I R E C T C O S T S				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT		**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION		**:**	**CONSTRUCTION OF TWO(2) UNITS HANGAR**			
LOCATION		**:**	Brgy. San Antonio, Sangley Airport			
					QUANTITY	UNIT
SUBJECT :			**Bill of Materials & Cost Estimate**		285,492.41	kgs
ITEM	DESCRIPTION		QUANTITY	UNIT	UNIT COST	AMOUNT
1.00	**CIVIL/STRUCTURAL WORKS**					
1.04	**Steel Works**					
A	**Materials**					
	WT 9 x 32.5 x 6m			pcs		
	WT 16.5 x 65 x 6m			pcs		
	WT 12 x 51.5 x 6m			pcs		
	WT 20 x 83.5 x 6m			pcs		
	WT 4 x 7.5 x 6m			pcs		
	WT 8 x 13 x 6m			pcs		
	W 12 x 72 x 6m			pcs		
	W 10 x 49 x 6m			pcs		
	W 16 x 31 x 6m			pcs		
	W 8 x 18 x 6m			pcs		
	W 6 x 15 x 6m			pcs		
	W 10 x 12 x 6m			pcs		
	L 100 x 100 x 7.87mm x 6m			pcs		
	L 75 x 75 x 6.35mm x 6m			pcs		
	L 64 x 64 x 6.35mm x 6m			pcs		
	L 50 x 50 x 6.35mm x 6m			pcs		
	LC 150 x 63.5 x 2.0mm x 6m			pcs		
	LC 150 x 50 x 3.0mm x 6m			pcs		
	16mmø x 6m DRSB			pcs		
	12mmø x 6m Sagrods			pcs		
	Turnbuckle			pcs		
	1.2m x 2.4m x 20mm thk base plate			pcs		
	20mmø J-bolt (650mm long) w/ Nuts & Washers			pcs		
	20mmø J-bolt (645mm long) w/ Nuts & Washers			pcs		
	16mmø J-bolt (470mm long) w/ Nuts & Washers			pcs		
	75mmx25mmx3mmx6m Tubular			pcs		
	25mmx25mmx3mmx6m Tubular			pcs		
	6m-ø50mm pipe SS SUS 304			pcs		
	25mmø SS pipe SUS 304 x 6m			pcs		
	12mmø SS SUS 304 plain round bar			pcs		
	Plate Holder SS SUS 304			pcs		
	8mmø SS SUS 304 expansion bolt			pcs		
	75mmø x 12mm thk. SS SUS 304 plate			pcs		
	2.5mm x 40mm x 1.5m Brass Stair Nosing			pcs		
	50mm x 100mm x 5mm x 6m Tubular Steel			pcs		
	1.2m x 2.4m x 16mm MS Plate			pcs		
	Welding Rod			boxes		
	SS Welding Rod			boxes		
	Oxygen & Acetylene			sets		
	Rust Converter			gals		
	Epoxy Primer			gals		
	QDE			gals		
	Paint Thinner			gals		
	4" Paint Brush			pcs		
	2" Paint Brush			pcs		
				Material Cost	. . . . .	
B	**Labor**		QTY.	DUR. (DAYS)	RATE/DAY	
	Construction Foreman					
	Skilled Worker					
	Common Worker					
				Labor Cost	. . . . .	
C	**Equipment**		QTY.	DUR. (DAYS)	RATE/DAY	
	Welding Machine, 200 amp					
	Generator Set, 51-100kW					
	Truck Mounted Crane, 31-35 MT					
	Oxy-Acetylene Cutting Torch/Welding Outfit					
				Equipment Cost	. . . . .	
A	**Total Material Cost**					
B	**Total Labor Cost**					
C	**Total Equipment Cost**					
D	**Total Direct Cost**					
	INDIRECT COSTS					
1. OCM (0% - 8% of TDC)						
2. CONTRACTOR's PROFIT (0% - 8% of TDC)						
E. TOTAL OCM & PROFIT						
F. VALUE ADDED TAX, (VAT)		5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P						
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit						
TOTAL ESTIMATED COST (D + G), P						
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit						

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF TWO(2) UNITS HANGAR**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		3,183.22	sq.m.
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
1.00	**CIVIL/STRUCTURAL WORKS**				
1.05	**Moisture and Thermal Protection**				
A	**Materials**				
	0.60mmx0.502mx LS -DN SEAM 490		l.m.		
	UCSP - Panel (0.40mm PPGI + Kraft Paper) (25mm thk PIR x 1.00m)		sq.m		
	0.60mm x 1.20mm x 2.4mm Box Gutter		pcs		
	0.60mm x 0.92mm x 2.4mm Flushing		pcs		
	0.60mm x 0.15mm x 2.4mm Ridge Flashing		pcs		
	0.60mm x 0.15mm x 2.4mm Panel End Cap		pcs		
	0.60mm x 0.15mm x 2.4mm End Closure		pcs		
	0.60mm x 1.20mm x 2.4mm End Fascia flashing		pcs		
	0.60mm x 0.92mm x 2.4mm Ridge Roll		pcs		
	0.60mm x 0.457mm x 2.44mm Counter Flashing		pcs		
	0.60mm x 0.92mm x 2.4mm End Wall Flashing		pcs		
	Seam Bracket - 5.25" x 4"		pcs		
	U-Flashing - 1.0mm x 0.102m x 0.114m		pcs		
	Tek Screw - 12mm x 55mm Bonded Washer		pcs		
	0.40mm x 2" x 2.44m- Straps		pcs		
	Type S - 10mm x 20mm w/ Bonded Washer		pcs		
	Blind Rivets - 5-3		pcs		
	Blind Rivets - 5-6		pcs		
	Concrete Nails -1"		pcs		
	Rubber Sealant		tubes		
	Touch-up Paint - Auto Lacquer 125ml		cans		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Construction Foreman				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
C	**Equipment**	QTY.	DUR. (DAYS)	RATE/DAY	
	Truck Mounted Crane, 31-35 MT				
	H-Frame (1set - 2 pcs frame(1.2x1.7m), 2 pcs cross brace, 4 pcs joint pin)				
	Catwalk (G.I.) 0.50x1.80m				
			Equipment Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
C	**Total Equipment Cost**				
D	**Total Direct Cost**				
	INDIRECT COSTS				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF TWO(2) UNITS HANGAR**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		647.72	sq.m.
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
2.00	**ARCHITECTURAL WORKS**				
2.01	**Tile Works**				
A	**Materials**				
	600mm x 600mm Homogeneous Synthetic Granite Floor Tiles Polished Finish		pcs		
	600mm x 600mm Homogeneous Synthetic Granite Floor Tiles Matte Finish		pcs		
	Portland Cement, 40kg/bag		bags		
	Sand		cu.m		
	Tile Adhesive, 25kg/bag		bags		
	Tile Grount, 2kg/bag		bags		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Construction Foreman				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
D	**Total Direct Cost**				
	I N D I R E C T C O S T S				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF TWO(2) UNITS HANGAR**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		2,717.38	sq.m.
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
2.00	**ARCHITECTURAL WORKS**				
2.02	**Dry wall works**				
A	**Materials**				
	50mm thk. Insulated Sandwich Panels including its framing and accessories		l.m		
	Aluminum Blind Rivest - 5/32 x 1/2"		pcs		
	Teckscrew M12 x 100		pcs		
	Silicon Sealant		tube		
	Touch up Paint - 125ml		cans		
	Toc #8		pcs		
	Screw 1-1/2 x 3/16		pcs		
	1.2m x 2.4m x 12mm thk double facing fire rated fiber cement board		pcs		
	32mm x 76mm x 0.8mm thk x 3m vertical studs		pcs		
	32mm x 76mm x 0.8mm thk x 3m horizontal tracks		pcs		
	Board Screw		pcs		
	Blind Revit		pcs		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Construction Foreman				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
D	**Total Direct Cost**				
	I N D I R E C T C O S T S				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF TWO(2) UNITS HANGAR**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		6,012.98	sq.m.
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
2.00	**ARCHITECTURAL WORKS**				
2.03	**Painting Works**				
A	**Materials**				
	Chlorinated Rubber Based Traffic Paint		sq.m.		
	Elastomeric Sealer		gals		
	Spot Putty		gals		
	Prime Coat		gals		
	Elastomeric Paint		gals		
	Paint Thinner		gals		
	Concrete Putty		gals		
	Flat Latex Paint		gals		
	Semi-gloss Latex Paint		gals		
	Thinning Solvent		gals		
	2" Paint Brush		pcs		
	4" Paint Brush		pcs		
	9" Paint Roller		pcs		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Construction Foreman				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
D	**Total Direct Cost**				
	I N D I R E C T C O S T S				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF TWO(2) UNITS HANGAR**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		687.55	sq.m.
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
2.00	**ARCHITECTURAL WORKS**				
2.04	**Ceiling Works**				
A	**Materials**				
	1.2m x 2.4m x 6mm Fiber Cement Board		pcs		
	J-furring 19mm x 50mm x 5.0m t=0.40mm		pcs		
	C-Channel, 12mm x 38mm x 5.0m, t=0.80mm		pcs		
	Wall Angle, 25mm x 25mm x 3.0m, t=0.40mm		pcs		
	W-clip, Double		pcs		
	Steel Angle		pcs		
	Suspension Clip and Hangar Rod		pcs		
	Blind Ribets, 1/8 x 3/8 (4-4)		pcs		
	Concrete Nail/kg		kgs		
	Fiber Cement Board Screw		pcs		
	Mesh Tape, 2" x 250'		pcs		
	Jointing Compund		bag		
	Concrete Neutralizer		gal		
	Flat Latex Paint		gals		
	Acrylic Water Base Latex Paint		gals		
	Acri-color		ltrs		
	Calsomine Powder		kgs		
	1.2m x 2.4m x 12mm thk. Ficem Board		pcs		
	Metal Screw		pcs		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Construction Foreman				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
D	**Total Direct Cost**				
	I N D I R E C T C O S T S				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)		5.0%	of (D + E)		
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF TWO(2) UNITS HANGAR**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		84.00	sets
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
2.00	**ARCHITECTURAL WORKS**				
2.02	**Doors & Windows**				
A	**Materials**				
D-1	0.80m x 2.10m, Single Swing Steel Flush Type Door with Honeycom Core in Epoxy Paint Finish and complete accessories	2.00	sets		
D-2	1.6m x 2.1m, 2-leaf double swing 12mm thk. Tempered clear glass frameless door in patch fittings with Complete Accessories	4.00	sets		
D-3	0.8m x 2.10m, Double swing 12mm thk tempered clear glass frameless door in patch fittings with Complete Accessories	6.00	sets		
D-4	1.00m x 2.10m, single swing 6mm thk. Marine plywood wooden flush door in QDE base paint finish with built-in louver and complete accessories	2.00	sets		
D-5	0.70m x 2.10m, single swing 6mm thk. Marine plywood wooden flush door in QDE base paint finish with built-in louver and complete accessories	6.00	sets		
D-6	0.70m x 2.10m, single swing 6mm thk. Marine plywood wooden flush door in QDE base paint finish with complete accessories	4.00	sets		
D-7	1.60m x 2.10m, single swing steel louvered door in epoxy paint finish with complete accessories	2.00	sets		
D-8	3.30m x 4.0m, 2 division Ga #18 G.I. Sheet manual operated roll-up door with peep hole in epoxy enamel base paint finish	6.00	sets		
W-1	1.60m x 1.20m, 8mm thk. Tempered clear glass window on powder coated aluminum frame with complete accessories	22.00	sets		
W-2	0.60m x 0.40m, 8mm thk. Tempered clear glass awning window on powder coated aluminum frame with complete accessories	4.00	sets		
W-3	0.80m x 1.25m, 8mm thk. Tempered clear glass fixed window on powder coated aluminum frame with complete accessories	2.00	sets		
W-4	4.00m x 1.25m, 8mm thk. Tempered clear glass fixed window on powder coated aluminum frame with complete accessories	6.00	sets		
W-5	0.60m x 2.40m, steel framed metal storm louver window in epoxy base paint finish with complete accessories	12.00	sets		
W-6	1.25m x 2.40m, steel framed metal storm louver window in epoxy base paint finish with complete accessories	6.00	sets		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Construction Foreman				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
D	**Total Direct Cost**				
	I N D I R E C T C O S T S				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF TWO(2) UNITS HANGAR**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		13,928.00	lm
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
3.00	**ELECTRICAL WORKS**				
3.01	**Wires, Conduits and Boxes**				
A	**Materials**				
	2.0 mm² THHN/THWN-2 600V 90ºC Copper Wire, Lead Free Type, 150m/roll		rolls		
	3.5 mm² THHN/THWN-2 600V 90ºC Copper Wire, Lead Free Type, 150m/roll		rolls		
	5.5 mm² THHN/THWN-2 600V 90ºC Copper Wire, Lead Free Type, 150m/roll		rolls		
	8.0 mm² THHN/THWN-2 600V 90ºC Copper Wire, Lead Free Type		lm		
	15mm diameter × 3m Electrical Metallic Tubing (1/2")		pcs		
	15mm diameter Flexible Metal Conduit (1/2") × 100m		rolls		
	15mm diameter EMT Coupling		pcs		
	15mm diameter EMT Connector with Locknut and Bushing		pcs		
	1/2" diameter Flexible Hose		lm		
	20mm diameter × 3m Electrical Metallic Tubing (3/4")		pcs		
	20mm diameter Liquidtight Flexible Metal Conduit (3/4")		lm		
	20mm diameter EMT Coupling		pcs		
	20mm diameter EMT Connector with Locknut and Bushing		pcs		
	Octagonal Junction Box, Steel Gauge 16 with cover		pcs		
	4"×2" Utility Box, Steel Gauge 16 with cover		pcs		
	Metal Pull Box with Cover, 300mm×300mm×150mm, Gauge 16 with cover		pcs		
	G.I. Tie Wire Gauge 16, Pull Wire		kgs		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Master Electrician				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
C	**Equipment**	QTY.	DUR. (DAYS)	RATE/DAY	
	Manlift up to 46ft ht.				
	Electric Drill				
			Equipment Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
C	**Total Equipment Cost**				
D	**Total Direct Cost**				
	I N D I R E C T C O S T S				
	1. OCM (0% - 8% of TDC)				
	2. CONTRACTOR's PROFIT (0% - 8% of TDC)				
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	:	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	:	**CONSTRUCTION OF TWO(2) UNITS HANGAR**			
LOCATION	:	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		500.00	sets
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
3.00	**ELECTRICAL WORKS**				
3.02	**Lighting Fixtures and Wiring Devices**				
A	**Materials**				
	427x1222 High Bay Industrial Fluorescent Luminaire, Full Bodied Steel Housing, High-Performance Polyester Powder Coat, Suspension Mount with 5x18-Watts 1800-Lumen T8 LED Tube	162.00	sets		
	1.20mx0.60m Recessed Type Fluorescent Fixture with Aluminum Reflector and Frosted Diffuser with 2x18-Watts 1800-Lumen T8 LED Tube	96.00	sets		
	6" Diameter Recessed Type Vertical Lamp Downlight Fixture with Powder Coated White Finish Steel Housing and Matte Aluminum Reflector and FULL Frosted Glass Cover with 1x12W 1200-Lumen LED Tube	80.00	sets		
	Bulkhead Lighting Fixture Oblong Type with 1x12-Watts 1200-Lumen LED Bulb	16.00	sets		
	1-Gang Switch with Plate, 16A, 250V Wide Series	10.00	sets		
	2-Gang Switch with Plate, 16A, 250V Wide Series	26.00	sets		
	3-Gang Switch with Plate, 16A, 250V Wide Series	22.00	sets		
	Duplex Universal Type Convenience Outlet with Ground, 16A, 250V	64.00	sets		
	Ground Fault Circuit Interrupter Duplex Outlet, 20 Ampere, 250 Volts	24.00	sets		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Master Electrician				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
C	**Equipment**	QTY.	DUR. (DAYS)	RATE/DAY	
	Manlift up to 46ft ht.				
	Electric Drill				
			Equipment Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
C	**Total Equipment Cost**				
D	**Total Direct Cost**				
	INDIRECT COSTS				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF TWO(2) UNITS HANGAR**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		16.00	assy

