PAMBANSANG MUSEO NG PILIPINAS
NATIONAL MUSEUM OF THE PHILIPPINES

BIDS AND AWARDS COMMITTEE

BIDDING DOCUMENTS

for the

REPAIR AND MAINTENANCE OF SULU ARCHIPELAGO AREA MUSEUM AND SATELLITE OFFICE

(JOLO, SULU)

(Reference No. 7797195*)*

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Section I. Invitation to Bid

PAMBANSANG MUSEO NG PILIPINAS
NATIONAL MUSEUM OF THE PHILIPPINES

Invitation to Bid
for
REPAIR AND MAINTENANCE OF SULU ARCHIPELAGO AREA MUSEUM AND SATELLITE OFFICE

1. The **National Museum of the Philippines**, through the **General Appropriation Act FY 2021** intends to apply the sum of **Five Million Three Hundred Sixty Thousand Pesos (PHP 5,360,000.00)**, being the Approved Budget for the Contract (ABC), to payments under the contract for **REPAIR AND MAINTENANCE OF SULU ARCHIPELAGO AREA MUSEUM AND SATELLITE OFFICE.** Bids received in excess of the ABC shall be automatically rejected at bid opening.

2. The **National Museum of the Philippines** now invites bids for the above Procurement Project. Completion of the Works is required within **Ninety (90) calendar days**. The Contractor must have a **Small B Category C & D** Contractor's License and must have completed or implemented at least one (1) contract that is similar to the project to be bid, and whose value, adjusted to current prices using PSA consumer price indices, must be at least fifty percent (50%) of the ABC to be bid. Similar is defined as "**having completed or implemented similar projects and must have proven relevant experience with proper client reference***".*

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

4. Interested bidders may obtain further information from the **National Museum of the Philippines Bids and Awards Committee** and inspect the Bidding Documents at the address given below from **Mondays - Fridays** from **9:30 A.M.** to **2:30 P.M.**

5. A complete set of Bidding Documents may be acquired by interested bidders on **28 June 2021,** from the given address below and the website **http://nationalmuseum.gov.ph/** and upon payment of the applicable non-refundable fee for the Bidding Documents, pursuant to the latest Guidelines issued by the GPPB, in the amount of **Five Thousand Pesos (PHP 5,000.00)**. The Procuring Entity shall allow the bidder to present its proof of payment for the fees presented in person, or through electronic means.

6. **Pre-Bid Conference** shall be on **6 July 2021, 9:30 A.M.** at **Old Civil Service Building, National Museum of the Philippines, Padre Burgos Street, Manila,** which shall be open to prospective bidders.

7. Bids must be duly received by the BAC Secretariat through manual submission at the office address as indicated below on or before **21 July 2021, at 9:30 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 **21 July 2021, 9:30 A.M.** at **Old Civil Service Building, National Museum of the Philippines, Padre Burgos Street, Manila**. Bids will be opened in the presence of the bidders' representatives who choose to attend the activity.

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

11. For further information, please refer to:

    Mr. Edwin J. dela Rosa
    Head, BAC Secretariat
    2nd Floor, BAC Room, North Annex of the
    National Museum of Fine Arts Building (Motorpool)
    Padre Burgos Street, Manila 1000
    Website: www.nationalmuseum.gov.ph
    Tel No. 298-1100 Local 1014
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(SGD)
ATTY. MA. ROSENNE M. FLORES-AVILA
Chairperson
Bids and Awards Committee

Section II. Instructions to Bidders

1. Scope of Bid

The Procuring Entity, **National Museum of the Philippines,** invites Bids for **REPAIR AND MAINTENANCE OF SULU ARCHIPELAGO AREA MUSEUM AND SATELLITE OFFICE**, with Project Identification Number ***NMPBAC-PB-2021-06-03***.

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 **2021** in the amount of **Five Million Three Hundred Sixty Thousand Pesos** (**Php 5,360,000.00)**.

2.2. The source of funding is: **NGA, the General Appropriations Act or Special 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:

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. If the bidder has already identified and has an existing contract with its subcontractor(s) during the procurement stage, it must submit together with its Bid the documentary requirements of the subcontractor(s) complying with the eligibility criteria 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, or

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

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

8. Pre-Bid Conference

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

9. Clarification and Amendment of Bidding Documents

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

10. Documents Comprising the Bid: Eligibility and Technical Components

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

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

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

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

10.5. A List of Contractor's major equipment units, which are owned, leased, and/or under purchase agreements, supported by proof of ownership, certification of availability of equipment from the equipment lessor/vendor for the duration of

the project, as the case may be, must meet the minimum requirements for the contract set in the **BDS**.

11. Documents Comprising the Bid: Financial Component

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

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

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

12. Alternative Bids

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

13. Bid Prices

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

14. Bid and Payment Currencies

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

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

15. Bid Security

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

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

16. Sealing and Marking of Bids

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

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

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

17. Deadline for Submission of Bids

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

18. Opening and Preliminary Examination of Bids

18.1. The BAC shall open the Bids in public at the time, on the date, and at the place specified in paragraph 6 of the **IB**. The Bidders' representatives who are present shall sign a register evidencing their attendance. In case videoconferencing, webcasting or other similar technologies will be used, attendance of participants shall likewise be recorded by the BAC Secretariat.

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

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

19. Detailed Evaluation and Comparison of Bids

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

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

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

20. Post Qualification

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

21. Signing of the Contract

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

Section III. Bid Data Sheet

Bid Data Sheet

ITB Clause	
5.2	For this purpose, contracts similar to the Project refer to contracts which have the same major categories of work, which shall be "**have completed or implemented similar projects and must have proven relevant experience with proper client reference***".*
7.1	The contractor may subcontract any portion of works under the project, subject to the approval of proper authorities and the National Museum of the Philippines, so long as the works intended to be subcontracted is not significant and material. The subcontracted works shall not exceed fifty percent (50%) of the contracted Works.
10.3	The Contractor must have a **Small B Category C & D** PCAB License. In case of a Joint Venture Agreement (JVA) between contractors, a Special Contractor's License is required.
10.4	The key personnel must meet the required minimum years of experience set below: Key Personnel General Experience Relevant Experience *****Note:*** ***Kindly refer to the Terms of Reference of the project for the qualifications of personnel.***
10.5	The minimum major equipment requirements are the following: Equipment Capacity Number of Units *****Note:*** ***Kindly refer to the Terms of Reference of the project for the minimum equipment requirements.***
12	Not applicable.
15.1	The bid security shall be in the form of a Bid Securing Declaration or any of the following forms and amounts: a. The amount of not less than **Php 107,200.00,** 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 **Php 268,000.00** if bid security is in Surety Bond.
19.2	Partial bids are not allowed. The project was for one (1) lot and not divided to sub-lots.

20	If needed, Environmental Compliance Certificate, Certification that the project site is not within a geohazard zone, among others is required.
21	Additional contract documents to be submitted by the winning bidder relevant to the Project that are required by existing laws and/or the National Museum of the Philippines; 1. Construction schedule and S-curve 2. Manpower schedule 3. Construction methods 4. Equipment utilization schedule 5. Construction safety and health program approved by the DOLE, 6. PERT/CPM

Section IV. General Conditions of Contract

1. Scope of Contract

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

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

2. Sectional Completion of Works

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

3. Possession of Site

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

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

4. The Contractor's Obligations

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

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

5. Performance Security

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

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

6. Site Investigation Reports

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

7. Warranty

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

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

8. Liability of the Contractor

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

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

9. Termination for Other Causes

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

10. Dayworks

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

11. Program of Work

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

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

12. Instructions, Inspections and Audits

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

13. Advance Payment

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

14. Progress Payments

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

15. Operating and Maintenance Manuals

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

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

Section V. Special Conditions of Contract

Special Conditions of Contract

GCC Clause	
2	Not Applicable
4.1	Not Applicable
6	The site investigation reports are: Field Report: Inspection and Assessment of Fort Pilar, Zamboanga City and Jolo Sulu November 13-16, 2019
7.2	Fifteen (15) 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 Ten (10) Calendar days of delivery of the Notice of Award.
13	The amount of the advance payment is Php 804,000.00
14	Not Applicable
15.1	The date by which operating and maintenance manuals are required is Fifteen (15) days from date of completion The date by which "as built" drawings are required is Fifteen (15) days from date of completion
15.2	The amount to be withheld for falling to produce "as built" drawings and/or operating and maintenance manuals by the date required is 1% of ABC

Section VI. Specifications

TECHNICAL SPECIFICATIONS

For the

REPAIR & MAINTENANCE OF SULU ARCHIPELAGO AREA MUSEUM AND SATELITE OFFICE

Jolo, Sulu

As prepared by

ROLDAN C. LAUREL
Architect II, FMD

Checked and Reviewed by:

Ar. NELSON L. AQUINO
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Recommending Approval:

Atty. MA. ROSENNE M. FLORES-AVILA
Deputy Director General (Administration)

Approved by:

JEREMY BARNS, CESO III
Director- General

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DIVISION 22 **PLUMBING**	This section details the specifications needed to complete the necessary works intended for the Supply & installation of water, sanitary and storm drainage lines	**5.0**

DIVISION 02 EXISTING CONDITIONS

PART I-GENERAL

1. SITE ASSESSMENT AND SITE SURVEY

General Contractor involved in site assessment and survey must have a thorough review of Phase 1 and its scope to be able to delineate the boundary of development of Phase 2. The Supervising Engineer must be familiar with the provision of the latest edition of the National Building Code and the regulations of the local authority concerned in the enforcement of the laws and ordinances.

Coordinate as necessary with other trades concerned to assure proper knowledge of scope of works for Phase 2.

Site assessment and survey shall be conducted using appropriate technologies including the use of standard and agreed –upon procedures.

2. SELECTIVE DEMOLITION

Existing concrete pavements at the line of development and to be affected by foundation works as per Plan shall be demolished as approved by the Supervising/Consulting Engineer.

Second floor beams of the elevator shall be demolished and replaced with steel wide flanges to accommodate elevator size.

No other portions of Phase 1 which are not included in the scope of works shall be altered, moved or demolished unless with written approval of Consulting Architect/Engineer.

Haul routes shall be designated by the Procuring Entity and Consulting Architect/Engineer.

3. GEOTECHNICAL AND MATERIAL INVESTIGATION

The General Contractor shall be responsible for geotechnical and material investigation as necessary to assess the existing soils, its composition and existing materials for proper coordination of work.

PART II- PRODUCTS

The work shall include the furnishing of all labor, materials, equipment like portable jack hammers, concrete cutters and services necessary for complete assessment, survey, testing, investigation and selective demolition as per Plan. In case of conflict between Plans and these Specifications, the Consulting Architect shall be notified.

PART III-EXECUTION

The work throughout will be executed in quality and most thorough manner known to the satisfaction of Consulting Architect/Engineer.

END OF SECTION

DIVISION 03 SITE WORKS

PART I-GENERAL

The General Contractor shall control the grading in the vicinity of all excavated areas to prevent surface drainage running into excavations. Excavation and filling shall be performed in manner and sequence that will provide proper drainage at all times. Water which accumulates in excavated areas shall be removed by pumping before fill or concrete in placed therein. He shall perform excavation of every type of material encountered within the limits of project to the lines, grades and elevations indicated and as specified herein.

The General Contractor shall protect and maintain existing utility lines or notify authorities concerned for removal or discontinuance of said utilities in accordance with the instructions and requirements of notified parties in the event that it would interfere with the excavation.

Any excess material remaining after completion of the site works shall be disposed of by hauling and spreading in nearby spoil areas designated by the Procuring Entity. Excavated material deposited in spoil areas shall be graded to a uniform surface.

PART II- PRODUCT

1. SITE CLEARING AND GRUBBING

The work shall include the furnishing of all labor, materials, equipment and services necessary for complete clearing of trees not marked for preservation, snags, logs, brush, stump, rubbish and disposal to designated areas.

2. SITE MOVING

2.1 Common Fill – shall be approved site – excavated material free from roots stumps and other perishable or objectionable matter.

2.2 Select Fill – shall be placed where indicated and shall consist of crushed gravel, crushed rock, or a combination thereof. The materials shall be free from adobe vegetable matters and shall be thoroughly tamped after placing.

2.3 Equipments like vibratory compactors and other equipments necessary for complete and proper procedure.

3. EARTHWORK METHODS

3.1 Termite Control

Liquid Termite Concentrate

Liquid Termicide Ready-Mixed Solution

Powder Termicide

4. SHORING AND UNDERPINNING

Adequate bracing, shoring, underpinning, excavation and support shall be provided by the General Contractor. Design and configuration shall be approved by the Consulting Engineer.

PART III-EXECUTION

1. SITE CLEARING AND GRUBBING

The General Contractor shall consult with the Procuring Entity and Consultants prior to begin clearing, and a full understanding is to be reached as to procedure.

Site clearing, as shown in Plans, shall be undertaken to allow the succeeding phase of works to proceed with limited constraints for grading, trench excavation, and other utility preparation.

The work shall consist of clearing and grubbing within the boundary limits. Clearing and grubbing shall be done prior to pipe installations. Existing structure shall be protected against damage.

1.2 Selective Tree and Shrub Removal and Trimming

Trees to be left standing and uninjured shall be designated by special markings that are conducive to preventing injury to the tree. All trees not marked for preservation and all snags, logs, brush, stumps, shrubs, rubbish and similar materials shall be cleared from within the limits of the designated areas.

2. SITE MOVING

2.1 Excavation and Fill

2.1.1 Subgrade Preparation

Sub-grade shall be shaped to line, grade, and cross-section, and compacted as specified. This operation shall include plowing, disking, and any moistening or aerating required to obtain proper compaction. Soft or otherwise unsatisfactory excavated materials or other approved materials as directed in writing. Low areas resulting from removal of unsatisfactory materials or excavation of rock shall be brought up to required grade with satisfactory materials, and entire sub-grade shaped as specified. Elevation of finish sub-grade shall conform to elevation as shown.

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 Consulting Architect and Engineer before any excavation work is commenced.

Erect basic batter boards and basic reference marks at such places where they will not be disturbed during the construction of the foundations.

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

2.1.2 Excavation

During construction, any excavation shall be kept shaped and drained. Ditches and drains shall be maintained in such a manner as to drain effectively at times. Storage or stockpiling of materials on the sub-grade will not be permitted. Graded areas shall be protected against action of elements prior to acceptance of work. Settlement or washing that may have occurred shall be repaired and grades re-established to the required elevations and slopes immediately prior to installation of paving.

Excavation carried below indicated depths will not be permitted except to remove unsatisfactory material. Unauthorized materials removed below depths indicated shall be replaced at no additional cost to the Procuring Entity.

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.

2.1.3 Trenching

Trenches shall be of necessary width for proper laying of pipe, while concrete lining, duct, or cable, and banks shall be nearly vertical as practicable. Trench excavation shall be coordinated to avoid open trenches for prolonged periods. Bottoms of trenches shall be accurately graded to provide uniform bearing and support for each section of pipe on undisturbed soil at every point along its entire length, except for portions of pipe sections where it is necessary to excavate for bell holes and for proper making of pipe joints.

Pile materials suitable for backfilling a sufficient distance from banks or trenches to prevent slides or cave-ins. Excavated materials shall be piled to one side only of trenches and in such a manner as to permit ready access to and use of existing utilities system. Sheathing and shoring shall be done as necessary for protection of work and for safety of personnel.

Backfilling shall be coordinated with testing of utilities. Trenches shall be carefully backfilled with satisfactory materials, free of large clod of earth or stones not over 25mm in size and deposited 0.20m max. layer, loose depth. Care shall be taken not to damage pipe. Trenches and excavation pits improperly backfilled, or where settlement occurs, shall be reopened to depth required for proper compaction, then refilled and compacted, with the surface restored to required grade and compaction.

2.1.4 Rock Removal

Hard material shall be defined as solid ledge rock, any boulder, masonry or concrete except pavements exceeding ½ cubic meter in volume, firmly cemented unstratified mass or conglomerate deposits possessing the characteristics of solid rock shall be removed through systematic drilling and blasting as directed or approved by the Engineer and at the General Contractor's expense.

2.1.5 Dewatering

Excavate in such manner that immediate surrounding will be continually drained. Water shall not be allowed to accumulate in excavations. Keep all excavations dry and protected from the weather. Drained water shall be connected to the nearest storm drainage system.

2.1.6 Backfill

Backfilling can only begin with the construction below finish grade approved, forms removed, underground utilities had been inspected, tested and approved, excavation cleaned of trash and debris. Backfill material shall be free of roots, other organic matters, trash, debris and stones larger than 75 centimeter in any dimension. Place backfill in 0.20 cm. maximum layers loose depth, each layer being thoroughly compacted and rammed by wetting, tamping or rolling.

Satisfactory excavated material required for fill and backfill shall be separately stockpiled as directed. Unsatisfactory and surplus excavated materials not required for fill and backfill shall be disposed of in a designated waste area. Stockpiles of excavated material shall be graded and sloped for proper drainage.

Before placing fill material, the surface upon which it will be placed shall be cleared of all brush roots, vegetable matter and debris, scarified and thoroughly wetted to ensure good bonding between the ground.

2.1.7 Compaction

Compaction shall be by rolling with approved tamping rollers or other approved equipment well –suited to the particular soil being compacted. Materials shall be moistened or aerated as necessary to provide moisture content that will facilitate obtaining the specified compaction with the equipment utilized. Each layer shall be compacted to not less than 95% maximum dry density.

2.2 Grading

Cutting, filling and grading will be done to bring all areas of respective surfacing as fixed by the finished grade. Site grading shall conform to the lines and grades indicated by the finish contours on the Plans. Where topsoil, pavement, aggregate surfacing and other items are shown, rough grade shall be finished to such depth below finish grade as necessary to accommodate these items. All areas where structures are to be built on fill, shall be stripped to such depth as necessary to remove turf, roots, organic matter and other objectionable materials.

3. EARTHWORK METHODS

3.1 Soil Treatment

3.1.1 Termite Control

The General Contractor shall termite-proof the project in applicable termite controls as approved by the Consulting Architect/Engineer. Termite control chemicals or toxicants shall be able to immediately exterminate termites or create barriers to discourage entry of subterranean termites into the building areas. The General Contractor shall give in Service guarantee covering the treatment of termite infestation without extra cost to the Procuring Entity if any infestation of recurrence of infestation occurs during the guarantee period of one year.

At the time soil poisoning is to be applied, the soil to be treated shall be in friable condition with low moisture content so as to allow uniform distribution of the toxicant agents.

Treatment of the soil on the exterior sides of the foundation walls, grade beams and similar structures shall be done prior to final grading and planting or landscaping work to avoid disturbance of the toxicant barriers by such operations.

Areas to be covered by concrete slab shall be treated before placement of granular fill after it has been compacted and set to required elevation. Additional treatment shall be applied in critical areas such as utility openings for pipes, conduits and ducts, along the exterior perimeter of the slab and under expansion joint.

Prior to landscaping of the lawn, saturate the building perimeter of about 3.0m wide with soil poison working solution. Earth fill shall be treated thoroughly with poison working solution as soon as fill is packed and levelled. Every square area shall be drenched with solution

3.1.2 Rodent Control Traps

Enclosed hollow spaces between ceiling and double sidings or partitions shall be rat proof in accordance with DOH requirements.

