PAMBANSANG MUSEO NG PILIPINAS
NATIONAL MUSEUM OF THE PHILIPPINES

BIDS AND AWARDS COMMITTEE

BIDDING DOCUMENTS

for the

HIGHLY URGENT REPAIR OF OUR LADY OF CAYSASAY CHURCH AND ASSOCIATED STRUCTURES, A DECLARED NATIONAL CULTURAL TREASURE IN TAAL, BATANGAS

(Reference No. 7567097)

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Section I. Invitation to Bid

PAMBANSANG MUSEO NG PILIPINAS
NATIONAL MUSEUM OF THE PHILIPPINES

Invitation to Bid
for
HIGHLY URGENT REPAIR OF OUR LADY OF CAYSASAY CHURCH AND ASSOCIATED STRUCTURES, A DECLARED NATIONAL CULTURAL TREASURE IN TAAL, BATANGAS

1. The **National Museum of the Philippines**, through the **General Fund FY 2021** intends to apply the sum of **Fourteen Million Seven Hundred Thirty-Five Thousand Four Hundred Forty-Two Pesos and 54/100 only (PHP 14,735,442.54)**, being the Approved Budget for the Contract (ABC), to payments under the contract for **HIGHLY URGENT REPAIR OF OUR LADY OF CAYSASAY CHURCH AND ASSOCIATED STRUCTURES, A DECLARED NATIONAL CULTURAL TREASURE IN TAAL, BATANGAS.** 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 **Two Hundred Forty (240) calendar days**. The Contractor must have a **Medium 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 built heritage project of government recognized importance, whether as National Cultural Treasure (NCT), Important Cultural Property (ICP) or National Historical Landmark (NHL). The contractor must have also proven relevant working experience within ten (10) years that deals with retrofitting, restoration and/ or reconstruction of unreinforced masonry (URM) structures 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** at **9:30 A.M.** to **2:30 P.M.**

5. A complete set of Bidding Documents may be acquired by interested bidders on **25 March 2021,** from the given address and below and the website **http://nationalmuseum.gov.ph/** and upon payment of the applicable fee for the Bidding Documents, pursuant to the latest Guidelines issued by the GPPB,

in the amount of **Twenty-five Thousand Pesos (PHP 25,000.00) and it is non-refundable**. The Procuring Entity shall allow the bidder to present its proof of payment for the fees thru presented in person, or through electronic means.

6. **Pre-Bid Conference** on **6 April 2021, 1:30 P.M.** at **Old Civil Service Building, National Museum of the Philippines, Padre Burgos Street, Manila,** which shall be open 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 April 2021, at 10:30 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 April 2021, 10:30 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
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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 **Highly urgent Repair of the Church of Our Lady of Caysasay and Associated Structures, a Declared National Cultural Treasure in Taal, Batangas**, with Project Identification Number ***NMPBAC-PB-2021-03-02***.

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 **Fourteen Million Seven Hundred Thirty Five Thousand Four Hundred Forty-Two Pesos & 54/100 only** (**Php 14,735,442.54)**.

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 built heritage project of government recognized importance, whether as National Cultural Treasure (NCT), Important Cultural Property (ICP) or National Historical Landmark (NHL). The contractor must have also proven relevant working experience within ten (10) years that deals with retrofitting, restoration and/ or reconstruction of unreinforced masonry (URM) structures 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 **Medium 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 294,708.85,** 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 736,772.13** 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 7. Credit line issued by a local commercial bank or a cash deposit certificate, which shall be equal to ten percent (10%) of the Approved Budget for the Contract to be Bid

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	
7.2	Fifteen (15) years.
10	Dayworks are applicable at the rate shown in the Contractor's original Bid.
14	Materials and equipment delivered on the site but not completely put in place shall be included for payment.
15.1	The date by which operating and maintenance manuals are required is upon submission of final billing request. The date by which "as built" drawings are required is upon submission of final billing request.

Section VI. Specifications

TECHNICAL SPECIFICATIONS

For the

HIGHLY URGENT REPAIR OF OUR LADY OF CAYSASAY CHURCH AND ASSOCIATED STRUCTURES A DECLARED NATIONAL CULTURAL TREASURE IN TAAL, BATANGAS

As prepared by

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Director- General

CONSERVATION GUIDELINES

M01 Removal of Mortar Joints and Repointing

PART 1 – PRODUCTS

1.01 EQUIPMENT FOR RAKING AND REPOINTING

A. Equipment for raking joints:

1. Traditional Method: Hand chisels and mash hammers

2. Modern Method: Power tools including small pneumatically-powered chisels scaler (power chipper), and thin diamond-bladed grinders. Power saws are not recommended.

B. Equipment for repointing:

1. Mortar pan mill or equipment for mortar mixing

2. Plastic buckets, hoe, wooden mallet or ax handle

3. Mortar board, hawk, trowels, pointing rod

4. Natural bristle or nylon brushes (metal bristle brushes are NOT to be used)

1.02 MORTAR SELECTION CRITERIA: See Section M02

A. Repair mortar shall match the color, texture, and tooling of the existing pointing.

B. Sand shall match the sand of the historic mortar.

C. Mortar shall have greater vapor permeability and be softer, measured in compressive strength, than the masonry units.

D. Mortar shall be as vapor permeable and be as soft or softer, measured in compressive strength, than the existing historic mortar.

PART 2 - EXECUTION

2.01 GENERAL

A. The restoration methods and materials selected for a specific structure shall take into account the total construction system of the building to be worked upon including different masonry and mortar materials, as well as non-masonry elements that may be affected by the work.

B. The extent of the repointing, whether partial or sectional repointing, complete facades or features, or total structure or building, shall be reviewed by the Architect on site prior to beginning operations. The Contractor shall submit a repointing schedule, including methods and materials to be used for approval before work starts.

C. The Contractor shall complete a survey of the condition of the mortar and masonry:

1. Existing general masonry failures that contribute mortar losses shall be noted and should be scheduled for repair prior to repointing.

2. Analysis of mortar type and color shall be conducted, the extent and type of analysis to be determined by the Architect.

D. The Contractor shall protect adjacent materials, installed non-masonry materials, and openings.

E. Manufacturer's instructions for mixing and installation of masonry and equipment shall be followed. Masonry shall conform to ASTM C 270.

F. Masonry cleaning shall be completed prior to beginning raking and repointing work.

2.02 SYSTEM FOR JOINT REMOVAL

A. The areas selected for repointing, if partial or selective repointing is to be done shall be designated and marked off.

B. Removal Methods:

1. Traditional Method: removal of mortar by hand with a hand chisel and mash hammer. This method produces the least damage and is preferred for masonry with thin joints and brick.

2. Modern Method: removal with power tools such as pneumatic chisels and grinders. Power saws are not recommended for use on most brick walls or thin joints. Small pneumatically powered chisels are generally effective for use on historic buildings, providing the operator is skilled. Grinders with thin diamond blades can be used for horizontal joints on hard Portland cement mortars.

3. Combined Methods: combined use of power tools and hand chiseling methods are generally recommended and achieve the highest degree of success when properly executed.

C. Specifications for Removal:

1. Mortar shall be removed to a minimum depth of 2 to 2 .times the width of the joint but not less than inch.

2. Chisels and power tools are to be the appropriate size to fit cleanly into mortar joints without damage to surrounding surfaces.

3. Loose or disintegrated mortar beyond the minimum depth shall be removed.

4. Removal of the mortar shall be done in a manner that does not score, chip, or otherwise damage masonry units or adjacent elements.

5. Mortar should be removed cleanly from the masonry units, leaving square corners at the back of the cut.

6. If using a grinder to rake head joints, the Contractor shall switch to the smallest diameter blade possible to make the deepest cut without overrunning the ends of the joint and cutting into the bricks above or below. Top and bottom of the head joints shall be finished with a chisel.

7. Use a hand chisel to finish joints adjacent to door and window openings to avoid damage to frames and trim.

8. If work is found unacceptable, all raking shall cease without additional cost to the Owner until deficiencies in tools, workmanship, or methodology have been corrected to the Architect's satisfaction.

2.03 SYSTEM FOR REPOINTING

A. The Contractor shall inspect all joints to receive mortar prior to commencing work:

1. After removal of the old mortar, joints shall be blown clean with compressed air (40-60 psi) to remove all loose particles and dust.

2. Prior to repointing, joints shall be dampened with low pressure water (100-150psi). Joints shall be damp with no visible standing water.

3. A continual mist of water shall be applied for a few hours prior to repointing walls of absorbent masonry units such as limestone, sandstone, and common brick.

B. Filling Joints:

1. Fill the deeper areas first, compacting the new mortar in several successive layers.

2. Apply successive amounts of mortar in-inch layers.

3. Allow each layer to harden before application of the next layer.

4. Apply the final layer flush with masonry units, except where old bricks or stones have worn, rounded edges, the final mortar layer should be recessed slightly from the face of the masonry. Do not feather-edge mortar over chipped or damaged edges.

C. Finishing:

1. Allow the final layer to set until "thumb-print hard" and tool to match the historic joint. Proper timing is important for uniform color and appearance of the mortar.

2. Remove excess mortar from the edges of the joints with a natural bristle or nylon brush after mortar has dried but before the mortar is initially set (1-2 hours).

D. Curing:

1. Periodically wet mortar joints after the mortar joints are thumb-print hard and have been tooled (especially important with high-lime content mortars, such as Type O, Type K, and especially Type L). Misting with a hand sprayer with a fine nozzle for one to two days is recommended.

2. Where ambient temperatures exceed 80 degrees F or where wind speeds exceed 20 mph, cover walls with burlap after repointing to keep walls damp and protected from direct sunlight. If plastic is used, it must be tented out and not placed directly against the wall.

3. Allow new mortar to cure for at least 30 days prior to exposure to other repairs, such as masonry cleaning.

M02 Preparation of Lime and Cement-Amended Mortars

PART 1 - PRODUCTS

1.01 MORTAR SELECTION CRITERIA:

A. Repair mortar shall be compatible with the material, quality, color, and texture of the existing mortar.

B. Sand shall match the gradation of the historic mortar and be free from impurities. The color, size, and texture of the sand should be similar to the original sand.

C. Mortar shall have greater vapor permeability and be softer, measured in compressive strength, than the masonry units.

D. Mortar shall be as vapor permeable and be as soft or softer, measured in compressive strength, than the existing historic mortar.

E. Testing and Mortar Selection for Masonry Units:

1. Selection of Mortar for Brick Units:

a. Identify type and strength of brick.

b. Identify the composition, strength, and hardness of the historic mortar.

c. Lime and Sand mortars are preferred for historic brick masonry.

d. Portland Cement generally should not be used for historic brick.

e. Mortar should have a lower compressive (psi) strength than brick.

f. Mortar should be harder than the historic mortar.

2. Stone:

a. Identify type of stone.

b. Identify geological and mineralogical nature of stone.

c. Identify the Compressive or Crushing Strength of stone both wet and dry: ASTM C170-87.

d. Mortar should have a lower compressive (psi) strength than stone: general about 1/3 the compressive or crushing strength of the stone units.

e. Hard, Portland cements are generally not appropriate for historic mortars.

1.02 MORTAR TYPE AND MIX

A. Depending on the desired strength and consistency, lime mortars should conform to ASTM C207 and ASTM C206, Mortar for Masonry, such as:

1. Type M (2,500 PSI): 3:1:12
2. Type S (1,800 psi): 2:1:9
3. Type N (750 psi): 1:1:6
4. Type O (350 psi): 1:2:9
5. Type K (75 psi): 1:3:11
6. Type L: 0:1:3

OR

B. Equivalent mortar that meets comparable National Museum Specifications.

1.03 POINTING MATERIALS AND MIXES (JOB-MIXED MORTAR)

A. Portland Cement: ASTM C150, Type I, non-staining and without air entrainment.

Gray and white Portland cement may be combined as required to match the desired color.

1. Non-staining white cement, preferred for historic applications, unless grey cement was used in the original mortar.

2. Standard grey cement is generally not used for historic masonry.

B. Hydrated Lime: ASTM C207, Type S.

C. Lime Putty (slaked lime): should conform to ASTM C5.

D. Sand: ASTM C144, free of clay, silt, soluble salts, and organic matter; shall match the color and texture of the original mortar sand. The Contractor may request from the Architect a sample of the original mortar sand for use in color and texture matching.

E. Water: Potable, free from injurious amounts of oil, soluble salts, alkali, acids, organic impurities and other deleterious substances which impair mortar strength or bonding.

1.04 PRE-MIXED MORTARS: Pre-mixed mortars may be used for repointing. All mortars must be approved by the Architect.

1.05 ACCESSORY MATERIALS

A. Historic Materials include other components that enhance the colour and texture matching and may include materials such as crushed oyster shells and animal hair, and historic pigments such as brick dust and lamp black.

B. Colorants (if required for exact color match): Non-fading, mineral oxide masonry pigment as approved by the Architect.

1. Pigments should not exceed 10% by weight of the pozzolamic materials in the mix.
2. Carbon black should not exceed 2% of the Portland cement in the mix.

1.06 ADMIXTURES

A. No air-entraining admixtures or material containing air-entraining admixtures.

B. No admixtures containing chlorides shall be added to mortar.

1.07 EQUIPMENT FOR MORTAR PREPARATION

A. Equipment:

1. Trough, plastic buckets, hoe, wooden mallet or ax handle, or similar implements
2. Mortar pan mill
3. Paddle or drum type mixers
4. Undyed, unprinted burlap

PART 2 – EXECUTION

2.01 GENERAL

A. Testing and Mortar Selection shall be reviewed by the Architect. The Contractor shall submit testing schedule, mortar schedule, and schedule of related repairs, including methods and materials to be used:

1. Identify masonry units: Type and composition.
2. Identify the crushing or compressive strength (psi) of masonry units.

3. Identify properties, composition, and strength of historic mortar.

4. Select mortars that match the existing in color, texture, quality, and materials.

5. Select mortars that are softer than the existing mortar and the masonry units.

B. Mortar components should be measured and mixed carefully (in a consistent manner) to assure uniformity of visual and physical characteristics.

C. Pre-mixed mortar should be mixed and handled following manufacturer's specifications.

2.02 FIELD MORTAR MIXING LIME MORTARS

A. Measure dry ingredients by volume.

B. In a clean trough, wheelbarrow, or mixer (depending on quantities needed) combine and mix all dry ingredients thoroughly (before adding water).

C. Add just enough clean water to "hold together," thus allowing the mixture to stand for a period prior to the addition of the remaining water.

D. Prior to use, add half of the water and mix thoroughly for five (5) minutes.

E. Add the remaining water in small portions until the desired consistency is reached. Keep the amount of water added to a minimum.

F. Mortar should be used within approximately 30 minutes of final mixing. Do not re temper or add more water after final mixing.

2.03 FIELD MIXING FOR MORTAR USING LIME PUTTY

A. Materials are measured by volume.

B. Do not add additional water.

C. Proportion sand first, and then add the lime putty.

D. Mix in a clean trough for five (5) minutes or until all the sand is thoroughly coated with the lime putty by beating with a wood mallet or ax handle, interspersed by chopping with a hoe to achieve the maximum workability and performance.

OR

E. Mix in a mortar pan mill when large quantities are needed, following the sequence above. Modern paddle and drum mixers do not achieve the desired results.

F. Protect the mixture from the air by covering with wet burlap or seal in a large plastic bag.

G. The sand/lime putty mix (which resembles brown sugar) can be stored indefinitely if placed in a sealed bag or container. Recombine mixture as specified in D above into a workable plastic state. Do not add water.

2.04 FIELD MIXING FOR POZZOLAMIC MATERIALS –LIME PUTTY-SAND MORTARS (Type O or Type K)

A. Materials are measured by volume.

B. Combine sand and lime putty as described above and mix. Do not add water at this point.

C. Mix the pozzolamic materials into a slurry paste using clean water.

D. Combine the pozzolamic materials slurry with the sand/lime putty mixture.

E. Add color pigments, if any.

F. Mix for five (5) minutes.

D. Mixture should be used within 30 minutes to 1 .hours. Do not re temper mixture. Once pozzolamic materials is added, the mortar can no longer be stored.

M03 Preparation of Lime or Portland-Based Stucco

PART 1 - PRODUCTS

1.01 EVALUATION OF EXISTING STUCCO

A. Microscopical and chemical analysis of historic stucco.

B. Visual inspection, conditions assessment, and documentation.

1.02 LIME STUCCO

The type of substrate must be identified. The chosen stucco composition must be compatible in colour, texture, finish, and quality with the existing stucco and substrate.

A. Lime Based Stucco

1. Lime should conform to ASTM C 207, Type S, Hydrated Lime for Masonry Purposes: 1,800 psi.

2. Sand should match the existing stucco as closely as possible in color, texture, and gradation, should be free from impurities, and should conform to ASTM C 144.

3. Water should be clean and potable.

4. Hair or fibre (if used) should be goat or cattle hair, or pure hemp or *abaca* of good quality, to 2 inches in length, clean and free of dust, dirt, oil, grease, or other impurities.

5. Colorants (if required for exact color match) should be non-fading, mineral oxide masonry pigment or Architect approved equal.

B. Equipment: Trough, wheelbarrow, plastic buckets, hoe, hawk, trowel, burlap (clean, undyed, and unprinted)

1.03 PORTLAND AMENDED STUCCO

The type of substrate must be identified. The chosen stucco composition must be compatible in color, texture, finish, and quality with the existing stucco and substrate

A. Portland amended stucco

1. Lime should conform to ASTM C 207, Type S, Hydrated Lime for Masonry Purposes: 1,800 psi.

OR

2. Gypsum: it is important to note that gypsum-based stucco is NOT compatible with lime based stucco. The two should NOT be used in conjunction with each other.

3. Sand should match the existing stucco as closely as possible in color, texture and gradation; be free from impurities; and conform to ASTM C 144

4. Cement should be gray and/or white, non-staining pozzolamic materials and conform to ASTM C 150, Type II. Gray and white cements may be combined as required to achieve the required color.

5. Water should be clean and potable.

6. Hair or fiber (if used) should be goat or cattle hair, or pure manila fiber of good quality to 2 inches in length, clean and free of dust, dirt, oil, grease, or other impurities.

7. Pigment (if used) should be compatible with the stucco mix and conform to ASTM C 979.

B. Equipment: Trough, wheelbarrow, plastic buckets, hoe, hawk, trowel, burlap (clean, undyed, and unprinted).

1.04 LIME AND CEMENT STUCCO MIX

A. General: Except as otherwise indicated, comply with the requirements of ASTM

C 926-98a for the proportioning of materials and the manner of mixing the plaster for each required application; comply with manufacturer's instructions if more stringent than ASTM C 926.

B. Lime-Based Stucco

1. Scratch coat:

1 part lime

3 parts sand

Binder

2. Finish coat:

1 part lime

3 parts sand

C. Lime-Pozzolamic materials Stucco

1. Type N:

Scratch and brown coats:

1 part lime

1 parts pozzolamic materials

6 parts sand

Binder

Finish coat:

1 part lime

1 parts pozzolamic materials

6 parts sand

2. Type O:

Scratch and brown coats:
2 part lime
1 parts pozzolamic materials

9 parts sand
Binder

Finish coat:
2 part lime
1 parts pozzolamic materials
9 parts sand

1.05 PRE-MIXED STUCCO

With the Architect's approval, pre-mixed stucco may be used for patching and new stucco, provided it is compatible with the existing stucco and/or the masonry substrate. Provide manufacturer's full color range for selection or provide custom match. Follow manufacturer's recommended mixing and preparation procedures for factory-mixed products.

PART 2 – EXECUTION

2.01 GENERAL

A. The extent of the stucco repair work and/or new areas to be stuccoed shall be reviewed by the Architect on site prior to beginning operations. The Contractor shall submit an annotated drawing or photographs showing the affected areas, along with a written description of the methods and materials to be used.
B. The Contractor shall protect adjacent materials, openings, and substrate.

2.02 LIME BASED STUCCO

A. Mix stucco mortars in accordance with ASTM C 270.
B. Measure dry ingredients by volume or equivalent weight. Do not measure by shovel. Combine in a clean, mechanical batch mixer.
C. Mix dry ingredients thoroughly.

D. Stucco materials shall be pre-hydrated to reduce shrinkage. Lime and sand shall be thoroughly mixed, adding only enough water to produce a damp, unworkable mix that will retain its form when pressed into a ball. Stucco shall stand in this condition for 1 hour. Add pozzolamic materials and remainder of

water and mix to provide a workable consistency. Stucco should be easily thrown from trowel and adhere to the surface for easy spreading.

E. Do NOT over-mix (machine mix for 3-5 minutes).

F. Stucco should be used in 1 .to 2 hours. Do not re temper or use partially hardened material.

G. Wash all equipment promptly.

M04 Repair and Replacement of Stucco

PART 1 – PRODUCTS

1.01 PATCHING HISTORIC STUCCO

The type of substrate must be identified

The chosen stucco composition must be compatible with the substrate.

A.Patching Material:

1.Stucco: See Section M03, Preparation of Lime or Portland-Based Stucco.

2.Bonding agent

B. Equipment:

1. Mixing: Trough, wheelbarrow, plastic buckets, hoe, hawk, trowel, burlap (clean, undyed, and unprinted)
2. Stucco Application: Plastic buckets, hoe, hawk, trowel, burlap (clean, undyed, and unprinted)
3. Stucco Removal: Chisel, mason's or chipping hammer, mallet, mortar board
4. Injection Grouting: Syringes (multiple sizes), plywood, miscellaneous lumber, foam-rubber padding

1.02 INJECTION GROUTING

A. Cementitious injection grout shall be an industry-approved, factory-mixed product. Selected products must be approved by the Architect.

B. Injection ports and surface cracks shall be sealed with removable, non-staining clay during injection grouting.

PART 2 - EXECUTION

2.01 GENERAL

A. The extent of the stucco work and areas to be stuccoed shall be reviewed by the

Architect on site prior to beginning operations. Contractor shall submit testing schedule and a stucco schedule, including the methods and materials to be used.

B. The Contractor shall protect adjacent materials, openings, and substrate

2.02 EVALUATION OF EXISTING STUCCO

A. Visual inspection and conditions analysis: The Contractor shall:

1. Identify cause and location of stucco deterioration.

2. Coordinate stucco work with other repairs such as gutter and roof work, cleaning, removal of overgrown vegetation, water runoff and diversion from the building, painting and sealing.