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
3.00	**ELECTRICAL WORKS**				
3.03	**Panel Board**				
A	**Materials**				
	Panel - DP Main: 300AT, 400AF, 3-Pole, 230V, 50KAIC MCCB Branches: 2 - 60AT, 100AF, 3-Pole, 230V, 50KAIC MCCB 1 - 80AT, 100AF, 3-Pole, 230V, 50KAIC MCCB 6 - 60AT, 100AF, 2-Pole, 230V, 50KAIC MCCB With Grounding Terminal Lugs, Pushlock and Directory Holder; Enclosure: NEMA-1 Gauge 16, Powder coated color gray	2	assy		
	Panel - LP Main: 60AT, 100AF, 3-Pole, 230V, 25KAIC MCCB Branches: 6 - 20AT, 100AF, 2-Pole, 230V, 25KAIC MCCB 3 - 30AT, 100AF, 2-Pole, 230V, 25KAIC MCCB With Grounding Terminal Lugs, Pushlock and Directory Holder; Enclosure: NEMA-1 Gauge 16, Powder coated color gray	2	assy		
	Panel - PP Main: 80AT, 100AF, 3-Pole, 230V, 25KAIC MCCB Branches: 10 - 20AT, 100AF, 3-Pole, 230V, 25KAIC MCCB With Grounding Terminal Lugs, Pushlock and Directory Holder; Enclosure: NEMA-1 Gauge 16, Powder coated color gray	2	assy		
	Panel - RP1 Main: 60AT, 100AF, 3-Pole, 230V, 25KAIC MCCB Branches 1 - 50AT, 100AF, 3-Pole, 230V, 25KAIC MCCB 4 - 20AT, 100AF, 2-Pole, 230V, 25KAIC MCCB With Grounding Terminal Lugs, Pushlock and Directory Holder; Enclosure: NEMA-1 Gauge 16, Powder coated color gray	2	assy		
	Panel - RP2 Main: 60AT, 100AF, 2-Pole, 230V, 25KAIC MCCB Branches: 1 - 40AT, 100AF, 2-Pole, 230V, 25KAIC MCCB 5 - 20AT, 100AF, 2-Pole, 230V, 25KAIC MCCB With Grounding Terminal Lugs, Pushlock and Directory Holder; Enclosure: NEMA-1 Gauge 16, Powder coated color gray	2	assy		
	Panel - RP3 Main: 60AT, 100AF, 2-Pole, 230V, 25KAIC MCCB Branches: 1 - 40AT, 100AF, 2-Pole, 230V, 25KAIC MCCB 5 - 20AT, 100AF, 2-Pole, 230V, 25KAIC MCCB With Grounding Terminal Lugs, Pushlock and Directory Holder; Enclosure: NEMA-1 Gauge 16, Powder coated color gray	2	assy		
	Panel - RP4 Main: 60AT, 100AF, 2-Pole, 230V, 25KAIC MCCB Branches: 1 - 40AT, 100AF, 2-Pole, 230V, 25KAIC MCCB 5 - 20AT, 100AF, 2-Pole, 230V, 25KAIC MCCB With Grounding Terminal Lugs, Pushlock and Directory Holder; Enclosure: NEMA-1 Gauge 16, Powder coated color gray	2	assy		
	Panel - RP5 Main: 60AT, 100AF, 2-Pole, 230V, 25KAIC MCCB Branches: 1 - 40AT, 100AF, 2-Pole, 230V, 25KAIC MCCB 5 - 20AT, 100AF, 2-Pole, 230V, 25KAIC MCCB With Grounding Terminal Lugs, Pushlock and Directory Holder; Enclosure: NEMA-1 Gauge 16, Powder coated color gray	2	assy		
	Enclosed Circuit Breaker 150AT, 250AF, 3-Pole,460V, 25KAIC MCCB With Grounding Terminal Lugs, Pushlock and Directory Holder; Enclosure: NEMA-1 Gauge 16, Powder coated color gray	2	assy		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Master Electrician				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	

A	**Total Material Cost**	
B	**Total Labor Cost**	
D	**Total Direct Cost**	
	I N D I R E C T C O S T S	
	1. OCM (0% - 8% of TDC)	
	2. CONTRACTOR's PROFIT (0% - 8% of TDC)	
E. TOTAL OCM & PROFIT		
F. VALUE ADDED TAX, (VAT)	5.0% of (D + E)	
G. TOTAL ESTIMATED INDIRECT COST (F + E), P		
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit		
TOTAL ESTIMATED COST (D + G), P		
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit		

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF TWO(2) UNITS HANGAR**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		3,373.00	lm
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
3.00	**ELECTRICAL WORKS**				
3.04	**Feeder Wires and Conduits**				
A	**Materials**				
	8.0 mm² THHN/THWN-2 600V 90ºC Copper Wire, Lead Free Type		lm		
	14 mm² THHN/THWN-2 600V 90ºC Copper Wire, Lead Free Type		lm		
	22 mm² THHN/THWN-2 600V 90ºC Copper Wire, Lead Free Type		lm		
	30 mm² THHN/THWN-2 600V 90ºC Copper Wire, Lead Free Type		lm		
	60 mm² THHN/THWN-2 600V 90ºC Copper Wire, Lead Free Type		lm		
	175 mm² THHN/THWN-2 600V 90ºC Copper Wire, Lead Free Type		lm		
	25mm diameter × 3m Intermediate Metal Conduit		pcs		
	25mm diameter IMC Elbow		pcs		
	25mm diameter IMC Coupling		pcs		
	25mm diameter IMC Locknut and Bushing		pcs		
	50mm diameter × 3m Intermediate Metal Conduit		pcs		
	50mm diameter IMC Elbow		pcs		
	50mm diameter IMC Coupling		pcs		
	50mm diameter IMC Locknut and Bushing		pcs		
	80mm diameter × 3m Intermediate Metal Conduit		pcs		
	80mm diameter IMC Elbow		pcs		
	80mm diameter IMC Coupling		pcs		
	80mm diameter IMC Locknut and Bushing		pcs		
	Metal Pull Box with Cover, 300mm×300mm×150mm, Gauge 16		pcs		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Master Electrician				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
D	**Total Direct Cost**				
	I N D I R E C T C O S T S				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF TWO(2) UNITS HANGAR**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		2.00	sets
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
3.00	**ELECTRICAL WORKS**				
3.05	**Transformer**				
A	**Materials**				
	112.5KVA, three-phase, 460V/230V, 60Hz Dry Type Transformer with complete standard accessories	2	sets		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Master Electrician				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
D	**Total Direct Cost**				
	I N D I R E C T C O S T S				
	1. OCM (0% - 8% of TDC)				
	2. CONTRACTOR's PROFIT (0% - 8% of TDC)				
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF TWO(2) UNITS HANGAR**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		30.00	pcs

