PHILIPPINE BIDDING DOCUMENTS

CONSTRUCTION OF MAPUNSO PUMPING STATION

Government of the Republic of the Philippines

Sixth Edition
April 2024

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Glossary of Terms, Abbreviations, and Acronyms

ABC – Approved Budget for the Contract.

ARCC – Allowable Range of Contract Cost.

BAC – Bids and Awards Committee.

Bid – A signed offer or proposal to undertake a contract submitted by a bidder in response to and in consonance with the requirements of the bidding documents. Also referred to as *Proposal* and *Tender*. (2016 revised IRR, Section 5[c])

Bidder – Refers to a contractor, manufacturer, supplier, distributor and/or consultant who submits a bid in response to the requirements of the Bidding Documents. (2016 revised IRR, Section 5[d])

Bidding Documents – The documents issued by the Procuring Entity as the bases for bids, furnishing all information necessary for a prospective bidder to prepare a bid for the Goods, Infrastructure Projects, and/or Consulting Services required by the Procuring Entity. (2016 revised IRR, Section 5[e])

BIR – Bureau of Internal Revenue.

BSP – Bangko Sentral ng Pilipinas.

CDA – Cooperative Development Authority.

Consulting Services – Refer to services for Infrastructure Projects and other types of projects or activities of the GOP requiring adequate external technical and professional expertise that are beyond the capability and/or capacity of the GOP to undertake such as, but not limited to: (i) advisory and review services; (ii) pre-investment or feasibility studies; (iii) design; (iv) construction supervision; (v) management and related services; and (vi) other technical services or special studies. (2016 revised IRR, Section 5[i])

Contract – Refers to the agreement entered into between the Procuring Entity and the Supplier or Manufacturer or Distributor or Service Provider for procurement of Goods and Services; Contractor for Procurement of Infrastructure Projects; or Consultant or Consulting Firm for Procurement of Consulting Services; as the case may be, as recorded in the Contract Form signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein.

Contractor – is a natural or juridical entity whose proposal was accepted by the Procuring Entity and to whom the Contract to execute the Work was awarded. Contractor as used in these Bidding Documents may likewise refer to a supplier, distributor, manufacturer, or consultant.

CPI – Consumer Price Index.

DOLE – Department of Labor and Employment.

DTI – Department of Trade and Industry.

Foreign-funded Procurement or Foreign-Assisted Project – Refers to procurement whose funding source is from a foreign government, foreign or international financing institution as

specified in the Treaty or International or Executive Agreement. (2016 revised IRR, Section 5[b]).

GFI – Government Financial Institution.

GOCC – Government-owned and/or –controlled corporation.

Goods – Refer to all items, supplies, materials and general support services, except Consulting Services and Infrastructure Projects, which may be needed in the transaction of public businesses or in the pursuit of any government undertaking, project or activity, whether in the nature of equipment, furniture, stationery, materials for construction, or personal property of any kind, including non-personal or contractual services such as the repair and maintenance of equipment and furniture, as well as trucking, hauling, janitorial, security, and related or analogous services, as well as procurement of materials and supplies provided by the Procuring Entity for such services. The term "related" or "analogous services" shall include, but is not limited to, lease or purchase of office space, media advertisements, health maintenance services, and other services essential to the operation of the Procuring Entity. (2016 revised IRR, Section 5[r])

GOP – Government of the Philippines.

Infrastructure Projects – Include the construction, improvement, rehabilitation, demolition, repair, restoration or maintenance of roads and bridges, railways, airports, seaports, communication facilities, civil works components of information technology projects, irrigation, flood control and drainage, water supply, sanitation, sewerage and solid waste management systems, shore protection, energy/power and electrification facilities, national buildings, school buildings, hospital buildings, and other related construction projects of the government. Also referred to as *civil works or works*. (2016 revised IRR, Section 5[u])

LGUs – Local Government Units.

NFCC – Net Financial Contracting Capacity.

NGA – National Government Agency.

PCAB – Philippine Contractors Accreditation Board.

PhilGEPS - Philippine Government Electronic Procurement System.

Procurement Project – refers to a specific or identified procurement covering goods, infrastructure project or consulting services. A Procurement Project shall be described, detailed, and scheduled in the Project Procurement Management Plan prepared by the agency which shall be consolidated in the procuring entity's Annual Procurement Plan. (GPPB Circular No. 06-2019 dated 17 July 2019)

PSA – Philippine Statistics Authority.

SEC – Securities and Exchange Commission.

SLCC – Single Largest Completed Contract.

UN – United Nations.

Section I. Invitation to Bid

Republic of the Philippines
TANAY WATER DISTRICT
IFP Bldg., No. 41 F.T. Catapusan St., Tanay, Rizal
8654-4450 / 8654-0033: ogm.tanwd@gmail.com

Invitation to Bid for the Construction of Mapunso Pumping Station

1. The **Tanay Water District**, through the **Corporate Budget for the contract approved by the governing Board** intends to apply the sum of **Three Million Two Hundred Fifty-Two Thousand Four Hundred Three Pesos (₱ 3,252,403.00)** being the Approved Budget for the Contract (ABC) to payments under the contract for the **Construction of Mapunso Pumping Station and PR 13765.** Bids received in excess of the ABC shall be automatically rejected at bid opening.

2. The **Tanay Water District** now invites bids for the above mentioned work. Completion of the Works is required within **One Hundred Twenty Five (125) Calendar Days**. Bidders should have completed a contract similar to the Project. The description of an eligible bidder is contained in the Bidding Documents, particularly, in Section II. Instruction to Bidders.

3. Bidding will be conducted through open competitive bidding procedures using non-discretionary "pass/fail" criterion as specified in the 2016 Revised Implementing Rules and Regulations (IRR) of Republic Act (RA) 9184.

4. Interested bidders may obtain further information from Tanay Water District and inspect the Bidding Documents at the address given below during Monday – Friday, **8:00 am to 5:00 pm Except Holidays**.

5. A complete set of Bidding Documents may be acquired by interested bidders on April 18, 2024 to May 15, 2024, Monday to Friday 8:00 AM – 5:00 PM from given address and website/s below and upon payment of the applicable fee for the Bidding Documents, pursuant to the latest Guidelines issued by the GPPB, in the amount of **Five Thousand Pesos (₱ 5,000.00)**. The Procuring Entity shall allow the bidder to present its proof of payment for the fees either to be presented in person, by facsimile, or through electronic means.

6. The **Tanay Water District** will hold a Pre-Bid Conference on **April 29, 2024 2:00 PM** at **Tanay Water District Conference Room, 2/F IFP Bldg. #41 F. T. Catapusan St., Tanay Rizal** and/or through videoconferencing/webcasting via Zoom, which shall be open to prospective bidders.

7. Bids must be duly received by the BAC Secretariat through manual submission at the office address indicated below on or before **May 15, 2024, 02:00 PM**. 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 15.

9. Bid opening shall be on **May 15, 2024, 02:00 PM** at the Tanay Water District Conference Room, #41 F. T. Catapusan St., Tanay Rizal, and/or through videoconferencing/webcasting. Bids will be opened in the presence of the bidders' representatives who choose to attend the activity.

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

11. For further information, please refer to:

DIMITREI MATTHEW A. PIGUING
BAC Secretariat
Tanay Water District
#41 F. T. Catapusan St., Tanay, Rizal
bacsec80@gmail.com
Telefax: 8654-3891
Tel.No. 8654-4450 loc.109

12. You may visit the following websites:

For downloading of Bidding Documents**:** **http://www.tanaywaterdistrict.gov.ph/**

April 18, 2024

(Sgd)ENGR. ARMANDO H. BONGAT
BAC Chairperson

Section II. Instructions to Bidders

1. Scope of Bid

The Procuring Entity, **Tanay Water District** wishes to receive Bids for the **Construction of Mapunso Pumping Station**, with **Purchase Request No. 13765**

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 FY **2024 (Eng'g Capex I-5)** in the amount of **Three Million Two Hundred Fifty-Two Thousand Four Hundred Three Pesos (₱ 3,252,403.00)**.

2.2. The source of funding is **Tanay Water District's Corporate Operating Budget**.

3. Bidding Requirements

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

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

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

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

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

5. Eligible Bidders

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

5.2. The Bidder must have an experience of having completed a Single Largest Completed Contract (SLCC) that is similar to this Project, equivalent to at

least fifty percent (50%) of the ABC adjusted, if necessary, by the Bidder to current prices using the PSA's CPI, except under conditions provided for in Section 23.4.2.4 of the 2016 revised IRR of RA No. 9184.

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

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

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

6. Origin of Associated Goods

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

7. Subcontracts

7.1. The Procuring Entity has prescribed that Subcontracting is not allowed

8. Pre-Bid Conference

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

9. Clarification and Amendment of Bidding Documents

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

10. Documents Comprising the Bid: Eligibility and Technical Components

10.1. The first envelope shall contain the eligibility and technical documents of the Bid as specified in **Section 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 special PCAB License in case of Joint Ventures, 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 **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 9 of the **IB**. The Bidders' representatives who are present shall sign a register evidencing their attendance. In case videoconferencing, webcasting or other similar technologies will be used, attendance of participants shall likewise be recorded by the BAC Secretariat.

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

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

19. Detailed Evaluation and Comparison of Bids

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

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

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

20. Post Qualification

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

21. Signing of the Contract

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

Section III. Bid Data Sheet

Bid Data Sheet

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: Construction of Pump House, Reservoir Concrete Pad, Genset Pad and Perimeter Fence.
7.1	No further instructions.
10.3	No further instructions.
10.4	The key personnel must meet the required minimum years of experience set below:
	<u>Key Personnel</u> <u>General Experience</u> <u>Relevant Experience</u> Project Engineer 3 Years Foreman 3 Years
10.5	The minimum major equipment requirements are the following: <u>Equipment</u> <u>Capacity</u> <u>Number of Units</u> Concrete Mixer 1 Bagger 1 Compactor At least 50kg 1 Welding Machine 300A 1
12	No further instructions.
15.1	The bid security shall be in the form of a Bid Securing Declaration or any of the following forms and amounts: a. The amount of not less **than ₱ 65,048.06** ***(Sixty-Five Thousand Forty-Eight Pesos and 6/100)*** *(2% of ABC,* if bid security is in cash, cashier's/manager's check, bank draft/guarantee or irrevocable letter of credit; b. The amount of not less than **₱ 162,620.15 (*One Hundred Sixty-Two Thousand Six Hundred Twenty Pesos and 15/100)*** *(5% of ABC]* if bid security is in Surety Bond.
19.2	No further instructions.
20	No further instructions.
21	Submission of construction schedule, PERT CPM and S-curve, manpower schedule, construction methods, equipment utilization schedule, construction safety and health program approved by the DOLE.

Section IV. General Conditions of Contract

1. Scope of Contract

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

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

2. Sectional Completion of Works

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

3. Possession of Site

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

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

4. The Contractor's Obligations

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

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

5. Performance Security

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

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

6. Site Investigation Reports

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

7. Warranty

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

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

8. Liability of the Contractor

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

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

9. Termination for Other Causes

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

10. Dayworks

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

11. Program of Work

11.1. The Contractor shall submit to the Procuring Entity's Representative for approval the said Program of Work showing the general methods,

arrangements, order, and timing for all the activities in the Works. The submissions of the Program of Work are indicated in the **SCC.**

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

12. Instructions, Inspections and Audits

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

13. Advance Payment

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

14. Progress Payments

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

15. Operating and Maintenance Manuals

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

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

Section V. Special Conditions of Contract

Special Conditions of Contract

GCC Clause	
2	The Intended Completion Date is One Hundred Twenty-Five (125) calendar days from the starting date; the starting date being seven (7) calendar days from the issuance of the Notice to Proceed. NOTE: The contract duration shall be reckoned from the start date and not from contract effectivity date.
4.1	The possession of the site to the Contractor is within Ten (10) days after receipt of Notice to Proceed
6	No further instruction
7.2	In case of permanent structures, such as buildings of types 4 and 5 as classified under the National Building Code of the Philippines and other structures made of steel, iron, or concrete which comply with relevant structural codes (e.g., DPWH Standard Specifications), such as, but not limited to, steel/concrete bridges, flyovers, aircraft movement areas, ports, dams, tunnels, filtration and treatment plants, sewerage systems, power plants, transmission and communication towers, railway system, and other similar permanent structures:] Fifteen (15) years.
10	No dayworks are applicable to the contract.
11.1	The Contractor shall submit the Program of Work to the Procuring Entity's Representative within **Fifteen (15)** calendar days upon receipt of the Notice to Proceed.
11.2	The amount to be withheld for late submission of an updated Program of Work is **P 1,500.00** from the latest submitted Progress Billing.
13	The amount of the advance payment is **Fifteen (15) percent** of the Contract Price subject to the requirements of the 2016 Revised IRR of RA No. 9184, ANNEX "E", Contract Implementation Guidelines for the Procurement of Infrastructures Projects and in accordance with the Checklist of Supporting Documents and Attachments, ANNEX "K" of the DPWH DO No. 11 dated February 2, 2021, Document Tracking System for Civil Works Projects.
14	The Contractor may submit a request for **Progress Payment for Work Accomplished** subject to the requirements of the 2016 Revised IRR of RA 9184, ANNEX "E", Contract Implementation Guidelines for the Procurement of Infrastructures Projects and in accordance with the Checklist of Supporting Documents and Attachments, ANNEX "K" of the DPWH DO No. 11 dated February 2, 2021, Document Tracking System for Civil Works Projects. Furthermore, any materials and/or equipment delivered on the site but not completely put in place must not be included for payment.
15.1	The date by which "**As Built**" drawings are required is **upon submission of the Final Billing request.**
15.2	Failure on the part of the Contractor to provide the As Built Drawings and/or manuals, the request for the Payment of their Final Billing shall not be processed and/or released.

Section VI. Specifications

STANDARD SPECIFICATIONS FOR CONSTRUCTING WATER DISTRIBUTION FACILITIES

CONSTRUCTION SPECIFICATIONS

GENERAL SPECIFICATIONS FOR WATER PUMPING STATION

1. GENERAL CONDITIONS

1.1 Scope

These specifications for construction of water pumping station are intended to provide a minimum quality workmanship acceptable to the water District. Any specifications not listed in this document in no way relieve the Contractor of full responsibility for providing a complete project of quality, finish appearance and satisfactory for operation. This shall form part of the Contract documents and shall govern the construction, handling, installation of pumping stations and accessories described herein

The Contractor shall furnish and install all materials, labor, and equipment for constructing the work included in these specifications and as detailed on the plans. The construction methods employed in the placement of the pumping stations and appurtenances shall be in accordance with current codes, practices and specifications of the district.

These specifications provide general standards for water pumping stations. Current detail requirements shall be coordinated with the Owner prior to the time of implementation.

The main items of work to be constructed includes are the following:

a) Clearing Works
b) Construction of Pump House
c) Construction of Concrete Fence & Steel Gate
d) Construction of Fence at Right of Way
e) Construction of Booster Pump Pedestal, Genset Pad & Shed
f) Construction of Cistern Tank Platform
g) Drainage Works & Flushing Box
h) Concreting of Ground & Ramp, Embankment & Gravel Filling
i) Electrical Works
j) Painting Works
k) Fabrication & Installation of Stainless Steel TanWD Logo & Signage

1.2 Interpretation, Definitions and Abbreviations

Unless specifically stated otherwise, this document includes all functions described in this Standard Technical Specification and the provision of any minor materials or services which are not described but are reasonably necessary to complete the project.

1.2.1 Owner

The word “Owner” refers to the Tanay Water District named in the Contract Documents.

1.2.2 Administration

The word “Administration” or “TanWD” refers to the “Tanay Water District”, the duly authorized for the proper implementation of the Contract, acting either indirectly, directly or through its

properly authorized agents, such agents acting within the scope of the particular duties entrusted to them.

1.2.3 Engineer

The word “Engineer” refers to the individual or firm authorized by the Owner to oversee the execution of this Contract, acting either indirectly, directly or through its properly authorized agents, such agents acting within the scope of the particular duties entrusted to them.

1.2.4 Contractor

The word “Contractor” refers to the party entering into the Contract for the performance of the work required, its legal representative and/or its duly appointed agent.

1.2.5 Subcontractor

The word “Subcontractor” refers to any person, firm, or corporation entering into agreement with the Contractor for the performance of any part of the Contractor’s obligation under the Contract.

1.2.6 Contract

The word “Contract” refers to the Contract Documents and shall include the Basic Contract entered into by the Owner and the Contractor for the performance of the work described in the Specifications and shown on the Drawings, together with the Invitation for Bids, Information for Bidders, Specifications, the Drawings, all addenda issued by TanWD with respect to the foregoing prior to the opening of bids and all change orders issued by the Owner and signed by the Contractor pertaining to the contract after the same has been awarded.

1.2.7 Specifications

The word “Specifications” refers to the General Conditions, Special Provisions and the Standard Technical Specifications of the Contract, together with all addenda and change orders issued with respect thereto.

1.2.8 Drawings

The word “Drawings” or “Contract Drawings” refers to those drawings accompanying the Specifications and subsequently approved drawings, which show the location, nature, extent, and form of the work, together with applicable detail.

1.2.9 Work

The word “Work” refers to the labor, materials, equipment, transportation and all incidental costs necessary to complete the Contract.

1.2.10 Site

The word “Site” refers to the lands and other places on, under, in or through which the work is to be executed or carried out and any other lands or places provided by the Owner for the purpose of the Contract together with such other places as may be specifically designated in the Contract as forming part of the site.

1.2.11 Approval

The word "Approval" refers to the concurrence in writing, including subsequent written confirmation of previous verbal approval.

1.2.12 Working/ Calendar Day

The term "Working Day" refers to working days in the government service. The term "Calendar Day"' refers to the days in a week, including Saturdays, Sundays and holidays. Whenever the word "day" is used, it shall refer to calendar day.

1.2.13 Abbreviations

Whenever the following abbreviations are used, they shall have the meanings indicated:

ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association, Inc.
DPWH	Department of Public Works and Highways
ISO	International Organization for Standardization
LWUA	Local Water Utilities Administration
PEC	Philippine Electrical Code
PBS	Philippine Bureau of Standards
TanWD	Tanay Water District

1.3 Specifications, Drawings and Discrepancies

a) The intent of these Specifications and Drawings is that the Contractor shall furnish all the required plant, labor, materials, equipment and services, unless otherwise specifically provided.
b) These Specifications and Drawings are complementary and what is called for in one shall be as binding as is called for in both.
c) Any discrepancies, errors, or omissions found in these Specifications or Drawings shall be reported in writing within five (5) days from discovery to the Engineer who will issue the correction in writing within the same period. The Contractor shall not take advantage of any such discrepancies, errors or omissions, but shall comply with any corrective measures regarding the same prescribed by the Engineer.

1.3.1 Shop Drawings

a) Whenever called for in these Specifications or on the Drawings, or where required by the Engineer, the Contractor shall furnish TanWD for review four (4) prints of each shop drawing. The term "shop drawing" as used herein shall be understood to include detail design calculations, fabrications and installations drawings, lists, graphs, operating instructions, etc. Shop drawings shall be submitted to TanWD for review/approval within ten (10) days from receipt of the Notice of Award, unless otherwise extended in writing by TanWD.

b) All shop drawing submittals shall be accompanied by a transmittal form. Any shop drawing submittal not accompanied by such a form, or where all applicable items on the form are not completed, will be returned for re-submittal. The Contractor may authorize a material or equipment supplier to deal directly with TanWD with regard to shop drawings; however, ultimate responsibility for the accuracy and completeness of the information contained in the submittal shall remain with the Contractor.

c) Within seven (7) calendar days after the receipt of said prints, TanWD will return prints of each drawing to the Contractor with his comments noted thereon. Whenever a resubmittal is required, the Contractor shall make a complete and acceptable submittal to TanWD within seven (7) days from receipt of the returned shop drawings. Non-compliance hereof will give rise to the Administration's right to either: (a) cancel the award; or (b) withhold the money due the Contractor to cover additional costs of the Engineer's review beyond the second submission. Such failure may be considered a factor against Contractor's competence in future biddings to be conducted by the Administration.

d) If two (2) prints of the drawings are returned to the Contractor marked "APPROVED", formal revision of said drawings will not be required.

e) If two (2) prints of the drawings are returned to the Contractor marked "APPROVED WITH COMMENTS ", formal revision of said drawings will not be required.

f) If one (1) print of the drawings is returned to the Contractor marked "NOT APPROVED", the Contractor shall revise the said drawings and shall resubmit four (4) copies of said revised drawings to TanWD.

g) Fabrication of an item shall not be commenced before TanWD has reviewed/examined the pertinent shop drawings and returned copies to the Supplier marked either "APPROVED" or "APPROVED WITH COMMENTS". Revisions indicated on shop drawings shall be considered as changes necessary to meet the requirements of the Contract Drawings and Specifications and shall not be taken as the basis of claims for extra work. The Contractor shall have no claim for damages or extension of time due to any delay resulting from the Contractor having to make required revisions to shop drawings (unless reviewed by TanWD of said drawings is delayed beyond a reasonable period of time and unless the Contractor can establish that TanWD's delay in review actually resulted to a delay in the Contractor's Construction Schedule). The review of said drawings by TanWD will be limited to checking for general agreement with the specifications and drawings, and shall in no way relieve the Contractor of the responsibility for errors or omissions contained therein nor shall review operate to waive or modify any provision contained in the Specifications or Contract Drawings. Fabricating dimensions, quantities of material, applicable code requirements shall be the Contractor's responsibility.

1.3.2 Catalog Data

a) For original submittal and each subsequent resubmittal required, submit 3 copies of catalog data.

b) Manufacturer's Catalog, Product, and Equipment Data: Certified and include material type, performance characteristics and similar data.

b.1 Indicate catalog, model, and serial numbers representing specified equipment.

b.2 Submit complete component information to verify specified required items.

1.3.3 Method of Construction

a) For original submittal and each subsequent resubmittal required, submit 3 copies of data detailing method of construction.

b) When Water District specifies or directs, submit proposed method of construction for specific portions of Work.

b.1 Include detailed written description of phases of construction operation to fully explain to Water District proposed method of construction.

b.2 If required by Specifications, submit working drawings to supplement description.

c) Review will follow the process herein and shall not relieve the Water District from responsibility for fulfillment of the requirements of the Contract Documents. Contractor assumes risks associated with proposed method.

After review, submit requests for modifications in detail, including justification for them. Do not implement modifications prior to the Water District's review.

1.3.4 Reference to Standard or Publications

Any reference in the Specifications or Drawings to any specification, standard or publication of any organization shall, in the absence of a specific designation to the contrary, be understood to refer to the latest edition of the specification, standard or publication in effect as of the date of advertising the work. Internationally accepted standards equal to or better than specified standards or specifications are acceptable.

1.4 Materials, Equipment and Utilities

1.4.1 Safeguarding of Equipment, Materials and Work

The Contractor shall properly safeguard all equipment, materials and work against loss, damages, malicious mischief or tampering by unauthorized person until acceptance of the Work by the Owner. Obtain all materials necessary for construction of the Works from approved sources. Comply with all recommendations of the manufacturers regarding the storage and handling of the materials. Undertake all handling, transport and storage such that no damage occurs to the materials including coatings and linings.

Any damaged material is liable to be rejected. Do not use any rejected material in the Works and remove it from the Site at the earliest opportunity.

1.4.2 New Materials and Equipment

Unless otherwise specifically shown, or permitted by the Engineer, all materials and equipment incorporated in the work shall be new and of current manufacture. The Engineer may request the Contractor to furnish manufacturer's certificate to this effect.

1.4.3 Contractor's Utilities

The Contractor shall provide his water, electric power and communication in the performance of the work under the Contract and shall pay all installation charges and monthly bills in connection therewith.

2. EARTHWORKS

2.1 General

The Contractor shall perform all earthworks required and shown on the drawings.

2.2 Excavation

General

Except when specifically provided to the contrary, excavation shall include the removal of materials of whatever nature encountered, including all obstructions of any nature that would interfere with the proper execution and completion of the work. The removal of said materials shall conform with the lines and grades shown or ordered. Unless otherwise provided, the

entire construction site shall be stripped of all vegetation and debris, and such materials shall be removed from the site prior to performing any excavation or placing of any fill. The Contractor shall furnish, place, and maintain all supports and shoring that may be required for the sides of the excavation, and all pumping, ditching or other approved measures for removal or exclusion of water, including taking care of storm water and waste water reaching the site of the work from any source as to prevent damage to the work or adjoining property. The walls and faces of all excavations in which workers are exposed to danger horn unstable ground, shall be guarded against by a shoring system, sloping of the excavation, or some other acceptable method. The contractor shall furnish, install and maintain such sheeting, bracing, etc., as may be necessary to protect the workers and to revent any movement of earth which could injure or delay the work or endanger adjacent structures. In excavations where workers may be required to enter, excavated or other materials shall be effectively stored and retained at least 600 mm or more from the edge of the excavation. All excavation and trenching operations shall conform with any and all national, provincial, and local safety requirements.

b. Excavation Beneath Proposed Structures

Except where otherwise specified for particular structures or ordered by the Engineer, excavation shall be carried to the grade of the bottom of the footing or slab, where shown or ordered, areas beneath proposed structures shall be over-excavated. When such over-excavation is shown on the Drawings, both over-excavation and subsequent backfill to the required grade shall be performed by the Contractor at his own expense. When such over-excavation is not shown but is ordered by the Engineer, such over-excavation and any resulting backfill will be paid for under a separate unit price bid item if such bid item has been established; otherwise, payment will be made in accordance with negotiated prices. After the required excavation or over-excavation has been completed, the exposed surface shall be scarified to a depth of 150 mm (6 in.) brought to optimum moisture content, and rolled with heavy compaction equipment to ninety-five percent (95%) of maximum dry density.

c. Excavation Beneath Areas to be Paved

Excavation under areas to be paved shall extend to the bottom of the aggregate base, if such base is called for; otherwise, it shall extend to the bottom of paving. After the required excavation has been completed, the exposed surface shall be scarified, brought to optimum moisture content, and rolled with heavy compaction equipment to ninety percent (90%) of maximum dry density.

Backfill

Backfill shall not be dropped directly upon any structure or pipe. Materials used for backfill shall be selected material, free from grass, roots, brush, or other vegetation, or rocks having maximum dimension larger than 150 mm (6 in.). Material placed within 150mm (6 in.) of any structure or pipe shall be free from rocks or unbroken masses or earthly materials having maximum dimension larger than 75 mm (3 in.).

