PHILIPPINE BIDDING DOCUMENTS

(As Harmonized with Development Partners)

Procurement of INFRASTRUCTURE PROJECTS

Government of the Republic of the Philippines

IB No. 2023-13

CONSTRUCTION OF ACADEMIC BUILDING II (COLLEGE OF DENTISTRY) – PHASE III (INCREASE IN CARRYING CAPACITY OF NURSING AND ALLIED HEALTH PROGRAMS)

PhP15,000,000.00

Sixth Edition
July 2020

Preface

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

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

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

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

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

a. All the documents listed in the Table of Contents are normally required for the procurement of Infrastructure Projects. However, they should be adapted as necessary to the circumstances of the particular Project.

b. Specific details, such as the "*name of the Procuring Entity*" and "*address for bid submission*," should be furnished in the Instructions to Bidders, Bid Data Sheet, and Special Conditions of Contract. The final documents should contain neither blank spaces nor options.

c. This Preface and the footnotes or notes in italics included in the Invitation to Bid, BDS, General Conditions of Contract, Special Conditions of Contract, Specifications, Drawings, and Bill of Quantities are not part of the text of the final document, although they contain instructions that the Procuring Entity should strictly follow.

d. The cover should be modified as required to identify the Bidding Documents as to the names of the Project, Contract, and Procuring Entity, in addition to date of issue.

e. Modifications for specific Procurement Project details should be provided in the Special Conditions of Contract as amendments to the Conditions of Contract. For easy completion, whenever reference has to be made to specific clauses in the Bid Data Sheet or Special Conditions of Contract, these terms shall be printed in bold typeface on Sections I (Instructions to Bidders) and III (General Conditions of Contract), respectively.

f. For guidelines on the use of Bidding Forms and the procurement of Foreign-Assisted Projects, these will be covered by a separate issuance of the Government Procurement Policy Board.

TABLE OF CONTENTS

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.

West Visayas State University
(Formerly Iloilo Normal School)
Procurement Division/ Bids and Awards Committee Secretariat Office
Luna St., La Paz, Iloilo City 5000
Iloilo, Philippines
* Trunkline: (063) (033) 320-0870 loc1103/1104 * Telefax No.: (033) 320-0879
* Website: **www.wvsu.edu.ph** * Email Address: **govtproc@wvsu.edu.ph**

Invitation to Bid for

CONSTRUCTION OF ACADEMIC BUILDING II (COLLEGE OF DENTISTRY) – PHASE III (INCREASE IN CARRYING CAPACITY OF NURSING AND ALLIED HEALTH PROGRAMS) - IB No. 2023-13

1. The ***West Visayas State University***, through the ***General Appropriations Act (GAA) 2022 – Continuing Appropriations*** intends to apply the sum of ***Fifteen Million Pesos (PhP15,000,000.00) Only*** being the Approved Budget for the Contract (ABC) to payments under the contract for ***Construction of Academic Building II (College of Dentistry) – Phase III (Increase in Carrying Capacity of Nursing and Allied Health Programs).*** Bids received in excess of the ABC shall be automatically rejected at bid opening.

2. The ***West Visayas State University*** now invites bids for the above Procurement Project. Completion of the Works is required ***One Hundred Eighty (180) calendar days.*** Bidders should have completed a contract similar to the Project. The description of an eligible bidder is contained in the Bidding Documents, particularly, in Section II (Instructions to Bidders).

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

4. Interested bidders may obtain further information from ***West Visayas State University, BAC Secretariat Office, Administration Building*** and inspect the Bidding Documents at the address given below from ***8:00 A.M. – 5:00 P.M.***

5. A complete set of Bidding Documents may be acquired by interested bidders on ***May 29 – June 19, 2023,*** 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* ***PhP25,000.00***. The Procuring Entity shall allow the bidder to present its roof of payment for the fees *in person, by facsimile, or through electronic means.*

6. The ***West Visayas State University*** will hold a Pre-Bid Conference[1] on ***June 05, 2023; 10:00 A.M.*** through videoconferencing/webcasting via ***zoom meeting platform (for registration of interested bidders, please send your request to this address: govtproc@wvsu.edu.ph)***, which shall be open to prospective bidders.

7. Bids must be duly received by the BAC Secretariat through **(i) manual submission at the office address as indicated below, (ii) online or electronic submission as indicated below, or (iii) both** on or before ***June 19, 2023; 10:00 A.M.*** Late bids shall not be accepted.

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

9. Bid opening shall be on ***June 19, 2023; 10:00 A.M.*** at the given address below and/or through ***electronic submission using a two-factor security procedure consisting of an archive format compression and password protection with separate password for technical and financial component envelope.*** Bids will be opened in the presence of the bidders' representatives who choose to attend the activity.

[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.

10. Requiring the Bidders to submit their bids using a two-factor security procedure consisting of an archive format compression and password protection with separate password for technical and financial component envelope and disclose the password for accessing their respective bid submission only during the actual bid opening.

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

12. For further information, please refer to:

    ROSALIE C. QUICOY
    Head, BAC Secretariat
    West Visayas State University
    BAC Secretariat Office, Administration Building
    Luna St., La Paz, Iloilo City, 5000
    govtproc@wvsu.edu.ph
    (033) 320-08-70-78 local 1103
    wvsu.edu.ph

13. You may visit the following websites:

    For downloading of Bidding Documents: ***wvsu.edu.ph***

    For online bid submission: ***govtproc@wvsu.edu.ph***

May 29, 2023

PORFERIO J. BARLAS, JR., Ph.D.
Special BAC, Chairperson

Section II. Instructions to Bidders

1. Scope of Bid

The Procuring Entity, ***West Visayas State University*** invites Bids for the ***Construction of Academic Building II (College of Dentistry) – Phase III (Increase in Carrying Capacity of Nursing and Allied Health Programs)***, with Project Identification Number ***IB No. 2023-13***

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 ***General Appropriations Act (GAA) 2022 – Continuing Appropriations*** in the amount of ***Fifteen Million Pesos (PhP15,000,000.00) Only.***

2.2. The source of funding is:

a. NGA, the ***General Appropriations Act (GAA) 2022 – Continuing Appropriations***

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 allowed. The portions of Project and the maximum percentage allowed to be subcontracted are indicated in the **BDS,** which shall not exceed fifty percent (50%) of the contracted Works.

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

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

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

8. Pre-Bid Conference

The Procuring Entity will hold a pre-bid conference for this Project on the specified date and time through videoconferencing/webcasting} *via* ***zoom meeting platform (for registration of interested bidders, please send your request to this address: govtproc@wvsu.edu.ph)***as indicated in paragraph 6 of the **IB.**

9. Clarification and Amendment of Bidding Documents

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

10. Documents Comprising the Bid: Eligibility and Technical Components

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

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

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

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

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

11. Documents Comprising the Bid: Financial Component

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

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

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

12. Alternative Bids

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

13. Bid Prices

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

14. Bid and Payment Currencies

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

the exchange rate as published in the BSP reference rate bulletin on the day of the bid opening.

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

a. Philippine Pesos.

15. Bid Security

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

15.2. The Bid and bid security shall be valid until ***October 17, 2023***. 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

<table>
<tr><th>ITB Clause</th><th></th></tr>
<tr><td>5.2</td><td>For this purpose, contracts similar to the Project refer to contracts which have the same major categories of work, which shall be:
<u>Civil Works</u></td></tr>
<tr><td>7.1</td><td>Item no. 7 – Water Filtration System
Item no. 9 – ECE Works
9.1 – FDAS
9.2 – TELECOM
9.3 – CCTV
Subcontract portions does not exceed 50% of the project.</td></tr>
<tr><td>10.3</td><td>PCAB License: Small B; License Category: C & D</td></tr>
<tr><td>10.4</td><td>The key personnel must meet the required minimum years of experience set below:

No personnel must occupy more than two (2) positions in the list of the contractor’s key personnel to be assigned to the contract to be bid. The submission should include curriculum vitae of the key personnel including licenses; 1. Valid PRC license for registered Engineers, Architects and Master Plumber; 2.Certificate of Accreditation as Materials Engineer issued by DPWH and 3. Certificate of completion of DOLE prescribed training (COSH) for Safety Officer.
<table><tr><th>Key Personnel</th><th>General Experience</th><th>Relevant Experience</th></tr><tr><td>Resident Engineer</td><td>Building Construction</td><td>at least 3 years</td></tr><tr><td>Project Manager</td><td>Building Construction</td><td>at least 3 years</td></tr><tr><td>Architect</td><td>Building Construction</td><td>at least 3 years</td></tr><tr><td>Electrical Engineer</td><td>Building Construction</td><td>at least 3 years</td></tr><tr><td>Master Plumber</td><td>Building Construction</td><td>at least 3 years</td></tr><tr><td>Mechanical Engineer</td><td>Building Construction</td><td>at least 3 years</td></tr><tr><td>Materials Engineer</td><td>Building Construction</td><td>at least 3 years</td></tr><tr><td>Electronics Engineer</td><td>Building Construction</td><td>at least 3 years</td></tr><tr><td>Safety Officer</td><td>Building Construction</td><td>at least 3 years</td></tr></table></td></tr>
<tr><td>10.5</td><td>The minimum major equipment requirements are the following:
<table><tr><th>Equipment</th><th>Capacity</th><th>Number of Units</th></tr><tr><td>Bar Cutter</td><td>Standard</td><td>1</td></tr><tr><td>Mixer</td><td>1-bagger</td><td>1</td></tr><tr><td>Bar Bender</td><td>Standard</td><td>1</td></tr><tr><td>Hauling Truck</td><td>5 cu.m.</td><td>1</td></tr></table></td></tr>
<tr><td>12</td><td>No further instructions.</td></tr>
<tr><td>15.1</td><td>The bid security shall be in the form of a Bid Securing Declaration or any of the following forms and amounts:
a. The amount of not less than <u>PhP300,000.00</u> [Insert 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 <u>PhP750,000.00</u> [Insert five percent (5%) of ABC] if bid security is in Surety Bond.</td></tr>
<tr><td>19.2</td><td>The infrastructure project is packaged in a single lot and the lot shall not be divided into sub-lots for the purpose of bidding, evaluation, and contract award.</td></tr>
<tr><td>20</td><td>1.Latest income and business tax returns filed and paid through the BIR Electronic Filing and Payment System (eFPS);
2. PRC License of key personnel assigned to the project.</td></tr>
<tr><td>21</td><td>Additional contract documents relevant to the Project that may be required by existing laws and/or the Procuring Entity, such as <u>construction schedule and S-curve, manpower schedule, construction methods, equipment utilization schedule, construction safety and health program approved by the DOLE, and other acceptable tools of project scheduling and Contractors All Risk Insurance (CARI).</u></td></tr>
</table>

Section IV. General Conditions of Contract

1. Scope of Contract

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

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

2. Sectional Completion of Works

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

3. Possession of Site

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

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

4. The Contractor's Obligations

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

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

5. Performance Security

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

5.2. The Contractor, by entering into the Contract with the Procuring Entity, acknowledges the right of the Procuring Entity to institute action pursuant to

RA No. 3688 against any subcontractor be they an individual, firm, partnership, corporation, or association supplying the Contractor with labor, materials and/or equipment for the performance of this Contract.

6. Site Investigation Reports

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

7. Warranty

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

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

8. Liability of the Contractor

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

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

9. Termination for Other Causes

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

10. Dayworks

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

11. Program of Work

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

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

12. Instructions, Inspections and Audits

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

13. Advance Payment

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

14. Progress Payments

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

15. Operating and Maintenance Manuals

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

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

Section V. Special Conditions of Contract

Special Conditions of Contract

GCC Clause	
2	*Completion of the Works:*_____
4.1	***3 days after the receipt of Notice to Proceed (NTP).***
6	The site investigation reports are: _____.
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. *[In case of semi-permanent structures, such as buildings of types 1, 2, and 3 as classified under the National Building Code of the Philippines, concrete/asphalt roads, concrete river control, drainage, irrigation lined canals, river landing, deep wells, rock causeway, pedestrian overpass, and other similar semi-permanent structures:]* Five (5) years. *[In case of other structures, such as bailey and wooden bridges, shallow wells, spring developments, and other similar structures:]* Two (2) years.
10	Dayworks are applicable at the rate shown in the Contractor's original Bid.
11.1	The Contractor shall submit the Program of Work to the Procuring Entity's Representative within *7 calendar days* of delivery of the Notice of Award.
11.2	The amount to be withheld for late submission of an updated Program of Work is ***Not applicable***.
13	The amount of the advance payment is ***shall not exceed 15% of the total contract price and schedule of payment.***
14	*[If allowed by the Procuring Entity, state:]* Materials and equipment delivered on the site but not completely put in place shall be included for payment. ***No further instructions.***
15.1	The date by which operating and maintenance manuals are required is ***not applicable***. The date by which "as built" drawings are required is ***upon completion.***
15.2	The amount to be withheld for failing to produce "as built" drawings and/or operating and maintenance manuals by the date required is ***None***.

Section VI. Specifications

PROJECT TITLE: **CONSTRUCTION OF ACADEMIC BUILDING II (COLLEGE OF DENTISTRY) – PHASE III (INCREASE IN CARRYING CAPACITY OF NURSING AND ALLIED HEALTH PROGRAMS)**

LOCATION: **WVSU – MAIN CAMPUS**

SITE WORK

A. WORK INCLUDED

1. Establishment of lines, grades and benchmarks and provision of temporary facility
2. All backfolding, filling and grading, removal of excess materials from site.
3. Protection of property, work and structures, workmen, and other people from damage and injury.

B. LINES, GRADES AND BENCHMARKS

1. Stake out accurately the lines of the building and of the other structures included in the contract, and establish grades therefore, after which secure approval by Architect before any excavation work is commenced.
2. Erect basic better boards and basic reference marks, at such places where they will not be disturbed during the construction of the foundations.

C. EXCAVATIONS

Structural Excavations – Excavations shall be to the depths indicated bearing values. Excavations for footings and foundations carried below required depths shall be filled with concrete, and bottom of such shall be level. All structural excavations shall extend to sufficient distance from the walls and footings to allow for proper erection and dismantling of forms, for installation of service and for inspection. All excavations shall be inspected and approved before pouring any concrete, laying underground services or placing select fill materials.

The Contractor shall control the grading in the vicinity of all excavated areas to prevent surface drainage running into excavations. Water which accumulates in excavated areas shall be removed by pumping before fill or concrete in placed therein.

Note: This structure will be adjacent with an existing structure, thus be careful with existing structures, footing, beams, posts, pipes underground, any other pipelines present on site. Consult with Engineer before any major demolition and boring. Any damages will be shouldered by the contractor.

D. FILLINGS AND BACKFILLING

1. After forms have been removed from footings, piers, foundations, walls, etc. and when concrete work is hard enough to resist pressure resulting from fill, backfilling may then be done. Materials excavated may be used for backfilling. All filling shall be placed in layers not exceeding six (6) inches in thickness, each layer being thoroughly compacted and rammed by wetting, tamping, rolling.

E. PLACING AND COMPACTING FILL

1. Common Fill- shall be approved site-excavated materials free from roots, stumps and other perishable or objectionable matter.
2. Select Fill – Shall be placed where indicated and shall consist of crushed gravel, crushed rock, or combinations thereof. The materials shall be free from adobe, vegetable matters and shall be thoroughly tampered after placing.
3. Before placing fill material, the surface upon which it will be placed shall be cleared of all brush roots, vegetable matters and debris, sacrificed and thoroughly wetted to insure good bonding between the grounds.

F. DISPOSAL OF SURPLUS MATERIALS

1. Any excess materials remaining after completion of the earthwork shall be disposed of by hauling and spreading in nearby spoil areas designated by the OWNER. Excavated materials deposited in soil areas shall be graded to a uniform surface.
2. On site area must be clean at all times. During and after construction, to observe proper board ups and site cleaning. Coordinate with project in charge for proper disposal.

II. CONCRETE AND REINFORCED CONCRETE

A. GENERAL

1. Unless otherwise specified herein, concrete works shall conform to the requirements of the ACI Building Code. Full cooperation shall be given other trades to install

embedded items. Provisions shall be made for setting items not placed in the forms. Before concrete is placed, embedded items shall have been inspected and tested for concrete aggregates and other materials shall have been done.

B. MATERIALS

1. Cement for concrete shall conform to the requirements of specifications for Portland Cement (ASTM C – 150)
2. Water used in mixing concrete shall be clean and free from other injurious amounts of oils, acids, alkaline, organic materials or other substances that may be deleterious to concrete or steel.
3. Fine aggregates shall consist of hard, tough, durable, uncoated particles. The shape of the particles shall be generally rounded or cubicle and reasonably free from flat or elongated particles. The stipulated percentages of fines in the sand shall be obtained either by the processing of natural sand or by the production of a suitably graded manufactured sand.
4. Coarse aggregates shall consist of gravel, crushed gravel or rock, or a combination of a gravel and rock, coarse aggregates shall consist of hard, tough, durable, clean and uncoated particles. The sizes of coarse aggregates to be used in the various parts of the works shall be in accordance of the following:
   Maximum Size – 1 ½" for all concreting works
5. Reinforcing bars shall conform to the requirements of ASTM standard specifications for Billet Steel Bars for concrete reinforcement (A15-625) and to Specification for requirements for the deformed steel bars for concrete reinforcement (A 305-56).
   All secondary ties such as stirrups, spirals and inserts may also be deformed bars. The main reinforcing bars shall be as follows:

No. 4 (1/2") 12 mm	No. 8 (1") 25 mm
No. 3 (3/8") 10 mm	No. 9 (1 11/8") 28 mm
No. 5 (5/8") 16 mm	fy – 33,000 psi
No. 6 (3/4") 20 mm	fy – 40,000 psi
No. 7 (7/8") 22 mm	fy – 60,000 psi

For 10mm and 12mm dia. RSB, use RSB Grade 40
For 16mm dia. and above, use RSB Grade 60
Testing of materials for the above mentioned items is required, to schedule with project in charge for testing at least 2 days before date of testing.

C. PROPORTIONING AND MIXING

1. Proportioning and mixing of concrete shall conform to the requirements for Item 405 of the standard specification with the following proportions:

	Cement	: Sand	: Gravel
Class "A" –	1	: 2	: 3
Class "B" -	1	: 2	: 4
Class "C" -	1	: 2 ½	: 5

3. Class of Concrete – concrete shall have 28-day cylinder strength of **4,000 psi**. for all concrete works, including columns and beams unless otherwise indicated in the plans or approved by the engineer.
   Concrete for slab-on-fill shall have a 28-day cylinder strength of **4,000 psi**.
4. Mixing – concrete shall be machine mixed. Mixing shall begin within 30 minutes after the cement has been added to the aggregates. In the absence of the concrete mixer, manual mixing is allowed.

D. FORMS

1. General – Forms shall be used whatever necessary to confine the concrete and shape it to the required lines, or to insure the concrete of contamination with materials caving from adjacent, excavated surfaces. Forms shall have sufficient strength to withstand the pressure resulting from placement and vibration of the concrete, and shall be maintained rigidly in correct position. Forms shall be sufficiently tight to prevent loss or mortar from the concrete. Forms for exposed surfaces against which backfill is not be placed shall be lines with a form grade plywood. For best practice, **use ½" Phenolic board** (of good quality) as form boards.
2. Cleaning and Oiling of Forms – before placing the concrete, the contact surfaces of the formed hall be cleaned of encrustations of mortar, the grout or other foreign material, and shall be coated with a commercial form oil that will effectively prevent sticking and will not stain the concrete surfaces.
3. Removal of Forms – forms shall be removed in a manner which will prevent damage to the concrete. Forms shall not be removed without approval. Any repairs of surface

imperfections shall be formed at once and airing shall be started as soon as the surface is sufficiently hard to permit it without further damage.

E. PLACING REINFORCEMENT:

1. General – steel reinforcement shall be provided as indicated, together with all necessary wire tires, chairs, spacer supported and other devices necessary to install and secure the reinforcement properly. All reinforcement, when placed, shall be free from loose, flaky rust and scale, oil grease, clay and other coating and foreign substances that would reduce or destroy its bond with concrete.

   Reinforcement shall be placed accurately and secured in place by use of metal or concrete supports, spacers and ties. Such supports shall be used in such manner that they will not be exposed or contribute in any way, to the discoloration or deterioration of the concrete.