2.03 STUCCO REPAIR OF MINOR CRACKS (¼ inch and smaller)

A. Crack should be free from dirt, grease, and vegetation. Blow cracks clean with compressed air.

B. Coat crack with a bonding agent in accordance with manufacturer's instructions.

C. Prepare a slurry coat of stucco to match the color and finish of the existing stucco.

D. Apply a light coat of the slurry along the crack and work to match existing stucco.

2.04 STUCCO REPAIR OF LARGE CRACKS (larger than ¼ inch)

A. Cracks to be repaired shall be routed to a minimum width and depth of an inch to accommodate mortar fill. The edges of the crack shall be undercut where possible. Brush cracks clean of loose debris with a soft brush.

B. The area to receive the mortar fill shall be thoroughly wetted to prevent dehydration of the mortar. Re-wet as necessary. Using the approved stucco mix, fill the crack proud and work mortar in as tightly as possible until flush with adjoining surface. Remove excess mortar. Protect filled areas with plastic and re-wet periodically to allow a full cure.

2.05 STUCCO REPAIR BY PATCHING

A. Extent and area of patches shall be carefully assessed and reviewed by the Architect.

B. Remove all loose, deteriorated, and severely cracked stucco to the masonry substrate or lath. Avoid over sounding to prevent additional damage to adjacent keys.

C.Stucco on Masonry Substrate:

1. Stucco is applied directly to masonry substrates such as brick, stone, concrete, or hollow tile without lath.

2. If necessary, rake out brick or stone mortar joints to a depth of ¾ inch.

D. Masonry on Wood/Bamboo Substrate:

1. Wood Substrate: Determine type of lath—horizontal wood slats or woven bamboo.

2. Lath should be in good condition, free of rot.

E. Surface should be free of debris, dust, dirt, grease, oil, paint, and vegetation.

Clean with a bristle brush.

F. Area should be cut on the diagonal and squared off with a butt joint to provide a neat patch. If necessary, and as reviewed by the Architect, it may be preferred to stucco the area of an entire feature

G. New patch must not overlap existing stucco.

H. Dampen surface before applying stucco.

I. Apply the scratch coat to the masonry substrate or lath. Number and thickness of the repair coats should match the historic stucco. The scratch coat is generally to ⅜ inch thick, and must be scratched or crosshatched with a comb to provide a key for the second coat. Allow scratch coat to dry 24 to 72 hours.

J. The leveling or second coat is often applied in the same thickness as the initial coat. The total thickness of the first two coats is generally ⅝ inch. Roughen with a wood float with a nail protruding to provide a key for the finish coat.

K. The final or finish coat is applied when the leveling coat is initially set. Work the finish coat to match the texture of the original stucco.

2.06 INJECTION GROUTING

A. Surface preparation:

1. Remove any surface vegetation to fully expose the delaminated area to be repaired following recommended cleaning treatments. Vines should be cut at the roots and allowed to wither and dry completely before removal from the wall. After the dry plant has been carefully pulled away, wash the wall with water and a soft bristle brush. In extreme cases where the tendrils are deeply imbedded, extensive damage may have occurred, and the section involved may require replacement of the stucco. In extreme cases, consult with the Architect prior to removal of the stucco.

2. Remove surface dirt by scrubbing with clean water and a soft bristle brush. No acidic or alkaline cleaning agents shall be employed.

3. The crack shall be blown clean with compressed air (40 to 60 psi) prior to grouting.

B. Injection Grouting:

1. Seal any cracks in the delaminated area to be grouted using the approved removable clay or sealant, leaving injection ports at regular intervals per the manufacturer's instructions. Test the seal and dampen the cavity using an initial injection of plain water; re-seal as necessary.

2. Begin grouting at the lowest injection port, continuing until grout is visible at the next injection port. Plug the injection port and proceed to the next one. Discontinue grouting if leakage appears, and do not resume until seal is repaired. Continue grouting from bottom to approximately half the height of the delaminated area. Using a padded piece of plywood, push the delaminated layer gently toward the substrate until grout appears at the topmost injection port. Support in place for a minimum of 72 hours until grout is fully cured.

3. Patch injection ports with approved stucco mixture. An alternative procedure for the reattachment of plaster onto *Tabique Pampango* walls is as follows:

• The loose or partially detached plaster layer is supported with foam plastic padding, plywood sheet, and timber shoring.

• If the wood or bamboo lathing is exposed at the back of the plaster, loose material is cleaned away with a vacuum cleaner.

• Small holes are drilled through from the front the back through the laths to the point where the plaster has detached from the lath or from its substrate or from a ground coat. Stops or collars are placed on the drill bit to ensure that it penetrates to the required plane and no further.

• A "pre wet" solution of diluted acrylic resin is injected into the holes with a hypodermic syringe of the type used by veterinarians. The pre wet solution has the essential role of stabilizing or fixing any dust which exists in the

hidden cracks or voids within the plaster. If this dust is not immobilized it tends to "roll" in front of the consolidating medium and form dams which then block further penetration

• A thrixotropic consolidating medium is injected by means of a bulk loading gun with a modified tip for injection purposes. The consistency of this consolidating medium can be as follows:

2 parts powdered chalk

2 parts microballons

2 parts fluid coke

3-3 .Rhoplex MC-76

Cabosil M-5 (pyrogenic silica) as a thickener if desired

(Other formulations use similar proportions but the acrylic resin is made up from 3 parts of Rhoplex M-76 to 1 part Rhoplex LC-67 plus . part of water.)

2.07 PREPARATIONS FOR STUCCO REPLACEMENT

A. Remove existing stucco, lath, and accessories down to masonry substrate to allow for masonry and/or flashing repairs as required. Coordinate with other trades to ensure that repairs are completed before installing new stucco.

B. Masonry surfaces to receive direct stucco application are to be thoroughly wetted prior to stucco application.

2.08 INSTALLATION OF REPLACEMENT STUCCO

A. General:

1. Standards: Except as otherwise indicated, comply with ASTM C 926 for stucco work.

2. Do not use materials that are frozen, caked, or lumpy, or that are contaminated by foreign materials. Use only clean water, free from impurities that may impair the plaster work; do not use water that has been used to clean tools.

3. Do not use excessive water in the mixing and application of plaster materials.

4. Sequence plastering applications with other work in accordance with recognized industry practices.

5. Prepare all stucco in a mechanical mixer.

B. Plaster Applications:

1. Apply 3-coat stucco over *Tabique Pampango* and masonry substrates (scratch/level, brown and finish coats). It is advisable to check the thickness of old stucco to duplicate this in new stucco. Stucco patches are to match the level of the surrounding surface.

2. Allowable Tolerances: For flat surfaces, do not exceed .inch in 8 feet for bow or warp surface, and for plumb and level.

3. Finish Coat Texture/Pattern: Patches to existing stucco shall match the existing surface texture:

a. Where scoring is required, utilize a straight-edge and a square-tipped tool of the same width as the existing joint scoring.

b. New scoring shall match the block sizes and bond of the existing pattern.

4. Curing: Protect each coat of stucco work from drying out for a period of 24 hours after placement (or until curing operation will not damage surface), and moisture cure not less than 48 hours after time of placement.

M07 Repair through Mechanical Pinning or Structural Reinforcement

PART 1 - PRODUCTS

1.01 MATERIALS

A. Mortar Materials

1. Lime: ASTM C-207, Type S

2. Pozzolamic materials: ASTM C-150, Type I, non-staining and without air entrainment. Gray and whitepozzolamic materials may be combined as required to match existing mortar.

3. Sand: ASTM-C-144, free of clay, silt, soluble salts, and organic matter, and shall match the color and texture of the original mortar sand.

4. Water: Potable and free of deleterious amounts of oil, soluble salts, alkali, acids, organic impurities, or other substances that may impair the strength or bond of the finished mortar.

5. Mortar colorant, if required to match the color of the existing mortar, shall be a standard, alkali resistant, non-fading product manufactured by an approved manufacturer. Submit product and manufacturer information to the Architect for approval.

1.02 MIXES

A. Mortar mixes shall be the appropriate the strength and hardness for the masonry units and existing mortar. The mix shall match the composition, color, and texture existing mortars. Refer to Section M02

1.03 ACCESSORY MATERIALS

A. Stainless-steel pins for stone repair shall be Type 316 stainless-steel all-thread rods, .inch diameter. Length shall be as required by the size of the stone to be repaired.

B. Epoxy adhesive for embedding pins shall be a high modulus epoxy resin conforming to ASTM C-881, Type I, II, IV, and V, Grade 3 epoxy resin adhesives.

C. Replacement cramps and other embedment shall be Type 316 stainless steel.

D. Joint reinforcement for rebuilding masonry shall be Type 316 stainless-steel all thread rods, .inch diameter. Verify number and spacing of rods with the Architect or Structural Engineer.

PART 2 - EXECUTION

2.01 GENERAL

A. Masonry cleaning shall be completed prior to beginning masonry restoration or repointing.

2.02 PINNED REPAIRS FOR BROKEN STONES

A. Remove loose flakes of stone, dirt, and debris from both the fragments to be reattached. Dry fit to verify placement, using register marks to align and mask edges to protect surface from excess adhesive.

B. Drill holes for new stainless steel rods parallel to the long dimension of the stone and centered in the thickness of the stone. Use register marks to ensure that holes in mating surfaces align perfectly and shall remove debris and dust after drilling with pressurized water or air (40 to 60 psi).

C. Mix adhesive according to manufacturer's instructions. Fill anchor holes for reinforcing rods full with epoxy to ensure full adhesion and apply epoxy adhesive to both mating surfaces in a uniform layer, working product well into surface.

D. Install rods and work stone fragment back into place, ensuring full contact with the adhesive. Immediately remove any excess adhesive from joint edges. Immobilize fragment until epoxy adhesive has cured.

2.03 RE-ANCHORING INDIVIDUAL BUILDING STONES

A. The Contractor shall complete any required pinning, patching or other repair to individual stones prior to reinstallation.

B. Remove damaged material from the area to be repaired and clean masonry backup and adjoining stones of mortar. Vacuum or rinse area free of dust and loose debris.

C. Install stainless steel pins as required to secure the unit to the existing substrate. Allow for 1 pin per 20 square inches of surface area to be patched. Pins shall penetrate a minimum of one third the thickness of the stone to be installed but under no circumstance be allowed to penetrate beyond half the depth of the stone.

D. The diameter of the holes for stainless steel anchor pins shall be drilled ⅛ inch greater than the diameter of the pins. The Contractor shall anchor pins in specified setting adhesive. The use of hammer drills is NOT permitted.

E. Use lead, slate, or plastic shims of the thickness required to maintain the required joint width. The use of wood shims is NOT permitted. Where the repair extends to the edge of the masonry unit, maintain the existing joint thickness. Joints occurring in the field of the masonry unit shall be hairline joints and shall not be pointed out. The Contractor shall dry fit the stone to assess the snugness of the fit and adjust as required.

F. Set stone straight, plumb, and true to line and level in full mortar bed. Ensure head joint and vertical joints, if required, are packed full with mortar. Tool joints flush to existing stone surface profile.

2.04 MASONRY DISASSEMBLY AND RECONSTRUCITON

A. The Contractor shall carefully dismantle selected areas of masonry. Dismantle adjacent assemblies as required for access to the designated masonry, salvaging components for reuse to the greatest extent possible.

B. Rake or grind mortar from joints to the greatest extent possible before attempted removal of the stones. Avoid excessive prying against the arises of the selected masonry units to avoid spalling and chipping. Label each unit on a concealed side with non-removable marking. Numbers shall be keyed to a drawing to ensure reinstallation in the original location.

C. Clean old mortar and sealants from masonry units to be reassembled.

D. Reset masonry units to proper position, straight, plumb, and true to line and level, with full mortar bed. The Contractor shall embed reinforcing rods in mortar bed, ensuring full coverage, and ensure that vertical head joints are completely filled with mortar. Rake and point as described above except at coping head joints, which shall be pointed with flexible sealant.

E. Reinstall adjacent materials or patch in kind as required to complete the installation.

M08 Repair through Patching, Consolidating, and Grouting

PART 1 - PRODUCTS

1.01 MATERIALS

A. Pointing and Patching Materials – Job-Mixed

1. Lime: ASTM C-207, Type S

2. Pozzolamic materials: ASTM C-150, Type I, non-staining and without air entrainment. Gray and white pozzolamic materials may be combined as required to match existing mortar.

3. Sand: ASTM-C-144, free of clay, silt, soluble salts and organic matter and shall match the colour and texture of the original mortar sand.

4. Water shall be potable and free of deleterious amounts of oil, soluble salts, alkali, acids, organic impurities, or other substances that may impair the strength or bond of the finished mortar.

5. Mortar colorant, if required, shall match the color of the existing mortar. Mortar colorant shall be a standard product by a recognized manufacturer of this type of product. Colorant products and manufactures selected shall be approved by the Architect.

B. Pointing and Patching Materials – Factory-Mixed: The Contractor shall have the option of providing factory-mixed pointing and patching mortars subject to approval of required technical data, samples, and mock-ups by the Architect.

C. Manufacturers: Obtain masonry materials and units from an established plant having the capacity and facilities for producing material of specified quality and finish, and in sufficient quantity so as not to delay progress of the work. Plant shall be that of a producer recognized by the industry as a supplier and/or manufacturer of this type of material, who can show successful completion of work of comparable quality and scope.

D. Dutchman materials

1. ASTM C568, Category II (medium density) Specification for Limestone

2. ASTM C503 Specification for Marble Dimension Stone, Classification 1 Calcite

3. ASTM C615 Specification for Granite Dimension Stone

4. ASTM C616 Specification for Quartz-Based Dimension Stone

5. ASTM C629 Specification for Slate Dimension Stone

6. Obtain stone consistent with the color and texture range of the existing material.

Stones shall be sound and free from cracks, chips, and other defects that may affect strength or appearance.

1.02 MIXES

A. Mortar mixes shall be of the appropriate strength and hardness for the masonry units and existing mortar. The mix shall match the composition, color, and texture of existing mortars. Refer to Section M02.

1.03 STONE CONSOLIDANT

A. The selection of a stone consolidant is highly dependent on the type of stone to be consolidated and the extent of its deterioration.

B. The Contractor shall provide information on industry recognized manufacturers that provide products that may be suitable for consolidation of fragile masonry surfaces. Specific guidance should be sought from the manufacturer regarding the product availability and use in the project locale. Manufacturers and products selected must be approved by the Architect.

1.04 ACCESSORY MATERIALS

A. Stainless steel pins for anchoring patches shall be Type 304 or 316 stainless steel all-thread rods, inch diameter. Length shall be as required by the depth of the patch. All other embedment such as eye bolts to be used for anchoring reinforcing pins and wire shall be stainless steel.

B. Stainless-steel rods for stitching vertical cracks shall be Type 304 or 316 stainless-steel all-thread rods, .inch diameter. Length shall be approximately 24 inches or as required to span crack 12 inches on either side.

C. Epoxy adhesive for embedding anchors and pins shall be a high modulus epoxy resin conforming to ASTM C-881, Type I, II, IV, and V, Grade 3 epoxy resin adhesives.

1.05 MIXING PROCEDURES

A. Job-Mixed Mortar:

1. Mix mortar in accordance with ASTM C-270.

2. Measure materials by volume or equivalent weight as indicated. Do not measure by shovel.

3. Mix ingredients in a clean mechanical batch mixer for 3 to 5 minutes.

4. Mortar shall stand for 20 minutes prior to use to allow for initial shrinkage. Place mortar in final position within two hours of mixing. Do NOT re temper or use partially hardened mortar.

B. Proprietary Mortars: Mix in accordance with manufacturers printed instructions.

PART 2 - EXECUTION

2.01 GENERAL

A. Complete masonry cleaning prior to masonry repair and repointing. The Contractor shall match new patching materials and mortars to the color of the cleaned stone.

B. The Contractor shall examine areas and conditions under which masonry restoration is to be performed and notify the Architect of any conditions detrimental to the proper and timely completion of the work. Work shall NOT commence until all unsatisfactory conditions have been adequately corrected.

2.02 MASONRY REPOINTING

A. Refer to Section M01 – Removal of Mortar Joints and Repointing.

2.03 REMOVAL OF EXISTING PATCHES AND PREPARATION OF SUBSTRATE

A. Existing patches showing visible signs of failure such as cracking or delamination shall be removed and replaced as noted on the Drawings. Where a single small stone requires extensive patchwork, the entire stone shall be removed back to sound material and a dutchman patch installed.

B. The Contractor shall remove existing patches by manual chiseling or using a low pressure (≤40 psi) pneumatic chisel. Grinding with a carborundum blade will be permitted only after review and approval of the grinding technique by the Architect. Final chipping of the corners of the area to be patched shall be done by hand.

C. The Contractor shall chip damaged areas back to sound material, ensuring a uniform minimum depth of . inch. Remove additional stone only as required to provide for a neat square patch. Back bevel the top and sides of the patch area to provide a mechanical key for the new patching material.

D. Wash area to be patched clean of dust, grit, and other debris.

E. Where stone patches exceed 20 square inches in area or 3 inches in depth, the Contractor shall install stainless-steel pins as required to secure the patch or dutchman unit to the existing substrate. The Contractor shall allow for 1 pin per 20 square inches of surface area to be patched. Pins shall penetrate a minimum of one third the thickness of the patch/dutchman to be installed but under no circumstance be allowed less than 2 inches mortar cover.

F. The diameter of the holes for stainless steel anchor pins shall be drilled ⅛ inch greater than the diameter of the pins. The use of hammer drills is not permitted. The Contractor shall anchor pins in specified setting adhesive.

2.04 MORTAR PATCHING

A. Thoroughly wet area to be patched to prevent suction of moisture from the patching material. Apply a slurry coat of approved mortar to the substrate.

B. Install mortar patching material in lifts to build the required depth of patch in accordance with the manufacturer's published instructions. The surface shall be tooled to match the adjacent stone texture

C. Keep the mortar patches damp for 24 hours using damp burlap, plastic sheeting or other membrane as required.

2.05 DUTCHMAN PATCHING

A. Remove damaged material from the area to be patched. Where possible, back bevel edges of opening and bevel edges of dutchman to improve mechanical key. The Contractor shall clean masonry backup and adjoining stones of mortar, and vacuum or rinse area free of dust and loose debris.

B. Where stones exceed 20 square inches in area, install stainless-steel pins as required to secure the unit to the existing substrate. The Contractor shall allow for 1 pin per 20 square inches of surface area to be patched. Pins shall penetrate a minimum of one third the thickness of the stone to be installed but under no circumstance be allowed to penetrate beyond half the depth of the stone.

C. The diameter of the holes for stainless-steel anchor pins shall be drilled ⅛ inch greater than the diameter of the pins. The use of hammer drills is not permitted. The Contractor shall anchor pins in specified setting adhesive.

D. Use lead, slate, or plastic shims of the thickness required to maintain the required joint width. The use of wood shims is not permitted. Where the patch extends to the edge of the masonry unit, maintain the existing joint thickness. Joints occurring in the field of the masonry unit shall be hairline joints and shall not be pointed out. The Contractor shall dry fit the Dutchman to assess the snugness of the fit and adjust as required.

E. Set dutchman straight, plumb, and true to line and level in full mortar bed. The Contractor shall ensure head joint and vertical joints, if required, are packed full with mortar. Tool joints flush to existing stone surface profile. Surfaces mating with the existing stone shall be coated with adhesive and fitted tightly together.

2.06 VERTICAL CRACK REPAIR

A. The Contractor shall rake horizontal masonry joints to approximately 12 inches on either side of the crack to be repaired and a minimum depth of 2 inches or to sound mortar. Rake entire crack down to sound mortar (where applicable). See Section M01 Removal of Mortar Joints and Repointing.

B. Where cracks extend through individual stones, the Contractor shall remove and replace cracked stones with sound material toothed into the adjacent masonry.

C. Repoint all joints full depth, embedding stainless-steel reinforcing rods at least 1. inches behind the finish joint surface to a minimum distance of 12 inches on either side of the crack. Space rods approximately 12 inches o.c. vertically. Ensure rods are set in a full mortar bed. Finish joints to match existing.

2.07 STONE REPAIR BY CONSOLIDATION

A. Consolidant should only be applied to those units most consumed by disaggregation. Face- bedded units exhibiting deep losses as a result of sloughing of parallel layers shall not be consolidated. The Contractor shall review the extent of the work with the Architect, marking each individual stone to be consolidated with chalk or other removable medium. All areas shall be photographed after marking is complete.

B. To ensure better penetration of the stone, the Contractor shall rake surrounding joints prior to application of consolidant.

C. Application to mortar joints is unnecessary and should be avoided.

D. The Contractor shall apply consolidant according to manufacturer's instructions and approved test panel.

M99 Replacement in Kind of Deteriorated Elements

PART 1 - PRODUCTS

1.01 MATERIALS

A. Pointing Materials

1. Lime: ASTM C-207, Type S

2. Pozzolamic materials: ASTM C-150, Type I, non-staining and without air entrainment. Gray and white pozzolamic materials may be combined as required to match existing mortar.

3. Sand: ASTM-C-144, free of clay, silt, soluble salts and organic matter and shall match the color and texture of the original mortar sand.

4. Water: Potable and free of deleterious amounts of oil, soluble salts, alkali, acids, organic impurities, or other substances that may impair the strength or bond of the finished mortar.

5. Mortar colorant, if required to match the color of the existing mortar, shall be a standard product manufacture by Solomon Grind-Chem Service, Medusa, or other approved manufacturer.

1.02 MIXES

A. Mortar mixes shall be appropriate the strength and hardness for the masonry units and existing mortar. The mix shall match the composition, colour, and texture existing mortars. Refer to Section 04100 = Historic Mortar.

1.03 IN-KIND STONE REPLACEMENT

A. Architectural stone: New stone must be compatible with the existing stone and match in color and texture. Any chosen product must be justified accordingly and approved by Architect.

B. One supplier for approved stone shall be used for completion of the work.

C. Fabrication:

1. New stone units shall be fabricated in accordance with approved shop drawings. Fabricated units shall match all dimensions indicated on the approved shop drawings within a tolerance of +/- ⅛ inch in 12 inches.