2.3 Granular Bedding

a. General

This work shall consist of furnishing, spreading and compacting graded granular base material in all trenches, slab on fill, column and wall footing and roadways in accordance with the Specification and Drawings.

b. Material Requirement

Material for granular bedding shall consist of natural or processed aggregates such as gravel sand or stone fragments. It shall be clean and free from organic matters, lumps of clay and other deleterious substances. The material shall be of such nature that it can be compacted readily under watering and rolling to form a firm, stable base.

2.4 Compaction

a. Compact fill material by manual or mechanical tampers. Flooding of the fill is not permitted.
b. Place and compact backfill in even layers on either side of structures to avoid differential loading.

c. Keep all dewatering systems operating during backfilling so that no fill material is placed or compacted under water. At all times ensure that the pipelines and structures are not damaged or moved during placement and compaction of fill.

3. STRUCTURAL WORKS

3.1 Work Included

The work to be undertaken under this Section shall include all labor, materials, equipment, plant and other facilities and the satisfactory performance of all work necessary to complete all concrete work shown on the Drawings and so specified herein. All work included under this Section shall be subject to the General Conditions accompanying these specifications. The Contractor is required to refer especially thereto.

3.2 Materials

a. Cement

Except as may be otherwise provided in these specifications cement shall conform with the “Standard Specifications for Portland Cement” (ASTM C-150 Latest Revision) and shall be Type I.

b. Concrete Aggregates

1. Concrete aggregates shall be well grade, clean, hard particles of gravel or crush rock conforming with the “Standard Specifications for Concrete Aggregates (ASTM C-33 Latest Revision).

2. The maximum size of the aggregates shall not be larger than one-fifth (1/5) of the narrowest dimension between forms and not larger than three-fourths (3/4) of the minimum clear spacing between individual reinforcing bars, or bundles of bards, and in no case larger than 38 mm (1-1/2) in diameter except that written permission from the Engineer. Use ¾’ size of coarse aggregate for reinforced concrete wall to avoid further segregation of fine and coarse aggregates during concreting work.

c. Water

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

d. Reinforcing Steel

All reinforced steel bars used shall be of deformed type, new, free from rust, oil, defects, greases, or kinks. They shall conform with the latest edition of National Structural Code for Buildings with a minimum grade equal to 275 MPs/Grade 40 unless otherwise shown on the plans.

e. Admixture

At the Contractor’s option or at the request of the Engineer, but in either case at the expense of the Contractors, and admixture may be added to the concrete to control the set, effect water reduction, and increase workability. Such admixture may be either a hydroxyllated polymer type, but shall contain

no calcium chloride. The required quantities of cement shall be used in the mix regardless of whether or not any admixture us use. The quantity of admixture used and the method of mixing shall be in accordance with the manufacturer's instructions. Where the air temperature at the time of placement is expected to be consistently over 26.7*c (80*F) such admixture shall be Super Concrete Emulsions "Plastiment", "Master Builder's", "Pozzolith 300R", substitute.

f. Calcium Chloride

Except as otherwise specified for Architectural finis, the use of calcium chloride in concrete will not be permitted.

3.3 Storage of Materials

Cement and aggregates shall be stored in such a manner as to prevent deterioration or intrusion by foreign matter. Any material which has deteriorated or which has been damage shall not be used for concrete. Steel shall be stored under cover or other prevented from rusting.

3.4 Testing of Materials

The Owner of his duly authorized representative or the Engineer shall periodically order the test of any material supplied by the Contractor entering into concrete or reinforced concrete to determine its suitability for the intended purpose. Such test shall be in accordance with the standards of the American Society for Testing and Materials, as noted elsewhere in this Specification. Samples shall be provided by the contractor without cost to the Owner, Expenses for the testing and cost of transporting samples to testing laboratories shall be borne by the Contractor. Copies of the results of the tests shall be furnished to the Owner Promptly Compressive strength specimens for tests of Concrete during construction shall be according to "Making and Curing of Concrete Compression and Flexural Strength Test Specimens in the Field" (ASTM C-31).

3.5 Controlled Strength of Concrete

a. Concrete for structural elements, including slabs on grade within water-retaining structures and stairs shall develop a minimum 28-day compressive cylinder strength of 20.68 mega Pascal (3,000 psi), unless otherwise specified in the plans.

b. Concrete for non-structural elements such as cradles, unreinforced encasements, thrust blocks, and partitions walls shall develop a minimum 28-day cylinder strength of 17.25 MPa (2500 psi), unless otherwise specified in the plans.

3.6 Method of Determining Strength: Trial Batch

The Contractor shall submit design and test results of samples made in accordance with the "Standard Method of Making and Curing Concrete Compression and Flexure Test Specimens in the Laboratory " (ASTM C-192-Latest Revision) and Standard Method of Test for Compressive Strength of Molded Concrete Cylinders" (ASTM Designation C-39) for each strength required, starting the proposed slum and the proportional weights of the cement, saturated surface dry aggregates, and the proportional weights of the cement, saturated surface dry aggregates, and water. These mixes shall prove by preliminary test thirty (30) days before concreting and shall show a 28-day strength of fifteen (15%) higher than the ultimate strength required. No substitution shall be made in the materials or mixed without additional test to show that the quality of concrete is satisfactory.

3.7 Concrete Proportion and Consistency

a. The proportion of aggregate to cement for any concrete shall be such as to produce a mixture which will work readily into the corners and angles of the forms and around reinforcement with the method of placing employed on the work but without permitting the materials to segregate, or excess free water to collect on the surface. The Combined aggregates shall be of such composition of sizes that when separated on the No.4 standard sieve, the weight passing the sieve (fine aggregate) shall not be

less than thirty percent (30%) of the total, except that these proportions d no necessarily apply to lightweight aggregates.

b. The methods of measuring concrete materials shall be such that the proportions can be accurately controlled and easily checked at any time during the work. Measurement of materials for ready-mixed concrete shall conform with the "Standard Specification for Ready-Mixed Concrete" (ASTM C-94, Latest Revision where applicable.

c. Aggregates shall be measured out by weight and to within one percent (1%). Cement shall conform with 40kg (88 lb) per bag and this is to be verified from time to time. Water shall be measured by weight or volume to within one and one-half percent (1 ½' 0/0).

d. The water shall in no case exceed 21.24 liters, and 25.67 liters (5.62 and 6.79 US Gallons) per bag of cement for all concrete with specified strength of f'c = 20.68 MPa (3000 psi) and 17.25 MPa (2500 psi), respectively.

Slumps shall be according to the "Test of Slumps for Portland Cement Concrete" (ASTM C-143).

e. The minimum cement content for 20.68 MPa (3000 psi) concrete shall be 8.39 sacks per cubic meter of concrete.

f. Job mix adjustment on water content shall be allowed only with Engineer's permission and provided that cement is also added to maintain the original water-cement ration of the design mix.

3.8 Exclusion of Water

No concrete shall be placed in any structure until all water entering the space to be filled with concrete has been properly cut off or has been diverted by pipes or other means, and carried out of the forms, clear of the work. No concrete shall be deposited under water without the explicit permission of the Engineer. And then only in strict accordance with his directions nor shall the Contractor, without explicit permission, allow still water to rise on any concrete until concrete has attained its initial set. Water shall not be permitted to flow over the surface of any concrete in such manner and at such velocity as will injure the surface finish of the concrete. Pumping of other necessary dewatering operations for removing ground water, if required, will be subjected to the approval of the Engineer

3.9 Mixing Concrete

a. No hand mixing shall be allowed, except in emergency such as mixer breakdown during concreting operations and this shall stop as soon as the pour is completed, at a construction joint shown or otherwise designated by the Engineer. All concrete shall be machine mixed for at least one and one-half (1 ½) minutes after all materials, including water, are in the mixing drum.

b. The mixer shall be of an approved size and type, which will insure a uniform distribution of materials throughout the mass. It shall be equipped with a device for accurately measuring and controlling the amount of mixing water in each batch.

c. The first batch of the concrete materials placed in the mixer shall contain a sufficient excess of cement, sand and water to coat the inside of the drum without reducing the cement of the mix to be discharged.

d. Re tempering, i.e, remixing with the addition of water to concrete that has been partially hardened with not be permitted.

3.10 Concrete Proportion and Mixing

a. The minimum cement content for 20.68MPa (3000 psi) concrete shall be 8.39 sacks per cubic meter of concrete (Class A) see Table 1-1.

TABLE 1-1 Concrete Proportion

Mixture Class	Proportion	Cement (40 kg.)	Sand (m^3)	Gravel (m^3)
AA	1 : 1 ½ : 3	12.0	0.50	1.00
A	1 : 2 : 4	9.0	0.50	1.00
B	1 : 2 ½ : 5	7.5	0.50	1.00
C	1 : 3 : 6	6.0	0.50	1.00

b. No hand mixing shall be allowed, except in emergency such as mixer breakdown during concreting operations and this shall stop as shown as soon as the pour is completed. All concrete shall be machine mixed for at least one and one-half (1 ½) minutes after all materials, including water, are in the mixing drum.

3.11 Preparation of Surface for Concrete

a. Earth surfaces shall be thoroughly wetted by sprinkling prior to the placing of any concrete, and these surfaces shall be kept moist by frequent sprinkling u to the time of placing concrete thereon. The surface shall be free from standing water, mud and debris at the time of placing concrete.

b. Concrete surfaces upon or against which concrete is to be placed, where the placement of the old concrete has been stopped or interrupted so that, in the opinion of the Engineer, the new concrete can't be incorporated integrally with the previously placed are defined as constructions joints. The surface if horizontal joints shall be leveled with a wooden float to provide a reasonably smooth surface. A surface consisting largely of coarse aggregate shall be avoided. Except where the drawing s call for joint surfaces to be painted, the joint surface shall be cleaned of all laitance, lose or defective concrete, and foreign material, such cleaning shall be accomplished by sandblasting followed by thorough washing. All pools of water shall be removed from the surfaces of the construction joints before the new concrete is placed. After surfaces have been prepared to the satisfaction of, all approximately horizontal construction joints shall be covered with a layer of mortar approximately 25 mm (1 in.) thick. The Mortar in place shall have the proportion of cement and sand as the regular concrete mixture, unless otherwise directed by the Engineer. The water- cement ratio of the mortar in place shall not exceed that of the concrete to be placed upon it, and the consistency of the mortar shall be suitable for placing and working in a manner hereinafter specified. The mortar shall be spread uniformly and shall be worked thoroughly into all irregularities of the surface, and wire brooms shall be sued where shall be used where possible to scrub the mortar into the surface. Concrete shall be placed immediately upon the fresh mortar.

c. When the placing of concrete is to interrupted long enough for the concrete to take a set, the working face shall be given a shape by the use of forms or other means that will secure proper union with subsequent work, provided that construction joints shall be made only where approved by the Engineer.

3.12 Placing Concrete

a. Concrete which upon or before placing is found not to conform with the requirements specified here in shall be rejected and immediately removed from the work. Concrete which is not placed in accordance with these specifications, or whish is of inferior quality, as determined by the Engineer, shall be removed and replaced except in the presence of a duly authorized representative of the Engineer. Concrete shall not be placed under unsuitable heat or wind conditions will prevent proper placement and curing, as determined by the Engineer, Prior to placing any concrete, the Contractor shall give the Engineer twenty-four (24) hours written notice.

b. Concrete shall be deposited in its final position without segregation re handling, or flowing, Placing shall preferably with buggies, buckets, or flowing. Placing shall be done preferably with buggies, except to transfer concrete from hoppers to buggies, wheelbarrows or buckets in which case, they shall not exceed six (6) meters (20 ft.) in aggregate length.

c. Placing of concrete with a free drop or fall more than 1.20 meters (4 ft. shall not be allowed, except when approved by the Engineer and when approved sheet metal conduits, pipes, or “elephant trunks” are employed. When Employed, these conveyors shall be kept full of concrete and the ends kept buried in the newly placed concrete as pouring progresses.

d. Concrete in forms shall be deposited in uniform horizontal layers not deeper than 450 mm (18.in.) and care shall be taken to avoid inclined layers or inclined construction joints except where such are required for sloping members. Each layer shall be placed while the previous layer is still soft. The rate of placing concrete in forms shall not exceed 1.5 meters (5 ft.) of vertical rise per hour.

3.13 Forms

a. The Contractor shall provide forms to confine the concrete and shape it to the required lines. Plastering, in general shall not be allowed. The Contractor shall assume full responsibility for the adequate design of all forms. However, forms, which in the opinion of the Engineer are unsafe or inadequate in any respect may at any time be condemned forms from the work and replace them at his own expense. A sufficient number of forms of each kind shall be provided to permit the required rate of progress to be maintained. Whenever, in the opinion of the Engineer, additional forms are necessary to maintain the progress schedule such additional forms shall be provided by the Contractor at his own expense. The design and inspection of the concrete forms, false work, and shoring shall comply with applicable safety regulations and as may be specified in the General Conditions of the Specification.

b. Materials

Except as otherwise expressly approved by the Engineer, all lumber brought at the job site for use as forms, shoring, or bracing shall be new material.

All forms shall be smooth surface forms and shall be of the following materials:

Walls	-steel or plywood panels
Columns	-steel, plywood or surface lumber
Roof	- plywood
All other work	-steel panels, plywood or surface lumber

Plywood shall be manufactured especially for concrete is deposited. Hand holes shall be provided in column forms at lowest points to render this spaces accessible for cleaning.

c. Columns forms hall be checked for plumpness before concrete is deposited. Hand holes shall be provided in column forms at lowest points of pour lifts to render this space accessible for cleaning.

d. All girder, beam and slab centerlines shall be crowned at least 6.3mm (1/4 in) in all directions for every 4.57 meters (15. Ft) span. However, cambers from all cantilevers shall be indicated on the plans or obtained from the Engineer by the Contractor.

e. The following are the tolerance limits for formwork:

1. Variation from plumb.

In lines and surfaces of columns, piers, walls and risers:

In 3.05 m (10 ft)	6.3 mm (1/4 in.)
6.10 m (20 ft) max	9.5 mm (3/8 in.)
12.20 m (40 ft)	19.0 mm (3/4 in.)
Or more	

For exposed corner columns and /or piers, control joint grooves and other conspicuous

Lines.

In any bay 6.10 m	6.3 mm (1/4 in)
(20 ft) max	
in 12.20 m (40 ft or more)	13.0 mm (1/2 in)

2. Variations in cross sectional dimensions of columns and piers. Beams, and thickness of walls and slabs:

Minus	6.3 mm (1/4 in)
Plus	13.0 mm (1/2)

3. Footings

Variation in dimensions on drawings

Misplacement of eccentricity, two percent (2%) of the footings width in the directions of misplacement but not exceed 50.0 mm (2 in.)

Reduction in thickness five percent (5%) at specified Thickness

4. Variation in steps:

a. In a flight of steps

Rise	3.2 mm (1/8 in.)
Tread	6.3 mm (1/4 in.)

b. In consecutive steps

Rise	1.6 mm (1/8 in.)
Tread	3.2 mm (1/4 in.)

When required for another work, or when requested by the Owner or his Engineer, the Contractor shall remove or relocate shoring; but existing shoring shall not be disturbed until new shore are set in position.

f. Design

1. All forms shall be true in every respected to the required shape and size, shall be of sufficient strength and rigidity to maintain their position and shape under the loads and operations incident to placing and vibrating the concrete Suitable and effective means shall be provided on all forms for holding adjacent edges and ends of panels and sections tightly together and in accurate alignment so as to prevent the formation of ridges, fins, or offsets, or similar surfaces defects in the finished concrete . plywood, 16,0 mm (5/8 in.) and greater in thickness, may be fastened directly to studding if the studs are close enough to prevent visible deflection marks in concrete. The forms

shall be tight so as to prevented the loss of water, cement and fines during the placing and vibrating of the concrete. Adequate clean-out holes shall be provided at the bottom of each lift of forms. The size, number and location of such clean outs shall be subject to the approval of the Engineer.

2. Concrete construction joints will not be permitted on locations other than those shown or specified excepts as may be approved by the Engineer. When a second lift is placed on hardened concrete, especial precaution shall be taken in the way of the number, location and tightening of ties at the top of the old lift and bottom of the new to prevent any unsatisfactory effect whatsoever on the concrete. Pipe stubs and anchor bolts shall be set in the form where required.

3. Unless otherwise shown exterior corners in concrete members shall provide with 19.0 mm (¾ in) chamfers. Re –entrant corners in concrete members shall not have fillets unless otherwise shown.

4. Reservoir forms and false work supporting the roof slab shall be designed for a minimum additional live load or 0.96 Kpa (20 psf)

g. Form Ties

Form ties with integral water stops shall be provided with a cork or other suitable means for forming a conical hole to insure that the form – tie may be broken off the back of the face of the concrete. The maximum diameter or removable cones for rod ties or of other removable form tie fasteners from the end s of snap – ties or form –ties shall be reamed with suitable toothed reamers so as to leave surfaces of the holes clean and rough before being filled with mortars provided in Section 5.5.10. Wire ties for holding forms will not be permitted. No form tying device or part thereof, other than metal shall be left embedded in the concrete, nor shall any tie be removed in such manner as to leave a hole extending through the interior of the concrete upon form stripping of tie removal will not be permitted. If steel panel forms are used, rubber grommets shall be provided where the ties pass through the form in orders to prevent loss of cement paste. Where metal rods extending through the concrete are used to support or to strengthen forms the rod shall remain embedded and shall terminate not less than 25 mm (1 in.) remain embedded ad shall terminate not less than 25 mm (1. In) back from the formed faces or faces of the concrete. Form or metal rods left embedded in concrete of water retaining tanks shall be equipped with an integral metal water stop of not less than 38 mm (1 ½ in.) in diameter.

h. Vertical Surfaces

All vertical surfaces of concrete members shall be formed, except where placement of the concrete against the ground is called for in the drawing or explicitly authorized by the Engineer. Not less than 25 mm (1 in.) of concrete shall be added to the thickness of the concrete member as shown where concrete is permitted to be placed against trimmed ground in lieu of forms. Such permission will be granted only for member of comparatively limited height and where the character of the ground is such that it can be trimmed to the required lines and will stand securely without caving or sloughing until the concrete has been placed.

i. Maintenance of Forms

Forms shall be maintained at all times in good condition particularly as to size, shape, strength, rigidity, tightness, and smoothness of surface. Forms, when in place, shall conform to the established alignment and grades. Before concrete is placed, the forms shall be thoroughly cleaned. The forms surfaces shall be treated with non-staining mineral oil or other lubricant approved by the Engineer. Any excess lubricant shall be satisfactorily removed before placing the concrete. In addition, all forms shall be given a preliminary oil treatment by the manufacturer or shall be oil by the Contractor at least two (2) weeks in advance of their use. Care shall be exercised to keep oil off the surfaces of steel reinforcement and other metal items to be embodied in the concrete. Forms may reuse if in good condition and if required whenever necessary in the opinion of the Engineer to obtain uniform surface texture on all exposed concrete surfaces. Exposed concrete surfaces are defined as surfaces,

which are permanently exposed to view. In the case of forms for the inside wall surfaces or hydraulic structures, unused tie rod holes shall be covered with metal caps or shall be filled by other methods approved by the Engineer.

j. Removal of Forms

Directions of the Engineer concerning the removal of forms shall be strictly followed and this work shall be done with care so as to avoid injury to the concrete. No heavy loading on green concrete will be permitted. In the case of roof slabs and above-ground floor slabs, forms shall remain in place until test cylinder for the roof concrete attain a minimum of compressive strength of 15..52 Mpa (2,250 psi provided that n forms shall be disturbed or removed under an individual panel or unit before the concrete in the adjacent panel or unit has attained a strength of 15.52 Mpa (2,250 psi) provided that no forms shall be disturbed or removed under an individual panel or unit before the concrete in the adjacent panel or unit has attained a strength of 15.52 Mpa (2,250 psi) and has been in place for a minimum of seven (7) days. The time required to establish said strength will determine by the Engineer who will make several test cylinders for the purpose from concrete used in the first group of root panels placed. If the time so determined is more than the seven-day minimum, then it shall be used as the minimum length of time. Forms for all vertical walls and columns shall remain in place at least three (3) days after the concrete has been placed. Forms for all parts of the work not specifically mentioned herein shall remain in place for periods of times as ordered by the Engineer.

3.14 Expansion of Joints

a. General

Expansion joints shall be provided where shown on the Drawings Special care shall be used to prepare concrete surfaces at joints where bonding between the two sections of concrete is required. Unless otherwise indicated on the Drawings, such bonding will be required at all horizontal joints in walls. Surfaces shall be prepared in accordance with Section 5.1.10. Except where otherwise shown or specified, at all joints where water stops are required, the joint face of the first pour shall be coated with an approved bond breaker applied in accordance with the recommendations of the manufacturer. It shall contain a coloring agent so that areas of applications will be readily distinguishable for a six-month period in sunlight. The surfaces of the grove for the sealant shall not be coated. Concrete next to water stops shall be placed in accordance with subsection 5.16(b)

b. Construction of Joint Sealant

Where shown, construction joints in floor slabs shall be provided with tapered grooves, which shall be filled with a construction joint sealant. The material used for forming the tapered grooves shall be left in the grooves, which shall be filled with a construction joint sealant. The material used for forming the tapered grooves shall be left in the grooves, all laitance and fins shall be removed, and the grooves shall be sandblasted. The grooves shall be blown out: immediately thereafter, they shall be primed and filled with the construction joint sealant. The primer used shall be supplied by the same manufacturer supplying the sealant. No sealant will be permitted to be used without a primer. Care shall be used to completely fill the sealant grooves. Areas designated to receive a sealant fillet shall be thoroughly cleaned, as outlined for tapered grooves, prior to application of the sealant. The sealant shall be polyurethane polymer design for bonding to concrete, which is continuously submerged in water. No material will be acceptable which has an unsatisfactory history as to bond or durability when used in the joints of hydraulic structures. Prior to ordering the sealant material, the Contractor shall be submitting to the Engineer for approval sufficient data to show general compliance with the specification requirements

3.15 Order of placing Concrete

a. The order of placing concrete in all parts of the work shall be subject to the approval of the engineer. In order to minimize the effects of shrinkage, the concrete shall be placed in units as bounded by construction joints shown on the drawings. The placing of units shall be done by placing alternate units in a manner such that each unit

placed shall have cured at least seven (7) days before the contiguous unit the wall footings have cured at least fourteen (14) days, and the corner sections of vertical walls shall not be placed until all the adjacent wall panels have cured at least fourteen (14) days.

b. The surface of the concrete shall be level whenever a run of concrete is stopped. To insure a level, straight joint on the exposed surface of walls, a wood strip at least 19.0 mm (0.75-in) thick shall be tacked to the forms on these surfaces. The concrete shall be carried about 13.0 mm (0.50-in.) above the underside of the strip. About one hour after the concrete is placed, the strip shall be removed and any irregularities in the edge formed by the strip shall be leveled with a trowel and all laitance shall be removed.

3.16 Tamping and Vibrating

a. As concrete is placed in the forms or in excavations, it shall be throughout the entire depth of the layer which is being consolidated, into a dense, homogenous mass, filling all corners and angles, thoroughly embedding the reinforcement, eliminating rock pocket, and bringing only a slight excess of water to the exposed surface of concrete during placement.

b. Care shall be used in placing concrete around waterstops. The concrete shall be carefully worked by rodding and vibrating to make sure that all air and rock pockets, and bringing only a slight excess of water to the exposed surface of concrete during placement.

c. Concrete in walls shall be internally vibrated and at the same time rammed, stirred, or worked with suitable appliances, tampering bars, shovels, or forked tools until it completely fills the forms or excavations and closes snugly against all surfaces. Subsequent layers of concrete shall not be placed until the layers previously placed have been worked thoroughly as specified. Except in special cases where their use is deemed impracticable by the Engineer, the Contractor shall not use internally vibrated, high speed power vibrations not less than 8000rpm of an approved immersion type in sufficient members, with standby units as (15 minutes after concrete of the prescribed consistency is placed in the forms. The vibrating head shall be kept b keep from contact with the surfaces of the forms. Care shall be taken not to vibrate concrete excessively or to work it any manner that causes segregations of its face.

3.17 Curing and Waterproofing

a. General

All concrete shall be cured for not less than fourteen (14) days after placing, in accordance with the methods specified herein for the different parts of the work, and described in detail in the following subsections.

Surface to be cured or waterproofed	Method
Unstripped wooden forms	1
Construction joints between footing and walls, and floor slabs and columns	2
Encasement concrete and Thrust blocks	3
All concrete surfaces not specifically provided for elsewhere In this subsection	4
Floor slabs in hydraulic structure and exterior surfaces of	

Exposed roof slabs	5
Exterior buried surfaces of walls	6

b. Method 1

Wooden forms shall be wetted immediately after concrete has been poured and shall be kept wet with water until removed. If forms are removed within fourteen (14) days of placing the concrete, curing shall be continued in accordance with the applicable method for the particular structure as set out in Method 2,4,5 and 6 below.

c. Method 2

The surface shall be covered with burlap mats which shall be kept wet with water for the duration of the curing period, until the concrete in the walls has been placed. No curing compound shall be applied to surfaces cured under method 2.

d. Method 3

The Surface shall be covered with moist earth, not less than four (4) hours or more than twenty – four (24) hours, after the concrete is placed.

e. Method 4

1. The surface shall be sprayed with a liquid curing compound which will not affect the bond or paint to the concrete surfaces. It shall be applied in accordance with the manufacturer's instruction at a maximum coverage rate of 4.91 m2/L (200 ft2 gal) in such a manner as to cover the surface with a uniform film, which will seal thoroughly.

2. Where the curing compound method is used, care shall be exercised to avoid damage to the seal during the curing period. Should the seal be damaged or broken before the expiration of the curing period the break shall be repaired immediately by the application of additional curing compound over the damaged portion.

3. Whenever curing compound may have applied by mistake to surface against which concrete, subsequently is to be placed and to which it is to adhere, said compound shall be entirely removed by sandblasting prior to the placing of new concrete.

4. Whenever curing compound is specified, it shall be applied within two (2) hours after completion of the finish or unformed surfaces, and within two (2) hours after removal of forms on surfaces. Repairs required to be made to formed surfaces shall be made within the said two (2) hour period provided, however, that any such repairs which cannot be made within the said 2- hour period shall be delayed until after the curing compound has been applied. When repairs are to made to an area on which curing compound has been applied, the area involve shall first be sandblasted to remove the curing compound, following which repairs shall be made as provided under Section 5.5.11.

f. Method 5

Immediately after the concrete has been trowel, it shall be given a coat of curing compound in accordance with subsection (e) herein. Not less than one (1) hour more than four (4) hours after the coat of curing compound has been applied, the surface shall be wetted with water delivered through a fog nozzle and concrete curing blankets shall be place on the slabs. The curing blankets shall consist of one of the following two types.