Hollow spaces between ceilings shall be rendered rat-proof by laying continuous strips of galvanized iron sheet or 10mm wire mesh, about 25cm wide and centered along floor plates or sills of partitions and exterior walls.

The rat proofing strips shall be sandwiched between floor joists/plates and sills of partitions of sidings. The strips shall be nailed to the top of the joists as well as to underside of sills and floor boards.

All exterior openings between adjoining floor joist and girders or beam that might give rats direct access into the hollow space inside shall when not closed by fascia board or the like, be covered with strips of the same rat proofing material of sufficient size to close entirely the opening in question.

4. SHORING AND UNDERPINNING

Shoring and underpinning of all excavations are necessary to protect workers, side banks, adjacent paving, structures and utilities. Shoring, bracing and sheathing shall be removed as excavations are backfilled in a manner to prevent caving or uneven ground settlements

The bracing and shoring systems required to provide temporary support of a structure shall be designed to support the dead, live, soil, earthquake and wind loads that maybe imposed on the structure during construction with standards and engineering principles.

END OF SECTION

DIVISION 04 CONCRETE

PART I-GENERAL

1. CONCRETE FORMWORKS

Design, erect, support, brace, and maintain form work so it will produce correctly aligned concrete and safety support vertical and lateral loads which might be applied until such loads can be supported safety by the concrete structure.

Construct forms to the exact sizes, shapes, lines and dimensions as required to obtain accurate alignment, location, grades, and level and plumb work in the finish structure.

2. CONCRETE REINFORCEMENTS

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

3. CAST-IN-PLACE AND PRE-CAST CONCRETE

All cements shall be stored, immediately upon delivery at the Site, in weatherproof building, which will protect the cement from dampness. The floor shall be raised from the ground. The buildings shall be placed in locations approved by the Supervising/Consulting Engineer. Provisions for storage shall be ample, and the shipments of cement as received shall be separately stored in such a manner as to allow the earliest deliveries to be used first and to provide easy access for identification and inspection of each shipment. Storage buildings shall have capacity for storage of a sufficient quantity of cement to allow sampling at least twelve days before the cement is to be used. Bulk cement, if used, shall be transferred to elevated air tight and weatherproof bins. Stored cement shall meet the test requirements at any time after shortage when wrested is ordered by the Supervising/Consulting Engineer. At the time of use, all cements shall be free of lumps.

The handling and storing of concrete aggregates shall be such as to prevent segregation or the inclusion of foreign materials. The Supervising/Consulting Engineer may require that aggregates be stored on separate platforms at satisfactory locations.

In order to secure greater uniformity of concrete mix, the Supervising/Consulting Engineer may require that the coarse aggregate be separated into two or more sizes. Different sizes of aggregates shall be stored in separate bins or in separate stockpiles sufficiently remote from each other to prevent the material at the edges of the piles from becoming intermixed.

PART II- PRODUCTS

1. CONCRETE FORMWORKS

Use plywood, metal, phenolic, or surfaced lumber form for all exposed concrete work, 1/4" thick minimum. Forms for surfaces exposed or unexposed to view and requires a standard finish shall be plywood or metal. For surfaces requiring special finishes, phenolic or plywood not less than 12mm shall be used. Surfaces of steel forms shall be free from irregularities.

2. CONCRETE REINFORCEMENTS

2.1 Reinforcing Steel

The reinforcing steel bars shall be as shown in Plans. The sizes shall be but not limited to the following: 10 mm Ø, 12 mm Ø, 16 mm Ø, 25 mm Ø, 28 mm Ø. Verify Plans for Reinforcing Steel Bar schedule.

2.2 Tie Wires

Tie wires to be used for steel reinforcements shall be Ga 16 Galvanized Iron conforming to ASTM A 641. Spacing and length shall be as shown in Plans

3. CAST-IN-PLACE CONCRETE

3.1 Portland Cement

All materials and workmanship shall conform to the latest building code of American Concrete Institute (ACI-318).

Cement shall conform to the requirements of the following cited Specifications for the specified or permitted.

Table 1: Types of Cement

Type	Specifications
Portland Cement	AASHTO M 85 (ASTM C 150)
Blended Hydraulic Cement	AASHTO M 240 (ASTM C 595)
Masonry Cement	AASHTO M 150-74 (ASTM C 91)

When Types IV and V (AASHTO M 85), P and PA (AASHTO M 150) cements are used, proper recognition shall be given to the effects of slower strength gain on concrete proportioning and construction practices. Types S and SA cements will be permitted only when blended with Portland Cement in proportions approved by the Supervising/Consulting Engineer.

Unless otherwise permitted by the Supervising/Consulting Engineer, the product of only one mill of any one brand and type of Portland Cement shall be used on the project.

The General Contractor shall provide suitable means of storing and protecting the cement against dampness. Cement which, for any reason, has become partially set or which contains lumps of caked cement will be rejected. Cement salvaged from discarded or used bags shall not be used.

3.2 Fine Aggregates

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

It shall not contain more than three mass percent of material passing the 0.075 mm (No. 200 sieve) by washing nor more than one mass percent each of clay lumps or shale. The use of beach sand will not be allowed without the approval of the Supervising/Consulting Engineer.

If the fine aggregate is subjected to five cycles of the sodium sulfate soundness test, the weighted loss shall not exceed 10 mass percent.

The fine aggregate shall be free from injurious amounts of organic impurities and if a color darker than the standard is produced, it shall be rejected. However, when tested for the effect of organic impurities of strength of mortar by AASHTO T 71, the fine aggregate may be used if the relative strength at 7 and 28 days is not less than 95 mass percent.

The fine aggregates shall be well graded from coarse to fine and shall conform to Table 2.

Table 2.Grading Requirements for Fine Aggregates

Sieve Designation	Mass Percent Passing
9.5 mm (3/8 in)	100
4.75 mm (No. 4)	95 – 100
1.18 mm (No. 16)	45 - 80
0.300 mm (No. 50)	5-30
0.150 mm (No. 100)	0 - 10

3.3 Coarse Aggregates

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

It shall contain no more than one mass percent of material passing the 0.075mm (No. 200) sieve, not more than 0.25 mass percent of clay lumps, nor more than 3.5 mass percent of soft fragments. If the coarse aggregate is subjected to five cycles of the sodium sulfate soundness test, the weighted loss shall not exceed 12 mass percent.

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

If slag is used, its density shall not be less than 1120kg/m3 (70 lbs/cu ft.) The gradation of the coarse aggregate shall conform to Table 3. Only one grading specification shall be used from any source.

Table 3. Grading Requirements for Coarse Aggregates

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

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

3.4 Water

Water used in mixing, curing, or other designated applications shall be reasonably clean and free of oil, salt, acid, alkali, grass or other substances injurious to the finished product. Water will be tested in accordance with and shall meet the requirements of Item 714, Water. Water which is drinkable may be used without test. Where the source of water is shallow, the intake shall be so enclosed as to exclude silt, mud, grass, or other foreign materials.

4. PRE-CAST CONCRETE

4.1 Structural Pre- stressed Concrete

4.1 Concrete Joists

Concrete joists shall be of two types:

3/8 mm diameter 7-wire strand grade 270 ksi

4.2 Portland Cement

Portland cement shall comply with ASTM C150, type I

4.3 Reinforcement

Reinforcements shall be 10mm welded wire mesh matting spaced at 0.25 m x 6m and Ga. 16 GI Tie wires. Provide 10mm diameter dowel bars (L/4) spaced at 0.60m

4.4 Aggregates

Provide clean, sharp, well graded aggregate free from injurious amounts of dust, lumps shale, alkali, surface coatings and organic matter and complying with ASTM C144.

4.5 Water

Provide water, free from deleterious amounts of acids, alkalis, and organic materials.

4.2 Architectural Mouldings and Lamp-posts

Mouldings and Lamp post shall be factory fabricated. Design and configuration is as shown in Plans.

PART III-EXECUTION

1. CONCRETE FORMWORKS

Concrete forms shall be mortar-tight, true to the dimensions, lines and grades of the structure and with sufficient strength, rigidity, shape and surface smoothness as to leave the finished works true to the dimension shown on the Plans or required by the Engineer and the surface finish as specified. The General Contractor shall be responsible for the adequacy of forms and form support. Wire ties shall not be used where concrete surface will be exposed to weathering and where discoloration will be exposed. All form work shall be provided with adequate clean-out openings to permit inspection and easy cleaning.

The inside surfaces of form shall be cleaned of all dirt, mortar and foreign material. Forms which will later be removed shall be thoroughly coated with non-staining type mineral form oil prior to use. The form oil shall be of commercial quality form oil or other approved coating which will permit the ready release of the forms and will not discolor the concrete.

Concrete shall not be deposited in the forms until all work in connection with constructing the forms has been completed, all inspected and approved said forms and materials. Such work shall include the removal of all dirt, chips, sawdust and other foreign material from the forms.

The rate of depositing concrete in forms shall be such to prevent bulging of the forms or form panels in excess of the deflections permitted by this Specifications. 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 and falsework shall not be removed without the consent of the Supervising/Consulting Engineer. The Engineer's consent shall not relieve the General Contractor of responsibility for the safety of the work. Blocks and bracing shall be removed at the time the forms are removed and in no case shall any portion of the wood forms be left in the concrete.

Falsework removal for continuous or cantilevered structures shall be as directed by the Supervising/Consulting Engineer or shall be such that the structure is gradually subjected to its working stress.

When concrete strength tests are used for removal of forms and supports, such removal should not begin until the concrete has attained the percentage of the specified design strength shown in the table below:

Table 4. Requirements for Removal of Forms

Element	Minimum Time
Foundation	24 Hrs.
Suspended slab except when additional loads are imposed	8 Days
Walls	18 Hrs.
Beams	14 Days

Forms and falsework shall not be released from under concrete without first determining if the concrete has gained adequate strength without regard to the time element. In the absence of strength determination, the forms and falsework are to remain in place until removal is permitted by the Engineer.

1.1 Tolerances and variations

The General Contractor shall set and maintain concrete forms to ensure that after removal of forms and prior to patching and finishing, no portion of concrete work will exceed any of the tolerances specified. Variations in floor levels shall be measured before removal of supporting shore. The General Contractor shall be responsible for variations due to deflection. The specified variation for one element of the structure will not be applicable when it will permit another element of the structure to exceed its variations.

1.2 Architectural Cast-in Place Concrete Forming

To facilitate finishing, forms used on ornamental work, railing, parapets and exposed vertical surfaces shall be removed in not less than 12 or more than 48 hours, depending upon the weather condition of concrete in columns, forms shall always be removed from them before the removal of shoring from beneath beams and girders.

1.3 Concrete Accessories

Waterstops

Water stop shall be of rubber, neoprene or PVC with applicable jointing vulcanizing agent.

Vapor Barrier shall be polyethylene sheet, 6mils minimum thickness, clear and conforming to commercial standard quality.

2. CONCRETE REINFORCEMENTS

2.1 Reinforcing Steel

Reinforcing steel shall meet the requirements of Item 710, Reinforcing Steel and Wire Rope, and conform to ASTM 615 Grade 33 for diameter 10 and larger bars.

In general, the latest edition of ACI-315, manual of Standard Practice Detailing of Reinforced Concrete Structures shall be adhered to unless otherwise shown or noted.

2.1.1 Order List

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

Maintain minimum concrete cover for reinforcing steel as follows:

Table 5. Minimum Concrete Cover

Suspended slabs	¾ in. (19mm)
Slabs on grade	1 ½ in. (38mm)
Walls above grade, lintel beams, stiffener columns	1 in. (25 mm)
Beams, stirrups, and column ties	1 ½ in (38 mm)
Where concrete is exposed to earth but poured against forms	2 in. (50mm)
Where concrete is deposited directly against earth	3 in. (75mm)

2.1.2 Bending

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

Table 6.Bends and Hooks

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

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

2.1.3 Placing and Fastening

Steel reinforcement shall be provided as indicated, together with all necessary wire ties, chairs, spacers, supports and other devices necessary to install and secure the reinforcement properly. All reinforcement, when placed, shall be free from loose, flaky rust and scale, oil grease, clay, and other coating and 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 of sufficient strength to maintain the reinforcement in place throughout the concreting operations. The 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.

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

Distance from the forms shall be maintained by means of stays, blocks, ties, hangers, or other approved supports, so that it does not vary from the position indicated on the Plans by more than 6 mm. Blocks for holding reinforcement from contact with the forms shall be precast mortar blocks of approved shapes and dimensions. Layers of bars shall be separated by precast mortar blocks or by other equally suitable devices. The use of pebbles, pieces of broken stone or brick, metal pipe and wooden blocks shall not be permitted. The minimum distance between bars shall be 40 mm. Reinforcement of any member shall be placed, inspected and approved by the Consulting Engineer before the concrete begins. Concrete placed in violation of this provision may be rejected and removal may be required.

The reinforcement shall be placed and secured by concrete or metal chair spacers. The clear distance between parallel bars shall be minimum of 1 ½ times the diameter of the bar. In no case shall the clear distance between the bars except in the columns and between multiple layers of bars in beams be less than 2.5 centimeters nor less than 1 1/3 times the maximum size of the coarse aggregates. Where bars are used in two or more layers, the bars in the upper layers shall be placed directly above those in the lower layers at a minimum clear distance of 2.5 centimeters. The clear distance between longitudinal bars in columns shall not be less than 1 ½ times the bar diameter, or 1 ½ times the maximum size of the coarse aggregate.

Vertical staples 10 millimeters in diameter spaced not more than 1.5 meters both ways shall connect top and bottom bars of all slab reinforcement.

Bends for stirrups and ties shall be made around a pin having a diameter of not less that six times the diameter of the bar, except that for bars larger than 20 millimeters, the pin shall not be less than eight times the diameter of the bar, all bars shall be bent cold.

All bars at the free end of a cantilever must be hooked.

All free ends of cantilever floor slabs shall have two longitudinal bars placed one above the other and spaced as far apart as possible to serve as a longitudinal stiffener to ensure a truly straight horizontal line.

All openings in slabs and concrete walls shall have diagonal reinforcements at the corners with sizes and lengths as shown in Plans.

2.1.4 Embedded Items

Do not embed piping, other than electrical conduit, in structural concrete unless reflected in Plans or approved by the Consulting Engineer. Provide necessary support and reinforcements as shown on Plans.

Locate conduit as shown in Plans to maintain maximum strength of the concrete.

Increase the thickness of the concrete if the outside diameter of the conduit exceeds 30% of the thickness of the concrete.

All required flashing, reglets, seals, masonry ties, anchors, bolts, inserts, wood locks, nailing strips, ground, wire hangers, sleeves, drains, guard angles, inserts for elevator guides, provisions for floor hinges and other required items in the concrete, accurately secured so they will not be displaced, and in the precise locations needed. All sub-contractors whose work is related to the concrete supported by it shall be given ample notice and opportunity to introduce or furnish embedded item before concrete is placed. All ferrous metal sleeves, inserts, anchors and other embedded ferrous items exposed to weather or where rust would impair the appearance of finish or structure shall be galvanized.

2.1.5 Splicing

All reinforcement shall be furnished in the full lengths indicated on the Plans. Splicing of bars, except where shown on the Plans will not be permitted without the written approval of the Consulting Engineer. Splices shall be securely wired together & shall lap in accordance with table. Splices shall be staggered as far as possible and with a minimum separation of not less than 40 bar diameters. Not more than one-third of the bars may be spliced in the same cross-section, except where shown on the Plans.

Table 7: Splices

For Tension

TABLE OF LAP SPLICE (FC' = 4000PSI) GR. 60

BAR Ø	TYPE A	TYPE B	ANCHORAGE LENGTH
16 MM	0.61 M	0.80 M	0.35 M (Hook)
20 MM	0.76 M	1.00 M	0.40 M (Hook)
25 MM	1.20 M	1.52 M	0.50 M (Hook)
28 MM	1.35 M	1.70 M	0.55 M (Hook)
32 MM	1.55 M	1.95 M	0.60 M (Hook)

TABLE OF LAP SPLICE (FC' = 2500PSI) GR. 33

BAR Ø	TYPE A	TYPE B	ANCHORAGE LENGTH
10 MM	0.30 M	0.40 M	0.24 M (Hook)

12 MM	0.32 M	0.41 M	0.30 M (Hook)

For Compression

TABLE OF LAP SPLICE (FC' = 4000PSI) GR. 60

BAR Ø	TYPE A	TYPE B	ANCHORAGE LENGTH
16 MM	0.50 M	0.60 M	0.35 M (Hook)
20 MM	0.60 M	0.75 M	0.40 M (Hook)
25 MM	0.75 M	0.95 M	0.50 M (Hook)
28 MM	0.85 M	1.05 M	0.55 M (Hook)
32 MM	0.95 M	1.20 M	0.65 M (Hook)

TABLE OF LAP SPLICE (FC' = 2500PSI) GR. 33

BAR Ø	TYPE A	TYPE B	ANCHORAGE LENGTH
10 MM	0.25 M	0.30 M	0.15 M (Hook)
12 MM	0.26 M	0.33 M	0.20 M (Hook)

In tapped splices, the bars shall be placed in contact and wired together. Lapped splices will not be permitted at locations where the concrete section is insufficient to provide minimum clear distance of one and one-third (1 1/3) the maximum size of coarse aggregate between the splice and the nearest adjacent bar. Welding of reinforcing steel shall be done only if detailed on the Plans or if authorized by the Consulting Engineer in writing. Spiral reinforcement shall be spliced by lapping at least one and a half turns or by butt welding unless otherwise shown on the Plans.

2.2 Tie wires

Clean all reinforcement by removing mud, oil or other materials before tying.

3. CAST-IN-PLACE CONCRETE

3.1 Structural Concrete

3.1.1 Strength

All concrete shall develop a min. compressive strength at the end of twenty eight (28) days w/ corresponding maximum aggregate and slumps as follows:

Table 8: Maximum Aggregate and Slump

Location	28 days Strength	Max.aggregate	Max. slump
All others including suspended slabs	3000 psi	¾ in. (19mm)	4 in. (100 mm)

Columns, R.C. walls	3000 psi	¾ in. (19mm)	4 in. (100 mm)
Beams, Girders	3000 psi	¾ in. (19mm)	4 in. (100 mm)
Lintel Beams/Stiffener Columns	3000 psi	¾ in. (19mm)	4 in. (100 mm)

3.1.2 Usage

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

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

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

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

Class P – Pre-stressed concrete structures and members.

Seal – Concrete deposited in water.

3.1.3 Sampling and Testing of Structural Concrete

As work progresses, at least one (1) sample consisting of three (3) concrete cylinder test specimens, 150mm x 300mm (6 "x12") shall be taken from each seventy five (75) cubic meter of each class of concrete or fraction thereof placed each day.