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
3.00	**ELECTRICAL WORKS**				
3.06	**Termination Accessories**				
A	**Materials**				
	Electrical Tape, 0.16mm×19mm×16m, UL Listed		pcs		
	Rubber Tape		pcs		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
D	**Total Direct Cost**				
	I N D I R E C T C O S T S				
	1. OCM (0% - 8% of TDC)				
	2. CONTRACTOR's PROFIT (0% - 8% of TDC)				
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF TWO(2) UNITS HANGAR**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		10.00	sets
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
4.00	**MECHANICAL WORKS**				
4.01	**Air Conditioning Unit and Pipings**				
A	**Materials**				
	7.0 HP / 5.0 TR Inverter Floor Standing Split Type Air-Conditioning Unit with complete standard accessories (indoor unit, outdoor unit, remote control, circuit breaker in NEMA-3R Enclosure and other standard fittings) Power Supply: 220-230 V, 3Ph, 60 Hz Refrigerant Type: R-410a	2.00	sets		
	4.0 HP / 3.0 TR Inverter Floor Standing Split Type Air-Conditioning Unit with complete standard accessories (indoor unit, outdoor unit, remote control, circuit breaker in NEMA-3R Enclosure and other standard fittings) Power Supply: 220-230 V, 1Ph, 60 Hz Refrigerant Type: R-410a	8.00	sets		
	Copper Tube Soft Drawn 3/4" OD. 0.028 thickness x 15m		pc		
	Copper Tube Soft Drawn 5/8" OD. 0.028 thickness x 15m		pcs		
	Copper Tube Soft Drawn 3/8" OD. 0.028 thickness x 15m		pcs		
	Rubber Insulation 3/4" I.D. 3/4" thickness x 1.8 m		pcs		
	Rubber Insulation 5/8" I.D. 3/4" thickness x 1.8 m		pcs		
	Rubber Insulation 3/8" I.D. 3/4" thickness x 1.8 m		pcs		
	Polyethylene tape (White)		rolls		
	25mm diameter PVC Pipe x 3m (drain pipe)		pcs		
	25mm diameter PVC Tee		pcs		
	25mm diameter PVC Elbow		pcs		
	25mm diameter PVC Coupling		pcs		
			Material Cost	. . . . .	
B	**Labor**	QTY	DUR(days)	RATE/DAY	
	Construction Foreman				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
D	**Total Direct Cost**				
	INDIRECT COSTS				
	1. OCM (0% - 8% of TDC)				
	2. CONTRACTOR's PROFIT (0% - 8% of TDC)				
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF TWO(2) UNITS HANGAR**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		52.00	sets
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
4.00	**MECHANICAL WORKS**				
4.02	**Ventilation Equipment and Exhaust Duct**				
A	**Materials**				
	Industrial Direct Driven Sidewall Propeller Type Exhaust Fan complete with standard fittings and accessories (wall housing, OSHA motor side guard, removable screen, damper, damper guard and weather hood) Power Supply: 220-240 V, 3 Ph, 60 Hz Capacity: 16,000 cfm	8.00	sets		
	Industrial Direct Driven Sidewall Propeller Type Supply Fan complete with standard fittings and accessories (wall housing, OSHA motor side guard, removable screen, damper, damper guard and weather hood) Power Supply: 220-240 V, 3 Ph, 60 Hz Capacity: 16,000 cfm	8.00	sets		
	20" Industrial Wall Mounted Type Fan, 220-240 V, 60 Hz, 1 Ph complete with standard accessories	6.00	sets		
	12" Ceiling Mounted Type Exhaust Fan, 220-240 V, 60 Hz, 1 Ph complete with standard accessories	22.00	sets		
	18" Ceiling Mounted Orbit Fan complete with fan speed switch and other standard accessories	8.00	sets		
	100 mm dia. x 3.0 m PVC Pipe (Exhaust Duct)		pcs		
	100 mm dia. PVC Coupling		pcs		
	100 mm dia. PVC Elbow		pcs		
	Stainless Steel Vent Cap with insect screen (100mmØ applicable pipe)		sets		
			Material Cost	. . . . .	
B	**Labor**	QTY	DUR(days)	RATE/DAY	
	Construction Foreman				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
D	**Total Direct Cost**				
	INDIRECT COSTS				
	1. OCM (0% - 8% of TDC)				
	2. CONTRACTOR's PROFIT (0% - 8% of TDC)				
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**				
DESCRIPTION	**:**	**CONSTRUCTION OF TWO(2) UNITS HANGAR**				
LOCATION	**:**	Brgy. San Antonio, Sangley Airport				
					QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**			36.69	sq.m.
ITEM	DESCRIPTION		QUANTITY	UNIT	UNIT COST	AMOUNT
4.00	**MECHANICAL WORKS**					
4.03	**Hangers and Support**					
A	**Materials**					
	Angle Bar 50mm X 50mm X 6mm X 6m			pcs		
	Welding Rod 1/8", 5 kg/box			boxes		
	1/4" dia. x 3 m Hanger Rod (threaded)			pcs		
	1/4" expansion shield			pcs		
	4" Clevis Hanger w/ bolt and nut			sets		
	G.I. Sheet Ga. 22, 4' x 8'			pcs		
				Material Cost	. . . . .	
B	**Labor**		QTY	DUR(days)	RATE/DAY	
	Construction Foreman					
	Skilled Worker					
	Common Worker					
				Labor Cost	. . . . .	
C	**Equipment**		QTY	DUR(days)	RATE/DAY	
	Portable Welding Machine (10-200 Amp)					
	H-Frame (2 pcs frame, 2 pcs cross brace, 4 pcs joint pin)					
	Catwalk (G.I.) 0.50x1.80m					
				Equipment Cost	. . . . .	
A	**Total Material Cost**					
B	**Total Labor Cost**					
C	**Total Equipment Cost**					
D	**Total Direct Cost**					
	INDIRECT COSTS					
	1. OCM (0% - 8% of TDC)					
	2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT						
F. VALUE ADDED TAX, (VAT)		5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P						
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit						
TOTAL ESTIMATED COST (D + G), P						
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit						

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF TWO(2) UNITS HANGAR**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		148.53	cu.m.
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
5.00	**PLUMBING WORKS**				
5.01	**Site Works**				
	(requires labor only)				
	Excavation (103.28 cu.m.)				
	Backfill (45.25 cu.m)				
A	**Materials**				
	Gravel Bedding (Septic Tank, Catch Basin & Trench Drain)				
	Gravel (3/4")		cu.m.		
	Sand Bedding (Ground Pipe Trenches)				
	Sand		cu.m.		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Master Plumber				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
D	**Total Direct Cost**				
	I N D I R E C T C O S T S				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF TWO(2) UNITS HANGAR**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		146.24	li.m.
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
5.00	**PLUMBING WORKS**				
5.02	**Sewer Line System**				
A	**Materials**				
	Soil/Waste Pipe (114.60 li.m.)				
	107x107mmØ (4x4"Ø) uPVC Pipe Series 1000		pcs.		
	57x57mmØ (2x2"Ø) uPVC Pipe Series 1000		pcs.		
	57mmØ (2"Ø) SS P-Trap		pcs.		
	57mmØ (2"Ø) PVC P-Trap		pcs.		
	107x107x107mmØ (4x4x4"Ø) uPVC Wye		pcs.		
	107x57x107 mmØ (4x2x4"Ø) uPVC Wye		pcs.		
	107x107mmØ (4x4"Ø) uPVC 45 deg. Elbow		pcs.		
	57x57mm Ø (2x2"Ø) uPVC 45 deg. Elbow		pcs.		
	107mmØ (4"Ø) uPVC Cleanout Set		pcs.		
	100x100mm (4x4") SS Floor Drain		pcs.		
	100x100mm (4x4") SS Access Cover		pcs.		
	100x100mm (4x4") Brass Countersunk Plug		pcs.		
	Solvent Cement (400 cc)		cans		
	Underground Sewer line Tape (Green) - 3" x 1000 ' per roll		roll		
	Pipe Hanger and Support		sets		
	Vent Pipe (31.64 li.m.)				
	57x57mmØ (2x2"Ø) uPVC Pipe Series 1000		pcs.		
	57x57mmØ (2x2"Ø) uPVC 90 deg. Elbow		pcs.		
	57x57x57mmØ (2x2x2"Ø) uPVC Tee		pcs.		
	107x57x107mmØ (4x2x4"Ø) uPVC Tee		pcs.		
	Solvent Cement (400 cc)		can		
	Pipe Hanger and Support		sets		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Master Plumber				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
D	**Total Direct Cost**				
	I N D I R E C T C O S T S				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF TWO(2) UNITS HANGAR**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		185.28	li.m.
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
5.00	**PLUMBING WORKS**				
5.03	**Waterline System**				
A	**Materials**				
	40mmØ (1 1/4"Ø) x4m PPR Pipe, PN20		pcs.		
	32mmØ (1"Ø) x4m PPR Pipe, PN20		pcs.		
	25mmØ (3/4"Ø) x4m PPR Pipe, PN20		pcs.		
	32mmØ (1"Ø) PPR Coupling		pcs.		
	25mmØ (3/4"Ø) PPR Coupling		pcs.		
	32x32mmØ (1x1"Ø) PPR 90 deg. Elbow		pcs.		
	25x25mmØ (3/4 x 3/4"Ø) PPR 90 deg. Elbow		pcs.		
	32x32x32mmØ (1x1x1"Ø) PPR Tee		pcs.		
	25x25x25mmØ (3/4 x 3/4 x 3/4"Ø) PPR Tee		pcs.		
	32x25mmØ (1x 3/4"Ø) PPR Reducer		pcs.		
	32x40mmØ (1x 1 1/4"Ø) PPR Increaser		pcs.		
	25x32mmØ (3/4 x1"Ø) PPR Increaser		pcs.		
	40mmØ (1 1/4"Ø) PPR End Cap		pcs.		
	32mmØ (1"Ø) PPR End Cap		pcs.		
	15mmØx300mm Flexible hose		pcs.		
	15mmØ x 60mm SS Nipple		pcs.		
	25mmØ PPR Compact Ball valve		pcs.		
	32mmØ Cast Iron Body Water meter		pc.		
	32mmØ Brass Gate valve		pc.		
	32mmØ Brass Check valve		pc.		
	Teflon Tape		pcs.		
	Underground Waterline Tape (Blue) - 2" x 1000 ' per roll		roll		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Master Plumber				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
C	**Equipment**	QTY.	DUR. (DAYS)	RATE/DAY	
	Heat Fusing Machine				
			Equipment Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
C	**Total Equipment Cost**				
D	**Total Direct Cost**				
	I N D I R E C T C O S T S				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF TWO(2) UNITS HANGAR**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		116.00	li.m.
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
5.00	**PLUMBING WORKS**				
5.04	**Storm Drainage System**				
A	**Materials**				
	200x200mmØ (8x8"Ø) uPVC Pipe Series 1000		pcs.		
	180x180mmØ (6x6"Ø) uPVC Pipe Series 1000		pcs.		
	107x107mmØ (4x4"Ø) uPVC Pipe Series 1000		pcs.		
	107x107mmØ (4x4"Ø) uPVC 90 deg. Elbow		pcs.		
	Solvent Cement (400 cc)		cans		
	107mmØ (4"Ø) Cast iron Body, Brass Dome Gutter Drain		sets		
	Galvanived Flat Bar Pipe Support		sets		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Master Plumber				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
C	**Total Equipment Cost**				
D	**Total Direct Cost**				
	I N D I R E C T C O S T S				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF TWO(2) UNITS HANGAR**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		27.50	cu.m.
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
5.00	**PLUMBING WORKS**				
5.05	**Septic Tank, Catch Basin and Trench Drain**				
A	**Materials**				
	Septic Tank (7.66 cu.m.)				
	Portland Cement (40kg per bag)		bags		
	Sand		cu.m.		
	Gravel (3/4")		cu.m.		
	6" Nonbearing CHB		pcs.		
	12mmØ DRSB, 6 meters		pcs.		
	10mmØ DRSB, 6 meters		pcs.		
	#16 G.I. Tie Wire		kgs.		
	1/2" x 4' x 8' Ordinary Plywood		pcs.		
	2" x3" Form Lumber		bd.ft.		
	Bituminous Paint (4L)		can		
	4" Paint brush		pc.		
	Assorted CWN		kg.		
	4"Ø PVC Check Valve		pcs.		
	Catch Basin (8.64 cu.m.)				
	Portland Cement (40kg per bag)		bags		
	Sand		cu.m.		
	Gravel (3/4")		cu.m.		
	4" Nonbearing CHB		pcs.		
	12mmØ DRSB, 6 meters		pcs.		
	10mmØ DRSB, 6 meters		pcs.		
	#16 G.I. Tie Wire		kgs.		
	1/2" x 4' x 8' Ordinary Plywood		pcs.		
	2" x2" Form Lumber		bd.ft.		
	16mmØ SS Hexagonal Nut		bag		
	Assorted CWN		kg.		
	Trench Drain (11.20 cu.m.)				
	Portland Cement (40kg per bag)		bags		
	Sand		cu.m.		
	Gravel (3/4")		cu.m.		
	4" Nonbearing CHB		pcs.		
	12mmØ DRSB, 6 meters		pcs.		
	10mmØ DRSB, 6 meters		pcs.		
	#16 G.I. Tie Wire		kgs.		
	1/2" x 4' x 8' Ordinary Plywood		pcs.		
	2" x3" Form Lumber		bd.ft.		
	3/4" x 3/4" x 6m Square bar		pcs.		
	1/4" x 1" x 1" Galvanized Angle bar		pcs.		
	Assorted CWN		kg.		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Master Plumber				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
C	**Equipment**	QTY.	DUR. (DAYS)	RATE/DAY	
	One bagger concrete mixer				
	Concrete vibrator				
			Equipment Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
C	**Total Equipment Cost**				
D	**Total Direct Cost**				
	I N D I R E C T C O S T S				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF TWO(2) UNITS HANGAR**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		1.00	lot
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
5.00	**PLUMBING WORKS**				
5.06	**Fixtures and Accessories**				
A	**Materials**				
	Oval Undercounter Lavatory with Faucet, Double Handle Lever, Complete Fittings and Accessories	8.00	sets		
	Water Closet Vitreous- Elongated with Top Inlet Flush Valve and Complete Fittings	8.00	sets		
	2" L-Type Stainless Steel Grab Bar Complete Hardware and Accessories	2.00	sets		
	Stainless Steel Tissue Holder	38.00	sets		
	Stainless Steel Hygiene Spray with Hose Bibb Faucet with Complete Fittings and Accessories	8.00 1.00	sets set		
	8mm thk Beveled Glass Mirror w/ Marine Plywood Backing	7.00	sq.m.		
	20mm Granite Ledge	11.00	sq.m.		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Master Plumber				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
D	**Total Direct Cost**				
	I N D I R E C T C O S T S				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**				
DESCRIPTION	**:**	**CONSTRUCTION OF 2-UNITS PUMP STATION**				
LOCATION	**:**	Brgy. San Antonio, Sangley Airport				
					QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**			118.33	cu.m.
ITEM		DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
1.00	**CIVIL/STRUCTURAL WORKS**					
1.01	**Site Works**					
	Excavation (101.81 cu.m.) - labor only					
	Backfill (16.52 cu.m.) - labor only					
B	**Labor**		QTY.	DUR. (DAYS)	RATE/DAY	
	Construction Foreman					
	Common Worker					
				Labor Cost	. . . . .	
C	**Equipment**		QTY.	DUR. (DAYS)	RATE/DAY	
	Plate Compactor, 5hp					
				Equipment Cost	. . . . .	
B	**Total Labor Cost**					
C	**Total Equipment Cost**					
D	**Total Direct Cost**					
		INDIRECT COSTS				
1. OCM (0% - 8% of TDC)						
2. CONTRACTOR's PROFIT (0% - 8% of TDC)						
E. TOTAL OCM & PROFIT						
F. VALUE ADDED TAX, (VAT)		5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P						
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit						
TOTAL ESTIMATED COST (D + G), P						
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit						