1. Sheets of heavy, waterproof sisal craft paper laid with edges butted together with the joints between strips sealed with 50 mm (2-in.)

wide strips of sealing tape or with the edges lapped not less than 76 mm (3-in.) and fastened together with a waterproof cement to form a continuous watertight joint.

2. Sheets of clear polyethylene having a thickness of not less than six (6) mils laid with edges butted together and with the joints between sheets sealed with 25 mm (1 in.) wide strips of acetate tape.

The curing blankets shall be left in place during the 14-day during and shall not be removed until after concrete for adjacent work has been placed. Should the curing blankets become torn or otherwise ineffective, the Contractor shall repair damaged sections? During the first seven (7) days of the curing period, no traffic of any materials shall be permitted on the curing blankets. During the remainder of the curing period, foot traffic and temporary depositing of materials the impose light pressure will be permitted only on top of plywood sheets 16 mm (5/8 in.) minimum thickness laid over the curing blanket.

g. Method 6

1. The surface shall be sprayed with a waterproofing agent consisting of an asphalt emulsion immediately after the wall forms have been removed. Applications shall be in two coats. The First coat shall be diluted to ½ strength by the addition of water and shall be sprayed on so as to provide maximum coverage rate of 2.45 m2/L (100 ft2/gal of diluted solution. The second coat shall consist of an application of the specified material undiluted, and shall be sprayed on so as to provide a maximum coverage rate of 2.45 m2/L (100 ft2/gal).

2. As soon as the asphalt emulsion applied in accordance with Subsection 5.5.17 (g) (1), has taken an initial set, the entire are thus coated shall be coated with whitewash. Any formula for mixing the whitewash may be used which produces a uniformly coated white surface and which so remains until placing of the backfill.

Should the whitewash fail to remain on the surface until backfill is placed, the Contractor shall apply additional whitewash as ordered by the Engineer.

3.18 Care and Repair of Concrete

The Contractor shall protect all concrete against injury or damage from excessive heat, lack of moisture, overstress or any other cause until final acceptance by the Owner. Particularly care shall be taken to prevent drying of concrete and to avoid roughening or otherwise damaging the surface. Any concrete found to be damaged or which have been originally defective, or which becomes defective at any time prior to the final acceptance of the complete work, or which departs from the established line or grade, or which for any other reason does not conform with the Specification, shall be satisfactorily repaired or removed and replaced with acceptance concrete all the Contractor's expense.

4. METAL WORKS

4.1 General

a. The Contractor shall furnish, fabricate, and install all steel and miscellaneous metal works as specified herein and as shown in the drawing. Miscellaneous metal works as specified herein and as show in the drawing. Miscellaneous metalwork is defined as all items required to be fabricated from structural steel shapes, plates, bars and their products. He shall provide the necessary labor, supervision, tools, materials, supplies, and appurtenances for the proper construction and operation of the elevated steel reservoir. The Contractor shall accomplish the work in a complete and finished

manner and insure the highest quality of workmanship in accordance with the drawing and specifications and to the satisfaction of the Engineer.

b. Structural steel straps, plates, bars and their products shall conform to the" Standard Specifications for Structural Steel" (ASTM Designation A36).

c. Unless otherwise shown, all miscellaneous metalwork of fabricated steel shall be galvanized after fabrication in accordance with Section 5.6.3. Unless otherwise indicated stainless steel metal works shall be of Type 18-8 stainless steel. Items fabricated stainless steel shall not be galvanized.

d. All materials to be used shall be new, previously unused, and in first class condition. Steel materials of unidentified analysis may be used provided they are tested and properly certified by a qualified testing laboratory,

e. Painting of all steel metalwork, unless otherwise specified shall be in accordance with Division 27, "Painting and Coating".

f. Testing and disinfecting shall be undertaken as specified in Division 25, "Pressure and Leakage Testing and Disinfecting".

g. Shop drawing for all steel and miscellaneous metalwork shall be submitted to the Engineer for review in accordance with Section 1.3.1 "Shop Drawings".

h. The work and equipment to be provided by the Contractor under this Contract shall conform to the U.S Standards as mentioned in the following articles or to any International Standards of equal value.

i. Welding terms used in this specification shall be interpreted according to the definition given in A W S A3.0.

4.2 Materials

a. Structural Shapes for use shall be produced by the open-hearth, basic oxygen, or electric-furnace process. Open or non-tubular structural shapes shall conform to ASTM A36. When structural shapes are fabricated from steel plates, the plates shall conform to item (b).

b. Plates

Plates material shall be open-hearth, electric- furnace, or basic oxygen process steel conforming to the latest revision of any of the following applicable ASTM specification: A36;

Grade A and B; A283, Grade A, B, C and D; or A573, Grade 58.

c. Anchor Bolts, Rods and Reinforcing Steel

1. The Contractor shall furnish and set all bolts, anchor bolts, rods, and reinforcing steel. Except where otherwise shown or specified all bolt, anchor bolts, washers and nuts shall be steel, galvanized after fabrication in accordance with Section 5.6.2.

2. Except as otherwise provided herein, steel for bolts, anchor bolts, and ca screws shall be in accordance with "Specifications for low Carbon Steel Externally and Internally Threaded Standard Fasteners," Grade B (ASTM Designation A307), or "Specifications for Carbon Steel Bars Subject to Mechanical Property Requirements" (ASTM Designation A306) or threaded parts of ASTM A36 and shall be free cutting steel, and (2) the nuts shall be capable of developing the full strength of the bolts and cap screws shall have hexagons heads, and nuts shall be heavy Hexagons Series.

3. Threads of galvanized bolts and nuts shall be formed with suitable taps and dies such that they retain the normal clearance after-hot dip galvanizing.

4. Unless otherwise shown, all bolts, anchor bolts, and nuts which are buried, submerged, or inside a covered hydraulic structure shall be Hot-Dip galvanized as per TS-20 and then coated with two coats of coal tar epoxy after installations.

4.3 Galvanizing

All structural steel plates, shapes, bars, ad fabricated assemblies required to be galvanized shall, after the steel has been thoroughly cleaned of rust and scale, be galvanized in accordance with the "Specification for Zinc (Hot- Galvanized) Coatings on products Fabricated from Rolled, Pressed and Forged Steel Shapes, Plates, Bars and Strip" (ASTM A123). Any galvanized part that becomes warped during the galvanizing operation shall be straightened. Bolts, anchor bolts, nuts and similar threaded fastener, after being properly cleaned, shall be galvanized in accordance with the "Specifications for Zinc Coating (Hot –Dip) on Iron and Steel Hardware" (ASTM A153). Field repairs to galvanizing shall be made using "Galvano", Galvo-Weld", or approved equal.

4**.4 Shop Fabrication – Steel Works**

a. General

All work required of the Contractor shall be of the highest quality workmanship. Laying out of shop-fabricated material shall be done only by experienced workmen.

b. Straightening

Any required straightening of materials shall be done by methods that will not harm the steel materials. Minor cold straightening may be performed by hammering or preferably by rolling or pressing. Heat may be used in straightening for more sever deformations.

c. Finish of Plate Edges – Welded Work

The plate edges to be welded may be universal mill edges or they may be prepared by shearing, machining, chipping, or by mechanically guided oxygen or plasma are cutting. Edges of irregular contour may be prepared by manually guided oxygen or plasma are cutting.

1. Oxygen or plasma are cutting. When edges of plates are oxygen or plasma cut, the surface obtained shall be uniform and smooth and shall be cleared of slag accumulation before welding. All cutting shall follow closely the lines prescribed.

2. Shearing. Shearing may be used for material 13 mm (½ in.) or less in thickness to be joined by butt joints, and for all thickness of materials permitted to joined by lap joints.

d. Shipping/Transportation

All materials shall be loaded, transported to the site, unloaded and store in such a manner as to prevent damage.

4.5 Welding

a. General

All welding shall be the shielded are method and shall conform to the AWS "Code for Are and Gas Welding in Building Construction". Qualification of welders shall be in accordance with the specifications for Standard Qualification Procedure of the AWS.

b. Butt joints

1. All welding in Butt joints shall be complete joint penetration welds, which may be double welded from both sides or welded from one side only using a backing strip or equivalent means to ensure complete joint penetration

welds. Butt joints mat be used for all thickness permitted to be welded under this specification.

2. Butt joints may be used for welding all thickness of material permitted to be welded under this specification.

c. Lap joints

1. Shall have continuous full fillet welds on both edges of the joints. The maximum thickness permitted for this type shall be 12mm (½ in.)

2. In any case, welded lap joints, except when shown on the plans, shall be lapped not less than five times the nominal thickness of the thinner plate joined (5t); but in the double-welded lap joints, the lap need not exceed 50 mm (2 in.), and in single-welded lap joints, the lap need not exceed 25 mm (1 in.)

d. Minimum Size of Fillet and Seal Welds

1. Fillet Welds: Plates 5 mm (3/16 in.) and less in thickness shall have full fillet welds. Plates more than 5 mm (3/16 in.) thick shall have welds of a size not less than one-third the thickness of the thinner plate at the joint, with a minimum of 5 mm (3/16 in.).

2. Seal Welds: Seal welding, when desired, shall be accomplished by a continuous weld combing the functions of sealing and strength, changing section only as the required strength may necessitate.

e. Minimum Length of Welds

The minimum length of any weld shall be four times the size but not less than 38 mm (1- ½ in.), or else the size of the weld shall be considered not exceed one- fourth of its length.

The effective length of a fillet weld shall not include the length of the tapered ends. A deduction of at least 6.35 mm (¼ in.) shall be made from the overall length as an allowance for tapered ends.

f. Safety in Welding and Cutting

Operations involving welding cutting, brazing, or allied processes shall conform with ANSI Z49.1 for the protection of welders, welding operation, and nearby personnel.

g. Safe Usage of Cutting and Welding Processes

Procedures shall conform with ANSI Z49.1 (NFPA 51b) for the prevention of fire and property damage.

5. FINISHING / ARCHITECTURAL

5..1 Finishing Concrete Surfaces

a. All finished or formed surfaces shall conform accurately with the shape, alignment, grades and sections as indicated on the plans or as prescribe by the Engineer. Surfaces shall be free from fins, bulges, ridges, offsets, honey combing or roughness of a kind and shall present a finished, smooth continuous hard surface.

b. Except ass otherwise provided herein, unformed top surfaces of the concrete shall be brought to uniform surfaces and worked with suitable tools to a reasonably smooth

wood float finish. Excessive floating of surfaces while the concrete is plastic will not be permitted. All surfaces shall be placed monolithically with the base slab. Dusting of dry cement and sand on the concrete surface to absorb excessive moisture will be permitted. Floor slabs and exposed tops of walls and curbs shall be given a steel trowel finish. All the Contractor's option, the abovementioned floor slabs may be finished with a power float after screed in. Subsequent to aforementioned finish, all sloping surfaces of floor slabs shall be lightly broom to provide a skid-resistant surface.

5..2 Treatment of Surface Defects

a. As soon as forms are removed, all exposed surface shall be rubbed or ground in a satisfactory manner in order to secure a smooth, uniform, and continuous surface. Plastering or coating of surface to be smoothed will not be permitted. No repairs shall be made until after inspection by the Engineer, and then only strict accordance with his directions. Concrete containing void, holes, honeycombing, or similar depression defects shall be completely removed and replaced; provided that where required or approved by the Engineer, defects shall be repaired with group or with cement case will extensive patching of honeycombed concrete be permitted. All repairs and replacements herein specified shall be promptly executed by the Contractor at his own expense.

b. Defective surfaces to be repaired as specified in Subsection (a) hereon shall be cut back from true line to a minimum depth of 13.0 mm (½ in.) over the entire area. Feathered edges shall be avoided. Where chipping or cutting tools are not required in order to deepen the area properly, the surface be prepared for bonding by the removal of all laitance of soft material, and not less than 0.79 mm (½ in.) depth of the surface film from all hard portions, ny ,eams of an efficient sandblast. After cutting and sandblasting, the surface shall be wetted sufficiently in advance of shooting with gaunt or with cement mortar so that while the repair material is being applied, the surfaces under repair will remain moist, but not so wet as to overcome the suction upon which a good bond depends. The material used for repair purposes shall consist of mixture of one (1) bag of cement to 0.08 m3 3 $ft3$ of sand. For exposed walls, the cement shall contain such a proportion of white Portland cement as is required to make the color or the patch match the color of the surrounding concrete.

c. Holes by tie – rod cones shall be reamed with suitable toothed reamers so as to leave the surfaces of the holes clean and rough. These holes then shall be repaired in an approved manner with dry packed mortar. Holes left by form-typing devices having a rectangular cross-section and other imperfections having a depth greater than their least surface dimension, shall not be reamed but shall be repaired in an approved manner with dry – packed mortar.

d. All repairs shall be built up and shaped in a manner that the completed work will conform with the requirements of Section 21.29 using approved methods which will not disturb the bond, cause sagging, or horizontal fractures. Surfaces of said repairs shall receive the same kind and amount of curing treatment as required for concrete in the repaired section.

e. Prior to filling any structure with water, any cracks that may have developed shall be "vee'd" as shown on the drawings and filled with sealant conforming with the requirements of Subsection 14.13 (b).

5..3 Architectural Finish

All prominently exposed exterior, vertical, aboveground concrete surfaces shall be given an architectural finish as follows:

Immediately after the forms are stripped, the concrete surface shall be inspected and any poor joints, void, rock pockets, or other defective areas shall be repaired and all form tie fastener holes filled as required in Section 21.20. After the concrete has been cured for at least fourteen (12) days, wet the surface and apply with a brush a grout made by mixing one (1) part Portland cement and one (1) part of fine sand that will pass a NO. 16 sieve with sufficient water to give it the consistency of thick paint. The cement used in said grout shall be one-half white Portland cement, or as directed by the Engineer. Calcium Chloride in the amount of five percent (5%) by

volume of the cement shall be used in the brush coat. The freshly applied grout shall be vigorously rubbed into the concrete surface with a wood float filling all small air holes. The surface shall then be kept moist for an hour or more, depending on the weather, until the grout hardens sufficiently so that it can be scraped from the surface with the edge of a steel trowel without disturbing grout in the air holes. After all the surface grout has been removed with steel trowel, the surface shall be allowed to dry and, when dry, shall be vigorously rubbed with burla to removed completely all surface, fout so that there is no visible paint like files of gour on the concrete. The entire cleaning operation for any area must be completed the day it is started, and no grout shall be left on the surface overnight. Cleaning operations for any given day shall be terminated at panel joints. It is essential that the various operations be carefully timed to secure the desired effect, which is a light – colored concrete surface of uniforms color and texture without any appearance of a paint or grout film. In the event that the improper manipulation results in an inferior finish, the Contractor shall rub such inferior areas with carborundum bricks as directed by the Engineer. Before beginning any of satisfactory manner an area of at least 18.6 m2 (200 ft2) in some inconspicuous place selected until the completion of the job. All the sample in texture, color and quality. It shall be the Contractor's responsibility to maintain and protect the concrete finish.

6. MASONRY WORKS

6.1 Scope of Works

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

6.2 General Requirements

Concrete masonry unit work of the type indicated shall be provided and shall be properly coordinated with the work of other trades. The source of supply of materials of materials, which will affect the appearance of the finished work shall not be changed after the work has started.

6.3 Materials

a. Concrete hollow blocks shall be standard machine vibrated and shall have fine and even texture and well-defined edges. Units shall be non-load bearing and shall conform with requirements of ASTM Specification C-129, with minimum compressive strength 2.45 Mpa (350 psi) (average of 5 specimens. Samples shall be submitted to the Engineer for approval.

b. Mortar and Grout. Mortar shall consist of one (1) part Portland cement, one-fourth (¼) part lime putty, and three (3) part mortar sand. Grout shall be of the same materials and proportions as mortar to which additional water shall be added to produce a consistency for pouring without segregation of the constituents. In concrete block wall constructions, a portion of the sand may be replaced with pea gravel up to not more than two (2) parts by volume of the cement used. Such pea gravel shall be graded with not more than five percent (5%) passing the No. 8 sieve and with 100 percent (100%) passing the 3/8-inch sieve.

c. Cast-in place concrete lintels or beams shall be made from concrete having a minimum 28-day compressive strength of 20.68 Mpa (3000 psi) and in compliance with Division 21 – Concrete Works.

d. Reinforcing steel bars shall conform with Division 21- Concrete Works

e. 25mm ø of Backer Rod & Silicon Sealants.

6.4 Laying Concrete Masonry Units

a. Workmanship

Units shall be set plumb and true to line with level horizontal joints. Hollow units shall be laid with full mortar coverage on horizontal and vertical face shells, and at least 50% of the cells shall be filled with grout the cells containing vertical reinforcements to be among those to be filled up. Solid units shall be laid with ful head and bed joints. Joints shall be uniform and approximately 10 mm wide unless otherwise indicated.

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

b. Setting Embedded Items

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

c. Masonry Lintels

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

d. Placing Reinforcing Bars and Grouting

All reinforcing steel, except dowels in concrete, shall be accurately set in strict accordance with the Drawings and the notes thereon. Vertical steel shall be secured firmly in place by means of frames or other suitable devices. Horizontal steel may be placed as the work progresses. In any core containing reinforcement, the distance between any masonry and the reinforcement shall be at least 12.7 mm (½ “) at all points. The masonry contractor shall furnish all tile, spacers and supports required to hold steel in position during grouting. Cores shall be grouted in lifts not exceeding 1.22 m (4’-0’) in height. Grout shall be thoroughly rodded. Splices in reinforcing bars shall be lapped at a distance sufficient to develop the stress in the bar, but not less than 40 bar diameter

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

e. Protection and Cleaning

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

f. Installation of Backer Rod (For Electrical Post)

For seismic purposes, to prevent cracking of fence walls due to sagging of electric wire.

7. CARPENTRY WORKS

7.1 Scope of Works

The work includes all equipment, tools, appliances, labor and materials together with the supervision necessary and incidental to performing all carpentry and joinery works required and/or herein specified.

7.2 General Requirements

a. Lumber Grades

Lumber shall be of the best grade available of the respective kinds required for the various parts of the work, well-seasoned, thoroughly dry and free from loose or unsound knots cupshakes or other imperfections impairing its strengths, durability and appearance. All exposed surfaces shall be smooth unless otherwise indicated or specified.

b. Substitution of Lumber

Any lumber equality good for the purpose intended may be substituted for the kind specified upon prior written approval of the Engineer, However, a reduction of the Contract price equal to the difference in costs of the kinds of lumber shall be made. Manila market prices shall be the basis of sale in reduction of price.

c. Delivery and Storage

The Contractor shall deliver materials to the site in undamaged condition. Lumber shall be stacked in such a manner as to ensure proper ventilation and drainage, and shall be supported at least 150 mm above ground. Lumber shall be protected against dampness before and after delivery, and enough protection shall be provided to prevent damage from the weather. Lumber shall be stored under cover in well-ventilated enclosure, not exposed to extreme changes of temperature and humidity; and in a manner as to provide air circulation around all surfaces of each pile to insure thorough air seasoning. Lumber or millwork in building shall not be finished until concrete, masonry work, and plaster are dry. Lumber shall be delivered at least thirty (30) days before use.

d. Grading of Plywood

Each sheet of plywood shall bear the mark identifying the plywood as to wood species, glue type and grade.

7.3 Materials

a. Lumber

Lumber for various uses shall be one of the species listed for the purpose indicated unless otherwise indicated on the Drawings. For any use not specified, the lumber shall be the best commercial grade normally used for the purpose, subject to the approval of the Engineer.

b. Plywood

Shall conform with Commercial Standard PSI, and shall be of Local manufacture.

c. Nails

Shall be of the smooth shank, zinc-coated, common wire nails of local manufacture, and of types and sizes suited for the purpose.

d. Wood Screws

Shall be brass or cadmium plated, of the best available commercial quality, and of types and sizes best suited for the purpose.

7.4 Rough Carpentry

a. All work shall be well-fitted, accurately set, and rigidly secured in place. Anchors and bolts (with nuts and washers), straps and tie rods shall be provided as required.

b. Cutting and fitting to accommodate other work shall be done as required an in a neat workmanlike manner; and cut or damaged work shall be patched and made good.

c. Framing and structural lumber shall be well-seasoned straight, square-edged stacks and free from loose or unsound knots, bark edges or other defects that will impair its strength.

d. Plates for walls and partitions shall be of the same width as the studs and shall form continuous horizontal ties.

e. Truss members and other roof framing members (if required) shall be assembled, fitted and set to the exact slopes indicated on the Drawing. Tops of trusses and purlins shall form a true plane structural members shall not be cut, bored or notched for the passage of pipes or conduits without approval.

All members damaged by such cutting or boring shall be reinforced by means of specially formed and approved sheet metal or steel shapes, or removed and replaced with a new member as directed.

f. Anchors, connectors and fastening not indicated or specified otherwise shall be of the types and sizes necessary to suit the conditions encountered. Size, type and spacing of nails, screws or bots for installation of manufactured building materials shall be as recommended by the product manufacturer unless indicated r specified otherwise. Rough hardware, exposed to weather or in or in contact with exterior walls or masonry or slabs, shall be zinc coated except as specified otherwise.

g. All lumber surfaces in contact with concrete or masonry shall be given a brush coat of bituminous paint before installation.

7.5 Joinery Work

a. All number used for joinery work shall be of the kinds and grades specified and shall be of the contours, patterns and profiles indicated.

b. All joints shall be made in an approved manner, installed tight and securely fastened. Exterior joints shall be mitered and interior angles coped. Panels shall be fitted to allow for shrinkage, avoid swelling, and insure that the work remains in place without warping, splitting and opening of joints.

c. Interior trims shall be of approved standard stock moldings, except where special patterns or profile are indicated.

d. Joints for cabinetwork shall be glued aside from nails or other fastening device required. Nailing shall be concealed where practicable. Where face nailing shall be set for putty stopping.

e. All exposed surfaces shall be machine or hand sanded to an even smooth surface ready for finish. No Hammer marks or other unsightly marks shall be allowed on any wood panel or veener.

8. DOOR-WINDOW-GLAZING

8.1 Scope of Work

The work includes all labor, materials, tools and equipment necessary to furnish and install doors, windows and glazing as required and as specified herein. Doors, windows and glazing shall be products of reputable nationally known manufacturers approved by the Engineer.

8.2 General Requirements

a. Doors and Windows

Door and Windows shall be factory- fabricated units of the types and sizes shall be in accordance with the drawing and shall be of the quality and workmanship acceptable to the Engineer. The contractor shall guarantee the finished doors against twisting warping, cracking and other defects due to construction and installation for a period of sixty days (60) after the final acceptance of the building.

b. Locks and Keys

All locks shall have two (2) keys with the lock number stamped upon them with the corresponding number as stamped upon the face of the lock. Blank keys shall be provided for a minimum of 10% of the total number of keys.

After all locks have been installed and upon completion of the work, the keys shall, in the presence of the Engineer be shown to operate their respective locks and shall be tagged correspondingly.

b. Shop Drawings

The Contractor shall submit to the Engineer for approval shop drawings of all doors. Approval of all shop drawings shall be required before start of fabrication. Shop drawings shall be required before start of fabrication. Shop drawing shall indicate elevations of each door and window, details of each frame type, location in the building for each item, typical and special details of construction, method of assembling sections, location and installation requirements for hardware, and size, shape and thickness of materials, joints and connections.

8.3 Glazing

a. General

- The Contractor shall be responsible for the correct sizes and grades of the glass to be used. Improperly set glass or glass which does not meet the requirements as to grade and size will not be accepted. Such glass shall be replaced to the satisfaction of the Engineer at no extra cost to the owner.

- The Contractor shall submit to the Engineer for approval samples of each type of glass and other materials required under this section, together with such other evidence as he may deem necessary to establish that the materials meet the requirements of the Contract Documents.

b. Materials

- Materials to be used shall be locally manufactured as approved by the Engineer.

- Clear Window Glass – Except otherwise indicated, glaze windows with clear window glass.

- Tempered Glass Window (25mm) – Except otherwise indicated, glaze windows with clear window glass.

- Glazing compound shall be non –hardening and shall be of a type that does not require painting. The compound shall be pigmented with aluminum or bronze powder to match the metal unit without staining or discoloring.

- Mirrors in comfort rooms shall be selected ¼ “polished plate glass. Edges square not beveled and highly polished plate glass. Edges square not beveled and highly polished with silvered backs. Silver to be deposited evenly on selected quality polished plate and protected with electro- copper backing, shellac, varnish and paint in an approved standard method. Each mirror shall bear manufacturer’s label guaranteeing quality and compliance with specification and guarantee for five (5) years to be free from any defects that impair full and complete reflection or that present an unsightly appearance.

- Installation

- Glass shall be accurately fitted and carefully set without springing, using setting or spacer block in accordance with the recommendation of the glass manufacturer. Set all glass before painting. Precaution shall be made to insure a first class glazing installation in every respect. Class shall be free from edge chips, cracks or other defects and all glazing materials installed to meet approval.

- Windows shall be glazed from the outside. Glass shall be secured by metal glazing clips properly bedded in a glazing compound and secured. Sash shall then be face puttied to from a triangular fillet with neatly mitered corners. Excess compound shall be stripped off from both sides of the glass at an angle.

- All mirrors shall be provided with 3/8” chrome plated brass and frames with mirror mastic or approved adhesive or by other securement device as approved by the Engineer,

- Broken replacement. Prior to final inspection or when directed by the Engineer, any and all broken, damaged or imperfect and/or unacceptable panes of window glass and mirrors shall be removed and replaced with intended kind and quality, as specified, without cost to the Owner for either materials or labor.

- Washing and Cleaning. After all glasses have been inspected thoroughly and approved, was and clean all glazed surface inside and outside, including all mirrors, utilizing experienced windows washer and complying with all safety requirements set forth by the applicable Building and Labor Departments.

8.4 Wrought Iron Grilles

a. General

- Wrought iron grilles shall be installed at all windows.

- The Contractor shall verify all measurement in the field and submit shop drawing to the Engineer showing sizes, gauges, details of construction, method of assembly and erection. Fabrication of work shall not commence until all shop drawings are approved.

b. Materials

- Wrought iron shall conform with ASTM A-41.

- The grills are fabricated with Flat bar 2”.

- Electrodes for are welding shall conform with the E-60 series of ASTM Specification A233 latest edition.

9. WALL & FLOOR FINISHES

9.1 Scope of Work

The work includes all labor, materials, tools and equipment required for the installation of wall and floor finishes, in accordance with the Drawings and as specified herein.