2. The Contractor shall cut masonry units with a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.

3. Exposed surfaces shall be tooled by hand or machine as required to match the original stone.

4. The Contractor shall provide slots or holes for anchors as indicated on the shop drawings.

1.04 ACCESSORY MATERIALS

A. Stainless-steel pins for anchoring patches shall be Type 304 or 316 stainless steel all-thread rods, . inch diameter. Length shall be as required by the depth of the patch. All other embedment such as eye bolts to be used for anchoring reinforcing pins and wire shall be stainless steel.

B. Stainless-steel rods for stitching vertical cracks shall be Type 304 or 316 stainless steel all-thread rods, . inch diameter. Length shall be approximately 24 inches or as required to span crack 12 inches on either side.

C. Epoxy adhesive for embedding anchors and pins shall be a high modulus epoxy resin conforming to ASTM C-881, Type I, II, IV, and V, Grade 3 epoxy resin adhesives.

PART 2 - EXECUTION

2.01 GENERAL

A. Masonry cleaning shall be completed prior to masonry repair and repointing. New replacement materials and mortars shall be matched to the color of the cleaned stone.

B. The Contractor shall examine areas and conditions under which masonry restoration is to be performed and notify the Architect of any conditions detrimental to the proper and timely completion of the work. Do not commence work until all unsatisfactory conditions have been adequately corrected.

C. Masonry repairs shall be completed prior to beginning masonry repointing.

2.02 IN-KIND REPLACEMENT OF HISTORIC STONE

A. Carefully dismantle selected areas of masonry where designated on the Drawings, and dismantle adjacent assemblies as required for access to the designated masonry, salvaging components for reuse to the greatest extent possible. The Contractor shall permanently label individual masonry units to remain on a concealed face to allow reassembly in original locations.

B. Rake or grind mortar from joints to the greatest extent possible before attempted removal of the building stones. Avoid excessive prying against the arises of the masonry units to remain to avoid spalling and chipping. Deteriorated masonry units to be replaced may be broken out using pneumatic chisels or grinders.

C. Clean old mortar and sealants from masonry units to be reused.

D. Install new masonry units where indicated to match the depth of the surrounding walls. Patch in kind and/or reinstall to match adjacent materials as required to complete the installation. The Contractor shall:

1. Cut units as required to provide bonding pattern to match the existing masonry and to fit adjoining work neatly. Use full units without cutting wherever possible.

2. Lay masonry units straight, plumb, and true to line and level in full mortar bed with full coverage for horizontal bed and vertical head joints. Rake back all mortar joints .inch for installation of pointing mortar.

3. Install stainless-steel pins or anchors as indicated on the approved shop drawings to secure stone units to the existing substrate. Pins shall penetrate a minimum of one third the thickness of the stone to be installed but under no circumstance be allowed to penetrate beyond half the depth of the stone.

4. The diameter of the holes for stainless steel anchor pins shall be drilled ⅛inch greater than the diameter of the pins. The use of hammer drills is NOT permitted. Anchor pins in specified setting adhesive.

5. Use lead, slate, or plastic shims of the thickness required to maintain the required joint width. The use of wood shims is NOT permitted.

E. Brush, vacuum, or flush joints to remove all dirt and loose debris. Dampen joints prior to pointing to prevent suction of moisture from the pointing mortar.

F. Where finish mortar joints are indicated, install pointing mortar in .-inch-thick layers, allowing each layer to reach thumbprint hardness before applying the succeeding layer. When the final layer of mortar is thumbprint hard, tool joint to match existing profile.

G. The Contractor shall keep joints damp for 48 hours after pointing.

M10 GROUTING OF CRACKS IN MASONRY WALL (Weaver, Martin)

PART 1 - PRODUCTS

1.01 MATERIALS

A. Pointing Materials

1. Lime: ASTM C-207, Type S

2. Pozzolamic materials: ASTM C-150, Type I, non-staining and without air entrainment. Gray and white pozzolamic materials may be combined as required to match existing mortar.

3. Sand: ASTM-C-144, free of clay, silt, soluble salts and organic matter and shall match the color and texture of the original mortar sand.

4. Water: Potable and free of deleterious amounts of oil, soluble salts, alkali, acids, organic impurities, or other substances that may impair the strength or bond of the finished mortar.

5. Mortar colorant, if required to match the color of the existing mortar.

6. Fly Ash

7. Bentonite

1.02 MIXES

A. Mortar mixes shall be appropriate the strength and hardness for the masonry units and existing mortar. The mix shall match the composition, colour, and texture existing mortars. Refer to Section M02.

There are several alternative grouting mixtures that are recommended. Given the nature of the walls of the different structures in ILOCOS REGION = these having been constructed for the most part with lime mortar (*lechada*) and filling stones (*vitoca*), while the coral stones can be seen as more of a protective cladding = it should be noted that a softer grout should be applied, as mixtures with Portland cement may prove to be too strong. Ashurst (John and Nicola, 1998) recommend the following grouts (for very delicate ruins):

1. A grouting operation in two stages withh mix A and mix B (all Parts By Volume) mix A = 1 pbv hydrated lime: 0.20 pbv fly ash: 0.75 pbv water. Mix B used after refusal of A ("no take") = mix A + intrusion aid.

2. 1 pbvprebagged (hydrated) lime: 1pbv fly ash: 1/pbv bentonite

3. A higher strenght grout is 1 pbvsulfate-resisting portland cement: 2 pbv hydrated lime: 1 pbv fly ash. Solids-to-water ratios are typically 1 : 3 or 1 : 4.

As tests are to be done, it may be worthwhile to do one with a stronger Pozzolamic materials-based grout:

Pozzolamic materials 53.3 lb (24.1 kg)

Sand 33.3 lb (15.0 kg)

Fly ash 17.1 lb (7.8 kg)

Intraplast N (intrusion aid) 11.2 oz (317.0 g)

Water 35.4 lb (16.1 kg)

PART 2 - EXECUTION

2.01 GENERAL

Typical gravity grout pressures for historic masonry may be 15-20 psi (about 98 kPa) while pumped grout pressures may be 145-215 psi (about 980-1470 kPa).

These pressures may be compared with pressures of 100-350 psi (700-21, 000 kPa) which are used for grouting fissured rock. Masonry walls may suffer from mortar losses in their interiors because of prolonged penetration of acidic rainwater for example. They will thus develop large cavities within their cores and unless mortar can be reproduced into these cavities the wall may fail under load. The art and rather inexact science of introducing liquid cementitious mixtures into voids in masonry, rock, and soils is called grouting. The liquid mixes are called grouts. The amount of grout which is "accepted" by the voids is called the "take."

2.02 GRAVITY GROUTING OF CRACKS IN MASONRY

General Notes: This type of grouting involves introducing liquid mortar by means of
hoses from small or medium sized reservoirs or "grout pans" which are raised about 12 to 15 ft (4 or 5 m) above the inlet point. The height of the reservoirs above the injection points are a series of holes drilled into the defective masonry about 3 ft (1 m) apart horizontally and 18 in. (50 cm) apart vertically on a staggered grid. As the holes are drilled they should be flashed out with clean water.

Procedure:

1. Proceeding up the wall, as water is injected at the walls and out at lower holes until it runs clear. Where water flows out through open or faulty jointsclay or tightly packed old rope.
2. Work usuall proceeds in 3-ft (1 m) vertical lifts at one time. A larger vertical lift will be liable to build up too high a pressure behind loose face stones which may then be forced out of the wall.
3. The liquid grout is allowed to rise up in the wall until it flows out of the next line of holes above. These holes may be stopped off and the grout flow cut off to the wall.
4. As the grout begins to cure, the next section of walling can be made ready. The temporary packing in the joints can be removed after the initial set to prepare the joints for subsequent pointing.
5. Very loose stones which may have dropped out of alignment may berealigned and supported in place with water-soaked hardwood wedges until the grout mortar has been placed and the stones are secure. As the wet wedges dry out they shrink, become loose, and can easily be removed. Being wet to start with they do not expand to push the sone out of alignment after it has been carefully positioned.

2.03 PUMPED GROUTING

Both hand and power-operated pumps may be used to inject grout under pressure. Hand-operated pumps are preferred for duplicate unstable masonry. The equipment consists of a mixer, a diaphragm pump, and hoses fitted with control valves.

Procedure:

1. The same layout of injection holes is employed as was used for gravity grouting.
2. The delivery hose is connected to the lowest injection nozzle, the pump is started, and the grout is allowed to rise within the wall.
3. The rising level of the grout is observed through clear plastic tubes fitted in weep holes at intermediate levels up the wall. These tubes can be doubled over and tied off as the grout rises higher in the wall.
4. When the top of the 3-ft (1 m) lift is reached at the next line injection nozzles, the grout flow is stopped and the lower nozzle is closed off.
5. When the grout has set the operation can be repeated.

2.04 VACUUM GROUTING

Procedure:

1. Injection nozzles and holes are located as before and coupled to the grout hoses.
2. The masonry to be grouted is then enclosed in a tough, air-tight, transparent polyethylene sheet.
3. The air within the enclosure is evacuated with a powerful vacuum pump and the valve is opened to allow the grout to flow. The vacuum causes the grout to be sucked into the wall.
4. The results are observed through the plastic and when the grouting is complete as shown by overflow from upper weep holes then the grout supply is cut off the grout allowed to set.

C01 Cleaning and Testing of Atmospheric Soiling, Graffiti, Stains, and Biological growth

PART 1 - PRODUCTS

1.01 CLEANING OF ATMOSPHERIC SOILING

A. Investigations and method selection: Types of materials, surface and substrate conditions, previous treatments, and the nature, cause and pattern of the stain type for each area shall be determined. The method of cleaning and the level of cleaning shall be approved by the Architect. The Contractor shall protect adjacent materials, installed non-masonry materials, and openings.

B. Cleaning methods: Cleaning shall be undertaken through the mildest, least abrasive method.

1. Water Washing: Washing the surface with low to medium-high jet pressure, not to exceed 1,000 psi at 4-6 gpm, using a 45-degree fan-type nozzle for water soluble dirt and chemical compounds. Optimal water pressure to be determined during preparation of cleaning samples. Begin with lowest possible pressure and increase as necessary to achieve the desired results.

2. Nebulous Sprays: Application of intermittent mist spray under low pressure to dampen surface. Dirt is removed through scrubbing and agitation.

3. Detergents: Formulations made with dilutions of detergents, surfactants, and chelating agents in water. Neutral or non-ionic detergents or surfactants are added to water for use on hydrophobic stains.

4. Masonry Cleaners: Proprietary cleaning solutions containing detergents, acidic or alkaline compounds. If this type of product is proposed, great care must be exercised in product selection and preparation of test panels to identify potentially detrimental effects on the masonry. This type of product is not recommended for polished stones or extremely fragile or deteriorated masonry. The use of raw acids and/or alkalis for masonry cleaning is not permitted at any time.

C. Water used for cleaning of historic masonry cleaning shall be potable, free of injurious amounts of oil, soluble salts, alkali, acids, and other impurities that might stain or otherwise damage masonry.

D. Equipment for masonry cleaning:

1. Pipes and hoses used for water cleaning shall be plastic or other similar material that is not subject to corrosion, which can cause discoloration and staining of surfaces being cleaned.

2. Natural bristle brushes shall be used for scrubbing (metal bristle brushes are NOT to be used).

3. Hoses, fittings, and equipment to be used for application of proprietary cleaning compounds shall be solvent, acid, or alkali-resistant as recommended by the manufacturer of the cleaning products.

4. Buckets, trowels, scrapers, and other tools to be used for mixing and application of poultices shall be solvent-resistant plastic. Wood scrapers and trowels are also permitted. No metal tools are to be used.

E. Water/rinsing method: Surfaces shall be rinsed with water after cleaning. Rinse water will be collected and disposed of as stipulated in 1.01 B above. Rates of water pressure shall be no greater than 200-300 psi at 3-6 gpm with minimal saturation.

1.02 CLEANING OF STAINS

A. Investigations and method selection: Types of materials, surface and substrate conditions, previous treatments, and the nature, cause and pattern of the stain, corrosion, or deposits for each area shall be determined. The method of cleaning and the level of clean shall be approved by the Architect.

B. Cleaning Methods:

1. Poultices (see Section C03)

2. Reducing Compounds: Iron stain/rust reducing with bleaching compounds or potassiumhexacyanoferrate. (See also Poultices, Section C03

3. Acids: Rust removal with colorless soluble formulations made with hydrofluoric,
formic, oxalic, or phosphoric acids at 5-10% concentrations.

C. Equipment for Application (see Atmospheric Soiling above)

D. Water/rinsing method (see Atmospheric Soiling above)

1.03 CLEANING OF GRAFFITI.

A. Investigations and method selection: Types of materials, surface and substrate conditions, previous treatments, and the materials used to create the graffiti for each area shall be determined. The method of cleaning and the level of cleaning shall be approved by the Architect.

1.Incised graffiti cannot be addressed by cleaning, and is, therefore, not covered under this section. If the damage is deep, removal may be addressed in Sections C02 and C03.

2.Staining and graffiti should be addressed after atmospheric soiling and biological growth are removed.

3. Graffiti is most easily removed when it has been freshly applied. Therefore, timely removal of graffiti is important.

B. Cleaning Methods:

1. Water and Detergent: Washing the surface with water at low to medium jet pressure, not to exceed 300 psi at 4-6 gpm. Neutral or non-ionic detergents or ammonia may be introduced. Use the lowest possible pressure to achieve the desired results.

2. Poultices: A paste or slurry made with absorbent material or powder-inert clay, such as kaolin or sepiolite, diatomaceous earth (fuller's earth); or Cellulose products such as pulp cellulose or shredded paper that is mixed with a cleaning solution (a liquid reagent such as water, organic solvent, paint stripper, or bleach).

3. Organic Solvents and Paint Removers: Proprietary graffiti-removal products and/ or commercial paint strippers containing organic solvents used in conjunction with a poultice (see 2.03 B 2 above), gel or paste removers, or paper or cloth-backed removers. Do not use "off-the-shelf" aerosol graffiti removers as these can cause additional staining and redistribution of pigments to clean areas.

4. Laser Cleaning: A unique source of light with an intense monochromatic, wellcollimatedbeam such as pulsed laser beams and xenon flash lamps. Cleaning is conducted at a low fluence (<1 J/cm/2).

C. Equipment for Application: See Atmospheric Soiling above

D.Water/rinsing method: See Atmospheric Soiling above

1.04 CLEANING BIOGROWTH AND BIRD DROPPINGS

A. Investigations and method selection: Types of materials, surface and substrate conditions and the nature, cause and pattern of biomaterials for each area shall be determined. The method of cleaning shall be approved by the Architect.

B. Cleaning Methods:

1. Water Washing: Cold water applied by low to medium jet pressure, not to exceed 300 psi. Ammonia may be introduced for treatment of algae, fungi, molds, and mildew. Use lowest possible pressure to achieve desired results.

2. Acidic Cleaners: Formulations of acids, surfactants, and chelating agents.

3. Poultices: See Section C03.

4. Herbicides: Quaternary ammonium treatment.

C. Equipment for Application: See Atmospheric Soiling above

D. Water/rinsing method: See Atmospheric Soiling above

1.05 STONE PROPERTIES AFFECTING CLEANING

A. Calcitic Stone (Limestone, Marble and some Sandstones): Marble, limestone and some sandstones are acid sensitive. Acids can cause etching and dissolution of the stones and should not be used for their cleaning.

B. Silicate Stone (most types of Sandstone): There are many kinds of sandstone, each with a different geological composition. For example, sandstones that contain water-soluble minerals can be eroded by water cleaning. Some sandstone can be cleaned with acids; others are acid-sensitive and can be severely etched or dissolved by an acid cleaner.

PART 2 - EXECUTION

2.01 GENERAL

A. The extent of the cleaning (clean level) and areas to be cleaned shall be reviewed by the Architect on site prior to beginning operations. Contractor shallsubmit testing schedule and a cleaning schedule, including the methods and materials to be used.

B. The Contractor shall protect all adjacent materials from spray and chemicals.

C. The cleaning runoff will be collected in plywood troughs lined with polyethylene sheeting. Polluted liquid gathered shall be pumped into tanker trucks or drums for properly controlled disposal. Acidic runoff shall be neutralized with lime or soda ash prior to release.

D. Masonry cleaning shall be completed prior to masonry repointing and repairs. The Contractor shall remove and store light fixtures, downspouts, and other appurtenances to ensure full access to wall surfaces, unless otherwise noted by the Architect. Anchor holes and penetrations from appurtenances must be temporarily filled with removable sealant or protected with cover plates.

E. The Contractor shall remove all live vegetation and plant debris prior to cleaning. With the approval of the Architect, invasive vines shall be cut close to the ground and allowed to wither and dry. The dry vines shall be carefully removed and the façade surface cleaned with a natural bristle brush prior to other treatments.

2.02 MASONRY CLEANING

A. Surface Preparation for Cleaning

1. Examine the surfaces to be cleaned prior to commencing cleaning operations. Large cracks (¼ inch or larger) and open joints discovered shall be temporarily filled with removable sealant to prevent penetration of cleaning solutions into the core of the wall.

2. Window and door openings shall be protected from leakage and damage from cleaning solutions by plastic sheeting or other waterproof membrane. Open joints around window frames and door frames shall be filled with temporary sealant to prevent leakage.

B. Water Mist Cleaning

1. Using ½-inch PVC pipe and fittings as required, construct a sprinkler assembly with mist-type spray heads located approximately 2 feet apart. Assembly to be connected to a continuous water source with a timed shutoff valve for on/off cycling. Assembly to be suspended beneath the overhanging surfaces to be cleaned.

2. Starting from the top and working downward in sections, saturate the stone surface in cycles of 4 hours on / 4 hours off for a period of 24 hours to soften soiling prior to final washing. Water flow to be approximately 20 to 25 gallons per hour. Do not point nozzles directly at joints in the masonry.

3. After water misting is complete for a section of masonry, manually agitate heavily soiled areas and areas of high relief decoration with masonry brushes to loosen deposits. Final washing of each section shall consist of a medium to high pressure wash, not to exceed 1,000 psi. Rinse surfaces from top to bottom using a 45°fantip nozzle and a flow of approximately 4 gallons per minute. Maintain a minimum distance of 18 inches between the nozzle tip and the masonry surface. Use lowest possible pressure to achieve desired results.

C. Chemical Cleaning

1. Masonry surfaces shall be saturated with water prior to application of chemical cleaning products to prevent undesirable absorption of cleaning chemicals.

2. Cleaning of masonry walls shall proceed from the bottom of the wall upward to minimize streaking.

3. Apply the masonry cleaning product in accordance with manufacturer's instructions and approved cleaning procedure submittal. The Contractor shall use tampicofiber brushes, rollers or very low-pressure spray (not to exceed 50 psi) for application. The Contractor shall NOT use high-pressure spray equipment to apply cleaning product.

4. After completion of the appropriate dwell time, loosened soiling shall be removed using a moderate pressure water rinse. Do NOT allow the cleaning products to dry on masonry surfaces. Rinse surfaces from top to bottom using a 45° fan-tip nozzle with a nozzle pressure not to exceed 800 psi and a flow of approximately 4 gpm. A minimum distance of 18 inches between the nozzle tip and the masonry surface shall be maintained.

5. After cleaning is completed, the Contract or shall remove protective coverings from adjacent surfaces and repair any damage or staining caused by the cleaning operation to adjacent surfaces.

D. Removal of Metallic Stains

1. See Section C03, Poulticing and Salt Removal

E. Removal of Salts

1. See Section C03, Poulticing and Salt Removal

F. Cleaning Graffiti

1. Apply the specified paint stripper using a brush, roller or low pressure spray apparatus equipped with a nozzle 0.019 inch or larger. Spray equipment must be equipped with chemical resistant packing and hoses. Apply to a minimum thickness of 10 mils.

2. Allow stripper to remain on the surface in accordance with the dwell time determined during preparation of the approved test panel. Dwell time will increase as temperatures decrease.

3. After dwell time is completed, the Contractor shall remove lifted layers using a squeegee, plastic scraper, or wet vacuum device as required. Collect paint and stripper residue, and dispose of in accordance with local, state and federal regulations.

4. Thoroughly rinse surface with clean water. Re-apply stripper as required to remove all existing paint layers.

G. Removal of Algal Growth, Moss, and Bird Droppings (Biological Staining)

1. The Contractor shall remove colonies of moss, loose growth, and accumulations of bird droppings from masonry surfaces to be cleaned using wooden scrapers.

2. The Contractor shall apply selected cleaning agent in accordance with manufacturers' instructions and approved test panel. Allow product to dwell on soiled surfaces to achieve optimal cleaning.

3. After completion of required dwell time, agitate with a bristle brush to lift and remove embedded growth. The contractor shall flush surfaces with low to medium high pressure (not to exceed 1,000 psi) water rinse as required to remove staining. Repeat applications as required to remove stains.

4. Spot clean for heavily soiled areas (biological growth):

a. Spot cleaning shall be performed only after general cleaning has been completed for approximately two weeks.

b. Thoroughly wet surfaces to be treated with spot cleaner. Apply product using a synthetic brush, roller or low-pressure spray and allow it to dwell on the surface. Dwell time to be in accordance with the approved test panel.

c. After dwell time has elapsed, thoroughly rinse the surface with clean water at moderate pressure (200 to 600 psi), working from the bottom up.

d. Apply neutralizing rinse (if required) and allow to dwell on the cleaned surface 3 to 5 minutes. After completion of the required dwell time, rinse the surface again with clean water at moderate pressure (200-600 psi) working from the bottom up.

C02 Appropriate Use of Wet and Dry Abrasive Cleaning Systems

PART 1 - PRODUCTS

1.01 WET ABRASIVE CLEANING SYSTEM

A. Equipment for Wet Abrasive Masonry Cleaning

1. Pipes and hoses used for water cleaning shall be plastic, rubber, or other similar material that is not subject to corrosion, which can cause discoloration and staining of surfaces being cleaned.

2. Natural or plastic bristle brushes shall be used for scrubbing. Do NOT use metallic wire brushes or pads.

3. Hoses, fittings, and equipment to be used for application of proprietary cleaning compounds shall be solvent, acid-, or alkali-resistant as recommended by the manufacturer of the cleaning products.