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF 2-UNITS PUMP STATION**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		76.42	cu.m
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
1.00	**CIVIL/STRUCTURAL WORKS**				
1.02	**Concrete Works**				
A	**Materials**				
	Portland Cement, 40kg/bag		bags		
	Sand		cu.m.		
	3/4" Crushed Gravel		cu.m.		
	16 mm Ø x 6m DRSB		pcs		
	10 mm Ø x 6m DRSB		pcs		
	#16 Tiewire		kgs		
	1/2 x 1.2m x 2.4m Ordinary Plywood		pcs		
	Coco Lumber		bd.ft.		
	Assorted Common Nail		kgs		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Construction Foreman				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
C	**Equipment**	QTY.	DUR. (DAYS)	RATE/DAY	
	One Bagger Concrete Mixer				
	Concrete Vibrator				
			Equipment Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
C	**Total Equipment Cost**				
D	**Total Direct Cost**				
	INDIRECT COSTS				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF 2-UNITS PUMP STATION**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		61.24	sq.m.

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
1.00	**CIVIL/STRUCTURAL WORKS**				
1.03	**Masonry Works** *(including Plastering)*				
A	**Materials**				
	6" CHB		pcs.		
	Portland Cement, 40kg/bag		bags		
	Sand		cu.m.		
	10 mm Ø x 6m DRSB		pcs.		
	#16 Tiewire		kgs.		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Construction Foreman				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
D	**Total Direct Cost**				
	I N D I R E C T C O S T S				
	1. OCM (0% - 8% of TDC)				
	2. CONTRACTOR's PROFIT (0% - 8% of TDC)				
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF 2-UNITS PUMP STATION**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		56.00	sq.m.
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
1.00	**CIVIL/STRUCTURAL WORKS**				
1.04	**Waterproofing Works**				
A	**Materials**				
	6m x 1m Bituminous Sheet Water Proofing Membrane		pcs		
	40kg Portland Cement		bags		
	Sand		cu.m.		
	3/8 Gravel		cu.m.		
	8 mm Ø x 6m Round Bar		pcs		
	#16 Tiewire		kg		
	2.8mmx1.2mx2.4m Wire Mesh (4"x4")		pcs		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Construction Foreman				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
D	**Total Direct Cost**				
	I N D I R E C T C O S T S				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT		**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION		**:**	**CONSTRUCTION OF 2-UNITS PUMP STATION**			
LOCATION		**:**	Brgy. San Antonio, Sangley Airport			
					QUANTITY	UNIT
SUBJECT :			**Bill of Materials & Cost Estimate**		254.47	sq.m.
ITEM	DESCRIPTION		QUANTITY	UNIT	UNIT COST	AMOUNT
2.00	**ARCHITECTURAL WORKS**					
2.01	**Painting Works**					
A	**Materials**					
	Concrete Putty			gals		
	Elastomeric Sealer			gals		
	Elastomeric Paint			gals		
	Paint Thinner			gals		
	Semi-Gloss Latex Paint			gals		
	Flat Latex Paint			gals		
	Epoxy Primer			ltrs		
	Epoxy Paint Top Coat			gals		
	9" Paint Roller			pcs		
	4" Paint Brush			pcs		
				Material Cost	. . . . .	
B	**Labor**		QTY.	DUR. (DAYS)	RATE/DAY	
	Construction Foreman					
	Skilled Worker					
	Common Worker					
				Labor Cost	. . . . .	
A	**Total Material Cost**					
B	**Total Labor Cost**					
D	**Total Direct Cost**					
	I N D I R E C T C O S T S					
1. OCM (0% - 8% of TDC)						
2. CONTRACTOR's PROFIT (0% - 8% of TDC)						
E. TOTAL OCM & PROFIT						
F. VALUE ADDED TAX, (VAT)		5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P						
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit						
TOTAL ESTIMATED COST (D + G), P						
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit						

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF 2-UNITS PUMP STATION**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		14.00	sets
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
2.00	**ARCHITECTURAL WORKS**				
2.02	**Doors & Windows**				
A	**Materials**				
D-01	1.8m x 2.40m, 2-Leaf Single Swing Steel Louvered Door in spray applied epoxy paint finish	8.00	sets		
	with butt hinges; chrome lever type lockset; door stopper; heavy duty door closer				
W-01	1.55m x 5.0m Ga. 18 Steel Storm Louver Window in spray applied epoxy paint finish	4.00	sets		
W-02	1.5m x 1.55m Ga. 18 steel storm louver window in spray applied epoxy paint finish	2.00	sets		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Construction Foreman				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
D	**Total Direct Cost**				
	I N D I R E C T C O S T S				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT		**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION		**:**	**CONSTRUCTION OF 2-UNITS PUMP STATION**			
LOCATION		**:**	Brgy. San Antonio, Sangley Airport			
					QUANTITY	UNIT
SUBJECT :			**Bill of Materials & Cost Estimate**		798.00	lm
ITEM	DESCRIPTION			QUANTITY	UNIT	UNIT COST	AMOUNT
3.00	**ELECTRICAL WORKS**						
3.01	**Wires, Conduits and Boxes**						
A	**Materials**						
	2.0 mm² THHN/THWN-2 600V 90ºC Copper Wire, Lead Free Type, 150m/roll				lm		
	3.5 mm² THHN/THWN-2 600V 90ºC Copper Wire, Lead Free Type, 150m/roll				lm		
	15mm diameter × 3m Electrical Metallic Tubing (1/2")				pcs		
	15mm diameter Flexible Metal Conduit (1/2") × 100m				rolls		
	15mm diameter EMT Coupling				pcs		
	15mm diameter EMT Connector with Locknut and Bushing				pcs		
	Octagonal Junction Box, Steel Gauge 16 with cover				pcs		
	4"×2" Utility Box, Steel Gauge 16 with cover				pcs		
	Metal Pull Box with Cover, 300mm×300mm×150mm, Gauge 16 with cover				pcs		
	Electrical Tape, 0.16mm×19mm×16m, UL Listed				pcs		
	G.I. Tie Wire Gauge 16, Pull Wire				kgs		
					Material Cost	. . . . .	
B	**Labor**			QTY.	DUR. (DAYS)	RATE/DAY	
		Master Electrician					
		Skilled Worker					
		Common Worker					
					Labor Cost	. . . . .	
A	**Total Material Cost**						
B	**Total Labor Cost**						
D	**Total Direct Cost**						
	I N D I R E C T C O S T S						
	1. OCM (0% - 8% of TDC)						
	2. CONTRACTOR's PROFIT (0% - 8% of TDC)						
E. TOTAL OCM & PROFIT							
F. VALUE ADDED TAX, (VAT)			5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P							
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit							
TOTAL ESTIMATED COST (D + G), P							
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit							

NAME OF PROJECT		**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION		**:**	**CONSTRUCTION OF 2-UNITS PUMP STATION**			
LOCATION		**:**	Brgy. San Antonio, Sangley Airport			
					QUANTITY	UNIT
SUBJECT :			**Bill of Materials & Cost Estimate**		38.00	sets
ITEM	DESCRIPTION		QUANTITY	UNIT	UNIT COST	AMOUNT
3.00	**ELECTRICAL WORKS**					
3.02	**Lighting Fixtures and Wiring Devices**					
A	**Materials**					
	1245mm Fluorescent luminaire, IP65 water proof, moisture proof, dust proof and corrosion proof with polycarbonate cover and metal bracket with 1×18W 1800-Lumen 6500K T8 LED Tube Light		28.00	sets		
	2-Gang Switch with Plate, 16A, 250V Wide Series		4.00	sets		
	3-Gang Switch with Plate, 16A, 250V Wide Series		2.00	sets		
	Ground Fault Circuit Interrupter Duplex Outlet, 20 Ampere, 250 Volts		4.00	sets		
				Material Cost	. . . . .	
B	**Labor**		QTY.	DUR. (DAYS)	RATE/DAY	
	Master Electrician					
	Skilled Worker					
	Common Worker					
				Labor Cost	. . . . .	
A	**Total Material Cost**					
B	**Total Labor Cost**					
D	**Total Direct Cost**					
	INDIRECT COSTS					
1. OCM (0% - 8% of TDC)						
2. CONTRACTOR's PROFIT (0% - 8% of TDC)						
E. TOTAL OCM & PROFIT						
F. VALUE ADDED TAX, (VAT)		5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P						
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit						
TOTAL ESTIMATED COST (D + G), P						
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit						