9.2 Plaster

a. General

Surface to receive plaster shall be clean and free from defects. Where necessary to reduce suction, masonry surface shall be dampened but not soaked with fog spray. Regulated ventilation shall be provided. Cement plaster finish coats shall have a reasonably uniform thickness of approximately 3 mm and not less than 1.5 mm in thickness at any point. Ceilings shall be level and walls straight and plumb. Corners and interior angles shall be square and which arises slightly rounded. Thickness of plaster, base to the finished plaster surfaces, shall not be less than 20 mm over metal lath and masonry and/or, except required otherwise, shall bring plaster surfaces in line with adjacent masonry materials. Prior to the removal of scaffolding utilized in connection with installation of ceiling plastering, Contractor shall notify the Engineer of his intention to do so in order that final inspections may be accomplished while they are in place. They shall then be removed, as plastering of sidewalls shall be performed with trestle scaffolds on horses.

b. Materials

1. Plaster Exterior

Portland Cement Plate- Where indicated on Drawings and/or Schedule of Room Finishes such surfaces shall be plastered with a 2-coat Portland cement plaster finish, the finish coat being troweled to provide a fine sand float finish.

All Portland cement plaster shall be mixed one part Portland Cement, three parts sand with 4 lbs of approved waterproofing compound per cwt of cement, applied in two (2) coats to a total thickness of not less than 20 mm/ Each application shall be kept moist or damp with a fog spray for a minimum of forty-eight (48) hours between application, and last coat (finish) kept moist for seventy-two (72) hours.

Trowel to a hard, smooth finish free of waves of blemishes that would preclude a uniformly true, smooth surface both vertically and horizontally.

2. Plaster interior

Interior plaster shall follow specification noted her before for exterior plaster, with the exception that the waterproofing compound is to be omitted.

c. Laying

1. Surface Hacking

Contractor is to insure permanent bonding of cement plaster to all concrete surface required to be plastered by hacking surfaces to required degree of roughness

Note: It is important that concrete masonry required to be plastered be thoroughly soaked with water prior to the application plaster to insure satisfactory bonding.

Plastering over furring around exposed pipes surfaces, plasters, plastered jambs, recesses, drop panel screen, etc, heads of windows and doors. Plaster on walls shall be carried to floor between grounds or base screed and other fixed equipment unless indicated otherwise.

2. Cutting & Patching

As work progresses and as required by other trades for proper installation of their work and after completion of all work of this section, the Contractor shall do all patching replacement or refinishing of any defective material or surface on either exterior of building to the Engineer's satisfaction and approval.

3. Cleaning After completion of work herein, the Contractor shall have all of his scaffolding, surplus materials, rubbish and debris and clean or remove all plaster daubs and stains from all floors, windows, stairs, or finished surfaces, to the Engineers satisfaction ad approval.

9.3 Ceramic Tiles

a. General

1. All tiles shall be installed by competent tradesmen and in accordance with the best practice of the trade, finished surfaces shall be produced in the true plans, free of damage, scratches or otherwise faulty tile in all places solidly backed up and firmly secure. An all tiling work shall be laid out, so that field or pattern is exactly centered on the area to preclude the use of tiles less than full size; do any cutting along the edges of area. Joints of uniform standard width and in true alignment shall be maintained throughout; completely fill with grouting or pointing mortar and finish smooth and flush with tile. Cut and drill without marring tile, smooth cut edge with a fine stone. Fit Carefully around pipes, outlets and similar items so that cover plates or trim will cover the cut edges. Remove surplus mortar and grout from tile surfaces before these have set.

2. Samples. Duplicate samples of each color and kind of title shall be submitted to the owner for approval. All materials installed in the work shall match the approved samples.

b. Materials

1. Ceramic tile for toilet floors & walls, size 20 x 20 mm. Caps inside and outside corners, and other moldings, as required, shall be provided.

2. Ceramic tile for floor finished, size 30 x 30 mm. Caps inside and outside corners, and other moldings, as required, shall be provided

3. Acid Resistant vitrified tiles shall be used in the laboratory.

4. Portland Cement shall be standard brand per brand per ASTM C-150.

5. White cement shall be of approved brand and quality.

c. Installation

1. All tiles shall be delivered to the site in sealed containers with labels intact.

2. All tiles shall be set in full mortar bed with all joints plumb and to the indicated heights. Mortar bed for floor tilling shall be spread until the surface is level or sloped for drainage and as large an area that can be tiles shall be plumb. The back of all tiles shall be covered with mortar to make the bed full and even. All tiles shall be soaked in water for twenty-four (24) hours before laying.

3. For wall tile, spread Portland cement paste with a trowel on the backside of the tiles and set on the prepared walls, true to line and plumb.

4. Set wall tile with slight twisting motion to assure suitable contact with the walls.

5. Caulking at completion of tile work, clean cut joints between the tiles of excess adhesive and finish with cement paste.

6. Clean-up. Excess adhesive materials shall be removed from face of tile with soft cloth dampened with water or kerosene as the case may be.

9.4 Plain Finish Cement

a. General

1. Colored cement shall be delivered in cartoons, cans or kegs to the building site with the labels intact and seals unbroken, subject to inspection by the Engineer before being opened.

2. Sample. Where colored cement and colored floor hardener cement finish and surface finish are required, samples shall be submitted to the Engineer for approval. Final choice shall be his.

b. Material

Fine aggregate shall consist of sand, stone screenings or other approved inert materials with similar characteristics or a combination thereof, having clean, hard, strong, sound durable, uncoated grains, free from injurious amounts of dust, lumps, soft or flaky particles, shale, alkali, organic matter, loam or other deleterious substances.

c. Installation

The concrete sub-floor shall be cleaned an d then moistened but not soaked, after which, dry cement shall be sprinkled over the surface and the mortar spread on the setting bed. Tamp to assure a good bond over the entire area and screed to provide a smooth and level bed at proper height. Mix mortar one (1) part Portland cement to two (2) parts sand.

To finish the surface with colored cement, sprinkle enough quantity that will assure average finish with mason pallet joints. Keep free for 48 hours.

10. ROOFINGS

10.1 Scope of Work

The work includes all labor, materials, equipment, plant, and other facilities and the satisfactory performance of all works necessary to complete all Roofing and Tinnery works as shown on the Drawings and as specified herein.

The materials supplied by the Contractor on this item shall conform with US Standard or with any other International Standard of equal value.

10.2 Long Span (Rib Type) (G.I. Sheet ga. 24)

10.3 Reinforce Concrete Slab

The method of construction on this item shall be I accordance with Division - Concrete Works.

10.4 Waterproofing (Sahara Cement)

a. Application Procedure

For certain types of works like water storage tanks, reservoirs, basement walls, roofs, swimming pools, sewage units, etc. the impermeability of concrete is absolutely essential. In general, it can be stated that if concrete is made dense and free from cracks, it is watertight. The dense concrete can be obtained by closely adhering the following essentials:

1. Using a high class Portland cement of guaranteed quality.
2. Taking extreme care to adopt correct grading and proportioning of the sand, aggregate and cement.
3. Using clean and non-porous aggregate.
4. Mixing thoroughly to the right consistency using the right amount of water.
5. Placing, tamping and curing carefully.
6. Making use of suitable water-proofing compound.

The cement concrete to a certain extent may be made impermeable to the water by using hydrophobic cement. All the flat roofs in the modern age are generally constructed of R.C.C. It becomes necessary to give some treatment of waterproofing to such roofs.

b. Finishes

1. Mortar Topping

Over the entire surface thus formed, 1:6 mix neat cement mortar shall be spread with a minimum thickness of one (1) inch with expansion joints in both directions and not greater than six (6) meters on centers. Concrete mix shall be steel troweled and finished smoot. The finished surface will slope towards the roof drains.

2. Roof Drains

Roof drains shall have cast iron body, installed in locations indicated on plans. Drains shall be provided with flash clamp device for making watertight connections with waterproofing membrane, unless otherwise specified.

11. PAINTING WORKS

11.1 General

The work included in this Section consists of the furnishing of labor material, apparatus, scaffolding, and all appurtenant work in connection with painting and coating in accordance with the Schedule of Finishes, Drawings, Bill of Quantities and as directed in writing by the Engineer. Any subcontractor for painting and coating shall be approved by the Engineer.

11.2 Scope

The following surfaces are to be painted, except where otherwise specified or shown:

a. Above ground piping and other metal surface
b. All submerged metal surface
c. All exposed concrete excluding concrete reservoir
d. All structural and miscellaneous steel
e. All equipment furnished without factory finished surface
f. All exposed steel mullions, tubular frames, door frames, steel sash. And metal windows
g. All sheet metal and ferrous metal trim
h. All buildings, interior and exterior
i. All exposed concrete block masonry
j. All plain and corrugated G.I sheets

The following surfaces are not to be painted:

a. Ferrous metals having approved plating or factory applied final paint finishes

b. Non-ferrous metal, unless otherwise noted or factory indicated; galvanized metal shall not be considered a non-ferrous metal

c. Equipment with factory finished surfaced unless otherwise noted.

In no case shall any metal or any other surface requiring protection be left unpainted even though not specifically defined herein.

11.3 Protection of the Work

The Contractor shall take the necessary steps to protect the work of others during the time his work is in progress. The Contractor shall be responsible for any and all damage to the work. Paint shall be applied only during period of favorable weather.

11.4 Workmanship

All works shall be first class and in accordance with best standard practices of the trade.

The Contractor shall examine carefully all surfaces to be painted and before beginning any of his work, shall see that the work of other trades has been left or installed in workmanlike condition to receive paint.

Metal surface shall be clean, dry and free from him scale, rust, grease oil, or any other substances, which could affect the quality of the painting.

Each coat of paint shall be applied at proper consistency and brushed evenly, free of brush marks, sags, runs, and with no evidence of poor workmanship. Care shall be sharply cut to lines and finished paint surfaces shall be free from defects or blemishes.

Protective covering shall be used to protect floors, fixtures, and equipment. Care shall be exercised to prevent paint from being spattered onto surfaces, which are not be painted.

Surfaces from which such paint cannot be removed satisfactorily shall be painted or repainted, as required, to produce a finish satisfactory to the Engineer.

No painting shall be done under conditions of weather, moisture or temperature unsure to good work, nor until previous coat is hard and dry.

All painting materials shall be used in strict accordance with manufacturer's directions spread or flowed on smoothly with proper film thickness and without runs, sags, or other defects.

11.5 Storage of Materials

The Contractor shall store painting materials and equipment in a room or area provided for that purpose. The receiving and opening of all paint materials and mixing shall be done in this room.

Rags, waste, etc., soiled with paint shall be removed from the premises at the end of each day's work, or stored in metal container with metal covers. Necessary precautions shall be taken to prevent fire.

11.6 Preparation of paint

Painter container shall be delivered to the job in the manufacturer's unopened containers and shall be opened only when required for use. Paint shall be mixed only in the designated room or space in the presence of Owner's representative. Paint shall be thoroughly stirred or agitated to a uniformly smooth consistency suitable for proper application. Unless otherwise specified or approved, no materials shall be reduced, changed, or used except in accordance with manufacturer's label or tag on the container. In all cases paint shall be prepared and handled in a manner to prevent deterioration and inclusion of foreign matter.

11.7 Paint to be Provided to Owner

The Contractor shall leave on the job site a minimum of four (4) liters (1 gal) each type and color of finish paint used in the project. Each gallon shall be properly labeled for identification.

11.8 Clean up

Upon completion of his work, the Contractor shall remove all surplus materials. All paints spill from rubbish, debris, etc., caused by his work. He shall present the work clean and free from blemish so that it is acceptable in every way. All glass shall be cleaned of paint spots and polished, and the job made ready for occupancy by the Owner.

11.9 Materials

a. Material

The Contractor may substitute other paint materials for those specified in Section 5.13.12 provided he first receives written approval from the Engineer stating that said proposed substituted materials are equal to that specified and are approved for use. The painting material shall be delivered to the job site in original containers properly labeled wit out evidence of tampering substitution of content, or of deterioration. A complete list of materials proposed for use shall be submitted for the Engineer's approval.

b. Colors and Samples

All finish colors shall be as selected by the owner. In multicoated work using color pigmented paints, each coat shall have sufficient variation of color to easily distinguish it from preceding coat. Using specified or approved materials, three (3) sample panels of

each finish, including all coats thereof shall be prepared and submitted for the Owner's approval. Completed work shall match approved colors and samples.

11.10 Preparation of Surfaces

a. General

Except as otherwise specified, surface to be painted shall be clean smooth and dry. The Contractor shall report to the Engineer in writing any surface, which cannot be properly prepared for painting. If work is commenced before defects have been reported and corrected, any unsatisfactory finish shall be rectified by the Contractor at no cost to the Owner.

b. Concrete and Masonry

All concrete and masonry surface shall cure thirty (30) days prior to painting. Dirt, dust, oil, grease, efflorescence, and other deleterious to insure good paint adhesion. The method of surface preparation shall be left to the discretion of the Contractor, provided results obtained are satisfactory to the Engineer. Before application of resin emulsion paint, surfaces shall be prepared in accordance with manufacturer's directions. Before applications of oil base or latex paints, surfaces shall be tested for presence of alkali. If alkali is present, surface shall be neutralized as recommended by the manufacturer of the paint materials to be applied.

c. Plaster

Dirt, dust, loose plaster, and other deleterious matter, which would prevent good paints adhesion, shall be removed. All holes, cracks, and depressions shall be neatly filled with patching plaster mixed and applied to match the existing plaster. Patches shall be sanded flush and smooth and property sealed before applying prime coat. After priming surfaces, suction spots shall be touched up with additional prime coat material until surfaces evidence a uniform coating. Enamel undercoats on smooth plaster shall be sandpapered by hand (with No. 00 sandpaper) and dusted clean before applying the succeeding coat.

d. Metal

Dirt, scale, and rust shall be removed by scrapping, wire brushing, and sanding or sandblasting as required. Mill scales shall be completely removed from fabricated parts either in the shops or in the field. Mill scales can be removed in the shop either by cleaning or pickling. In such case, the steel must be painted before rusting or surface soiling occurs with zinc dust, phenolic primers to effect proper adhesion of the first field coat. If mill scales are removed in the field prior to welding, all welded joints should be cleared of slag and weld spatter by blasting either by nozzle or with spot blasting equipment. Where blasting is not practical, grinding, sanding, or brushing may be used provided satisfactory degree of cleaning is obtained.

Oil and grease shall be removed with mineral spirits or appropriate solvent. Before painting, ferrous metal surfaces, including galvanized ferrous metal surfaces shall be pre-treated with approved phosphoric acid etching cleaner in accordance with manufacturer's direction to produce a chemically clean surface. Unless already performed in accordance with specifications of other sections, abrasions on bare spots in shop prime coatings shall

be touched up with metal primer matching shop coatings. Enamel undercoats shall be sandpapered by hand and dusted clean before applying succeeding coats.

11.11 Application of Paint

a. General

All painting and finishing shall be performed by skilled craftsmen. Each coat of paint shall be applied at proper consistency, evenly, and free of laps, sags and runs cut sharply to required lines. Except as otherwise specified or required, paints shall be applied only under dry and dust-free conditions tat will insure properly finished surfaces, free of defects and blemishes. Paint shall not be applied when temperature is likely to be above 32°C (90°F). Sufficient time shall be allowed between coats to insure proper drying. All primer and intermediate coats shall be unscarred and completely integral at the time of the applications of each succeeding coat. The Engineer shall be notified when each coat is inspected and approved by Engineer, no succeeding coats shall be applied. Whenever two coats of dark colored paint are specified, the first coat shall contain sufficient powdered aluminum to act as indicator for proper coverage when applying the second coat.

b. Methods of Application

Except as otherwise specified or when, in the opinion of the Engineer, a particular method would produce unsatisfactory results, paint may be applied by brush, spray, or other application method at the option of the Contractor.

Before installation, all surfaces of millwork, which are to be painted, shall be primed, giving particular attention to sealing of cross-granted surfaces, in all cases, all work shall be primed as soon as possible after delivery before or after installation, as required, or, in case of prefabricated items, at fabricator's shop or mill before shipment, if practicable.

11.12 Painting System

a. Architectural Items

Surface		Type / Color
1. Exterior Finishes		
a. On concrete walls		
	1st coat	Flat Latex White / Skim Coat
	2nd coat	Elastomeric Paint (Milk/Aqua Blue/Royal Blue)
b. Unprimed Ferrous Metal		
	1st coat	Epoxy Primer (Gray)
	2nd coat	Quick Dry Enamel (Silver/Royal Blue)
2 Interior Finishes		
a. On Plaster		
	1st coat	Flat Latex White
	2nd coat	Elastomeric Paint (Milk/Aqua Blue/Royal Blue)

12. PLUMBING WORKS

12.1 Scope Work

The work shall include all materials, labor, tools and equipment and the performance of all, work, necessary for the complete execution of all plumbing woks as indicated on the Drawings. This will include the following:

a. Water distribution system and supply lines for the pump stations;

b. Building sanitary drains, waste, and venting systems, including floor drains;

c. Sewage collection and disposal system and connection to septic tank;

d. Building storm drainage system, including roof drains and junction boxes;

e. Testing for pressure and leakage of all water supply and distribution system; leakage test for drains, waste, and venting system; disinfection of the water supply and distribution system;

f. Securing and payment for all permits and licenses as require; and

g. Preparation and submittal of AS-built Drawings.

12.2 General Requirements

The Contractor shall furnish and install all plumbing fixtures and accessories indicated in the BOQ and in the Drawings complete with trimmings and fittings, unless otherwise specified under each item.

12.3 Materials

a. All fittings and trimmings for fittings shall be chromium-plated and polished brass, unless otherwise specified.

b. Generally, fixture shall have the water supply discharge above the rim, equipped with angle stops or straight stops. Stops integral with the faucets shall be furnished and installed with fixtures. Exposed traps and supply pipes for all fixtures and equipment shall be connected to the rough piping system at the wall unless otherwise specified.

c. All soil, waste, and vent pipes and fitting shall be cast iron pipes, service weight for pipes above ground and extra heavy for pipes underground, or uPVC with the specifications recommended by the manufacturer engaged in the production of such materials.

d. Downspout and Drainage Piping shall be as specified in the drawing.

e. Water Pipes and Fittings

Domestic Water Supply- galvanized iron pipe, Schedule 40 threaded connection, ASTM 120-66 and fitting shall be malleable iron (exposed location only), or PVC (Polyvinyl Chloride) pipe and fittings, ASTM- DI784, D-2241, and ASTM-D-2466; fittings shall be Schedule 40 ASTM-D 2466 (exposed or non-exposed location).

f. Cleanouts and Plugs shall be the same as the pipe and shall be easily accessible place.

g. Floor Drains shall be chrome- plated cast or forged bronze or brass fixtures.

12.4 Excavation, Trenching and Backfilling

Excavation, trenching, and backfilling for all underground pipelines shall be in accordance with Earthwork of his project's Specifications.

12.5 Installation of Soil, Waste, Drain, and Vent Piping

a. Horizontal Drainage Pipe and Vent Piping

Horizontal waste pipe 76 mm and smaller shall have a minimum grade of 20.33 mm/linear mete. All main vertical soil and waste stacks shall be extended full size above roofline as vent except where otherwise specifically indicated. Where practicable, two (2) or more vent pipes shall be connected together and extended as one pipe through the roof. Vent pipes in roof spaces shall be run as close as possible to underside of the roof, with horizontal piping pitch down to sacks without forming traps in pipes using fittings as required Vertical vent pipes may be connected to a vent line carrying other fixtures. The connection shall be at least 1.20 m above floor on which the fixture. The connection shall be at least 1.20 m above floor on which the fixture is located to prevent the use of any vent lines as waste lines. Horizontal waste lines receiving the discharge from two (2) or more fixture shall be provided with vents, unless separate venting of fixtures is noted.

b. Fittings

All changes in pipe sizes on soil waste lines shall be made with reducing fittings or recessed reducers. All changes in direction shall be made by the appropriate use of forty-five (45°) degree wyes; half wyes long sweep quarter bends, or elbows may be used in solid and waste lines where the change in direction and flow is from the horizontal to the vertical, and on the discharge from water closets. Where it becomes necessary to use short radius fittings in any other locations, the approval of the Engineer shall be obtained before they are installed.

c. Cast Iron Pipe Joints

All joints in bell and spigot cast iron soils, waste, drains and vents pipe or caulking ferrules shall be firmly packed with oakum or hemp and caulked with lead at least 25 mm deep. In lieu of lead, any other valuable joint system may be used.

d. Cleanouts

Cleanouts as the bottom of each soils stack, water stacks, interior downspout, and where else indicated, shall be the same size as the pipe up to and including 100 mm and 150 mm for larger pipes. Cleanouts on floors shall be cast iron ferrule caulked into cast hub and fitted with cast brass screws plug finish with the floor.

e. Flashing

All pipes passing through the roof shall be provided with lead flashing. All flashing shall be made watertight with 2.72 kg. sheet lead or 16-ounce sheet copper and shall extend up to the pipe and down over the top of the pipe at least 0.15 m, and along the roof not less than 0.30 m and shall lap over flashing to make a weatherproof joint.

f. Traps

Each fixture and piece of equipment requiring connection to the drainage system, except fixtures with waste shall be equipped with a trap. Traps are specified installed on threaded pipes shall have recessed drainage pattern.

g. Pipe Sleeves, Hangers, and Supports

Pipe sleeves shall be installed and properly secured in place at all points where pipes pas through masonry or concrete except unframed floor on earth. Pipes shall not be permitted to pass through footings or beams unless noted in the drawings. Pipe sleeves in the floors shall extend no less than 25 mm and not more than 50 mm above finish floor elevation. After installation of the pipe, the space around the pipe shall be packed with plastic materials and made watertight. Flashing shields for sleeves passing through water proofing membrane shall be thoroughly mopped into the membrane.

12.6 Installations of Water Pipes, Fittings, and Connections

a. General

Gate Valves shall be installed close to the point of connection to the existing service line outside the building. The piping shall be extended to all fixture outlets and equipment's from the gate valves.

Other, where indicated, shall be capped or plugged and left ready for future connections.

b. Mains, Branches and Run-outs

All runs of piping shall be installed as indicated on the plan. The piping shall be cut accurately to measurement established at the building by the Contractor and shall be worked into place without springing or forcing. Care shall be taken not to weaken the structural portions of the building. All piping above ground shall be run parallel with the lines of the building. All piping above ground shall be run parallel with the lines of the building unless otherwise be run parallel with the lines of the main or side of the main, using such cross over fittings as ma be required by structural or installation condition. All service pipes, valves, and fittings shall be kept at sufficient distance from other work to permit a finished covering not less than 12.5 mm between finished covering on the different services. No water piping shall be buried in floors or masonry walls unless approved by the Engineer. Changes in pipe sizes shall be made with reducing fittings. The use of long screw and bushing is prohibited.

c. Joints

After cutting and before threading, all pipes shall be reamed and shall have burrs removed. All screw joints shall be made with graphite and oil or with an approved graphite compound applied to male threads only. Threads shall be full cut and not more than three threads only. Unions shall be provided where required for disconnection. Threaded swing bolts shall be used for branch connection to riser and mains.

d. Valves

Valves shall be provided on all supplied fixtures. Where valves are indicated on the drawings in connection with run-outs, risers, branches, and mains, they shall be in accordance with these Specifications.

e. Union

Union, where required, shall not be concealed in walls, ceilings, or partitions.

12.7 Fastenings for Fixtures and Equipment

All fixtures and equipment shall be supported and fastened in a satisfactory manner.

a. Where secured to concrete or hallow block walls, fixtures and equipment shall be fastened with 6 mm diameter brass bolts with twenty threads to the inch, sufficient length to extend at least 76 mm into solid concrete or hallow block work. Fasteners sall be fitted with loose tubing of sleeves. Inserts shall be securely anchored and installed flush with the finished walls, and shall completely concealed when the fixtures are installed.

b. Where secured to wood partitions, fixtures and equipment shall be fastened with brass screws. Screws shall go into wood such as wood insects, floor joists, stud, or solid pieces not between studs.

c. Where through bolts are used, they shall be provided with plate3s or washers at back set so that heads, nuts and washers will be concealed by.

d. Upon completion of the work, all fixtures, trimmings, and equipment shall be thoroughly cleaned, polished, and left in the first class conditions for final acceptance.

12.8 As-Built Drawings

Upon completion and before temporary acceptance of the work, the Contractor shall be preparing and submit to the Engineer as-built drawings indicating in all details the actual as-built conditions of the work require. As-built drawings shall be prepared in reproducible originals, together with three (3) printed copies.

12.9 Tests of System

a. The cold water piping system shall be tested in the presence of the Engineer in conjunction with the pump discharged line before being put into operation. Any defect or deficiency discovered as a result of the test shall be immediately repeated until the test requirements are fully complied with. No caulking of pipe joints to remedy leaks will be permitted.

b. The entire drainage and venting system shall have necessary openings plugged and the entire system shall be filled with water to level of the highest vent stack above the roof. The system shall hold the water for 30 minutes with a drop not greater than 100 mm.

c. At the completion of the work, all part of the installation shall be thoroughly cleaned of grease metal cuttings, and sludge, which have accumulated during the testing operation.

13. ELECTRICAL WORKS

13.1 Scope of Work

The work under this division consists of furnishing all labor, materials, equipment, tools and all services necessary to complete and make ready for operation the Electrical Power and Lighting System and other signal Systems described below and/or as indicated in the Electrical Plans for the proposed Pumping Station located at Balikatan Village II, Brgy. Sampaloc, Tanay, Rizal, in accordance with the Drawings, Specifications and Contract.

13.2 The work shall include the furnishing and installing of the following each complete and in proper operating conditions, unless otherwise stated in these specifications:

a. Furnishing and installing an underground service entrance complete with conduits, conductors, and other accessories from a point indicated in the plans and as approved by the electric service provider.

b. Furnishing service entrance facilities conduit ‘s wire, and all items required as per electric service provider policies

c. Furnishing and installing of all panels, safety switches and all necessary main and branch air circuit breakers at the various load centers with the corresponding ratings as indicated in the plans.

d. Furnishing and installing feeder and branch circuit conductors with the necessary conduits as indicated in the Electrical Plans.

e. Furnishing and installing all necessary pull boxes, junction boxes, utility boxes as required and/or as indicated in the plans.

f. Furnishing and installing of all necessary utilization outlets and wall switches complete with their proper cover plated.

g. Furnishing and installing of all lighting fixtures as indicated in the plans.