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

Table 9.AASHTO Standard Methods

Sampling of fresh concrete	T 141
Weight per cubic meter and air content (gravi-metric) of concrete	T 121
Sieve analysis of fine and coarse aggregates	T 27
Slump of Portland Cement Concrete	T 119
Specific gravity and absorption of fine aggregate	T 84
Test for strength shall be made in accordance with the following:	
Making and curing concrete compressive and flexural test	
Specimens in the field	T 23

Compressive strength of molded concrete cylinders T 22

3.1.4 Proportioning and Strength of Structural Concrete

The concrete materials shall be proportioned in accordance with the requirements for each class of concrete as specified in Table 10, using the absolute method as outlined in the American Concrete Institute (ACI) Standard 211.1. "Recommended Practice for Selecting proportions for Normal and Heavyweight Concrete". Other methods of proportioning may be employed in the mix design with prior approval of the Engineer. The mix shall either be designed or approved by the Consulting Engineer. A change in the source of materials during the progress of work may necessitate a new mix design. The strength requirements for each class of concrete shall be as specified in Table 10.

Table 10. Composition and Strength of Concrete for use in Structure

Class of Concrete	Minimum Cement Content Per m^3 Kg (bag **)	Maximum Water Cement Ratio Kg/kg	Consistency Range in Slump Mm (inch)	Designated Size of Coarse Aggregate Square Opening Std. mm	Minimum Compressive Strength of 150mm x 300mm Conc. Cylinder Specimen at 28 days MN/m^3 (psi)
A	(360) (9 bags)	0.53	50 – 100 (2 – 4)	37.5 – 4.75 (1-½" – No. 4	20.7 (3000)
B	(320) (8 bags)	0.58	50 – 100 (2 – 4)	50 – 4.75 (2" – No. 4)	16.5 (2400)
C	380 (9.5 bags)	0.55	50 – 100 (2 – 4)	12.5 – 4.75 (1/2" – No.	20.7 (3000)

				4)	
P	440 (11 bags)	0.49	100 Max. (4 Max.)	19 – 4.75 (3/4" – No. 4)	37.7 (5000)
Seal	380 (9.5 bags)	0.58	100 - 200. (4 - 8.)	25 – 4.75 (1" – No. 4)	20.7 (3000)

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

** Based on 40 kg/bag

3.1.5 Consistency

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

3.1.6 Mixing and Delivery

Concrete may be mixed at the site of the construction, at a central point or by a combination of central point and truck mixing or by a combination of central point mixing and truck agitating. Mixing and delivery of concrete shall be in accordance with the appropriate requirement of AASHTO M 157 except as modified in the following paragraphs of this section, for truck mixing or a combination of central point and truck mixing or truck agitating. Delivery of concrete shall be regulated so that placing is at a continuous rate unless delayed by placing operations. The intervals between delivery of batches shall not be so long as to allow the concrete in place to harden partially, and in no case shall such an interval exceed 30 minutes.

In exceptional cases and when volumetric measurements are authorized, for small project requiring less than 75 cubic meters per day of pouring, the weight proportions shall be converted to equivalent volumetric proportions. In such cases, suitable allowance shall be made for variations in the moisture condition of the aggregates, including the bulking effect in the fine aggregate. Batching and mixing shall be in accordance with ASTM C 685, Section 6 through 9.

3.1.7 Mixing Concrete: General

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

All concrete shall be mixed in mechanically operated mixers. Mixing plant and equipment for transporting and placing concrete shall be arranged with an ample auxiliary installation to provide minimum supply of concrete in case of breakdown of machinery or in case the normal supply of concrete is disrupted. The auxiliary supply of concrete shall be sufficient to complete the casting of a section up to a construction joint that will meet the approval of the Consulting Engineer.

Concrete mixers may be of the revolving drum or the revolving blade type and the mixing drum or blades shall be operated uniformly at the mixing speed recommended by the manufacturer. The pick-up and throw-over blades of mixers shall be restored or replaced when any part or section is worn 20mm or more below the original height of the manufacturer's design. The first batch of concrete materials placed in the mixer shall contain a sufficient excess of cement, sand and water to coat inside the drum without reducing the required mortar content of the mix.

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

The batch shall be so charged into the mixer that some water will enter in advance of cement and aggregate. All water shall be in the drum by the end of the first quarter of the specified mixing time. Cement shall be batched and charged into the mixer so that it will not result in loss of cement due to the effect of wind, hoppers, or other conditions which reduce or vary the required quantity of cement in the concrete mixture.

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

All concrete shall be mixed for a period of not less than 1 – ½ minutes after all materials, including water, are in the mixer. During the period of mixing, the mixer shall operate at the speed for which it has been designed. When mixing is to cease for a period of one hour or more, the mixer shall be thoroughly cleaned. Mixers and agitators which have an accumulation of hard concrete or mortar shall not be used.

3.1.8 Conveying

Perform concrete placing at such a rate that concrete which is being integrated with fresh concrete is still plastic.

Deposit concrete in its final position without segregation, re handling, or flowing. Place concrete with buggies, buckets or wheelbarrows. No chutes shall be allowed except to transfer concrete from the mixer to the buggies and shall not exceed six meters in total length.

Do not place concrete with a free fall of more than 1-½ meters, except when approved sheet metal conduits, pipes or elephant trunks are employed. These conveyers, when used, shall be kept full of concrete and the ends kept buried in the newly placed concrete as pouring progresses.

Do not use concrete which becomes non- plastic or unworkable, or does not meet required quality control limits, or has been contaminated with foreign materials remove rejected concrete from the job site.

3.1.9 Placing Concrete

Deposit concrete in horizontal layers not deeper than 60 centimeters, and avoid inclined construction joints.

Deposit concrete in its final position within three hours from the time of mixing, after which it will be rejected.

Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, unit the placing of a panel or a section is completed.

Bring slab surfaces to the correct level with a straightedge, and then strike off.

Use bull floats to smooth the surface, leaving the surface free from bumps and hollows.

Do not sprinkle water on the plastic surface. Do not disturb the slab surface prior to start of finishing operations.

3.1.10 Consolidation

Consolidate each layer of concrete immediately after placing; by use of concrete vibrators supplemented by hand spading, rodding, or tamping.

Do not allow pouring without the use of vibrators. Avoid segregation due to over vibration. Do not use vibrators to transport or spread concrete inside the forms.

Stop vibration when mixture ceases to decrease in volume. When possible, concreting shall be continuous until the section is complete.

3.1.11 Construction Joints

Construction joints shall be made only where shown on the Plans or called for in the pouring schedule, unless otherwise approved by the Supervising/Consulting Engineer. Shear keys or reinforcement shall be used, unless otherwise specified, to transmit shear or to bond the two sections together.

Before depositing new concrete on or against concrete which has hardened, the forms shall be retightened. The surface of the hardened concrete shall be roughened as required by the Engineer, in a manner that will not leave loose particles of aggregate or damage concrete at the surface.

The placing of concrete shall be carried continuously from joint to joint. The face edges of all joints which are exposed to view shall be carefully finished true to line and elevation.

3.2 Architectural Concrete

Mouldings, Trims, shoes and other architectural concrete shown in Plans shall have the same concrete mix design as structural concrete. Design, configuration and reinforcements shall be as shown in Plans.

3.3 Finishing Concrete

3.3.1 Ordinary Finish

Immediately following the removal of forms, all formwork and irregular protection shall be removed from all surfaces except from those which are not to be exposed or are not to be waterproofed. Complete repair on concrete imperfections within 24 hours after removal of forms. Neatly remove pins from exposed surfaces. On all surfaces the cavities produced by form ties and all other holes, honeycomb spots, broken corners or edges and other defects shall

be thoroughly cleaned, and having been kept saturated with water and made true with a mortar and fine aggregate mixed in the proportions used in the grade of concrete being finished. Concrete that is damaged or honeycombed must be removed to reach concrete and replaced with the dry-pack mortar, or concrete as hereinafter specified. Where large bulges and abrupt irregularities protrude, the protrusions shall be removed by grinding. Use dry-pack filling for holes whose width is less than its depth, for holes left by removal of fasteners from the ends of form tie-rods, for grout and pipe recesses, and for narrow slots cut for repairing of cracks. Do not use dry pack for filling behind reinforcements or for filling holes that extend completely through the concrete.

Use motor filling placed under pressure by a motor gun for holes too wide for dry-pack filling and too shallow for concrete filling and not deeper than the far side of the reinforcement nearest to the surface.

Use concrete filling for holes extending entirely through the concrete, for holes greater in area than 1,000 square centimeters and deeper than 10 centimeters, and for holes, which extend beyond the reinforcements.

Mortar to be used shall not be more than one (1) hour old. All construction and expansion joints in the completed work shall be left carefully tooled and free of all mortar and concrete. The joint filler shall be left exposed for its full length, with clean and true edges.

All concrete shall be given Class 1, Ordinary Finish and additionally any further finish as specified. The resulting surfaces shall be true and uniform. All repaired surfaces, the appearance of which is not satisfactory to the Engineer, shall be "rubbed" as specified below.

3.3.2 Rubbed Finish

After removal of forms, the rubbing of concrete shall be started as soon as its condition will permit. Immediately before starting this work, the concrete shall be kept thoroughly saturated with water for a minimum period of three hours. Sufficient time shall have elapsed before the wetting down to allow the mortar used to thoroughly set. The mortar shall be composed of cement and fine sand mixed in the proportions used in the grade of concrete being finished. Rubbing shall be continued until all form marks, protections and irregularities have been removed, all voids have been filled, and a uniform surface has been obtained.

Unless otherwise specified, the following surfaces shall be given a Class 2, Rubbed Finish.

The exposed faces of piers, abutments, wingwalls and retaining walls.

The outside faces of girders, T-beams, slabs, columns, brackets, curbs, headwalls, railings, arch rings, spandrel walls and parapets.

3.4 Specialty Placed Concrete

Ready mixed concrete defined in this specification as concrete poured regularly by a commercial establishment and delivered to the purchaser in a plastic state. Subject to approval of the Supervising/Consulting Engineer, ready mixed concrete maybe used provided that:

The plant has sufficient capacity and transportation equipment to deliver the concrete at rate desired,

The plant meets the requirements specified herein before for equipment, measurement of materials, and mixing, except as modified herein. The cement, aggregates, water and admixtures shall conform to all applicable requirements of this specification.

Ready mixed concrete not specified otherwise hereinafter shall be mixed and delivered by means of truck mixing, combination central plant and truck mixing or central plant mixing as directed and approved by the Engineer.

3.5 Water Concrete Curing

All concrete shall be kept moist for a minimum of seven consecutive days immediately after pouring by the use of wet burlap, fog spraying, curing compounds or other approved methods.

Waterproof kraft paper or polyethylene-coated waterproof paper for concrete curing shall be of commercial quality.

Burlap, plain or polyethylene coated burlap shall be of commercial quality

4. PRE-CAST CONCRETE

4.1 Structural Pre-stressed Concrete

4.1.1 Installation

Installation for floor system shall be as recommended by the Contractor or Manufacturer and as specified herein.

4.1.2 Shoring

Shoring shall be provided by the Contractor. Concrete joist shall rest firmly before pouring of concrete topping. Shoring members shall be capable of supporting the dead weight of concrete joist and concrete topping. For c-joist more than 5m span, quarter spacing of shoring is required. For concrete joist 3.00-5.00 m span, mid span shoring is required. For concrete joist less than 3.00 m span, no shoring is required.

4.1.3 Steel forms

Removable steel forms, steel stiffeners and other wood forms as required shall be removed as recommended by the Engineer after pouring of concrete topping. However, shoring of the concrete joist must remain in place for not less than seven (7) days.

4.1.4 Pointing and Cleaning

After removal of forms, all damaged portions shall be pointed and repaired. Excess mortar shall be removed and care shall be taken to prevent damage while on the curing period.

4.2 Architectural Mouldings and Lamp posts

4.2.1 Installation

Installation shall be as recommended by the Contractor or Manufacturer.

END OF SECTION

DIVISION 05 MASONRY

PART I-GENERAL

Concrete Masonry Unit Corners shall be protected from damage, with substantial board covers. Mortar or grout stains on masonry work shall be removed immediately. Any masonry work showing stains from mortar or concrete, or grout at completion of work, shall be replaced or the entire masonry surface sandblasted to provide uniform approved appearance. In cleaning the block, only stiff fiber brushes and wooden scrapers shall be used. Metal implements or acids shall not be used for cleaning blocks. All imperfect joining, nail holes, chipped edges of corners, and similar defects shall be corrected or replaced as directed.

TESTING AND SAMPLING BRICK UNITS FOR RESTORATION

In sampling the blocks for strength, absorption and moisture content determination, ten (10) individual units shall be selected from each 50,000 units or fraction thereof, contained in the lot. For non-load bearing type of CHB, no sampling for test shall be required for less than 500 units to be used in the job.

Units shall be tested in accordance with the standard method of testing Masonry units of the ASTM designation. No blocks shall be used unless results of tests are known and duly approved by the supervising Architect/Engineer.

PART II- PRODUCTS

1. CONCRETE UNIT MASONRY

Concrete hollow blocks shall be standard machine fabricated and shall have fine and even texture and well defined edges. All non-load bearing type concrete blocks shall have a unit weight not to exceed 80 PCF. For load bearing type, a minimum compressive strength of 6.90 MPa shall be developed. Samples shall be tested and submitted to the Consulting Engineer. Dimensions and tolerances shall be as individually specified on the Plans.

Provide units of dimensions shown on the Plans. Where dimensions are not shown on the Plans, provide units having nominal dimensions of 4" x 8" x 16" shown or otherwise required. Provide accessory shapes as indicated or otherwise required.

2. PORTLAND CEMENT

Portland cement shall comply with ASTM C150, type I

3. REINFORCEMENTS

Reinforcements shall be based on wall thickness as shown in Plans

4. FINE AGGREGATES

Fine aggregate shall conform to the requirements of AASHTO M 45 (ASTM C 144). Provide clean, sharp, well graded aggregate free from injurious amounts of dust, lumps shale, alkali, surface coatings and organic matter.

5. WATER

Water shall conform to the requirements of Item 714, Water. Provide water, free from deleterious amounts of acids, alkalis, and organic materials.

6. LIME

Provide hydrated lime complying with ASTM C207, or quicklime complying with ASTM C5.When quicklime is used, Slake and then screen through a 16 mesh sieve. After slaking and screening, but before using, store and protect for not less than ten days.

PART III-EXECUTION

1. MASONRY MORTARING

Unless otherwise indicated on the Plans, masonry mortar shall be composed of one (1) part Portland cement, and two (2) parts fine aggregate by volume to which hydrated lime has been added in an amount equal to ten (10) mass percent of the cement. Grout shall be of the same materials and proportion as mortar to which additional water shall be added to produce a consistency for pouring without segregation.

1.1 Mixing

Provide mortar type 'M' or type "S", as designated on the Plans or otherwise directed by the Consulting Engineer, and in accordance with ASTM C270.

1.2 Proportions

For type "M" mortar, provide one part Portland cement to ¼ part hydrated lime and 3-3/4-part sand by volume.

For type "S" mortar, provide one part Portland cement to ½ part hydrate lime and 4-1/2-part sand by volume.

Mechanically mix in a batch mixer for not less than three minutes, using only sufficient water to produce a mortar, which is spreadable, and of a workable consistency.

Plastic cement shall have less than 12% of the total volume in approved types of plastic agents and shall conform to all of the requirements for Portland Cement per ASTM C-150

Mortar shall be re-tempered with water as required to maintain high plasticity. Re-tempering on mortar boards shall be done only by adding water within a basin formed with mortar and mortar re-worked into water.

1.3 Admixture

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

The use of admixtures shall not be permitted in mortar without reducing the lime content.

Insert coloring pigments maybe added but not to exceed 6% by weight of cement

2. MASONRY GROUTING

Grout for pouring shall be of fluid consistency and mixed in the proportion by volume: 1 part Portland Cement, 2-3 parts maximum damp loose sand. Grout for pumping shall be fluid consistency and shall not have less than 7 bags of cement in each cubic meter. The mix design shall be approved by Consulting Engineer.

Concrete hollow blocks shall be laid with all cells completely grouted from the wall footing up to the ground level. The rest of the concrete hollow blocks above ground shall have at least 50 percent of the cells grouted, including those containing the vertical reinforcements.

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

Mortar dropping should be kept out of the grout space. All grout shall be puddled or vibrated in place.

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

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

Spaces around door frames and other built-in items shall be filled solidly with grout of mortar.

3. MASONRY ANCHORAGE AND REINFORCING

3.1 Masonry Anchors

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

3.2 Masonry Reinforcing Bars

Wall reinforcements shall be as follows:

Table 8.Masonry Reinforcements

Wall Thickness	Vertical Reinforcement	Horizontal Reinforcement
8 in (200 mm)	12 mm Ø @ 600 mm	10 mm Ø @ 600 mm
6 in (150 mm)	12 mm Ø @ 600 mm	10 mm Ø @ 600 mm
4 in (100 mm)	10 mm Ø @ 600 mm	10 mm Ø @ 600 mm

Lap splices shall be 40db long (minimum) where splice dowels from footing or slabs shall extend into the block wall a minimum of 40db and dowels to match.

All reinforcing steel, except dowels in concrete, shall be accurately set in strict accordance with the Plans and the notes thereon. Vertical steel shall be secured firmly in place by means of frames or other suitable devices. Horizontal steel may be placed as the work progresses. In any core containing reinforcement, the distance between any

masonry and the reinforcement shall be at least 12.7 mm (1/2 in) at all points. The masonry contractor shall furnish all tiles, spacers and supports required to hold steel in position during grouting. Cores shall be grouted in lifts not exceeding 1.22 m (4 ft) in height. Grout shall be thoroughly rodded. Splices in reinforcing bars shall be lapped at a distance sufficient to develop the stress in the bar, but not less than 40 bar diameters.

Reinforcing steel shall be straight except for bends around corners and where bends or hooks are detailed on Plans.

Provide 1-16 mm Ø vertical bars with 38 mm clearance from openings at corners, intersections, end of walls and each side of openings.

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

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

3.3 Lintel Beams

Unless noted otherwise, lintel beams to be used shall have a depth of 0.20 m and the thickness of CHB wall, reinforced by 4 – 10 mm Ø bars with 10 mm Ø at 150 mm stirrups.

Lintel beams shall be provided on top of CHB wall openings. It shall extend at least 0.20 m beyond each opening.

Stiffener beams (detail similar to lintel beam) shall be provided on top CHB partition walls not anchored to regular reinforced concrete beams/girders. Stiffener beams shall be provided for walls exceeding 3 meters in height.

3.4 Dowels

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

3.5 Setting Embedded Items

All anchor bolts and miscellaneous metalwork embedded in masonry shall be set in accordance with setting plans or instructions furnished by trades supplying the metalwork. Care shall be exercised to ensure that all anchors are completely surrounded by grout.

3.6 Masonry Lintels

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

3.7 Movement Gaps

3.7.1 Control Joints

Do not continue bond beams or joint reinforcing across control joints.

Install preformed control joint filler at locations indicated on Plans.

Use proper size material to create sealant joint space.

Backer rod and sealant installed according to Plans.

3.7.2 Expansion Joints

Install expansion joint filler material on centreline of wall at locations indicated on drawings

Backer rod and sealant installed according to Plans.

3.7.3 Seismic Joints

Provide seal and cover at both faces of joint, as indicated in Plans.