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF 2-UNITS PUMP STATION**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		2.00	assy

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
3.00	**ELECTRICAL WORKS**				
3.03	**Panel Board**				
A	**Materials**				
	Panel - PB	2	assy		
	Main: 20AT, 100AF, 2-Pole, 230V, 25KAIC MCCB				
	Branches: 4 - 20AT, 100AF, 2-Pole, 230V, 25KAIC MCCB				
	With Grounding Terminal Lugs, Pushlock and Directory Holder; Enclosure: NEMA-1				
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Master Electrician				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
D	**Total Direct Cost**				

I N D I R E C T C O S T S			
1. OCM (0% - 8% of TDC)			
2. CONTRACTOR's PROFIT (0% - 8% of TDC)			
E. TOTAL OCM & PROFIT			
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)	
G. TOTAL ESTIMATED INDIRECT COST (F + E), P			
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit			
TOTAL ESTIMATED COST (D + G), P			
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit			

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF 2-UNITS PUMP STATION**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		2.00	sets
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
3.00	**ELECTRICAL WORKS**				
3.04	**Power Supply**				
A	**Materials**				
	400 Watts Solar Panel with complete standard accessories (railings, clamps, wiring, connectors, surge protection device, etc.)	4.00	sets		
	40 Ampere Solar Charge Controller, LCD Display	2.00	sets		
	1000 Watts Solar Power Inverter, Input Voltage : 12 VDC, Output Voltage : 220 VAC	2.00	sets		
	4 units 3.2V 202Ah Prismatic LiFePO4 Lithium Ion Phosphate Cell Battery	2.00	sets		
	BMS and Active Balancer	2.00	sets		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Master Electrician				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
D	**Total Direct Cost**				
	INDIRECT COSTS				
	1. OCM (0% - 8% of TDC)				
	2. CONTRACTOR's PROFIT (0% - 8% of TDC)				
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF 2-UNITS PUMP STATION**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		12.00	sets
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
4.00	**MECHANICAL WORKS**				
4.01	**Diesel Engine Driven Water Pump and Pipings**				
A	**Materials**				
	Diesel Engine Driven, Self-Priming Water Pump complete with Controller, steel base, exhaust pipe, diesel fuel (full tank), clamp, hangers and other standard accessories to complete the system Flow Capacity: 2,200 gal/min Head: 20 m. Inlet & Outlet Diameter: 200 mm.	12.00	sets		
	Flexible PVC Pipe, 200 mmØ x 3 m.		pcs		
	PVC Pipe, 200 mmØ x 3 m.		pcs		
	PVC Elbow 200 mmØ		pcs		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Construction Foreman				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
C	**Equipment**	QTY.	DUR. (DAYS)	RATE/DAY	
	20 Tonner Mobile Crane				
			Equipment Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
C	**Total Equipment Cost**				
D	**Total Direct Cost**				
	INDIRECT COSTS				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**CONSTRUCTION OF 2-UNITS PUMP STATION**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		84.00	li.m.

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
5.00	**PLUMBING WORKS**				
5.01	**Storm Drain**				
A	**Materials**				
	4" CHB		pcs		
	Portland Cement, 40kg/bag		bags		
	Sand		cu.m.		
	4" stainless roof drain		pcs		
	4" - 90° Bend		pcs		
	3m - 4" PVC Pipe		pcs		
	4" coupling		pcs		
	Solvent Cement		cans		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Construction Foreman				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	

A	**Total Material Cost**			
B	**Total Labor Cost**			
D	**Total Direct Cost**			
	I N D I R E C T C O S T S			
	1. OCM (0% - 8% of TDC)			
	2. CONTRACTOR's PROFIT (0% - 8% of TDC)			
E. TOTAL OCM & PROFIT				
F. VALUE ADDED TAX, (VAT)		5.0%	of (D + E)	
G. TOTAL ESTIMATED INDIRECT COST (F + E), P				
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit				
TOTAL ESTIMATED COST (D + G), P				
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit				

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**Sheet Piling Works**			
LOCATION	**:**	San Antonio, Sangley Point, Cavite City, Cavite		QUANTITY	UNIT
SUBJECT	**:**	**Bill of Materials & Cost Estimate**		21,624.00	ln.m.

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
523(1)	**Polyvinyl Chloride (uPVC)Sheet Pile (furnished)**				
A	**Material**				
	Polyvinyl Chloride (uPVC)Sheet Pile (450mm x 10mm x 12m)		pcs.		
	PVC Seet Pile Cap (290mm x 10mm x 2m)		pcs.		
			Material Cost	. . . . .	
A	**TOTAL MATERIAL COST**				
D	**TOTAL DIRECT COST**				
	I N D I R E C T C O S T S				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0% of (D + E)				
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**Sheet Piling Works**			
LOCATION	**:**	San Antonio, Sangley Point, Cavite City, Cavite		QUANTITY	UNIT
SUBJECT	**:**	**Bill of Materials & Cost Estimate**		21,624.00	ln.m.
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
523(2)	**Polyvinyl Chloride (uPVC)Sheet Pile (driven)**				
B	**Labor**	QTY	DUR. (DAYS)	RATE/DAY	
	Construction Foreman				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
C	**Equipment**	QTY	DUR. (DAYS)	RATE/DAY	
	Vibro Hammer (Hydraulic Pile Driver)				
	Backhoe (0.80 m³) with Mandrel Attachment				
			Equipment Cost	. . . . .	
B	**TOTAL LABOR COST**				
C	**TOTAL EQUIPMENT COST**				
D	**TOTAL DIRECT COST**				
	INDIRECT COSTS				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0% of (D + E)				
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**Sheet Piling Works**			
LOCATION	**:**	San Antonio, Sangley Point, Cavite City, Cavite		QUANTITY	UNIT
SUBJECT	**:**	**Bill of Materials & Cost Estimate**		441.19	cu.m.
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
1.00	**Concrete Works**				
A	**Material**				
	40kg Portland Cement		bags		
	Sand		cu.m.		
	Crushed Gravel 3/4"		cu.m.		
	12 mm Ø x 6m DRSB		pcs.		
	10 mm Ø x 6m DRSB		pcs.		
	#16 GI Tie Wire		kgs.		
	1/2" x 4' x 8' Ordinary Plywood		pcs.		
	Form Lumber		bd.ft.		
	CWN Assorted		kgs.		
			Material Cost	. . . . .	
B	**Labor**	QTY	DUR. (DAYS)	RATE/DAY	
	Construction Foreman				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
C	**Equipment**	QTY	DUR. (DAYS)	RATE/DAY	
	One bagger concrete mixer				
	Concrete Vibrator				
			Equipment Cost	. . . . .	
A	**TOTAL MATERIAL COST**				
B	**TOTAL LABOR COST**				
C	**TOTAL EQUIPMENT COST**				
D	**TOTAL DIRECT COST**				
	INDIRECT COSTS				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0% of (D + E)				
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**Sheet Piling Works**			
LOCATION	**:**	San Antonio, Sangley Point, Cavite City, Cavite		QUANTITY	UNIT
SUBJECT	**:**	**Bill of Materials & Cost Estimate**		234.00	ln.m.

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
2.00	**Deadman's Anchorage (furnished)**				
A	**Material**				
	40kg Portland Cement		bags		
	Sand		cu.m.		
	Crushed Gravel 3/4"		cu.m.		
	25 mm Ø x 6m DRSB		pcs.		
	10 mm Ø x 6m DRSB		pcs.		
	#16 GI Tie Wire		kgs.		
	1/2" x 4' x 8' Ordinary Plywood		pcs.		
	Form Lumber		bd.ft.		
	CWN Assorted		kgs.		
			Material Cost	. . . . .	
B	**Labor**	QTY	DUR. (DAYS)	RATE/DAY	
	Construction Foreman				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
C	**Equipment**	QTY	DUR. (DAYS)	RATE/DAY	
	One bagger concrete mixer				
	Concrete Vibrator				
			Equipment Cost	. . . . .	
A	**TOTAL MATERIAL COST**				
B	**TOTAL LABOR COST**				
C	**TOTAL EQUIPMENT COST**				
D	**TOTAL DIRECT COST**				
	I N D I R E C T C O S T S				
	1. OCM (0% - 8% of TDC)				
	2. CONTRACTOR's PROFIT (0% - 8% of TDC)				
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0% of (D + E)				
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**Sheet Piling Works**			
LOCATION	**:**	San Antonio, Sangley Point, Cavite City, Cavite		QUANTITY	UNIT
SUBJECT	**:**	**Bill of Materials & Cost Estimate**		234.00	lin.m.
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
3.00	**Deadman's Anchorage (driven)**				
B	**Labor**	QTY	DUR. (DAYS)	RATE/DAY	
	Construction Foreman				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
C	**Equipment**	QTY	DUR. (DAYS)	RATE/DAY	
	Vibro Hammer (Hydraulic Pile Driver)				
	Backhoe (0.80 m³) with Mandrel Attachment				
			Equipment Cost	. . . . .	
B	**TOTAL LABOR COST**				
C	**TOTAL EQUIPMENT COST**				
D	**TOTAL DIRECT COST**				
	INDIRECT COSTS				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0% of (D + E)				
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**Sheet Piling Works**			
LOCATION	**:**	San Antonio, Sangley Point, Cavite City, Cavite		QUANTITY	UNIT
SUBJECT	**:**	**Bill of Materials & Cost Estimate**		25,072.48	kgs.
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
4.00	**Tension Rod and Accessories**				
A	**Material**				
	25mm dia. Tension Rod with washer plate & Nuts		kgs.		
	25mm dia. Turn Buckle		pcs.		
	6mm thk. Washer plate		pcs.		
	50mm x 150mm x 16mm Steel C-Channel		pcs.		
	Rust Converter		gals.		
	Epoxy Primer		gals.		
	4" Paint Brush		pcs.		
	2" Paint Brush		pcs.		
			Material Cost	. . . . .	
B	**Labor**	QTY	DUR. (DAYS)	RATE/DAY	
	Construction Foreman				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
C	**Equipment**	QTY	DUR. (DAYS)	RATE/DAY	
	Welding Machine				
	Oxy-Acetylene Cutting Torch/Welding Outfit				
	51-100kW, Generator Set				
	Electric Bar Cutter				
	Electric Bar Bender				
			Equipment Cost	. . . . .	
A	**TOTAL MATERIAL COST**				
B	**TOTAL LABOR COST**				
C	**TOTAL EQUIPMENT COST**				
D	**TOTAL DIRECT COST**				
	INDIRECT COSTS				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0% of (D + E)				
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II CY 2021**			
PROJECT DESCRIPTION	**:**	**Site Development (Airside Strip)**			
LOCATION	**:**	San Antonio, Sangley Point, Cavite City, Cavite			
SUBJECT	**:**	**Bill of Quantities & Cost Estimates**		2,583.43	sq.m.
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
P-101(1)	**REMOVAL OF STRUCTURES & OBSTRUCTION**				
	Activity:				
	Demolition of Abandoned Armory/ Bunker (4 units)				
B	**Labor**	QTY	DUR. (DAYS)	RATE/DAY	
	Construction Foreman				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
C	**Equipment**	QTY	DUR. (DAYS)	RATE/DAY	
	Backhoe w/ Breaker, 0.80 cu.m.				
	Air Compressor (356 - 450 cfm)				
	Jackhammer				
	Payloader, 1.50 cu.m.				
	Dump Truck, 12yd³				
			Equipment Cost	. . . . .	
B	**TOTAL LABOR COST**				
C	**TOTAL EQUIPMENT COST**				
D	**TOTAL DIRECT COST**				
	INDIRECT COSTS				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & CONTRACTOR':					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (E + F), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II CY 2021**			
PROJECT DESCRIPTION	**:**	**Site Development (Airside Strip)**			
LOCATION	**:**	San Antonio, Sangley Point, Cavite City, Cavite			
SUBJECT	**:**	**Bill of Quantities & Cost Estimates**		216,152.68	sq.m.