13.3 Codes and Regulation

a. All work hereunder shall comply with the latest Philippine Electrical Code, the rules and regulations of the Electrical Ordinances in Tanay, Rizal, the rules and regulations of other governing authorities and with Republic Act 184 as applied or enforced in the city.

b. All work shall comply with the rules and regulations of electric service provider as far as they are concerned in providing their permanent services for use of the said proposed Pumping Station.

c. With respect to the rules and regulations of the electric service provider, it shall be the Contractor's responsibility to verify the point of service entrances and other requirements necessary to be complied with for the electric service connection.

13.4 Drawings and Specifications

a. The Drawings and Specifications are meant to be complimentary to each other and what is called for by one shall be binding as if called for by both.

b. Any apparent conflict between the Drawings and Specifications and any controversial or unclear points in either shall be referred to the Tanay Water District authorized representative for final decision.

c. Upon completion of the work as described herein, the contractor shall furnish the Owner, at his own expense, copy of the " AS BUILT" plans for future reference and maintenance purposes.

13.5 Permits and Inspections

a. The Contractor shall obtain at his own expense, all the necessary permits and Certificate of Electrical Inspection from the proper government authorities required both for the performance of the work involved and for the operation of the system upon completion of the work.

b. The Contractor shall at his expense, reproduce the Electrical Plans for this work to the necessary scale, and complete them with necessary information and requirements as required by the government approving authorities concerned in issuing permits and Certificate for Electrical Inspection.

13.6 Materials and Workmanship

a. All materials to be installed shall be unused, brand new and shall conform to the standards of the U.S. Underwriters Laboratories, Inc., in every case where such a standard has been established for the particular type of materials to be used.

b. Only skilled workmen using proper tools and equipment shall be employed during the entire course of installation work. All workmanship shall be of the best quality, and all work shall be done in accordance with the best practice of the trade involved. The same job foreman shall be assigned and maintained at the jobsite during the entire course of the job.

c. The Contractor shall furnish and install all equipment and materials as indicated in the Drawings for the various load.

d. The Contractor shall furnish and install as indicated in the Drawings the necessary panel boards of the multi-breaker type including the breakers.

e. Circuit breakers shall be of the magnetic, common trip, thermal type with the ratings and number of poles as indicated in the drawings.

f. Panel boards to be used shall be flush mounted if and when located in areas that are visible to the general public, such as corridors and lobbies, and may be flush or semi-flush mounted when located in electrical rooms, or in machine rooms and in areas where they are not visible to the general public. All panel boards shall be mounted and set plumb and symmetrical with surrounding objects.

g. Panel boards shall be installed in a perfectly fit cabinet of appropriate size provided with a stop in door trim ad good quality cylinder locks.

13.7 Wiring Methods

a. All wiring running under floor, underground, and through concrete ceiling, or concrete and hallow block partitions shall be in flexible conduit unless indicated in the plans.

b. Wiring installations through wooden double wall partitions shall be in electrical metallic tubing or Intermediate Metal conduits, no BX cables shall be allowed in this work.

c. All conduits for main service entrance feeders from the line side shall be Rigid Steel Conduit (RSC)

d. In all cases the wiring installations shall be concealed from view. All conduits and conduit fittings shall be galvanized or standardized and shall conform to the U.S. Underwriter's Laboratories Inc., Standards and Codes.

e. Conduits shall not be less the 15 mm (½ inch) diameter, and where no indicated, sizes shown shall be minimum.

f. All conduits installation work shall be done during construction. Installation shall be concealed by imbedding in concrete with all parts installed in proper places at such stages in the progress of construction so as to permit cabinets, outlet boxes, and device boxes to be flush mounted. All conduits installed underground shall be enclosed in concrete, which shall have a minimum thickness of 80mm (3 inches) around the conduit.

g. All splices, taps and junctions, except those for feeder and service conductor, shall be soldered, insulated with rubber tape and protected with friction tape.

h. For service and feeder conductors, taps shall be made with heavy-duty, all brass or copper solder less connectors. Solder type lugs or solder less tap shall not be permitted. After solder less connectors are tighten for maximum mechanical and electrical bond, they shall be served with sufficient rubber and friction tapes to insure insulation strength equal to at least that of the insulators of the conductors they join.

13.8 Feeders

a. Feeders shall be laid out in accordance with the one-line diagrams shown in the Drawings.

b. Unless otherwise specified in these specifications or shown in the Drawings, Type TW wires shall be used for feeder runs. The wires and conduits shown on the Drawings shall be the minimum sizes to be used.

c. Feeders shall be continuous and without splices from the main distribution center up to the various load centers.

d. Feeder circuits rising to various floors may be installed with conduits exposed but properly strapped along concrete wall when installed at places not visible to the public such as machine rooms.

13.9 Outlet and Switch Boxes

a. All boxes shall be galvanized, gauge #16, approved products of reputable manufacturers. Enamel coating shall not be used in lieu of zinc coating.

b. All ceiling outlet boxes intended for lighting outlets shall be of the gauge #16 100mm x 100mm octagonal box, larger when required, with a depth of 50mm minimum.

c. Convenience and wall switch outlet boxes shall be of the 100mm x 50mm rectangular, deep type, flush type, except in cases where 10-amp or 20-amp. Switches shall be mounted in gangs of two or three, therefore the proper sizes of boxes and cover plates shall be used.

d. All boxes, including junction and pull boxes, shall be of gauge #16, sufficiently sized to provide free space for all conductors enclosed in the box, in addition to the fittings, such as switch mechanism and receptacles that may be contained in the box.

e. All junction boxes, pull boxes, and blank boxes shall be fitted with standard flat metal box covers.

f. Care should be taken to mount all boxes level and true.

13.10 Wall Switches and Receptacles

a. Care should be taken to mount all boxes level and true.

b. Wall switches intended to control more than eleven or more 40_watt fluorescent lamps using high power factor ballasts shall be rate 10 amperes, 250 volts. Wall switches controlling ten or less of the 40_watt fluorescent lamps with high power factor ballasts shall be rated no less than 5 amps. 250 volts.

c. All duplex receptacles shall be rated no less than 15 amps. 250 volts A.C. and shall be for flush mounting. Interchangeable type receptacles shall not be acceptable.

13.11 Lighting and Outlets Fixtures

a. Lighting outlets unless otherwise specified shall be furnished and installed by the Contractor. Octagonal boxes of 100mm x 100mm shall be gauge #16, installed for ceiling lights and wall mounted bracket lights.

b. Standard utility boxes of the 50mm x 100mm gauge #16, rectangular, deep-type shall be furnished and installed flush mounted by the contractor for wall-mounted outlets. Proper cover plates for wall outlets shall likewise be furnished and installed by the Contractor.

c. Fixtures for yard outdoor security light shall be LED street lights

13.12 Auxiliary Power Transformer

The pump station shall be equipped with a 15 KVA step-down transformer to supply 230 VAC, 3 phase for the control and auxiliary equipment. The primary and secondary side of the transformer to be protected by a thermal magnetic circuit breaker, sized to meet the power requirements of the transformer. An operating mechanism shall penetrate the control panel door. A pad lockable operator handle shall be secured on the exterior surface. Interlocks must prevent opening the door until circuit breakers are in "OFF" position.

13.13 Miscellaneous

a. Although the location of the panel boards, safety switches, wall switches, lighting outlets, receptacles, telephone outlets, terminal boxes, etc., are indicated in the plans, the TanWD authorized representative however shall be consulted for confirmation of such locations for the exact point where they shall be installed.

b. All defects arising due to the fault of the Contractor during the construction period shall be corrected by him at his own expense.

13.14 Guarantee

The Contractor shall guarantee that his work materials and equipment furnished shall be free from all defects for a period of twelve months after acceptance of the project and shall agree to repair and make good at his own expense any and all defects which may develop in his work during that time if said defects arise due to poor workmanship and materials furnished by the Contractor.

Section VII. Drawings

PERSPECTIVE

SCALE N.T.S

KEY PLAN

CIVIL ENGINEER:

ENGR. MARVIN A. BALAGOT

PRC REG NO.:	PTR NO.:
DATE ISSUED:	TIN NO.:

NOTES

CADD BY:

MR. ALLEN B. SACRAMENTO

PREPARED BY:

ENGR. MARVIN A. BALAGOT

CHECKED BY:

ENGR. JENNET S. LORENZO

RECOMMENDED FOR APPROVAL:

ENGR. ARMANDO H. BONGAT

APPROVED BY:

MR. EMMANUEL C. CATOLOS

REVISION

NO.	DESCRIPTION	CAD BY	PREPD BY	CKD BY	APPRD BY		DATE
[illegible]	ISSUED FOR APPROVAL	ABS	MAB	JSL	AHB	ECC	[illegible]

OWNER:

TANAY WATER DISTRICT

CONTRACTOR:

PROJECT TITLE:

CONSTRUCTION OF MAPUNSO PUMPING STATION

DRAWING TITLE:

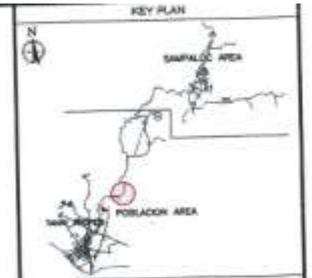
ARCHITECTURAL
(PERSPECTIVE)

LOCATION:

Sitio Mapunso, Tanay Sampaloc Rd., Brgy. Plaza Aldea, Tanay, Rizal

DRAWING NO.	SHEET NO.	REV. NO.
	1 OF 6	00

KEY PLAN



CIVIL ENGINEER:

ENGR. MARVIN A. BALAGOT

PRC REG NO.: PTR NO.:
DATE ISSUED: TIN NO.:

NOTES

CADD BY:

MR. ALLEN B. SACRAMENTO
AUTOCAD OPERATOR / DRAFTSMAN

PREPARED BY:

ENGR. MARVIN A. BALAGOT
SUPERVISING ENGINEER

CHECKED BY:

ENGR. JENNET S. LORENZO
ENGINEERING DIVISION MANAGER B

RECOMMENDED FOR APPROVAL:

ENGR. ARMANDO H. BONGAT
ENGINEERING & OPERATION DEPARTMENT MANAGER B

APPROVED BY:

MR. EMMANUEL C. CATOLOS
GENERAL MANAGER B

REVISION

NO.	DESCRIPTION	CAD BY	PREP BY	CKD BY	APPRD BY	DATE
A	ISSUED FOR APPROVAL	ABS	MAB	JSL	AHB	ECC

OWNER:

TANAY WATER DISTRICT

CONTRACTOR:

PROJECT TITLE:

CONSTRUCTION OF MAPUNSO PUMPING STATION

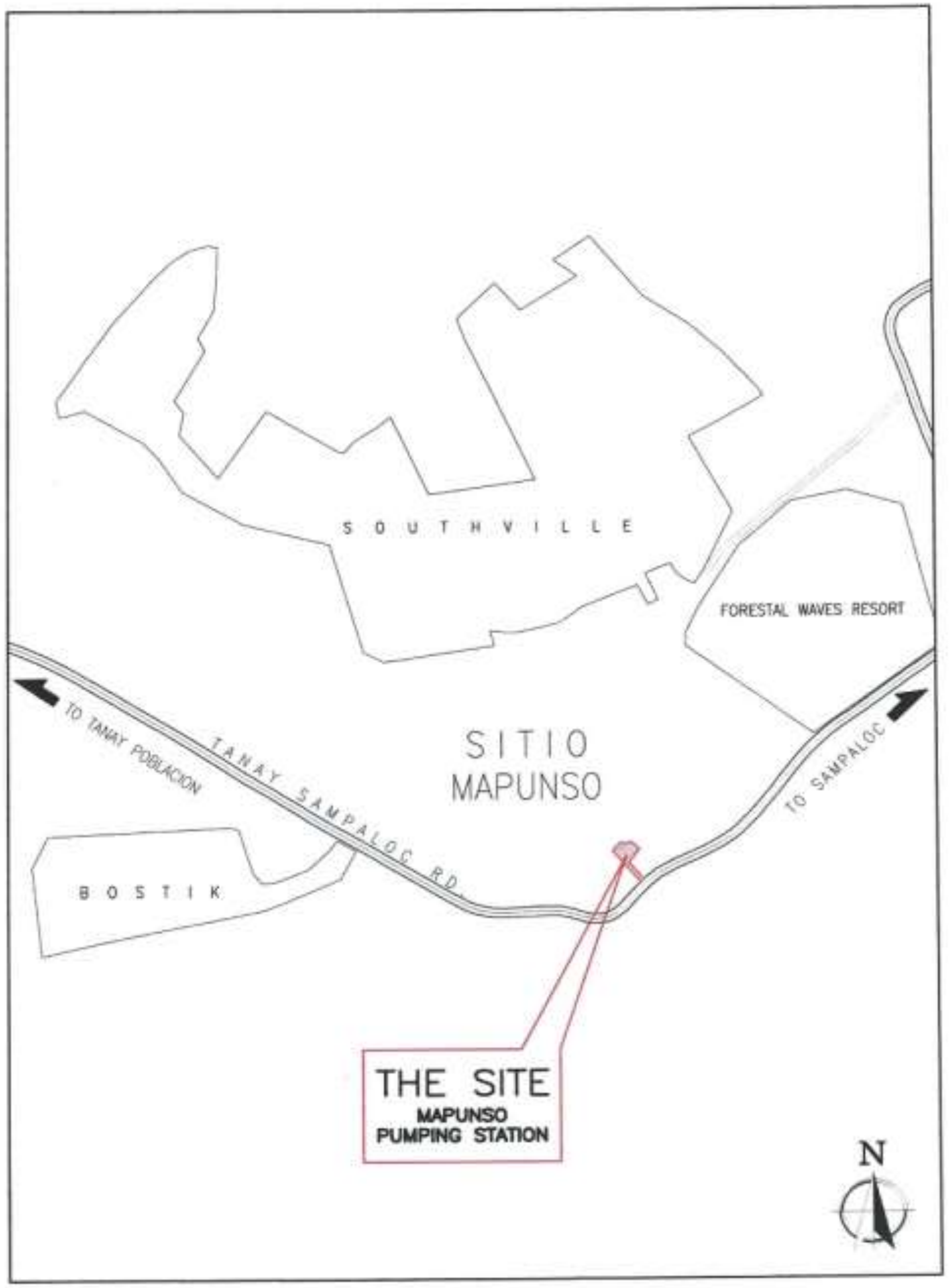
DRAWING TITLE:

ARCHITECTURAL
(VICINITY MAP & SITE DEVELOPMENT)

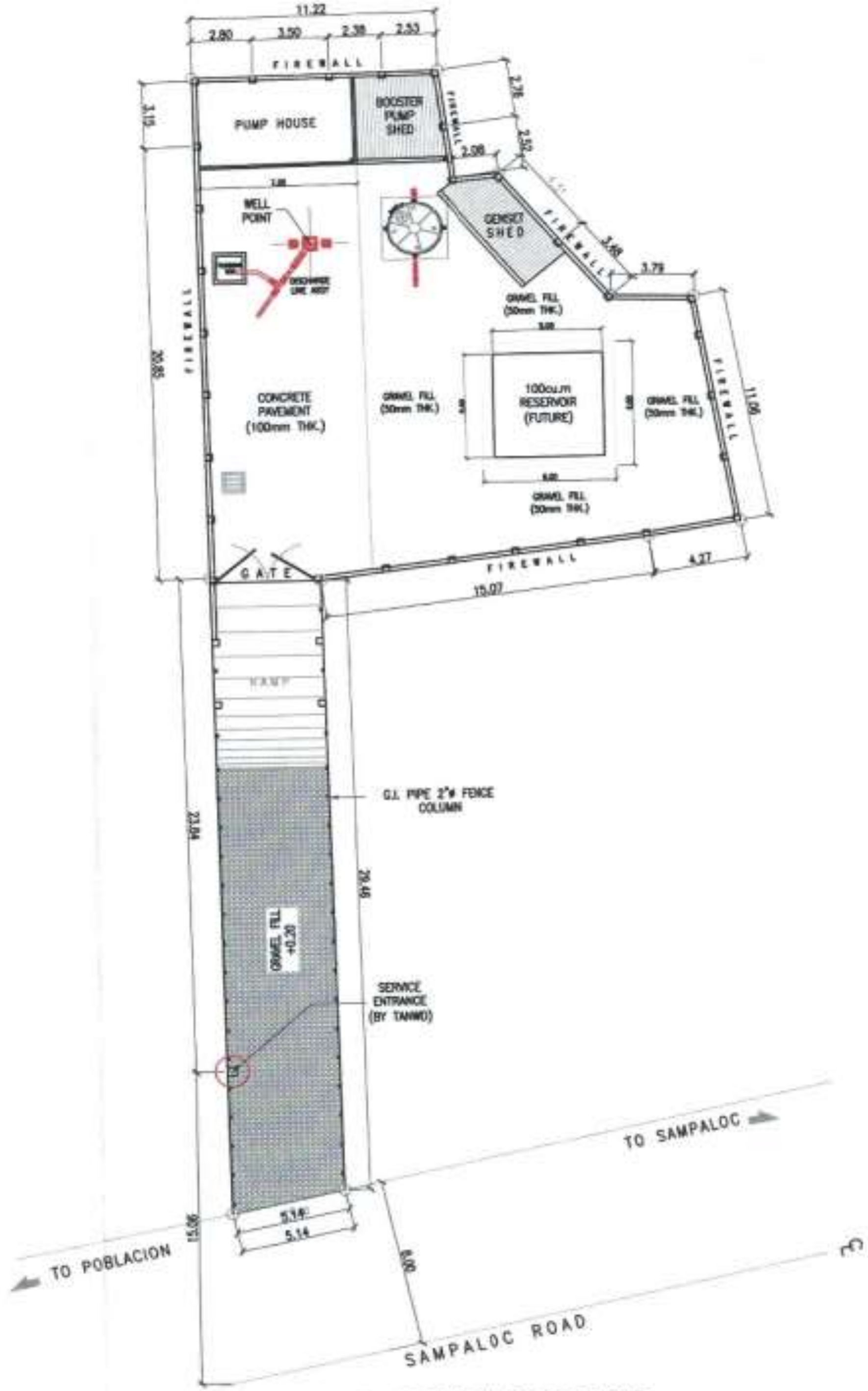
LOCATION:

Sitio Mapunso, Tanay Sampaloc Rd., Brgy. Plaza Aldea, Tanay, Rizal

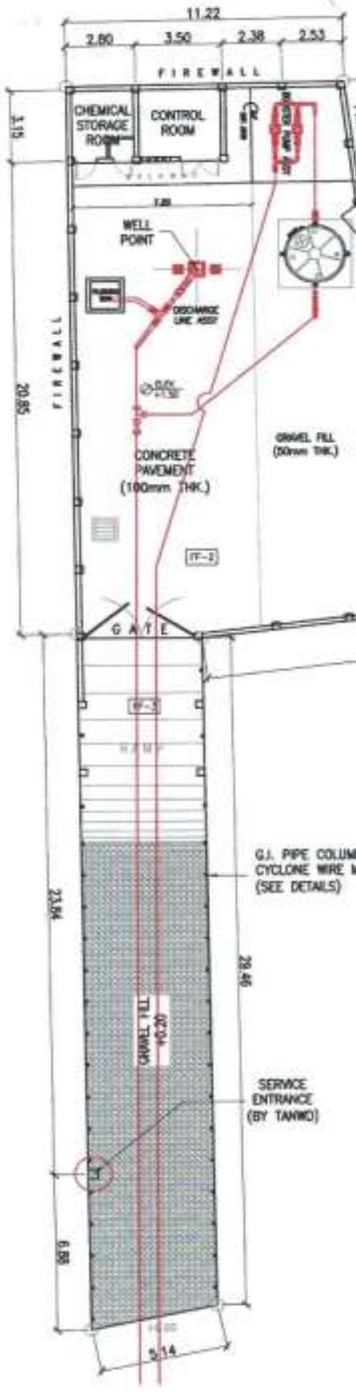
DRAWING NO.	SHEET NO.	REV. NO.
	2 OF 6	00



VICINITY MAP
SCALE NTS

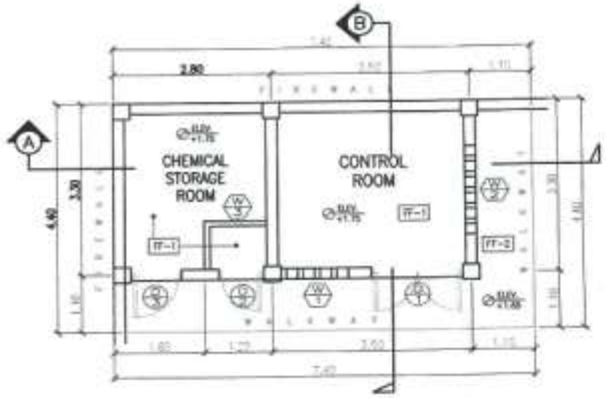


SITE DEVELOPMENT
SCALE 1 : 250



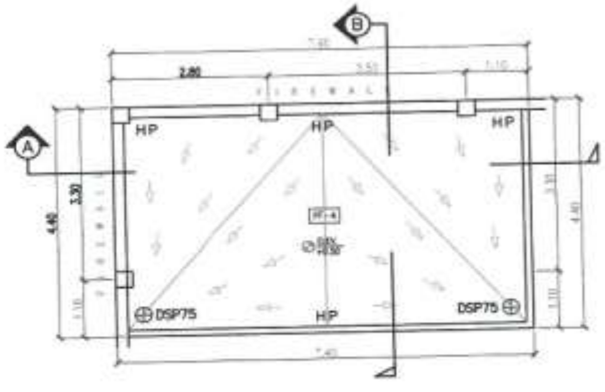
FLOOR PLAN

SCALE 1 : 230



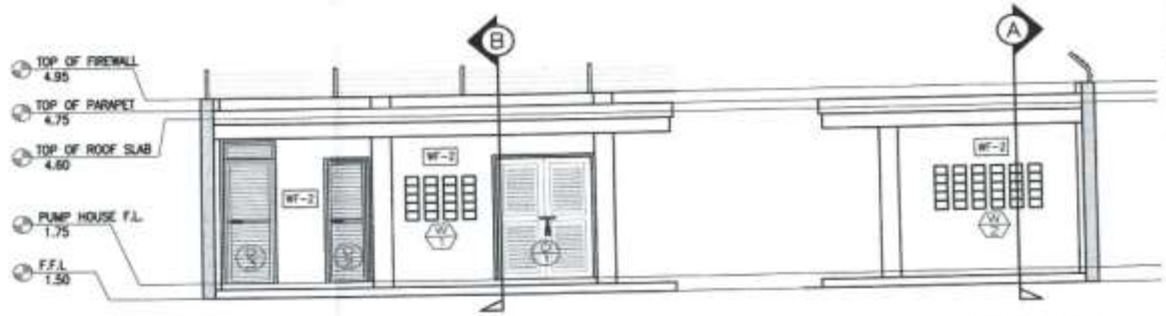
PUMP HOUSE FLOOR PLAN

SCALE 1 : 100



PUMP HOUSE ROOF PLAN

SCALE 1 : 100

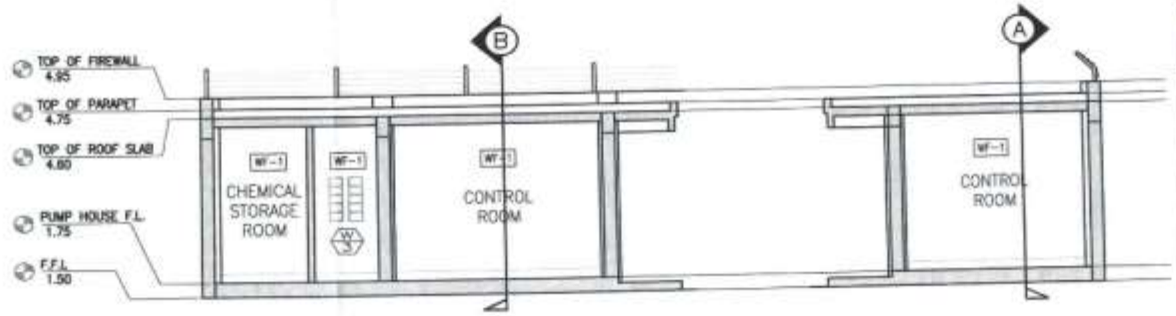


FRONT ELEVATION (P.HOUSE)

SCALE 1 : 90

SIDE ELEVATION (P.HOUSE)

SCALE 1 : 90



SECTION "A"

SCALE 1 : 90

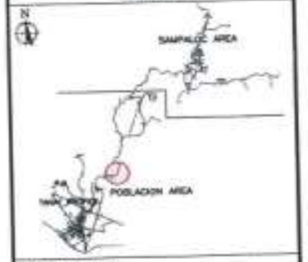
SECTION "B"

SCALE 1 : 90

FLOOR FINISHES	
FF-1	FOR PRIMER : EPOXY PRIMER (2 COATS) FOR TOP COAT : POWER FLOOR EPOXY PAINT GLOSS GRAY (3 COATS)
FF-2	ROUGH FINISH CONCRETE
FF-3	ROUGH FINISH CONCRETE w/ GROOVE
FF-4	PLAIN CEMENT FINISH w/ WATER PROOFING (ROOF SLAB) - SEE WATER PROOFING DETAIL

WALL FINISHES	
WF-1	PLAIN CEMENT FINISH w/ LATEX GLOSS PAINT (OFF-WHITE)
WF-2	PLAIN CEMENT FINISH w/ ELASTOMERIC PAINT (OFF-WHITE)
WF-3	PLAIN CEMENT FINISH w/ ELASTOMERIC PAINT (AQUA BLUE)
WF-4	PLAIN CEMENT FINISH w/ ELASTOMERIC PAINT (ROYAL BLUE) - BASE BOARD FOR CONCRETE FENCE @0.40m HEIGHT ROYAL BLUE FOR COLUMNS, BEAMS, PARAPET & BASE BOARD

KEY PLAN



CIVIL ENGINEER:

ENGR. MARVIN A. BALAGOT

PRC REG NO.: | PTR NO.:
DATE ISSUED: | TIN NO.:

NOTES

CADD BY:
MR. ALLEN B. SACRAMENTO
AUTOCAD OPERATOR/DRAFTSMAN

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CHECKED BY:
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RECOMMENDED FOR APPROVAL:
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ENGINEERING & OPERATION DEPARTMENT MANAGER B

APPROVED BY:
MR. EMMANUEL C. CATOLOS
GENERAL MANAGER B

REVISION

NO.	DESCRIPTION	CAD BY	PREP BY	CHK BY	APPRD BY		DATE
A	ISSUED FOR APPROVAL	ASB	MAB	JSL	AHB	ECC	

OWNER:
TANAY WATER DISTRICT

CONTRACTOR:

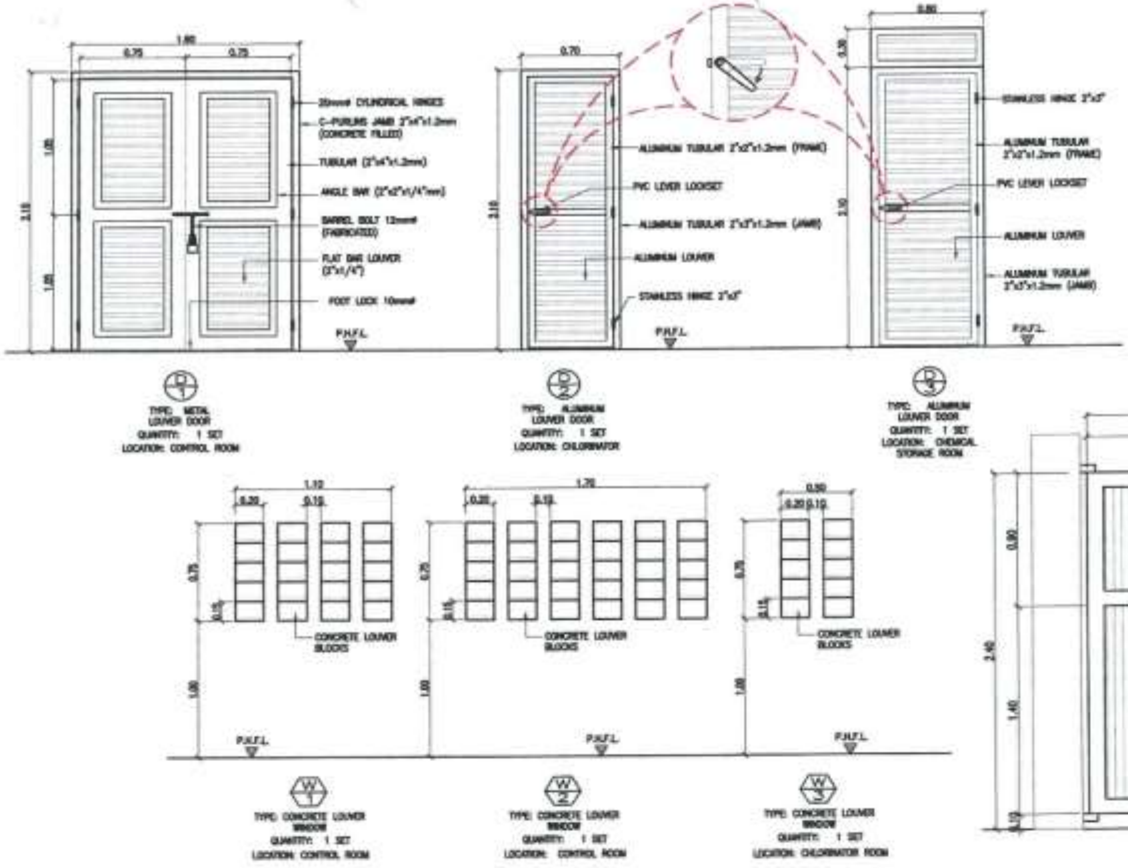
PROJECT TITLE:
CONSTRUCTION OF MAPUNSO PUMPING STATION

DRAWING TITLE:
ARCHITECTURAL
(FLOOR PLANS, ROOF PLAN, ELEVATION, SECTION & FINISHES)

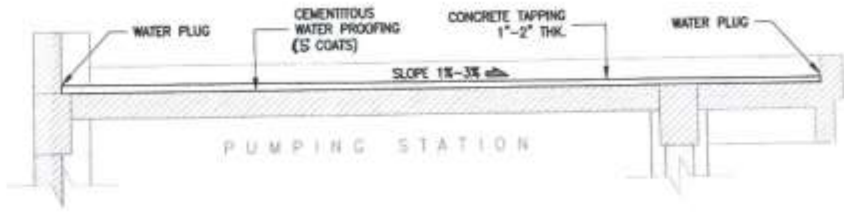
LOCATION:
Sitio Mapunso, Tanay Sampaloc Rd., Brgy. Plaza Aldea, Tanay, Rizal

DRAWING NO.	SHEET NO.	REV. NO.
	3 OF 6	00

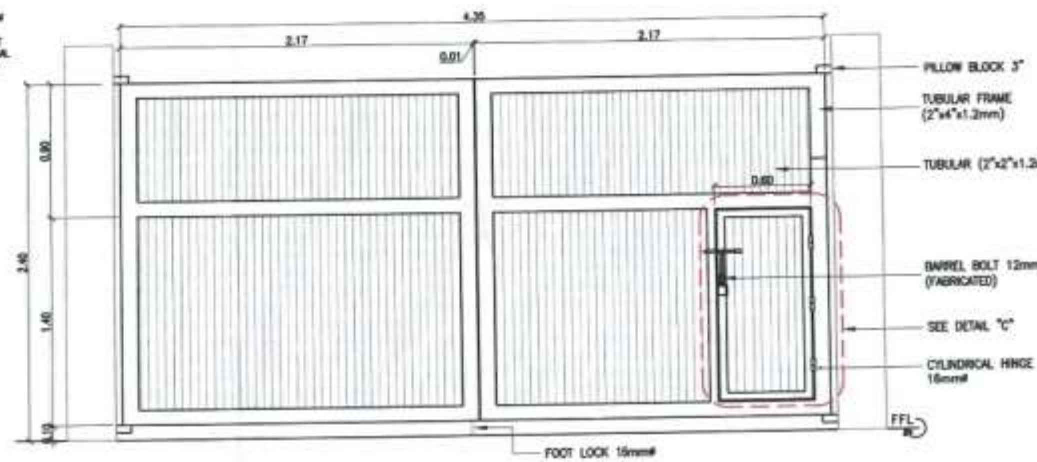
NOTE : FINISHED PAINT FOR STEEL GATES : ROYAL BLUE
: FINISHED PAINT FOR BARBED WIRE FENCE & G.I.PIPE : SILVER



DOOR & WINDOWS DETAIL
SCALE 1 : 35

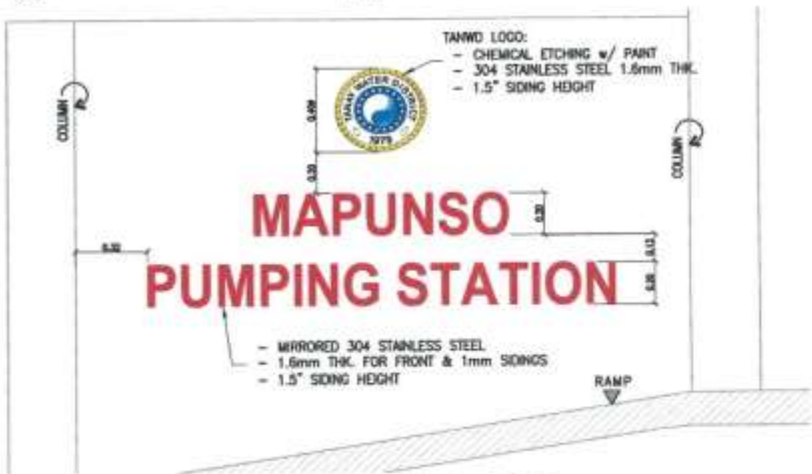


WATER PROOFING DETAIL
SCALE 1 : 30

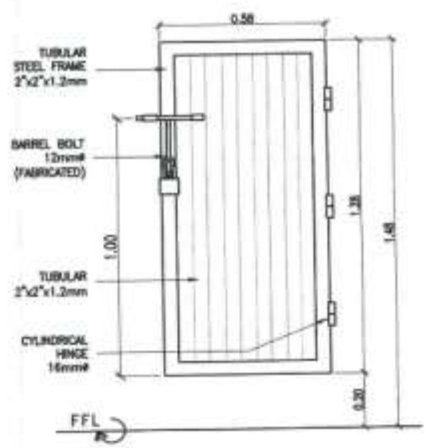


GATE DETAIL
SCALE 1:30

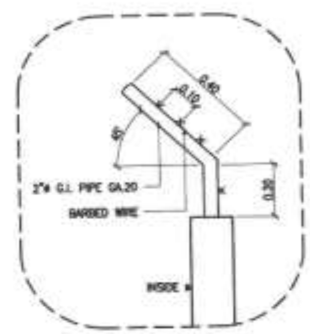
TANWD LOGO
SCALE N T S



LETTERING DETAIL & LOGO
SCALE 1 : 90



DETAIL "C"
SCALE 1:20



BARBED WIRE FENCE DETAIL
SCALE 1 : 20

KEY PLAN

SAMPALOC AREA
POBLACION AREA

CIVIL ENGINEER:
ENGR. MARVIN A. BALAGOT

PRC REG NO.: | PTR NO.:
DATE ISSUED: | TIN NO.:

NOTES

CADD BY:
MR. ALLEN B. SACRAMENTO
AUTOCAD OPERATOR/DRAFTSMAN

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SUPERVISING ENGINEER

CHECKED BY:
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ENGR. ARMANDO R. BONGAT
ENGINEERING & OPERATION DEPARTMENT MANAGER B

APPROVED BY:
MR. EMMANUEL C. CATOLOS
GENERAL MANAGER B

REVISION

OWNER:
TANAY WATER DISTRICT

CONTRACTOR:

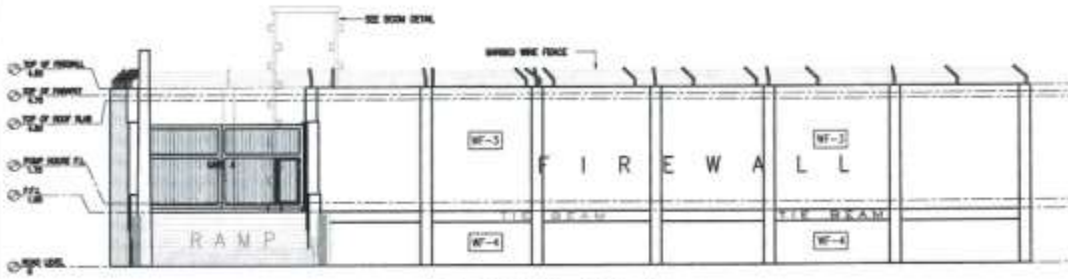
PROJECT TITLE:
CONSTRUCTION OF MAPUNSO PUMPING STATION

DRAWING TITLE:
ARCHITECTURAL
(DOOR & WINDOWS, LOGO & LETTERING, GATE, BARBED WIRE FENCE & WATER PROOFING DETAILS)

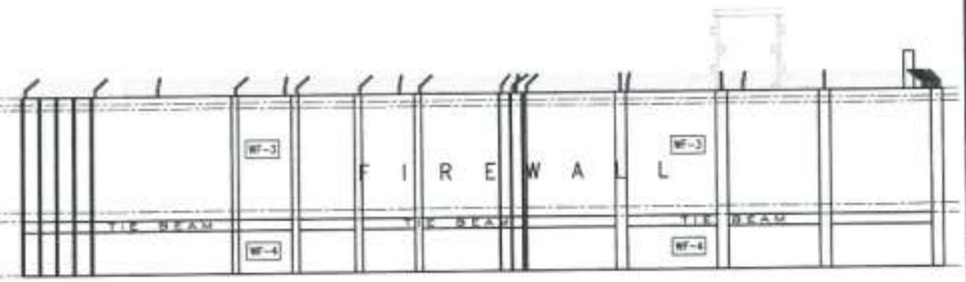
LOCATION:
Sitio Mapunso, Tanay Sampaloc Rd., Brgy. Plaza Aldea, Tanay, Rizal

DRAWING NO.	SHEET NO.	REV. NO.
	4 OF 6	00

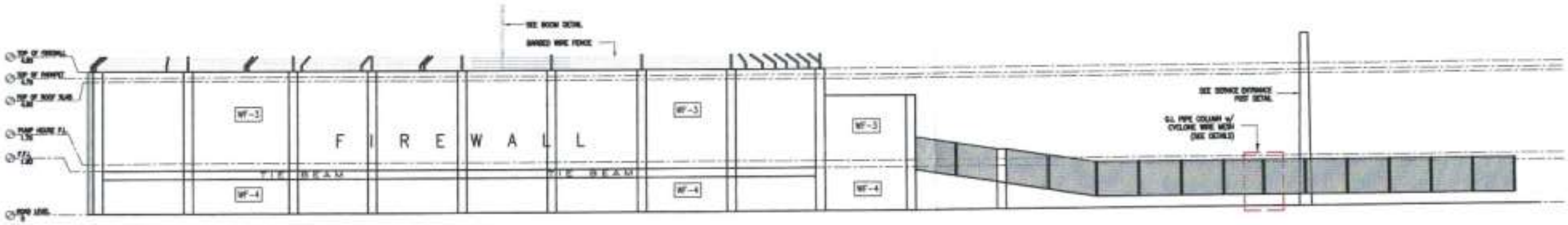
NOTE: CONCRETE FENCE w/ BASE BOARD INSIDE 40cm ON HEIGHT (ROYAL BLUE)



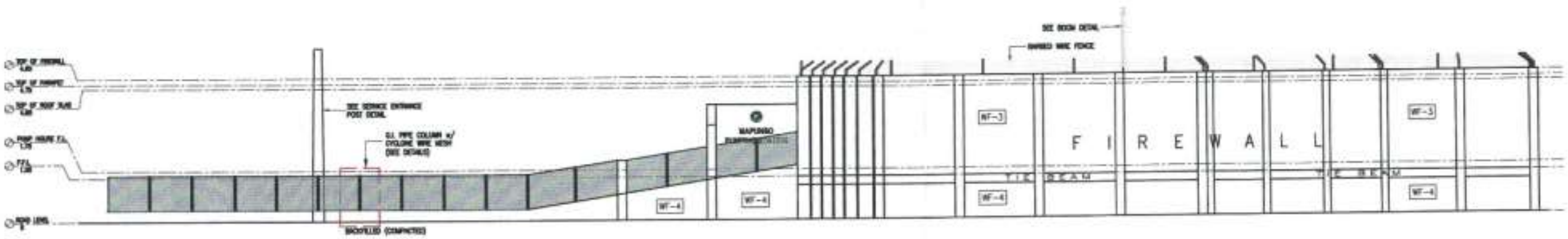
FRONT VIEW
SCALE 1:100



REAR VIEW
SCALE 1:100



LEFT SIDE VIEW
SCALE 1:100



RIGHT SIDE VIEW
SCALE 1:100

KEY PLAN

CIVIL ENGINEER:
ENGR. MARVIN A. BALAGOT

NOTES

CADD BY:
MR. ALLEN B. SACRAMENTO

PREPARED BY:
ENGR. MARVIN A. BALAGOT
SUPERVISING ENGINEER

CHECKED BY:
ENGR. JENNET S. LORENZO

RECOMMENDED FOR APPROVAL:
ENGR. ARMANDO H. BONGAT

APPROVED BY:
MR. EMMANUEL C. CATOLOS
GENERAL MANAGER B

REVISION

OWNER:
TANAY WATER DISTRICT

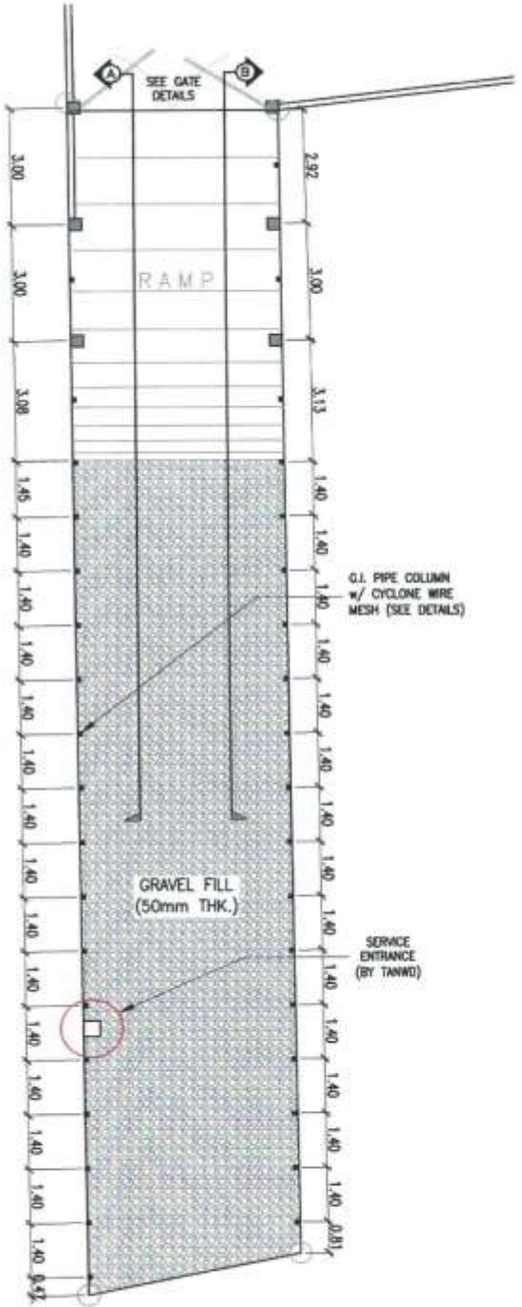
CONTRACTOR:

PROJECT TITLE:
CONSTRUCTION OF MAPUNSO PUMPING STATION

DRAWING TITLE:
ARCHITECTURAL
(FENCE ELEVATIONS)

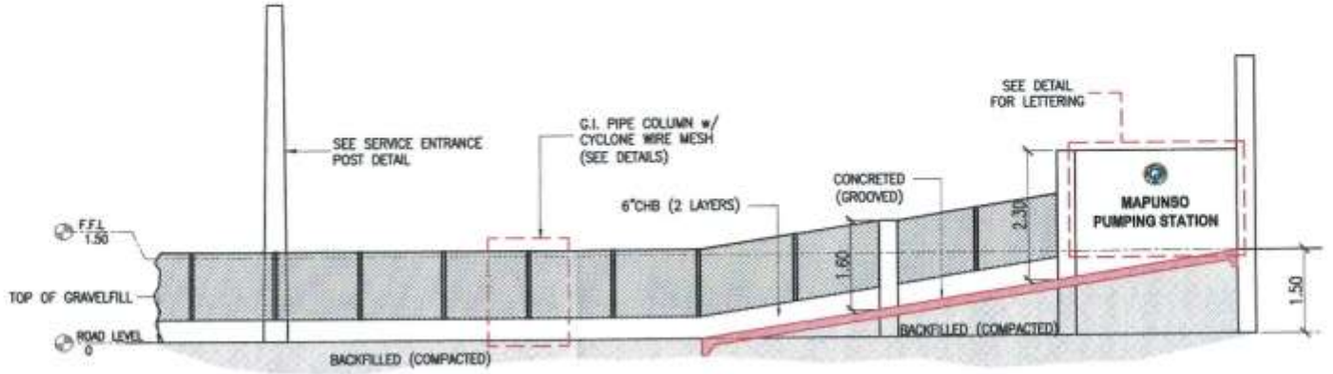
LOCATION:

DRAWING NO.	SHEET NO.	REV. NO.
	5 OF 6	00



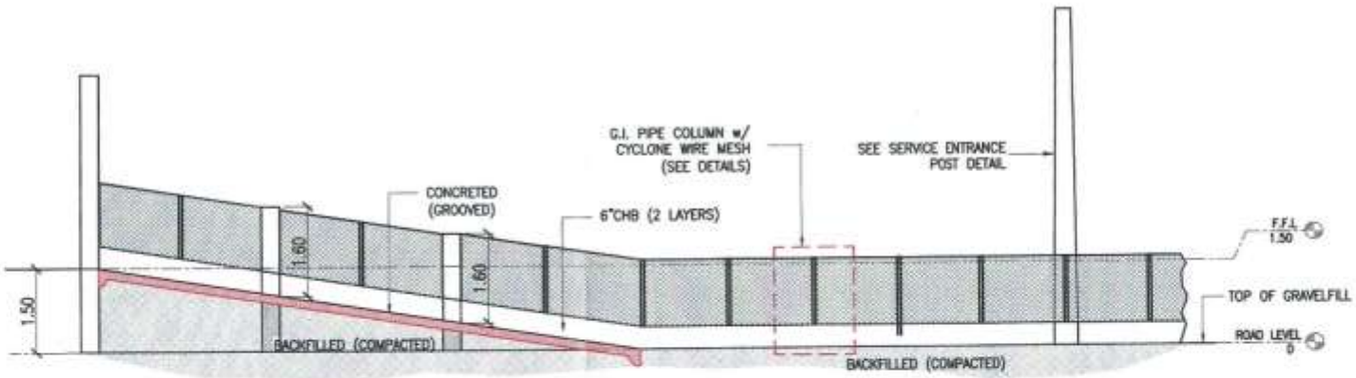
RIGHT OF WAY & RAMP PLAN

SCALE 1 : 110



SECTION "A"

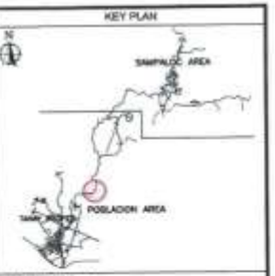
SCALE 1 : 80



SECTION "B"

SCALE 1 : 80

KEY PLAN



CIVIL ENGINEER:

ENGR. MARVIN A. BALAGOT

PRC REG NO. :	PTR NO. :
DATE ISSUED	TIN NO. :

NOTES

CADD BY:

MR. ALLEN B. SACRAMENTO
ACTING SUPERVISOR / DRAFTSMAN

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SUPERVISING ENGINEER

CHECKED BY:

3/14/24
ENGR. JENNET S. LORENZO
ENGINEERING DIVISION MANAGER B

RECOMMENDED FOR APPROVAL:

3/15/24
ENGR. ARMANDO H. BONGAT
ENGINEERING & OPERATION DEPARTMENT MANAGER III

APPROVED BY:

MR. EMMANUEL C. CATOLOS
GENERAL MANAGER B

REVISION

NO.	DESCRIPTION	CAD BY	PREPD BY	CHKD BY	APPR BY	DATE
0	ISSUED FOR APPROVAL	ABS	AAB	JSL	AHB	ECC

OWNER:

TANAY WATER DISTRICT
2nd Bldg., #1 P.T. Calderon St. Brgy. Plaza Aldea, Tanay, Rizal
Tel. Nos.: 654-4482 / 654-0562 / 654-2681

CONTRACTOR:

PROJECT TITLE:

CONSTRUCTION OF MAPUNSO PUMPING STATION

DRAWING TITLE:

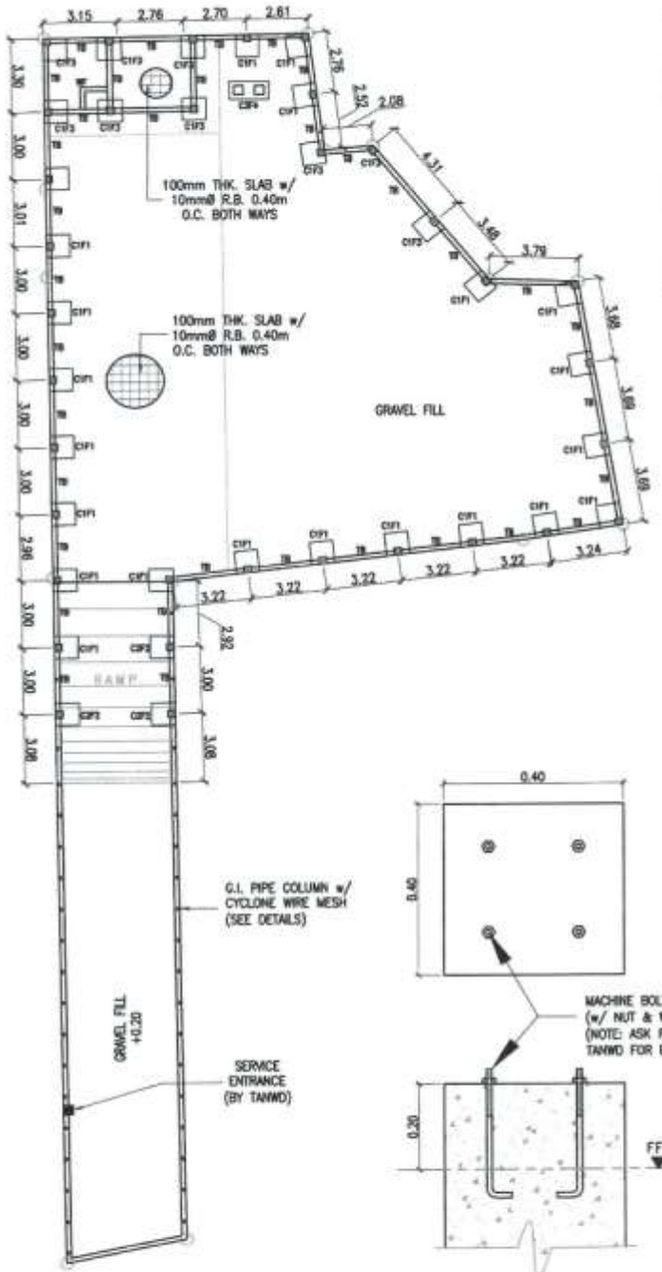
ARCHITECTURAL

(RIGHT OF WAY & RAMP PLAN & SECTION)

LOCATION:

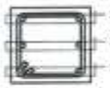
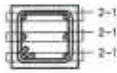
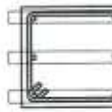
Sitio Mapunso, Tanay Sampaloc Rd., Brgy. Plaza Aldea, Tanay, Rizal

DRAWING NO.	SHEET NO.	REV. NO.
	6 OF 6	00



FOUNDATION PLAN

SCALE 1 : 100

SCHEDULE OF COLUMNS	SCHEDULE OF COLUMNS	SCHEDULE OF COLUMNS
C-1	C-2	C-3
		
SIZE: 300mm x 300mm	SIZE: 250mm x 250mm	SIZE: 400mm x 400mm
VERT. BARS: 6-12mmØ	VERT. BARS: 6-12mmØ	VERT. BARS: 6-12mmØ
TIES: 10mmØ 10 @50mm; 15 @100mm & REST @ 150mm O.C.	TIES: 10mmØ 10 @50mm; 15 @100mm & REST @ 150mm O.C.	TIES: 10mmØ 10 @50mm; 15 @100mm & REST @ 150mm O.C.
		REMARKS: 0.20m HEIGHT FROM F.F.L. TO TOP OF CONCRETE PEDESTAL