4. Pressurizing equipment for masonry cleaning shall be fitted with pressure gauges located at or near the nozzle so as to be easily visible to the operator.

Equipment shall provide for continuous adjustment in nozzle pressure and flow by the operator.

B. Abrasives for wet masonry cleaning may include, but are not limited to, the following:

1. Crushed walnut or almond shells
2. Corncobs
3. Rice husks
4. Glass beads or micro-balloons
5. Plastic beads or micro-balloons
6. Baking soda
7. Silica flour
8. Moderate to high pressure water (600 psi and above) may be considered an abrasive.
9. Appropriate abrasives for testing shall be determined by the surfaces to be cleaned and the type of soiling to be removed. Final determination shall be based on preparation of test panels.

C. Water: Cleaning and rinsing water shall be potable and free of injurious amounts of oil, soluble salts, alkali, acids, and other impurities that might stain or otherwise damage masonry.

1.02 DRY ABRASIVE CLEANING SYSTEM

A. Equipment for Dry Abrasive Masonry Blasting

1. Pipes and hoses used for dry cleaning shall be plastic or other similar material that is not subject to corrosion, which can cause discoloration and staining of surfaces being cleaned.
2. Hoses, fittings, and equipment to be used for application of abrasives shall be as recommended by the manufacturer of the cleaning products.

B. Other equipment used for dry abrasive masonry cleaning includes:

1. Grinders
2. Belt sanders
3. Wire brushes

C. Abrasive materials for dry masonry cleaning may include, but are not limited to, the following:

1. Sand: Shall NOT be used on historic buildings.
2. Crushed walnut or almond shells
3. Corncobs
4. Rice husks

5. Glass beads or micro-balloons

6. Plastic beads or micro-balloons

7. Baking soda: Not appropriate for all types of masonry

8. Silica flour

9. Ice Particles, or palletized dry ice (carbon dioxide [CO2]): Generally not appropriate for use on historic masonry.

D. Rinse water: Water shall be potable, free of injurious amounts of oil, soluble salts, alkali, acids, and other impurities that might stain or otherwise damage masonry.

PART 2 - EXECUTION

2.01 GENERAL

A. The extent of the cleaning (acceptable level of cleaning) and areas to be cleaned shall be reviewed by the Architect on site prior to beginning operations. Contractor shall submit testing schedule and a cleaning schedule, including the methods and materials to be used.

B. The Contractor shall protect all adjacent materials from spray and cleaning materials or dust.

C. The cleaning and rinse runoff for both wet and dry cleaning will be collected in plywood troughs lined with polyethylene sheeting. Polluted liquid gathered shall be pumped into tanker trucks or drums for properly controlled disposal. Acidic runoff shall be neutralized with lime or soda ash prior to release.

D. Where dry abrasive blasting is to be used, contain and collect all spent abrasive and dispose of in accordance with local, state, and federal regulations.

E. Masonry cleaning it to be completed prior to masonry repointing and repairs. Remove and store light fixtures, shutters, awnings, downspouts, and other appurtenances to ensure full access to wall surfaces, unless otherwise noted by the Architect. Anchor holes and penetrations from appurtenances must be temporarily filled with removable sealant or protected with cover plates.

F. Remove all live vegetation and plant debris prior to cleaning. With the approval of the Architect, invasive vines shall be cut close to the ground and allowed to wither and dry. The dry vines shall be carefully removed and the façade surface cleaned with a natural bristle brush prior to other treatments.

2.02 PROBLEMS/USES OF ABRASIVE CLEANING METHODS

A. Problems of Abrasive Cleaning Methods. Most abrasive cleaning methods are very difficult to monitor and control and are NOT considered appropriate for

cleaning historic buildings as they often permanently harm building surfaces.

Abrasive cleaning methods can harm building surfaces by:

1. Removing the dense fired surface (also called the "fire-skin") from brick and terra-cotta, which causes physical and aesthetic damage to exposed surfaces.
2. Removing patina and causing micro-fractures in exposed surfaces of natural stones, causing aesthetic damage and possibly accelerating surface deterioration.
3. Increasing water permeability of brick and some types of stone.
4. Creating rough surfaces that may attract more dirt and contaminants.
5. Diminishing or destroying decorative detail.
6. Eroding mortar joints.
7. Introducing airborne dust and pollutants.
8. Damaging adjacent surfaces.
9. With high pressure wet cleaning, forcing moisture into the building envelope, damaging interior features.

B. Variables to be Considered:

1. Type and condition of the material being cleaned. Fired masonry units such as brick are subject to degradation by abrasive treatments that remove the protective outer shell of the units. Stucco and other soft masonry can literally be washed away by abrasive cleaning.
2. Size, hardness, and sharpness of the grit particles. Polished surfaces are easily clouded or scratched by grit used in abrasive cleaning.
3. The pressure with which water and/or abrasive grit is applied to the building surface: The nozzle distance is a primary determinant in achieving the desired pressure.
4. Skill and care of the operator.
5. Constancy of the pressure on all surfaces during the cleaning process.

C. Appropriate Uses of Abrasive Cleaning

1. Remove stubborn stains and buildup from stone that is detrimental to the building.
2. Clean isolated hard-to-reach areas of carved, molded, or cut ornament.

D. Inappropriate Use of Abrasive Cleaning

1. Abrasive cleaning is almost never appropriate for polished surfaces.
2. Abrasive cleaning is almost never appropriate for cleaning stucco.
3. Abrasive cleaning is almost never appropriate for interior plaster or other finish surfaces.

2.03 WET ABRASIVE CLEANING SYSTEM

A. Types of Wet Abrasive Cleaning

1. Moderate to High Pressure Wash: not to exceed 1,800 psi.

2. Micro-Abrasive Grit Wash: Small amounts of abrasive grit material used in conjunction with low pressure wash, not to exceed 100 psi.

B. Surface Preparation for Cleaning

1. The Contractor shall examine the surfaces to be cleaned prior to commencing cleaning operations. Large cracks (¼ inch or larger) and open joints discovered shall be temporarily filled with removable sealant to prevent penetration of cleaning solutions into the core of the wall.

2. Window and door openings shall be protected from leakage and damage from cleaning solutions by plastic sheeting or other waterproof membrane. Open joints around window frames and door frames shall be filled with temporary sealant to prevent leakage

C. High Pressure Wash: General Procedure

1. Water (sometimes with chemical additives) is applied at approximately 1,500 psi (should not exceed 1,800 psi).

2. Starting from the top and working downward in sections, direct spray at surface at a constant angle and minimum distance of 18 inches from the surface. Do not point nozzle directly at joints in the masonry.

3. After pressure washing is complete for a section of masonry, manually agitate heavily soiled areas and areas of high relief decoration with masonry brushes to loosen deposits. Rinse surfaces from top to bottom using a 45° fan-tip nozzle and a flow of approximately 4 gpm. Maintain a minimum distance of 18 inches between the nozzle tip and the masonry surface.

D. Wet Abrasive Grit Cleaning: Project-specific specifications are required for all wet abrasive cleaning work contained herein. As material and methods of construction vary greatly, each building must be evaluated and work scheduled accordingly. Procedures shall be based on those used in preparation of the approved test panel(s). The Contractor shall submit schedules, including methods and materials to be used. The following is a general procedure for wet abrasive cleaning work:

1.Using 00 or 0 mesh grit with a .-inch opening and fittings as required, set up spray assembly with controlled pressure of 20 to 100 psi. Assembly to be connected to a continuous water source.

2. Starting from the top and working downward in sections, direct spray at surface at a constant angle and distance from the surface. Nozzle distance to be as determined by approved test panels. Do not point nozzles directly at joints in the masonry.

E. Rinsing: After abrasive wash is complete for a section of masonry, wash the slurry from the surface and manually agitate heavily soiled areas and areas of high

relief decoration with masonry brushes to loosen deposits. Final washing of each section shall consist of a low to moderate pressure wash. Rates of water pressure shall be 200-300 psi at 3-6 gpm with minimal saturation. Maintain a minimum distance of 18 inches between the nozzle tip and the masonry surface.

2.04 DRY ABRASIVE CLEANING SYSTEM

A. Types of Dry Abrasive Cleaning

1. Micro-Abrasive Grit: Small amounts of abrasive grit material consisting of very small particles directed at the surface in a stream of compressed air. This technique requires careful use and supervision and is generally not suitable for large-scale cleaning.

2. Mechanical Cleaning: Grinders and sanders are used to abrade the soiling away and with it, the building surface. This type of equipment shall NOT be used to clean building surfaces.

B. Surface Preparation for Cleaning

1. The Contractor shall examine the surfaces to be cleaned prior to commencing cleaning operations.

2. Window and door openings and mechanical intakes shall be protected from dust infiltration by plastic sheeting or other waterproof membrane. Open joints around window frames and door frames shall be filled with temporary sealant to prevent infiltration.

C. Dry Abrasive Grit Cleaning: Project-specific specifications are required for all dry abrasive cleaning work contained herein. As material and methods of construction vary greatly, each building must be evaluated and work scheduled accordingly. Procedures shall be based on those used in preparation of the approved test panel(s). The Contractor shall submit schedules including methods and materials to be used.

D. Rinsing: After abrasive cleaning is complete for a section of masonry, wash the dust from the surface and manually agitate heavily soiled areas with masonry brushes to loosen remaining deposits. Final washing of each section shall consist of a low to moderate pressure wash. Rates of water pressure shall be 200-300 psi at 3-6 gpm with minimal saturation. Maintain a minimum distance of 18 inches between the nozzle tip and the masonry surface.

C03 Poulticing and Salt Removal

PART 1 - PRODUCTS

1.01 GENERAL

A. The type of stone to be cleaned must be identified. This method of removal must compatible with the stone type and type of soiling.

B. Cleaning and rinse water shall be potable, and free of injurious amounts of oil, soluble salts, alkali, acids, and other impurities that might stain or otherwise damage masonry.

1.02 EQUIPMENT

A. Clean pail or containers to prepare poultices

B. Nonmetallic spatulas

C. Wooden scrapers

D. Trowels

E. Natural and synthetic fiberbristle brushes

F. Polyethylene sheeting

G. Protective paper recommended by the manufacturer

H. Japanese tissue or thin polyester geotextile, 200 g/sq m (for use on very porous or highly textured masonry surfaces)

1.03 MATERIALS AND MANUFACTURERS

A. Cleaning materials including poultice clay; poultices for iron and copper staining; poultices for oil and grease removal; paint remover for paint and adhesives; and asphalt, sealant and tar removal; shall be products appropriate for the work in this section and manufactured by industry recognized sources. The Contractor shall submit all selected materials and manufactures to the Architect for approval.

1.04 ACCESSORIES AND RELATED MATERIALS

A. Temporary Sealant: Non-staining, removable sealant suitable for masonry substrates.

B. Brushes for scrubbing masonry and stucco shall be stiff-bristle, nonmetallic brushes as recommended by the manufacturer of the masonry cleaning products. Metal bristle brushes shall NOT be used.

PART 2 - EXECUTION

2.01 GENERAL

A. The extent of the cleaning (desired level of cleaning) and areas to be cleaned shall be reviewed by the Architect on site prior to beginning operations. Contractor shall submit testing schedule and a cleaning schedule, including the methods and materials to be used.

B. Masonry cleaning is to be completed prior to masonry repointing and repairs. The Contractor shall remove and store light fixtures, downspouts, and other appurtenances to ensure full access to wall surfaces, unless otherwise noted by the Architect. Anchor holes and penetrations from appurtenances must be temporarily filled with removable sealant or protected with cover plates.

C. The Contractor shall protect all adjacent materials from rinse water and poultice chemicals.

D. The cleaning/rinsing runoff shall be collected by wet vacuum or in plywood troughs lined with polyethylene sheeting. Polluted liquid shall be gathered and stored in plastic containers for properly controlled disposal. Acidic runoff shall be neutralized with lime or soda ash prior to release.

E. Masonry cleaning shall employ the gentlest means possible. When evidence of deterioration causes doubts about the ability of a stone or other masonry unit to withstand rinsing pressures and manual scrubbing or scraping,

remove cleaning products as gently as possible and cease the cleaning procedure at that location. The Contractor shall notify Architect of the location and condition of masonry units involved.

2.02 SURFACE PREPARATION FOR CLEANING

A. The Contractor shall examine the surfaces to be cleaned prior to commencing cleaning operations. Large cracks (¼inch or larger) and open joints discovered in the area to be cleaned shall be temporarily filled with removable sealant to prevent penetration of cleaning materials.

B. Window and door opening shall be protected from leakage and damage from cleaning materials and spray by plastic sheeting or other waterproof membrane. Open joints around window frames and door frames shall be filled with temporary sealant to prevent leakage.

C. The Contractor shall remove all live vegetation and plant debris prior to cleaning. With the approval of the Architect, invasive vines shall be cut close to the ground and allowed to wither and dry. The dry vines shall be carefully removed and the façade surface cleaned with a natural bristle brush prior to other treatments.

2.03 POULTICING WITH CLAY OR PAPER BASED POULTICES

A. Dampen the surface area to be cleaned with clean water.

B. In a plastic bucket or container, combine poultice ingredients in accordance with manufacturer's printed instructions. Stir continuously until the mixture forms a smooth, wet paste.

C. Apply a layer of poultice paste, ⅛ inch to .inch in thickness, immediately to the stained surface. Surfaces to be cleaned should be free of surface dirt or dust.

D. Leave poultice paste on the masonry surface until completely dry or for a maximum of 24 hours.

E. During hot and/or windy conditions or to protect passers-by, the Contractor shall cover poultice with protective paper covering, sealing and taping the edges. Leave covered for 12-24 hours, adjusting dwell time for cases of extreme humidity. Remove covering, and if the poultice is still wet, allow it to dry completely.

F. Once the poultice is completely dried, the Contractor shall scrape mixture from the surface using wood, plastic, or rubber spatulas.

G. Rinse the treated area thoroughly with water and a soft brush to remove remaining residue.

H. Reapply poultice for consecutive treatments if required.

2.04 SALT REMOVAL WITH SURFACTANTS AND WATER BASED TREATMENTS

A. In a plastic bucket or container, combine poultice filler (paper fiber or clay) ingredients with water. Stir continuously until the mixture forms a smooth, wet paste.

B. Apply a layer of poultice paste, ⅛ inch to .inch in thickness, immediately to the stained surface. Surfaces to be cleaned should be dry and free of surface dirt or dust.

C. Leave poultice paste on the masonry surface until completely dry or for a maximum of 24 hours.

D. Once the poultice is completely dried, scrape mixture from the surface using wood, plastic, or rubber spatulas.

E. Rinse the treated area thoroughly with water and a soft brush to remove remaining residue.

F. After each application, the Contractor shall test poultice material after it is removed to determine the salt concentration and the need for additional treatments. The Contractor shall reapply poultice for consecutive treatments, as needed. When cleaning limestone, the Contractor shall check between each application to ensure that the removal of the salts is not causing discoloration of the stone.

2.05 REMOVAL OF METALLIC STAINS

A. In a plastic bucket or container, combine poultice ingredients in accordance with manufacturer's printed instructions. Stir continuously until the mixture forms a smooth, wet paste.

B. Apply a layer of poultice paste, ⅛ inch to .inch in thickness, immediately to the stained surface. Surfaces to be cleaned should be dry and free of surface dirt and dust.

C. Leave poultice paste on masonry until completely dry or for a maximum of 24 hours.

D. Once the poultice is completely dried, the Contractor shall scrape mixture form the surface using wood, plastic, or rubber spatulas. Rinse the treated area thoroughly with water and a soft brush to remove remaining residue.

2.06 REMOVAL OF OIL AND GREASE

A. Mix poultice ingredients thoroughly and apply a coat to completely cover the stained area, following manufacturer's instructions. Do Not pre-wet the surface.

B. Allow poultice to dry for 5 to 8 hours overnight until completely dried. Fully developed cracking indicates that the poultice is completely dry.

C. Protect poultice from pedestrian contact and rain while drying. Area may be tented with plastic. Do NOT use tightly-adhered covers.

D. The Contractor shall remove residue powder and properly dispose of the residue. Pressure water rinsing can be used on textured finished to facilitate removal of the poultice residue.

2.07 PAINT REMOVAL

A. Scrape loose material from surface to the greatest extent possible.

B. Prepare poultice-solvent mixture in accordance with manufacturer's instruction.

C. Apply the poultice to the stained area to a minimum thickness of .inch.

D. The poultice shall be covered with a plastic film to prevent drying. Press the film to the poultice, and tape and seal edges. Allow the poultice to dwell on the surface in accordance with the approved test panel.

E. After dwell time, remove the plastic cover.

F. Remove the poultice and softened residue by scraping with a nonmetallic spatula. Wash the surface thoroughly with fresh water. Scrub with a stiff bristle brush to loosen spots. Do not allow poultice material to dry on surface.

G. The process shall be repeated as needed.

3.08 SEALANT, TAR AND MASTIC REMOVAL

A. The Contractor shall clean bituminous material from surfaces of walls using wood scrapers to remove bulk of material prior to applying specified remover.

B. Masonry shall be cleaned using specified cleaning agent in accordance with manufacturer's instructions. The Contractor shall:

1. Pre-wet the surface with clean water.
2. Thoroughly rinse the surface after cleaning and apply neutralizing agent if required by manufacturer.
3. Keep area below stained area wet and rinsed free of cleaning residues.
4. Remove protective coverings from adjacent surfaces and repair any damage or staining caused by the cleaning operation to adjacent surfaces.

T01 Epoxy Repair for Deterioration and Decay in Wooden Members

PART 1 - PRODUCTS

1.01 MATERIALS

A. Epoxy consolidant and epoxy filler, both are multiple part compounds. Purchase by the gallon unless a large amount of epoxying needs to be done. Use one of the following, or approved equal:

1. "Con Serv (T) Flexible Consolidant 100" (Conservation Services): Cures slowly with a 5 to 7 hour application time to allow deep penetration. Complete hardness is achieved in 3 to 6 days.
2. "Con Serv (T) Flexible Patch 200" (Conservation Services): A four part puttylike filler; Is not easy to mix in small amounts; Consistency and hardness are easily controlled with this material.

NOTE: The products of Conservation Services are recommended for treatment of thicker wood such as windowsills. Because of its slower curing time, it allows for deeper penetration into members.

3. "Liquidwood-1" Consolidant (Abatron): Solidifies in a short period.
4. "Woodepox-2" Adhesive Paste (Abatron): A two-part paste mix; final hardness is determined by varying the ratio of the two parts. The LiquidWood can be used as a thinner, but this reduces the flexibility of the filler.

NOTE: These Abatron products are recommended for use on smaller members such as window sashes where deep penetration of consolidant is not required. The quick drying feature is an advantage for small, but repetitive, jobs. Abatron carries twenty different types of wood consolidant with varying degrees of penetration.

2. Oil clay that can be purchased from a hobby store – used to keep consolidant from leaking through cracks.
3. Nitril Rubber Gloves (Abatron)
4. Disposable vinyl gloves: Available from drug store or pharmaceutical supply distributor in 50 count or larger boxes.

2.03 EQUIPMENT

A. Plastic bottles, like those used for hair dye, to apply the consolidant; having many on hand is recommended. Cleaning of the bottles for reuse is possible.

1. Applicator bottles: Available from drug store and sold for hair dye application usually in 8 fl. oz. size; Also available in bulk from Roux Laboratories. Roux Color Applicators lend themselves more easily to cleaning and reuse.

2. Rags of different sizes to wipe up spills before epoxy has a chance to harden, small rags are recommended for quick one-time uses such as wiping off spouts and caps.

3. Thin wooden sticks, approximately 8" long for scooping out paste and mixing consolidant.

4. Goggles and a respirator for protection from fumes.

5. Putty knives for application of filler

6. Channel lock pliers for opening stuck caps

7. Allen wrench to clean out cap holes

8. Needle nose pliers to pull out hardened epoxy

9. 1/8"x8"x12" Masonite boards for mixing paste filler

10.Carbon dioxide fire extinguisher: Curing epoxy creates heat that may cause fire

11.Rotary saw

12.Air compressor

13.Drill

14.Stiff bristle brushes

PART 2 - EXECUTION

2.01 EXAMINATION

A. Detect rot using the "Pick Test":

1. Insert an ice pick into the wood at a slight angle.

2. Lift the pick out. If the wood splinters in long pieces, the wood is ok. If the wood snaps where the pick is being lifted, the wood is decayed.

When rot is discovered:

1. Determine the source of moisture infiltration and eliminate it.

a. If rot is only present on the surface, drying is all that is necessary to stop the spread of decay and kill off any growth.

2. If source of moisture is unknown, treat the wood with a preservative.

a. Preservatives are caustic chemicals and should be handled with care.

b. A particularly dangerous wood preserving chemical is pentachlorophenol (a.k.a. penta).

CAUTION: THIS CHEMICAL IS CARCINOGENIC AND ITS USE IS BANNED IN MANY STATES.

3. Preservatives will eliminate fungal growth, but generally do not restored strength to the deteriorated wood material.

2.02 PREPARATION

A. Surface Preparation:

1. Dry affected wood member completely to arrest further decay. Dry in place if possible -or- remove the member and keep in a cool dry place until dry.

CAUTION: IF THIS PRECAUTION IS NOT TAKEN, THE EPOXY CAN ACTUALLY TRAP MOISTURE IN WOOD FIBERS AND ACCELERATE THE DECAY PROCESS.

2. Have all materials at hand before the mixing process begins.

3. Label all caps and lids so that a cap or lid is not placed on the wrong container or it may remain there permanently.

2.03 ERECTION, INSTALLATION, APPLICATION

CAUTION: AS EPOXIES CURE, HEAT IS PRODUCED. FOR THIS REASON, EPOXIES SHOULD BE USED IN SMALL QUANTITIES TO DETER EXTENSIVE HEAT BUILD-UP. CARE SHOULD BE TAKEN WHEN USING EPOXY ON A HOT DAY.

A. Repair decayed wood using epoxy wood consolidant:

1. Drill 1/4" or 3/16" holes in affected wood to receive epoxy consolidant:

a. Drill holes at an angle and spaced approximately 2" on center in staggered rows. The top of one hole should line up with the bottom of the next hole.