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
P-152-4.2	**CLEARING & GRUBBING (STRIPPING)**				
B	**Labor**	QTY	DUR. (DAYS)	RATE/DAY	
	Construction Foreman				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
C	**Equipment**	QTY	DUR. (DAYS)	RATE/DAY	
	Bulldozer, 165HP				
	Payloader, 1.5 cu.m.				
	Dump Truck, 12yd³				
			Equipment Cost	. . . . .	
B	**TOTAL LABOR COST**				
C	**TOTAL EQUIPMENT COST**				
D	**TOTAL DIRECT COST**				
	INDIRECT COSTS				
	1. OCM (0% - 8% of TDC)				
	2. CONTRACTOR's PROFIT (0% - 8% of TDC)				
E.	**TOTAL OCM & CONTRACTOR'S**				
F.	**VALUE ADDED TAX, (VAT)** 5.0% of (D + E)				
G.	**TOTAL ESTIMATED INDIRECT COST (E + F), P**				
H.	**TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit**				
	TOTAL ESTIMATED COST (D + G), P				
	TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit				

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**RECLAMATION WORKS**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		197,767.20	cu.m.
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
104	**Embankment Works**				
A	**Materials**				
	Selected Common Borrow with 95% compaction		cu.m		
	(Delivered in site)		Material Cost	. . . . .	
B	**Labor (16 hrs operation)**	QTY.	DUR. (DAYS)	RATE/DAY	
	Construction Foreman				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
C	**Equipment (16 hrs operation)**	QTY.	DUR. (DAYS)	RATE/DAY	
	Road Grader (135 hp)				
	Vibratory Single Smooth Drum Roller				
	Water Truck (1000 gals)				
			Equipment Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
C	**Total Equipment Cost**				
D	**Total Direct Cost**				
	INDIRECT COSTS				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**RECLAMATION WORKS**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		14,677.63	cu.m.
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
SPL-3	**Hauling & Relocation of Rocks**				
	Hauling and Re-arranging of Armour Rocks				
	(Equipment & Labor Only)				
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Construction Foreman				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
C	**Equipment**	QTY.	DUR. (DAYS)	RATE/DAY	
	Crawler Crane, (36-40MT)				
	Backhoe, 0.8 cu.m.				
	Payloader, 1.50 cu.m.				
	Dumptruck, 10 cu.m.				
			Equipment Cost	. . . . .	
B	**Total Labor Cost**				
C	**Total Equipment Cost**				
D	**Total Direct Cost**				
	INDIRECT COSTS				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0% of (D + E)				
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**DRAINAGE WORKS**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		1,791.90	cu.m.
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
1.00	**Civil/Structural Works**				
1.01	**Site Works**				
	Excavation (1,628.90 cu.m.) (Labor Only)				
A	**Materials**				
	Gravel Bedding, G1		cu.m		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Construction Foreman				
	Common Worker				
			Labor Cost	. . . . .	
C	**Equipment**	QTY.	DUR. (DAYS)	RATE/DAY	
	Backhoe, 0.80 cu.m.				
	Dumptruck, 10 cu.m.				
			Equipment Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
C	**Total Equipment Cost**				
D	**Total Direct Cost**				
	INDIRECT COSTS				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**DRAINAGE WORKS**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		432.29	cu.m.
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
1.02	**Concreting Works**				
A	**Materials**				
	Portland Cement, 40kg/bag		pcs		
	Sand		cu.m.		
	3/4" Gravel		cu.m.		
	Ø10mm DRSB x 6m		pcs		
	#16 Tiewire		kgs		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Construction Foreman				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
C	**Equipment**	QTY.	DUR. (DAYS)	RATE/DAY	
	One Bagger Concrete Mixer				
	Concrete Vibrator				
			Equipment Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
C	**Total Equipment Cost**				
D	**Total Direct Cost**				
	INDIRECT COSTS				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

NAME OF PROJECT	**:**	**SANGLEY AIRPORT DEVELOPMENT PROJECT PHASE II**			
DESCRIPTION	**:**	**DRAINAGE WORKS**			
LOCATION	**:**	Brgy. San Antonio, Sangley Airport			
				QUANTITY	UNIT
SUBJECT :		**Bill of Materials & Cost Estimate**		1,503.60	sq.m.
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
1.03	**Masonry Works**				
A	**Materials**				
	6" CHB		pcs		
	Portland Cement, 40kg/bag		bags		
	Sand		cu.m.		
	10 mm Ø x 6m DRSB		pcs		
	#16 Tiewire		kgs		
			Material Cost	. . . . .	
B	**Labor**	QTY.	DUR. (DAYS)	RATE/DAY	
	Construction Foreman				
	Skilled Worker				
	Common Worker				
			Labor Cost	. . . . .	
A	**Total Material Cost**				
B	**Total Labor Cost**				
D	**Total Direct Cost**				
	INDIRECT COSTS				
1. OCM (0% - 8% of TDC)					
2. CONTRACTOR's PROFIT (0% - 8% of TDC)					
E. TOTAL OCM & PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%	of (D + E)			
G. TOTAL ESTIMATED INDIRECT COST (F + E), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

Submitted by:

Signature: _____

Printed Name: _____

Position: _____

Name Company: _____

Date: _____

Section IX. Bidding Forms

TABLE OF CONTENTS

Other Bidding Forms

(ANNEX "A")

{ATTACH COMPANY LETTERHEAD/LOGO}

Statement of all its ON-GOING 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

Name of Project: _____
Location of Project: _____

Name of Company : _____
Address of Company: _____

Name of Contract	a. Owner's Name b. Address c. Telephone No.	Nature of Work	Contractor's Role		Contract Amount at Award	a. Date Awarded b. Date of Contract c. Contract Duration d. Date Started e. Date Completed	Accomplishment		Values of Outstanding Works
			Description	%			Planned	Actual	
Government									
Private									
							Total value of outstanding works		

Submitted by: _____
(Print Name & Signature)

Designation: _____

Date: _____

{ATTACH COMPANY LETTERHEAD/LOGO}

Statement of single largest COMPLETED contract similar to the contract to be bid

Name of Project: _____
Location of Project: _____

Name of Company : _____
Address of Company: _____

Name of Contract	a. Owner's Name b. Address c. Telephone No.	Nature of Work	Contractor's Role		Contract Amount at Award	a. Date Awarded b. Date of Contract c. Contract Duration d. Date Started e. Date Completed
			Description	%		

Submitted by: _____
(Print Name & Signature)

Designation: _____

Date: _____

JOINT RESOLUTION

Whereas, _____ (Bidder / Name of Particular JV Partner), duly organized and existing under the Laws of the _____, with office address at _____, represented herein by its _____, _____, and _____ (Name of Particular JV Partner), duly organized and existing under the Laws of the _____, with main office address at _____, represented by herein by its _____, have entered into a Joint Venture (JV) Agreement to undertake the following project / contract:

(Name of Project / Contract)

Whereas, in order to facilitate the orderly execution and conduct of the contract that was entered into by the joint venture in the name of the joint venture, it is hereby resolved by the parties in the Joint Venture as follows:

a. To appoint _____ as the Authorized Managing Officer and Official Representative, to represent, to manage the Joint Venture and is empowered to enter in contract in the name of the Joint Venture, or to sign for any document in the name of the Joint Venture required by the (Procurement Agency) or any entities pursuant to the terms of the Joint Venture Agreement:

b. That, the parties agreed to make _____(Name of Particular Lead Partner) _____ as the Lead Partner of the Joint Venture and (Name of Authorized Officer) _____ as the Official Representative & Managing Partner of the Joint Venture, and are granted full power and authority to do, execute and perform any and all acts necessary and/or to represent the Joint Venture in the Eligibility Check, Bidding and Undertaking of the said contract in the name of the Joint Venture, as fully and effectively and the Joint Venture may do and if personally present with full power of substitution and revocation. _____ is fully authorized and empowered to sign any or all documents pertaining to the above stated project / contract in the name of the Joint Venture.

c. That the parties agree to be jointly and severally liable for their participation in the Eligibility Check, Bidding and Undertaking of the said contract.

d. That the terms of the JV Agreement entered into the parties shall be valid and is co-terminus with the final completion and turnover of the Name of Contract / Project to

the agency of the government, which in this case, the (Name of Procurement Entity);

IN WITNESS THEREFORE, We hereby sign jointly this Joint Resolution this _____ day of _____, 20 ____ in _____.

Name of Bidder (Lead Partner)	**Name of Bidder (Member Partner)**
By: _____	**By:** _____
Signature & Name of Managing Officer	Signature & Name of Authorized Authorized Representative
_____	_____
Designation / Position	Designation / Position

Name of Bidder (Member Partner)	**Name of Bidder (Member Partner)**
By: _____	**By:** _____
Signature & Name of Managing Officer	Signature & Name of Authorized Authorized Representative
_____	_____
Designation / Position	Designation / Position

SIGNED IN THE PRESENCE OF:

_____

_____

_____

_____

A C K N O W L E D G E M E N T

REPUBLIC OF THE PHILIPPINES)

CITY OF_____)S.S.

BEFORE ME, a Notary Public, for and in the City of _____, Philippines, this _____ day of _____, 20____ personally appeared the following persons:

NAME	**Community Cert. No.**	**Date / Place of Issue**

Representing to be the _____ of _____ and _____ of _____ respectively, known to me and to me known to be the same persons who executed the foregoing instrument for and in behalf of said corporations and who acknowledge to me that same is their free and voluntary act and deed as well as of the corporations which they represent, for the uses, purposes, and considerations therein set forth and that they are duly authorized to sign the same.

This Instrument consists of THREE (3) pages including this page wherein this Acknowledgement is written and signed by the parties and their instrumental witnesses on each and every page thereon.

WITNESS MY HAND AND NOTARIAL SEAL at the place and date hereinafter first above written.

NOTARY PUBLIC

Doc. No. _____

Book No. _____

Page No. _____

Series of _____

Other Bidding Forms

(ANNEX "B")

Republic of the Philippines
CIVIL AVIATION AUTHORITY OF THE PHILIPPINES

CERTIFICATE OF SITE INSPECTION

This is to CERTIFY that _____, employee of _____, has conducted the required Site Inspection for the bidding of the project "_____" at _____.

Issued this _____**, 2021**

Airport Manager/Officer-in-Charge:

_____
Signature over Printed Name

Bid-Securing Declaration

(REPUBLIC OF THE PHILIPPINES)
CITY OF _____) S.S.
x----------x

Invitation to Bid *[Insert reference 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 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 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 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;

    c. I am/we are declared as 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'S AUTHORIZED REPRESENTATIVE]
[Insert signatory's legal capacity]

Affiant

SUBSCRIBED AND SWORN to before me this __ day of *[month] [year]* at *[place of execution]*, Philippines. Affiant/s is/are personally known to me and was/were identified by me through competent evidence of identity as defined in the 2004 Rules on Notarial Practice (A.M. No. 02-8-13-SC). Affiant/s exhibited to me his/her *[insert type of government identification card used]*, with his/her photograph and signature appearing thereon, with no. _____.

Witness my hand and seal this ___ day of *[month] [year]*.