F. CONVEYING AND PLACING CONCRETE:

1. Conveying – concrete shall be conveyed from mixer to forms as rapidly as applicable, by methods which will prevent segregation, or loss of ingredients. There will be no vertical drop greater than 1.5 meters except where suitable equipment is provided to prevent segregation and where specifically authorized.
2. Placing – concrete shall be worked readily into the corners and angles of the forms and around all reinforcement and imbedded items without permitting the material to segregate, concrete shall be deposited as close as possible to its final position in the forms so that flow within the mass does not exceed two (2) meters and consequently segregation is reduced to a minimum near forms or embedded items, or elsewhere as directed, the discharge shall be so controlled that the concrete may be effectively compacted into horizontal layers not exceeding 30 centimeters in depth within the maximum lateral movement specified.
3. Time interval between mixing and placing. Concrete shall be placed before initial set has occurred and before it has contained its water content for more than 45 minutes. No concrete mix shall be placed before 60 complete revolution of the machine mixer.
4. Consolidation of Concrete – concrete shall be consolidated with the aid of mechanical vibrating equipment and supplemented by the hand spading and tamping. Vibrators shall not be inserted into lower cursed that have commenced initial set; and reinforcement embedded in concepts beginning to set or already set shall not be disturbed by vibrators. Consolidation around major embedded parts shall by hand spading and tamping and vibrators shall not be used.
5. Placing Concrete through reinforcement – In placing concrete through reinforcement, care shall be taken that no segregation of the coarse aggregate occurs. On the bottom of beams and slabs, where the congestion of steel near the forms makes placing difficult, a layer of mortar of the same cement-sand ratios as used in concrete shall be first deposited to cover the surfaces.

G. CURING

1. General – All concrete shall be moist cured for a period not less than seven (7) consecutive days by an approved method or combination applicable to local conditions.
2. Moist Curing – The surface of the concrete shall be kept continuously wet by covering with burlap plastic or other approved materials thoroughly saturated with water and keeping the covering spraying or intermittent hosing.

H. FINISHING

1. Concrete surfaces shall not be plastered unless otherwise indicated. Exposed concrete surfaces shall be formed with plywood, and after removal of forms, the surfaces shall be smooth, true to line and shall present or finished appearance except for minor defects which can be easily repaired with patching with cement mortar, or can be grounded to a smooth surface to remove all joint marks of the form works.
2. Concrete Slabs on Fill. The concrete slabs on fill shall be laid on a prepared foundation consisting of sub grade and granular fill with thickness equal to the thickness of the overlaying slab except as indicated otherwise.

III. MASONRY WORKS

A. MATERIALS

1. Concrete Hallow Blocks shall have a minimum face shell thickness of 1” (.025). Nominal size shall be 4” x 8” x 16” or 6” x 8” x 16” with minimum compressive strength as follows:

Class “A” – 900 psi
Class “B” – 750 psi

All units shall be stoned for a period of not less than 28 days (including curing period) and shall not be delivered to the job site prior to that time unless the strengths equal or exceed those mentioned in these specifications.

2. Wall Reinforcement shall be 10mmØ or 12mmØ steel bars as specified in the plans.
3. Sand shall be river sand, well screened, clean, hard, sharp sillicious, free from loam, silt or other impurities, composed of grains of varying sizes within the following limits:

Sieve No.		Percent (%)
9	Passing	100
16	Retained	5
100	Retained	95

4. Cement shall be standard Portland cement, ASTM D-150-68 Type 1.
5. Mortar – Mix Mortar from 3 to 5 minutes in such quantities as needed for immediate use. Retampering will not be permitted if mortar stiffens because of premature setting. Discard such materials as well as those which have not been used within one hour after mixing.

   Proportioning: Cement mortar shall be one (1) part Portland cement and two (2) parts sand by volume but not more than one (1) part Portland cement and three (3) parts sand by volume.

B. ERECTION

1. All masonry shall be laid plumb, true to line, with level and accurately spaced courses, and with its course breaking joint with the source below. Bond shall be kept plumb throughout; corners and reveals shall be plumb and true. Units with greater 12 percent absorption shall be wet before laying. Work required to b built in with masonry, including anchors, wall plugs and accessories shall be built in as the erection progresses.
2. Masonry Units. Each course shall be solidly bedded in Portland cement mortar. All units shall be damp when laid units shall be showed into place not laid, in a full bed of unfurrowed mortar. All horizontal and vertical points shall be completely filled with mortar when and as laid. Each course shall be bonded at corners and intersections. No cell shall be left open in face surfaces. All cell shall be filled up with mortar for exterior walls. Units terminating against beam or slab suffits shall be wedge tight with mortar. Do not lay cracked, broken defaced block.
3. Lintels shall be of concrete and shall be enforced as shown in the drawings. Lintels shall have a minimum depth of 0.20 (8”) and on each side of opening.

C. WORKMANSHIP AND INSTALLATION:

1. Plastering: Clean and evenly wet surfaces. Apply scratch coat with sufficient force to form good keys. Cross scratch coat after scratch coat has set at least 24 hours after scratch coat application. Lightly scratch brown coat; keep moist for two (2) days; allow drying out. Do not apply finish until brown coat has seasoned for seven (7) days. Just before applying coat, wet brown coat again. Float finish coat to true even surface; trowel in manner that will force sand particles down into plaster; with final toweling, leave surfaces banished smooth, free from rough area, trowel marks, cheeks, other blemishes. Keep finish cost mist for at least two (2) days; thereafter protect against rapid drying until properly, thoroughly cured.
2. Pea Gravel Washout: Before start of work, provide desired pitch for drainage. Roughen concrete surface with pick or similar tool. Clean off loose particles and other materials which may prevent bond, keep surface wet for at least four (4) hours before applying. Scratch coat of mortar. Coat more than ¾” thick. Apply mixture of pea gravel and Portland cement with pressure to obtain solid adhesion. Trowel pea gravel to hard, smooth, and even plain and rod and float to uniform surface or even texture. When surface is semi-dry evenly spray surfaces with clean water with spray machine to washout loose cement to part exposed pea gravel. Remove and wash down remaining cement paste with soft brush, to leave pea gravel in its natural texture appearance. Before applying pea gravel finish, submit samples to owner for approval.

D. SCAFFOLDING

Provide all scaffolding required for masonry works, including cleaning down on completion, remove.

IV. ARCHITECTURAL FINISHES SCHEDULE

A. Bush-Hammered Finish

1. General – The work includes the performance of all work required in connection with bush hammered finish on concrete and masonry surfaces as shown on the drawings.
   1.1 Materials
      1.1.1 Cement shall conform to ASRM Standard, C150, Type 1.
      1.1.2 Adobe Granules shall be of high quality subject to the approval of the Engineer.
2. Requirements. The surface to be finished shall be thoroughly cleaned. Bush-Hammered finish shall be composed of one part cement and two parts of adobe granules. The base coat shall be applied with sufficient materials and pressure to form a good bond with masonry and then it shall be dressed with a bush-hammer to provide a uniformly roughened surface. No abrupt irregularities shall be permitted and the granules shall not exceed in any case one (1) mm, using a straight edge or templates for testing irregularities. Corrective work, if any, shall be done by the Contractor to the satisfaction of the Engineer.

B. Pea-Gravel Finish

1. Pea-Gravel Finish shall have a composition of cleaned "Bohol" pea-gravel, No. 10 size, and with a 70 percent beige and 30 percent white color of pebble, unless otherwise indicated.
2. Sealer. Penetrating type, free from harmful alkali or acid content. Sealer shall not discolor the surface nor leave a tacky or sticky finish film on surface.
3. Pea-Gravel Washout Matrix shall be composed of 100 kilograms of pea-gravel composition per bag of Portland cement. Thoroughly mix dry ingredients before adding water in the amount of 18 liters per bag of cement. Apply to a minimum thickness of 13mm.
4. Installation Pea-Gravel Washout Matrix. Thoroughly moisten substrate but do not saturate; slush with neat cement into the substrate surfaces and then place the matrix. Compact by toweling to extract all excess cement and water. Sprinkle with pebble composition where required to produce even texture of matrix. Follow immediately with water fogging to expose pebbles over matrix.
5. Curing. Keep the completed pea-gravel washout continuously moist for a period of 6 days by sprinkling water.
6. Cleaning and Sealing. After curing, remove all laitance from washout surfaces with an acid bath, using a 1 to 10 solution of muriatic acid to water and scrubbing surface, followed by thoroughly rinsing with clean water. When surface is dry, apply sealer in accordance with sealer manufacturer's instructions.
7. Protection. Protect pea-gravel washout works from damage until completion of the work of all other trades.

C. TILEWORKS

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

2. Materials
   2.1 Floor tiles shall be standard grade unglazed natural clay tile of 6mm thick manufactured by "Mariwasa" or its equivalent. Color and pattern shall be specified in the drawings or as approved by the Architect/Engineer. Present actual samples for approval before implementation
   2.2 Wall and Special Tiles shall be of 6 mm thick non-vitreous body glazed tiles, manufactured by "Mariwasa" or its approved equivalent. Color and pattern shall be as specified in the drawings or as approved by the Engineer. Tiles shall be free from laminations, serrated edges, chipped off corners and other imperfection affecting their quality, appearance and strength.
   2.3 Cement shall conform to ASTM Standard c150, Type 1.
   2.4 Heavy duty tile and heavy-duty tile adhesive be used when specified by the Architect/Engineer.
   2.5 Sand shall be natural sand and shall be retained between No. 50 and No. 100 sieves.
   2.6 Lime shall be hydrated lime where the free (unhydrated) calcium oxide and magnesium oxide content does not exceed 8 percent by weight.

2.7 Cement Pigment non-Fading mineral oxides of the quality as approved by the Engineer.

2.8 White cement shall be of the standard quality approved by the Engineer. Manufactured materials shall be delivered in the original unbroken packages or containers that are labeled plainly with the manufacturer's names and brands. Containers for tiles shall be grade-sealed. Materials shall be stored in dry, weather tight enclosures and shall be handled in a manner that will prevent the intrusion of deleterious materials that will affect the quality and appearance of the tiles.

3. Mortar – A scratch coat for wall tile shall consist of one part Portland cement, ¼ part lime putty and 3 parts sand by volume. Scratch coat shall have a minimum thickness of 9mm. The Buttering mortar for setting wall tiles and mortar setting bed for floor tiles shall have the same proportion as that of scratch coat.

D. FLOOR TILING

a. Preparation of Surfaces. Before tile is applied with a dry-set mortar bed, the structural floor shall be tested for levelness or uniformity of slope by flooding it with water. Areas with water ponds shall be gilled, leveled and retested before the setting bed is applied. The slab shall be soaked thoroughly with clean water on the day before the setting bed is applied. Immediately preceding the application of the setting bed, the slab shall again be wetted thoroughly but no free water shall be permitted to remain on the surface. A skin coat of Portland cement mortar shall then be applied not more than 1.5mm thick. The mortar shall be spread until its surface is true and even, and thoroughly compacted, either level or sloped uniformly for drainage, where required. A setting bed, as far as can be covered with the tile before the mortar shall reached its initial set, must be placed in one (1) operation, but in the event that more setting mortar has been placed than can be covered, the unfinished portion shall be removed and cut back to a clean leveled edge.

b. Application for Floor Tile. All tiles shall be soaked in clean water to a minimum of one (1) hour before they are installed. Absorptive mounted tile shall be damped by placing tile on a wetted cloth in a shallow pan before installing. Before the initial set has taken place in the setting bed, a skim of Portland cement mortar .75mm to 1.5mm thick shall be toweled or brushed over the setting bed or plain Portland cement .75mm to 1.5mm thick may be hand-dusted uniformly over the setting bed and worked lightly with a trowel or brush until thoroughly damp. The tiles shall then be pressed firmly upon the setting bed, and carefully tapped into the mortar until true and even with the place of the finished floor base. Tapping and leveling shall be completed within one (1) hour after placing tiles. Borders and defines lines shall be laid before the field or body of the floor. Where floor drain is provided, the floor shall be slopped properly to the drains. Cutting of tiles, where necessary, shall be done along the outer edges of tile against trim, base, thresholds, pipes, built-in fixtures, and similar surfaces and shall be geared and joined carefully. Tiles shall be secured firmly in place, and loose tiles or tiles sounding hollow shall be removed and replaced to the satisfaction of the Engineer. All lines shall be kept straight, parallel and true and all finished surface brought to true and even planes.

E. WALL TILLING

a. Preparation of wall Surfaces. Scratch coat shall be applied on prepared surface to serve as backing for wall tiles, not less than 24 hours or more than 48 hours before starting the tile setting. Temporary screeds shall be applied to the scratch coat to provide a true and plumb surface to the proper distance back from the finished wall. The setting bed shall be applied, rodded, and floated flushed with the screeds over an area no greater than will be covered with the title while the bed remain plastic. The thickness of the setting bed shall not exceed 20mm and the mortar shall not be retempered. For corner tiles, it must be of "kutsilyada", at 45 degree cutting for corner tiles.

b. Application of Wall Tile. Tiles shall be soaked in clean water for a minimum of one (1) hour before they are installed. A skim coat of Portland cement mortar, mixed with water to the consistency of thick cream shall be applied .75mm thick to the mortar setting bed, or to the back of each tile. The tiles shall then be pressed firmly upon the setting bed and tapped until flush and in the place of the other tiles. The tiles shall be applied before the mortar bed has taken its initial set. Intersections and returns shall be formed accurately. All lines shall be kept straight and true, and all finished surfaces brought to true and even planes, internal corners squared and external

corners, rounded. Horizontal joints shall be maintained level and vertical joints plumb in alignment.

F. JOINTS

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

G. PROTECTION

1. Areas where tiles are being laid shall be closed to traffic of other work until the floors are completed and the tiles have firmly set. Tile works shall be adequately protected from damage until the completion of the Contract.

H. GROUTING

1. Grouting shall be done as soon as the mortar beds have sufficiently set. All cement shall be Portland cement, colored or white, as required. Where light colored mortar is required in joints, a mixture of white cement and non-fading mineral oxide shall be used to produce the desired colors. The quantity of mineral oxides shall not exceed 10 % of the volume of the cement in any case.

I. CLEANING

1. Upon completion of the grouting, the tiles shall be thoroughly cleaned and maintained in this condition until completion of the Contract.

VI. CEILINGS

A. General – This item shall consist of all fabricated materials complete with hardware necessary for the proper functioning thereafter as called for in this specification unless indicated otherwise in the drawing.

1. All interior ceilings shall be as specified in the drawings.
2. Outside ceiling eaves shall be as specified in the drawing.

VII. DRYWALL PARTITIONS/ SPECIALTY PARTITIONS

A. General – This item shall consist of all fabricated materials complete with hardware necessary for the proper functioning thereafter as called for in this specification unless indicated otherwise in the drawing.

1. **VARIFOLD PARTITION**. Use industrial heavy duty wooden folding door system.
   Panel size: 6" x 12.5mm thick MDF Board, Opening: Center split with handles and center lock keys. With Industrial series Panel core medium density fiberboard. Finish is Nylex wood veneer with US grade rubber joinery. To have heavy duty Vinyl roller pins with aluminum alloy cap connectors. Heavy duty aluminum alloy track. Attachment: 2 poles of 2x2 laminated MDF.
2. **LEAD SHEET WALL.** Lead sheet and Lead glass XRAY Room**.** To use 1.5mm x 12" x 7' lead sheet. Lead glass, 8-10mm w/ 2.4MMPB lead equivalency including lead lining installation, lead adhesive for the lead sheet.
   Note: in case of DOH testing failure to comply on radiation safety handrails, the contractor will replace/repair any portion/item.

VIII. WOOD DOORS/ SPECIALTY DOOR

A. General – This item shall consist of all fabricated wooden doors complete with hardware necessary for the proper functioning thereafter as called for in this specification unless indicated otherwise in the drawing.

B. Materials – All limber for doors, jambs, door bars, shall be kiln dried with not more than fourteen percent (14%) moisture content.

1. Doors (Swing-Doors). Doors shall have 44mm thickness unless otherwise specified or shown on plans, except counter or louver doors which shall be 31mm thick. In cases where varifold type is indicated on plans, the manufacturers' specifications shall be followed subject to the approval of the Engineer.
2. Door Types (as applicable)
   2.1 Solid Core Doors (Glazed and/or Wood Panel). This Type of door shall have cores of the stile and nail type raised on both faces, set loose and either nailed

or glued in place. It can either be of glass or wood panels or combination thereof.

2.2 Hollow Core Doors (Flush Door). Except as otherwise specified, flush door shall be done in accordance with the details as shown on the plans. The plywood edge protection shall be around and into the outside frame of the door in order to prevent "pulling off" of the plywood veneers at the edges.

2.3 Glass Window Pane. This type of window shall consist of a single plate of glass framed in kiln–dried lumber, fabricated, shaped and molded true to details and joined properly to acquire rigidity.

2.4 **MD-1 Fire Resistant Door**. Dimension as follows: 1.00m x 2.10m H. 44mm thk. With fire rating UL-10c, Ga #18 G.I. door, GA #16 G.I. (50mm x 150mm) single rabbet jamb, rockwool insulation with 6mm thick fire rated clear wired glass (10mm W x 625mm h) visible glass, and epoxy primer finish, with panic device aluminum fire rated, with door closer non-hold open fire rated hinge.

C. REQUIREMENTS

1. Pre-fitting and Factory-Priming or Factory Finishing. Doors with surfaces to receive paint finish may be furnished factory primed, and doors with natural finish may be furnished factory pre-finish. Final finishing shall be done in site in accordance with painting and varnishing specifications.
2. Adhesive and Bonds. Adhesive and Bonds shall be in accordance with manufacturer's recommendations for all types of doors subject to the approval of the Engineer. Adhesive for doors with natural finish shall be non-staining.

D. INSTALLATION. Installations shall be installed only after completion of other work which may affect the moisture content of the doors. Doors shall be fitted and trimmed as required by the opening they will cover. Doors shall have a clearance of 3mm at the side and top and shall have a bottom clearance of 6mm over threshold or as known on details. The lock edge of doors shall be beveled at the rate of 3mm in 50mm. Cuts made on the jambs shall be sealed immediately after cutting, using a clear water resist and varnish or sanding sealer.

VIII. CARPENTRY AND JOINERY WORK

A. Materials

1. Quality of Lumber: Lumber shall be approved quality of the respective kinds of the various parts of the work, well seasoned, thoroughly dry, and free from large, loose, or unsound knots, sups, shakes, and other imperfections impairing its strength, durability or appearance. All finishing lumber to be used shall be completely dried and shall not contain more than 14% moisture. All flooring, tongue and groove shall be kiln dried.
2. Treatment of the Lumber:
    a. All concealed lumber shall be sprayed with anti-anay or buk-bok liquid.
    b. Surface in contact with masonry and concrete coated with creosote or equivalent.
3. Door Sashes: All door sashes shall be well seasoned, flush type, semi-hollow core and solid core, Tanguile plywood veneers on both sides. Exterior doors shall be of kiln dried Tanguile panel doors.
4. Kind of Lumber:
   All unexposed lumber for framings shall be of Apitong.
   All windows and door jambs shall be of Apitong or Tanguile.

B. WORKMANSHIP

1. Execute rough carpentry in best, substantial, workmen like manner. Erect framing true to line, levels and dimensions, squared, aligned, plumbed, well spliced and nailed, and adequately braced, properly fitted using mortise and tennon joists.
2. Millwork – Accurately milled to details, clean cut moldings profiles, lines, scrape, sand smooth; mortise, tennon, splice, join, block, nail screw, bolt together, as approved, in manner to allow free play of panels; avoid swelling, shrinkage, ensure work remaining in place without warping, splitting opening or joints. Do not install mill work and case until concrete and masonry work have been cured and will not release moisture harmful to woodwork.
3. Secure work to ground, otherwise fasten in position to hold correct surfaces, lines and level, Make finished work flat, plumb, true.

IX. PAINTING, VARNISHING AND FINISHING

SCOPE OF WORK

1.1 This section includes the supply and furnishing of all materials, labor, and equipment required for the preparation, painting and finishing of all shown on the Drawings and all other work required to complete Painting work as required by these Specifications.

1.2 GENERAL REQUIREMENTS

a. Refer to Drawings and schedule for location, extent of work and other requirements;
b. Materials Handling: Deliver all materials to the jobsite in clean, sealed, original containers with all labels and markings intact. Store materials, in designated storage areas that will be kept neat, clean and locked;
c. Protection: Protect designated and adjacent areas and materials, lawns, shrubbery and other areas not to be painted, from stains and paint splatters resulting in the performance of painting work;
d. Fire Prevention: Contractor shall take every precaution to prevent fires. At the end of each day's work, all oily rags, empty containers and combustible materials must be removed from the premises;
e. Clean-up: Upon completion of work, Contractor shall remove all paint splatters and leave the area in neat and orderly condition;
f. Color Scheme: The Contractor shall faithfully follow the color chips supplied for matching the Color Scheme and Painting Schedule of the Project Engineer. All undercoats shall be tinted to approximate the finish color coat.