Secure seal to face of wall.

4. MASONRY WORKMANSHIP

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

All cells of CHB walls from footing up to at least the ground floor level shall be filled up. Clean the top surface of foundation free from dirt, debris, and laitance, and expose the aggregate prior to start of installing first course Solid units shall be laid with full head and bed joints. Joints shall be uniform and approximately 10 mm wide unless otherwise indicated.

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

Unless otherwise shown on the Plans, joints of exterior concrete masonry units that will be exposed and painted shall be cut flush and tooled finished with a 6.5 mm depth "V" joint for horizontal joints. Vertical joints between the horizontal joints shall be tooled flush. Joints of interior concrete masonry units shall be cut flush, and the blocks shall be given a cement plaster finish except as otherwise shown on the Plans. The minimum of cement plaster shall be 10 mm.

Use masonry saws to cut and fit masonry units and cuts shall be neat and true to line..

Accurately fit the units to plumbing, ducts, opening, and other interfaces, neatly patching all holes.

Keep the walls continually clean, preventing grout and mortar stains. If grout does run over, clean immediately.

Unless otherwise shown on the Plans, provide running bond with vertical Joints located at center of masonry units in the alternate course below.Do not use chipped or broken units. If such units are discovered in the finished wall, the Architect may require their immediate removal and replacement with new units at no additional cost to the owner.

Concrete masonry units shall be laid with thicker edge of the core up to provide a wide mortar bed. Both face core and ends of blocks should receive a full bed of mortar. Cross web should be mortared.

Intersecting masonry walls and partitions shall be bounded by the use of steel ties.

END OF SECTION

DIVISION 07 WOOD, PLASTICS, AND COMPOSITES

PART I-GENERAL

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

Stress grade lumber is seasoned, close grained and high quality lumber of the specified specie, free from defects and suitable for sustaining heavy load.

Stress grade lumber shall be used for wooden structural members subject to heavy loads, and for sub-floor framing embedded or in contact with concrete and masonry.

Select grade lumber of the specified specie is generally of high quality of good appearance, without imperfections, and suitable for use without waste due to defects and suitable also for natural finish. Select grade lumber shall be used for fascia and base boards, trims, moulding, mill work, shelves, doors, frame of openings as specified and shown in Plans.

Common grade lumber has minimum tight medium knot larger than 25mm in diameter, with minimal imperfections, without sapwood, without decay, insect holes, and suitable for use with some waste due to minor defects and suitable also for paint finish. Common grade lumber shall be used for light framework, and nailers.

Dressed lumber for exterior and interior finishing for doors and windows and millwork shall be kiln-dried having no moisture content in excess of 14 percent at the time of its installation.

Any lumber equally good for the purpose extended may be substituted for the specific kind subject to the prior approval of the Consulting Architect/Engineer. Provided that the substitution shall be of equal or better specie acceptable to the Supervising/Consulting Architect/Engineer.

In case of substitution with better specie, no additional cost therefore shall be allowed to the General Contractor.

All lumber shall be surfaced four sides. All cutting, framing and fitting necessary for accommodation of other work shall be provided. All nails, spikes, screws, bolts, clips, anchors, shapes and any other rough hardware, necessary for the completion of the work, shall be provided.

STORAGE AND PROTECTION OF MATERIALS

Lumber and other materials shall be protected from dampness during and after delivery at the site.

Materials shall be delivered well in advance of actual need and in adequate quantity to preclude delay in the work.

Lumber shall be piled in orderly stack at least 15.0 cm. above the ground and at sheltered place where it will be of least obstruction to work.

Lumber and woodwork shall be covered and protected from the elements until used.

Building shall be thoroughly dry before the finish is placed in them.

Exterior and interior finish shall be dressed and smooth. Finishing woodwork shall be hand smoothed and sanded at the site as necessary to produce the proper finish.

Where practicable, millwork shall be fabricated in the shop, doweled and mortised and tenoned together, backed up and glued machine and hand sanded to a smooth surface, and delivered to the site, ready to be secured in place.

PART II- PRODUCTS

1. CABINETRY

1.1 Prefinished Plywood Paneling

Plywood shall be of good grade and made of laminated wood strips bonded together with water resistant resin glue.

The laminated glue core shall be finished both faces with select grade tanguile or red lauan veneers or equivalent not less than 2mm thick, similarly bonded to the core.

The plywood of not less than 19mm thick shall be free from defects such as split in veneer, buckling or warping and shall conform to the requirements of the Philippine Trade Standards 631-02.

Thickness of a single layer of laminate shall not be less than 2mm. The laminate shall be superimposed in layers with grains crossing at right angles in successive layers to produce stiffness.

The face veneers shall be rotary cut from selected grade timber. The laminate and face veneers shall be bonded with water resistant resin glue, hot pressed and pressure treated.

Waterproof or marine plywood shall be used for exposed to moisture.

Cabinet sides, counters and doors shall be 19 mm thick.

Drawer fronts shall be 19 mm thick, sides and back shall be 12 mm with glued dovetail or multiple dowel joints.

2.2 Hardware

Drawer guides shall be heavy duty, full over travel-extension, ball bearing type.

Concealed Hinges shall be full overlay, self-closing.

Pulls shall be solid stainless steel pulls, fastened from back with two screws. Provide longer pulls for drawers more than 24 ".

2. CEILINGS

2.1 Fiber Cement Board

Fiber Cement board to be used in ceilings shall be of good grade and shall be 6 mm and 12 mm thick as shown on Plans, tempered or oil impregnated for moisture/water resistance.

Texture shall be subject to the approval of Consulting Architect/Engineer.

3. FASTENERS

Nails of adequate size shall be steel wire, diamond-pointed, ribbed shank and bright finish. Nails shall not be driven close together than one half their lengths unless driven in bored holes or closer to the edge of the timber than one quarter their length. Nails shall penetrate by at least half their length into the timber farthest from the head. End distance, edge distance and spacing of nails shall be such as to avoid splitting of wood.

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

Lag screw of adequate size, for anchoring heavy timber framing in concrete or masonry, shall be galvanized steel. Lag screw shall be set into pre-bored lead holes and not driven. The lead hole for the shank shall have the same diameter as the shank and the same length as the threaded portion.

Bolts and nuts shall be of steel having a yield point of not less than 245 Mpa. Bolts shall have square heads and provided with standard flat steel washers and hexagonal nuts. Bolts shall be set into drill holes suitably sized enough for snug fit. All nuts shall be accessible for servicing by wrenches. Length of the bolts shall be enough to extend through the nut and an allowance for nut tightening.

Threads shall conform to American coarse thread series. The threaded portion shall be long enough such that the nut can be tightened against the bolted members without any need for blocking.

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

All materials to be incorporated in the wood, plastics and composites shall be of approved quality as specified. Before using, all materials shall have been inspected and accepted by the Consulting Architect/Engineer.

4. MILL WORKS

Mill works such as fascia, trims, casings and mouldings shall be sound, plumb, properly treated or finished, and adequately seasoned. Design and Configurations shall be approved by the Consulting Architect.

5. WOOD TREATMENT

Lumber, plywood and plyboard specified and treated with approved wood preservative shall be pressure treated with water borne preservative as wolman salt, boliden salt or tanalith H-R.

Pressure treatment shall meet the standards set by the American Wood Preservers Association per publication C 2-77, or Philippine Trade Standards PTS 243-02.00 as to penetration and amount of chemicals retained in the treated lumber.

Pressure treated lumber shall be accompanied by a certification of pressure treatment from the wood preserving plant as to the pressure treatment, sizes and quantity of wood treated.

Notwithstanding the presentation of said certification, the supervising Architect/Engineer may require physical inspection and undertake borings to ascertain penetration of preservative into the wood.

PART III-EXECUTION

1. FINISH CARPENTRY

Finished carpentry covers work on ceiling boards, cabinets, fabricated woodwork, millwork and trims.

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

Panels shall be fitted to allow for construction or expansion and ensure that the panels remain in place without warping, splitting and opening of joints.

Exposed edges of plywood shall be provided with select grade hardwood strips, rabbeted as necessary, glued in place and secured with finishing nails. To prevent splitting, hardwood for trims shall be drilled before fastening with nails or screws.

Fabricated woodwork shall be done preferably at the shop. It shall be done true to details and profiles indicated on the Plans.

Where set against concrete or masonry, woodwork shall be installed after curing is completed.

Exposed wood surfaces shall be free from disfiguring defects such as raised grains, stains, uneven planning, sanding, tool marks and scratches.

Exposed surfaces shall be machine or hand sanded to an even smooth surface, ready for finish.

END OF SECTION

DIVISION 08 THERMAL AND MOISTURE PROTECTION

PART I-GENERAL

Materials shall be delivered in original sealed containers, clearly marked with brand name and type of materials.

Materials shall be stored at temperature specified with normal handling to prevent damage to container. Do not store for long periods in direct sunlight.

Manufactured coating materials shall delivered to the site in the original sealed containers or package bearing the manufacturer's name and brand designation.

To have a bond between the membrane waterproofing and the slab, concrete topping shall be placed as the membrane dries after 48 hours of application.

If a bond is not required, the membrane shall be protected with asphalt asbestos board or asphalt felt paper until such time as topping and concrete covering is applied.

Prior to topping or placing concrete cover, inspect the membrane for any damage and repair work as required.

PART II- PRODUCTS

1. WATERPROOFING/DAMPPROOFING

1.1 Waterproofing for Concrete Roof Decks, Toilets, Canopies, Concrete gutters

Provide membrane waterproofing where shown on the Plans, as specified herein, and as needed for a complete and proper installation.

1.1.1 Integral waterproofing

Integral waterproofing compound shall be cementitious powder pre-mix admixture or water base surface coat conforming with the standard Specifications set by the Bureau of Product Standards, Department of Trade and Industry.

1.1.2 Membrane Waterproofing

Membrane waterproofing shall be osmo-seal powder, liquid elastomeric or epoxy solvent less waterproofing compound formulated for extra flexibility and resiliency to give lasting waterproof effect.

2. THERMAL INSULATION

2.1 Ceilings

Mat or blanket insulation shall be 50mm thick with aluminum foil membrane facing and with edges suitable for fastening insulation to supporting members. Insulation including affixed vapor barrier, shall have a flame spread rating not greater than 25 and a smoke developed rating not greater than 50 when tested in accordance with ASTM e84.

Fasteners and adhesives shall be approved standard product of insulation manufacturer.

3. ROOF GARDEN

Base concrete shall be lined with quality impervious liner, topped with cushion layer. Air drain Geocell drainage layer shall then be placed on top of the cushion layer, covered with filter fabric and finally synthetic turf on top.

All materials shall be quality standard, from a reputable Roof Garden manufacturer/Installer and approved by Procuring Entity and Consulting Architect/Engineer.

PART III-EXECUTION

1. WATERPROOFING / DAMPPROOFING

1.1 Field Quality Control

Waterproofed areas shall be given 24-hour flood test upon completion of the waterproofing. Allow system to cure 48 hours prior to flood test or until dry enough to support foot traffic and test.

Waterproofing works shall be done in a skillful manner, completely watertight, and free from loose applications. The Contractor shall submit a guarantee certificate against water leaks for a period of five years. In case of failure within the guarantee period, the General Contractor shall repair the defective work free of charge to the Procuring Entity.

1.2 Application

1.2.1 Integral Waterproofing

Mixture shall be applied by notched trowel, squeegee, roller, paint brush or airless spray and shall remain tight under condition of expansion.

Concrete mixture for roof decks, toilet, gutters, parapets and other areas indicated on the Plans to be integrally waterproofed shall be blended with integral waterproofing compound.

Only a minimum quantity of clean water shall be used in the concrete mixture to be sufficiently plastic and to obtain enough workability in placing concrete.

Top barrier or coating shall be a mixture of high early strength Portland cement with fine silica sand and water-white elastomer chemicals to provide a cementitious water barrier for concrete. Application of cementitious barrier or coating shall be 90 mils thick.

Concrete slab shall be properly graded to drain rainwater. A minimum pitch of one percent (1%) is satisfactory to drain water freely into the drain lines.

Drainage connection and weep-holes shall be set up to permit the free flow of water.

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

Prepared surfaces shall be cured and kept wet by sprinkling water at regular intervals for a period of atleast three days when smooth surface finish is actually set.

Allow cured surfaces to dry and remove all dust, dirt, debris and oil.

All loose areas shall be refitted and well secured. Repair cracks, breaks and open seams. Where required or as directed in the membrane waterproofing product instruction manual, prepared surface shall be prime coated.

1.2.2 Membrane Waterproofing

Prior to application, concrete surfaces shall be sound and cured without the use of curing compound.

Apply a coat of neutralizer to remove oil, dirt, and other contaminants

Apply a coat of concrete primer on surfaces to be installed with membrane self-sealing type when required or as directed in the product instruction manual.

Stir thoroughly each container of membrane waterproofing before use.

Apply a coat of membrane waterproofing by manufacturer standard through brush, airless spray, notched trowel, squeegee or roller, with approval of the Supervising/Consulting Engineer.

Three applications is recommended and each coat is allowed a minimum of 24 hours curing time between each coat or as recommended in the product manufacturer's instruction manual.

Application of membrane waterproofing coat should not commence unless ambient temperature is 4.44° C or higher and shall not proceed during inclement weather condition.

The waterproofing compound is combustible. Extra care shall be observed by persons having skin sensitiveness to wear protective gloves while applying.

All surfaces on which coating is to be applied shall be steel trowelled finish, dry, clean, smooth and free from oil or grease and from projections that might puncture the coatings. Floor surfaces shall be kept dry prior to and during installation.

Concrete surfaces like basement, deck, plant boxes, etc., are free of ridges or sharp projections.

Concrete must be cured for a minimum of 14 days.

Concrete shall be finished by a power or hand steel trowel followed by soft hair broom to obtain light texture or light sidewalk finish.

Method of application shall be as per manufacturer's specifications to attain the thickness specified hereinbefore.

At all integral flashing, apply 120-mil thick of cementitious coating to the surface to be flashed extending 150mm unto the floor slab and up the vertical wall.

2. THERMAL INSULATION

All surfaces on which insulation and vapor barriers are to be applied shall be clean, smooth, dry, and free from any projections which might puncture the vapor barriers. The condition of the surfaces shall be inspected and approved by the Construction Architect/Engineer immediately before the work is started.

Each space between framing members shall be insulated completely with blanket insulation. Continuous strips of blanket shall be cut to required length for attachment at top and bottom. Blankets shall be butted snugly. Affixed facing shall be installed facing toward the interior side of the construction. Insulation shall be secured in place by use of nailing strips, or an approved adhesive standard of manufacturer. The insulation shall be installed after all electric wiring, plumbing, and other concealed work are in place; areas around electrical outlets, pipes, and all protruding objects shall be snugly fitted. When water pipes occur in ceiling construction, insulation shall be applied between the ceiling and the pipe. Large pipes may require compression or removal of some of the insulation, retaining the vapor-barrier facing. The insulation shall be cut to fit, angles, corners, or irregular spaces, always forming a flange of the affixed facing where insulation is to be fastened to the forming. All joints or breaks shall be sealed in a manner that will assure a continuous vapor barrier capable of effectively controlling condensation.

3. ROOF GARDEN

Roof garden works shall be done in a skillful manner preferably from a reputable Roof garden manufacturer, contractor/ installer; completely watertight, and free from loose applications. The Contractor shall submit a guarantee certificate against water leaks and defects for a period agreed upon by the Contractor, Procuring Entity and Consultants.

A pre-installation meeting shall be coordinated by the Roof Garden Contractor, Consultants, Procuring Entity and other trades working on the roof system both before and after installation. The purpose is to discuss the necessity of ensuring proper membrane protection during all phases of installation and to review other applicable requirements of unusual field conditions.

When feasible, begin the application at the highest point of the highest roof level and work to the lowest point to prevent moisture infiltration and minimize construction traffic on completed sections. This will include completion of all flashings and terminations.

The Consulting Engineer must ensure the ability of the structure to withstand the total weight of the specified roofing system, as well as construction loads and live loads. Defects in the roof deck must be reported to the General Contractor and Consulting Engineer for assessment. Roof garden Contractor shall not proceed unless defects are corrected.

Prior to application, concrete sub base shall be sound and cured without the use of curing compound and waterproofed by the waterproofing material recommended by the Roof Garden manufacturer. Sub base must be dry, relatively smooth and free of protrusions, debris, sharp edges or foreign materials and must be free of accumulated water.

END OF SECTION

DIVISION 09 OPENINGS

PART I-GENERAL

Stockpile items sufficiently in advance to assure their availability, and make necessary deliveries in a timely manner to assure orderly progress of the total work.

Coordinate as necessary with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

Upon completion of the work, and as a condition of its acceptance, provide the inspection, adjustment, and report.

Materials list of items proposed to be provided under this Section.

Manufacturer's specifications and other data needed to prove compliance with the specified requirements

Shop Drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades.

Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

Provide quality grade wooden doorframes in the types and designs indicated on the Plans and properly reinforced for the finish hardware required.

All parts shall be protected adequately to ensure against damage during transit and construction operations.

1. DOORS, FRAMES AND PARTITIONS

1.1 Repair of Existing Steel Grille Doors and Windows

Work includes:

Doors:

Cutting of excess grilles along designated cutting lines to adopt to new finish floor line

Chipping of concrete jambs to remove bottom hinges of door grilles

Joining (Re-welding) of steel grille door bottom frame to existing door

Re-installation of bottom hinges to concrete walls / re-welding to installed bottom frame

Restoration of chipped-off concrete on door jambs

Windows:

Chiiping of concrete to remove defective window grilles or as necessary

Cutting of defective grilles/ grilles not conforming to design

Fabrication of window grilles according to design and configuration

Joining (Re-welding) of window grilles as necessary

Re-installation of new/restored window grilles

1.2 Wooden Panel Doors

Panel doors shall be protected against damage and dampness. Doors shall be stored under cover in a well ventilated building where they will not be exposed to extreme changes in humidity. They shall not be brought into the structure until plastering has been completed and is thoroughly dry.

1.3 Customized Metal Door Backing

Provide metal fabrications, miscellaneous metal, and related accessory items, galvanized and prime painted, complete, as shown on Plans and specified.

1.4 Glass Entrances and Partitions, including Customized Glass Door Backing at Existing Steel Grille Doors

All steel, stainless steel and aluminum parts shall be protected adequately to ensure against damage during transit and construction phase.

The Contractor does not only protect all entrance units during the construction phase but shall also be responsible for removal of protective materials and cleaning the aluminum and steel surface including glazing before work is accepted by the Consulting Architect/Engineer.

Aluminum frames and stainless steel finishing hardware shall be thoroughly cleaned with kerosene or gasoline, diluted with water and then wipe surface using clean cloth rugs. No abrasive cleaning materials shall be permitted in cleaning surface.

Upon completion of the building, cracked, broken or imperfect glass, or glass which has been set improperly shall be replaced. Glass surfaces shall be thoroughly cleaned, with labels; paint spots, putty, and other defacements removed, and shall be clean at the time the work is accepted.