NAME OF NOTARY PUBLIC

Serial No. of Commission _____
Notary Public for _____ until _____
Roll of Attorneys No. _____
PTR No. __, *[date issued], [place issued]*
IBP No. __, *[date issued], [place issued]*
Doc. No. ___
Page No. ___
Book No. ___
Series of ____.

Contractor's Organizational Chart for the Project

Submit Copy of the Organizational Chart that the Contractor intends to use to execute the contract if awarded to him. Indicate in the chart the names of the Key Engineering Personnel who will be assigned in the Project.

{ATTACH COMPANY LETTERHEAD/LOGO}

Attach the required Proposed Organizational Chart for the Contract as stated above.

Submitted by: _____

Designation : _____

Date : _____

{ATTACH COMPANY LETTERHEAD/LOGO}

Qualification of Key Personnel Proposed to be Assigned to the Project

Name of Project: _____
Location of Project: _____

Name of Company: _____
Address of Company: _____

	Project Manager/Engineer	Material Engineer	Foreman	Construction Safety and Health Personnel	Other Position deemed required by the Applicant for this project
1. Name					
2. Address					
3. Date of Birth					
4. Employed Since					
5. Experience					
6. Previous Employment					
7. Education					
8. PRC License					

Note: Attached individual PRC License of the (professional) personnel.

Submitted by : _____
(Signature over Printed Name)
Designation : _____
Date : _____

{ATTACH COMPANY LETTERHEAD/LOGO}

Date: _____

CAPTAIN DONALDO A. MENDOZA
Chairman, Bids and Awards Committee - Charlie
Civil Aviation Authority of the Philippines
Mia Road, Pasay City, M.M. 1300
Tel: 944-2358

Subject: Contractor's Letter-Certificate to Procuring Entity

Dear Sir:

Supplementing our Organizational Chart for the Contract, we have the honor to submit herewith, and to certify as true and correct, the following pertinent information:

That I/we have engaged the service of *(Name of Employee)*, to be the *(Designation)* of the *(Name of Project)*, who is a *(Profession)* with Professional License Certificate No. __ issued on _____ and who has performed the duties in the construction of the project enumerated in the filled Annex "B" Form 5b.

That *(Name of Employee)* shall personally perform the duties of the said position in the above-mentioned project, if and when the same is awarded in our favor.

That *(Name of Employee)* shall employ the best care, skill and ability in performing his duties in accordance with the Contract Agreement, Conditions of Contract, Plans, Specifications, Special Provisions, and other provisions embodied in the proposed contract.

That *(Name of Employee)* shall be personally present at the jobsite all the time to supervise the phase of the construction work pertaining to his assignment as *(Designation)*.

That *(Name of Employee)* is aware that he shall be authorized to handle only one contract at a time.

That in order to guarantee that *(Name of Employee)* shall perform his duties properly and be personally present in the Job Site, he is hereby required to secure a certificate of appearance for the Procuring Entity's Engineer at the end of every month.

That in the event that I/we elect or choose to replace *(Name of Employee)* with another Engineer, the Procuring Entity will be accordingly notified by us in writing at least twenty one (21) days before making replacement. We will submit to the Procuring Entity, for prior approval, the name of the proposed new *(Designation)*, his qualification, experience, list of projects undertaken and other relevant information.

That any willful violation on my/our part of the herein conditions may prejudice my/our standing as a reliable contractor in future bidding of the Procuring Entity.

Very truly yours,

_____

(Authorized Representative of Bidder)

CONCURRED BY:

_____

(Name of Engineer)

{ATTACH COMPANY LETTERHEAD/LOGO}

Date: _____

CAPTAIN DONALDO A. MENDOZA
Chairman, Bids and Awards Committee - Charlie
Civil Aviation Authority of the Philippines
Mia Road, Pasay City, M.M. 1300
Tel: 944-2358

Subject: Key Personnel's Certificate of Employment

Dear Sir:

I am *(Name of Employee)* a License _____ Engineer with Professional License No. issued on *(Date of Issuance)* at *(Place of Issuance)*.

I hereby certify that *(Name of Bidder)* has engaged my services as *(Designation)* for *(Name of the Project)*, if awarded in their favor.

As *(Designation)*, I know I will have to stay in the job site all the time to supervise and managed the Contract works to the best of my ability, and aware that I am authorized to handle only one (1) contract at a time.

I do not allow the use of my name for the purpose of enabling the above-mentioned Contractor to qualify for the Contract without any firm commitment on my part to assume the post of *(Designation)*.

As *(Designation)*, I supervised the following completed projects similar to the contract under bidding:

NAME OF PROJECT	OWNER	COST	DATE COMPLETED

At present, I am supervising the following project:

NAME OF PROJECT	OWNER	COST	DATE COMPLETION

In case of my separation for any reason whatsoever from the above-mentioned Contractor, I shall notify the _____*(Name of the Procuring Entity)* at least twenty one (21) days before the effective date of my separation.

_____
(Signature of Engineer)

SUBSCRIBED AND SWORN to before me this ___ day of _____, 20___ affiant exhibiting to me his/her Residence Certificate No. _____ issued on _____ at _____, Philippines.

_____
Notary Public

Until 31 December 20
PRT No.: _____
Issued at: _____
Issued on: _____
TIN No.: _____

Doc. No._____
Page No._____

Book No. _____
Series of_____

CAAP-BAC-SF Annex "B" Form 5c

KEY PERSONNEL

(FORMAT OF BIO-DATA)

Give the detailed information of the following personnel who are scheduled to be assigned as full-time field staff for the project. Fill up a form for each person.

1. Authorized Managing Officer / Representative: _____

2. Sustained Technical Employee:

Name: _____

Date of Birth: _____

Nationality: _____

Education and Degrees: _____

Specialty: _____

Registration: _____

Length of Service with the Firm:

_____Year From _____ (months) _____ (year)

To _____ (months) _____ (year)

Years of Experience:

If Item 7 is less than ten (10) years, give name and length of service with previous employers for a ten (10) year period (attached additional sheet/s, if necessary:

Name and Address of Employer	Length of Service	
_____	_____ year(s)	from _____to _____
_____	_____ year(s)	from _____to _____
_____	_____ year(s)	from _____to _____

Experience:

This should cover the past ten (10) years of experience. (Attached as many pages as necessary to show involvement of personnel in projects using the format below).

a. Name: _____
b. Name and Address of Owner: _____
_____
c. Name and Address of the Owner's Engineer (Consultant):_____
_____
d. Indicate the Features of Project (particulars of the project components and any other particular interest connected with the project): _____
_____
e. Contract Amount Expressed in Philippine Currency: _____
f. Position: _____
g. Structures for which the employee was responsible: _____
_____
h. Assignment Period: from _____(months) _____ (years)
to _____(months) _____ (years)

_____
Name and Signature of Employee

It is hereby certified that the above personnel can be assigned to the _____ Project, if the contract is awarded to our company.

_____ _____
(Place and Date) (The Authorized Representative)

List of Equipment, Owned or Leased and/or under Purchased Agreements, Pledge to the Proposed Project

Name of Project: _____
Location of Project: _____

Name of Company: _____
Address of Company: _____

Description	Model/Year	Capacity/ Performance/ Size	Plate No.	Motor No./ Body No.	Location	Condition	Proof of Ownership/ Lessor or Vendor
A. Owned							
I.							
II.							
III.							
IV.							
V.							
B. Leased							
I.							
II.							
III.							
IV.							
V.							
C. Under Purchased Agreement							
I.							
II.							
III.							
IV.							
V.							

Submitted by : _____
(Signature over Printed Name)
Designation : _____
Date : _____

Omnibus Sworn Statement

REPUBLIC OF THE PHILIPPINES)
CITY/MUNICIPALITY OF _____) S.S.

A F F I D A V I T

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] [insert "as shown in the attached duly notarized Special Power of Attorney" for the authorized representative]*;

   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]*, accompanied by the duly notarized Special Power of Attorney, Board/Partnership Resolution, or Secretary's Certificate, 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;

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 following responsibilities as a Bidder:

   a) Carefully examine all of the Bidding Documents;

   b) Acknowledge all conditions, local or otherwise, affecting the implementation of the Contract;

   c) Made an estimate of the facilities available and needed for the contract to be bid, if any; and

   d) Inquire or secure 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.

IN WITNESS WHEREOF, I have hereunto set my hand this __ day of ___, 20__ at _____, Philippines.

_____
Bidder's Representative/Authorized Signatory

SUBSCRIBED AND SWORN to before me this ___ day of *[month] [year]* at *[place of execution]*, Philippines. Affiant/s is/are personally known to me and was/were identified by me through competent evidence of identity as defined in the 2004 Rules on Notarial Practice (A.M. No. 02-8-13-SC). Affiant/s exhibited to me his/her [insert type of government identification card used], with his/her photograph and signature appearing thereon, with no. _____ and his/her Community Tax Certificate No. _____ issued on ____ at _____.

Witness my hand and seal this ___ day of *[month] [year]*.

NAME OF NOTARY PUBLIC
Serial No. of Commission _____
Notary Public for _____ until _____
Roll of Attorneys No. _____
PTR No. _____ *[date issued], [place issued]*
IBP No. _____ *[date issued], [place issued]*

Doc. No. _____
Page No. _____
Book No. _____
Series of _____

* This form will not apply for WB funded projects.

{ATTACH COMPANY LETTERHEAD/LOGO}

Bid Form

Date: _____

IB[2] N°: _____

To: *[name and address of PROCURING ENTITY]*

Address: *[insert address]*

We, the undersigned, declare that:

(a) We have examined and have no reservation to the Bidding Documents, including Addenda, for the Contract *[insert name of contract]*;

(b) We offer to execute the Works for this Contract in accordance with the Bid and Bid Data Sheet, General and Special Conditions of Contract accompanying this Bid;

The total price of our Bid, excluding any discounts offered below is: *[insert information]*;

The discounts offered and the methodology for their application are: *[insert information]*;

(c) Our Bid shall be valid for a period of *[insert number]* days from the date fixed for the Bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

(d) 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;

(e) Our firm, including any subcontractors or suppliers for any part of the Contract, have nationalities from the following eligible countries: *[insert information]*;

(f) 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;

(g) Our firm, its affiliates or subsidiaries, including any subcontractors or suppliers for any part of the Contract, has not been declared ineligible by the Funding Source;

[2] If ADB, JICA and WB funded projects, use IFB.

(h) 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

(i) We understand that you are not bound to accept the Lowest Calculated Bid or any other Bid that you may receive.