MATERIALS

a. All paints, latex, enamels, varnishes, lacquers, and other products to be used in this project shall be of excellent brand and quality
b. Materials necessary to complete the painting and finishing schedule that are specified in these Specifications are standards for kind, quality and function.

PREPARATION OF SURFACES

3.1 GENERAL

Follow standard surface preparation Specification or as specified by the Architect;
a. Metal Surfaces - Remove dust, rust, oil and grease before application of priming coat;
b. Concrete and Masonry surfaces - Remove all loose grit, mortar, dust, dirt, grease, oil and any other foreign matter. Treat with Masonry Neutralizer;
c. Wood Surfaces - Follow manufacturer's instruction for both exterior surface preparation producers before painting work;
d. Fill, caulk or putty all holes, cracks and open joints. Apply putty with knife where necessary, after application of priming coats.

WORKMANSHIP AND APPLICATION

4.1 Apply paint as per manufacturer's Specifications and recommended application procedures.

4.2 WORKMANSHIP

a. Finished surfaces shall be smooth, even and free from defects;
b. Apply paint to completely dry surfaces only and no succeeding coat applied until preceding coat is completely dry;
c. Paint by spray, brush or rollers as per Architect's instructions and specifications.

4.2 PAINTING SCHEDULE

a. Exterior concrete and masonry surfaces:

Coating System	Semi-gloss Finish (acrylic solvent type)
Primer	Flat latex paint
Putty	Masonry glazing putty
$2^{nd}/3^{rd}$ Coats	Latex semi gloss

b. interior concrete and masonry surfaces:

Coating System	Semi-gloss Finish (acrylic solvent type)
Primer	Flat latex paint
Putty	Masonry glazing putty
2nd/3rd Coats	Latex semi gloss

c. Fiber Cement board and similar materials surfaces:

Coating System	Semi-gloss Finish (acrylic solvent type)
Primer	Flat latex paint
Putty	Masonry glazing putty
2nd/3rd Coats	Latex semi gloss

d. Wood flush doors, jambs, and cabinets:

Coating System	Acrylic Finish

e. Architectural Metal surfaces

Coating System	
Primer	Epoxy Paint Finish
2nd/3rd Coat	Acrylic Finish

X. STEEL/ ALUMINUM WINDOWS

A. General – The work covered by this section consist of furnishing of all equipment, materials and labor in the fabrication and installation of steel windows complete in accordance with the applicable drawings and specifications.

B. Materials. All members shall be hot rolled new billet steel with frame and ventilators section not less than 33.3mm (1-5/16") deep from front to back. Frame members shall be of equal leg design section at points where called for by detail drawings, and continuous angle fins, as indicated on drawings, shall be furnished. See-type section of special design with offset permitting down turned leg of the vent member to seat flush when vent in a fully closed position, shall be used for frame angle shaped. Frames and vent members shall have integral weathering baffles providing double first parallel weathering contracts of not less than 6 mm width on all four side of the vent. Muntins shall be 22mm by 31mm rolled-tee sections. **For aluminum frames, use 50mm thick powder coated aluminum frame with 6mm thick clear glass**, refer to specifications on plan and boq, and approval from project in charge and if any changes in specifications, before installation proper.

a. Requirements

1. Aide Hinged Ventilators (Casement Type)

1.1 Simplex-type Hinges shall be of extension friction type with bronze friction washers and rust proofed steel acorn-nuts. Hinged design shall provide ferrous to non-ferrous contacts between all movable surfaces, Hinges shall be welded to both frame and vent.

1.2 Polished bronze locking handle and strike shall be furnished for ventilators 1524mm and under in height, two-point locking device and three hinges shall be furnished for vents over 1524mm in height. Sill adjustors shall be provided for vent over 3.048 sq. m.

4. Mullions. Rolled Steel T-bars, pipe, plate or other formed section, or a combination of them, as shown on drawings, shall be furnished where two or more window units are installed in the same window opening.

5. Aluminum frames must be of good quality, with thickness as specified and of standard quality. To include heavy duty accessories including hinges, locks, closers, etc.

C. Installations of Corners

i. Corners of vents shall be mitered, electrically butt-welded and ground smooth. Corners of frame and all other window joints and intersections of Muntins with frame and vent members shall be coped and electrically welded. Muntin, bars, except where ventilators occur, is to be continuous from head to sill and from jamb to jamb. Muntin cross joints shall be rigidly and neatly interlocked with faces flushed. Frame sections at vent sill shall have weep holes to provide for drainage. Continuous weather drips

shall be provided where required at the heads for side-hinged ventilators. Windows shall be designed for glazing at the outside with wire glazing clips and steel casement putty. All units shall be prepared and supplied with necessary standard hardware and screens when included or called for on plans or drawings.

ii. Windows shall be set plumb and true in openings. The joints between the window frame and masonry shall be carefully caulked. Contacts between windows and adjacent steel, including mullions, shall be sealed with mastic. Windows shall be glazed on the inside glass, shall be bedded with steel window putty, held in place by wire glazing clips and faced putted to a neat trim line.

iii. Window edges for aluminum frame should be installed properly at 45 degrees with proper sealants. Avoid sharp edges.

D. Shop Finish

1. Hot (or cold) Phosphate Surface Treatment. Cleaned, chemically treated and primed; except as otherwise specified, windows should be given a treated and primed finish, consisting of the following operation:

iv. After fabrication; grease and dirt shall be removes by a hot alkali solution and the window rinsed in hot water.

v. After cleaning, all parts shall be immersed in a hot phosphate solution and rinsed in a diluted solution of chromic acid.

vi. After air drying under controlled temperature, one coat of shop primer shall be applied by dipping or spraying all surfaces. The primer shall be of a type specifically developed for materials treated with phosphate.

vii. The cleaning, phosphating, dipping or spraying of shop primer, and the even drying shall be done on a continuous operation at the factory.

E. Shop Drawings

viii. The Contractor, shall before proceeding with the manufacture of steel windows, prepare and submit complete manufacturing and installation drawings in full size and in triplicate, together with samples of member-sections and hardware to be used, or the approval of the Engineer. Windows to be manufactured shall conform to the approved drawings and samples.
Submit shop drawings for finalization of actual measurements on site, as built for installation.

XI. GLASS JALOUSIE WINDOWS

- Scope. This section covers furnishing of all glass jalousie window type materials and fixing accessories necessary for the proper functioning thereafter as shown on plans and as herein specified.
- Materials
  - i. Lever Type Operation. This type of jalousie window shall be capable of locking the unit in any position and cannot be opened outside. Louver or glass slats clip and tilt bar casing shall be extruded aluminum sections, true to details with clear, straight, sharply defined profiles and free from defects impairing its strength or durability. Aluminum extruded section and strips shall be type AA conforming to ASTM B 235-50T.
  - ii. Window Frames (Wood Jambs). Opening frames for jalousie window shall be well seasoned thoroughly dried “Yakal” to avoid any possibility of warping after this glass jalousie window type material has been set in place.
  - iii. Glass panes shall be “Industrex” glass of high quality free from unevenness or other imperfection that affects its quality and form.

- Construction Requirements. All wood frames used as jambs for window opening shall be shaped, molded true to details and properly equipped with weather strip to prevent penetration of rain water. Corners of frames shall be mitered and mechanically locked resulting in extremes rigidity. Aluminum lever casing with glass clips, tilt bar and locking handles shall be set and properly adjusted leveled and aligned to acquire satisfactory operation and to assure weather tight construction. Aluminum parts shall be protected in adequate manner to insure against damage during delivery and construction operation. Glass panes shall be fitted and accurately cut to size as required in the plans

XII. GLASS AND GLAZING

A. Scope of Work. The Contractor shall furnish all materials, equipment, tools, labor and incidentals necessary for the satisfactory performance of all works for glass and glazing, including mirrors as shown in the drawings and as specified herein.

B. Materials.

i. Materials shall be delivered and stored in a safe location.

ii. Label shall be affixed to each pane at the factory and shall remain intact until final cleaning.
iii. Quality and thickness of glass shall be mentioned in USGM Specification No. 123 in so far as it is established as a requirement. For other qualities and thickness, recognized commercial standards can be referred to subject to the approval of the Engineer.
iv. Putty on wood or steel sash shall be of the approved type as recommended by the manufacturer and acceptable to the Engineer.
v. All glass works including bronze glass and tempered glass, to refer to specs and boq, and approval from project in charge for thickness and if any changes in specification before installation proper. Standard thickness for tempered glass not less than 6mm.

C. Quality of Glass and Glazing Materials

1. All glass sheets for doors and windows, unless otherwise specified herein or otherwise indicated in the drawings, shall be locally manufactured.

2. All glass sheets used in aluminum and steel doors and windows shall be 5.6mm (7/32") thick or as required by the Engineer.

3. All tempered glass specified herein or indicated on drawings shall be locally manufactures safety glass, 5.6mm (7/32") thick or as required by the Engineer.

4. Plate glass for mirrors shall be 6mm (1/4") thick, polished glass mirror, copper-backed, with exposed edges, leveled and polished. Mirror should project a clear image without refractory effect.

5. Samples of all glass and glazing shall be submitted to the Engineer for approval prior to any installation work.

D. Workmanship

1. All glass shall be accurately cut to fit openings and set with equal bearing on the entire width of the pane. Convex side of glass shall be on the outside.

2. The Contractor shall be responsible for all glass broken due to faulty setting and shall be replaced to the satisfaction of the Engineer.

3. Mirrors, as specified, shall have the proper backing of 6mm (1/4") thick tanguile or palosapis veneer plywood with brass chromium plated frame.

4. Putty shall be neatly run in straight line parallel with inside of glazing frame. Corners shall be carefully made; all excess putty shall be removed and surfaces left clean.

E. Installation

1. Set glass after steel framing have been primed and dried.

2. All glass shall be bedded, back and face puttied, secured in place. Secure glass in aluminum frames with non-corrosive clips excepts where glazing beeds are required. Apply putty uniformly in straight lines, with accurately formed levels and clean cut corners; remove excess putty from glass.

3. Set glass in hollow metal doors and in metal frames to interior partitions in felt channel inserts or bed in putty to prevent any rattle; secure glass in wood doors with glazing stops; secure stops on doors with screws.

4. Improperly set glass shall be replaced to the satisfaction of the Engineer. Install heavy duty door/window handles and sliding guide frames with equivalent heavy-duty locking system. Provide duplicate keys for locks.

F. Cleaning

1. Clean all glass on both sides after puttying has been done completely. Do not disturb edge of putty with scraper. At completion of work leave glass whole free from cracks and rattles.

XIII. FINISH HARDWARE AND SPECIALITITES

A. General Requirements

1. The Contractor shall provide all rough hardware required for the completion of the work, including hails, spikes, bolts, screws, etc., and shall provide and fit in place all finishing hardware.

2. The Contractor shall provide and fit in place all hardware not herein specifically mentioned but necessary to complete the work. All such hardware, should be there be any, shall conform in every respect to the hardware herein specified.

3. Finishing hardware, suitable to the service required to fully equip in the most satisfactory operative condition, for all doors and windows transom sashes, screen doors and windows, closet, built-in cabinet 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 adaptable to the finishing, shape or size or members requiring the hardware, suitable types as applicable to same operation and quality as the corresponding individual types specified shall be furnished subject to the approval of the Engineer.

B. Make
   1. The model numbers herein given designate and quality and style (type, design, operation, materials and finish) of hardware designed. Any other hardware equally good, may be substituted only in cases of urgent necessity and subject to the written approval of the Engineer.

C. Finish
   1. Unless otherwise specified, exposed surfaces shall have the following U.S. Standard Finishes:
      1.1 US9 (Polished, Bright Brass or Bronze), Bronze surfaces exposed on exterior building not specified to have US26 finish.
      1.2 US26 (Polished Chromium plated over nickel or brass). Brass or bronze surfaces exposed in toilets, lavatory and shower rooms and all others in the interior of the building.
      1.3 USP (Prime Coated for Painting) Ferrous metal surfaces, unless zinc coated.

D. Fastenings
   1. 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 to concrete, brick tile or masonry instead of wood screws.

E. Exposed Items of Hardware
   1. After hardware has been properly fitted, all exposed items such as knobs, plates, pulls, locks, etc., shall be removed until final coat of painter's finish has been applied, and then hardware installed.

   2. Other items of hardware 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 cover shall be removed.

F. Placing Order of Hardware
   1. The Contractor shall schedule his order for all hardware in such a way to avoid delay in the job.

   2. No request for extension of time will be entertained by the Engineer consequence to Contractor's delay in placing his order.

   3. No substitution of hardware shall be allowed due to negligence of the Contractor to place his order ahead of time.

G. Door Knobs, Locks and Latch Strikes. A
   1. All lock and latch strikes shall be installed in door frames at the same height from the floor. Door knobs shall be so located that the center of the knob is 0.95 m. from the finished floor.
      Use lever type door knobs with twist lock (Heavy duty, good quality). Submit actual sample for approval.

H. Butt Hinges
   1. Each panel of hinged doors shall be provided with two (2) butts for doors 1.50m or less in height; three (3) butts over 1.50 m high and not over 2.10 m; four (4) butts, above 2.10 m in height.

2. Doors of a greater height than 2.10 m, unless otherwise specified, shall be provided with an additional one (1) butt for each 0.65 m or fraction thereof.

3. Size of Butt Hinges required:

Thickness Of Door	Width of Door	Size of Butt Hinges
21mm or 25mm (7/8" or 1")	:	: 63mm(2 ½")
28mm (1-1/8")	:	: 75mm x 75mm (3"x3")
35mm (1-3/8")		: 0.90 mtrs. (3')
		: (3-1/2"x3-1/2") or less
44mm (1-3/4")	:	: 100mm x125mm (4" x 4")
56mm x 63mm (2-1/4" x 2-1/4")	:	: 125mm x 125mm (5" x 5")

The shower doors shall be covered by the above schedule for hinges.
Use stainless steel type for all wooden door hinges to include stainless steel screws.

4. Where size of the butt hinges is not sufficient to allow door to clear door trim in open position, same shall be increased.

5. Unless otherwise specified, and except for toilet or shower or water closet compartment doors, provide in all double acting doors type Nu-Jamb No. 42024 – ½ double acting hinge or approved equivalent.

I. Butt Hinges (Make)
1. For all doors in butt hinges, unless otherwise specified, use bottom tip butts, "HAGER", "STANLEY", U.S., or approved equivalent, highly polished and plated with non-raising pin for door opening outside. For size and number to each door, refer to section H.3 of this section of the specifications.

J. Door Latches, Indicator.
1. Provide and fit each door of all water closets compartment with No. 1990 rim bolt No. 1985 indicator, cast brass, chromium plated and polished as illustrated and describe on Hinges Catalog, or any approved equivalent of similar type.

K. Locks
1. The Contractor shall provide and set complete, ready for operation, one pin tumbler cylinder lock of the medium or standard type, for each door in accordance with the schedule below. Standard finished as specified, shall apply to all locks, used "YALE", "CORBINE" of the standard type, or approved equivalent.

The trademark and plate numbers given herein are to designate only the quality, type, operation, materials and style (design) required.

L. Schedule of Lockset and Door Closers
1. Lockset shall be of any approved equivalent installed complete ready for use and service in accordance with the manufacturer's institutions for the doors on all rooms and Comfort Rooms.

XIV. PLUMBING WORKS

PART 1 – GENERAL

1. All work shall be done under the direct supervision of a licensed plumber and a strict accordance with this specification and for the methods as prescribed by the National Plumbing Cod of the Philippines.

1.1 SCOPE

a. Provide plumbing where shown on the drawings, as specified herein, and as needed for a complete and proper installation including, but necessarily limited to:
1. Water piping system;

2. Drain, waste, and vent system;
3. Storm drainage system within the structures;
4. Plumbing fixtures and trim.

b. The work shall include the furnishing of all labor, materials, equipment and services necessary the complete installation, testing and commissioning of the system as per plan. In case of conflict between plans and this specification, the Architect/Consultant shall be notified.

PART 2 – PRODUCTS

2.1 MATERIALS

a. PP-R system pipes and fittings
b. Water closet, lavatory, urinal, soap & paper holders, towel& curtain rods, faucets and all necessary accessories shall be approved by the Architect.

2.2 OTHER MATERIALS

a. Provide other materials, not specifically described but required for a complete and proper installation as selected by the Contractor subject to the approval of the Architect.

PART 3 – EXECUTION

3.1 SURFACE CONDITIONS

a. Examine the areas and conditions under which work will be performed. Correct conditions detrimental to timely and proper completion of the work.

3.2 PLUMBING SYSTEM LAYOUT

a. Layout the plumbing system in careful coordination with the Drawings, determining proper elevations for all components of the system and using only the minimum number of bends to produce a satisfactory functioning system.
b. Follow the general layout shown on the Drawings in all cases except where other work may interfere.
c. Layout pipes to fall within partition, wall, or roof cavities, and to not require furring other than as shown on the Drawings.

3.3 INSTALLATION OF PIPING AND EQUIPMENT

a. General:
   1. Proceed as rapidly as the building construction will permit.
   2. Thoroughly clean items before installation. Cap pipe openings to exclude dirt until fixtures are installed and final connections have been made.
   3. Cut pipe accurately, and work into place without springing or forcing, properly cleaning windows, doors, and other openings. Excessive cutting or other weakening of the building will not be required.
   4. Show no tool marks or threads on exposed plated, polished, or enameled connections from fixtures. Tape all finished surfaces to prevent damage during construction.
   5. Make changes in directions with fittings; make changes in main sizes with eccentric reducing fittings. Unless otherwise noted, install water supply and return piping with straight side of eccentric fittings at the top of the pipe.
   6. Run horizontal sanitary and storm drainage piping at a uniform grade of ¼ “per ft., unless otherwise noted. Run horizontal water piping with an adequate pitch upwards in direction of flow to complete drainage.
   7. Provide sufficient swing joint, ball joints, expansion loops, and devices necessary for a flexible piping system, whether or not shown on the Drawings.
   8. Support piping independently at pumps and similar locations, so that weight of pipe will not be supported by the equipment.
   9. Pipe the drains from pump glands, drip pans, relief valves, air vents, and similar locations, to spill over an open sight drain, or other acceptable discharge point, and terminate with a plain end unthreaded pipe 6” above the drain.
   10. Provide union and shut off valves suitably locked to facilitate maintenance and removal of equipment and apparatus.

b. Equipment access:
   1. Install piping equipment, and accessories to permit access for maintenance. Relocate items as necessary to provide such access, and without additional cost to the Owner.
   2. Provide access doors where valves, motors or equipment requiring access for maintenance are located on walls or chases or above ceilings. Coordinate location of access doors with other trades as required.

3.4 CLEANOUTS

a. Secure the Architect's approval of locations for cleanouts in finished areas prior to installation.
b. Provide cleanouts of same nominal size as the pipes they serve: except where cleanouts are required in pipes 4" and larger provide 4 "cleanouts.

3.5 VALVES

a. Provide valves in water system. Locate arrange so as to give complete regulation of apparatus, equipment, and fixtures.
b. Provide valves in at least the following locations :
    1. In branches and/ or headers of water piping serving group fixtures.
    2. For shutoff risers and branch mains.
    3. Where shown on the Drawings.
c. Locate valves for easy accessibility and maintenance.

3.6 BACKFLOW PREVENTION

a. Protect plumbing fixtures, faucets with hose connections, and other equipment having plumbing connection, against possible back-siphonage.

3.7 PLUMBING FIXTURE

a. Installation
    1. Set fixtures level and in proper alignment with respect to walls and floors, and with fixtures equally spaced.
    2. Provide supplies in proper alignment with fixtures and with each other.
    3. Provide flush valves in alignment with the fixture, without vertical or horizontal offsets.

XV. WATER FILTRATION SYSTEM

A. Scope. This section consists of performing essential works in furnishing and installing piping materials, and other devices and fixtures necessary to construct and complete the fully automatic water filtration system in accordance with this specification unless otherwise specified in the drawing.

B. Requirements.

General. Unless indicated or specified otherwise herein, all materials and workmanship shall conform to the specifications and to the applicable standards, codes, regulations and specifications listed herein. Workmanship shall be of the highest grade.