SCHEDULE OF BEAMS

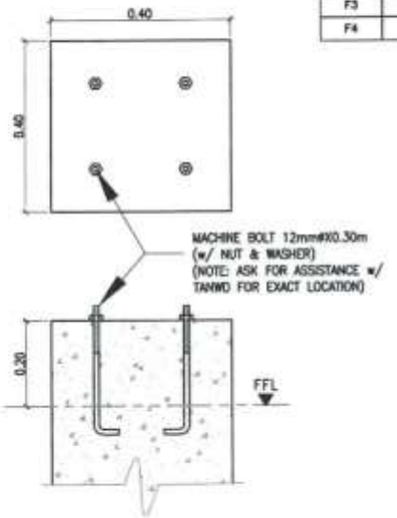
MARK	SIZE (mm) BASE	SIZE (mm) HEIGHT	Ø OF BAR	DISCONTINUOUS TB	DISCONTINUOUS BB	MIDSPAN TB	MIDSPAN BB	CONTINUOUS TB	CONTINUOUS BB	STIRRUPS
RB-1	200	300	12mmØ	3	2	2	3	3	2	USE 10mmØ STIRRUPS SPACED @ 5-0.05; 5-0.10; 0.15m, REST O.C.
CB-1	200	300	12mmØ	3	2	2	3	3	2	
TB	200	300	12mmØ	2	2	2	2	2	2	

SCHEDULE OF SLAB

MARK	THICKNESS t. (mm)	REBARS PARALLEL TO SHORT SPAN TB @SUPPORT	REBARS PARALLEL TO SHORT SPAN BB @SUPPORT	REBARS PARALLEL TO LONG SPAN TB @SUPPORT	REBARS PARALLEL TO LONG SPAN BB @SUPPORT	REMARKS
S-1	150	12mmØ @150	12mmØ @125	12mmØ @150	12mmØ @150	TWO WAY SLAB
CS-1	150	12mmØ @150	12mmØ @125	12mmØ @0.2 TEMP. BARS		CANTILEVER SLAB

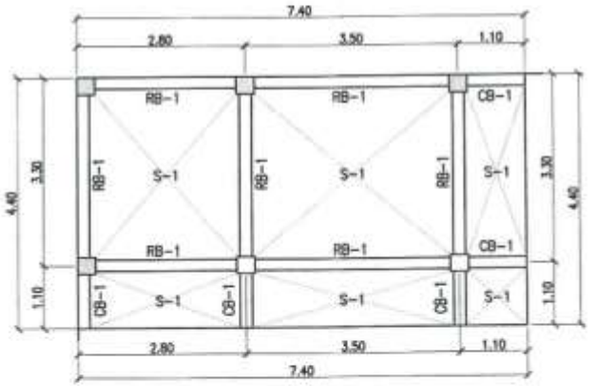
SCHEDULE OF FOOTINGS

MARK	THICKNESS t. (mm)	DIMENSION L	DIMENSION W	REINFORCEMENTS SHORT SPAN	REINFORCEMENTS LONG SPAN	DEPTH (MM) FROM NGL	REMARKS
F1	300	1000	1000	7-12mmØ	7-12mmØ	1.20m from NGL	SPREAD FOOTING
F2	300	700	700	5-12mmØ	5-12mmØ		SPREAD FOOTING
F3	300	1000	1000	9-12mmØ	9-12mmØ		SPREAD FOOTING
F4	300	1700	800	8-12mmØ	5-12mmØ	0.60m from NGL	COMBINED FOOTING



BOOSTER PEDESTAL (C-3)

SCALE 1 : 15



ROOF DECK FRAMING PLAN (PUMP HOUSE)

SCALE 1 : 90

STRUCTURAL NOTES:

GENERAL NOTES:

1. GENERAL NOTES AND TYPICAL STRUCTURAL DETAILS SHALL APPLY TO ALL DRAWINGS UNLESS OTHERWISE SHOWN OR NOTED. FEATURES OF CONSTRUCTION SHOWN ARE TYPICAL AND SHALL APPLY GENERALLY THROUGHOUT.
2. FOR SIMILAR CONDITIONS, MODIFY TYPICAL DETAILS AS REQUIRED TO MEET SPECIAL CONDITIONS.
3. THE CONTRACTOR SHALL EXAMINE THE DRAWINGS AND SHALL NOTIFY THE ENGINEER AND/OR THE ARCHITECT OF ANY DISCREPANCIES HE MAY FIND THEREIN PRIOR TO AND/OR DURING THE CONSTRUCTION BEFORE PROCEEDING WITH THE AFFECTED WORK.
4. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE ADEQUATE SHORING AND BRACING OF THE STRUCTURE FOR ALL LOADS THAT MAY BE IMPOSED DURING CONSTRUCTION.
5. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE LATEST APPLICABLE STANDARDS OR SPECIFICATIONS. ALL WORKS SHALL CONFORM WITH THE BEST PRACTICE PREVAILING IN THE VARIOUS TRADES.
6. ALL CONSTRUCTION MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION, EXAMINATION AND TESTING BY THE ENGINEER AND/OR THE ARCHITECT. THE ENGINEER AND/OR THE ARCHITECT SHALL HAVE THE RIGHT TO REJECT DEFECTIVE MATERIALS AND WORKMANSHIP OR REQUIRE ITS RECTIFICATION.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF WORK AMONG THE VARIOUS TRADES AS NECESSARY TO AVOID CONFLICTS AND TO INSURE THE INSTALLATION OF ALL WORK WITHIN THE AVAILABLE SPACE.
8. DO NOT SCALE DRAWINGS. CALLED-OUT DIMENSIONS AND STANDARD CODE REQUIREMENTS SHALL GOVERN OVER UNSCALED DRAWINGS.
9. DIMENSIONS INDICATED IN THE STRUCTURAL DRAWINGS SHALLBE COORDINATED WITH THE ARCHITECTURAL DRAWINGS. ARCHITECTURAL DRAWINGS SHALL BE USED TO DEFINE DETAILED CONFIGURATIONS, ELEVATIONS, OPENINGS, JOINTS, SLOPES, ETC.
10. THE CONTRACTOR IS GIVEN THE OPTION TO UTILIZE ALTERNATIVE METHODS OF DESIGN AND CONSTRUCTION AS DEEMED SUITABLE PROVIDED THAT SUCH OPTION IS IN CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND IN COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS.

REINFORCED CONCRETE :

SCHEDULE OF STRUCTURAL CONCRETE
28-DAY COMPRESSIVE STRENGTH AND TYPES:

STRUCTURAL ELEMENTS	COMPRESSIVE STRENGTH @ 28 DAY
FOUNDATIONS (FOOTINGS, PEDESTALS)	3,000.00 psi
COLUMNS	3,000.00 psi
FLOOR BEAMS/ ROOFBEAMS	3,000.00 psi
SUSPENDED SLABS	3,000.00 psi
SLAB ON FILL	3,000.00 psi

REINFORCING STEEL:

SCHEDULE OF REINFORCING BARS:

DIAMETER OF BARS	GRADE (fy)	ASTM
#10	GRADE 33 (33,000psi)	A615/A615M DEFORMED
#12 - #32	GRADE 40 (40,000psi)	A615/A615M DEFORMED

FORMS:

FORMS SHALL BE PROVIDED FOR ALL CONCRETE INDICATED UNLESS SPECIFIED OTHERWISE. FORMS SHALL BE SET TRUE TO LINE AND GRADE AND MAINTAINED SO AS TO INSURE THAT COMPLETED WORK SHALL BE WITHIN THE ALLOWABLE TOLERANCES SPECIFIED AND SHALL BE MORTAR TIGHT.

FORMS AND SUPPORTS SHALL BE DESIGNED SO AS NOT TO DAMAGE PREVIOUSLY PLACED STRUCTURE. FORMS SHALL BE REMOVED IN SUCH MANNER AS NOT TO IMPAIR SAFETY AND SERVICEABILITY OF THE STRUCTURE.

SCHEDULE OF STRIPPING OF FORMS AND SHORINGS:

ITEM:	TIME:
FOUNDATION	24 HRS.
SUSPENDED SLAB EXCEPT WHEN ADDITIONAL LOADS ARE IMPOSED	14 DAYS
COLUMNS / WALL	10 DAYS
BEAMS	14 DAYS

FOUNDATION:

FOUNDATION IS DESIGNED FOR 100 Kpa. (VERIFY ACTUAL)
FOOTING SHALL REST ON TOP OF A 50MM GRAVEL BED WITH 90% PROCTOR COMPACTED SOIL
NO FOOTING SHALL REST ON BACKFILL MATERIALS.

MASONRY CONCRETE BLOCKS:

1. ALL CONCRETE BLOCKS SHALL BE NORMAL WEIGHT,HON LOAD BEARING TYPE
2. UNTEL BEAMS SHALL AT LEAST (0.20M) ON EACH SIDE OF MASONRY WALL OPENING
3. REINFORCING BARS SHALL BE LAPPED A MINIMUM OF 1.3LD WHERE SPLICED. DOWELS FROM CONRETE FOOTING OR SLAB SHALL EXTEND INTO THE BLOCK WALL 20 BAR DIA DOWELS TO MATCH VERTICAL REINFORCING ON WALLS
4. WALL REINFORCEMENT SHALL BE AS FOLLOWS

WALL THICKNESS	VERTICAL REINFORCEMENT	HORIZONTAL REINFORCEMENT
6" (150mm) EXTERIOR	12mmØ @ 0.80 M O.C.	10mmØ @ 0.80 M O.C.
4" (100mm) INTERIOR	10mmØ @ 0.8 M O.C.	10mmØ @ 0.60 M O.C.

KEY PLAN

CIVIL ENGINEER:

ENGR. MARVIN A. BALAGOT

PRC RES./NO.: PTR NO.:
DATE ISSUED: TIN NO.:

NOTES

CADD BY:

MR. ALLEN B. SACRAMENTO
ADVANCED OPERATOR I (DRAFTSMAN)

PREPARED BY:

ENGR. MARVIN A. BALAGOT
SUPERVISING ENGINEER

CHECKED BY:

ENGR. JENNET S. LORENZO
ENGINEERING DIVISION MANAGER B

RECOMMENDED FOR APPROVAL:

ENGR. ARMANDO H. BONGAT
ENGINEERING & OPERATION DEPARTMENT MANAGER B

APPROVED BY:

MR. EMMANUEL C. CATOLOS
GENERAL MANAGER III

REVISION

NO.	DESCRIPTION	CAD PREP BY	CAD CHK BY	SPREAD BY	DATE
0	ISSUED FOR APPROVAL	ABS	MAB	JDL	MAR 28, 2022

OWNER:

TANAY WATER DISTRICT

CONTRACTOR:

PROJECT TITLE:

CONSTRUCTION OF MAPUNSO PUMPING STATION

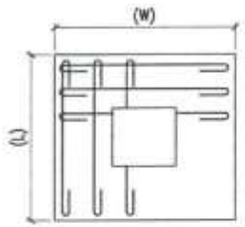
DRAWING TITLE:

STRUCTURAL
(FOUNDATION PLAN, FOOTINGS, BEAMS & SLAB SCHEDULE)

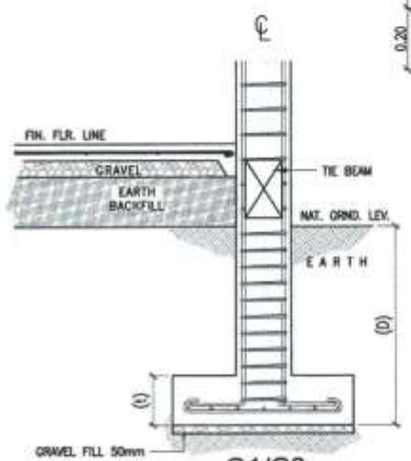
LOCATION:

Sitio Mapunso, Tanay Sampaloc Rd., Brgy. Plaza Aldea, Tanay, Rizal

DRAWING NO.	SHEET NO.	REV. NO.
	1 OF 6	00



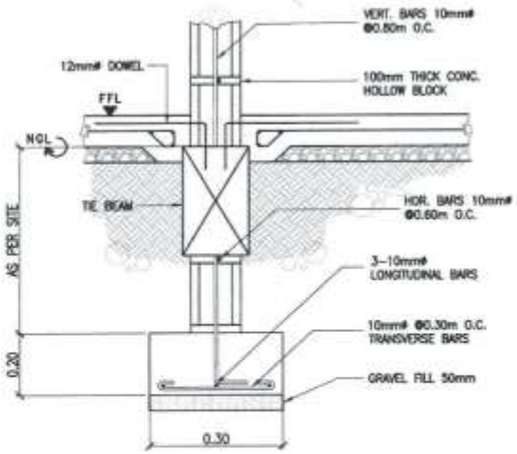
PLAN



C1/C2
F1/F2

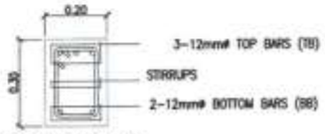
COLUMN FOOTING DETAIL

SCALE N T S



WALL FOOTING DETAIL

SCALE 1 : 15



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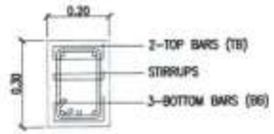
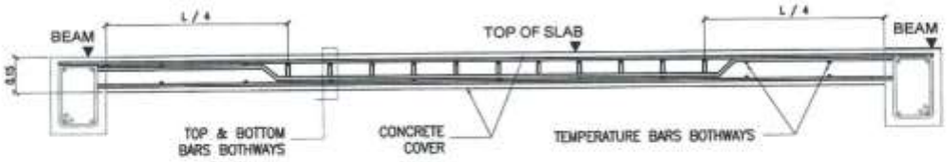


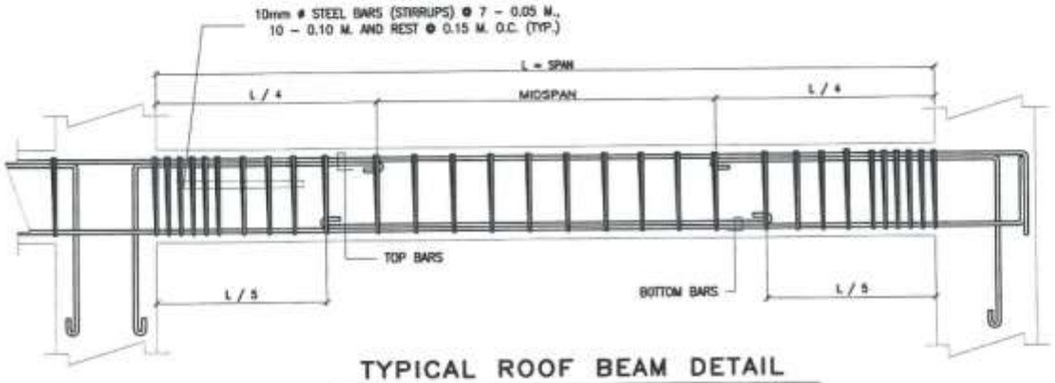
@ MIDSPAN

ROOF BEAM



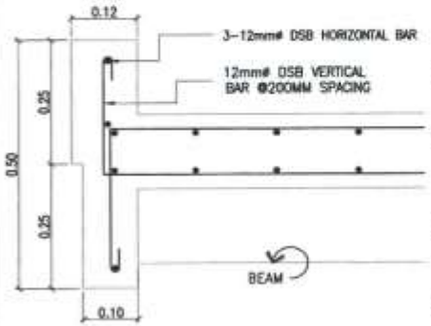
TYPICAL SLAB DETAIL

SCALE N T S



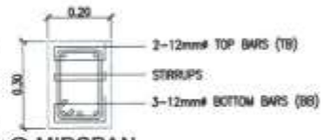
TYPICAL ROOF BEAM DETAIL

SCALE N T S



PARAPET DETAIL

SCALE 1 : 12



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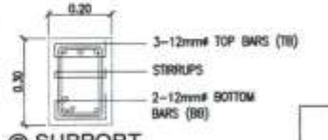
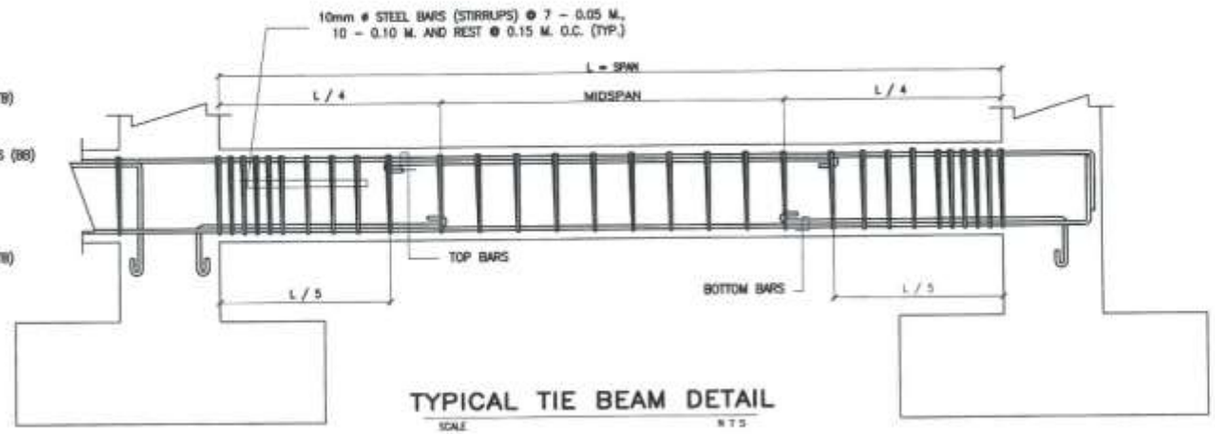


@ SUPPORT

TIE BEAM



TYPICAL TIE BEAM DETAIL

SCALE N T S

KEY PLAN

CIVIL ENGINEER:

ENGR. MARVIN A. BALAGOT

PRC REG NO.:	PTR NO.:
DATE ISSUED:	TIN NO.:

NOTES:

CADD BY:

MR. ALLEN B. SACRAMENTO
DRAFTING OPERATION - DRAFTSMAN

PREPARED BY:

ENGR. MARVIN A. BALAGOT
SUPERVISING ENGINEER

CHECKED BY:

ENGR. JERNET S. LORENZO
ENGINEERING DIVISION MANAGER II

RECOMMENDED FOR APPROVAL:

ENGR. ARMANDO H. BONGAT
ENGINEERING OPERATION DEPARTMENT MANAGER II

APPROVED BY:

MR. EMMANUEL C. CATOLOS
GENERAL MANAGER III

REVISION

NO.	DESCRIPTION	DATE
A	SUBMISSION FOR APPROVAL	

OWNER:

TANAY WATER DISTRICT

CONTRACTOR:

PROJECT TITLE:

CONSTRUCTION OF MAPUNSO PUMPING STATION

DRAWING TITLE:

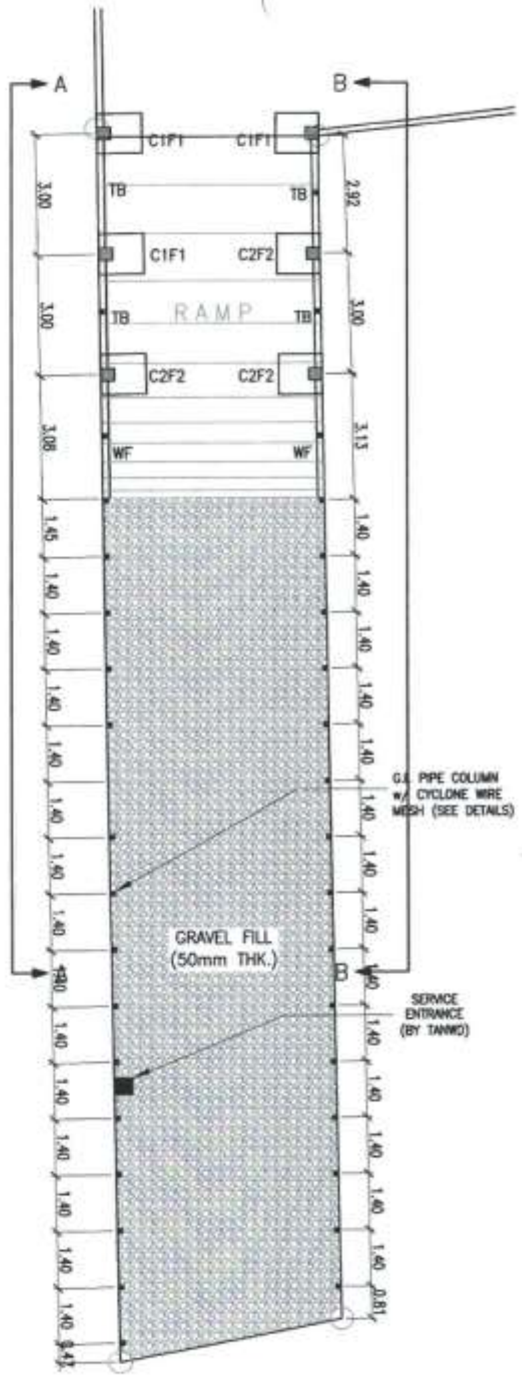
STRUCTURAL

(WALL FOOTING, COLUMN FOOTING, COLUMN SCHEDULE, BEAM & PARAPET DETAIL)

LOCATION:

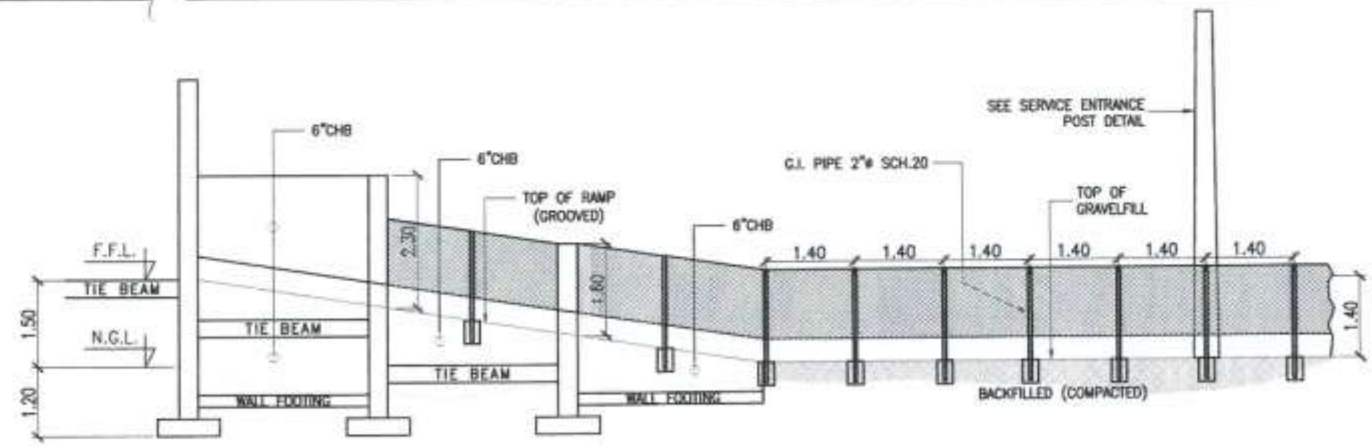
Sitio Mapunso, Tanay Sampaloc Rd., Brgy. Plaza Aldea, Tanay, Rizal

DRAWING NO.	SHEET NO.	REV. NO.
	2 OF 6	00



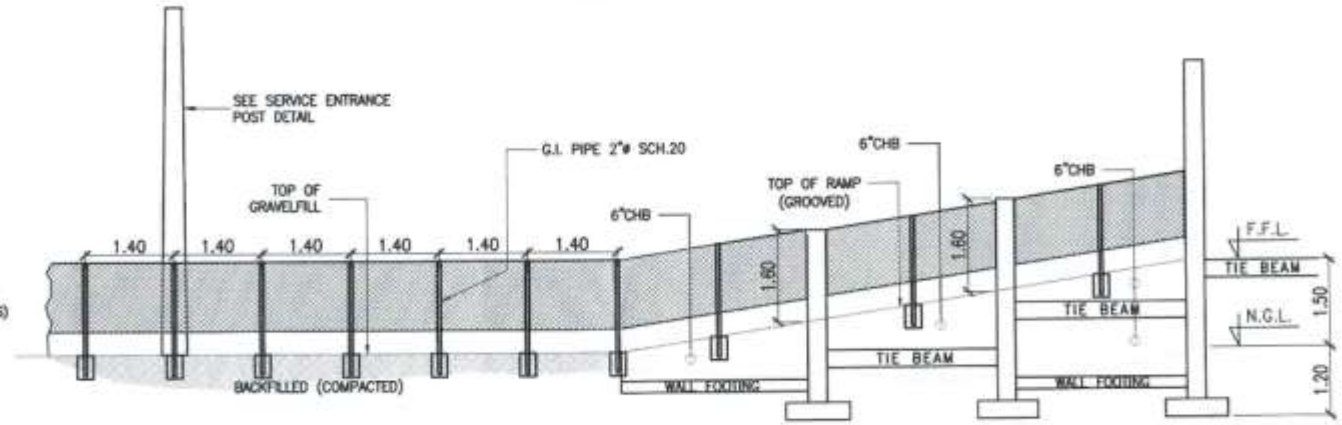
FOUNDATION PLAN (RAMP)

SCALE 1 : 100



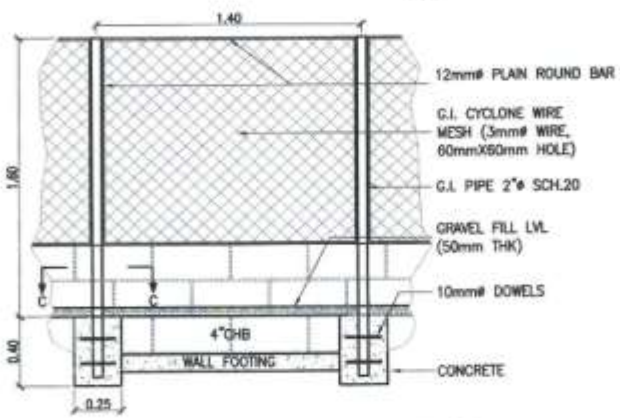
ELEVATION "A"

SCALE 1 : 90



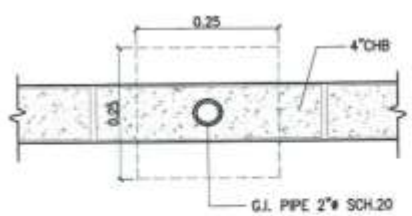
ELEVATION "B"

SCALE 1 : 90



STEEL FENCE DETAIL

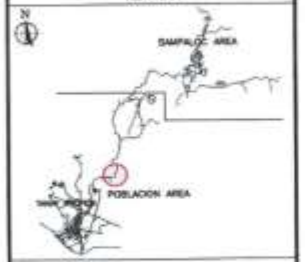
SCALE 1 : 90



SECTION "C"