CAUTION: BE SURE NOT TO DRILL THROUGH THE ENTIRE SURFACE FOR CONSOLIDANT WILL LEAK OUT FROM BEHIND.

b. Dam any surface cracks with oil clay so that epoxy will not leak.

2. Remove sawdust and dirt from drilled holes using compressed air or stiff bristle brushes.

3. Following manufacturer's instructions, mix a small amount of the consolidant

Components (resin and hardener) together in an applicator bottle. Stir the mixture thoroughly by hand with a thin stick for 4 minutes or with a bent coat hanger chucked into a drill for 2 minutes.

4. Using a large plastic syringe or squeeze bottle and tube spout, carefully squirt the consolidant into the pre-drilled holes. Completely saturate the wood, moving from hole to hole refilling until the wood can hold no more. More than one application may be needed.

5. Wipe off any excess consolidant or spills and cover the treated area to protect until cured as directed by epoxy manufacturer.

6. If severed pieces need to be re-attached, glue them in place with a mixture of consolidant and filler.

B. When the consolidant has cured, fill the voids in the surface with epoxy filler

(wood-epoxy putty):

1. Mix the two part epoxy filler following the same procedures for mixing consolidant in Section 3.03 A.3. above. Mix filler to achieve the consistency of a glazing compound that can be worked with a putty knife.

2. Apply the filler to the surface:

a. For large voids, apply filler in 1" thick layers. This reduces the possibility of problems associated with heat build-up.

b. Build up filler layers slightly above the wood surface to allow for planning and sanding smooth after it has cured.

3. When the filler has cured, sand or plane the surface smooth.

4. Apply a wood preservative to surrounding wood surfaces and prime and paint the entire surface.

T02 PATCHING CRACKS AND HOLES IN WOODWORK

PART 1 PRODUCTS

1.01 MATERIALS

A. Patching Materials:

1. Wood Filler: Standard filler manufactured specifically for restorative patching of woodwork. a. Tint filler to match existing woodwork.

2. Sandpaper:No.3/0orNo.5/0garnetpaper.

B. Replacement Wood: Match species, grade, grain pattern, and other special characteristics of existing woodwork.

PART 2 EXECUTION

2.01 ERECTION, INSTALLATION, APPLICATION

1. Remove all minor surface imperfections such as scratches, dents, etc., by rubbing surface with fine grit sandpaper.

2. Patch all holes and cracks in woodwork with wood filler tinted to match existing wood

3. Carefully hand rub filled area with a fine grit sandpaper to match surface characteristics of adjacent woodwork.

4. Touch-up patch during finishing so that color and other appearance characteristics of filled area match the finish of adjacent woodwork.

5. Patch holes and cracks in woodwork including woodwork damaged from hardware changes with wood plugs or wood patches.

6. Rout out hole or crack woodwork to receive plug or patch materials.

7. All repair plugs and patches in wood with a transparent finish shall have grain aligned.

2.02 ADJUSTING/CLEANING

1. Upon completion of this work, all floors, walls, and other adjacent surfaces that are stained, marred, or otherwise damaged by work under this section shall be cleaned and repaired and all work and the adjacent areas shall be left in a clean and perfect condition.

2. All completed work shall be adequately protected from damage by subsequent building operations and effects of weather. Protection shall be by methods recommended by the manufacturer of installed materials and as approved by the Cultural Resources POC. Repair damaged and defective woodwork wherever possible to eliminate functional and visual defects. Where it is not possible to repair properly, replace woodwork, and adjust joinery for uniform appearance.

Clean woodwork: Dust and damp wipe woodwork with a soft cloth dampened in clean water; dry rub with soft cloth to maintain the polish, rubbing along the grain of the wood.

Stain and Spot Removal:

1. Stains may be cleaned by prompt damp wiping with cloth dampened in clear water or rubbing with cloth dampened in solvent. Dry the wood with a soft cloth.
2. White spots may be removed by rubbing them with a small amount of linseed oil.

T03 REPAIRING WATER-DAMAGED WOODWORK

PART 1 PRODUCTS

1.01 MATERIALS

1. Wood stain
2. Wood bleach: Solution of sodium perborate, hydrogen peroxide or proprietary mixture suitable for oak.
3. Wood filler, colored to match wood
4. Sandpaper: Extra fine grit
5. Mild cleaner such as "Murphy's Oil Soap"

PART 2 EXECUTION

2.01 PREPARATION

A. Surface Preparation:

1. Mask all adjacent surfaces and protect other exposed surfaces in the work area.
2. Fill any splits in existing wood and sand smooth prior to sealer application.

2.02 ERECTION, INSTALLATION, APPLICATION

1. Select an inconspicuous area on which to test materials and application for each method type required. Test area must be approved by the Contracting Officer.
2. After each test area has been prepared, receive approval from the Contracting Officer before commencing general application.
3. Check area with a moisture meter to verify that wood does not have moisture on surface.
4. Sand stained areas to bare wood.
5. If bare wood is stained, apply wood bleach to remove stain. Minimize flow of bleach onto areas not stained. Allow to dry and sand wood lightly to remove chemical residue.
6. Fill wood if required and apply stain of color to match existing.

2.03 ADJUSTING/CLEANING

1. Wash woodwork with mild detergent and water.
2. Dry immediately with clean cloth.
3. Finish to match historic finish.

T04 REPLACING DETERIORATED WOODWORK

PART 1 PRODUCTS

1.01 MATERIALS

A. New or Replacement Materials:

1. Wood Moisture Content: Provide kiln-dried lumber with an average moisture content range of 6% to 11% for interior work. Maintain temperature and relative humidity during fabrication, storage, and finishing operations so that moisture content values for woodwork at time of installation do not exceed the above range.

2. Replacement Wood: Match species, grade, grain pattern, and other special characteristics of existing woodwork.

B. Clean, soft cloths

PART 2EXECUTION

2.01 PREPARATION

A. Surface Preparation:

1. Condition woodwork to average prevailing humidity conditions in installation areas prior to installing.

2. Back prime woodwork on all surfaces, which will be concealed with one coat of wood primer. Schedule delivery to allow time for application and drying of back prime coat before installation of woodwork.

3. Remove miscellaneous hardware, nails, etc., from all existing woodwork as required to provide a first class installation of new or replacement woodwork.

4. Prior to installation of new architectural woodwork, examine shop fabricated work for completion, and complete work as required, including back priming and removal of packing.

2.02 ERECTION, INSTALLATION, APPLICATION

A. Carefully remove at locations indicated any damaged or deteriorated woodwork.

Unless indicated otherwise, replace the entire length of the existing damaged piece to the next butt joint.

B. For partial replacement of existing pieces, use a neat, well-fitted level cut with grain aligned in transparent finished wood.

C. Install new pieces as described below:

1. Install the work plumb, level, true and straight with no distortions. Shim as required using concealed shims.

2. Cut to fit unless specified to be shop-fabricated or shop-cut to exact size. Where woodwork abuts other finished work, scribe, and cut for accurate fit. Before making cutouts, drill pilot holes at corners.

3. Standing and Running Trim: Install with minimum number of joints possible, using full-lengthpieces (from maximum length of lumber available) to the greatest extent possible. Stagger joints in adjacent and related members. Cope at returns, miter at corners, and comply with Quality Standards for joinery.

4. Anchor woodwork to anchors or blocking built-in or directly attached to

substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Except where prefinished matching fasteners heads are required, use fine finishing nails for exposed nailing, countersunk and filled flush with woodwork, and matching final finish where transparent finish is indicated.

D. Finish replacement woodwork to match adjacent woodwork surfaces. See 06400-05-R and 06400- 10-R for guidance.

2.03 ADJUSTING/CLEANING

1. Upon completion of this work, all floors, walls, and other adjacent surfaces that are stained, marred, or otherwise damaged by work under this section shall be cleaned and repaired and all work and the adjacent areas shall be left in a clean and perfect condition.

2. All completed work shall be adequately protected from damage by subsequent building operations and effects of weather. Protection shall be by methods recommended by the manufacturer of installed materials and as approved by the Architect.

3. Repair damaged and defective woodwork wherever possible to eliminate functional and visual defects. Where it is not possible to repair properly, replace woodwork, and adjust joinery for uniform appearance.

4. Clean woodwork: Dust and damp wipe woodwork with a soft cloth dampened in clean water; dry rub with soft cloth to maintain the polish, rubbing along the grain of the wood.

5. Stain and Spot Removal:

1. Stains may be cleaned by prompt damp wiping with cloth dampened in clear water or rubbing with cloth dampened in solvent. Dry the wood with a soft cloth.

2. White spots may be removed by rubbing them with a small amount of linseed oil.

TERMS OF REFERENCE

HIGHLY URGENT REPAIR OF OUR LADY OF CAYSASAY CHURCH AND ASSOCIATED STRUCTURES, A DECLARED NATIONAL CULTURAL TREASURE IN TAAL, BATANGAS

I. PROJECT BACKGROUND

Declared as a National Cultural Treasure, the **Church of Our Lady of Caysasay** (built in 1639) and its associated structures of the Balon de Santa Lucia (erected in the early 1600s) and the Hagdan-Hagdan (erected circa 1755; the present granite steps date to 1850) in Taal, Batangas, are among the most exceptionally important cultural properties the Philippines. The image depicting the Immaculate Conception, discovered in 1603 in the Pansipit River by a fisherman, is believed to be the oldest in the country, and many miracles and apparitions attributed to or associated with the image have been documented through history. The spring feeding the Santa Lucia wells and its surrounding site have long been known as *Banal na Tubig* and *Banal na Pook* since time immemorial. There are also documented linkages with both Mexican and Chinese devotees in early times, and associations with the galleon trade.

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 heritages to the public by encouraging more visits to the museums.

Therefore, this project of providing necessary repair and restoration works to one of National Museum's National Cultural Treasure will further enhance the public's cultural experience. In return, it 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.

7. The Contractor must report to the National Museum any archeological finding during excavation works. An automatic work stoppage shall take effect after National Museum's confirmation.

8. The Contractor must submit as-built plans of the project including the different test results conducted by the dye tracer test, soil boring test and 3D GPR Scanning.

REPAIR AND RESTORATION WORKS:

1. The Contractor is expected to provide emergency stabilization works for the highly damaged portico and facade area of the church. This includes the strengthening of facade & portico core walls, retrofitting of damaged arched openings/ facade walls and soil stabilization by concrete grouting.

2. The Contractor must also provide identified architectural conservation works to assist the structural intervention conducted and prevent further failure caused by natural and man-made deterioration. This include the clearing and removal of biological growth or vegetation, chipping of cement based plaster and replacement with lime plaster and other corrective conservation works to correct previous interventions.

3. The Contractor shall also provide supplementary structural stabilization works to the church walls through beam capping and additional steel support for the dome area.

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.

3. The Contractor shall secure the property, provide temporary utilities on site, manage their own personnel, dispose and recycle construction waste, monitor schedule and cash flows and maintain daily logbook of activities.

4. Submit for approvals plan that outlines the safety measures that will be implemented to the people not directly related to the construction of the project, the safety and protection of their workers during the construction, prevention and occurence of fire.

5. Abide with the contract including the General Condition and Specification which form part of the contract.

V. EXPECTED TIME FRAME

The Project's actual construction is expected to be completed in **two hundred forty (240) calendar days**.

VI. CONSTRUCTION SUPERVISION

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

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 built heritage projects of government recognized importance, whether as National Cultural Treasure (NCT), Important Cultural Property (ICP) or National Historical Landmark (NHL). The contractor must have also proven relevant working experience within ten (10) years that deals with retrofitting, restoration and/ or reconstruction of unreinforced masonry (URM) structures with proper client references.

VIII. SOURCE OF FUND

The General Appropriations Act through CO-Supplemental 2021 has appropriated **Fifteen Million Pesos Only (Php 15,000,000.00)** for the proposed repair & restoration works.

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:

MARVIN M. BELGICA
Architect III, FMD

Checked & Reviewed by:

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

Recommending Approval:

ATTY. MA. ROSENNE M. FLORES- AVILA
Deputy Director General for Administration

Approved by:

JEREMY R. BARNS, CESO III
Director-General

SCOPE OF WORKS

PROJECT TITLE AND LOCATION

HIGHLY URGENT REPAIR OF OUR LADY OF CAYSASAY CHURCH AND ASSOCIATED STRUCTURES, A DECLARED NATIONAL CULTURAL TREASURE IN TAAL, BATANGAS

I. SCOPE OF WORKS

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8. The Contractor must submit as-built plans of the project including the different test results conducted by the dye tracer test, soil boring test and 3D GPR Scanning.

II. CHURCH EXTERIOR WORKS

1. Scientific clearing & grubbing of biological growth (vegetation)

Identified vegetation at the façade area, a potential harm to the church's structural integrity

2. Manual chipping of existing cement based plastering/ mortar

Existing cement-based plastering at portico and façade area

3. Mechanical & chemical cleaning of wall surface

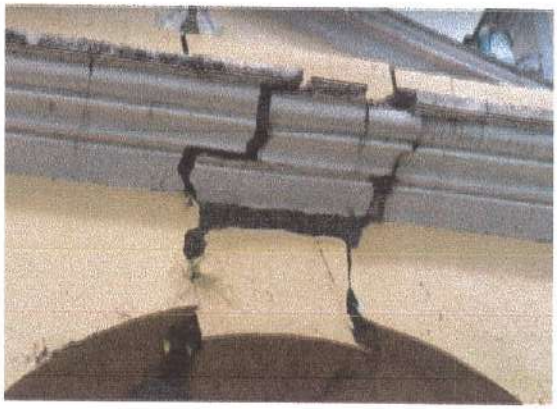
Black deposits at the ledges of the bell tower & cornice

4. Strengthening of facade & portico core walls by lime water consolidation

Lime water consolidation technique procedure

5. Retrofitting of arched openings & facade walls

Stainless steel helical rod installation to reinforce masonry walls



Damaged masonry units for retrofitting

6. Scientific and systematic repointing of original stone walls including ornaments and details

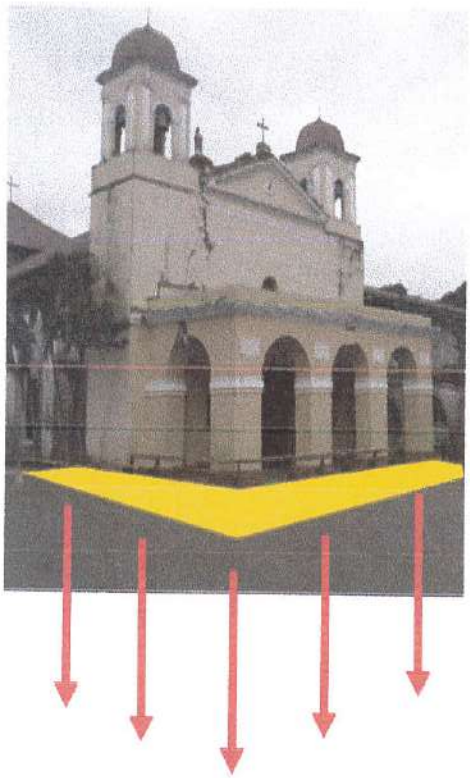
Repointing techniques of stone masonry

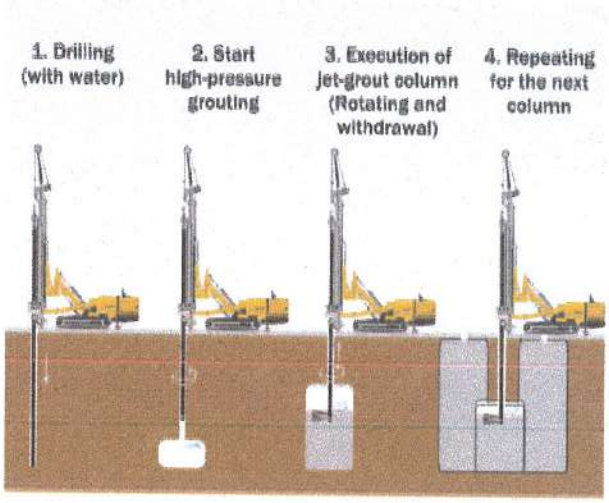
7. Lime washing of wall surface

8. Repair of damaged cement floor tiles (inclusive of corrective ground topping)

Existing condition of cement floor tiles

9. Underground treatment by concrete grouting



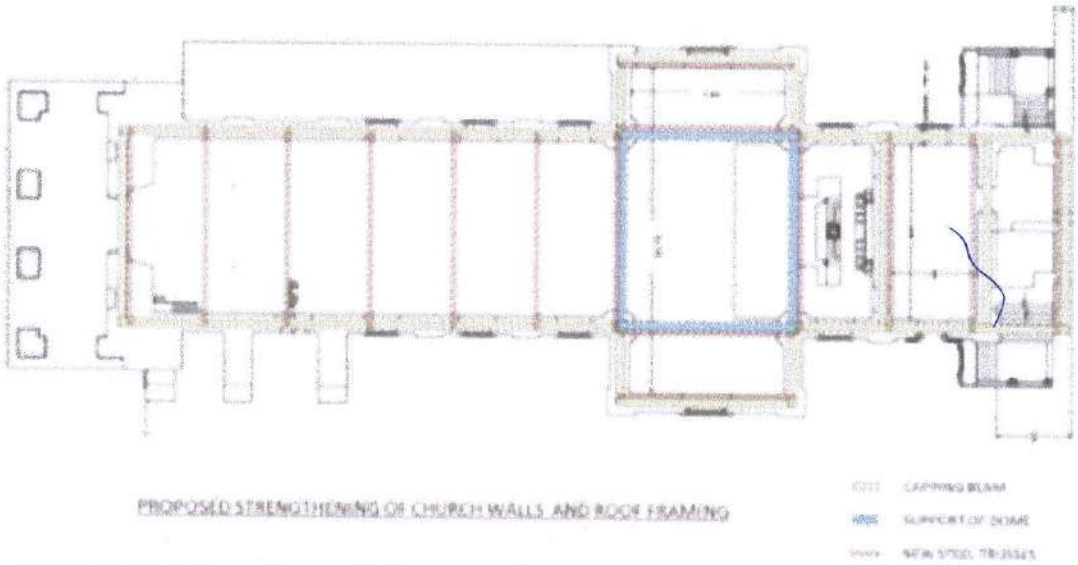


Proposed area of concrete grouting (left) and sample concrete grouting method by Geo Grout Ground Modification Specialist

III. CHURCH INTERIOR WORKS

1. Strengthening of wooden dome by steel bracing at the crossing area, inclusive of dismantling & reinstallation of affected ceiling.

2. Stabilization of stone walls by adding concrete beam capping



Proposed location of concrete beam capping

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:

MARVIN M. BELGICA
Architect III,FMD

Checked & Reviewed by:

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

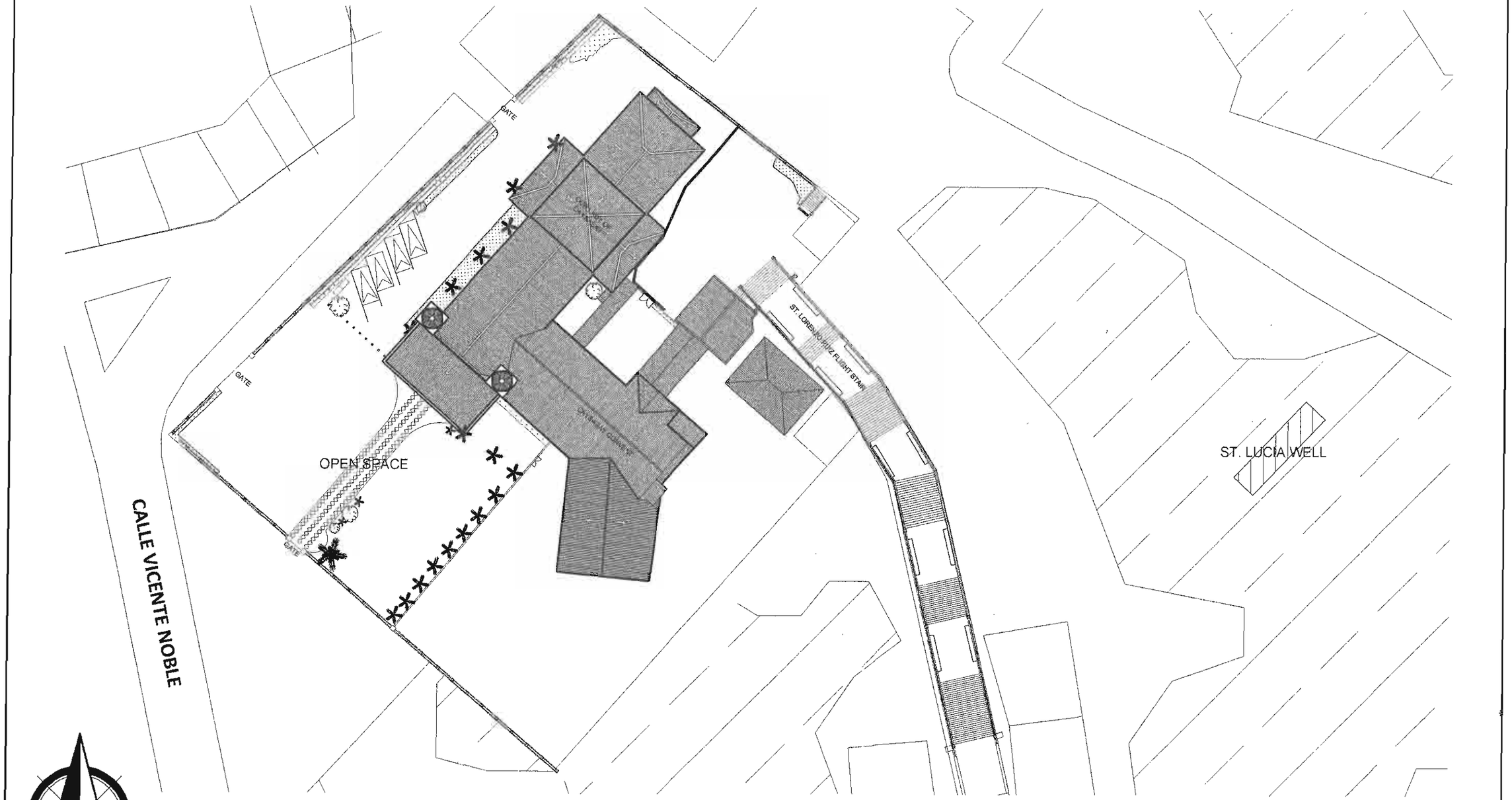
Recommending Approval:

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

Approved by:

JEREMY R. BARNS, CESO III
Director- General

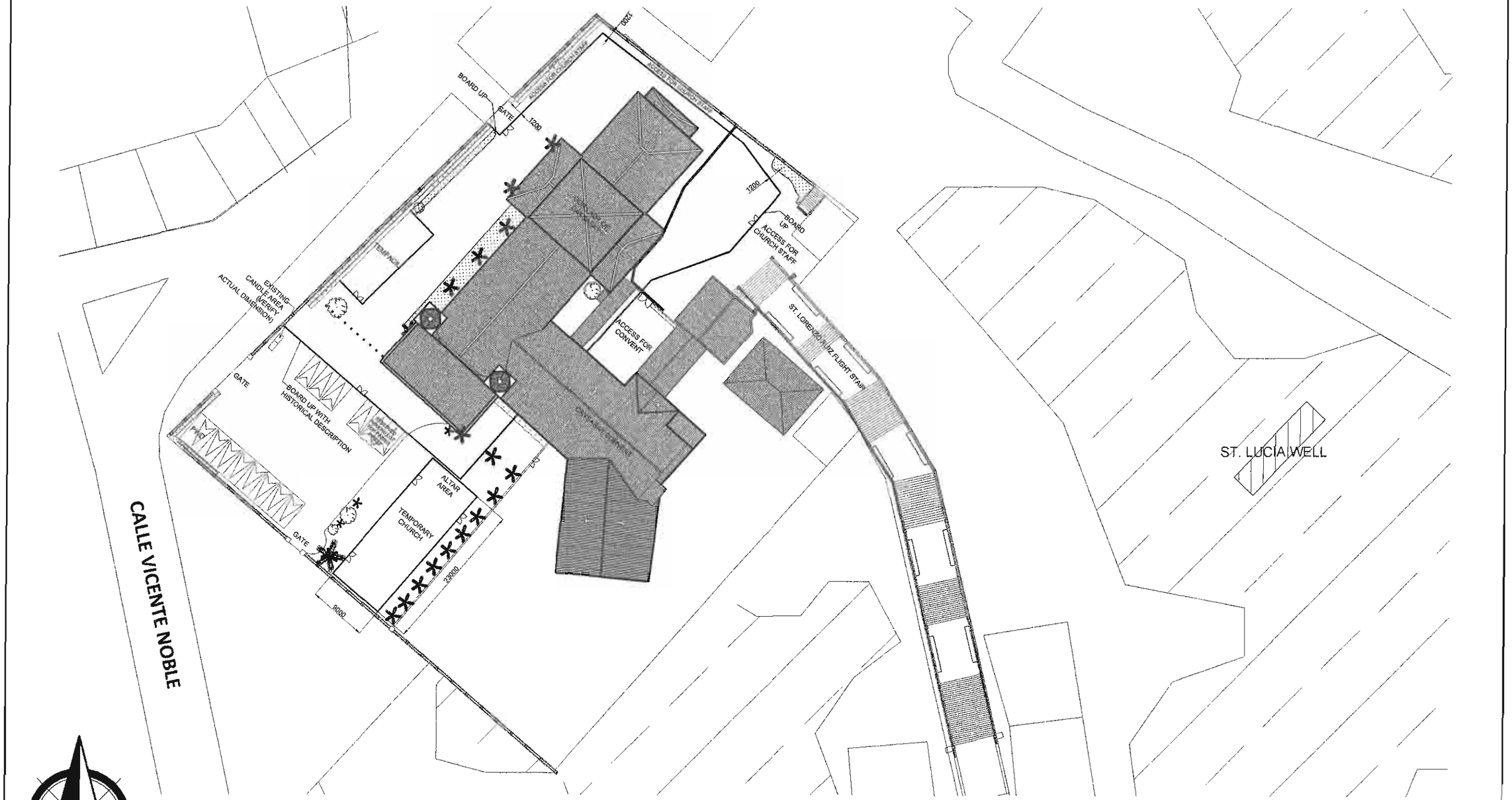
Section VII. Drawings



1 / A-1 EXISTING SITE DEVELOPMENT PLAN

SCALE 1:600 MTS

NATIONAL MUSEUM OF THE PHILIPPINES FACILITIES MANAGEMENT DIVISION P. BURGOS DRIVE, MANILA, 1000	PROJECT TITLE: HIGHLY URGENT REPAIR OF OUR LADY OF CAYSASAY CHURCH AND ASSOCIATED STRUCTURES	PREPARED BY: AR. MARVIN M. BELGICA ARCHITECT III, FMD	REVIEWED AND CHECKED BY: AR. NELSON L. AQUINO ARCHITECT IV, O.I/C FMD	APPROVED BY: DR. JEREMY BARNS, CESO III DIRECTOR-GENERAL	APPROVED BY: MOST. REV. GILBERT A. GARCERA, D.D. ARCHBISHOP OF LIPA		REVISIONS. DRAWN BY: EB/CJA CHECKED BY: DATE:	'SHEET CONTENT. EXISTING SITE DEVELOPMENT PLAN	SHEET NO. A-01 01 02
DATE:	PROJECT NO:	LOCATION: BRGY. LABAC, TAAL, BATANGAS							



1 / A-2 PROPOSED SITE DEVELOPMENT PLAN

SCALE 1:600 MTS

NATIONAL MUSEUM OF THE PHILIPPINES FACILITIES MANAGEMENT DIVISION P. [illegible], MANILA, 1008	PROJECT TITLE: HIGHLY URGENT REPAIR OF OUR LADY OF CAYSASAY CHURCH AND ASSOCIATED STRUCTURES	PREPARED BY: AR. MARVIN M. BELGICA ARCHITECT III, FMD	REVIEWED AND CHECKED BY: AR. NELSON L. AQUINO ARCHITECT IV, O.I C. FMD	APPROVED BY: DIR. JEREMY BARNS, CESO III DIRECTOR-GENERAL	APPROVED BY: MOST. REV. GILBERT A. GARCERA, D.D. ARCHBISHOP OF LIPA	REVISIONS:	SHEET CONTENT:	SHEET NO.
DATE:	PROJECT NO:	LOCATION: BRGY. LABAC, TAAL, BATANGAS				DRAWN BY: EB/CJA CHECKED BY: DATE:	PROPOSEDSITE DEVELOPMENT PLAN	A-02 02 02

OUR LADY OF CAYSASAY CHURCH
BRGY. LABAC, TAAL, BATANGAS

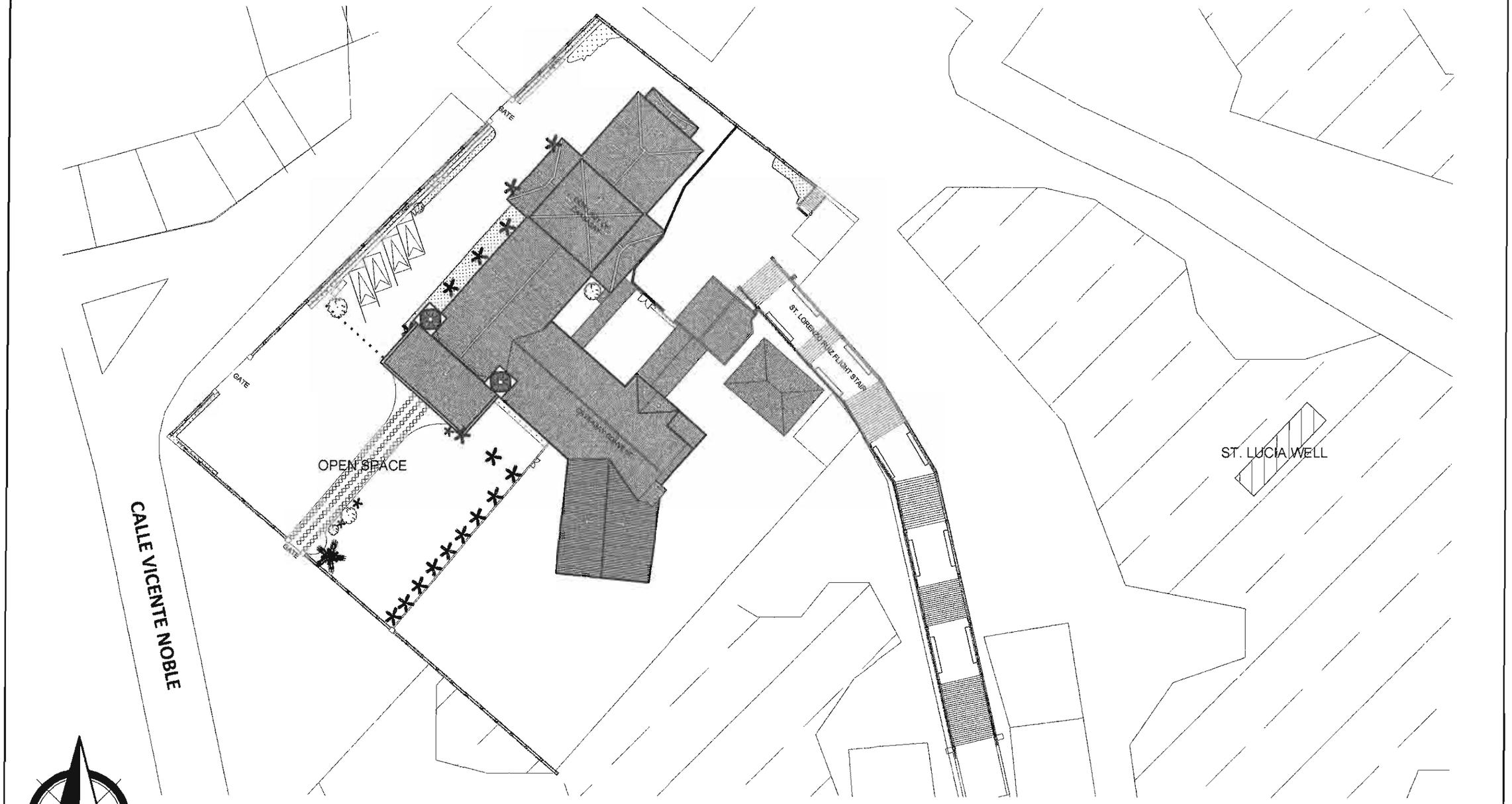
1 / A-1 LOCATION MAP
NOT TO SCALE

2 / A-1 VICINITY MAP
NOT TO SCALE

LEGEND:

- CAYSASAY CONVENT
- ST. LORENZO RUIZ FLIGHT STAIR
- CAYSASAY CHURCH/ST. LUCIA WELL

PAMBANSANG MUSEO NG PILIPINAS NATIONAL MUSEUM OF THE PHILIPPINES	NATIONAL MUSEUM OF THE PHILIPPINES FACILITIES MANAGEMENT DIVISION P. BURGOS DRIVE, MANILA, 1000	PROJECT TITLE: HIGHLY URGENT REPAIR OF OUR LADY OF CAYSASAY CHURCH AND ASSOCIATED STRUCTURES	PREPARED BY: AR. MARVIN M. BELGICA ARCHITECT III, FMD	REVIEWED AND CHECKED BY: AR. NELSON L. AQUINO ARCHITECT IV, O.I C FMD	APPROVED BY: DIR. JEREMY BARNS, CESO III DIRECTOR-GENERAL	APPROVED BY: MOST. REV. GILBERT A. GARCERA, D.D. ARCHBISHOP OF LIPA	DIOCESE OF LIPA	REVISIONS.	SHEET CONTENT:	SHEET NO.
	DATE. / PROJECT NO.	LOCATION: BRGY. LABAC, TAAL, BATANGAS						DRAWN BY: CJ ANZALDO CHECKED BY. DATE.	LOCATION MAP VICINITY MAP	A-01 01 / 11



1 / A-2 SITE DEVELOPMENT PLAN

SCALE 1:600 MTS

NATIONAL MUSEUM OF THE PHILIPPINES FACILITIES MANAGEMENT DIVISION P. BURGOS DRIVE, MANILA, 1002	PROJECT TITLE: HIGHLY URGENT REPAIR OF OUR LADY OF CAYSASAY CHURCH AND ASSOCIATED STRUCTURES	PREPARED BY: AR. MARVIN M. BELGICA ARCHITECT III, FMD	REVIEWED AND CHECKED BY: AR. NELSON L. AQUINO ARCHITECT IV, O.I.C FMD	APPROVED BY: DR. JEREMY BARNS, CESO III DIRECTOR-GENERAL	APPROVED BY: MOST. REV. GILBERT A. GARCERA, D.D. ARCHBISHOP OF LIPA		REVISIONS.	SHEET CONTENT:	SHEET NO.
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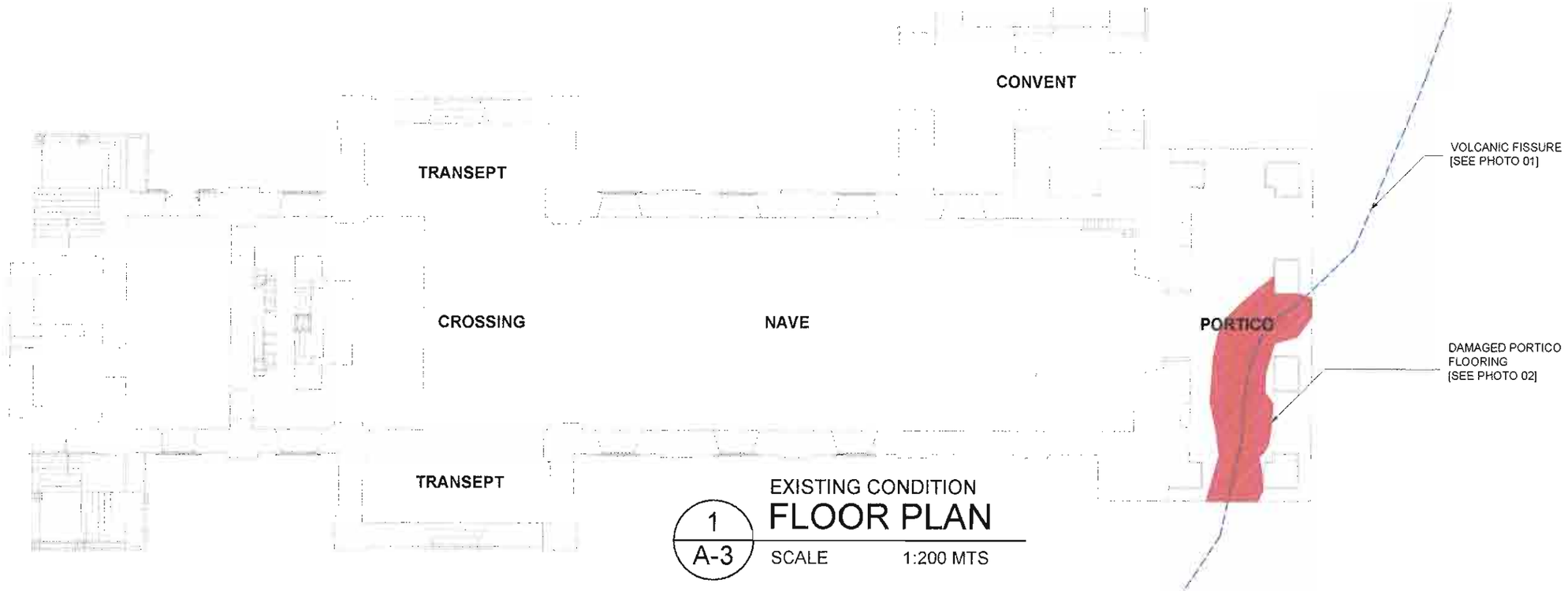


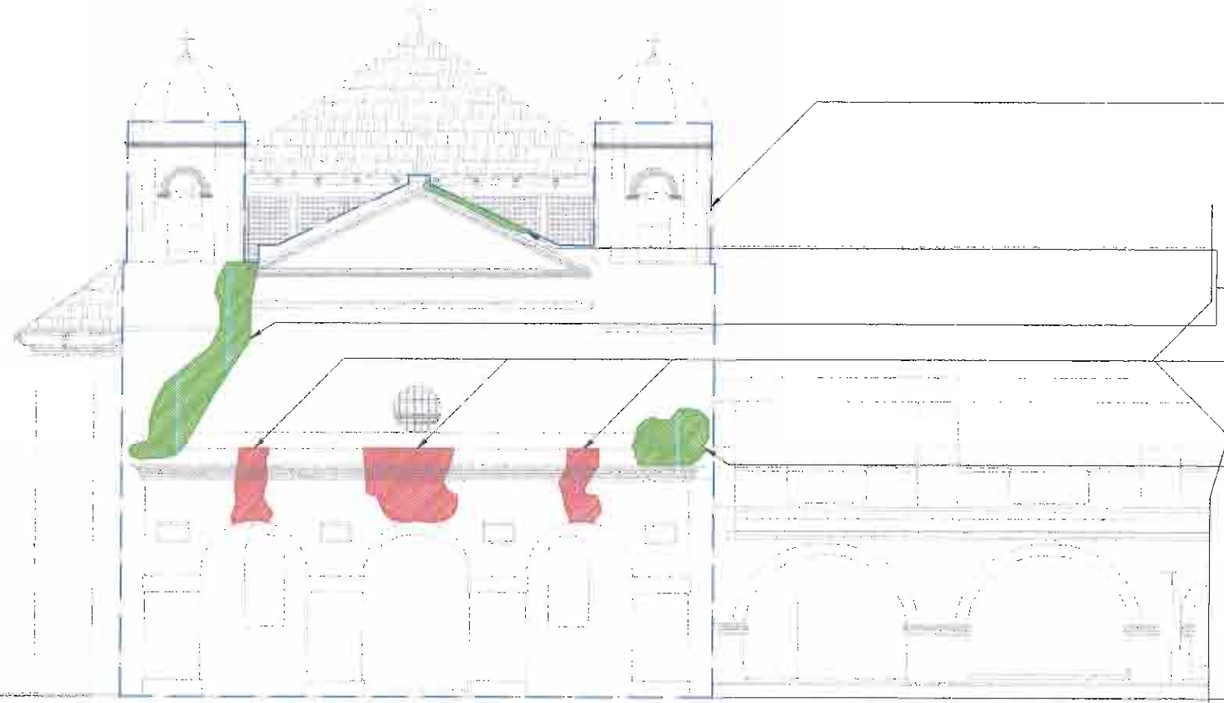
1
A-3

EXISTING CONDITION
FLOOR PLAN
SCALE 1:200 MTS

PHOTO 01: VOLCANIC FISSURE ACROSS PORTICO AREA (SOURCE: GEORISKPH)

PHOTO 02: DAMAGE PORTICO FLOORING

NATIONAL MUSEUM OF THE PHILIPPINES FACILITIES MANAGEMENT DIVISION P. BURGOS DRIVE, MANILA, 1000	PROJECT TITLE: HIGHLY URGENT REPAIR OF OUR LADY OF CAYSASAY CHURCH AND ASSOCIATED STRUCTURES	PREPARED BY: AR. MARVIN M. BELGICA ARCHITECT III, FMD	REVIEWED AND CHECKED BY: AR. NELSON L. ACUINO ARCHITECT IV, O.I.C FMD	APPROVED BY: DR. JEREMY BARNS, CESO III DIRECTOR-GENERAL	APPROVED BY: MOST. REV. GILBERT A. GARCERA, D.D. ARCHBISHOP OF LIPA		REVISIONS:	SHEET CONTENT:	SHEET NO.
DATE: / PROJECT NO:	LOCATION: BRGY. LABAC, TAAL, BATANGAS						DRAWN BY: CJ ANZALDO CHECKED BY: DATE:	EXISTING CONDITION FLOOR PLAN PHOTOS	A-03 03 11



1
A-4

EXISTING CONDITION
FRONT ELEVATION

SCALE 1:150 MTS

PHOTO 01: FACADE GENERAL DAMAGED BY VOLCANIC EARTHQUAKES

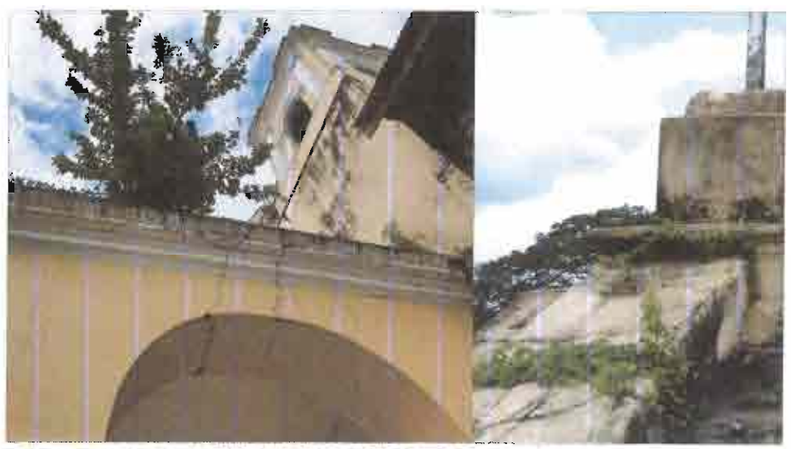


PHOTO 02: EXISTING BIOLOGICAL GROWTH (VEGETATION)

PHOTO 03: DAMAGED PORTICO AREA

NATIONAL MUSEUM OF THE PHILIPPINES FACILITIES MANAGEMENT DIVISION P. BURGOS DRIVE, MANILA, 1000		PROJECT TITLE: HIGHLY URGENT REPAIR OF OUR LADY OF CAYSASAY CHURCH AND ASSOCIATED STRUCTURES	PREPARED BY: AR. MARVIN M. BELGICA ARCHITECT III, FMD	REVIEWED AND RECOMMENDED BY: AR. NELSON L. AQUINO ARCHITECT IV, O.I.C. FMD	APPROVED BY: DIR. JEREMY BARNS, CESO III DIRECTOR-GENERAL	APPROVED BY: MOST. REV. GILBERT A. GARCERA, D.D. ARCHBISHOP OF LIPA		REVISIONS:	SHEET CONTENT:	SHEET NO.
									EXISTING CONDITION FRONT ELEVATION PHOTOS	A-04
DATE:	PROJECT NO.	LOCATION: BRGY. LABAC, TAAL, BATANGAS					DRAWN BY: CJ ANZALDO CHECKED BY: DATE:			04 11