1. Main features. Fully automatic filtration system
2. Water source and quality.
    2.1 Ground water with sediments and hardness.
        2.1.1 Total Dissolved Solids (TDS) should not be above 300 parts per million (PPM). PPM higher than 300 will require more filtration equipment. Result of bacteriological analysis of water source must be "passed" (negative/low coliform count).
        2.1.2 Provision for NAWASA
3. System feature highlights.
    3.1 Centralized treatment processing produces purified water from every faucet.
    3.2 Automatic operation. Minimum human intervention required.
    3.3 Automatic programmable digital heads initiate filter backwash-regeneration cycles on schedules.
    3.4 Multimedia filter removes odor and sediments up to 300 microns.
    3.5 Activated carbon filter removes odor, color, and sediments up to 100 microns.
    3.6 Water softener removes calcium hardness, thus, preventing scaling.
    3.7 Reverse osmosis membrane purification system produces purified water on automatic operation 24/7.
    3.8 Ultra-violet light sterilizer/bactericidal module disinfects water by eliminating pathogens in product water.

C. Materials.

1. Water Pumping System
    1.1 Pipes and Fittings

1.1.1 PPR pipes with equivalent fittings will be used.
1.1.2 Brass valves, GI connectors & gauges.

2. Centralized Water Treatment System
1.2 Pipes and Fittings
1.2.1 PPR pipes with equivalent fittings will be used.
1.2.2 Brass valves, GI connectors & gauges.

3. Purified Water Supply System
1.3 Pipes and Fittings
1.3.1 PPR pipes with equivalent fittings will be used.
1.3.2 Brass valves, GI connectors & gauges.

D. Equipment

1. Water Pumping System
1.1 Centrifugal Suction Pump
1.1.1 **1.3HP, 220v, 60hz**
1.1.2 Automatic Pump Control – flow sensor, 220v, 60hz
1.1.3 Must include electrical wirings, conduits, outlets and connectors

2. Centralized Water Treatment System

2.1 1354 FRP
2.1.1 Multimedia Filter Tank with Automatic Digital Backwash Head
2.1.2 Carbon Filter Tank with Automatic Digital Backwash Head
2.1.3 Softener Tank with Automatic Digital Backwash Head

2.2 Tank
2.2.1 Fiberglass Pressure Tank, 50 gallons
2.2.2 Brine Tank, 50 gallons
2.2.3 Industrial Salt

2.3 Filter
2.3.1 20BB Sediment Filter Cartridge in Big Blue Housing
2.3.2 20BB Carbon Block Cartridge in Big Blue Housing
2.3.3 Ultraviolet (UV) Light Sterilizer/Bactericidal System

2.4 Must include electrical wirings, conduits, outlets and connectors

3. Purified Water Supply System

3.1 Reverse Osmosis Module in Stainless Steel 304 Skid:
3.1.1 **1HP Multi-Stage Vertical Booster Pump, 220v, 60hz, 1ph**
3.1.2 Twin 4040 Membrane in FRP SS Housing
3.3.3 20SL Sediment Filter Cartridge in Slim Housing
3.3.4 20SL Carbon Block Cartridge in Slim Housing
3.3.5 Gauges, valves, breakers, float switches
3.3.6 Complete pipes and fittings

3.2 Tank
3.2.1 Vertical stainless-steel storage tank, 2000 liters
3.2.2 Fiberglass Pressure Tank, 50 gallons

3.3 Booster Pump, 1HP, Automatic Pump Control Flow Sensor, 220v, 60hz, 1ph
3.4 Must include electrical wirings, conduits, outlets and connectors

E. Approval of Materials and Equipment

The Contractor shall submit for approval a complete description of all materials to be used in the work. The description shall include catalog numbers, illustrations, diagrams, dimensional data, etc., as required to describe fully the materials.

XVI. ELECTRICAL WORKS

1. Provisions

A. The Architectural General and Special Conditions for the work of this project shall be part of the Electrical Specifications. The Electrical Contractor shall examine the General Conditions before submitting a proposal.

B. The General Contractor shall be responsible for all the work included in this section. The delegation of this work to the Electrical Contractor shall not relieve the Electrical Contractor of responsibility. The Electrical Contractor and Sub-Contractors who perform work under this section will be responsible to the General Contractor.

C. The intent of the repetition of paragraphs under the General or Special Conditions is to call particular attention of them, and it is not intended nor shall it be assumed that any other parts of the General or Special Conditions have been omitted if not repeated herein.

D. The naming of a manufacturer or brand with catalog number or other product identification without the words 'or equivalent' in the specifications shall indicate that it is the only product approved for purchase. If the words 'or equivalent' are used in the specification, they shall be interpreted as establishing a quality or performance standard for the material or product to be purchased. This shall indicate that the Electrical Contractor is not restricted to the use of the named and identified brand product if a substitute approved by the Architect/Engineer is available. However, where a substitution is requested, it will be permitted only with the written approval of the Architect/Engineer. The Electrical Contractor shall assume all responsibility for additional expenses as required to make changes from the original material or product specified. If a notice of substitution is not furnished to the Architect/Engineer within fifteen (15) days after the General Contract is awarded, then the materials or products named in the specification shall be purchased and used.

E. The Electrical Contractor shall furnish and present five (5) copies of all electrical drawings, brochures, and installation instruction relating to specified equipment, wiring devices, and accessories to the Architect/Engineer for approval and shall furnish and present five (5) copies of a schedule of the manufacturers of all items for which shop drawing or brochures are not presented. No equipment shall be ordered, purchased, or installed prior to the approval of shop drawings, brochures, installation instruction, and schedules. Approval by the Architect/Engineer is intended to establish conformance with the project design concept and the requirements of the drawings and specifications.

F. The Electrical Contractor shall examine the drawings of all trades whose work relates to or is dependent on electrical work to become fully informed of the extent and character of their specified work and be able to coordinate it while avoiding possible interference with the electrical work.

G. Before submitting the bid, the Electrical Contractor shall visit the site and examine all adjoining existing buildings, equipment, and space conditions on which his or her network is in any way dependent to anticipate any possible space restrictions or constraints that could affect timely completion of the electrical work in accordance with the intent of the specifications and drawings. The Electrical Contractor shall report to the Architect/Engineer any conditions that might prevent the specified electrical work from being performed in the manner intended. No consideration or allowance will be granted to the Electrical Contractor.

2. General

A. All wire, cable, conduit, conduit fittings, cabinets, panel boxes, wiring devices, and miscellaneous hardware and fittings shall be new and undamaged, and bear the UL label where applicable, and be as specified for use in each specific location.

B. Samples of specific wire, cable, conduit, fittings, cabinets, panels, and boxes procured for use shall be made available to the Architect/Engineer for approval when requested.

C. Equipment Finish: All factory-finished electrical boxes, cabinets, and panelboards shall be furnished in the manufacturer's standard color and finish. The Electrical Contractor shall be furnished in the manufacturer's standard color and finish. The Electrical Contractor shall notify the Painting Contractor when all exposed unpainted electrical equipment, except conduit, primed as required, and finish-painted in the colors selected by the Owner in accordance with the Painting Section of these specifications.

3. Materials

Standard Products. The materials shall be the standard product of manufacturers regularly engaged in the production of such equipment and shall be the manufacturer's latest standard design that complies with the specifications requirements.

4. Approval of Materials

The Contractor shall submit for approval a complete description of all materials to be used in the work. The description shall include catalog numbers, illustrations, diagrams, dimensional data, etc., as required to describe fully the materials.

5. Conduit and Conduit Fittings
   A. Rigid Steel conduit shall be used for service entrance and main feeders and branch circuits where shown on the drawings and in the specifications. Rigid steel conduit shall be made from low-carbon steel that has been hot-dip galvanized inside and outside, and the ends shall be threaded to accept threaded fittings. Other finishes may be substitute if approved by the Architect/Engineer. All conduit shall be UL approved.
   B. Electrical Metallic Tubing (EMT) may be used for branch circuits and raceways other than for service entrance and main feeders, unless prohibited by the NEC or local ordinances. All EMT shall be UL approved, pressure-connected type, and galvanized inside and outside, and shall comply with ASA C-80.3 for zinc-coated EMT with fittings of the same type, material, and finish.
   C. Conduit diameter shall be as indicated on the drawings, or as stated in fill schedules in the current PEC. Provision shall be made for including a green insulated grounding conductor where specified or as shown on the drawings.
   D. Conduit fittings shall be appropriate for each application, and shall be manufactured by _____ or approved equal.
   E. All conduit joints shall be cut square, threaded, reamed smooth, and drawn uptight. Bends or offsets shall be made with an approved bender or hickey, or hub-type conduit fittings. The number of bends per run shall conform to those stated in the current PEC.
   F. Concealed conduit systems shall be run in a direct line with long sweep bends and offsets. Exposed conduit runs shall be parallel to and at right angles to building lines, using conduit fittings for all turns and offsets.
   G. Transitions between non-metallic conduits and metallic conduits shall be made with the manufacturer's standard adapters made for this purpose.
   H. Exposed conduit shall be securely fastened in place on maximum _____ foot intervals. Hangers, supports, or fasteners shall be provided at each elbow and at the end of each straight run terminating at a box or cabinet. Only couplings and fittings designed specifically for the type of conduit procured shall be used. The conduit shall be supported by corrosion-resistant straps and/or clamps.
   I. Conduit systems shall be installed in accordance with the current PEC to provide a continuous and throughout the system in a neat, workmanlike manner.

6. Wires and Cables
   A. All wires and cables shall meet all applicable specifications and standards and shall conform with the current edition of the PEC. Insulated wire shall have information including but not limited to gauge, voltage rating, insulation type, temperature rating, sheath type, permissible location, and manufacturer's name, as applicable to the type, permanently marked on the outer covering at regular intervals not exceeding 4 feet. Cable shall have information including but not limited to type, style, voltage rating, number of conductors, ground conductors, maximum voltage, UL listing, and sunlight resistance, as applicable to the type, permanently marked on the outer covering at regular intervals not exceeding 4 feet. Wire and cable shall be delivered in complete coils or reels with identifying tags stating the gauge and type of insulation.
   B. Conductors shall be soft-drawn copper conforming to ASTM B3 for solid wire and ASTM B8 for stranded wire. Stranded wire shall be No. 6 American Wire Gauge (AWG) and larger, and solid wire shall be No. 8 AWG and smaller.
   C. Wire and cable shall be factory color-coded with a separate color for each phase and a neutral color used consistently throughout the system, as required by the current PEC.
   D. All conductors shall be rated for 600V, unless otherwise specified or shown on the drawings, or for electronic or communication use.
   E. Conductors for lighting, receptacles, and power branch circuits, feeders, and sub-feeders size No. 1/0 AWG and smaller shall be type THHN/THWN flame-retardant, moisture and heat-resistant, thermoplastic included.
   F. Conductors for feeders and sub-feeders size No. 1/0 and larger shall be type THHN/THWN flame-retardant, moisture-resistant, thermoset insulated.
   G. Branch circuits containing all electric heating elements such as electric duct coils, baseboard radiation, and cabinet unit heaters shall be type THHN/THWN flame-retardant, heat-resistant, thermoplastic insulated with maximum operating temperature of 90°C.
   H. Underground feeder and branch circuit wire for direct burial in earth or in conduit shall be type UF for use in wet or dry locations.
   I. Wire and cable shall be as manufacture by _____ or approved equal.

7. Outlets
   1. Outlet Boxes with the correct fitting for the application shall be located at each conductor splice point, at each outlet, switch point, or junction point, and at each pull point for the connection of conduit and other raceways. They shall also be located at all transition from conduit to open cables. All outlet boxes for concealed wiring shall be made from galvanized or cadmium-plated sheet steel, and they shall have depth of at least 1.5 inches, whether single

or ganged. The boxes shall be large enough size to accommodate the number of wiring devices and conductors as specified in the fill schedule of the PEC. The depths, clamps, and number of knockouts shall be as specified in the outlet box schedule.

2. Rectangular 3 x 2 inch metal boxes shall be used for installing single switches or duplex receptacles, as specified or shown on the drawings. Two compatible boxes may be ganged together to accept to switches or two duplex receptacles at a single location or as specified or shown on the drawings.
3. Square 4 x 4 inch or 4 11/16 x 4 11/16 shall be used for installing two switches or two duplex receptacles at a single location or specified or shown on the drawings.
4. Octagonal 4 x 4 inch metal boxes shall be used for containing and protecting wire connections for ceiling or wall-mounted luminaries as specified or shown on the drawings. The Electrical Contractor shall furnish all required telescoping metal braces, hickeys, covers, and miscellaneous hardware, as required.
5. Round ceiling metal pan boxes with diameter of 3 ¼ inches shall be used for containing and protecting wire connection for ceiling or wall-mounted luminaries as specified or shown on the drawings. The Electrical Contractor shall furnish all hickeys, covers, and miscellaneous clamps, as required.
6. Telephone and communications boxes shall be as specified or shown on the drawings.
7. Outlet boxes shall be in industry standard sizes as manufactured by _____ or approved equal.

8. Junction and Pull Boxes

A. The Electrical Contractor shall furnish and install all junction and pull boxes to provide access points for pulling and feeding conductors into a raceway system. They shall be used in conduit runs where the number of bends between outlets exceeds the maximum number permitted by the current PEC. Junction and pull boxes shall be located as shown on the drawings in the sizes indicated in the junction and pull box schedule.

B. Junction and Pull Boxes and their covers shall be formed from sheet steel and shall have widths, heights, and depths as shown on the drawings or junction and pull box schedules and shall be finished in gray enamel paint. Boxes without hinged covers shall include covers with attached screws.

C. Junction and Pull Boxes shall be in industry standard sizes and manufactured by _____, or approved equal.

9. Device Plates

Device plates of the one-piece shall be provided for all outlets, to suit the devices installed. Plates for exposed work shall be of zinc-coated sheet metal having rounded or beveled edges. Plate for concealed work shall be bake lite ivory. Screws shall be o metal with oval heads, having color to match the finish of the plate. Plate shall be installed with all four edges in continuous contact with similar devices. Plaster fillings shall not be permitted. Plates shall be installed vertically, use of sectional-type device plates shall not be permitted. Device plates for telephone inter-communication outlets shall have 10 mm opening in the center.

10. Receptacles

1. Receptacle shall be of the type and rating as shown in the drawings.

1.1. Duplex Receptacles shall be rated 15 amperes, 250 volts, 2 wire, 2- pole, for flush mounting or as indicated in the drawings.

1.2. Receptacle for air conditioning units shall rated 30A, 250V, 3-wires,
2-pole grounding receptacle for flush mounting or as indicated in the drawings.

11. Panel Boards

i. Panel board shall be of the dead-front safety type conforming to the Underwritters Laboratories, Inc., standard for panel board UL67, and provide with the size and number of circuits as indicated. Panel Board shall be the automatic circuit breaker type.

ii. Circuit Breaker shall be molded bolt-on type with frame size and trip settings as shown on the drawings. Molded case circuit breakers shall conform to NEMA standard publication AB1. Tripping mechanism shall be thermal-magnetic with interrupting capacity of 18,000 amperes similar to “Mitsubishi NF breakers C-line type” or equivalent.

12. Safety Switch

Safety switch shall be general duty cartridge fuse type and spring assisted positive make and break mechanism full cover interlock and quick make, quick break mechanism. The switch shall be rated 250 volts with ampere rating as indicated in the drawing.

13. Lamp and Lighting Fixtures

A. Lamp and lighting fixtures of type and sizes as specified in the drawings shall be furnished and installed completely

B. Incandescent lamps shall be inside frosted lamp, 220 volts, wattage as indicated in the plan.
C. Fluorescent lamp shall be pre-heat type, cool white color characteristics and shall have complete energy saver type.
D. Wall switches shall be of the totally enclosed type. Bodies shall be thermo-setting plastic compound. Wiring terminals shall be of the screw type. Not more than three switches shall be installed in a single plate position.
E. Fixture shall conform to Under writers Laboratories, Inc., standard UL57. Fixtures are designated by letters and illustrated on the drawings. Illustrations shall be indicative of the general type desired and shall not restrict selection to fixture of any particular manufacture. Fixtures of similar design and equivalent light distribution and brightness characteristics having equal finish and quality may be acceptable but subject to the approval of the Engineer.
F. See specifications on drawings for verification of lighting and electrical fixtures and conduits. Confirm with Engineer for approval.

14. Installation

Conduit System. The contractor shall install and test all embedded and exposed conduit, boxes, and fittings including all necessary hardware required for the electrical power, control, communication and lighting systems as shown on the drawings. Installation of all conduits, boxes, fittings, and accessories shall conform to the requirements of the National Electrical Code (NEC), and the Philippine Electrical Code (PEC) unless otherwise specified. During installations, due precaution shall be taken to protect the conduits and threads from mechanical injury. The ends of conduits shall be sealed in an approved manner during installation, whenever the work is interrupted and upon completion, runs shall be sealed by the use of caps and discs or plugs. The seals shall be maintained, except during inspection and tests, until the conductor is pulled in. Conduits shall be checked from constructions by pulling a wooden mandrel of the proper size through the conduit, whenever required or directed by the Engineer. All boxes and fittings shall be kept closed and protected from dirt, moisture and debris.

15. Installation of Imbedded Metal Conduit

A. Each run of conduit between boxes or equipment shall be electrically continuous. Threads shall conform to the American Standard for tapered pipe threads. Conduits shall be cut square, ends reamed and threads cut with approved dies. Running or non-tapered threads shall not be used. Conduits entering slip holes in boxes shall be secured with a locknut on each side of the box wall and terminated with a bushing.
B. All joints between lengths of conduits and threaded connections to boxes, fittings, and equipment enclosures shall be made watertight.
C. Conduits shall be sloped towards drain points. Conduits shall be rigidly supported and braced to avoid shifting during placement of concrete. Conduits extending out of the floors, wall, or beams shall be at right angles to the surface.
D. Spacing of conduits shall be such as to permit the floe of concrete between them. A minimum spacing of not less than 5 cm. shall be maintained, except where conduits enter boxes. Where conduits are placed in two or more layers or rows, the conduits in the upper or inner layers shall be placed directly over or behind the lower or outer layers, respectively.
E. Conduits terminating at the face of the concrete for initial or future extensions as exposed runs shall be terminated with plugged couplings set flush with the floor, ceiling or wall. Galvanized iron plugs shall be provided for conduits which are to be extended in the future. Where it is not practical to employ flush couplings, the conduits ends shall be suitably boxed otherwise protected and plugged.
F. Conduits running in floors and terminating at motors or other equipment mounted on concrete bases shall be brought to up to the equipment within the concrete base wherever possible.
G. Conduit boxes shall be flush with the finished wall with covers and openings easily accessible. The contractor shall remove and reset all boxes not properly installed or shifted out of line during concreting to the satisfaction of the Engineer.
H. Conduits shall have long field bends wherever possible, but shall in no case have bends of smaller radius than that given in the National Electrical Code (NEC) / Philippine Electrical Code (PEC). Bends shall be made with a bending machine, or other approved devices which will not reduce the internal diameter of the conduit or injure the protective coatings. The bend shall be free of kinks, indentations, or flattened surfaces, heat shall not be applied. Factory-made elbows shall be used only where conduits turn out of floor slabs or at conduit termination.

16. Installation of Cancelled or Exposed Conduit

Conduit concealed or exposed shall be rigidly supported at intervals of not more than 1800mm and shall have runs installed parallel or perpendicular to the walls, structural members, or intersections of vertical plains and ceiling.

17. Wiring System

A. Wiring Methods. Wiring in rigid steel conduits shall be used or as indicated in the drawings. Wiring for general purpose location shall be in accordance with the provisions of NEC general purpose installation. Branch circuit shall be used for any branch circuits unless otherwise noted on drawings for special system drawings. The conductors terminating at each wired outlet shall be left not less than 300mm long within the outlet devices or fixtures.
B. Where two or more pairs of conductors or circuits enter an outlet, the several pairs of circuits shall be neatly spliced and made mechanically and electrically secure to one or more single or multiple conductors.

18. Conductor Installation

All power, lighting, control and alarm conductors shall be continuous from outlet to outlet and no splice and shall be made except on outlet boxes. At least 300mm of free conductor shall be left on each conductor at each outlet to make splices or joints, except where it is intended to loop through outlet without splice or joints. Splices shall be mechanically strong and have conductivity equal to that of the conductors. Each splice shall be properly soldered or clamped. Tape as required to provide installation equal to that of the conductors shall be used for stranded wire terminals. All wiring shall be color coded in accordance with the National Electrical Code. Wire and cable shall be pulled in conduit using talc as lubricant.