2. CURTAIN WALL ASSEMBLY

A qualified independent testing agency to test glazed curtain-wall systems for compliance with specified requirements for performance and test methods should be employed. Provide test specimens and assemblies representative of proposed materials and construction.

Select sizes and configurations of assemblies to adequately demonstrate capability of glazed curtain-wall systems to comply with performance requirements

Conduct meeting at Project site to review methods and procedures related to glazed curtain-wall systems including, but not limited to, the following:

Review structural load limitations.

Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

Review required testing, inspecting, and certifying procedures.

Notify Consulting Architect seven days in advance of the dates and times when assemblies will be constructed.

2.1 Special Assembly Warranty

Contractor's standard form in which Contractor agrees to repair or replace components of glazed curtain-wall systems that do not comply with requirements or that deteriorate as defined in this Section within specified warranty period as agreed upon by the Procuring Entity and Consultants from date of Substantial Completion.

Failures include, but are not limited to, the following:

Structural failures including, but not limited to, excessive deflection.

Noise or vibration caused by thermal movements.

Deterioration of metals (metal finishes), and other materials beyond normal weathering.

Water leakage.

Failure of operating components to function normally

3. WINDOWS

3.1 Customized Aluminum Framed Glass Windows on Existing Steel Window Grilles

Fabricate custom windows as shown in Plans. Verify window openings by field measurements before fabrication and indicate measurements on Shop Drawings.

4. METAL FRAMED SKYLIGHTS

4.1 Dome Metal Framed Skylight

Plastic skylights on metal frame must meet the requirements of required polycarbonate thickness adequate to withstand positive and negative test pressure.

5. DOOR HARDWARE

With the delivery of permanent keys, deliver to the Owner one complete set of adjustment tools and one set of maintenance manuals for lockets, latch, sets, closets, and panic devices.

After hardware has been properly fitted, all exposed items such as knob platers, pulls, locks., etc. shall be removed until final coat of painter's finish has been approved, and then hardware installed.

Other items of hardware, unless to be painted over that are not to be removed before painting shall be properly marked or completely covered until final coat of painter's finish has been applied, after which such protective cover shall be removed.

The Contractor shall place his order for all hardware early in order to avoid delay in the job. No request for extension of time shall be entertained by the Procuring Entity due to this delay and no substitution of hardware shall be allowed due to negligence of contractor on this matter.

6. GLAZING

Clean all glass on both sides after putty has been applied completely. Do not disturb edge of putty with scraper. At completion of work leave glass and glazing works free from cracks and rattles and clean on both sides.

Glass shall be provided with caution stickers to call attention. Wherever needed, glazed glasses shall be protected using protective materials.

Work instruction on glass fitting and installation should strictly follow a standard precautionary measure to avoid damage or breakage on glass and secure total work safety. Glazing and fitting methods shall depend on the type of frame and glass to be used. Glazing on conventional frame section such as aluminum shall be glazing bead, glazing channel or sealant as caulking materials while glazing on concrete or metal channel support shall be sealant or glazing gaskets.

The sizes to provide for the required edge clearances shall be determined by measuring the actual opening to receive the glass. The labels shall be left in place until installation is approved. Movable items shall be securely fixed, or in a closed and locked position until glazing compound has thoroughly set. Beads or stops which are furnished with the items to be glazed shall be used to secure the glass in place.

Items to be glazed shall be shop or field glazed, using the glass of the quantity and thickness specified or indicated, shall be in conformance with the detail and general conditions governing glazing manuals.

Clearances shall be as specified herein or as specified by glass manufacturer as approved. The minimum edge clearance shall not be less than the thickness of the glass. The face clearance of glass from rabbets or stops shall not be less than 3mm.

Sufficient glazing compound shall be applied to the entire perimeter

All glass and glazing materials shall be delivered at jobsite with labels affixed indicating quality, make type and thickness. Each glass in glazed position shall resist a design pressure of 244 kilograms per square meter.

6.1 Glass Elevator Shaft

Glazing shall conform to Plans and this Division under Section Glazing-Products. Fittings shall be heavy duty Spider Fittings that can accommodate glass thickness of 12 mm.

6.2 Mirrors

Mirror shall be clear glass substrate with high reflecting mirror coating, appropriate backing and sizes as shown in Plans.

6.3 Glass Railings

Glazing shall conform to Plans this division under Section Glazing-Products. Framing shall be under Division 06 Section Metal Fabrications-Stainless Stair Railings.

PART II- PRODUCTS

1. DOORS, FRAMES AND PARTITIONS

1.1 Repair of Existing Steel Grille Doors and Windows

The Contractor shall refer to Plans for the design for the existing steel grille doors and window grilles to be adopted.

1.1.1 Doors

3. WINDOWS

3.1 Customized Aluminum Framed Glass Windows on Existing Steel Window Grilles

3.1.1 Glazing

Plate glass shall be clear 6mm thick for customized windows on existing steel grilles. They shall be clear, except where indicated on the Plans as tinted, frosted, diffused or opaque.

3.1.2 Frames and Accessories

Frames for windows shall be fabricated from extruded aluminum section true to details with clean, straight, sharply defined profiles and free from defects impairing strength or durability. Extruded aluminum section shall conform to the specification requirements defined in ASTM B 211.

4. METAL FRAMED SKYLIGHTS

3.1 Glazing

4.5mm solid sheet structural polycarbonate

3.2 Frames and Accessories

Anchor profile cap to connecting profile

Aluminum connecting cap profile

Aluminum connecting profile

Aluminum base profile

2 ½ Sheet anchoring screw

Bell seal

Rubber sealing profile/gasket

5. DOOR HARDWARE

5.1 Wooden Panel Doors

5.1.1Heavy Duty Hinges

Butt hinges shall be provided 4 pieces for each door. Butt hinges shall be heavy duty, non-rising loose pin type, 75mm x 75mm, and wrought bronze or brass finish, button tips and mounting screws of the same material

5.1.2 Lockset/Handle set

Lockset shall be finish and type as recommended by the manufacturer on their specific use and as approved by the Consulting Architect. Other factors being equal, preference will be given to the lockset offering the larger number of non-ferrous components, of the types specified hereinafter. Knobs shall be located so that the center line of the strike is 97 cm nominal above floor line.

All lockset shall be installed in a neat, professional manner, following manufacturer's instructions. Except as indicated or specified otherwise, fasteners furnished with the lockset shall be used to fasten hardware in place. After installation, protect hardware from paint, stains, blemishes and other damages until acceptance of the work. All lockset shall be adjusted properly and checked in the presence of the Consulting Architect/Engineer, and all hinges, locks, bolts, pulls, closers and other items shall operate properly. After lockset is checked, keys shall be tagged, identified, and delivered to the Owner. All errors in cutting and fitting, and all damage to adjoining work shall be corrected, repaired and finished as directed.

Security lockset shall be delivered to the jobsite in their original individual containers with the necessary appurtenances; including screws, and instructions. Each individual container shall be marked with manufacturer's name and catalog number.

All lock and latch strikes shall be installed in door frames at the same height from the floor.

5.1.3 Door stopper

Door stop shall be heavy-duty,wall-mounted as indicated

5.1.4 Door pulls/handles, Door knobs

Door pulls, handles and door knobs shall be same finish as locksets or handle sets, sizes and configuration in accordance with the Plans.

5.2 Customized Metal Door Backing

Hardwares such as locks and hinges shall be as shown in Plans and to be approved by the Consulting Architect/Engineer.

5.3 Glass Entrances and Partitions, including Customized Glass Door Backing at Existing Steel Grille Doors

5.3.1 Hinges/Locks

Use Patch Fittings (L-Patch, Top and Bottom) and Patch Locks on Frameless Glass Entrances at Curtain Wall and Interior Partition Entrances

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

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

Weather strip shall be first class quality flexible vinyl forming an effective seal and without adverse deformation when installed.

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

5.3.2 Lockset/Handle set

Lockset shall stainless steel type for frameless glass doors as recommended by the manufacturer on their specific use and as approved by the Consulting Architect. Other factors being equal, preference will be given to the lockset offering the larger number of non-ferrous components, of the types specified hereinafter. Knobs shall be located so that the center line of the strike is 97 cm nominal above floor line.

All lock and latch strikes shall be installed in door frames at the same height from the floor.

5.3.3 Door stopper

Door stop shall be heavy-duty, wall-mounted as indicated.

5.3.4 Door pulls/handles, Door knobs

Door pulls, handles and door knobs shall be stainless steel finish, sizes and configuration in accordance with the Plans.

5.3.5 Frames

Frames for interior partitions shall be fabricated from extruded aluminum section true to details with clean, straight, sharply defined profiles and free from defects impairing strength or durability. Extruded aluminum section shall conform to the specification requirements defined in ASTM B 211.

6. GLAZING

6.1 Glass Elevator Shaft

6.1.1 Glazing

Tempered glass shall be heat strengthened clear 12mm thick for elevator shaft.

6.1.1 Fittings and Accessories

Spider fittings type shall be heavy duty 304L, double or 4-way arm as needed and as shown in Plans with structural sealant as approved by the Contractor and Consulting Engineer/Archhitect.

6.2 Mirrors

All comfort rooms whether shown or not, the General Contractor shall provide and fit securely in place at the most convenient height above each lavatory 1 mirror, made from local glazing quality polished plate glass 6 mm. thick with beveled edges and brass chromium plated frame 3 mm. thick waterproof tanguile marine plywood backing, all in accordance with full size details.

6.3 Glass Railings

Tempered glass shall be heat strengthened clear 12mm thick for railings

6.4 Miscellaneous Glazing Materials

6.1.1 Plate Glass

Plate glass shall be manufactured from float glass that is mechanically rounded and polished and sealed with a coating of silver and a uniform film of electrolytic copper plating, then applied with protective coating of paint to seal out moisture from the silver. Use where good vision is required.

6.1.2 Float Glass

This basic type of glass shall be manufactured by "floating" continuous ribbon of molten glass into a bath of molten tin where it is reheated to obtain a flat fire-polished finish and annealed slowly to produce a transparent float glass thus eliminating grinding and polishing. Used commonly in windows, sliding doors and window walls. Variation of this basic types are as follows:

Grade AA – Intended for use where superior quality is required.

Grade A - Intended for selected glazing.

Grade B - Intended for general glazing.

Greenhouse quality – Intended for greenhouse glazing where quality is not important.

6.1.3 Tempered Glass (Reflective/Clear)

Tempered or toughened glass is a safety glass processed by controlled thermal or chemical treatments to increase its strength compared with normal glass. Tempering puts the outer surfaces into compression and inner surfaces into tension. Such stresses cause the glass, when broken, to crumble into small granular chunks instead of splintering into jagged shards plate glass creates.

Tempered glass is made reflective by coating the outside with a transparent metallic coating to reflect a significant fraction of the light and radiant heat which strikes it.

6.1.4 Bulk compounds

Mastics that are elastic compounds and non-skinning compound.

Putties – shall be wood sash putty, or metal sash quality.

Sealant shall be chemically compatible with setting blocks, edge blocks and sealing tapes. It shall be single or two-component silicone rubber or two-component polysulfide type

6.1.5 Preformed sealants

Structural sealant

Synthetic polymer shall be base sealants that is resilient or non-resilient, weatherproof type.

Performed gaskets shall be compression or structural type.

6.1.6 Setting and Edge Blocks

Setting and edge blocks shall be made of lead or neoprene, chemically compatible with sealants.

6.1.7 Accessories

Glazing clips, shims spacer strips, etc. shall be made from non-corroding metal accessories.

PART III-EXECUTION

1. DOORS, FRAMES AND PARTITIONS

1.1 Repair of Existing Steel Grille Doors and Windows

1.1.1 Examination

Examine the substrate and conditions in which the work is to be installed. Correct unsatisfactory substrate and conditions prior to start of installation.

1.1.2 Preparation

Furnish setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as concrete inserts, anchor bolts, and miscellaneous items having integral anchor, which are to be embedded in concrete construction. Coordinate delivery of such items to project site.

Coordinate metalwork with adjoining work. Do cutting, shearing, drilling, punching, threading, tapping, etc., required for metal work and for attachment of adjacent work. Drill or punch holes; do not use cutting torch. Shearing and punching shall leave true lines and surfaces.

Obtain Consulting Architect/Engineer's review prior to site cutting or making adjustments to structural members not indicated to be cut or adjusted.

Clean and strip primed steel items to bare metal where site welding is to be done.

Make provision for erection loads with temporary bracing. Keep work in alignment.

1.1.3 Installation

Provide anchorage devices and fasteners for securing metal work to in-place construction, including threaded fasteners for concrete inserts, through bolts, lag bolts, screws, and other connectors as required.

Conceal fastenings where practical. Thickness of metal and details of assembly and supports shall give ample strength and stiffness. Form joints exposed to weather to exclude water.

Perform cutting, drilling, and fitting required for installation of metal work. Set work accurately in location, alignment, and elevation, plumb, level, true, and free of rack, measured from established lines and levels. Provide temporary bracing anchors in formwork for items which are to be built into concrete or similar construction.

Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Grind exposed joints smooth and touch up shop paint coat. Do not weld, cut, or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication and are intended for bolted or screwed field connections.

1.2 Wooden Panel Doors

Panel doors shall be decorative or carving type, from tanguile or Narra configuration and sizes as shown on Plans.

Frames shall be of the design, size and thickness as indicated. This shall be set plumb and true, and well-braced to prevent distortion. Frames in masonry or concrete walls shall be secured as indicated.

Provide panel wood door, design, and thickness shown on the door schedule in the Plans, labeled or non-labeled as indicated and required, and in solid core as shown on the Door schedule.

Grade: Except as may be shown otherwise on the Plans.

Fabricate the work of this Section to "custom grade" standards of the referenced organization. .

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.

1.1.1 Placing Frames

Except where specifically otherwise directed by the Supervising/Consulting Engineer/Architect, or not practicable because of construction conditions, place frames prior to construction of enclosing walls and ceilings. Set frames accurately into position, plumb, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.

1.1.2 Installation Procedure

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

Door panel shall be accurately joined at corners assembled and fixed rigidly to ensure weather tightness.

Panel doors and frames shall conform to best commercial standard. Doors and frames shall have wood preservative treatment.

Panel doors shall be levelled, hung plumbed, and fitted accurately allowing 2mm clearance at the jambs and heads. Lock stiles of doors, 45mm thick or thicker, shall be beveled 3mm in 50mm. Knob locks and latches shall be installed

1mm from finished floors to center knobs. Apply hardware with fastenings to size, quality, quantity and finish to provide workable door system.

1.1.3 Touch-up

Upon completion of the installation, visually check all exposed surfaces of the work of this Section and touch-up all scratches and abrasions to be completely invisible to the unaided eye from a distance of one and a half meters.

1.3 Customized Metal Door Backing

1.3.1 Fabrication

Verify dimensions on site prior to shop fabrication. Coordinate metalwork with adjoining work for details of attachment and fit. Be responsible for fabrication detailing and correct fitting of steel members to each other and to their supports.

Use materials of size and thickness shown in Plans or, if not shown, of size and thickness to produce strength and durability in the finished product for the utility intended.

Fabricate items with joints tightly fitted and secured. Make exposed joints butt tight, flush, and hairline.

Grind exposed welds flush and smooth with adjacent finished surface. Ease exposed edges to small uniform radius.

Fit and shop assemble in largest practical sections, for delivery to site and handling through building openings.

Provide components required for anchorage of metal fabrications. Fabricate anchorage and related components of same material and finish as metal fabrication, except where specifically noted otherwise.

1.3.2 Shop Priming

Shop-paint metal work except members or portions of members to be embedded in concrete, surfaces and edges to be field welded, and galvanized surfaces.

Immediately after surface preparation, brush or spray on primer in accordance with the paint manufacturer's instructions at a rate to provide uniform dry-film thickness of 2.0 mils for each coat. Use painting methods which will result in full coverage of joints, corners, edges, and exposed surfaces.

Apply one shop coat to metal items, except apply two coats to surfaces inaccessible after assembly or erection. Change color of the second coat to distinguish it from the first.

1.4 Glass Entrances and Partitions, including Customized Glass Door Backing at Existing Steel Grille Doors

1.3.1 Construction Requirements

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

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

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

Weather strip shall be furnished on edges at the meeting stiles

2. CURTAIN WALL ASSEMBLY

Safety precaution and procedure shall be taken in determining the sizes and in providing the required clearances by measuring the actual opening to receive the glass. Movable items shall be kept in closed and locked position until glazing compound has thoroughly set.

Verify actual locations of structural supports for glazed curtain-wall systems by field measurements before fabrication and indicate measurements on Shop Drawings.

Coordinate construction to ensure that actual dimensions correspond to established dimensions.

Fabricate components that, when assembled, have the following characteristics:

Sharp profiles, straight and free of defects or deformations.

Accurately fitted joints with ends coped or mitered.

Internal guttering systems or other means to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.

Physical and thermal isolation of glazing from framing members.

Accommodations for thermal and mechanical movements of glazing and framing to prevent glazing-to-glazing contact and to maintain required glazing edge clearances.

Provisions for reglazing from [interior] [exterior] [interior for vision glass and exterior for spandrel glazing or panels].

Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

Factory-Assembled Frame Units:

Rigidly secure non-movement joints.

Seal joints watertight, unless otherwise indicated.

After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

3. WINDOWS

3.1 Installation

Examine openings, substrates, structural support, anchorage, and conditions, with Consulting Architect present, for compliance with requirements for installation tolerances, rough opening dimensions, levelness, coordination with wall flashings, and other built-in components; operational clearances and other conditions affecting performance of work.

Fabricate aluminum windows, in sizes indicated, that for performance class and performance grade indicated. Include a complete system for assembling components and anchoring windows. Fabricate aluminum windows that are reglazable without dismantling sash.

Provide operable sash with a double row of sliding weather stripping in horizontal rails and single- or double-row weather stripping in meeting or jamb stiles, as required to meet specified performance requirements. Provide weather stripping where applicable.

Weep Holes: Provide weep holes and internal passages to conduct infiltrating water to exterior.

Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components; Drawings; and Shop Drawings.

Install windows level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.

Set sill members in bed of sealant or with gaskets, as indicated, for weathertight construction.

Install windows and components to drain condensation, water penetrating joints, and moisture migrating within windows to the exterior.

Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials

Adjust operating sashes and ventilators, screens, hardware, and accessories for a tight fit at contact points and weather stripping for smooth operation and weathertight closure. Lubricate hardware and moving parts.

3.2 Protection and Cleaning

Protect window surfaces from contact with contaminating substances resulting from construction operations. In addition, monitor window surfaces adjacent to and below exterior concrete and masonry surfaces during construction for presence of dirt, scum, alkaline deposits, stains, or other contaminants. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written recommendations.

Clean aluminum surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.

Clean factory-glazed glass immediately after installing windows. Comply with manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels and clean surfaces.

Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

Exposed Aluminum surfaces shall be Powder Coated Hard coats (White).

4. METAL FRAMED SKYLIGHTS

4.1 Fabrication

Skylight shall be factory assembled, with customized polycarbonate solid sheet shapes as shown in Plans.