1
A-5

EXISTING CONDITION
LEFT-SIDE ELEVATION

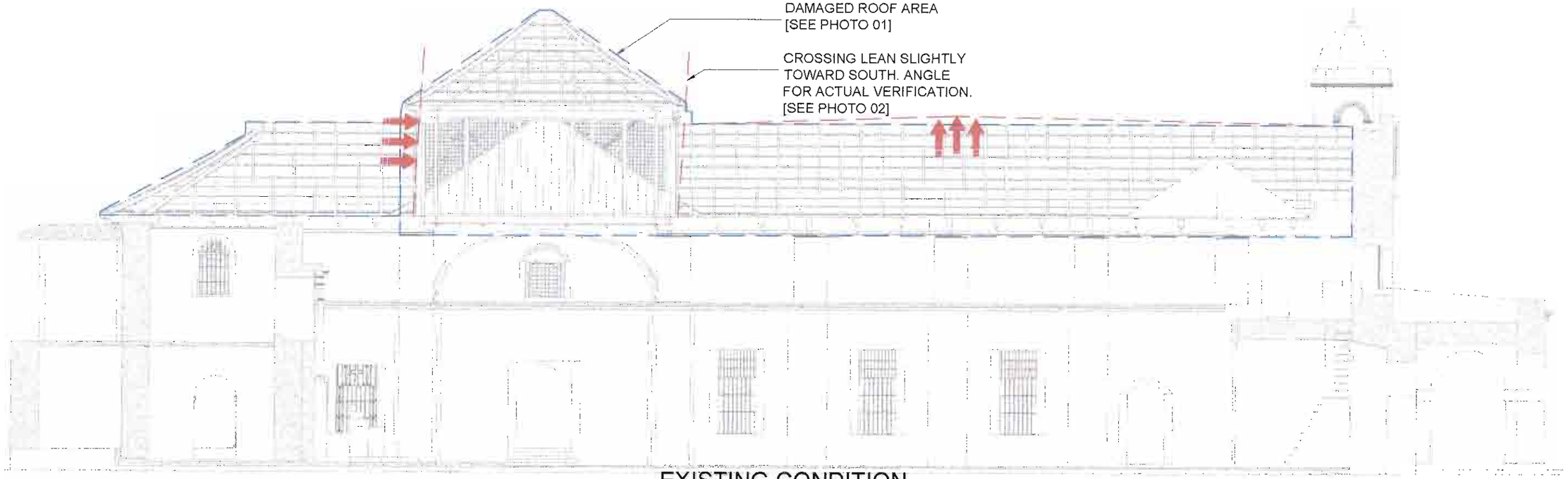
SCALE 1:150 MTS

PHOTO 01: EXISTING BIOLOGICAL GROWTH (VEGETATION)

PHOTO 02: DAMAGED PORTICO AREA

PHOTO 03: PORTICO LEAN SLIGHTLY TOWARD SOUTH

PAMBANSANG MUZEO NG PILIPINAS NATIONAL MUSEUM OF THE PHILIPPINES	NATIONAL MUSEUM OF THE PHILIPPINES FACILITIES MANAGEMENT DIVISION P. BURGOS DRIVE, MANILA, 1000	PROJECT TITLE: HIGHLY URGENT REPAIR OF OUR LADY OF CAYSASAY CHURCH AND ASSOCIATED STRUCTURES	PREPARED BY: AR. MARVIN M. BELGICA ARCHITECT III, FMD	REVIEWED AND CHECKED BY: AR. NELSON L. AQUINO ARCHITECT IV, O.I.C. FMD	APPROVED BY: DIR. JEREMY BARNS, CESO III DIRECTOR-GENERAL	APPROVED BY: MOST. REV. GILBERT A. GARCERA, D.D. ARCHBISHOP OF LIPA	1910 DIYOSESIS · ARSIDIYOSESIS 2021 LIPA	REVISIONS:	SHEET CONTENT:	SHEET NO
	DATE:	PROJECT NO:	LOCATION: BRGY. LABAC, TAAL, BATANGAS					DRAWN BY: CJ ANZALDO CHECKED BY: DATE:	EXISTING CONDITION LEFT-SIDE ELEVATION PHOTOS	A-05 05 11



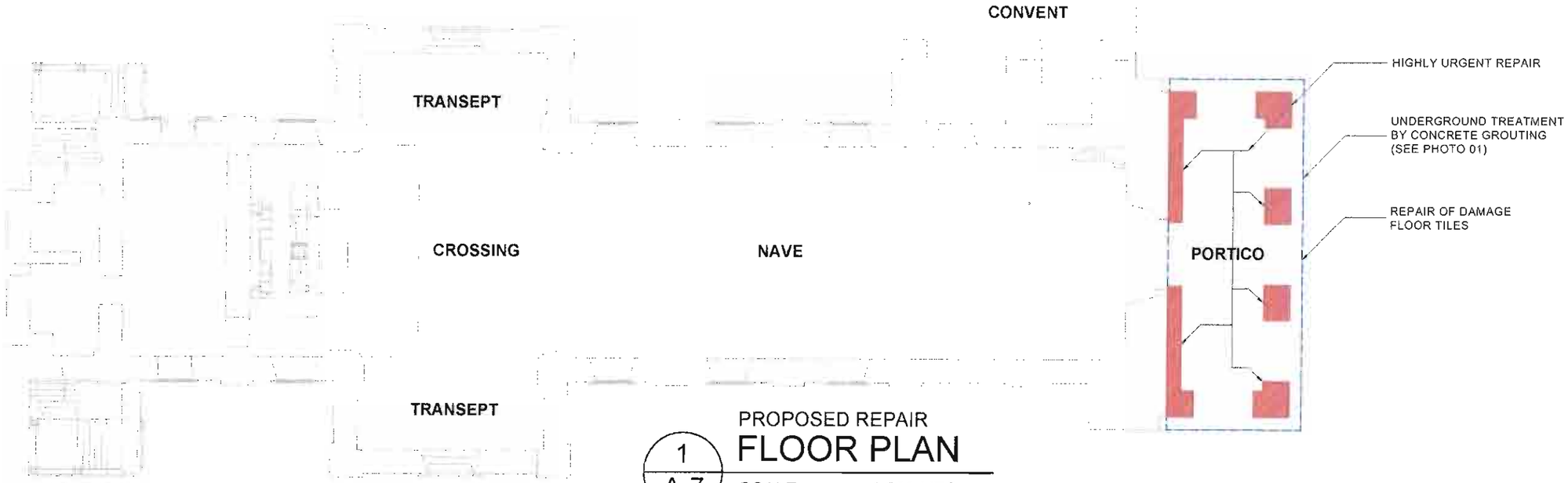
1 / A-6 EXISTING CONDITION
LONGITUDINAL SECTION

SCALE 1:150 MTS

PHOTO 01: DAMAGED ROOF AREA

PHOTO 02: CROSSING LEAN SLIGHTLY TOWARD SOUTH

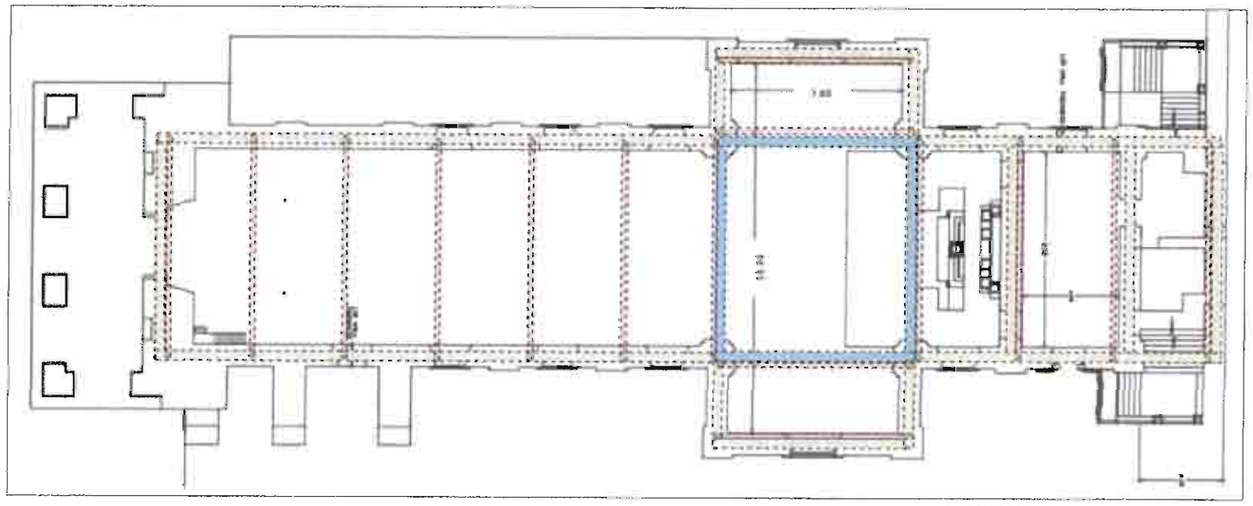
NATIONAL MUSEUM OF THE PHILIPPINES FACILITIES MANAGEMENT DIVISION P. BURGOS DRIVE, MANILA, 1000	PROJECT TITLE: HIGHLY URGENT REPAIR OF OUR LADY OF CAYSASAY CHURCH AND ASSOCIATED STRUCTURES	PREPARED BY: AR. MARVIN M. BELGICA ARCHITECT III, FMD	REVIEWED AND CHECKED BY: AR. NELSON L. AQUINO ARCHITECT IV, O.I.C. FMD	APPROVED BY: DIR. JEREMY BARNS, CESO III DIRECTOR-GENERAL	APPROVED BY: MOST. REV. GILBERT A. GARCERA, D.D. ARCHBISHOP OF LIPA		REVISIONS:	SHEET CONTENT:	SHEET NO
DATE:	PROJECT NO:	LOCATION: BRGY. LABAC, TAAL, BATANGAS					DRAWN BY: CJ ANZALDO CHECKED BY: DATE:	LONGITUDINAL SECTION PHOTOS	A-06 06 11



1 / A-7

PROPOSED REPAIR
FLOOR PLAN

SCALE 1:200 MTS



2 / A-7

PROPOSED STRENGTHENING OF CHURCH WALLS AND ROOF FRAMING

NOT TO SCALE

LEGEND:

- CAPPING BEAM
- SUPPORT OF DOME
- NEW STEEL TRUSSES

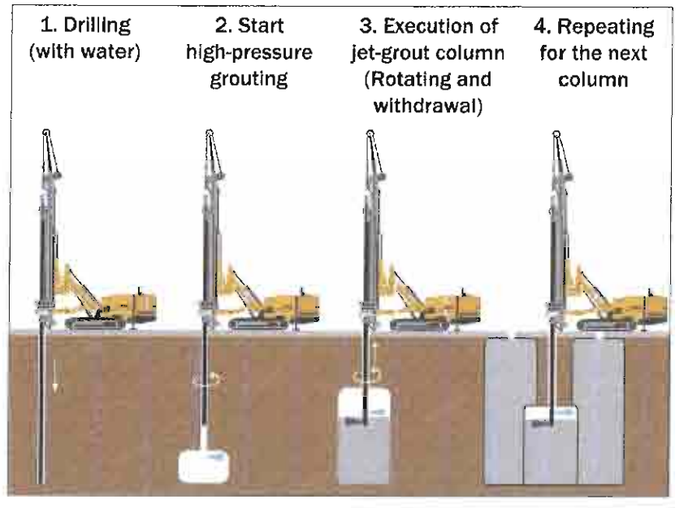
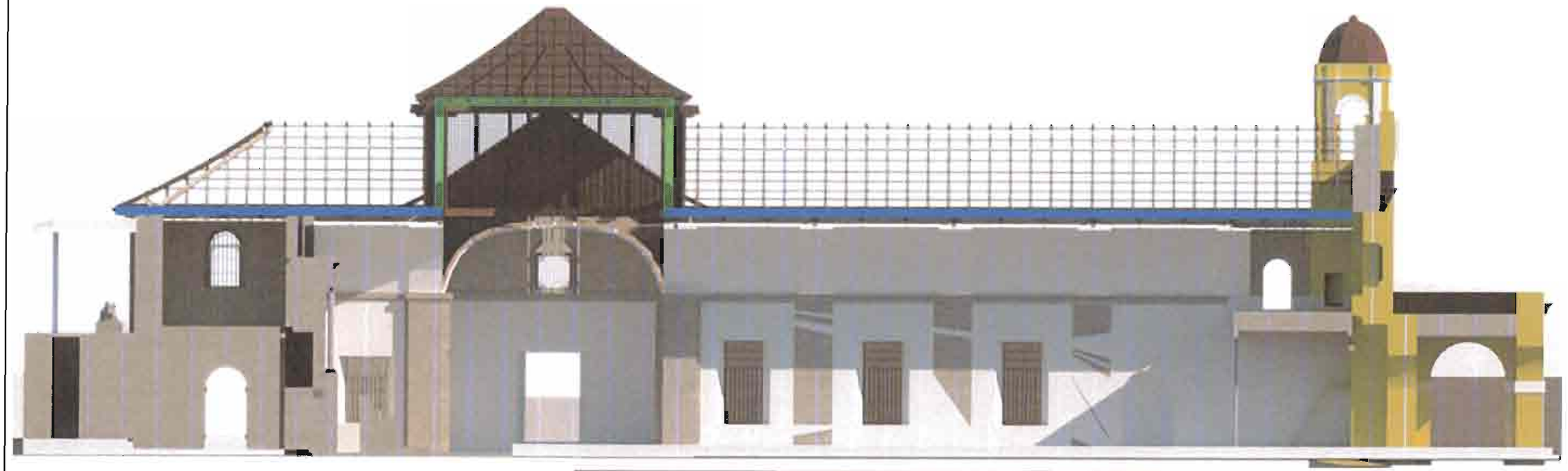


PHOTO 01: UNDERGROUND TREATMENT BY CONCRETE GROUTING

NATIONAL MUSEUM OF THE PHILIPPINES FACILITIES MANAGEMENT DIVISION P. BURGOS DRIVE, MANILA, 1000	PROJECT TITLE: HIGHLY URGENT REPAIR OF OUR LADY OF CAYSASAY CHURCH AND ASSOCIATED STRUCTURES	PREPARED BY: AR. MARVIN M. BELGICA ARCHITECT III, FMD	REVIEWED AND CHECKED BY: AR. NELSON L. AQUINO ARCHITECT IV, O.I.C. FMD	APPROVED BY: DIR. JEREMY BARNS, CESO III DIRECTOR-GENERAL	APPROVED BY: MOST. REV. GILBERT A. GARCERA, D.D. ARCHBISHOP OF LIPA		REVISIONS:	SHEET CONTENT:	SHEET NO
DATE: / PROJECT NO.	LOCATION: BRGY. LABAC, TAAL, BATANGAS						DRAWN BY: CJ ANZALDO CHECKED BY: DATE:	PROPOSED REPAIR FLOOR PLAN PHOTOS	A-07 07 / 11



1 / A-8

PROPOSED REPAIR LONGITUDINAL SECTION

NOT TO SCALE

2 / A-8

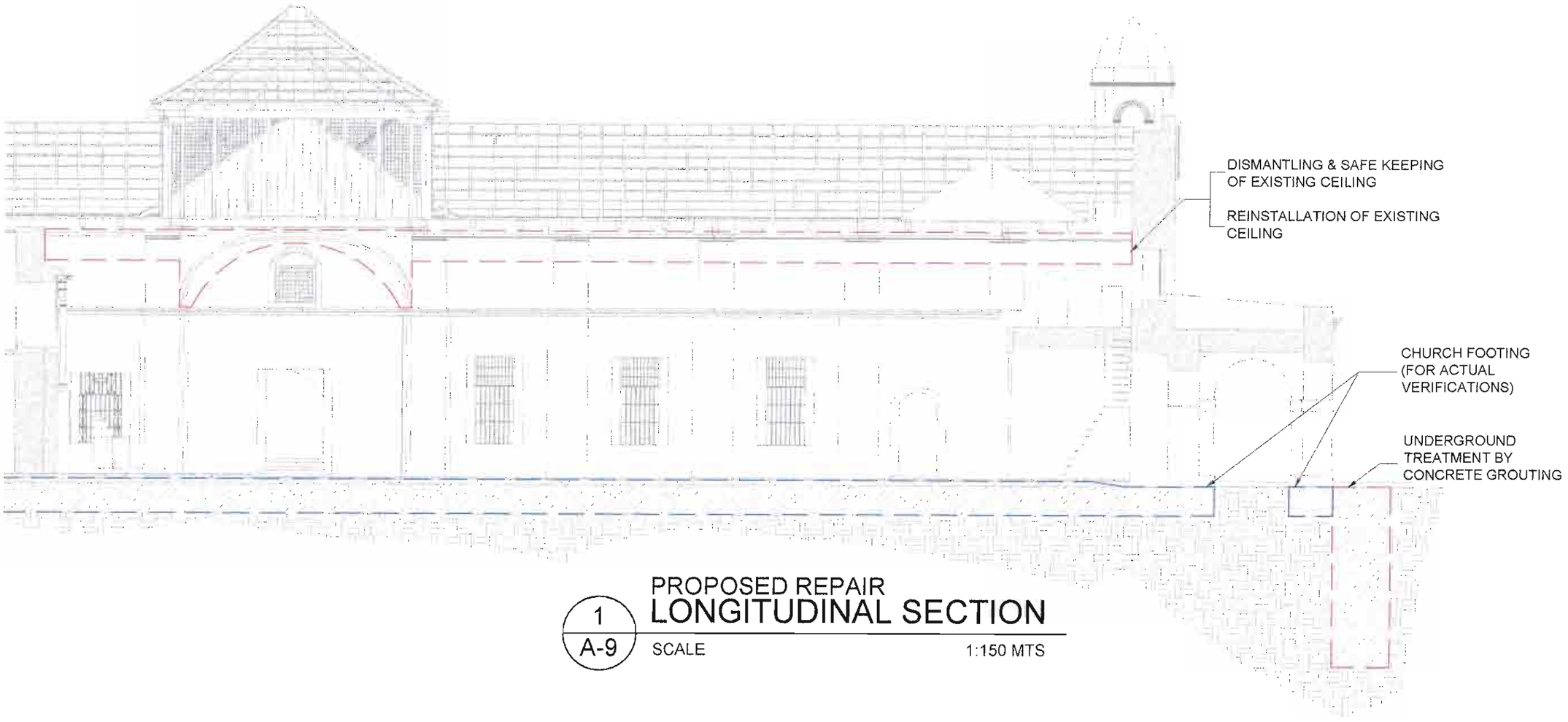
PROPOSED REPAIR PERSPECTIVE

NOT TO SCALE

LEGEND:

- CAPPING BEAM
- STEEL DOME SUPPORT

NATIONAL MUSEUM OF THE PHILIPPINES FACILITIES MANAGEMENT DIVISION P. BURGOS DRIVE, MANILA, 1000	PROJECT TITLE: HIGHLY URGENT REPAIR OF OUR LADY OF CAYSASAY CHURCH AND ASSOCIATED STRUCTURES	PREPARED BY: AR. MARVIN M. BELGICA ARCHITECT III, FMD	REVIEWED AND CHECKED BY: AR. NELSON L. AQUINO ARCHITECT IV, O.I.C. FMD	APPROVED BY: ATTY. JEREMY BARNS, CESO III DIRECTOR-GENERAL	APPROVED BY MOST. REV. GILBERT A. GARCERA, D.D. ARCHBISHOP OF LIPA		REVISIONS	SHEET CONTENT.	SHEET NO.
DATE.	PROJECT NO:	LOCATION BRGY. LABAC, TAAL, BATANGAS					DRAWN BY: CJ ANZALDO CHECKED BY DATE	PROPOSED REPAIR LEFT-SIDE ELEVATION PHOTOS	A-08 08 / 11



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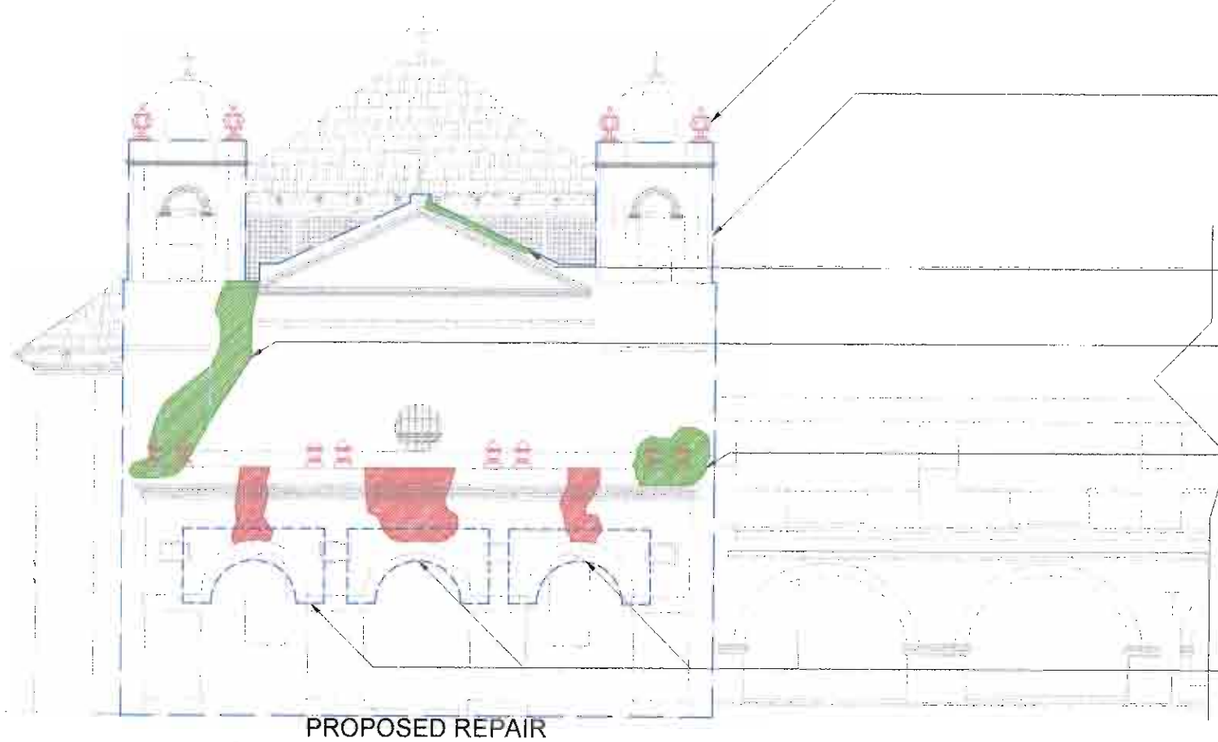
PROPOSED REPAIR LONGITUDINAL SECTION