19. Grounding System

A. General- The Contractor shall install a complete embedded electrical grounding system as shown in the drawings and described herein which shall be permanently and effectively ground conduits and non-current carrying metal parts. The overall resistance to grounds of the entire grounding system shall not exceed 25 ohms by measurement. Resistance to ground of over 25 ohms shall be corrected by driving an additional electrode parallel to the original ground rod with no further resistance measurement required.
B. General Conductor – Ground conductor shall be here, soft drawn, stranded copper cables. All joint connections within the grounding system shall be made by means of connector suited for the particular joint. The cable be clean of all dirt, grease, and oxidation before connection are made.
C. Ground Rod – Ground Rod shall be copper-clod steel of not less than 20mm in diameter, 3 meters long, driven full length into the earth. Ground wire shall be secured to the upper end of the ground rod and ground wire attached securely thereto by means of bolted connection. PVC conduit pipes of schedule 20 shall be provided to protect the ground cable from physical damage.

20. Quality Assurance Provisions

A. After the installation is completed and before final acceptance of the project, the Engineer shall conduct the operating test. Equipment shall be demonstrated to operate in accordance with the requirement of this specification. The Contractor shall furnish all instrument, tools and personnel required for the test. All defects is closed as a result of such test hat are due to the fault of the Contractor shall be remedied by the Contractor to the satisfaction of the Engineer.
B. Insulation resistance test shall be conducted conforming to the requirements of the Philippine Electrical Code. Transformer test shall include ratio, polarity, coreless, exciting current, high voltage, impulse, low voltage impulse, high voltage applied and induced tests.

21. Guarantee

A. The Contractor shall guarantee all work installed under this contract to be free from all defects for a period of one (1) year after acceptance of the project and shall agree and repair and make good at his own expense. Any and all defect which may develop in his work during the time if said defects arise due to poor workmanship and materials furnish by the Contractor.
B. The contractor must provide as built plan in soft and hard copy for final layout and specifications due to revisions and other changes made from the original plan.

22. Permit and Inspection

A. The Contractor shall obtain, at his own experience, all the necessary permits and Certificate of Electrical Inspection from the proper government authorities and the operation of the system upon completion.
B. The Contractor, shall, at his own expense, all the electrical plans for his work to the necessary scale and complete them with the necessary information and requirements as required by the government approving authorities concerned in issuing permits and certificate of Electrical Inspection.

XVI. ELECTRONICS WORKS

A. Scope. The work contained in this section includes furnishing of all labor, equipment, tools and materials and performing all operations, including cutting, channeling and chasing necessary for the

installation of complete wiring and conduit system, electrical equipment and electric service connection in accordance with this specification unless otherwise required in the drawings.

B. Requirements.

General. Unless indicated or specified otherwise herein, all materials and workmanship shall conform to the specifications and to the applicable standards, codes, regulations and specifications listed herein. Workmanship shall be of the highest grade. Electrical and Electronics materials shall be new and approved by the Underwriters Laboratories, Inc. wherever standards have been established by the agency. Defective equipment or equipment damage in the course of installation shall either be replaced or repaired as directed by the Engineer. The contract drawings indicate the extent and general arrangement of the conduit and wiring system. If nay departures from the contract drawings are deemed necessary by the Contractor, details of such departures and the reasons thereto shall be submitted as soon as practicable to the Engineer for approval. No departure shall made without the prior written approval of the Engineer.

C. Materials

Standard Products. The materials shall be the standard product of manufacturers regularly engaged in the production of such equipment and shall be the manufacturer's latest standard design that complies with the specification requirements, and with warranty for any repairs or replacements.

D. Approval of Materials

The Contractor shall submit for approval a complete description of all materials to be used in the work. The description shall include catalog numbers, illustrations, diagrams, dimensional data, etc., as required to describe fully the materials.

E. Conduit and Conduit Fittings

Conduit shall be of standards and approved by Engineer and complying to the desired specifications and requirements.

F. Wires and Cables

Conductors in conduits shall be copper, moisture and heat-resistant rubber or thermo-plastic insulated. In dry locations, wires and cables shall be type TW for sizes 8 sq.mm and smaller and type THW for sizes 14 sq.mm and larger. In damp or wet locations as defined by the National Electrical Code/Philippine Electrical Code, wires and cables shall be type THW, for sizes 8 sq.mm and smaller; and type RHW with neoprene jacket for sizes 14 sq.mm and larger. All conductors shall have 600 volts insulation unless otherwise specified in the drawings. Wire shall be stranded copper for 8 sq.mm and larger sizes. The number and sizes shall be as specified in the drawings.

G. Outlets

Each outlet in the wiring or raceway system shall be provided with an outlet box to suit the conditions encountered. Boxes for exposed work or in wet locations shall be of the cast metal type having threaded hubs. Boxes for concealed work shall be the cadmium-plated or zinc-coated sheet metal type. Each box shall have sufficient volume to accommodate the number of conductors entering the box in accordance with the requirements of the National Electrical Code/Philippines Electrical Code. Boxes shall not be less than 40 mm deep unless shallower boxes are required by structural conditions that are specifically approved by the Engineer. Ceiling and bracket outlet boxes shall not be less than 100 mm octagonal except that smaller boxes may be used where required by the particular fixtures to be installed. Switch and receptacle boxes shall be approximately 100 mm x 54 mm x 40 mm. Boxes installed in concealed locations shall be set flushed by the finished surfaces and shall be provided with the proper extension rings or plaster covers where required. Boxes shall be installed in a rigid and satisfactory manner and shall be supported by bar hangers in frame construction, or shall be fastened directly with wood screws on wood. Location of outlets shown on the drawings are approximates; the Contractor shall study the building plans in relation to the spaces and equipment surrounding the outlet so that the lighting fixtures are symmetrically located according to the room layout. When necessary, with the approval of the Engineer, outlets shall be relocated to avoid interference with mechanical equipment or structural features.

F. CCTV and Structured Cabling

1. CCTV cameras and other accessories must comply with the required specifications according to the Engineers details and of standard, quality tested materials. Includes such features as weatherproof, with IR for night time recording and with complete accessories.
2. All installation to be properly conducted by trained and authorized technicians and Supervised for correct installation. Refer to the Engineer for any revisions on site.
3. After installation sales includes testing of units and other facilities related for approval of Engineer and owner before turn-over of product.

XVII. MECHANICAL WORKS

PART 1 **GENERAL**

1.1 DESCRIPTION

A. Comply with - General Requirements and all documents referred to therein.

B. Provide all labor, material, equipment and appliances, and perform all operations for the work as outlined in the specifications and delineated on the Drawings for the installation of complete Sprinkler System in the proposed tenancy location. All work shall be performed in strict accordance with these specifications and the Drawings. Secure and pay for permits, fees and inspections required for the approval of Fire Sprinkler systems. Perform hydraulic calculations, and file the shop drawings and the calculations with Factory Mutual and the Building Authorities.

C. The contract drawing and specifications are complimentary to each other and any labor or material for by either, whether or not called for both if necessary for the successful operation of any of the particular type of the equipment furnished and installed without additional cost of the Procuring Entity.

D. GENERAL CONTRACTOR for this work shall be held to have read all of the tender requirements, the General Conditions, and in the execution of work he will be bound by all of the conditions and requirements therein.

E. Following is a brief outline and description of the work included, but shall not be considered as complete and all inclusive:

1. Pipe and Fittings
2. Joints
3. Hangers and Supports
4. Pipe Sleeves
5. Valves
6. Sprinkler Heads
7. Fire Cabinets

F. It is not intended that the drawings shall show every pipes, fittings, valve and equipment. All such items whether specifically mentioned or not, or indicated on the drawings, shall be furnished and installed if necessary to complete the system in accordance with the best practice of the fire protection trade and to the satisfaction of the Procuring Entity.

1.2 QUALITY ASSURANCE

A. All materials and equipment shall be produced in a plant of recognized reputation and regularly engaged in the production of pipes and/or equipment conforming to the specified standards. A single manufacturer shall produce all the pipe of the same type supplied for the work. Materials and equipment shall be new, of makes and kinds specified herein, or as indicated on the Drawings, without exception.

B. All material and work to be in accordance with applicable portions of the latest revisions and editions of the following standards unless otherwise indicated.

1. NFPA13 Standard for the Installation of Sprinkler Systems
2. NFPA14 Standard for the Installation of Standpipe and Hose Systems
3. NFPA 72 National Fire Alarm Code
4. ASTM American Society for Testing Materials
5. ANSI American National Standards Institute
6. AWWA American Water Works Association
7. UL Underwriters Laboratories Inc.
8. FM Factory Mutual
9. IBC International Building Code 2003
10. IFC 2003 International Fire Code
11. NFPA 10 Standard for Portable Fire Extinguishers
12. Local Codes and Regulations
13. FM Global Data Sheets

C. All equipment shall be UL-listed and FM approved.

D. The complete fire protection installation shall be made by an approved installer, specializing in sprinkler and fire protection work, having not less than five (5) years experience in installing systems of comparable size.

E. GENERAL CONTRACTOR shall submit proof of valid license to perform work in the Philippines.

F. If any of the requirements of the above are in conflict with one another or with the requirements of these specifications, the most stringent requirement shall govern.

PART 2 **PRODUCTS**

2.1 PIPE FITTINGS

A. Pipe shall be made of B.I. Pipes, Schedule 40 as indicated, conforming to the latest standard specification for welded steel pipe of the ASTM A-53 Grade B and ASTM A135 (ERW).

B. Fitting

1. Fittings shall be malleable iron ANSI B16.3 for threaded fittings, Steel ANSI B16.5 for welded fittings and steel flange.

2. Flanges shall be ANSI B 16.5, Class 150

- Gaskets. Shall be AWWA C 111 cloth inserted red rubber gaskets.
- Bolts. Shall be ASTM A 193 Grade B8. Bolts shall be extended no less than two full treads beyond the nut with the bolts tightened to the required torque.
- Nuts. Shall be ASTM A 194 Grade 8.
- Washers. Shall be ASTM F 436. Provide flat circular washers under bolts heads and nuts.

2.2 VALVES

A. Valves 50 mm and smaller shall be made of bronze to ASTM B61 NRS solid wedge and screw ends.

2.3 DRAINS

Provide test & drain piping to discharge at safe points outside of the building or to sight cones attached to drains of adequate size to readily receive the full flow from each drain particularly the affected floors covered by renovation under maximum pressure. Provide auxiliary drains as required by NFPA 13.

2.4 HANGERS AND SUPPORTS

A. Hangers and supports shall be provided and installed for all piping as required by this specification and all authorities having jurisdiction over the work, and shall be approved by the MEPF CONSULTANT. Support piping independently from structure.

B. All hangers and supports shall be made of steel or other durable and non-combustible materials. Wood, wire, or perforated strap iron shall not be used as permanent hangers or supports. Hangers that penetrate finished ceilings shall be provided with a chrome or nickel-plated escutcheon plate.

B. Hangers and supports shall be installed so as not to interfere with the free expansion and contraction of piping, and all nuts and bolts shall be drawn up tight.

D. Except where specified elsewhere, hangers for pipes shall be adjustable wrought steel, clevis type. Hangers shall be complete with bolts, rod and two nuts for each bolt. The diameter of hanger rods shall be as follows:

Pipe size	**Diameter of Rod**
20 mm – 50 mm	10 mm
65 mm – 85 mm	13 mm
100 mm – 125mm	16 m

E. All vertical piping shall be firmly supported by riser clamps properly installed to relieve weight from fittings and piping at base of risers. Vertical pipes shall have riser clamps not to exceed 4.5 m spacing.

F. Where required, furnish and install heavy anchorage to the pipe against movement from expansion and contraction and secure the approval of the MEPF CONSULTANT for the method of installing the anchorage before the work.

G. Horizontal piping shall be supported at intervals not greater than 3 m spacing and at all changes of direction.

H. Where static pressure exceeds 650 kPa, provide support to prevent upward movement at the end of branch lines and arm-overs where sprinklers are below ceilings, where required by NFPA 13.

2.5 PIPE SLEEVES

Furnish, install sleeves for all pipes passing through floor, walls, partitions or other building construction. Sleeves passing through walls and floors between rooms shall be filled from both ends of sleeve with fire proof insulation material of a fire rating equal to that of the wall or floor. pipe sleeves materials shall be Black Iron schedule 40.

2.6 IDENTIFICATION

A. Signs, charts and tags shall be provided as described in NFPA 13 (Standard for the Installation of Sprinkler Systems).

B. Painting finish (type, quality, and colour) to all fire protection pipework shall comply with the requirements of Local Code Authority.

C. All equipment shall have a nameplate that identifies the manufacturer's name, address, type or style, model or serial number, and catalog number.

2.7 SPRINKLER

A. Pendent Sprinkler Head - UL Listed & FM Approved sprinkler head, standard coverage, quick response , 155 degree Fahrenheit temperature rating, K factor 5.6, and 1/2 inch orifice.

PART 3 **EXECUTION**

3.1 GENERAL

A. The work throughout shall be executed in the best and most thorough manner in accordance with NFPA standard.

B. The contractor required to visit the site and to ascertain himself as to the local conditions and facilities that may affect his work. He will be deemed to have done this before preparing his proposal and any subsequent claims on the ground of inadequate or inaccurate information will not be entertained.

C. Install a complete fire sprinkler coverage to subject area with all piping, valves, hangers, signs, valves, tests, etc., as indicated on Drawings and as specified herein.

D. Furnish and install all drain piping, flushing, connections, drain plugs, drain valves, etc., at drain points and all low points.

E. Piping shall be run parallel to walls and beams. Before finalizing the location of any piping, consult with other trades so as to avoid interfering with their work.

F. Care shall be exercised in the installation of the piping so that the system will drain by gravity, back through branches.

G. All electrical devices associated with and/or listed within this Section including power and control wiring with the exception of main source of power from the building's electrical system shall be the sole responsibility of the Contractor. This shall include but is not limited to conduit, wiring, termination of wiring, etc.

3.2 TEST

A. General:

1. The entire works shall be fully tested in stages as the work proceeds and on completion of work as applicable.

2. To provide during normal working hours, all necessary labours, instruments, equipment, materials, fuel, power and maker's representatives, to carry out such tests as may be necessary to satisfy the MEPF CONSULTANT that the installation meets the requirement and intent of the specification as well as such tests required by Local Fire Dept.

3. All tests shall be made in the presence of the MEPF CONSULTANT & or his representative or any inspecting authority. Test shall be coordinated with the school maintenance representative.

4. Tests described hereinafter and including all tests prescribed by the Authority having jurisdiction shall be carried out. Any tests proved unsatisfactory shall be repeated to the satisfaction of the inspecting parties.

a. Flow Switches

1) The testing equipment for the flow switches shall be as shown on the drawings or of an equivalent approved by the MEPF CONSULTANT.

2) The calibration test equipment shall provide a flow of 1 l/s over the vane of the flow switch in the direction shown, to be confirmed by the direct reading flow meter.

3) The flow switch contacts shall make with energisation of the lamp and the buzzer, upon a flow not greater than 1 l/s flowing over the vane in the correct direction.

b. Hydrostatic

1) Aboveground piping shall be hydrostatically tested in accordance with NFPA 13 at not less than 200 psi or 50 psi in excess of maximum system operating pressure and shall maintain the pressure without loss for 2 hours. There shall be no drop in gauge pressure or visible leakage when the system is subjected to the hydrostatic test. The test pressure shall be read from a gauge located at the low elevation point of the system or portion being tested.

2) Where any section of pipework or equipment unable to withstand the maximum pipework test pressure, it shall be isolated during the pipework test then that section of pipework or equipment shall be re-tested at the appropriate test pressure.

c. Cleaning, Flushing and Pre-treatment

1) Prior to start-up and satisfactorily hydraulic testing, clean the entire installation including all fittings and pipework and the like after installation and keep them in a new condition. All pumping systems shall be flushed and drained at least once through to get rid of contaminating materials. All pipes shall be rodded when necessary to ensure clearance of debris, cleaning and flushing shall be carried out in sections as the installation becomes completed.

2) When the entire systems are reasonably clean, a pre-treatment chemical shall be introduced and circulated for at least 8 hours. Warning signs shall be provided at all outlets during pre-treatment. The pre-treatment chemical shall:

a) Remove oil, grease and foreign residue from the pipework and fittings.

b) Pre-condition the metal surfaces to resist reaction with water or air.

c) Establish as initial protective film.

d) After pre-treatment, the system shall be drained and refilled with fresh water and left until the system is put into operation.

e) Details and procedures of the pre-treatment shall be submitted to the MEPF CONSULTANT for approval.

B. Final Acceptance Tests:

1. Following commissioning of the entire installation, and prior to issue of Taking Over Certificate. The GENERAL CONTRACTOR shall carry out final acceptance tests in accordance with a programme to be agreed with the MEPF CONSULTANT.

2. Should the results of the acceptance tests show that plant, systems and/or equipment fail to perform to the efficiencies or other performance figures as given in this Specification, the GENERAL CONTRACTOR shall adjust, modify and if necessary replace the equipment without further payment in order that the required performance can be obtained.

3. Where acceptance tests are required by the relevant Authorities having jurisdiction, these tests shall be carried out by the GENERAL CONTRACTOR prior to the issue of Taking Over Certificate to the acceptance of the Authorities.

FIRE HOSE CABINETS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Fire protection cabinets for the following:

a. Portable fire extinguishers.
b. Fire hose valves.
c. Fire hoses and racks

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for fire protection cabinets.

1. Fire Protection Cabinets: Include roughing-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type, trim style, and panel style.
2. Show location of knockouts for hose valves.

B. Shop Drawings: For fire protection cabinets. Include plans, elevations, sections, details, and attachments to other work.

C. Samples for Initial Selection: For each type of fire protection cabinet indicated.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:

1. Size: 6 by 6 inches (150 by 200 x 400mm) square.

E. Product Schedule: For fire protection cabinets. Coordinate final fire protection cabinet schedule with fire extinguisher schedule to ensure proper fit and function.

F. Maintenance Data: For fire protection cabinets to include in maintenance manuals.

1.4 QUALITY ASSURANCE

A. Fire-Rated, Fire Protection Cabinets: Listed and labeled to comply with requirements in ASTM E 814 for fire-resistance rating of walls where they are installed.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Preinstallation Conference. 1. Review methods and procedures related to fire protection cabinets including, but not limited to, the following:
a. Schedules and coordination requirements.

1.5 COORDINATION

A. Coordinate size of fire protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

B. Coordinate size of fire protection cabinets to ensure that type and capacity of fire hoses, hose valves, and hose racks indicated are accommodated.

C. Coordinate sizes and locations of fire protection cabinets with wall depths.

1.6 SEQUENCING

A. Apply decals vinyl lettering powdered coated painting for fire protection cabinets final color is used on architectural wall finishes.

PART 2 PRODUCTS

2.1 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.

B. Aluminum: Alloy and temper recommended by aluminum producer and manufacturer for type of use and finish indicated, and as follows: 1. Sheet: ASTM B 209 (ASTM B 209M). 2. Extruded Shapes: ASTM B 221 (ASTM B 221M).

C. Stainless-Steel Sheet: ASTM A 666, Type 304.

D. Copper-Alloy Brass Sheet: ASTM B 36/B 36M, alloy UNS No. C26000 (cartridge brass, 70 percent copper).

E. Copper-Alloy Bronze Sheet: ASTM B 36/B 36M, alloy UNS No. C28000 (muntz metal, 60 percent copper).

F. Clear Float Glass: ASTM C 1036, Type I, Class 1, Quality q3, 3 mm thick.

G. Tempered Float Glass: ASTM C 1048, Kind FT, Condition A, Type I, Quality q3, and 3 mm thick, [Class 1 (clear).

H. Break Glass: Clear annealed float glass, ASTM C 1036, Type I, Class 1, Quality q3, 1.5 mm thick, single strength.

I. Tempered Break Glass: ASTM C 1048, Kind FT, Condition A, Type I, Quality q3, 1.5 mm thick.

J. Wire Glass: ASTM C 1036, Type II, Class 1, Form 1, Quality q8, Mesh m1 (diamond), 6 mm thick.

K. Transparent Acrylic Sheet: ASTM D 4802, Category A-1 (cell-cast sheet), 1.5 thick, with (patterned, textured). L. Acrylic Bubble: One piece.

2.2 FIRE PROTECTION CABINET (SURFACE MOUNTED)

A. Cabinet Type: Suitable for fire hose, rack, valve, and extinguisher.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include.