4.2 Inspection

Prior to starting installation, the skylight Contractor/Installer shall inspect the supporting curbs for completeness and watertightness to verify that they are properly prepared to receive the work. Report, in writing, any deficiencies in the substrate. Work shall not proceed until all deficiencies are corrected.

4.3 Installation

An experienced installer authorized by the manufacturer and knowledgeable of manufacturer's system or and installation procedures shall install the skylight.

5. DOOR HARDWARE

5.1 Keying

Factory key, masterkey, and grand-masterkey locks and cylinders as directed by the Architect.

Furnish three keys for each lock, twelve masterkeys for each set, and three grand-masterkeys.

Furnish a construction masterkey system with 15 keys for locks & cylinders.

Use only the construction keys during construction.

Upon substantial completion of the work, as that Date is established by the Architect, void the construction key system and, in the presence of the Architect, demonstrate that the specified keying system is operating properly.

5.2 Surface Conditions

Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

All lockset shall be installed in a neat, professional manner, following manufacturer's instructions. Except as indicated or specified otherwise, fasteners furnished with the lockset shall be used to fasten hardware in place. After installation, protect hardware from paint, stains, blemishes and other damages until acceptance of the work. All lockset shall be adjusted properly and checked in the presence of the Architect/Engineer, and all hinges, locks, bolts, pulls, closers and other items shall operate properly. After lockset is checked, keys shall be tagged, identified, and delivered to the Owner. All errors in cutting and fitting, and all damage to adjoining work shall be corrected, repaired and finished as directed.

5.3 Fasteners

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 or masonry.

Furnish necessary screws, bolts, and other fasteners suitable size and type to anchor the hardware, in position of long life under use.

Where necessary, furnish fasteners with toggle bolts, expansion shields, bolts, and other anchors approved by the Consulting Architect, according to the material to which the hardware is to be applied and according to the recommendations of the hardware manufacturer.

Provide fasteners which harmonize with the hardware as to finish and material.

Where butts are required to swing 180 degrees, furnish butts of sufficient throw to clear the trim.

Furnish silencers for door frames at the rate of three for each single door and two for each door or pair of doors; except weather-stripped doors and doors with light seals or sound seals.

6. GLAZING

6.1 Installation

Install the work of this Section in strict accordance with the manufacturer's recommendations as approved by the Architect, and as required by governmental agencies having jurisdiction, anchoring all components firmly into position for long life under hard use.

Leave labels on glass until inspection and approved by the Consulting Architect, and then clean in accordance with provisions.

All glass sheets shall be bedded, back puttied, secured in place and face puttied. Secure glass in aluminum frame with non-corrosive clips except where glazing beads are required. Apply putty in uniformly straight lines, with accurately formed bevels and clean-cut corners; remove excess putty from glass.

Set glass in frames of interior partitions in felt channel insets or bedded in putty to prevent any rattle: secure glass in wood doors and wooden frames with glazing stops: secure stops on doors with screws.

Glass breakage caused in executing the work or by faulty installation shall be replaced by the Contractor without extra cost.

Improperly set glass which does not fully meet requirements of its grade shall not be accepted and shall be replaced without extra cost.

The Contractor shall provide and install complete set ready for use, mirrors in all comfort rooms and elsewhere shown on the Plans. Size and location for each mirror shall be as indicated on the Plans.

6.2 Workmanship

Examine areas to receive glazing. Notify Consulting Architect/Engineer of conditions that would adversely affect installation. Do not proceed with installation until unsatisfactory conditions are corrected.

All glass shall be accurately cut to fit opening and set with equal bearing on the entire width of pane.

Putty shall be neatly run in straight lines as parallel with inside of glazing rebate; corners shall be carefully made; all excess putty shall be removed and surfaces left clean.

Apply a thin layer of putty to rebate and set glass or putty, pressing until an even bed is secured; place spring wire or angle glazing clips and run face putty; remove excess putty from other side flush with edge of rebate.

6.3 Fittings and Accessories

Verify dimensions, tolerances, and method of attachment with other work.

Install in accordance with Manufacturer's/Contractor's instructions, approved Shop Drawings, and Engineering calculations.

Point support fittings to be mounted to structural post and beams.

Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

Provide alignment attachments and shims to permanently fasten system to building structure.

Align assembly plumb and level, free of twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

END OF SECTION

DIVISION 10 FINISHES

PART I-GENERAL

1. PORTLAND CEMENT PLASTERING

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

2. TILEWORKS

Slabs/Tiles found damaged, which in the opinion of the Consulting Architect/Engineer, may affect the appearance or aesthetic of the floor system, shall not be used in the work.

3. PAINTING AND COATING

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

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

3.1 Paint Schedule

Table 8. Paint Schedule

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

d) Woodwork sea-mist	3 coats of 3 parts thinner 1 part lacquer
e) Wood varnish	1st coat, of one part sanding sealer to one part solvent 2nd coat of 2/3 sanding sealer to 1/3 solvent
f) Wood painted finish	3 coats of oil base paint
g) Ceiling boards textured finish	1 coat oil based paint allow to dry then patch surfaces unevenness and apply textured paint coat

3.2 Application

Paints and coatings shall be applied to:

All Existing and Proposed Exterior and Interior Walls

All Existing Concrete Mouldings, Logo, Seals, Corbels, Decorative Columns

All Existing soffit and Proposed Fiber Cement Board Ceiling

All Existing Steel Grille Doors and Windows

All Exposed plumbing, electrical, mechanical items as necessary

All Wooden Panel doors, Cabinets, Jambs, Baseboards, Casings, mouldings and other exposed wood works

Fences, Gates and Columns

All Exposed Surfaces as necessary

PART II- PRODUCTS

1. PORTLAND CEMENT PLASTERING

Portland cement

Portland cement shall conform with comply with ASTM C150, type I

Fine Aggregates

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

2. TILEWORKS

2.1 Ceramic/Porcelain Tiling

It shall be of the standard good quality grade, gloss smooth or rough finish; color, texture and size code should be strictly adhered as shown in the Plans and approved by the Consulting Architect.

Floor Tiles

Tiles shall be standard grade, rustic tiles, ceramic/porcelain, and 6 mm thick. Sizes shall be 0.60x0.60m and 0.30x0.30m.

The surface, color, type and pattern shall be as specified in the Plans or as approved by the Consulting Architect.

Wall Tiles

Tiles shall be standard grade, polished, ceramic/porcelain, and 6 mm thick. Sizes shall be 0.60x0.60m and 0.30x0.30m.

Tile accents shall be ceramic/porcelain, 6 mm thick. Sizes shall be 0.20 x .60 m and 0.30 x 0.60 m.

The surface, color, type and pattern shall be as specified in the Plans or as approved by the Consulting Architect.

Baseboard

Tiles shall be standard grade, polished, ceramic/porcelain, and 6 mm thick. Sizes shall be 0.10 m x 0.60 m, cut from 0.60 m x0.60 m tiles.

The surface, color, type and pattern shall be as specified in the Plans or as approved by the Consulting Architect.

2.2 Granite Tiling

Provide granite cut size tile 0.60 x 0.60 m, 25 mm thick for stair steps and 25 mm, 0.60 m width, length to verify at site for slab on counter at toilets and pantry, with all tiles of uniform grain and pattern.

2.3 Tile Adhesive

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

2.4 Mortar Bed

2.4.1 Portland cement

Portland cement shall conform with comply with ASTM C150, type I

2.4.2 Fine Aggregates

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

3. PAINTING AND COATING

3.1 Glazing Putty

Putty shall be an alkyd type product for filling minor surface unevenness.

3.2 Concrete Neutralizer

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

3.3 Silicone Water Repellant

Silicone water repellant shall be transparent water shield especially formulated to repel rain and moisture on exterior masonry surfaces.

3.4 Patching Compound

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

3.5 Tinting Colors

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

3.6 Wood filler

Wood paste filler shall be quality filler ready mixed in can for filling and sealing open grains of interior wood. It shall produce a level finish for succeeding coats of paint, varnish, or lacquer and other related products.

3.7 Wood Stain

Wood stain shall contain colored pigments and oil which penetrate the wood and provide a rich and lasting protective stain.

3.8 Wood Putty

Putty shall be oil based type for alkyd enamel top coating and two-component type for polyurethane top coating

3.9 Sanding sealer

Sanding sealer shall be quality sealer for wood sufaces that provides a non-absorbent base for color treatment which are applied on it. It shall exhibit good hold out and sealing properties, fast drying and easy to smooth by sandpaper.

3.10 Varnish

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

3.11 Lacquer

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

3.12 Clear polyurethane

Coating shall be two component thermosetting type.

3.13 Sandpaper

Shall be waterproof type

4. SUSPENDED CEILING ASSEMBLY

2 mm thick Perforated Metal, design to be approved by the Consulting Architect

Main support shall be 4 mm thick x 25 mm x 25 mm Angle Bars, 4 mm thick x 25 mm x 100 mm welded steel plate and 12 mm Ø G.I. Pipe Schedule 20 Hanger Wire Conduit bolted on concrete slab at 1.20 m. O.C.

Bolts and nuts of the proper sizes for intended use and shall be of the best commercial standard.

PART III-EXECUTION

1. PORTLAND CEMENT PLASTERING

1.1 Mixture

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

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

1.2 Surface Preparation

After removal of formworks reinforced concrete surfaces shall be roughened to improve adhesion of cement plaster.

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

1.3 Application

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

Finish coat shall not be applied until after the brown coat has seasoned for seven days and corrective measures had been done by the General Contractor on surfaces that are defective. Just before the application of the finish coat, the

brown coat surface shall be evenly moistened with potable water. Finish coat shall be floated first to a true and even surface, then trowel in a manner that will force the mixture to penetrate into the brown coat. Surfaces applied with finish coat shall then be smooth with paper in a circular motion to remove trowel marks, checks and blemishes. All cement plaster finish shall be 10 mm. thick minimum, on vertical concrete and/ or masonry walls.

Cement plaster shall not be applied directly to:

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

Surfaces that had been painted or previously plastered.

1.4 Workmanship

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

2. TILEWORKS

2.1 Ceramic/Porcelain Tiling

The work 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. Tile work 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.

2.1.1 Mortar for Tiles

A scratch coat for wall tile shall be approved tile adhesive. Scratch coat shall have a minimum thickness of 9 mm. The buttering mortar for setting wall tiles and mortar setting bed for floor tiles shall have the same material as that of scratch coat.

2.1.2 Floor Tiling

2.1.2.1 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 filled, 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 skim coat of tile adhesive shall then be applied not more than 1.5 mm 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 have 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.

2.1.3 Installation

2.1.3.1 Floor Tile

Determine and mark lay-out of ceramic tiles as to joint location, position of trims and fixtures so as to minimize cutting less than one half size of the tile.

2.1.3.1.1 Limits of tile

Extend tile into recess and under equipment and fixtures to form a complete covering without interruptions.

Terminate tile neatly at obstructions, edges, and corners, without disruption of pattern or joint alignment.

2.1.3.1.2 Joining pattern

Lay tile in grid pattern unless otherwise indicated on the Plans or directed by the Consulting Architect.

Align joints when adjoining tiles on floor, base, trim, and walls are the same size.

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 tile adhesive .75 mm to 1.5 mm thick, shall be trowelled or brushed over the setting. 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 defined lines shall be laid before the field or body of the floor. Where floor drain is provided, the floor shall be sloped properly to the drains. Cutting of tiles, where necessary, shall be done along the outer edges of tile against trim, base, thresholds, pipes, built-in fixtures, and 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 Consulting Architect. All lines shall be kept straight, parallel and true and all finished surface brought to true and even planes.

2.1.3.2 Wall Tile and Baseboards

Ceramic tiles shall be soaked in clean water prior to installation for a minimum of one hour.

Determine and mark lay-out of ceramic tiles as to joint location, position of trims and fixtures so as to minimize cutting by less than one half the size of the tile.

Thoroughly dampen the surface of wall but not to saturate the surface.

Apply a bond coat mix with consistency of cream paste 1.5mm thick to the wall surface or to the back of the tile to be laid.

Lay the tiles true to profile then exert pressure and tamp tile surface before the bond coat mix has initially set.

Continue the next full tile to be laid and pressed firmly upon the setting bed tamped until flush and in place of other tiles.

Intersections and returns shall be formed accurately using the appropriate trim

All lines shall be kept straight and true to profiles, plumbed and internal corners rounded using the appropriate trim.

2.1.3.2.1 Jointing

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.

2.1.4 Grouting

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

2.1.5 Cleaning

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

Apply a protective coat of neutral cleanser solution diluted with water in the proportion of 1:4 or one liter cleanser concentrate to one gallon of water.

In addition, cover tile flooring with heavy duty non-staining construction paper, taped in place.

Just before final acceptance of the work, remove paper and rinse the protective coat of neutral cleanser from the tile surface.

Do not let the protective paper get torn or removed

2.2 Granite Tiling

2.2.1 Setting Materials

Provide a mortar system of Portland cement, sand and water.

2.2.2 Others Materials

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 Consulting Architect.

2.2.3 Surface Conditions

Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

2.2.4 Installation

2.2.4.1 Floor Tiles and Counter Slabs

Measure mortar materials in approved containers. Mix all materials in proportions by volume. Water and aggregates shall be introduced and mixed gradually to ensure a uniform distribution. Set mortar beds in a volume proportion of one part Portland cement, four parts dry sand and ½ part lime.

Mortar setting beds shall be a minimum thickness of 25 millimeters.

Apply a coat of tile adhesive, one to two millimeters thick over the setting bed. Press tiles and slab firmly on the bed, keeping lines straight, parallel and true.

2.2.4.2 Pointing

Pointing material shall be polyurethane or polyester resin of best quality standard.

2.2.4.3 Sanding

Flooring shall be sanded with an approved equipment intended to provide smooth, even, uniform finish without burns. Final finished flooring shall be applied with heavy duty abrasion resistant wax to provide a lasting mirror like finish

2.2.4.4 Cleaning

Clean surrounding areas of slabs, tiles, and debris.

3. PAINTING AND COATING

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

3.1 Surface Preparation

All surfaces shall be in proper condition to receive the finish. Woodworks shall be hand-sanded smooth and dusted clean. All knot-holes pitch pockets or sappy portions shall be sealed with natural wood filler. Nail holes, cracks or defects shall be carefully puttied after the first coat, matching the color of paint.

Interior woodworks shall be sandpapered between coats. Cracks holes of imperfections in plaster shall be filled with patching compound and smoothed off to match adjoining surfaces.

Concrete and masonry surfaces shall be coated with concrete neutralizer and allowed to dry before any painting primer coat is applied. When surface is dried apply first coating. Hairline cracks and unevenness shall be patched and sealed with approved putty or patching compound. After all defects are corrected apply the finish coats as specified on the Plans. Color samples to be approved by the Consulting Architect.

Metal shall be clean, dry and free from mill scale and rust. Remove all grease and oils from surfaces. Wash unprimed galvanized metal with etching solution and allow it to dry. Where required to prime coat surface with red lead primer same shall be approved by the Engineer.

In addition the General Contractor shall undertake the following:

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

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

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

Allow appropriate ventilation during application and drying period.

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

3.2 Mixing and Thinning

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

3.3 Workmanship in General

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

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

Where surfaces are not fully covered or cannot be satisfactorily finished in the number of coats specified such preparatory coats and subsequent coats as may be required shall be applied to attain the desired evenness of surface without extra cost to the Procuring Entity.

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

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

3.4 Application

3.4.1 Brush application

Paints when applied by brush shall become non-fluid, thick enough to lay down as adequate film of wet paint. Brush marks shall flawed out after application of paint.

Brush out and work the brush coats onto the surface in an even film.

Cloudiness, spotting, holidays, laps, brush, marks, runs, sags, ropiness, and other surface imperfections will not be acceptable.

3.4.2 Spray application

Paints made for application by roller must be similar to brushing paint. It must be non-sticky when thinned to spraying viscosity so that it will break up easily droplets.

Paint is atomized by high pressure pumping rather than broken up by the large volume of air mixed with it. This procedure changes the required properties of the paint.

Except as specifically otherwise approved by the Consulting Architect, confine spray application to metal framework and similar surfaces where hand brushwork would be inferior.

Where spray application is used, apply each coat to provide the hiding equivalent of brush coats.

Do not double back with spray equipment to build up thickness of two coats in one pass.

For complete work, match the approved samples as to texture, color, and coverage, Remove, refinish, or repaint work not in compliance with the specified requirements.

3.5 Touch-up and Finishing

Touch up shop-applied prime coats which have been damaged, and touchup bare areas prior to start or finish coats application.

Slightly vary the color of succeeding coats.

Do not apply additional coats until the completed coat has been inspected and approved.

Only the inspected and approved coats of paint will be considered in determining the number coats applied.

Sand and dust between coats to remove defects visible to the unaided eye from a distance of five feet.

On removable panels and hinged panels, paint the backsides to match the exposed sides.

3.6 Drying

Allow sufficient drying time coats, modifying the period as recommended by the material manufacturer to suit adverse weather conditions.

Consider oil-base and oleo-resinous solvent type paint as dry for re-coating when the paint feels, firm, does not deform or feel sticky under moderate pressure of the thumb, and when the application of another coat of paint does not cause lifting or less of adhesion of the undercoat.

3.7 Miscellaneous surfaces and procedures

3.7.1 Exposed mechanical items

Finish electric panels, access, conduits, pipes, ducts, grilles, registers, vents, and items of similar nature to match the adjacent wall and ceiling surfaces, or as directed.

3.7.2 Hardware

Paint prime coated hardware to match adjacent surfaces;

Paint metal portions of head seals, jamb seals, and astragal seals to match the color of the doorframe unless otherwise directed by the Architect.

3.7.3 Wet areas

In toilet rooms and contiguous areas, add an approved fungicide to paints.

For oil based paints, use 1-% phenol mercuric or 4% pentachlorophenol.

For water emulsion and glue size surfaces, use 4% sodium pentachlorophenol.

Exposed vents: Apply two coats of heat resistant paint approved by the Architect.

4. SUSPENDED CEILING ASSEMBLY

All materials and workmanship shall be the best of their respective kinds, fabricated to true, plumb and straight lines. All ferrous metals shall have a rust-inhibitive finish of approved paint.

When fastening to in-place construction, provide anchorage devices and fittings to properly secure ceiling assembly to in-place construction. Examples of such devices include threaded fittings (for concrete inserts), toggle bolts and through-bolts.

END OF SECTION

DIVISION 14 PLUMBING

PART I-GENERAL

1. PLUMBING WORKS

All plumbing works herein shall be executed in accordance with the requirements of the National Plumbing Code, and the rules and regulations of the province.

The General Contractor shall verify all existing utilities at site and coordinate the works with Phase 1 plumbing works connecting point.

Coordinate the drawings with other related drawings and specifications. The Consulting Master Plumber shall be notified immediately of any discrepancy in the Plans.

The work throughout will be executed in the best and most thorough manner known to the satisfaction of Consulting Architect/Engineer.

All pipes shall be installed as indicated. Piping above the ground shall be run parallel with the lines of the building unless otherwise indicated on the Plans. Any relocation required for the proper execution of other trades shall be with prior approval of the Consulting Master Plumber.

Sanitary and Drainage lines shall have a minimum slope of 1%.