SCALE 1:150 MTS

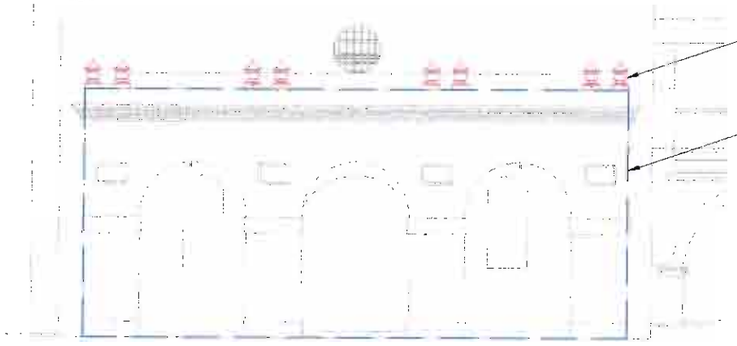
NATIONAL MUSEUM OF THE PHILIPPINES FACILITIES MANAGEMENT DIVISION P. BURGOS DRIVE, MANILA, 1000	PROJECT TITLE: HIGHLY URGENT REPAIR OF OUR LADY OF CAYSASAY CHURCH AND ASSOCIATED STRUCTURES	PREPARED BY: AR. MARVIN M. BELGICA ARCHITECT III, FMD	REVIEWED AND CHECKED BY: AR. NELSON L. AQUINO ARCHITECT IV, O.I C. FMD	APPROVED BY: DIR. JEREMY BARNS, CESO III DIRECTOR-GENERAL	APPROVED BY: MOST. REV. GILBERT A. GARCERA, D.D. ARCHBISHOP OF LIPA		REVISIONS:	SHEET CONTENT:	SHEET NO.
DATE:	PROJECT NO.	LOCATION: BRGY. LABAC, TAAL, BATANGAS					DRAWN BY: CJ ANZALDO CHECKED BY: DATE	PROPOSED REPAIR LONGITUDINAL SECTION	A-09 09 11



PROPOSED REPAIR

1 / A-10 FRONT ELEVATION

SCALE 1:150 MTS



PROPOSED REPAIR

2 / A-10 PORTICO ELEVATION

SCALE 1:150 MTS

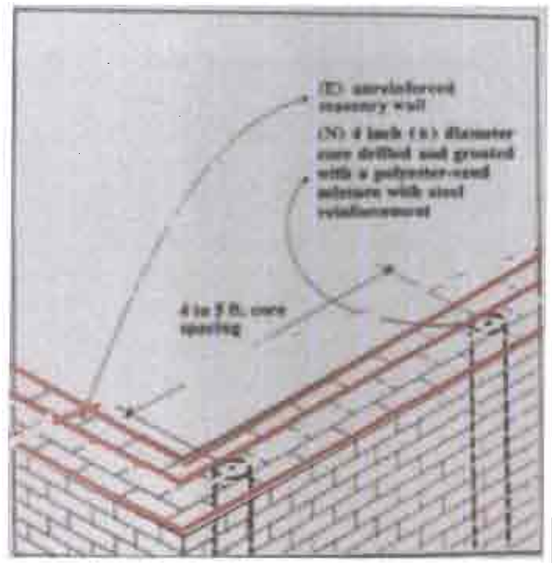


FIGURE 01: STRENGTHENING OF FACADE & PORTICO CORE WALLS

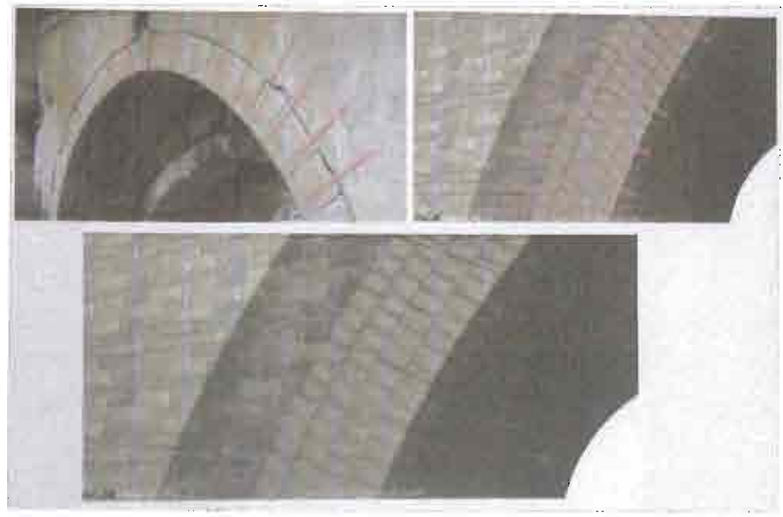
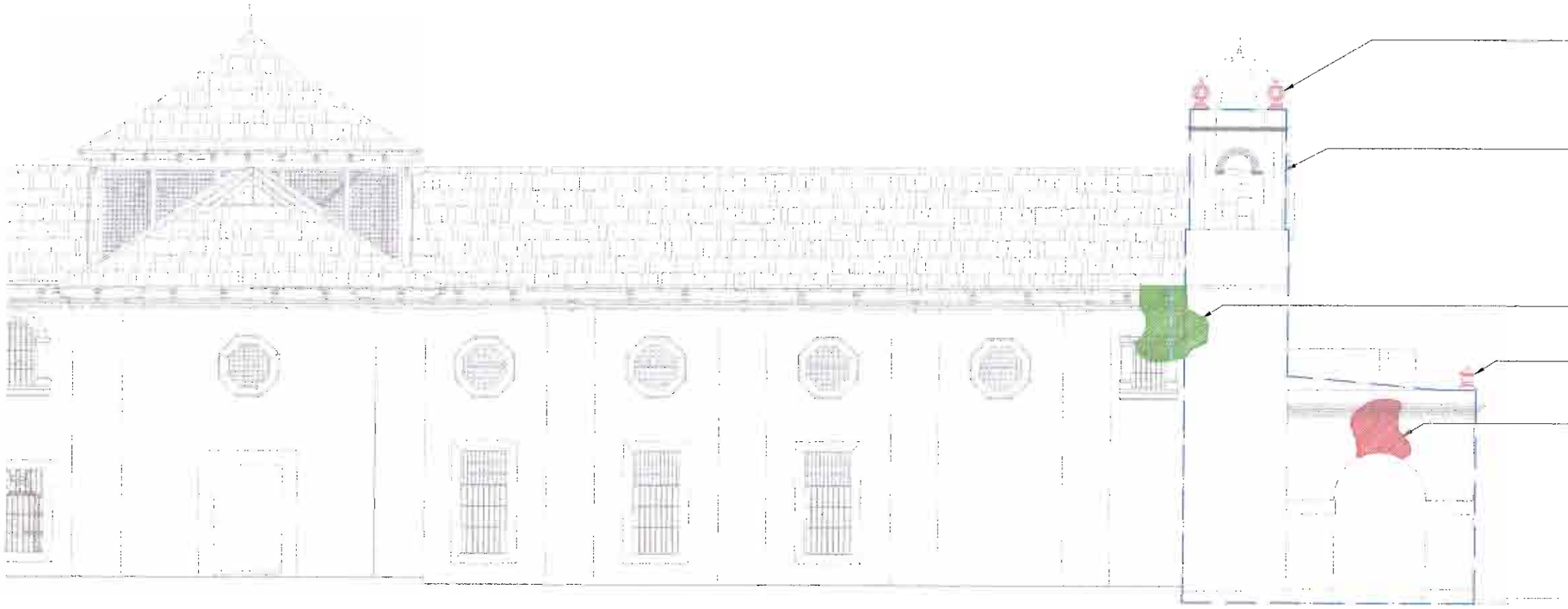


FIGURE 02: RETROFITTING OF ARCHED OPENINGS AND FACADE WALL

PANGANGASIWAAN NG PILIPINAS / NATIONAL MUSEUM OF THE PHILIPPINES	NATIONAL MUSEUM OF THE PHILIPPINES FACILITIES MANAGEMENT DIVISION P. BURGOS DRIVE, MANILA 1000	PROJECT TITLE: HIGHLY URGENT REPAIR OF OUR LADY OF CAYSASAY CHURCH AND ASSOCIATED STRUCTURES	PREPARED BY: AR. MARVIN M. BELGICA ARCHITECT III, FMD	REVIEWED AND CHECKED BY: AR. NELSON LAQUINO ARCHITECT IV, O.I C. FMD	APPROVED BY: DIR. JEREMY BARNS, CESO III DIRECTOR-GENERAL	APPROVED BY: MOST. REV. GILBERT A. GARCERA, D.D. ARCHBISHOP OF LIPA	DIOCESIS · ARSIDIOCESIS 1951 LIPA	REVISIONS:	SHEET CONTENT:	SHEET NO
	DATE	PROJECT NO:	LOCATION: BRGY. LABAC, TAAL, BATANGAS					DRAWN BY: CJ ANZALDO CHECKED BY: DATE:	PROPOSED REPAIR FRONT ELEVATION PROPOSED REPAIR PORTICO ELEVATION	A-10 10 | 11



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A-11

PROPOSED REPAIR LEFT-SIDE ELEVATION

SCALE 1:150 MTS

	NATIONAL MUSEUM OF THE PHILIPPINES FACILITIES MANAGEMENT DIVISION P. BURGOS DRIVE, MANILA, 1000	PROJECT TITLE: HIGHLY URGENT REPAIR OF OUR LADY OF CAYSASAY CHURCH AND ASSOCIATED STRUCTURES	PREPARED BY: AR. MARVIN M. BELGICA ARCHITECT III, FMD	REVIEWED AND CHECKED BY: AR. NELSON L. AQUINO ARCHITECT IV, O.I.C FMD	APPROVED BY: DIR. JEREMY BARNS, CESO III DIRECTOR-GENERAL	APPROVED BY: MOST. REV. GILBERT A. GARCERA, D.D. ARCHBISHOP OF LIPA		REVISIONS:	SHEET CONTENT:	SHEET NO.
	DATE:	PROJECT NO:	LOCATION: BRGY. LABAC, TAAL, BATANGAS					DRAWN BY: CJ ANZALDO CHECKED BY: DATE:	PROPOSED REPAIR FRONT ELEVATION	A-11 11 11

Section VIII. Bill of Quantities

CONTRACTOR'S LOGO

Project : HIGHLY URGENT REPAIR OF OUR LADY OF CAYSASAY CHURCH AND ASSOCIATED STRUCTURES
Location : Barangay Labac, Taal, Batangas
Duration : 240 Calendar days

Project No. :
Date :

APPROVED BUDGET FOR THE CONTRACT

Item No.	Description	Qty	Unit	Estimated Direct Cost (EC)					Indirect Cost (IC)			TOTAL COST	Unit Cost
				MATERIAL		LABOR		TOTAL EDC	OCMP	Sub-Total	VAT	EDC + IC	
				Unit	Total	Unit	Total		20%		5%		
I. GENERAL WORKS													
1	**Mobilization & Demobilization**	1.00	lot										
2	**Project Signage (8' x 8')**	1.00	set										
3	**TEMFACIL**	160.00	sq.m										
	(includes site office, warehousing and utility consumption)												
4	**Safety, Security and Housing**	240.00	C.D										
	(basic PPE only)												
5	**Supply and Installation of 2.40m high perimeter board-up**	366.95	sq.m										
	a. Scrap GI sheets	125.00	pcs										
	b. 2"x2" coco lumber	103.00	pcs										
	c. Assorted common wire nails	19.85	kgs										
										SUB-TOTAL I. GENERAL WORKS			
II. CHURCH EXTERIOR WORKS													
	FAÇADE & PORTICO												
1	**Scientific clearing & grubbing of biological growth (vegetation)**	147.42	sq.m										
	* Est 30% of surface												
	a. Herbicide (glyphosate concentrate)	4.00	liters										
	b. Padded rubber gloves	2.00	pairs										
	c. PPE respirator face mask	2.00	pcs										
	d. PPE jumpsuit	2.00	sets										
	e. Machete knife	2.00	sets										
	f. 50ml reusable syringe (for herbicide application)	2.00	sets										
2	**Manual chipping of existing cement based plastering/ mortar**	491.41	sq.m										
	a. Manual chipping of cement based plaster (labour)	491.41	sq.m										
3	**Mechanical and chemical cleaning of wall surface**	491.41	sq.m										
	a. Hydrated lime	10.00	bags										
	b. Soft nylon bristle brush	10.00	pcs										
	c. Non-ionic liquid detergent (sulfactant)	9.00	liters										
4	**Strengthening of Façade & Portico Core Walls**	491.41	sq.m										
	a. Consolidation of wall core by lime water injection	491.41	sq.m										
	b. 25mm dia x 6m stainless steel rod	24.00	pcs										
	c. 12mm x 1200mm x 2400mm stainless steel plate	1.00	pc										
	d. 25mm dia stainless steel nuts & bolts	56.00	pcs										

	e. Coring works (4" diameter)	134.88	ln.m										
	f. Hydrated Lime (for patching-up)	131.00	bags										
	g. Sand (for patching- up)	7.03	cu.m										
5	**Retrofitting of arched openings and façade walls**	**221.13**	**sq.m**										
	* Est 45% of wall& arch areas												
	a. 25mm dia x 6m stainless steel rod	24.00	pcs										
	b. 500mm x 500mm perforated stainless steel sheet	681.00	pcs										
	c. Coring works (4" diameter)	35.95	ln.m										
	d. Hydrated Lime (for grouting)	131.00	bags										
	e. Sand (for grouting)	7.03	cu.m										
	f. Reintegration of fallen stone debris	7.03	sq.m										
6	**Scientific & systematic repointing of original stone walls including ornaments & details**	**221.13**	**sq.m**										
	a. Manual chipping of existing mortar (labour)	221.13	sq.m										
	b. Hydrated Lime	80.00	bags										
	c. Sand	4.15	cu.m										
7	**Lime washing of wall surface**	**491.14**	**sq.m**										
	a. Hydrated Lime	131.00	bags										
8	**Repair of damaged cement floor tiles**	**75.20**	**sq.m**										
	a. Dismantling of existing cement floor tiles	75.20	sq.m										
	b. Hydrated Lime (adhesive & grout)	40.00	bags										
	c. Sand (adhesive & grout)	18.80	cu.m										
	d. Corrective ground topping	75.20	sq.m										
	e. Reinstallation of existing floor tiles	75.20	sq.m										
9	**Equipment (Rental)**	**1.00**	**lot**										
	a. Scaffolding	44.00	sets										
	b. 2 HP Portable air compressor	2.00	units										
	c. Knapsack pressure sprayer	2.00	units										
											Sub- Total Façade & Portico		
	UNDERGROUND TREATMENT												
1	**Underground treatment by concrete grouting**	**110.95**	**sq.m**										
	a. Manual chipping of concrete ground	110.95	sq.m										
	b. Manual Excavation works (6.0m deep)	665.90	cu.m										
	c. Hauling works (3.5 cu.m dump truck)	190.00	trips										
	d. Backfil works	11.10	cu.m										
	e. Concrete grouting	666.30	cu.m										
											Sub- Total Underground Treatment		
											SUB-TOTAL II. CHURCH EXTERIOR WORKS		
III. CHURCH INTERIOR WORKS													
1	**STRENGTHENING OF WOODEN DOME (CROSSING)**												
	1.1. Dismantling & safe keeping of existing ceiling	**143.66**	**sq.m**										
	1.2. Construction of steel brace support including levelling of dome & termite protection of wood parts	**60.00**	**l.m**										
	a. 6mm x 4 x 4 x 6m angle bar	54.00	pcs										
	b. 6mm x 2 x 2 x 6m angle bar	34.00	pcs										
	c. 12mm dia x 1-1/2" M-bolts	232.00	pcs										
	d. 16mm dia x 0.30m anchor bolt	16.00	pcs										
	e. Red oxide paint	10.00	gals										
	f. Welding rod	50.00	kgs										

	g. Levelling of leaning dome	1.00	lot										
	h. Termite control treatment	5.50	sq.m										
	1.3. Reinstallation of existing ceiling	**143.66**	**sq.m**										
2	**STABILIZATION OF STONE WALLS**												
	2.1. Dismantling & safe keeping of existing ceiling	**397.55**	**sq.m**										
	2.2. Construction of 0.20m D x 0.60m W reinforced concrete beam capping	**156.26**	**l.m**										
	a. Carving of original stone walls to create a niche for the rc beam capping	156.26	l.m										
	b. Cement	147.00	bags										
	c. Sand	7.87	cu.m										
	d. Gravel	15.75	cu.m										
	e. 16mm dia steel bars	2,962.71	kgs										
	f. 10mm dia steel bars	693.05	kgs										
	g. Formworks	1.00	lot										
	2.3. Reinstallation of existing ceiling	**397.55**	**sq.m**										
2	**Equipment (Rental)**	**1.00**	**lot**										
	a. Cut-off	1.00	set										
	b. Welding machine	1.00	set										
	c. Scaffolding	150.00	sets										
												SUB-TOTAL III. CHURCH INTERIOR WORKS	
												PROPOSED TOTAL PROJECT COST (Php)	

Prepared by:

CONTRACTOR

Section IX. 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);
and

☐ 2. 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

☐ 3. 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

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

Technical Documents

☐ 5. 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**

☐ 6. 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**

☐ 7. 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**

☐ 8. 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:

☐ 9. Organizational chart for the contract to be bid; **and**

☐ 10. 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

☐ 11. 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 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 a e–copy of all Eligibility, Technical and Financial Components of the Bid Proposal 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**.

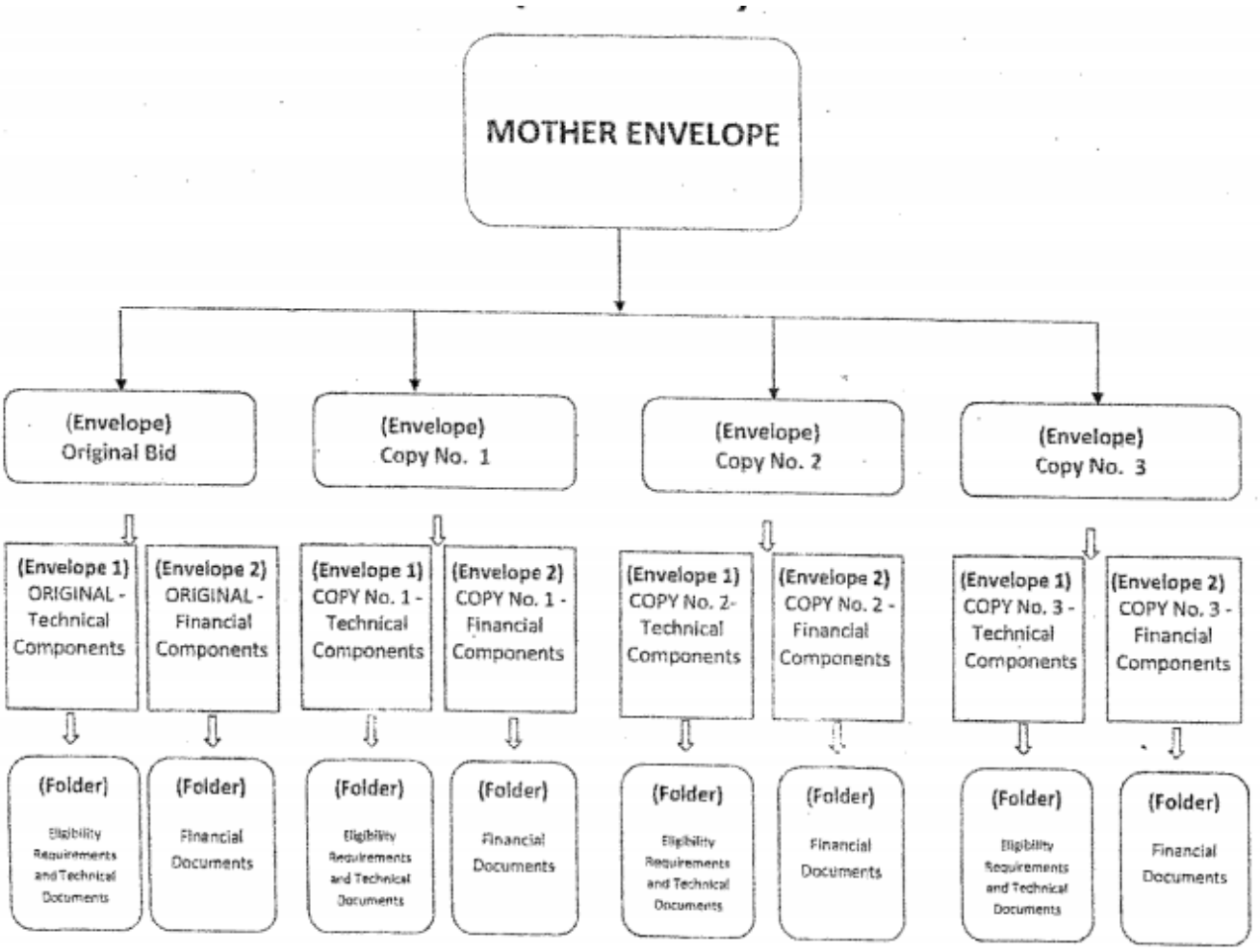
4. All documents must be marked with **Ear tabs**. There must be a Table of Contents indicating all the documents to be submitted per folder.

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