B. Cabinet Construction: Non rated Locally fabricated.

C. Cabinet Material: (1.7-mm-) thick steel.

1. Shelf: Same metal and finish as cabinet.

D. Surface-Mounted Cabinet: Cabinet box fully exposed and mounted directly on wall; with no trim. Provide where walls are of insufficient depth for semi recessed cabinet installation.

E. Cabinet Trim Material: Steel sheet.

F. Door Material: 0.0966-inch- (2.5-mm-) thick steel.

G. Door Style: Solid opaque panel with frame.

H. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style
indicated, and as follows:

1. Recessed door pull.

2. Continuous Hinge: Same material and finish as trim, permitting door to open 180 degrees.

3. Mechanical Deadlock: Lockbolt retracted and extended by five-tumbler cylinder; keyed one side. a. Lockbolt: 1-1/2 inches high by 3/4 inch (38 mm high by 19 mm) thick; 5/8-inch (16-mm) throw.

4. Mechanical Deadlock: As specified in Division 8 Section "Detention Door Hardware."

5. Mechanical Snaplatch: Automatic snaplatch when closed; latchbolt retracted by five-tumbler cylinder; keyed one side. a. Lockbolt: 1 inch high by 7/16 inch (25 mm high by 11 mm) thick; 5/16-inch (8-mm) throw.

6. Mechanical Snaplatch: As specified in Division 8 Section "Detention Door Hardware."

I. Accessories:

1. Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher to security fire protection cabinet, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.

2. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location as indicated on the plan.

a. Identify fire extinguisher in security fire protection cabinet with the words "FIRE EXTINGUISHER".

1) Location: Applied to location indicated on Drawings.
2) Application Process: Pressure-sensitive vinyl letters.
3) Lettering Color: Red.
4) Orientation: As indicated on Drawings.

3. Keys to Door Locks: Three per lock.

J. Finishes:

1. Manufacturer's standard baked-enamel paint for the following:

a. Exterior of cabinet door surfaces indicated to receive another finish.
b. Interior of cabinet and door.

2. Steel

3. Steel Sheets: Powdered coated

2.3 FABRICATION

A. Fire Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.

1. Weld joints and grind smooth.
2. Provide factory-drilled mounting holes.
3. Prepare doors and frames to receive locks.
4. Install door locks at factory.

B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles selected.

1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch (13 mm) thick.
2. Fabricate door frames of one-piece construction with edges flanged.
3. Miter and weld perimeter door frames.

C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine roughing-in for hose valves racks and cabinets to verify actual locations of piping connections before cabinet installation.

B. Examine walls and partitions for suitable framing depth and blocking where recessed and surface mounted cabinets will be installed.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPERATION

A. Prepare recesses for recessed and surface fire protection cabinets as required by type and size of cabinet and trim style.

3.3 INSTALLATION

A. General: Install fire protection cabinets in locations and at mounting heights indicated at heights acceptable to authorities having jurisdiction.

1. Fire Protection Cabinets: as indicated on detailed drawings.

B. Fire Protection Cabinets: Fasten cabinets to structure, square and plumb.

1. Unless otherwise indicated, provide recessed fire protection cabinets. If wall thickness is not adequate for recessed cabinets, provide semi-recessed fire protection cabinets.

2. Provide inside latch and lock for break-glass panels.

3. Fasten mounting brackets to inside surface of fire protection cabinets, square and plumb.

4. Fire-Rated, Hose and Valve Hose-Valve Cabinets:

a. Install cabinet with not more than 1/16-inch (1.6-mm) tolerance between pipe OD and knockout OD. Center pipe within knockout.

b. Seal through penetrations with fire-stopping sealant as specified in Division 7 Section “Through-Penetration Fire-stop Systems”

C. Identification: Apply decals vinyl lettering at locations indicated.

3.4 ADJUSTING AND CLEANING

A. Remove temporary protective coverings and strippable films, if any, as fire protection cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.

B. Adjust fire protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

C. On completion of fire protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.

D. Touch up marred finishes, or replace fire protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire protection cabinet and mounting bracket manufacturers.

E. Replace fire protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

STANDPIPE SYSTEMS

PART 1 GENERAL REQUIREMENTS

1.1 SYSTEM DESCRIPTION

Design and provide new automatic wet Class I standpipe and fire sprinkler systems as shown.

1.2 SYSTEM DESCRIPTION

System design and manufacturer's products shall be in accordance with the required and advisory provisions of NFPA 14 except as modified herein. Provide sprinkler portion of system under Section 13930 WET PIPE SPRINKLER SYSTEM. Each system shall be designed for earthquakes and shall include materials, accessories, and equipment inside and outside the building necessary to provide each system complete and ready for use. Devices and equipment shall be UL Fire Prot Dir listed or FM P7825 approved for fire protection service. In the publications referred to herein, the advisory provisions shall be considered to be mandatory, as though the word "shall" had been substituted for "should" wherever it appears; reference to the "authority having jurisdiction" shall be interpreted as Local Protection Engineer.

1.2.1 Residual Pressure

The minimum residual pressure at the outlet of the most remote 64 mm hose connection shall be 100 psig while the system is discharging at the required design flow rates.

1.2.2 Friction Losses

Calculate losses in piping in accordance with the Hazen-Williams formula with 'C' value of 120 for steel piping, 150 for copper tubing, and 140 for cement-lined ductile-iron piping.

1.2.3 Water Supply

Base hydraulic calculations on a static pressure of 105 psi (gage with 500 gpm available at a residual pressure of 15 psi (gage) at the Base hydraulic calculations on operation of fire pumps provided in Section 13920, "Fire Pumps."

1.2.4 Standpipe System Drawings

Prepare in accordance with the requirements for "Plans and Specifications" as specified in NFPA 14. Each drawing shall be 34 by 22 inches. Plans shall be drawn to a scale not less than 1/8 inch scale Do not commence work until the design of each system and the various components have been approved. Show data essential for proper installation of each system. Show details, plan view, elevations, and sections of the systems supply and piping. Show piping schematic of systems supply, devices, valves, pipe, and fittings. Submit drawings signed by a registered fire protection engineer. Show:

a. Room, space or area layout and include pipe supports and hangers.

b. Field wiring diagrams showing locations of devices and points of connection and terminals used for all electrical field connections in the system, with wiring color code scheme.

PART 2 PRODUCTS

2.1 ABOVEGROUND PIPING SYSTEMS

Provide fittings for changes in direction of piping and for connections. Make changes in piping sizes through tapered reducing pipe fittings; bushings will not be permitted. Perform welding in the shop; field welding will not be permitted. Conceal piping in areas with suspended ceiling.

2.1.1 Pipe and Fittings

NFPA 14, except as modified herein. Steel piping shall be Schedule 40 for sizes less than 8 inches, and Schedule 30 or 40 for sizes 8 inches and larger. Fittings shall be welded, threaded, or grooved-end type. Plain-end fittings with mechanical couplings and fittings which use steel gripping devices to bite into the pipe when pressure is applied will not be permitted. Rubber gasketed grooved-end pipe and fittings with mechanical couplings shall be permitted in pipe sizes 1.5 inches and larger. Fittings shall be UL Fire Prot Dir listed or FM P7825 approved for use in wet pipe sprinkler systems. Fittings, mechanical couplings, and rubber gaskets shall be supplied by the same manufacturer. Steel piping with wall thickness less than Schedule 30 shall not be threaded. Side outlet tees using rubber gasketed fittings shall not be permitted. Pipe and fittings shall be metal.

2.1.2 Pipe Hangers and Supports

Provide in accordance with NFPA 14.

2.1.3 Valves

NFPA 14. Provide valves of types approved for fire service. Hose and gate valves shall open by counterclockwise rotation. Provide isolation and check valves as required by NFPA 14. Isolation valves shall be OS&Y type. Check valves shall be flanged clear opening swing-check type with flanged inspection and access cover plate for sizes 4 inches and larger.

2.1.3.1 Hose Valves Provide bronze pressure regulating type hose valve with 2 1/2 inch National Standard male hose threads, and 2 1/2 inch NH female by 1 1/2 inch IPT male reducer with cap and chain. Equip valve with a device to regulate pressure at the outlet to a pressure not exceeding 100 psi under both flow and no-flow conditions.

2.1.4 Identification Signs

NFPA 14. Attach properly lettered and approved metal signs to each valve and alarm device.

2.1.5 Waterflow Test Connection

Provide test connections approximately 6 feet above the floor for each standpipe system or portion of each standpipe system equipped with an alarm device; locate downstream and adjacent to each alarm actuating device. Provide test connection piping to a location where the discharge will be readily visible and where water may be discharged without property damage. Discharge to janitor sinks or similar fixtures shall not be permitted. Provide discharge orifice equivalent to 1/2 inch sprinkler orifice. The penetration of the exterior wall shall be no greater than 2 feet above finished grade.

2.1.6 Main Drains

Provide separate drain piping to discharge at safe points outside each building or to sight cones attached to drains of adequate size to readily receive the full flow from each drain under maximum pressure. Provide auxiliary drains as required by NFPA 13 and NFPA 14.

2.1.7 Pipe Sleeves

Provide where piping passes entirely through walls, floors, roofs and partitions. Secure sleeves in position and location during construction. Provide sleeves of sufficient length to pass through entire thickness of walls, floors, roofs and partitions. Provide one inch minimum clearance between exterior of piping and interior of sleeve or core-drilled hole. Firmly pack space with mineral wool insulation. Seal space at both ends of the sleeve or core-drilled hole with plastic waterproof cement which will dry to a firm but pliable mass, or provide a mechanically adjustable segmented elastomeric seal. In fire walls and fire floors, seal both ends of pipe sleeves or core-drilled holes with UL listed fill, void, or cavity material.

2.1.7.1 Sleeves in Masonry and Concrete Walls, Floors, and Roofs Provide hot-dip galvanized steel, ductile-iron, or cast-iron sleeves. Core drilling of masonry and concrete may be provided in lieu of pipe sleeves when cavities in the core-drilled hole are completely grouted smooth. Extend sleeves in floor slabs 3 inches above finished floors.

2.1.7.2 Sleeves in Partitions Provide 26 gage galvanized steel sheet.

2.1.8 Escutcheon Plates

Provide one piece or split hinge type metal plates for piping passing through walls, floors, and ceilings in both exposed and concealed spaces. Provide polished stainless steel plates or chromium-plated finish on copper alloy plates in finished spaces. Provide paint finish on metal plates in unfinished spaces. Securely anchor plates in place.

2.1.9 Fire Department Connections

Provide connections approximately 3 feet above finish grade, of the approved two-way type with 2.5 inch National Standard female hose threads with plug, chain, and identifying fire department connection escutcheon plate.

2.1.10 Alarm Valves

Provide variable pressure type alarm valve complete with retarding chamber, alarm test valve, alarm shutoff valve, drain valve, pressure gages, accessories, and appurtenances for the proper operation of the system. The alarm shut-off valve in the piping between the alarm valve and the alarm pressure switch shall be a UL listed electrically supervised quarter-turn valve. Connection of switch shall be under Section

2.1.11 Water Motor Alarms

Provide alarms of the approved weatherproof and guarded type, to sound locally on the flow of water in each corresponding standpipe. Mount alarms on the outside of the outer walls of each building. Provide separate drain piping directly to exterior of building.

2.1.12 Pressure Switch

Provide switch with circuit opener or closer for the automatic transmittal of an alarm over the facility fire alarm system. Connect into the building fire alarm system. Alarm actuating device shall have mechanical diaphragm-controlled retard device adjustable from 10 to 60 seconds and shall instantly recycle.

2.1.13 Waterflow Detector

Provide vane-type waterflow detector. Provide detector with adjustable retard feature to prevent false alarms caused by momentary water surges. Connect into the building fire alarm system. Alarm actuating device shall have mechanical diaphragm-controlled retard device adjustable from 10 to 60 seconds and shall instantly recycle. Provide detector where indicated in accordance with manufacturer's instructions.

2.1.14 Fire Hose Cabinets

Provide recessed or surface-mounted cabinets where indicated. Cabinets shall be prime grade, cold-rolled, reannealed, process-leveled, furniture steel. Fabricate cabinet from 20 gage steel and door and trim from 18 gage steel. Provide fully welded joints ground smooth. On each jamb, provide at least two anchors or reinforcements spaced approximately 24 inches apart for building in or attaching the cabinets to adjacent construction. Doors shall be flush hollow metal type with fully welded joints ground smooth and full

glazed opening. Provide door with continuous hinge, latch and pull. Hinge door for 180 degree opening. Glass shall conform to ASTM C 1036 and shall be Type II (flat wired glass), Class 1 (clear), Form 1 (wired, polished both sides), Quality q 8 (glazing quality), diamond or square wire mesh, ¼ inch thick. Factory finish cabinet inside and out with one coat of enamel applied over a primer. Interior finish color shall be white. Exterior finish color shall be white or as specified.

2.1.15 Valve Tamper Switch

Provide valve tamper switch(es) to monitor the open position of valve(s) controlling water supply to the standpipe system. Switch contacts shall transfer from the normal (valve open) position to the off-normal (valve closed) position during the first two revolutions of the hand wheel or when the stem of the valve has moved not more than one-fifth of the distance from its normal position. Switch shall be tamper resistant. Removal of the cover shall cause switch to operate into the off-normal position.

2.1.16 Fire Pumps

Provide as specified in Section FIRE PUMPS.

2.1.17 Backflow Preventer

Provide double check valve assembly backflow preventer with OS&Y gate valve on both ends. Each check valve shall have a drain. Backflow prevention assemblies shall have current "Certificate of Approval from the Foundation for Cross-Connection Control and Hydraulic Research, FCCCHR List. Listing of the specific make, model, design, and size in the FCCCHR List shall be acceptable as the required documentation."

2.2 ELECTRICAL WORK

Provide electrical work associated with this section under Section 16402 INTERIOR DISTRIBUTION SYSTEM, except for fire alarm wiring. Provide fire alarm wiring and connection to fire alarm systems under Section 13852 INTERIOR FIRE DETECTION AND ALARM SYSTEM.

PART 3 EXECUTION

3.1 EXCAVATION, BACKFILLING, AND COMPACTING

Provide under this section as specified in Section 02300 EARTHWORK.

3.2 CONNECTIONS TO EXISTING WATER SUPPLY SYSTEMS

Connections to existing water supply system are specified in Section 02510 WATER DISTRIBUTION.

3.3 STANDPIPE SYSTEM INSTALLATION

Equipment, materials, installation, workmanship, fabrication, assembly, erection, examination, inspection, and testing shall be in accordance with the NFPA standards referenced herein. Install piping straight and true to bear evenly on hangers and supports. Conceal piping to the maximum extent possible. Piping shall be inspected, tested and approved before being concealed. Provide fittings for changes in direction of piping and for all connections Make changes in piping sizes through standard reducing pipe fittings; do not use bushings. Cut pipe accurately and work into place without springing or forcing. Ream pipe ends and free pipe and fittings from burrs. Clean with solvent to remove all varnish and cutting oil prior to assemble. Make screw joints with PTFE tape applied to male thread only.

3.4 PRELIMINARY TESTS

Each piping system shall be hydrostatically tested at 200 psig in accordance with NFPA 14 and NFPA 24 and shall show no leakage or reduction in gauge pressure after 2 hours. The Contractor shall conduct complete preliminary tests, which shall encompass all aspects of system operation. Individually test alarms, and all other components and accessories to demonstrate proper functioning. Test water flow alarms by flowing water. When tests have been completed and all necessary corrections made, submit to the Contracting Officer a signed and dated certificate, similar to that specified in NFPA 13, attesting to the satisfactory completion of all testing and stating that the system is in operating condition. Also include a written request for a formal inspection and test.

3.5 FORMAL INSPECTION AND TESTS (ACCEPTANCE TESTS)

Fire Protection Engineer, will witness formal tests and approve all systems before they are accepted. The system shall be considered ready for such testing only after all necessary preliminary tests have been made and all deficiencies found have been corrected to the satisfaction of the Contracting Officer and written certification to this effect is received by the Division Fire Protection Engineer. Submit the request for formal inspection at least 15 working days prior to the date the inspection is to take place. Experienced technicians regularly employed by the Contractor in the installation of both the mechanical and electrical portions of such systems shall be present during the inspection and shall conduct the testing. All instruments, personnel, appliances and equipment for testing shall be furnished by the Contractor. The Government will furnish water for the tests. All necessary tests encompassing all aspects of system operation shall be made including the following, and any deficiency found shall be corrected and the system retested at no cost to the Government.

3.6 FLOW TEST

Perform flow tests of each standpipe riser in accordance with NFPA 14. Affix 0- 200 psi pressure gauges to lowest hose valve and next-to-highest hose valve. Connect lined, 2 1/2 inch diameter fire hose with underwriter's playpipe to highest hose valve and flow at least 250 gpm for 5 minutes from standpipe to a safe location outside the building. Furnish hose, nozzles and fittings required for this test.

3.7 ALARM TESTING

a. Each pressure switch, waterflow detector, and water motor gong shall be activated by flow of water.
b. Each valve tamper switch shall be activated by partially closing the associated control valve.
c. Alarm annunciation at the fire alarm control panel shall be verified.
d. Circuit supervision shall be demonstrated.

3.8 ADDITIONAL TESTS

When deficiencies, defects or malfunctions develop during the tests required, all further testing of the system shall be suspended until proper adjustments, corrections or revisions have been made to assure proper performance of the system. If these revisions require more than a nominal delay, the Contracting Officer shall be notified when the additional work has been completed, to arrange a new inspection and test of the system. All tests required shall be repeated prior to final acceptance, unless directed otherwise.

FIRE PUMPS

PART 1 GENERAL

1.1 JOCKEY PUMP

Pressure maintenance pump is the Jockey Pump. Vertical Inline type pump shall automatically stop when the system pressure reaches the set Cut-out pressure and after the pump has operated for the minimum pump run time specified herein.

1.2 EXTRA MATERIALS

Submit Spare Parts data for each different item of equipment and material specified. The data shall include a complete list of parts and supplies, with current unit prices and source of supply, and a list of parts recommended by the manufacturer to be replaced after 1 year and 3 years of service. Include a list of special tools and test equipment required for maintenance and testing of the products supplied by the Contractor.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

a. Materials and equipment shall be standard products of a manufacturer regularly engaged in the manufacture of such products and shall essentially duplicate items that have been in satisfactory use for at least 2 years prior to bid opening.

b. All equipment shall have a nameplate that identifies the manufacturer's name, address, type or style, model or serial number, contract number and accepted date; capacity or size; system in which installed and system which it controls and catalog number. Pumps and motors shall have standard nameplates securely affixed in a conspicuous place and easy to read. Fire pump shall have nameplates and markings in accordance with UL 448. Diesel driver shall have nameplate and markings in accordance with UL 1247. Electric motor nameplates shall provide the

2.2 FIRE PUMP

Fire pump shall be electric motor driven. Fire pump shall furnish not less than 150 percent of rated flow capacity at not less than 65 percent of rated net pressure. Pump shall be vertical turbine type equipped with all standard accessories. Pump shall be automatic start and manual stop. Pump shall conform to the requirements of UL 448.

2.3 REQUIREMENTS FOR FIRE PROTECTION SERVICE

2.3.1 General Requirements Materials and Equipment shall have been tested by Underwriters Laboratories, Inc. and listed in UL Fire Prot Dir or approved by Factory Mutual and listed in FM P7825a and FM P7825b. Where the terms "listed" or "approved" appear in this specification, such shall mean listed in UL Fire Prot Dir or FM P7825a and FM P7825b.

2.3.2 Alarms NOTE: Power for alarms must be from a source other than the engine starting batteries and shall not exceed 125 volts. Power shall not be supplied from the same circuit supplying power to the fire pump controllers or from an emergency circuit.

Provide audible and visual alarms as required by NFPA 20 on the controller. Provide remote supervision as required by NFPA 20, in accordance with NFPA 72. Provide remote alarm devices located at where shown. Alarm signal shall be activated upon the following conditions: fire pump controller has operated into a pump running condition, pump controller main switch has been turned to OFF or to MANUAL position. Exterior alarm devices shall be weatherproof type. Provide alarm silencing switch and red signal lamp, with signal lamp arranged to come on when switch is placed in OFF position.

2.4 ABOVE GROUND PIPING COMPONENTS

2.4.1 Pipe Sizes 65mm Ø and Larger

2.4.1.1 Pipe

Piping shall be Electric Resistance Welded, Grade A or Grade B in accordance with ASTM A 53/A 53M, Schedule 40, Grade A or B, black steel pipe. Steel pipe acceptable method for seismic considerations only. Suction piping shall be galvanized in accordance with NFPA 20. Pipe riser of size 150mm and larger in diameter shall be seamless type in accordance with ASTM A53 Grade A or B, schedule 80, black steel pipe.