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

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

Thoroughly clean items before installation. Cap pipe openings to exclude dirt until fixtures are installed and final connections have been made.

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.

Show no tool marks or threads on exposed plated, polished, or enameled connections from fixtures. Tape all finished surfaces to prevent damage during construction..

Support piping independently at pumps and similar locations, so that weight of pipe will not be supported by the equipment.

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.

Install piping equipment, and accessories to permit access for maintenance. Relocate items as necessary to provide such access, and without additional cost to the Procuring Entity.

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.

2. THREADED PIPE JOINTS

All pipes shall be reamed before threading. All screw joints shall be made with graphite and oil or with an approved graphite compound applied to make threads only. Threads shall be full cut and not more than three threads on the pipe shall remain exposed.

3. EXPANSION AND CONTRACTION OF PIPES

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

4. VALVES AND HOSE BIBS

Valves shall be provided on all supplied fixtures as herein specified

Provide union and shut off valves suitably locked to facilitate maintenance and removal of equipment and apparatus.

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

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

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

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

5. INSPECTION, WARRANTY TEST AND DISINFECTION

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

6. DEFECTIVE WORK

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

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

Caulking of screwed joints or holes will be permitted

PART II- PRODUCTS

1.WATER DISTRIBUTION SYSTEM (to connect to Proposed RC Cistern)

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

Pipes and fitting for sanitary and potable water lines as approved shall be Polypropylene Random Pipes and Fittings (PPR) PN 20. Hot water line shall be XLPE (RED color) and shall be tested at 150 psi for the period of two hours before covering.

Pipes and fittings shall be made of virgin materials. Fittings shall be molded type and designed for solvent cement joint connection for water lines and rubber O-ring seal joint for sanitary lines.

Sizes of water supply pipes to fixtures shall be as shown in Plans and in accordance with manufacturer's instructions.

2. STORM DRAINAGE SYSTEM

Pipes for storm drainage shall be Unplasticized Polyvinyl Chloride (uPVC) series 1000 (High Impact)

3. RC CISTERN

The cistern shall be provided as shown on the Plans including all pipe fittings. The various construction materials such as concrete masonry work shall conform to the corresponding Items of these Specifications. Inlet and outlet pipes shall conform to the latest edition of the National Plumbing Code.

The cistern shall be of watertight construction, such as concrete with smooth interior surfaces.

The water cistern shall be thoroughly flushed and disinfected with chlorine before it is placed on operation. It shall be washed and swabbed.

Chlorination materials shall be liquid chlorine of hypoclorite as specified and shall be introduced into the water lines in manner approved by the Engineer.

Cistern shall be thoroughly cleaned of all debris dirt or dust before swabbing.

4. DRAINAGE CANAL

Drainage canal shall be located at site, as shown in Plans. It shall be 0.50 m wide x 0.50 m deep, made of reinforced concrete base, wall on 4" x 8" x 16" concrete hollow block reinforced with 10 mm Ø steel bars and covered with 75 mm thick reinforced concrete reinforced with 10 mm Ø bars equally spaced.

5. PLUMBING FIXTURES, FITTINGS AND ACCESSORIES

All fitting, trimmings and fixtures shall be as approved by the Consulting Architect/Engineer. Exposed traps and supply pipes for fixtures shall be connected to the roughing-in, piping system at the wall unless otherwise indicated on the Plans. Built –in fixtures shall be watertight with provision of water supply and drainage outlet, fittings and trap seal.

Water closets shall be floor mounted, close coupled and made of vitreous china complete with fittings.

Urinals shall be wall hung, made of vitreous china complete with fittings.

Lavatory shall be countertop, made of vitreous china complete with fittings.

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

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

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

Tissue paper holders, soap dispensers and hand dryers shall be approved by the Consulting Architect

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

Sink for pantry shall be stainless steel, design to be approved by the Consulting Architect.

6. VALVES

Gate Valve - 50mm & larger, shall be rising stem iron body with bronze trim, flanged connection, min., of 150 psig working pressure. 50mm & smaller, shall be non-rising stem, all bronze, female threaded, min. of 150 psig working pressure.

Check Valve - 50mm &larger shall be iron body with bronze trim, flanged connection, min. of 150 psig working pressure. 50mm & smaller same except female threaded connection.

Float Valve - shall be the float & lower type globe valve, single seated-tight closing, bronze or iron material, flanged connection, with float.

PART III-EXECUTION

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

1. WATER DISTRIBUTION SYSTEM

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

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

Provide valves in water system. Locate for easy accessibility and maintenance and arrange so as to give complete regulation of apparatus, equipment, and fixtures.

Provide valves in at least the following locations: In branches and/ or headers of water piping serving group fixtures, for shutoff risers and branch mains, where shown on the Drawings.

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

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

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

1.1 Pressure Tests for Water Lines

After the pipe have been installed, the joints completed and with joints exposed for examination, all newly installed pipe or any valve section therefore, shall be subjected to hydrostatic pressure 1½ the designed working pressure of the system or as specified by the Consulting Architect.

1.2 Leakage Tests for Water Lines

Leakage test shall be conducted after satisfactory completion of the pressure and shall consist of an examination of all exposed joints for leakage as well as on overall leakage test completed pipelines.

2. STORM DRAINAGE SYSTEM

Horizontal lines shall be supported by well secured length heavy strap hangers. Vertical lines not embedded shall be secured strongly by hooks to the building frame and a suitable brackets or chairs shall be provided at the floor from which they start.

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

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.

Provide sufficient swing joint, ball joints, expansion loops, and devices necessary for a flexible piping system, whether or not shown on the Plans.

All changes in pipe sizes on drain lines shall be made with reducing fittings or recessed reducers. All changes in directions shall be made by appropriate use of 45 degrees wyes, half wyes, long sweep quarter bends or elbows may be used in drain lines where the change in direction of flow is from the horizontal to the vertical and on the discharge from waste closets. Where it becomes necessary to use short radius fittings in other locations the approval of the Supervising/Consulting Engineer shall be obtained prior to installation of the same.

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

Secure the Consulting Architect/Engineer's approval of locations for cleanouts in finished areas prior to installation.

Provide cleanouts of same nominal size as the pipes they serve: except where cleanouts are required in pipes 4" and larger provide 4 "cleanouts.

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

2.1 Drainage System Test

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

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

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

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

3. RC CISTERN

The cistern should be located and constructed in such a manner that neither underground nor surface contamination from any septic tanks, seepage pit, disposal field, corral, flooding, or other possible source of pollution can enter such cistern. The cistern should be located on higher ground than any source of pollution and the horizontal distance from any such source of pollution should be as great as possible.

3.1 Pump

The type of hand pump used shall embody the following features: a closed spout directed downward, and the top of the pump made watertight by means of a seal through which the pump rod operates. The cylinder shall be located within six (6) inches of the bottom of the cistern. The pump shall require no priming.

3.2 Drain Line:

A drain line shall be used only if the cistern can be drained to the ground surface. If the cistern cannot be drained to ground surface, it will have to be emptied by pumping and hand bailing. The floor of the cistern shall slope to the drain or to one (1) side if there is no drain.

4. DRAINAGE CANAL

The drainage canal shall be constructed in such as watertight as possible.

5. PLUMBING FIXTURES, FITTINGS AND ACCESSORIES

Each fixtures and place of equipment requiring connection to the drainage system except fixtures with continuous waste shall be equipped with a trap. Each trap shall be placed as near to the fixture as possible. Traps installed on threaded pipe shall be recessed drainage pattern.

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

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

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

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

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

4.1 Installation

Set fixtures level and in proper alignment with respect to walls and floors, and with fixtures equally spaced.

Provide supplies in proper alignment with fixtures and with each other.

Provide flush valves in alignment with the fixture, without vertical or horizontal offsets.

4.2 Protection and Cleaning

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

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

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

END OF SECTION

TERMS OF REFERENCE

PROJECT TITLE AND LOCATION

REPAIR & MAINTENANCE OF SULU ARCHIPELAGO AREA MUSEUM AND SATELLITE OFFICE

Jolo, Sulu

I. PROJECT BACKGROUND

The NM Sulu Archipelago Area Museum and Satelite Office situated in Jolo,the provincial capital of the main island of Sulu province. The Sulu Museum and Library was established through a Sangguniang Panlalawigan resolution in 1981 to house ethnographic materials of Sulu culture and a library. With public funds and private donations, then Provincial Board member, Mrs. Oswalda A. Cabel, developed the museum. Since its inauguration on July 22, 1982, the Sulu Provincial Museum and Library had served domestic and foreign scholars, tourists and local visitors. It was donated and transferred to National Museum on May 24, 1994.On September 19, 1997, the Jolo Satelite Office was formally opened to the public.

II. OBJECTIVE

The National Museum of the Philippines has a legacy of enhancing universal access by all Filipinos to exhibits and displays that showcase our national patrimony and heritage. Likewise, the agency aims to reach and promote these heritage to the public by encouraging more visits to the museums.

Therefore, this project of providing necessary repair and maintenance works to one of National Museum's regional branches will further enhance the public's museum experience in turn allows the agency to better achieve its goals and fulfill expectations to the benefit of the entire Filipino people and the wider world.

III. SCOPE OF WORKS

This shall pertain to necessary works needed to complete the proposed project and shall include but is not limited to the supply, fabrication and installation of all materials, labour and equipment; provision for specialized activities, technical knowledge and skills; together with the liaison and coordination of applicable works such as applications of permits, licenses and notices to statutory authorities.

GENERAL WORKS:

1. The Contractor is expected to have conducted a site inspection prior to the actual mobilization, so as to acquiant and familiarize themselves with the location and condition of the project.

2. The Contractor shall obtain all official documents and payment of required fees and other costs incidental to the fullfillment of the requirements of the contract.

3. The Contractor shall safeguard the works and all building materials whether acquired or existing through proper warehousing and timely inventory. This shall include but is not limited to the installation of temporary facilities such as repository or warehouse,

office and bunkhouse, as well as the installation of 2.40 meter high perimeter board-up.

4. The Contractor is held responsible in ensuring the safety and protection of all persons engaged in the execution of the project. They shall also provide good general housekeeping practices.

5. The Contractor shall commission the necessary professionals, in this case-Structural Engineers to obtain the needed professional services.

6. The Contractor must secure and maintain all salvaged original materials on site. No original material can be removed, altered or transported without the authority from the National Museum.

GENERAL REQUIREMENTS

1. Mobilization/Demolization
2. TEMFACIL (includes warehousing & utility consumption)
3. Site Safety and Housekeeping
4. Project Signage (4' x8')
5. Supply and Installation of 2.40m high perimeter board-up

DISMANTLING & HAULING WORKS

1. Dismantling and hauling of damaged concrete ledges
2. Dismantling and hauling of damaged concrete brise -solei
3. Dismantling of Dilapidated Roof
4. Disposal Work
5. Equipment Rental

REPAIR & RENOVATION WORKS

ARCHITECTURAL WORKS

1. Supply and Installation of Waterproofing at Third Floor
2. Replacement of Existing Roof and repainting of steel trusses
3. Repainting of Existing Roof
4. Supply and Application of Termite Treatment
5. Repainting of Exterior and Interior Walls
6. Equipment
7. Replacement of Wooden Partition that are affected by termite
8. Repair of Male & Female Toilet
9. Application of Red Cement finish
10. Repair of Glass Door and Supply & Installation of Windows
11. Repair of Dilapidated Ceiling
12. Replacement of all busted light in grnd & 2nd

STRUCTURAL WORKS

1. Reconstruction of damage concrete ledges
2. Reconstruction of damage concrete brise-solei
3. Re-construction of Damage Slab

IV. EXPECTED OUTPUT

1. The Contractor must provide confirmation of National Museum's building design requirements.
2. The Contractor shall provide all the materials, labor, equipment and services necessary for the construction of the project and other incidental expenses.
3. The Contractor shall secure the property, provide temporary facilities & utilities on site, manage their own personnel & contruction traffic, dispose and recycle construction waste, monitor schedule and cash flows and maintain daily logbook of activities.
4. Submit for approval plans that outlines the safety measures that will be implemented on site applicable tovisitors,construction team & other personnel to include safety & protection of workers during construction,prevention & occurance of fire & potential risk.
5. Furnish the National Museum of the Philippines with a set of the original copy of As built plans.
6. Abide with the contract including all its annexes & attachment like the General Condition, Scope of Works, Term of Reference, Specification and etc. which form part of the contract.
7. contractor must ensure high standard of workmanship and structurally sound construction methods if found not in compliance to the standard provision as specified in the building code & related laws,he/she must report the same to FMD for proper disposition otherwise, it is covered by the contractor's liability.
8. The Contractor must report to the National Museum of the Philippines (NMP) any archaeological finding during excavation works. An automatic work stoppage shall take effect after NMP's documentation & confirmation.
9. The Contractor must secure and maintain all salvaged original materials on site. No original material can be removed, altered or transported without the authority from the NMP

V. EXPECTED TIME FRAME

The Project's actual construction is expected to be completed in **Ninety (90) calendar days.**

VI. CONSTRUCTION SUPERVISION

The project will be implemented under the direct supervision of the National Museum of the Philippines- Facilities Management Division.

The project engineering component will be implemented under the periodic supervision of the qualified and licensed Engineers who signed and sealed the engineering plans and are engaged by the Contractor to assist the NM Architects.

VII. THE CONTRACTOR

The National Museum of the Philippines requires the services of a building contractor with legal, technical and financial capability to implement the abovementioned project. The contractor must have completed or implemented similar projects and must have proven relevant experience with proper client references

VIII. SOURCE OF FUND

The General Appropriations Act through Fiscal Year 2021 **Five Million Three Hundred Sixty Thousand Pesos And 00/100 Only (Php 5,360,000.00)** for the proposed Repair & Maintenance of NM Sulu Archipelago Area Museum and Satelite Office located at Jolo, Sulu.

iX. PROCUREMENT PROCESS

Procurement of services of a building contractor for the abovementioned project shall be in accordance with the provisions of the Government Procurement Reform Act (R.A 9184) and its Revised Implementing Rules and Regulations.

Prepared by:

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Architect II, FMD

Checked & Reviewed by:

Ar. NELSON L. AQUINO
Architect IV, OIC-FMD

Recommending Approval:

Atty. MA. ROSENNE M. FLORES-AVILA
Deputy Director General (Administration)

Approved by:

JEREMY R. BARNS, CESO III
Director-General

SCOPE OF WORKS

PROJECT TITLE AND LOCATION

REPAIR & MAINTENANCE OF SULU ARCHIPELAGO AREA MUSEUM AND SATELLITE OFFICE

Jolo, Sulu

I. SCOPE OF WORKS

This shall pertain to necessary works needed to complete the proposed project and shall include but is not limited to the supply, fabrication and installation of all materials, labour and equipment; provision for specialized activities, technical knowledge and skills; together with the liaison and coordination of applicable works such as applications of permits, licenses and notices to statutory authorities.

GENERAL WORKS:

1. The Contractor is expected to have conducted a site inspection prior to the actual mobilization, so as to acquiant and familiarize themselves with the location and condition of the project.

2. The Contractor shall obtain all official documents and payment of required fees and other costs incidental to the fullfillment of the requirements of the contract.

3. The Contractor shall safeguard the works and all building materials whether acquired or existing through proper warehousing and timely inventory. This shall include but is not limited to the installation of temporary facilities such as repository or warehouse, office and bunkhouse, as well as the installation of 2.40 meter high perimeter board-up.

4. The Contractor is held responsible in ensuring the safety and protection of all persons engaged in the execution of the project. They shall also provide good general housekeeping practices.

5. The Contractor shall commission the necessary professionals, in this case- Structural Engineers to obtain the needed professional services.

6. The Contractor must secure and maintain all salvaged original materials on site. No original material can be removed, altered or transported without the authority from the National Museum.

GENERAL REQUIREMENTS

1. Mobilization/Demolization
2. TEMFACIL (includes warehousing & utility consumption)
3. Site Safety and Housekeeping
4. Project Signage (4' x8')
5. Supply and Installation of 2.40m high perimeter board-up

DISMANTLING & HAULING WORKS

1. Dismantling and hauling of damaged concrete ledges
2. Dismantling and hauling of damaged concrete brise -solei
3. Dismantling of Dilapidated Roof
4. Disposal Work
5. Equipment Rental

REPAIR & RENOVATION WORKS

ARCHITECTURAL WORKS

1. Supply and Installation of Waterproofing at Third Floor

Image 1(Actual Condition @ Third Level)

2. Replacement of Existing Roof and repainting of steel trusses

Image 2(Actual Condition of Roof Trusses)

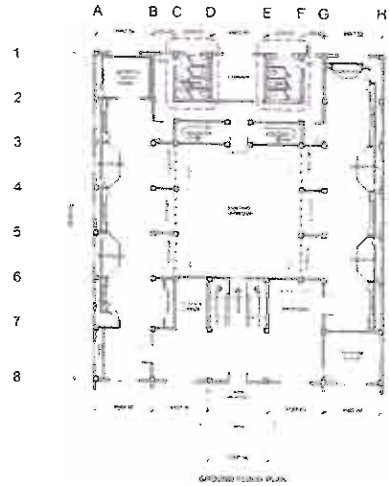
3. Repainting of Existing Roof
4. Supply and Application of Termite Treatment
5. Repainting of Exterior and Interior Walls

6. Equipment
7. Replacement of Wooden Partition that are affected by termite

Image 3(Actual Condition)

8. Repair of Male & Female Toilet

Image 4(Actual Condition)



9. Application of Red Cement finish
10. Repair of Glass Door & Supply and Installation of Windows

Image 5(Actual Condition)

11. Repair of Dilapidated Ceiling

Image 6(Actual Condition)

12. Replacement of all busted light in grnd & 2nd

STRUCTURAL WORKS

1. Reconstruction of damage concrete ledges

Image7(Actual Condition)

2. Reconstruction of damage concrete brise-solei
3. Re-construction of Damage Slab
4. Supply and Installation of Louver Type Windows(along the stair)

Image 8(Actual Conditio)

5. Construction of Zocalo Wall at the Balcony
6. Repair of Male & Female Toilet(refer to Image 9-10)

Image 9(Actual Toilet Condition)

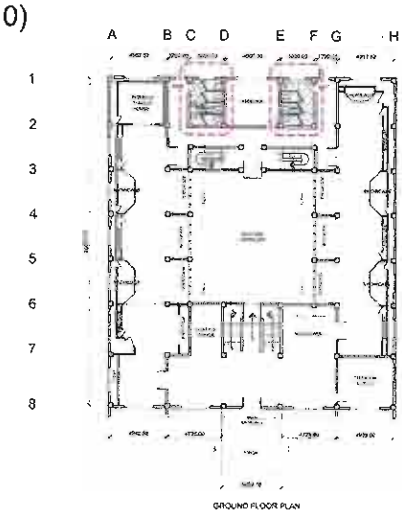


Image 10(Ground Floor Plan)

7. Supply of Interior Lights

II. NOTE

All works shall be read in conjuction with the working drawings, any discrepancy shall be timely coordinated with the National Museum of the Philippines- Facilities Management Division.