(j) **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]*.**

(k) **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: _____

In the capacity of: _____

Signed: _____

Duly authorized to sign the Bid for and on behalf of: _____

Date: _____

Other Bidding Forms

(ANNEX "C")

{ATTACH COMPANY LETTERHEAD/LOGO}

BILL OF QUANTITIIES

PROJECT: _____
LOCATION: _____

ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT PRICE (Pesos)	AMOUNT (Pesos)
	Pesos_____ Amount in Words _____ _____ __and_____ _____ centavos				
	Pesos_____ Amount in Words _____ _____ __and_____ _____ centavos				
	Pesos_____ Amount in Words _____ _____ __and_____ _____ centavos				
	Pesos_____ Amount in Words _____ _____ __and_____ _____ centavos				

TOTAL BID AMOUNT (Php) _____

TOTAL BID AMOUNT IN WORDS _____
_____
_____

Signature: _____
Printed Name: _____
Position: _____
Name Company: _____
Date: _____

CAAP-BAC-SF Annex " C" Form 2

{ATTACH COMPANY LETTERHEAD/LOGO}

SUMMARY OF BID PROPOSAL

PROJECT:
LOCATION:

ITEM NO.	DESCRIPTION OF WORK	QTY	UNIT	ESTIMATED DIRECT COST	MARK-UPS IN PERCENT		TOTAL MARK-UP		V.A.T.	TOTAL INDIRECT COST	TOTAL COST	UNIT COST
					OCM	PROFIT	%	VALUE				
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9] [5] x [8]	[10] 5%{[5] +[9]}	[11] [9] +[10]	[12] [5] + [11]	[13] [12] / [3]

SUBMITTED BY:

Signature: _____
Printed Name: _____
Position: _____
Name Company: _____
Date: _____

{ATTACH COMPANY LETTERHEAD/LOGO}

BILL OF MATERIALS & COST ESTIMATES

NAME OF PROJECT	:				
DESCRIPTION	:				
LOCATION	:			QUANTITY	UNIT
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
A	**TOTAL MATERIAL COST**				
B	**TOTAL LABOR COST**				
C	**TOTAL EQUIPMENT COST**				
D	**TOTAL DIRECT COST**				
	INDIRECT COSTS				
1. OCM (0% of TDC)					
2. CONTRACTOR's PROFIT (0% of TDC)					
E. TOTAL OCM & CONTRACTOR's PROFIT					
F. VALUE ADDED TAX, (VAT)	5.0%				
G. TOTAL ESTIMATED INDIRECT COST (E + F), P					
H. TOTAL ESTIMATED UNIT INDIRECT COST (G / Quantity), P/Unit					
TOTAL ESTIMATED COST (D + G), P					
TOTAL ESTIMATED UNIT COST (Total Estimated Cost / Quantity), P/Unit					

SUBMITTED BY:

Signature: _____

Printed Name: _____

Position: _____

Name Company: _____

Date: _____

{ATTACH COMPANY LETTERHEAD/LOGO}

SUMMARY FOR UNIT PRICES OF MATERIALS

PROJECT: _____

LOCATION: _____

DESCRIPTION	UNIT PRICE	UNIT

SUBMITTED BY:

Signature: _____

Printed Name: _____

Position: _____

Name Company: _____

Date: _____

{ATTACH COMPANY LETTERHEAD/LOGO}

SUMMARY FOR UNIT PRICES OF LABOR

PROJECT: _____

LOCATION: _____

DESCRIPTION	UNIT PRICE	UNIT

SUBMITTED BY:

Signature: _____

Printed Name: _____

Position: _____

Name Company: _____

Date: _____

{ATTACH COMPANY LETTERHEAD/LOGO}

SUMMARY FOR UNIT PRICES OF EQUIPMENT

PROJECT: _____

LOCATION: _____

DESCRIPTION	UNIT PRICE	UNIT

SUBMITTED BY:

Signature: _____

Printed Name: _____

Position: _____

Name Company: _____

Date: _____

{ATTACH COMPANY LETTERHEAD/LOGO}

Name of Project : _____

Location of Project : _____

CASH FLOW BY QUARTER AND PAYMENY SCHEDULE

PARTICULAR	% W	1ST QUARTER	2ND QUARTER	3RD QUARTER	4TH QUARTER
ACCOMPLISHMENT					
CASH FLOW					
CUMULATIVE ACCOMPLISHMENT					
CUMULATIVE CASH FLOW					

Submitted by:

_____
Name of the Representative of the Bidder

_____
Position

_____
Name of the Company

_____
Date

Other Bidding Forms

(ANNEX "D")

Annex "D" Form 1 ……. Authority of Signatory (Secretary's Certificate)

AUTHORITY OF SIGNATORY

(SECRETARY'S CERTIFICATE)

I,, a duly elected and qualified Corporate Secretary of (Name of the Bidder), a corporation duly organized and existing under and by virtue of the law of the, DO HEREBY CERTIFY, that:

I am familiar with the facts herein certified and duly authorized to certify the same;

At the regular meeting of the Board of Directors of the said Corporation duly convened and held on at which meeting a quorum was present and acting throughout, the following resolutions were approve, and the same have been annulled, revoked and amended in any way whatever and are in full force and effect on the date hereof:

RESOLVED, that*(Name of Bidder)*be, as it hereby is, authorized to participate in the bidding of*(Name of the Project)*by the*(Name of the Procuring Entity)*; and in that if awarded the project shall enter into a contract with the*(Name of the Procuring Entity)*and in connection therewith hereby appoints*(Name of Representative)*, acting as duly authorized and designated representatives of*(Name of the Bidder)*, and granted full power and authority to do, execute and perform any and all acts necessary and/or to represent*(Name of the Bidder)*in the bidding as fully and effectively as the*(Name of the Bidder)*might do if personally present with full power of substitution and revocation and hereby satisfying and confirming all that my said representative shall lawfully do or cause to be done by virtue hereof;

RESOLVED FERTHER THAT, the Board hereby authorized its President to:

a. execute a waiver of jurisdiction whereby the*(Name of the Bidder)*hereby submits itself to the jurisdiction of the Philippine government and hereby waives its right to question the jurisdiction of the Philippine court;
b. execute a waiver that the *(Name of the Bidder)* shall not seek and obtain writ of injunctions or prohibition or restraining order against the CAAP or any other agency in connection with this Project to prevent and restrain the bidding procedures related thereto, the negotiating and award of a contract to a successful bidder, and the carrying out of the awarded project.

WITNESS the signature of the undersigned as such officer of the said this.

(Corporate Secretary)

SUBSCRIBED AND SWORN to before me thisday of, 20affiant exhibited to me his/her Community Tax Certificate No. _____ issued on_____ _____at, Philippines.

Notary Public

Until 31 December 20_____

PRT No.: _____

Issued at: _____

Issued on: _____

TIN No.: _____

Doc. No. _____

Page No.: _____

Book No.: _____

Series of _____

Section X. 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

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

Technical Documents

☐ (e) Statement of the prospective bidder of all its ongoing government and private contracts, including contracts awarded but not yet started, if any, whether similar or not similar in nature and complexity to the contract to be bid. *(Annex "A" Form 1)*; **and**

☐ (f) Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid, except under conditions provided under the rules. *(Annex "A" Form 2)*; **and**

☐ (g) 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 Joint Resolution *(Annex "A" Form 3)*; **and**

Required PCAB License for the project:

1. **Medium A – License Category B** (Building & Industrial Plant)
2. **Large A – License Category AA (***Road, Highway pavement, Railways, Airport, horizontal structures and Bridges)*

☐ (h) 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 *(Annex "B" Form 2)*; **and**

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

☐ 1. Organizational chart for the contract to be bid *(Annex "B" Form 3)*; **and**

☐ 2. 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 *(Annex "B" Form 4, 5a, 5b & 5c)*; **and**

☐ 3. 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 *(Annex "B" Form 6)*; **and**

☐ (j) Original duly signed Omnibus Sworn Statement (OSS) *(Annex "B" Form 7)*; **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; **and**

This shall include all of the following documents as attachment to the Omnibus Sworn Statement:

☐ 1. Certification, under oath, attesting that they have no pending case(s) against the Government, in addition to the eligibility requirements as prescribe under the 2016 Revise Implementing Rules and Regulation (R-IRR) of RA No. 9184; **and**

☐ 2. Legal Clearance to be issued by the CAAP Enforcement and Legal Service with respect to the non-pending cases of the prospective bidders against this Authority; **and**

☐ 3. Bid Bulletins (if applicable); **and**

☐ (k) **Certificate of Site Inspection** *(Annex "B" Form 1)* duly signed by **Mr. Monico B. Basallote, Airport Manager of Sangley Airport** or his duly authorized representative; **and**

This shall include all of the following documents as attachment to the Certificate of Site Inspection:

☐ 1. Copy of company ID of the person who conducted the site inspection; **and**

☐ 2. Copy of the airport/facility visitor's logbook; **and**

☐ 3. Picture of the proposed site including the personnel who conducted the site inspection together with the Airport Manager/Officer in Charge or his duly authorized representative: **and**

Financial Documents

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

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

Class "B" Documents

☐ (n) If applicable, duly signed joint venture agreement (JVA) in accordance with RA No. 4566 and its IRR in case the joint venture is already in existence;
or
duly notarized statements from all the potential joint venture partners stating that they will enter into and abide by the provisions of the JVA in the instance that the bid is successful.

II. FINANCIAL COMPONENT ENVELOPE

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

Other documentary requirements under RA No. 9184

☐ (p) Original of duly signed Bid Prices in the Bill of Quantities *(Annex "C" Form 1)*; **and**

☐ (q) Summary of Bid Proposal *(Annex "C" Form 2)*; **and**

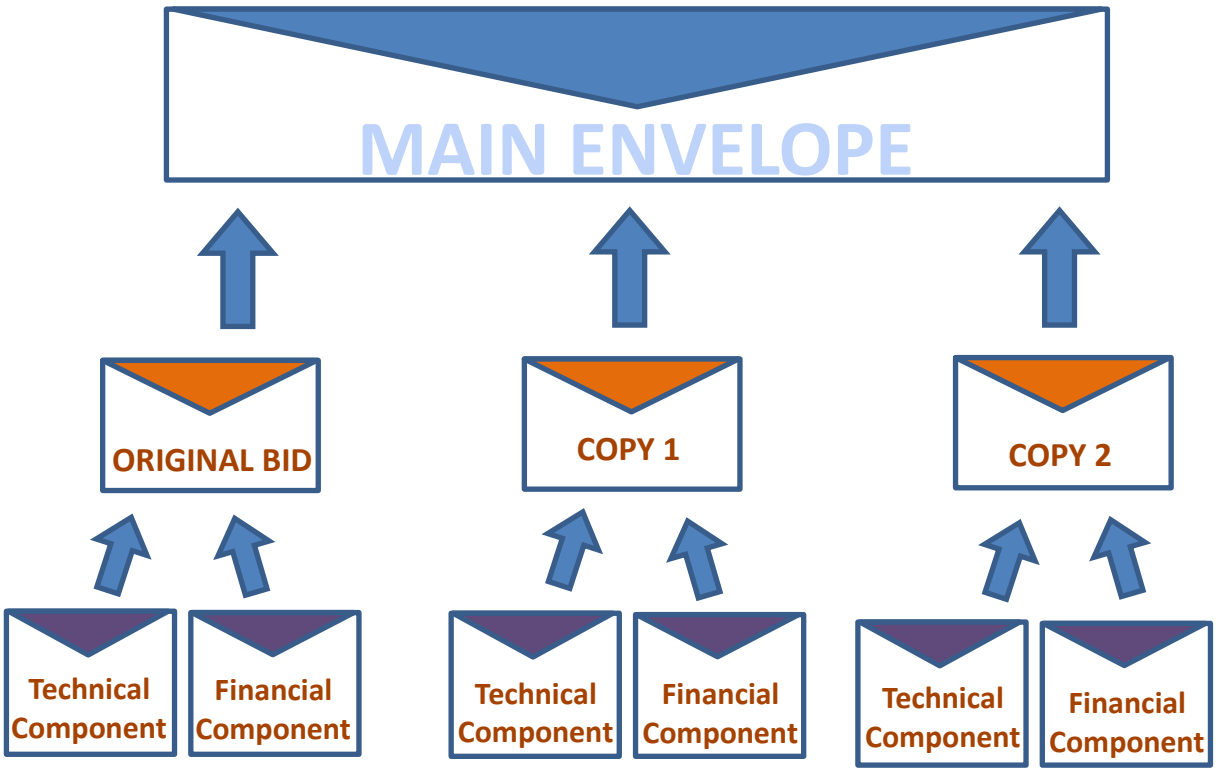
☐ (r) Bill of Materials & Cost Estimates *(Annex "C" Form 3)*; **and**

☐ (s) Summary Sheet indicating the Unit Prices of Construction Materials, Labor Rates, and Equipment Rentals used in coming up with the Bid *(Annex "C" Form 4, 5 & 6)*; **and**

☐ (t) Cash Flow and Payment Schedule *(Annex "C" Form 7)*.

Others:

Sample Illustration of 10 envelope system:



Note:

Inside the Technical Component are the Legal, Technical & Financial Eligibility documents.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