2.4.1.2 Grooved Mechanical Joints and Fittings

Joints and fittings shall be designed for not less than 175 psi service and shall be the product of the same manufacturer. Fitting and coupling houses shall be malleable iron conforming to ASTM A 47/A 47M, Grade 32510; ductile iron conforming to ASTM A 536, Grade 65-45-12. Gasket shall be the flush type that fills the entire cavity between the fitting and the pipe. Nuts and bolts shall be alloy steel conforming to ASTM A193/A193M and ASTM A194/A194M respectively.

2.4.1.3 Flanges

Flanges shall be ASME B16.5, raised face finished, Class 150 flanges. Flanges shall be provided at valves connections to equipment, and where indicated.

2.4.1.4 Gaskets

Gaskets shall be AWWA C111/A21.11, cloth inserted red rubber gaskets. 2.4.1.5 Bolts Bolts shall be ASTM A 193/A 193M, Grade B7. Bolts shall extend no less than three full threads beyond the nut with bolts tightened to the required torque.

2.4.1.6 Nuts

Nuts shall be ASTM A 194/A 194M, Grade B7. Washers shall meet the requirements of ASTM F 436. Flat circular washers shall be provided under all bolt heads and nuts.

2.4.2 Piping Sizes 50mm and Smaller

2.4.2.1 Steel Pipe

Steel piping shall be ASTM A53/A53M, Schedule 40, Grade A or Grade B, electric resistance welding, black steel pipe with threaded end connections. Fittings shall be ASME B16.3, Class 150, zinc-coated threaded fittings. Unions shall be ASME B16.39, Class 150, zinc-coated unions.

2.4.3 Pipe Hangers and Supports

Pipe hangers and support shall be MSS SP-58 and or MSS SP-69,UL listed UL Fire Prot Dir or FM approved FM P7825a and FM P7825b and shall be fixed or adjustable type. Finish of rods, nuts, washers, hangers, and supports shall be zinc-plated after fabrication.

2.4.4 Valves

Valves shall be UL listed UL Fire Prot Dir or FM approved FM P7825a and FM P7825b for fire protection service. Valves shall have flange or threaded end connections.

2.4.4.1 Gate Valves and Control Valves

Gate valves and control valves shall be outside screw and yoke (O.S.&Y.) type which open by counterclockwise rotation.

2.4.4.2 Tamper Switch

The suction control valves, the discharge control valves, valves to test header and flow meter, and the by-pass control valves shall be equipped with valve tamper switches for monitoring by the fire alarm system.

2.4.4.3 Check Valve

Check valve shall be clear open, swing type check valve with flange or threaded inspection plate.

2.4.4.4 Relief Valve

Relief valve shall be pilot operated or spring-operated type conforming to NFPA20. A means of detecting water motion in the relief lines shall be provided where the discharge is not visible within the pump house.

2.4.4.5 Circulating Relief Valve

An adjustable circulating relief valve shall be provided for each fire pump in accordance with NFPA 20.

2.4.4.6 Suction Pressure Regulating Valve

Suction pressure regulating valve shall be FM approved FM P7825a and FM P7825b. Suction pressure shall be monitored through a pressure line to the controlling mechanism of the regulating valve. Valve shall be arranged in accordance with the manufacturer's recommendations.

2.4.5 Hose Valve Manifold Test Header

Construct header of steel pipe. Provide ASME B16.5, Class 150 flanged inlet connection to hose valve manifold assembly. Provide approved bronze hose gate valve with 65mm Ø National Standard male hose threads with cap and chain; locate 3 feet above grade in the horizontal position for each test header outlet. Welding shall be metallic arc process in accordance with ASME B31.1.

2.4.6 Pipe Sleeves

A pipe sleeve shall be provided at each location where piping passes entirely through walls, roofs, and floors, including pipe entering buildings from the exterior. Secure sleeves in position and location during construction. Provide sleeves of sufficient length to pass through entire thickness of walls and floors. Provide 25mm minimum clearance between exterior of piping or pipe insulation, and interior of sleeve or core-drilled hole. Firmly pack space with mineral wool insulation. Seal space at both ends of the sleeve or core-drilled hole with plastic waterproof cement which will dry to a firm but pliable mass, or provide a

mechanically adjustable segmented elastomeric seal. In fire walls and fire floors, a fire seal shall be provided between the pipe and the sleeve in accordance with Section 07 84 00 FIRESTOPPING.

a. Sleeves in Masonry and Concrete Walls, Roofs, and Floors: Provide hot-dip galvanized steel or black steel pipe sleeves. Core drilling of masonry and concrete may be provided in lieu of pipe sleeves provided that cavities in the core-drilled hole be completely grouted smooth.

b. Sleeves in Other Than Masonry and Concrete Walls, Roofs, and Floors: Provide galvanized steel sheet pipe not less than 0.90 psf.

2.4.7 Escutcheon Plates

Provide one-piece or split-hinge metal plates for piping entering floors, walls, and ceilings in exposed areas. Provide polished stainless steel or chromium-plated finish on copper alloy plates in finished spaces. Provide paint finish on plates in unfinished spaces. Plates shall be secured in place.

2.5 DISINFECTING MATERIALS

2.5.1 Liquid Chlorine

Liquid chlorine shall conform to AWWA B301.

2.6 ELECTRIC MOTOR DRIVER

Motors, controllers, contactors, and disconnects shall be provided with their respective pieces of equipment, as specified herein and shall have electrical connections provided under Section 16402 INTERIOR DISTRIBUTION SYSTEM. Controllers and contactors shall have a maximum of 120-volt control circuits, and auxiliary contacts for use with the controls furnished. When motors and equipment furnished are larger than sizes indicated, the cost of providing additional electrical service and related work shall be included under this section. Motor shall conform to NEMA MG 1 Design B type. Integral size motors shall be the premium efficiency type in accordance with NEMA MG 1. Motor horsepower shall be of sufficient size so that the nameplate horsepower rating will not be exceeded throughout the entire published pump characteristic curve. The motor and fire pump controller shall be fully compatible.

2.7 FIRE PUMP CONTROLLER

Controller shall be the automatic type and UL listed UL Fire Prot Dir or FM approved FM P7825a and FM P7825b for fire pump service. Pump shall be arranged for automatic start and stop, and manual push-button stop. Automatic stopping shall be accomplished only after all starting causes have returned to normal and after a minimum pump run time has elapsed. Controllers shall be completely terminally wired, ready for field connections, and mounted in a NEMA Type 2 drip-proof] or NEMA Type 4 watertight and dust tight enclosure arranged so that controller current carrying parts will not be less than 300mm above the floor. Controller shall be provided with voltage surge arresters installed in accordance with NFPA 20. Controller shall be equipped with a bourdon tube pressure switch or a solid-state pressure switch with independent high and low adjustments, automatic starting relay actuated from normally closed contacts, visual alarm lamps and supervisory power light. Controller shall be equipped with a thermostat switch with adjustable setting to monitor the pump room temperature and to provide an alarm when temperature falls below 40 degrees F. The controller shall be factory-equipped with a heater operated by thermostat to prevent moisture in the cabinet.

2.7.1 Controller for Electric Motor Driven Fire Pump

Controller shall be electronic soft start, auto-transformer, wye-delta, closed circuit transition starting type. Controller and transfer switch shall have a short circuit rating as indicated. An automatic transfer switch (ATS) shall be provided for each fire pump. The ATS shall comply with NFPA 20 and shall be specifically listed for fire pump service. The ATS shall transfer source of power to the alternate source upon loss of normal power. Controller shall monitor pump running, loss of a phase or line power, phase reversal, low reservoir and pump room temperature. Alarms shall be individually displayed in front of panel by lighting of visual lamps. Each lamp shall be labeled with rigid etched plastic labels. Controller shall be equipped with terminals for remote monitoring of pump running, pump power supply trouble (loss of power or phase and phase reversal), and pump room trouble (pump room temperature and low reservoir level, and for remote start. Limited service fire pump controllers are not permitted, except for fire pumps driven by electric motors rated less than 15 hp. Controller shall be equipped with a 7-day electric pressure recorder with 24-hour spring wound back-up. The pressure recorder shall provide a read-out of the system pressure, time, and date. Controller shall require the pumps to run for ten minutes for pumps with driver motors under 200 horsepower and for 15 minutes for pumps with motors 200 horsepower and greater, prior to automatic shutdown. The controller shall be equipped with an externally operable isolating switch

which manually operates the motor circuit. Means shall be provided in the controller for measuring current for all motor circuit conductors.

2.8 PRESSURE SENSING LINE

A completely separate pressure sensing line shall be provided for each fire pump and for the jockey pump. The sensing line shall be arranged in accordance with Figure A-7-5.2.1. of NFPA 20. The sensing line shall be 1/2 inch H58 brass tubing complying with ASTM B 135. The sensing line shall be equipped with two restrictive orifice unions each. Restricted orifice unions shall be ground-face unions with brass restricted diaphragms drilled for a 3/32 inch. Restricted orifice unions shall be mounted in the horizontal position, not less than 5 feet apart on the sensing line. Two test connections shall be provided for each sensing line. Test connections shall consist of two brass 1/2 inch globe valves and 1/4 inch gauge connection tee arranged in accordance with NFPA 20. One of the test connections shall be equipped with a 0 to 300 psi water oil-filled gauge. Sensing line shall be connected to the pump discharge piping between the discharge piping control valve and the check valve.

2.9 PRESSURE MAINTENANCE PUMP

2.9.1 General

Pressure maintenance pump shall be electric motor driven, in-line vertical shaft, centrifugal type, with a rated discharge of 10 gpm at 150 psig. Pump shall draft from the suction supply side of the suction pipe gate valve of the fire pump or as indicated and shall discharge into the system at the downstream side of the pump discharge gate valve. An approved indicating gate valve of the outside screw and yoke (O.S.&Y.) type shall be provided in the maintenance pump discharge and suction piping.Oil-filled water pressure gauge and approved check valve in the maintenance pump discharge piping shall be provided. Check valve shall be swing type with removable inspection plate.

2.9.2 Pressure Maintenance Pump Controller

Pressure maintenance pump controller shall be arranged for automatic and manual starting and stopping and equipped with a "manual-off automatic" switch. The controller shall be completely prewired, ready for field connections, and wall-mounted in a NEMA Type 2 drip-proof enclosure. The controller shall be equipped with a bourdon tube pressure switch or a solid-state pressure switch with independent high and low adjustments for automatic starting and stopping. A sensing line shall be provided connected to the pressure maintenance pump discharge piping between the control valve and the check valve. The sensing line shall conform to paragraph, PRESSURE SENSING LINE. The sensing line shall be completely separate from the fire pump sensing lines. An adjustable run timer shall be provided to prevent frequent starting and stopping of the pump motor. The run timer shall be set for 2 minutes.

2.9.3 Steel pipe

ASTM A 53/A 53M, hot-dipped zinc-coated, Schedule 40, threaded connections. Fittings shall be ASME B16.3, zinc-coated, threaded malleable iron fittings. Unions shall be ASME B16.39 zinc-coated, threaded unions.

2.10 PUMP BASE PLATE AND PAD

A common base plate shall be provided for each horizontal-shaft fire pump for mounting pump and driver unit. The base plate shall be constructed of cast iron with raised lip tapped for drainage or welded steel shapes with suitable drainage. Each base plate for the horizontal fire pumps shall be provided with a 25mm galvanized steel drain line piped to the nearest floor drain. For vertical shaft pumps, pump head shall be provided with a cast-iron base plate and shall serve as the sole plate for mounting the discharge head assembly. Pump units and bases shall be mounted on a raised 100mm or 150mm reinforced concrete pad that is an integral part of the reinforced concrete floor

2.11 HOSE VALVE MANIFOLD TEST HEADER

Hose valve test header shall be connected by ASME B16.5, Class 150 flange inlet connection. Hose valves shall be UL listed UL Fire Prot Dir or FM approved FM P7825a and FM P7825b bronze hose gate valves with 65mm American National Fire Hose Connection Screw Standard Threads (NH) in accordance with NFPA 1963. The number of valves shall be in accordance with NFPA 20. Each hose valve shall be equipped with a cap and chain, and located no more than 3 feet and no less than 2 feet above grade.

2.12 FLOW METER

Meter shall be UL listed UL Fire Prot Dir or FM approved FM P7825a and FM P7825b as flow meters for fire pump installation with direct flow readout device. Flow meter shall be capable of metering any water flow quantities between 50 percent and 150 percent of the rated flow of the pumps. The flow meter shall be arranged in accordance with Figure A-2-14.2.1 of NFPA 20. The meter throttle valve and the meter control valves shall be O.S.&Y. valves. Automatic air release shall be provided if flow meter test discharge is piped to the pump suction and forms a closed-loop meter arrangement as defined in Figure A-2- 14.2.1 of NFPA 20. Meter shall be of the venture, annular probe or orifice plate type.

3 EXECUTION

3.1 EXAMINATION

After becoming familiar with all details of the work, verify all dimensions in the field, and advise the Contracting Officer of any discrepancy before performing the work.

3.2 FIRE PUMP INSTALLATION RELATED SUBMITTALS

The Fire Protection Engineer shall prepare a list of submittals, from the Contract Submittal Register, that relate to the successful installation of the fire pump(s). The submittals identified on this list shall be accompanied by a letter of approval signed and dated by the Fire Protection Consultant when submitted to the Government.

3.3 INSPECTION BY FIRE PROTECTION CONSULTANT

The Fire Protection Engineer shall periodically perform a thorough inspection of the fire pump installation, including visual observation of the pump while running, to assure that the installation conforms to the contract requirements. There shall be no excessive vibration, leaks (oil or water), unusual noises, overheating, or other potential problems. Inspection shall include piping and equipment clearance, access, supports, and guards. Any discrepancy shall be brought to the attention of the Contracting Officer in writing, no later than three working days after the discrepancy is discovered. The Fire Protection Engineer shall witness the preliminary and final acceptance tests and, after completion of the inspections and a successful final acceptance test, shall sign test results and certify in writing that the installation the fire pump installation is in accordance with the contract requirements.

3.4 INSTALLATION REQUIREMENTS

Carefully remove materials so as not to damage material which is to remain. Replace existing work damaged by the Contractor's operations with new work of the same construction. Equipment, materials, workmanship, fabrication, assembly, erection, installation, examination, inspection and testing shall be in accordance NFPA 20, except as modified herein. In addition, the fire pump and engine shall be installed in accordance with the written instructions of the manufacturer.

3.5 PIPE AND FITTINGS

Piping shall be inspected, tested and approved before burying, covering, or concealing. Fittings shall be provided for changes in direction of piping and for all connections. Changes in piping sizes shall be made using tapered reducing pipe fittings. Bushings shall not be used. Photograph all piping prior to burying, covering, or concealing.

3.5.1 Cleaning of Piping

Interior and ends of piping shall be clean and free of any water or foreign material. Piping shall be kept clean during installation by means of plugs or other approved methods. When work is not in progress, open ends of the piping shall be securely closed so that no water or foreign matter will enter the pipes or fittings. Piping shall be inspected before placing in position.

3.5.2 Threaded Connections

Jointing compound for pipe threads shall be polytetrafluoroethylene (PTFE) pipe thread tape conforming to ASTM D 3308 Teflon pipe thread paste and shall be applied to male threads only. Exposed ferrous pipe threads shall be provided with one coat of zinc molybdate primer applied to a minimum of dry film thickness of 1 mil.

3.5.3 Pipe Hangers and Supports

Additional hangers and supports shall be provided for concentrated loads in aboveground piping, such as for valves and risers.

3.5.4 Underground Piping

Installation of underground piping and fittings shall conform to NFPA 24. Joints shall be anchored in accordance with NFPA 24. Concrete thrust block shall be provided at elbow where pipe turns up towards floor, and the pipe riser shall be restrained with steel rods from the elbow to the flange above the floor. After installation in accordance with NFPA 24, rods and nuts shall be thoroughly cleaned and coated with asphalt or other corrosion-retard materials approved by the Contracting Officer. Minimum depth of cover shall be 3 feet.

3.5.5 Grooved Mechanical Joint

Grooves shall be prepared according to the coupling manufacturer's instructions. Grooved fittings, couplings, and grooving tools shall be products of the same manufacturer. Pipe and groove dimensions shall comply with the tolerances specified by the coupling manufacturer. The diameter of grooves made in the field shall be measured using a "go/nogo" gauge, Vernier or dial caliper, narrow-land micrometer, or other method specifically approved by the coupling manufacturer for the intended application. Groove width and dimension of groove from end of pipe shall be measured for each change in grooving tool setup to verify compliance with coupling manufacturer's tolerances. Grooved joints shall not be used in concealed locations, such as behind solid walls or ceilings, unless an access panel is shown on the drawings for servicing or adjusting the joint.

3.6 ELECTRICAL WORK

Electric motor and controls shall be in accordance with NFPA 20, NFPA 72 and NFPA 70, unless more stringent requirements are specified herein or are indicated on the drawings. Electrical wiring and associated equipment shall be provided in accordance with NFPA 20 and Section 16402 INTERIOR DISTRIBUTION SYSTEM. Provide wiring in rigid metal conduit or intermediate metal conduit, except electrical metallic tubing conduit may be provided in dry locations not enclosed in concrete or where not subject to mechanical damage.

3.7 PIPE COLOR CODE MARKING

Color code marking of piping shall be as specified in Section 09911 PAINTING.

3.8 FLUSHING

The fire pump suction and discharge piping shall be flushed at 150 percent of rated capacity of each pump. Where the pump installation consists of more than one pump, the flushing shall be the total quantity of water flowing when all pumps are discharging at 120 or 150 percent of their rated capacities. The new pumps may be used to attain the required flushing volume. No underground piping shall be flushed by using the fire pumps. Flushing operations shall continue until water is clear, but not less than 10 minutes. Submit a signed and dated flushing certificate before requesting field testing.

3.9 FIELD TESTS

Submit, at least 2 weeks before starting field tests, system diagrams that show the layout of equipment, piping, and storage units, and typed condensed sequence of operation, wiring and control diagrams, and operation manuals explaining preventative maintenance procedures, methods of checking the system for normal, safe operation, and procedures for safely starting and stopping the system shall be framed under glass or laminated plastic. After approval, these items shall be posted where directed.

3.9.1 Hydrostatic Test

Piping shall be hydrostatically tested at 225 psig for a period of 2-hours, or at least 50 psi in excess of the maximum pressure, when the maximum pressure in the system is in excess of 175 psi in accordance with NFPA 20.

3.9.2 Preliminary Tests

The Fire Protection Engineer shall take all readings and measurements. The Manufacturer's Representative, a representative of the fire pump controller manufacturer, shall witness the complete operational testing of the fire pump and drivers. The fire pump controller manufacturer's representative shall each be an experienced technician employed by the respective manufacturers and capable of demonstrating operation of all features of respective components including trouble alarms and operating features. Fire pumps, drivers and equipment shall be thoroughly inspected and tested to ensure that the system is correct, complete, and ready for operation. Tests shall ensure that pumps are operating at rated capacity, pressure and speed. Tests shall include manual starting and running to ensure proper operation and to detect leakage or other abnormal conditions, flow testing, automatic start testing, testing of automatic settings, sequence of operation check, test of required accessories; test of pump alarms devices and supervisory signals, test of pump cooling, operational test of relief valves, and test of automatic power transfer, if provided. Pumps shall run without abnormal noise, vibration or heating. If any component or system was found to be defective, inoperative, or not in compliance with the contract requirements during the tests and inspection, the corrections shall be made and the entire preliminary test shall be repeated.

3.9.3 Final Acceptance Test

The Fire Protection Engineer shall take all readings and measurements. The Manufacturer's Representative, and the fire pump controller manufacturer's representative, shall also witness for the final tests. The Contractor shall be responsible for repairing any damage caused by hose streams or other aspects of the test. The final acceptance test shall include the following:

3.9.3.1 Flow Tests

Flow tests using the test header, hoses and play pipe nozzles shall be conducted. Flow tests shall be performed at churn (no flow), 75, 100, 125 and 150 percent capacity for each pump and at full capacity of the pump installation. Flow readings shall be taken from each nozzle by means of a calibrated pitot tube with gauge or other approved measuring equipment. Rpm, suction pressure and discharge pressure reading shall be taken as part of each flow test.