Prepared by:

ROLDAN C. LAUREL
Architect II,FMD

Checked & Reviewed by:

Ar. NELSON L. AQUINO
Architect IV, OIC-FMD

Recommending Approval:

Atty. MA. ROSENNE M. AVILA-FLORES
Deputy Director General (Administration)

Approved by:

JEREMY R. BARNS, CESO III
Director- General

Section VII. Bill of Quantities

CONSTRACTOR'S LOGO

Project **REPAIR & MAINTENANCE OF SULU ARCHIPELAGO AREA MUSEUM & SATELITE OFFICE**
Locati Jolo,Sulu
Durati
on 90 Calendar days

Project
Date: April 22, 2021

APPROVED BUDGET FOR THE CONTRACT

Item No.	Description	Qty	Unit	Estimated Direct Cost (EDC)					Indirect Cost (IC)			TOTAL COST	Unit Cost
				MATERIAL		LABOR		TOTAL EDC	OCMP	Sub-Total	VAT	EDC + IC	
				Unit	Total	Unit	Total		25%		5%		
I. GENERAL REQUIREMENTS													
1	**Mobilization/ Demobilization**	**1.00**	**lot**										
2	**TEMFACIL (includes warehousing & utility consumption)**	**75.00**	**sq.m**										
	a) Temporary Facilities(Site office,Warehousing & Barracks)	**75.00**	**sq.m**										
	(Container van rental)												
	b) Temporary Utilities	**90.00**	**cd**										
	water consumption	90.00	cd										
	electrical consumption	90.00	cd										
	communication consumption	90.00	cd										
3	**Site Safety and Housekeeping**	**90.00**	**cd**										
	a. Security Services	**90.00**	**cd**										
	b. Safety/Health/PPE												
	(including Safety harness,Hardhats,safety Shoes,etc.)												
	Safety Officer(1)	90.00	days										
	Caution Tape	3	pcs										
	Hardhat (Various color & sizes)	10	pcs										
	Safety Signages	3	sets										
	Rubber Boots	10	pcs										
	Dark Glass	1	pcs										
	Maong Gloves	3	pcs										
	Leather Gloves	3	pcs										
	Welding Mask	1	pcs										
	Safety Harness	4	pcs										
	Safety Shoes (Various sizes)	10	pcs										
	Hardhat Strap	4	pcs										
	First Aid Kit	1	set										
	Heavy duty Folding Stretcher w/ wheels	1	set										
	First Aid Wall Cabinet	1	set										
	c. Covid 19 Precautionary Equipments												
	Thermal Scanner/Infrared Thermommeter forehead	1	set										
	Portable Hand Sanitazer	1	set										
	refilling bottle(500ml)	1	set										
	70% isophropyl alcohol	15	gal										
	Disposable Surgical Mask	60	box										
	face shields	30	set										
	refilling spray bottle(500ml)	2	pcs										
	Disinfectant Door Mat w/ Tray	2	pcs										
	Signages	3	set										
	6mm thick Acrylic Sheet Clear	1	pcs										
	Consumables(Acrylic Adhesive,Aluminum Connectors,Tools)	1	lot										
4	**Project Signage (4' x8')**	**1.00**	**set**										
5	**Supply and Installation of 2.40m high perimeter board-up**	**103.400**	**l.m.**										
								SUB-TOTAL I. GENERAL				**0.00**	

II. DISMANTLING & HAULING WORKS													
1	**Dismantling and hauling of damaged concrete ledges**	**4.51**	***cu. m***										
2	**Dismantling and hauling of damaged concrete brise -solei**	**20.80**	***cu. m***										
3	**Dismantling of Dilapidated Roof**	**207.21**	***sq. m***										
4	**Disposal Work**	**1.00**	***lot***										
	a. 1 unit dump truck(rental)	24.00	hrs										
5	**Equipment Rental**	**1.00**	**lot**										
	a. 1 unit pay loader (rental)	16.00	hrs										
	b. 1 unit Jackhammer (rental)	64.00	hrs										
	d. Scaffolding	8.00	days										
												SUB-TOTAL II. DISMANTLING & HAULING	***0.00***
III.REPAIR & RENOVATION WORKS													
ARCHITECTURAL WORKS													
1	**Supply & Installation of Waterproofing at Third Floor**	**196.56**	**sq.**										
	c. Application Waterproofing Membrane,Supply and Installation of Torch-on Bitumen Waterproofing Membrane (4.5mm thick/ 5 ply) and its accessoriesSupply and Installation of Torch-on Bitumen Waterproofing Membrane (4.5mm thick/ 5 ply) w/ cleaning & chipping and its accessories	*196.56*	*sqm*										
2	**Replacement of Existing Roof & Repainting of steel trusses**	**207.21**	**sqm**										
	a. 0.6mm thck pre painted long span	*207.21*	*sqm*										
	b. Hardware Accessories(tek screw/blind rivets,sealant,bended sections0	*207.21*	*sqm*										
	c.Double sided aluminum foil insulation	*207.21*	*sqm*										
	h. Epoxy primer	*2*	*gals*										
	i. Lacquer Thinner	*2*	*gals*										
	j,.Paint thinner	*0.5*	*gals*										
	h. Consummables(Welding rods & Equipment rentals,etc)	*1*	*lot*										
3	**Repainting of Existing Roof**	**382.08**	**sqm**										
	a. Topcoat(4L)	7.00	liters										
	b. Assorted brush	4.00	pcs										
	c. Steel brush	3.00	pcs										
	d. Metal Etching solution	2.00	liter										
	e. Scaffolding(H Frames & Support Accessories)-rentals	*2.00*	*sets*										
4	**Supply and Application of Termite Treatment**	**984.00**	**sq.**										
	It includes Soil Barrier Treatment,Wood protection & Baiting granule treatment												
5	**Repainting of Exterior and Interior Walls**	**#REF!**	**sq.**										
	b.Top coat	*90.00*	*gals.*										
	c. 4" painting brush	*15.00*	*pcs*										
	d. 2" painting brush	*15.00*	*pcs*										
	e. Roller brush, refil, extension pole and tray set	*20.00*	*sets*										
	f.Spot Putty	*215.00*	*liters*										
	g. Acrytex Reducer	*30.00*	*liters*										
	f. Grit 100 sanding paper	*80.00*	*pcs*										
6	**Equipment**	**1.00**	**lot**										
	a. Scaffolding	*10.00*	*sets*										
7	***Replacement of Wooden Partition that are affected by termite***	***10.80***	***sq.m***										
	a. 2"x2" hardwood frames	*55.00*	*bdft*										
	b. 1/4" thick ficemboads	*5.00*	*pcs*										
	c. Flat Latex Paint	*2.00*	*liters*										
	d.Semi-gloss Latex Paint	*4.00*	*liters*										
	e.Paint Brush 4"	*4.00*	*pcs*										
	f.Paint Brush 2"	*6.00*	*pcs*										
	g.Sanding Paper # 100	*25.00*	*pcs*										
	h.Sanding Paper # 150	*25.00*	*pcs*										
	i.Masking Tape 3/4"	*5.00*	*pcs*										
	j.Stopa	*10.00*	*bundles*										

	k. Consummable(Nail,Wood Adhesives,etc.)	*1.00*	*lot*										
9	***Repair of Male & Female Toilet***	***23.96***	***sqm***										
	Floor Area=23.96sqm	**11.98**	**sqm**										
	a. Toilet Phenolic Doors w/hooks & locksets	*7.00*	*set*										
	b. 4" Floor Drain	*4.00*	*pcs*										
	c.faucets	*5.00*	*pcs*										
	d.Solvent Cement 400cc	*1.00*	*cans*										
	e. Ceramic Tiles-30x30-	*320.00*	*pcs*										
	f.Tile Adhesive 25kg/bag	*6.00*	*bags*										
	g. Tile Grout 2kg/bag	*5.00*	*bags*										
	h.Polyethylene Water Storage Tank,1500L	*1.00*	*set*										
	i.Dismantling of Existing Tiles	*23.96*	*sqm*										
	3/4 HP water pump	*1.00*	*set*										
	Water Closet	*7.00*	*pcs*										
	Faucet	*9.00*	*pcs*										
	Lavatory	*3.00*	*pcs*										
	Urinal	*3.00*	*pcs*										
	Hand Dryer,1400-1650watts,105 m/s wind speed	*3.00*	*set*										
	Plumbing Waterline(	*1.00*	*lot*										
10	***Application of Red Cement finish***	***#REF!***	***sqm***										
	Cement	299.00	bags										
	Sand	12.30	cum										
	4L Epoxy paint primer	55.00	cans										
	4L Epoxy paint(red)	36.00	cans										
11	**Repair of Glass Door & Supply & Intallation of Windows**	**2.00**	**sets**										
	a. Glass door in balcony & 2nd floor window(selected area)												
12	**Repair of Dilapidated Ceiling**	**91.07**	**sqm**										
	a. 12mm thk ficem board	*32.00*	*pcs*										
	b. 2" x 75m mesh tape	*10.00*	*rolls*										
	c. Grit 100 sanding paper	*16.00*	*pcs*										
	d. 5kg gypsum putty	*10.00*	*packs*										
	e. Carrying channel	*10.00*	*pcs*										
	f. Furring channel	*20.00*	*pcs*										
	g. #8 hanger rod	*75.00*	*pcs*										
	h. W-clip	*146.00*	*pcs*										
	i. Drive pin	*75.00*	*pcs*										
	j. Suspension clip	*75.00*	*pcs*										
	k. Steel angle	*75.00*	*pcs*										
	l. Drywall screw	*33.00*	*pcs*										
	m. Rod joiner	*75.00*	*pcs*										
	n. Wall angle	*21.00*	*pcs*										
	Painting of fiber cement ceiling	**91.07**	**sq.**										
	(1 coat primer + 2 coats topcoat)												
	a. 4L Primer	*5.00*	*cans*										
	b. 4L Top coat, flat	*8.00*	*cans*										
	c. 4" painting brush	*10.00*	*pcs*										
	d. 2" painting brush	*10.00*	*pcs*										
	e. Roller brush, tray set	*5.00*	*sets*										
	f. Grit 100 sanding paper	*18.00*	*pcs*										
	Equipment	**1.00**	**lot**										
	a. Scaffolding(rental)	*6.00*	*sets*										
13	**Replacement of all busted light in grnd & 2nd**	**65.00**	**set**										
	8w Compact Flourestcent lights	*65.00*	*set*										
												SUB-TOTAL III. ARCHITECTURAL	***0.00***

STRUCTURAL WORKS													
1	**Reconstruction of damage concrete ledges**	**3.16**	**cu.m**										
	a. Cement	28	*bags*										
	b. Sand	2	*cu.m*										
	c. Gravel	3	*cu.m*										
	d. 12mm rebars	45	*pcs*										
	e. #16 tie wire	3	*kgs.*										
	f. Formworks	1	*lot*										
	h. Assorted common wire nails	3	*kg*										
	Plastering	*22.57*	*sqm*										
	a. Cement	*9*	*bags*										
	b. Sand	*0.56*	*cu.m*										
2	**Reconstruction of damage concrete brise-solei**	**14.56**	**cu.m**										
	a. Cement	131	*bags*										
	b. Sand	7	*cu.m*										
	c. Gravel	15	*cu.m*										
	d. 12mm rebars	34	*pcs*										
	e. #16 tie wire	2	*kgs.*										
	f. Formworks	1	*lot*										
	h. Assorted common wire nails	3	*kg*										
3	**Re-construction of Damage Slab**	**#REF!**	**cu.m**										
	Cement	*#REF!*	*bag*										
	Sand	*#REF!*	*cu.*										
	Gravel	*#REF!*	*cu.*										
	12mm rebars	*80.00*	*pcs*										
	m.# 16 G.I. Tie wire	6	*kgs.*										
	f. 1/2" thk Ordinary plywood	65	*pcs*										
	g. Scaffolding(rental)	40	*sets*										
										SUB-TOTAL III. STRUCTURALWORKS		***0.00***	
										TOTAL PROJECT COST		**0.00**	

SUMMARY OF ABC		**AMOUNT**
I. GENERAL REQUIREMENTS		**-00**
II. DISMANTLING & HAULING WORKS		**-00**
III.REPAIR & RENOVATION WORKS		**-00**
ARCHITECTURAL WORKS		-00
STRUCTURAL WORKS		-00
PROPOSED TOTAL BUILDING COST:		**-00**

Section VIII. Checklist of Technical and Financial Documents

Components of Bid Proposal

Checklist of Technical and Financial Documents

I. TECHNICAL COMPONENT ENVELOPE (FIRST ENVELOPE)

Class "A" Documents

Legal Documents

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

or

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

and

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

and

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

Technical Documents

☐ 2. 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**

☐ 3. 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**

☐ 4. 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**

☐ 5. 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**

Project Requirements, which shall include the following:

☐ 6. Organizational chart for the contract to be bid; **and**

☐ 7. 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; **and**

☐ 8. 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**

☐ 12. 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

☐ 13. 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**

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

Class "B" Documents

☐ 15. 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 (SECOND ENVELOPE)

☐ 1. Original of duly signed and accomplished Financial Bid Form; **and**

Other documentary requirements under RA No. 9184

☐ 2. Original of duly signed Bid Prices in the Bill of Quantities; **and**

☐ 3. 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**

☐ 4. Cash Flow by Quarter.

Note: Please provide us e–copy of all Eligibility, Technical and Financial Components of the Bid Proposal save in a compact disc.

ANNEX "A"

PACKAGING AND LABELLING INTRUCTIONS

1. Two Envelope System
   The ORIGINAL - TECHNICAL COMPONENTS requirements stated below shall be enclosed into a folder, same as with the ORIGINAL - FINANCIAL COMPONENTS requirements which will also be done in a separate folder. These two (2) folders shall be placed into separate envelope forming the **Two-Envelope System**.

   Envelope 1 : Technical Components (see attached listing)
   Envelope 2 : Financial Components (see attached listing)

2. The First Envelope, ORIGINAL - TECHNICAL COMPONENTS and the Second Envelope, ORIGINAL - FINANCIAL COMPONENTS should be sealed in an outer envelope marked as ORIGINAL BID. Each copy of the first and second envelopes shall be similarly sealed duly marking the inner envelopes as "COPY NO. ___ - TECHNICAL COMPONENT" and "COPY NO. ___ – FINANCIAL COMPONENT" and the outer envelope as "COPY NO. ___", respectively. The First and Second envelope should be produced into three (3) copies marked as Copy No. 1 , Copy No. 2 and Copy No. 3.

3. All four (4) envelopes, Original, Copy No. 1, Copy No. 2 and Copy No. 3, shall be enclosed in a single envelope referred to as the **Mother Envelope**.

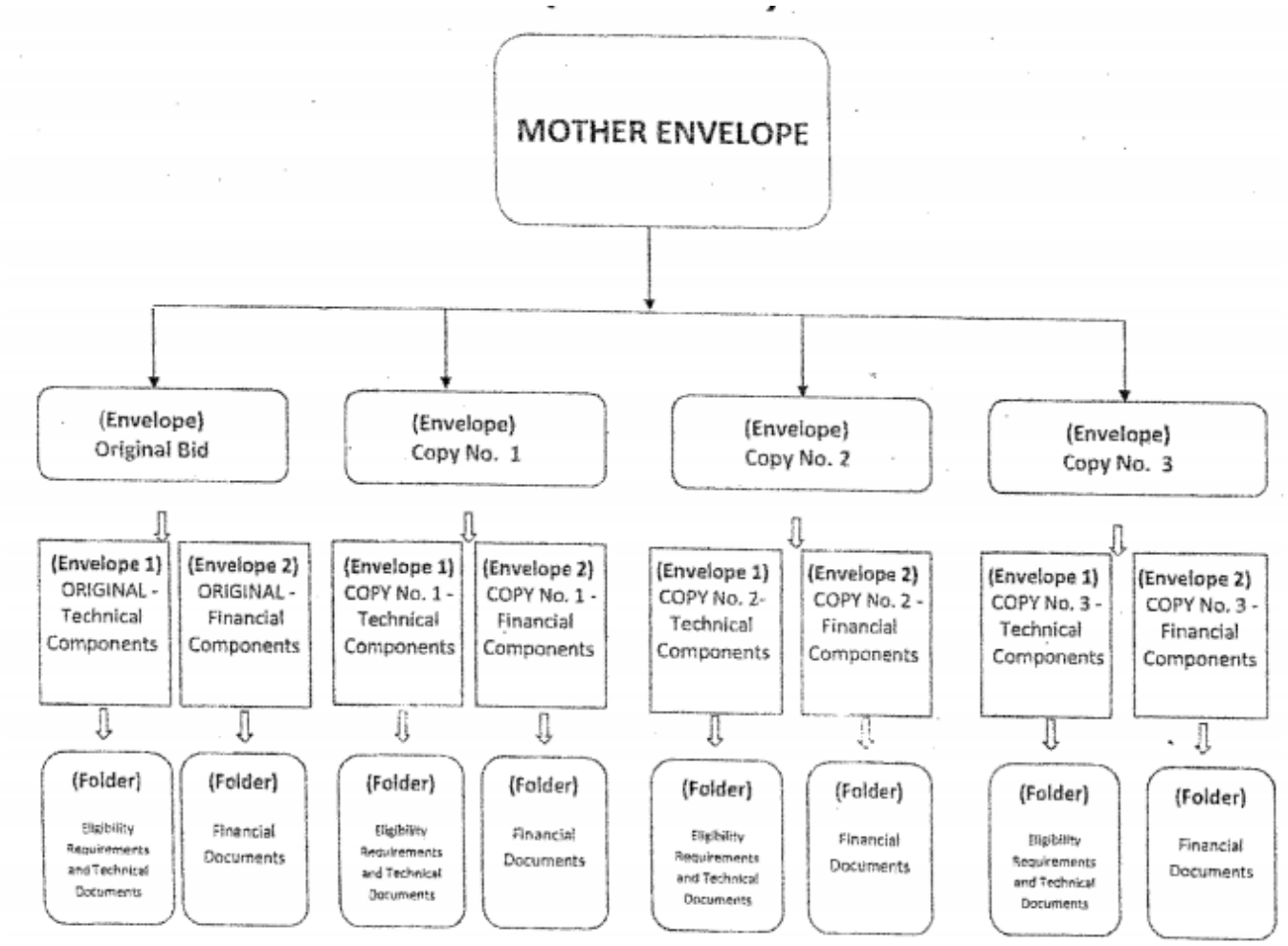
4. All documents must be marked with **Ear tabs**. There must be a Table of Contents indicating all the documents to be submitted per folder.

5. All envelopes should properly be **sealed, signed and labelled**. The folders should also be be labelled properly.

6. All copies must be **Certified True Copy** and signed.

TO:	ATTY. MA. ROSENNE M. FLORES-AVILA Chairperson Bids and Awards Committee National Museum of the Philippines Padre Burgos Avenue, ermita Manila
FROM:	Name of Company Address & Telephone Number
Reference No.	
	Project Title Location
	Do not Open Before: date and time of the Submission and Opening of Bids

PACKAGING AND LABELING INSTRUCTIONS (DIAGRAM)



Annex B Bidding Form

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

Acknowledgment

[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]

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]

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[1] 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: _____

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