3.9.3.2 Starting Tests

Pumps shall be tested for automatic starting and sequential starting. Setting of the pressure switches shall be tested when pumps are operated by pressure drop. Tests may be performed by operating the test connection on the pressure sensing lines. As a minimum, each pump shall be started automatically 10 times and manually 10 times, in accordance with NFPA 20. The fire pumps shall be operated for a period of a least 10 minutes for each of the starts. Pressure settings that include automatic starting and stopping of the fire pumps shall be indicated on an etched plastic placard, attached to the corresponding pump controller.

3.9.3.3 Alarms

All pump alarms, both local and remote, shall be tested.

3.9.3.4 Test Documentation

The Manufacturer's Representative shall supply a copy of the manufacturer's certified curve for each fire pump at the time of the test. The Fire Protection Engineer shall record all test results and plot curve of each pump performance during the test. Complete pump acceptance test data of each fire pump shall be recorded. The pump acceptance test data shall be on forms that give the detail pump information such as that which is indicated in Figure A-11-2.6.3(f) of NFPA 20. All test data records shall be submitted in a three-ring binder.

XVIII. PAYMENT AND MEASUREMENT

A. Payment shall be made at the Contract unit price or lump sum price of the various pay items in the Bid Schedule, which payment shall constitute full compensation for furnishings all materials, labor, equipment, tools, and other construction contingencies including profit, fees, and other expenses comprising the total and complete cost of all the

work involved in each work item as shown in the plans, and as specified in this technical specification and the special provisions and as directed by the Engineer. When the contract does not include a contract pay item for associated or ancillary work requires to complete the work specified in the Bid Schedule, the cost shall be considered as included in the price paid for the listed bid.

B. Measurement for Payment of work covered by the various sections of the Technical Specifications shall be based on the net quantity required for the work based on the drawings unless otherwise directed by the Engineer. Allowance for any bulking, shrinkage, consolidation or loss of material shall be deemed to have been taken into account in the Contractor's unit prices. Only actual quantities of work performed shall be measured and paid for. In the cases of lump sum bid items, the value of the actual work performed shall be calculated by the Engineer and shall be the basis for progress payments.

Section VII. Drawings

Pls. see attached Drawings/ Plans

Section VIII. Bill of Quantities

Contract Reference Number*:* ***IB No. 2023-13***
Name of the Contract: ***Construction of Academic Building II (College of Dentistry) – Phase III (Increase in Carrying Capacity of Nursing and Allied Health Programs)***
Location of the Contract: ***West Visayas State University***
Calendar Days: ***180 Calendar days***

Item No.	*Item Description*	*Quantity*	*Unit*	*Price ceiling (Total)*	*Unit Price*	*Total Price*
	2nd FLOOR					
1	***MASONRY WORKS***					
1.1	*4" CHB*	*476.28*	*sq.m.*	***790,393.09***		
1.2	*6" CHB*	*703.89*	*sq.m.*	***1,205,657.40***		
2	***PLASTERING WORKS***	*2,539.93*	*sq.m.*	***490,512.96***		
3	***CEILING WORKS***					
3.1	*Ceiling Boards*	*1,433.34*	*sq.m.*	***692,707.05***		
3.2	*Ceiling Frames*	*1,433.34*	*sq.m.*	***303,751.54***		
4	***TILE WORKS***					
4.1	*Ceramic Tiles*	*1.00*	*lot*	***1,329,625.56***		
4.2	*Continuous Vinyl Tiles*	*809.00*	*sq.m.*	***1,592,125.64***		
5	***PAINTING WORKS***					
5.1	*Concrete Surface*	*2,539.93*	*sq.m.*	***549,040.91***		
5.2	*Ceiling Board Surface*	*1,433.34*	*sq.m.*	***211,292.55***		
6	***PLUMBING WORKS***	*1.00*	*lot*	***1,116,086.30***		
7	***WATER FILTRATION SYSTEM***	*1.00*	*lot*	***2,557,800.00***		
8	***ELECTRICAL WORKS***	*1.00*	*lot*	***1,450,912.18***		
9	***ECE WORKS***					
9.1	*FDAS*	*1.00*	*lot*	***634,850.27***		
9.2	*TELECOM*	*1.00*	*lot*	***570,872.83***		
9.3	*CCTV*	*1.00*	*lot*	***396,863.91***		
10	***MECHANICAL WORKS***					
10.1	*ACU*	*1.00*	*lot*	***322,568.83***		
10.2	*Fire Sprinkler System*	*1.00*	*lot*	***742,066.61***		
	DARK ROOM AT X-RAY ROOM					
11	***MASONRY WORKS***	*8.37*	*sq.m.*	***32,549.83***		
12	***PLASTERING WORKS***	*16.74*	*sq.m.*	***10,322.55***		
	----Noting Follows----					
	TOTAL BID PRICE					

Submitted by:

_____

Name of Representative of the Bidder

_____

Position

_____

Name of Bidder

_____

Date

Section IX. Checklist of Technical and Financial Documents

Checklist of Technical and Financial Documents

I. TECHNICAL COMPONENT ENVELOPE

(Bidder should submit only one copy labeled "ORIGINAL")

Class "A" Documents

Legal Documents

☐ (a) Valid and updated PhilGEPS Certificate of Platinum Registration and Membership ONLY for purposes of determining eligibility in accordance with GPPB Resolution No. 015-2021. Please see attached sample of Revised PhilGEPS Certificate of Platinum Registration and Membership;

Technical Documents

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

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

☐ (d) 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**

☐ (e) Original copy of Bid Security. If in the form of a Surety Bond, submit also a certification issued by the Insurance Commission;
or
Original copy of Notarized Bid Securing Declaration; **and**

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

☐ (a) Organizational chart for the contract to be bid;

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

No personnel must occupy more than two (2) positions in the list of the contractor's key personnel to be assigned to the contract to be bid. The submission should include curriculum vitae of the key personnel including licenses; 1. Valid PRC license for registered Engineers, Architects and Master Plumber; 2.Certificate of Accreditation as Materials Engineer issued by DPWH and 3. Certificate of completion of DOLE prescribed training (COSH) for Safety Officer.

Key Personnel	***General Experience***	***Relevant Experience***
Resident Engineer	*Building Construction*	*at least 3 years*
Project Manager	*Building Construction*	*at least 3 years*
Architect	*Building Construction*	*at least 3 years*
Electrical Engineer	*Building Construction*	*at least 3 years*
Master Plumber	*Building Construction*	*at least 3 years*
Mechanical Engineer	*Building Construction*	*at least 3 years*
Materials Engineer	*Building Construction*	*at least 3 years*
Electronics Engineer	*Building Construction*	*at least 3 years*
Safety Officer	*Building Construction*	*at least 3 years*

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

Equipment	***Capacity***	***Number of Units***
Bar Cutter	*Standard*	*1*
Mixer	*1-bagger*	*1*
Bar Bender	*Standard*	*1*
Hauling Truck	*5 cu.m.*	*1*

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

Financial Documents

☐ (h) 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**

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

Class "B" Documents

☐ (j) 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
(Bidder should submit only one copy labeled "ORIGINAL")

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

Other documentary requirements under RA No. 9184

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

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

☐ (d) Cash Flow by Quarter.

Bid Form for the Procurement of Infrastructure Projects

[shall be submitted with the Bid]

BID FORM

Date : _____

Project Identification No. : _____

To: [name and address of Procuring Entity]

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

a. We have no reservation to the PBDs, including the Supplemental or Bid Bulletins, for the Procurement Project: *[insert name of contract];*

b. We offer to execute the Works for this Contract in accordance with the PBDs;

c. The total price of our Bid in words and figures, excluding any discounts offered below is: *[insert information]*;

d. The discounts offered and the methodology for their application are: *[insert information]*;

e. The total bid price includes the cost of all taxes, such as, but not limited to: *[specify the applicable taxes, e.g. (i) value added tax (VAT), (ii) income tax, (iii) local taxes, and (iv) other fiscal levies and duties]*, which are itemized herein and reflected in the detailed estimates,

f. Our Bid shall be valid within the a period stated in the PBDs, and it shall remain binding upon us at any time before the expiration of that period;

g. If our Bid is accepted, we commit to obtain a Performance Security in the amount of *[insert percentage amount]* percent of the Contract Price for the due performance of the Contract, or a Performance Securing Declaration in lieu of the the allowable forms of Performance Security, subject to the terms and conditions of issued GPPB guidelines[2] for this purpose;

h. We are not participating, as Bidders, in more than one Bid in this bidding process, other than alternative offers in accordance with the Bidding Documents;

i. We understand that this Bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal Contract is prepared and executed; and

j. We understand that you are not bound to accept the Lowest Calculated Bid or any other Bid that you may receive.

k. We likewise certify/confirm that the undersigned, is the duly authorized representative of the bidder, and granted full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for the [Name of Project] of the [Name of the Procuring Entity*]*.

l. We acknowledge that failure to sign each and every page of this Bid Form, including the Bill of Quantities, shall be a ground for the rejection of our bid.

Name: _____
Legal Capacity: _____
Signature: _____
Duly authorized to sign the Bid for and behalf of: _____
Date: _____

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[2] currently based on GPPB Resolution No. 09-2020

Performance Securing Declaration (Revised)

[if used as an alternative performance security but it is not required to be submitted with the Bid, as it shall be submitted within ten (10) days after receiving the Notice of Award]

REPUBLIC OF THE PHILIPPINES)

CITY OF _____) S.S.

PERFORMANCE SECURING DECLARATION

Invitation to Bid: [Insert Reference Number indicated in the Bidding Documents]

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

I/We, the undersigned, declare that:

1. I/We understand that, according to your conditions, to guarantee the faithful performance by the supplier/distributor/manufacturer/contractor/consultant of its obligations under the Contract, I/we shall submit a Performance Securing Declaration within a maximum period of ten (10) calendar days from the receipt of the Notice of Award prior to the signing of the Contract.

2. I/We accept that: I/we will be automatically disqualified from bidding for any procurement contract with any procuring entity for a period of one (1) year for the first offense, or two (2) years **for the second offense**, upon receipt of your Blacklisting Order if I/We have violated my/our obligations under the Contract;

3. I/We understand that this Performance Securing Declaration shall cease to be valid upon:
   a. issuance by the Procuring Entity of the Certificate of Final Acceptance, subject to the following conditions:
      i. Procuring Entity has no claims filed against the contract awardee;
      ii. It has no claims for labor and materials filed against the contractor; and
      iii. Other terms of the contract; or
   b. replacement by the winning bidder of the submitted PSD with a performance security in any of the prescribed forms under Section 39.2 of the 2016 revised IRR of RA No. 9184 as required by the end-user.

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

[Insert NAME OF BIDDER OR ITS AUTHORIZED REPRESENTATIVE]

[Insert signatory's legal capacity]

Affiant

[Jurat]

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

Suggested Format/ Template

Name of the Procuring Entity: _____

Project: _____

Location of the Project: _____

Statement of all Ongoing Government & Private Contracts including contracts awarded but not yet started

Business Name**:** _____

Business Address: _____

Name of Contract	Date of Contract	Contract Duration	Owner's Name and Address	Nature of Work	Start Date	Amount		End-user's acceptance or official receipt(s) or sales invoice issued for the contract
						Contract	Value of Outstanding Contract	
Government								
Private								
						Total Cost		

Note: This statement shall be supported with:

1. **Notice of Award (NOA)**
2. **Contract**
3. **Notice to Proceed (NTP)**
4. **And other documents, if necessary**

Name: _____
Legal Capacity: _____
Signature: _____
Duly authorized to sign the Bid for and behalf of: _____
Date: _____

Suggested Format/ Template

Name of the Procuring Entity: _____

Project: _____

Location of the Project: _____

Statement of Bidder's Single Largest Completed Contract (SLCC) similar to the Contract to be bid which should be at least fifty percent (50%) of the ABC

Business Name: _____

Business Address: _____

Name of Contract	a. Owner's Name b.Owner's Name Address c.Telephone Nos.	Nature of Work	**Bidder's Role**		a. Amount of Award b.Amount of Completion c.Duration	a. Date Awarded b.Contract Effectivity c.Date Completed
			Description	%		

Note: This statement shall be supported with:

1. **Contract**
2. **Certificate of acceptance/ completion or**
3. **Official Receipt issued to the Procuring Entity**

Name: _____

Legal Capacity: _____

Signature: _____

Duly authorized to sign the Bid for and behalf of: _____

Date: _____

Suggested Format/ Template

Name of the Procuring Entity: _____
Project: _____
Location of the Project: _____

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

Business Name: _____
Business Address: _____

	Resident Engineer	*Project Manager*	*Architect*	*Electrical Engineer*	*Master Plumber*	*Mechanical Engineer*	*Materials Engineer*	*Electronics Engineer*	*Safety Officer*
1.Name									
2.Address									
3.Date of Birth									
4.Citizenship									
5.Civil Status									
6. Education									
College Name and location of School Year Graduated									
Post Graduate Name and location of School Year Graduated									
Technical Seminars (Use extra sheets, if necessary)									
7.PRC License No.									

Notes: Minimum qualification requirement for relevant experience:

Resident Engineer – ***Three (3) Years***
Project Manager - ***Three (3) Years***
Architect - ***Three (3) Years***
Electrical Engineer - ***Three (3) Years***
Master Plumber - ***Three (3) Years***
Mechanical Engineer - ***Three (3) Years***
Materials Engineer - ***Three (3) Years***
Electronics Engineer - ***Three (3) Years***
Safety Officer - ***Three (3) Years***

Name: _____

Legal Capacity: _____

Signature: _____

Duly authorized to sign the Bid for and behalf of: _____

Date: _____

Suggested Format/ Template

Name of the Procuring Entity: _____
Project: _____
Location of the Project: _____

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

Business Name: _____

Business Address: _____

Description (Type, Model, Make)	No. of each	Year of Manufacture	Owned 1} Leased 2} /Under Purchase Agreement 3}	Capacity Performance	Serial No./ Motor No./ Body No.	Condition	Present Location

Name: _____

Legal Capacity: _____

Signature: _____

Duly authorized to sign the Bid for and behalf of: _____

Date: _____

Notes:

1] The Applicant Firm shall enumerate hereunder the equipment units it owned, under leased, and or under purchase agreement that it shall commits to use exclusively in the project. Incomplete required data as indicated above shall be disqualified.

2] Equipment with purchase agreement must be owned at the time of bidding.

Bid Securing Declaration Form

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

REPUBLIC OF THE PHILIPPINES)

CITY OF _____) S.S.

BID SECURING DECLARATION

Project Identification No.: ***[Insert number]***

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

I/We, the undersigned, declare that:

1. I/We understand that, according to your conditions, bids must be supported by a Bid Security, which may be in the form of a Bid Securing Declaration.

2. I/We accept that: (a) I/we will be automatically disqualified from bidding for any procurement contract with any procuring entity for a period of two (2) years upon receipt of your Blacklisting Order; and, (b) I/we will pay the applicable fine provided under Section 6 of the Guidelines on the Use of Bid Securing Declaration, within fifteen (15) days from receipt of the written demand by the procuring entity for the commission of acts resulting to the enforcement of the bid securing declaration under Sections 23.1(b), 34.2, 40.1 and 69.1, except 69.1(f),of the IRR of RA No. 9184; without prejudice to other legal action the government may undertake.

3. I/We understand that this Bid Securing Declaration shall cease to be valid on the following circumstances:

    a. Upon expiration of the bid validity period, or any extension thereof pursuant to your request;
    b. I am/we are declared ineligible or post-disqualified upon receipt of your notice to such effect, and (i) I/we failed to timely file a request for reconsideration or (ii) I/we filed a waiver to avail of said right; and
    c. I am/we are declared the bidder with the Lowest Calculated Responsive Bid, and I/we have furnished the performance security and signed the Contract.

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

[Insert NAME OF BIDDER OR ITS AUTHORIZED REPRESENTATIVE]

[Insert signatory's legal capacity]

Affiant

[Jurat]

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

Omnibus Sworn Statement (Revised)

[shall be submitted with the Bid]

REPUBLIC OF THE PHILIPPINES)

CITY/MUNICIPALITY OF _____) S.S.

AFFIDAVIT

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

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

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

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

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

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

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

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

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

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

6. *[Select one, delete the rest:]*

   [If a sole proprietorship:] The owner or sole proprietor is not related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

   [If a partnership or cooperative:] None of the officers and members of *[Name of Bidder]* is related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

[If a corporation or joint venture:] None of the officers, directors, and controlling stockholders of *[Name of Bidder]* is related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

7. *[Name of Bidder]* complies with existing labor laws and standards; and

8. *[Name of Bidder]* is aware of and has undertaken the responsibilities as a Bidder in compliance with the Philippine Bidding Documents, which includes:
   a. Carefully examining all of the Bidding Documents;
   b. Acknowledging all conditions, local or otherwise, affecting the implementation of the Contract;
   c. Making an estimate of the facilities available and needed for the contract to be bid, if any; and
   d. Inquiring or securing Supplemental/Bid Bulletin(s) issued for the *[Name of the Project]*.

9. *[Name of Bidder]* did not give or pay directly or indirectly, any commission, amount, fee, or any form of consideration, pecuniary or otherwise, to any person or official, personnel or representative of the government in relation to any procurement project or activity.

10. **In case advance payment was made or given, failure to perform or deliver any of the obligations and undertakings in the contract shall be sufficient grounds to constitute criminal liability for Swindling (Estafa) or the commission of fraud with unfaithfulness or abuse of confidence through misappropriating or converting any payment received by a person or entity under an obligation involving the duty to deliver certain goods or services, to the prejudice of the public and the government of the Philippines pursuant to Article 315 of Act No. 3815 s. 1930, as amended, or the Revised Penal Code.**

IN WITNESS WHEREOF, I have hereunto set my hand this __ day of ___, 20__ at _____, Philippines.

[Insert NAME OF BIDDER OR ITS AUTHORIZED REPRESENTATIVE]

[Insert signatory's legal capacity]

Affiant

[Jurat]

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

Contract Agreement Form for the Procurement of Infrastructure Projects (Revised)

[not required to be submitted with the Bid, but it shall be submitted within ten (10) days after receiving the Notice of Award]

CONTRACT AGREEMENT

THIS AGREEMENT, made this *[insert date]* day of *[insert month]*, *[insert year]* between *[name and address of PROCURING ENTITY]* (hereinafter called the "Entity") and *[name and address of Contractor]* (hereinafter called the "Contractor").

WHEREAS, the Entity is desirous that the Contractor execute *[name and identification number of contract]* (hereinafter called "the Works") and the Entity has accepted the Bid for *[contract price in words and figures in specified currency]* by the Contractor for the execution and completion of such Works and the remedying of any defects therein.

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. In this Agreement, words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.
2. The following documents as required by the 2016 revised Implementing Rules and Regulations of Republic Act No. 9184 shall be deemed to form and be read and construed as part of this Agreement, *viz.*:

   a. Philippine Bidding Documents (PBDs);
   - i. Drawings/Plans;
   - ii. Specifications;
   - iii. Bill of Quantities;
   - iv. General and Special Conditions of Contract;
   - v. Supplemental or Bid Bulletins, if any;

   b. Winning bidder's bid, including the Eligibility requirements, Technical and Financial Proposals, and all other documents or statements submitted;

   Bid form, including all the documents/statements contained in the Bidder's bidding envelopes, as annexes, and all other documents submitted (*e.g.*, Bidder's response to request for clarifications on the bid), including corrections to the bid, if any, resulting from the Procuring Entity's bid evaluation;

   c. Performance Security;

   d. Notice of Award of Contract and the Bidder's conforme thereto; and

   e. Other contract documents that may be required by existing laws and/or the Procuring Entity concerned in the PBDs. **Winning bidder agrees that additional contract documents or information prescribed by the GPPB that are subsequently required for submission after the contract execution, such as the Notice to Proceed, Variation Orders, and Warranty Security, shall likewise form part of the Contract.**

3. In consideration for the sum of *[total contract price in words and figures]* or such other sums as may be ascertained, *[Named of the bidder]* agrees to *[state the object of the contract]* in accordance with his/her/its Bid.

4. The *[Name of the procuring entity]* agrees to pay the above-mentioned sum in accordance with the terms of the Bidding.

IN WITNESS whereof the parties thereto have caused this Agreement to be executed the day and year first before written.

[Insert Name and Signature] *[Insert Signatory's Legal Capacity]* *for:* *[Insert Procuring Entity]*	*[Insert Name and Signature]* *[Insert Signatory's Legal Capacity]* *for:* *[Insert Name of Supplier]*

Acknowledgment

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

Republic of the Philippines

gppb

Government Procurement Policy Board