SCALE 1 : 90

KEY PLAN



CIVIL ENGINEER:

ENGR. MARVIN A. BALAGOT

PRC REG NO.: PTR NO.:
DATE ISSUED: TIN NO.:

NOTES

CADD BY:

MR. ALLEN B. SACRAMENTO
AUTOCAD OPERATOR / DRAFTSMAN

PREPARED BY:

ENGR. MARVIN A. BALAGOT
SUPERVISING ENGINEER

CHECKED BY:

ENGR. JENNET S. LORENZO
ENGINEERING DIVISION MANAGER B

RECOMMENDED FOR APPROVAL:

ENGR. ARMANDO H. BONGAT
ENGINEERING & OPERATION DEPARTMENT MANAGER B

APPROVED BY:

MR. EMMANUEL C. CATOLOS
GENERAL MANAGER B

REVISION

NO.	DESCRIPTION	CAD BY	PREP BY	CKD BY	APRD BY	DATE
1	ISSUED FOR APPROVAL	ABS	MAB	JSL	AHB	ECC	

OWNER:

TANAY WATER DISTRICT

CONTRACTOR:

PROJECT TITLE:

CONSTRUCTION OF MAPUNSO PUMPING STATION

DRAWING TITLE:

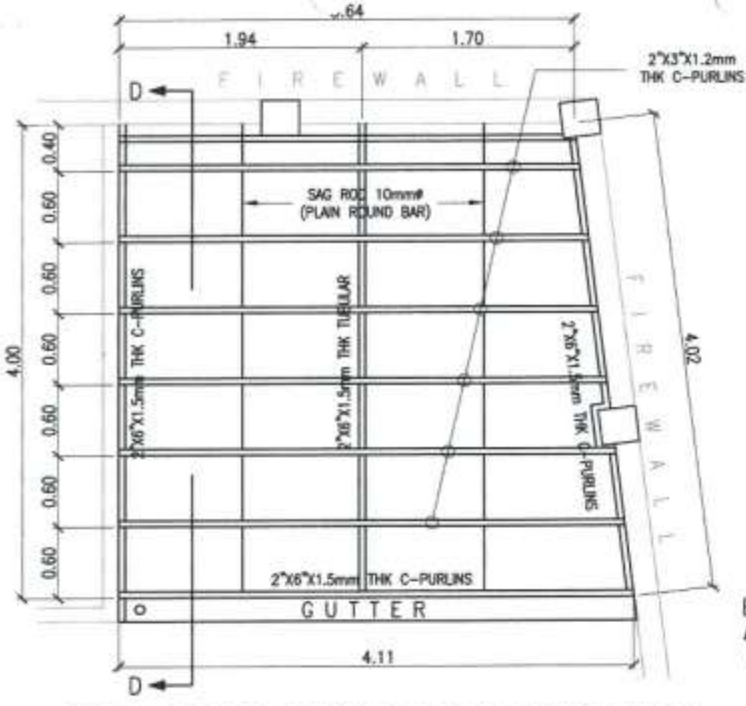
STRUCTURAL
(RAMP & STEEL FENCE DETAIL)

LOCATION:

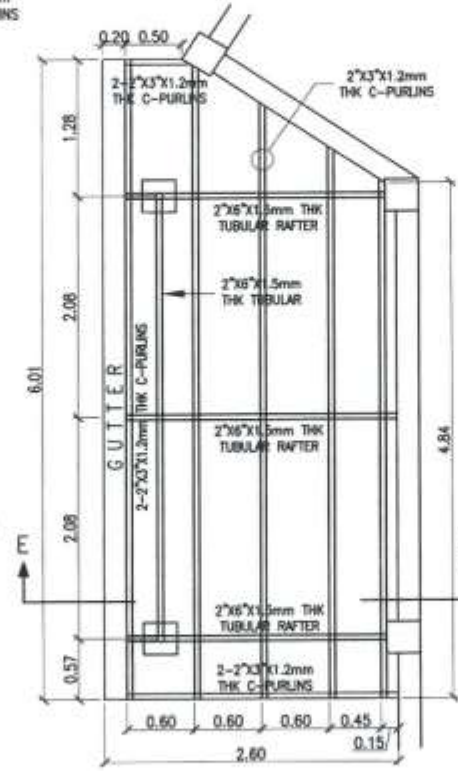
Sitio Mapunso, Tanay Sampaloc Rd., Brgy. Plaza Aldea, Tanay, Rizal

DRAWING NO.	SHEET NO.	REV. NO.
	3 OF 8	00

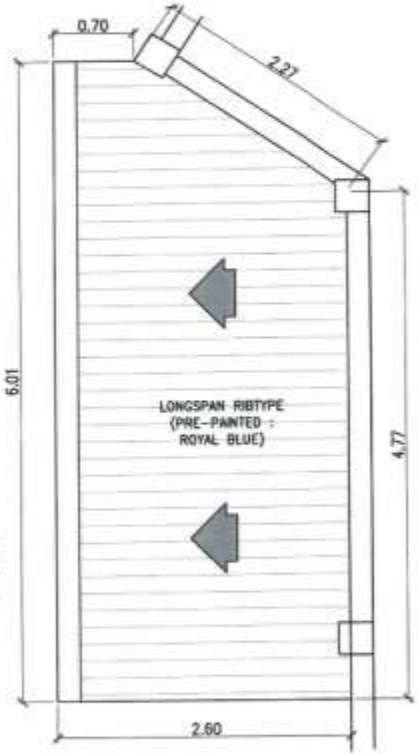
NOTE : ALL STEEL MEMBERS ARE PAINTED w/ QDE GRAY



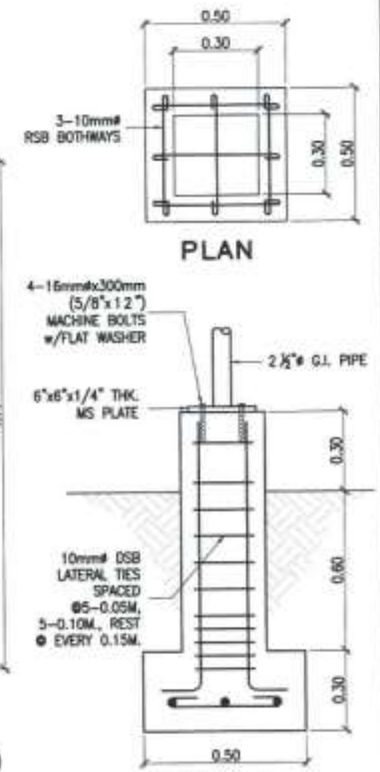
ROOF FRAMING PLAN (BOOSTER PUMP SHED)
SCALE 1 : 45



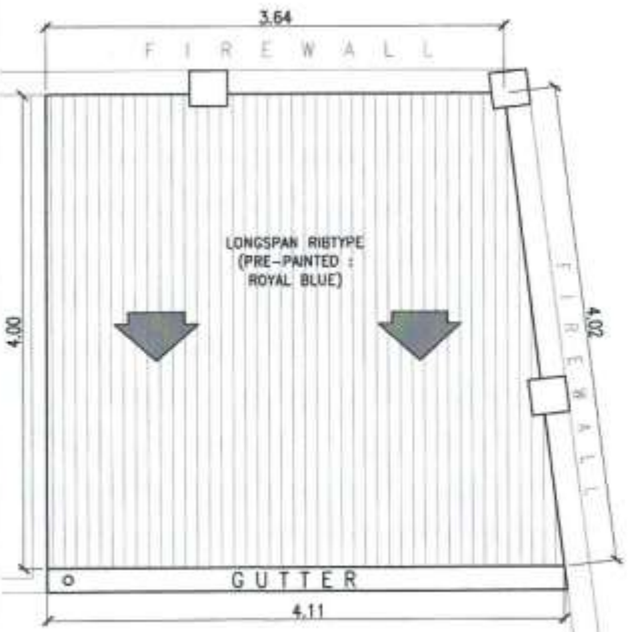
ROOF FRAMING PLAN (GENSET SHED)
SCALE 1 : 45



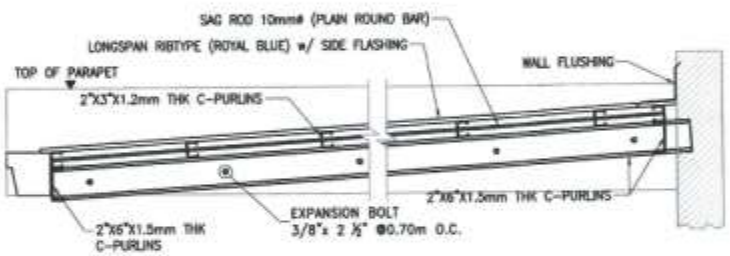
ROOF PLAN (GENSET SHED)
SCALE 1 : 45



CONCRETE PEDESTAL DETAIL
SCALE 1:20

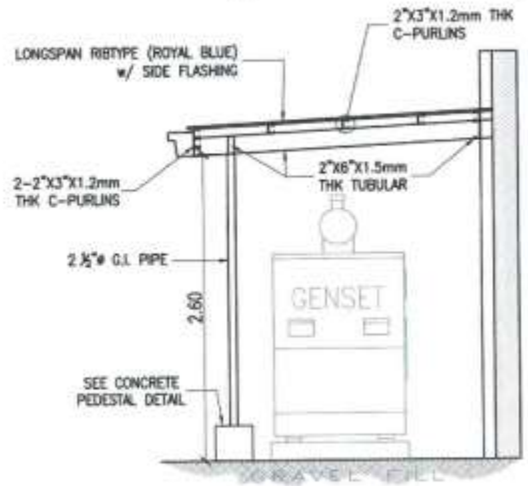


ROOF PLAN (BOOSTER PUMP SHED)
SCALE 1 : 45



SECTION "D"
SCALE 1 : 25

NOTE : ALL STEEL MEMBERS ARE PAINTED w/ QDE GRAY



SECTION "E"
SCALE 1 : 45

KEY PLAN

CIVIL ENGINEER:
ENGR. MARVIN A. BALAGOT
PRC REG NO.: PTR NO.:
DATE ISSUED: TIN NO.:

NOTES

CADD BY:
MR. ALLEN B. SACRAMENTO
CADD OPERATOR / DRAFTSMAN

PREPARED BY:
ENGR. MARVIN A. BALAGOT
SUPERVISING ENGINEER

CHECKED BY: 3/4/24
ENGR. JENNET S. LORENZO
ENGINEERING DIVISION MANAGER B

RECOMMENDED FOR APPROVAL: 3/5/24
ENGR. ARMANDO R. BONGAT
ENGINEERING & OPERATION DEPARTMENT MANAGER B

APPROVED BY:
MR. EMMANUEL C. CATOLOS
GENERAL MANAGER B

REVISION

NO.	DESCRIPTION	CAD BY	PREPD BY	CHKD BY	APPRD BY	DATE
A	ISSUED FOR APPROVAL	ABS	MAB	JSL	ARB	ECC

OWNER:
TANAY WATER DISTRICT

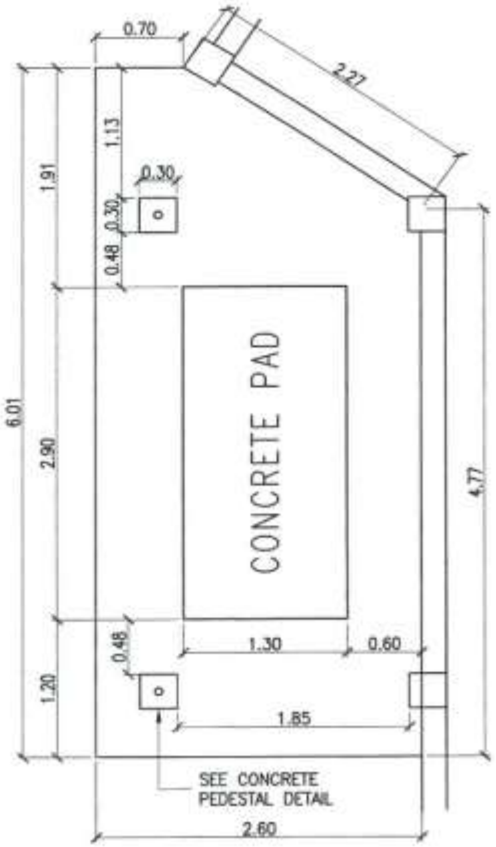
CONTRACTOR:

PROJECT TITLE:
CONSTRUCTION OF MAPUNSO PUMPING STATION

DRAWING TITLE:
STRUCTURAL
(GENSET & BOOSTER PUMP ROOFING DETAILS & CONCRETE PEDESTAL)

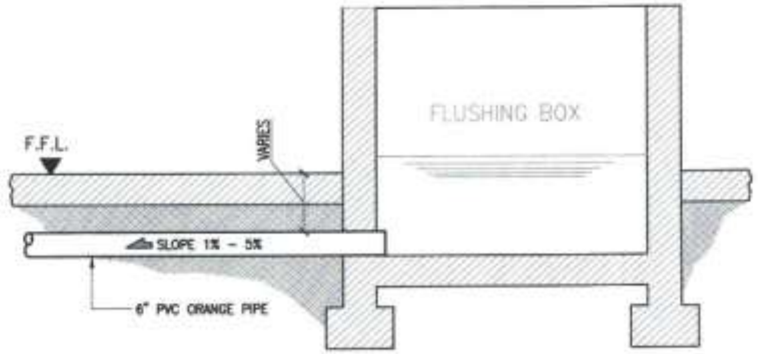
LOCATION:
Sitio Mapunso, Tanay Sampaloc Rd., Brgy. Plaza Aldea, Tanay, Rizal

DRAWING NO.	SHEET NO.	REV. NO.
	4 OF 6	00



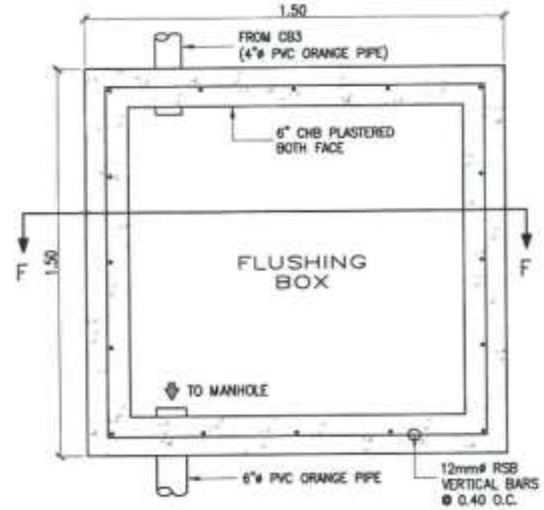
CONCRETE PAD & PEDESTAL LAYOUT

SCALE 1:50

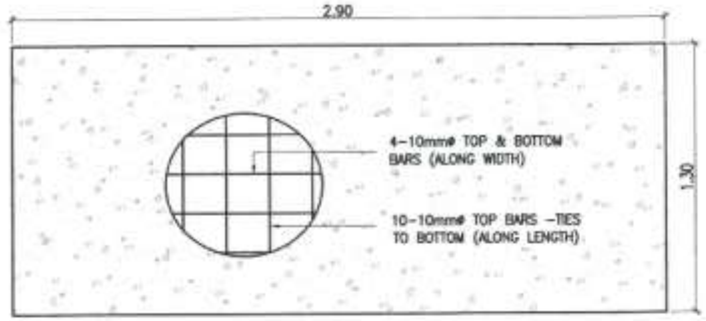


DRAINAGE SECTION

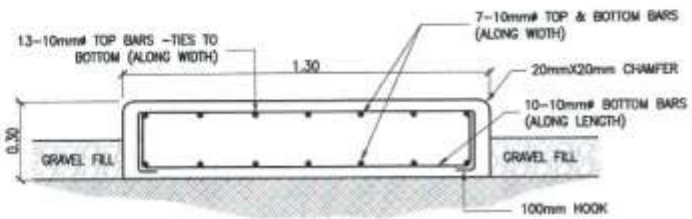
SCALE 1 : 25



PLAN



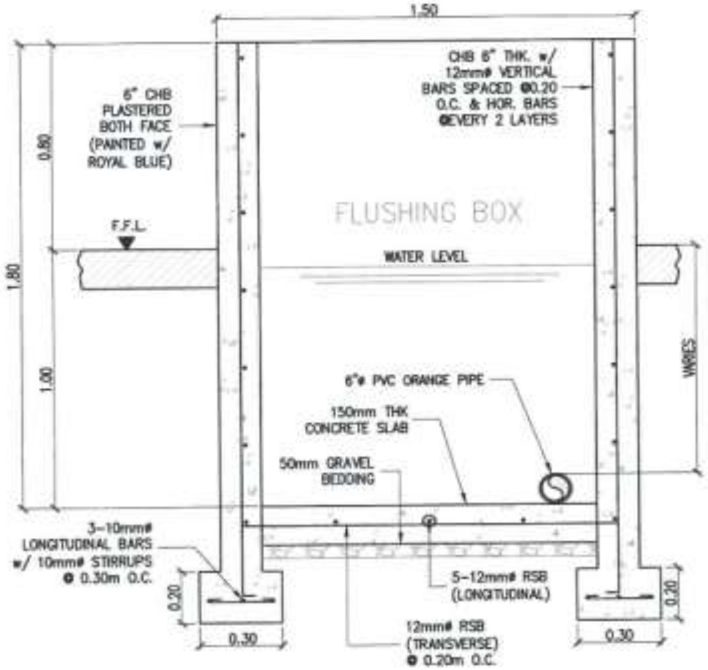
PLAN



SECTION

GENSET PAD

SCALE 1 : 20



SECTION "F"

FLUSHING BOX DETAIL

SCALE 1 : 20

KEY PLAN

CIVIL ENGINEER:

ENGR. MARVIN A. BALAGOT

PRC REG NO.: | PTR NO.:
DATE ISSUED: | TIN NO.:

NOTES

CADD BY:

MR. ALLEN B. SACRAMENTO
AUTOCAD OPERATOR (DRAFTSMAN)

PREPARED BY:

ENGR. MARVIN A. BALAGOT
SUPERVISING ENGINEER

CHECKED BY:

ENGR. JENNET S. LORENZO
ENGINEERING DIVISION MANAGER B

RECOMMENDED FOR APPROVAL:

ENGR. ARMANDO H. BONGAT
ENGINEERING & OPERATION DEPARTMENT MANAGER B

APPROVED BY:

MR. EMMANUEL C. CATOLOS
GENERAL MANAGER B

REVISION

OWNER:

TANAY WATER DISTRICT

CONTRACTOR:

PROJECT TITLE:

CONSTRUCTION OF
MAPUNSO PUMPING STATION

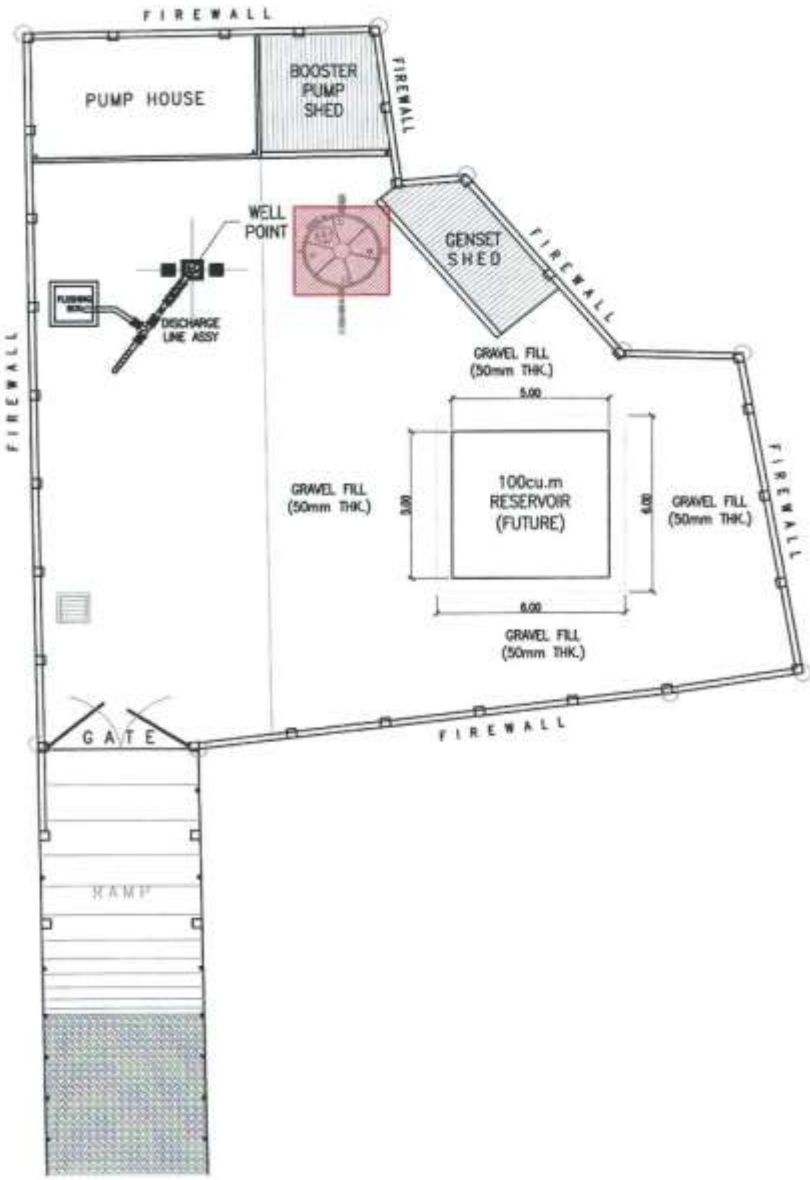
DRAWING TITLE:

STRUCTURAL
(GENSET PAD, DRAINAGE SECTION & FLUSHING BOX DETAIL)

LOCATION:

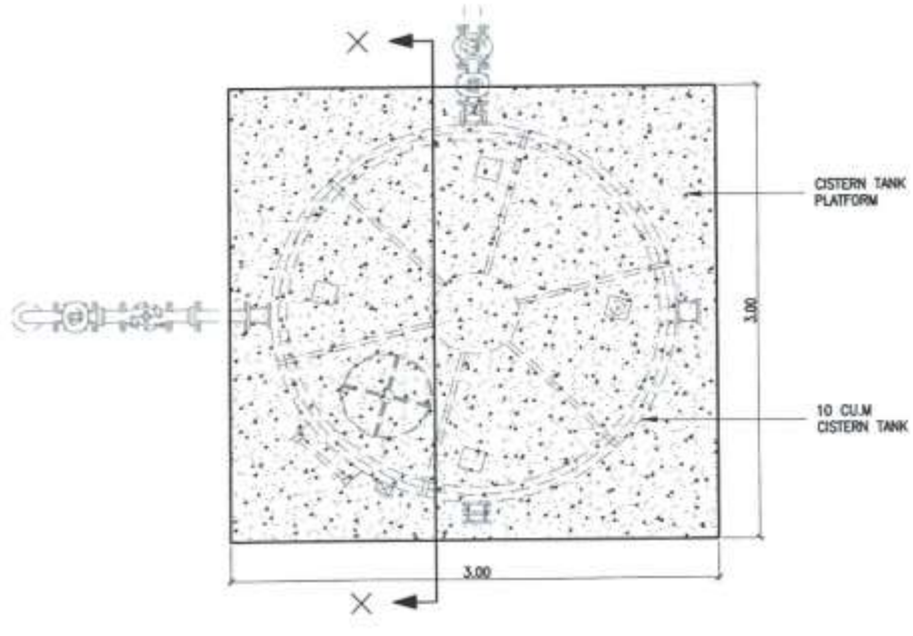
Sitio Mapunso, Tanay Sampaloc Rd., Brgy. Plaza Aldea, Tanay, Rizal

DRAWING NO.	SHEET NO.	REV. NO.
	5 OF 6	00



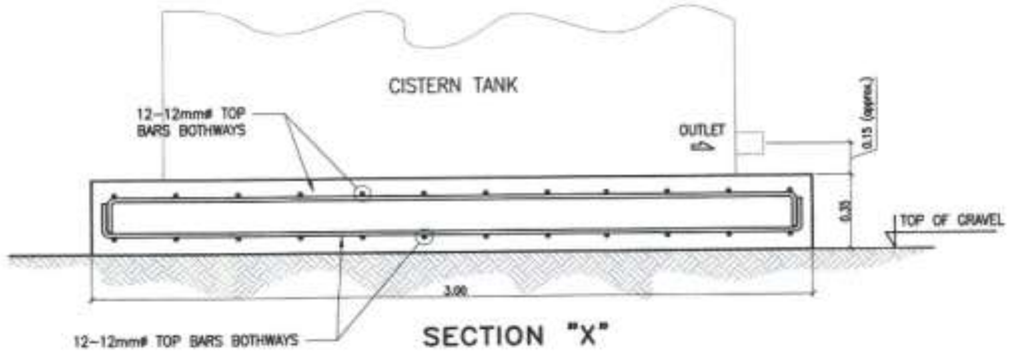
CISTERN TANK PLATFORM PLAN

SCALE 1 : 180



CISTERN TANK PLATFORM LAYOUT

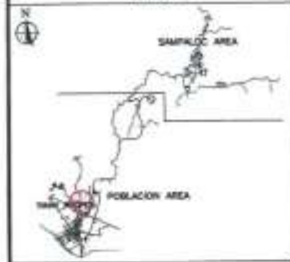
SCALE 1 : 35



CISTERN TANK PLATFORM REBAR DETAIL

SCALE 1 : 25

KEY PLAN



CIVIL ENGINEER:

ENGR. MARVIN A. BALAGOT

PRC REG NO.: | PTR NO.:
DATE ISSUED: | TIN NO.:

NOTES

CADD BY:

MR. ALLEN B. SACRAMENTO
AUTOCAD OPERATOR/DRAFTSMAN

PREPARED BY:

ENGR. MARVIN A. BALAGOT
SUPERVISING ENGINEER

CHECKED BY:

ENGR. JENNET S. LORENZO
ENGINEERING DIVISION MANAGER B

5/9/24

RECOMMENDED FOR APPROVAL:

ENGR. ARMANDO H. BONGAT
ENGINEERING & OPERATION DEPARTMENT MANAGER B

APPROVED BY:

MR. EMMANUEL C. CATOLOS
GENERAL MANAGER B

REVISION

NO.	DESCRIPTION	CAD BY	PREP BY	CHD BY	APRD BY		DATE
A	ISSUED FOR APPROVAL	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

OWNER:

TANAY WATER DISTRICT

CONTRACTOR:

PROJECT TITLE:

CONSTRUCTION OF ASTERIA PUMPING STATION

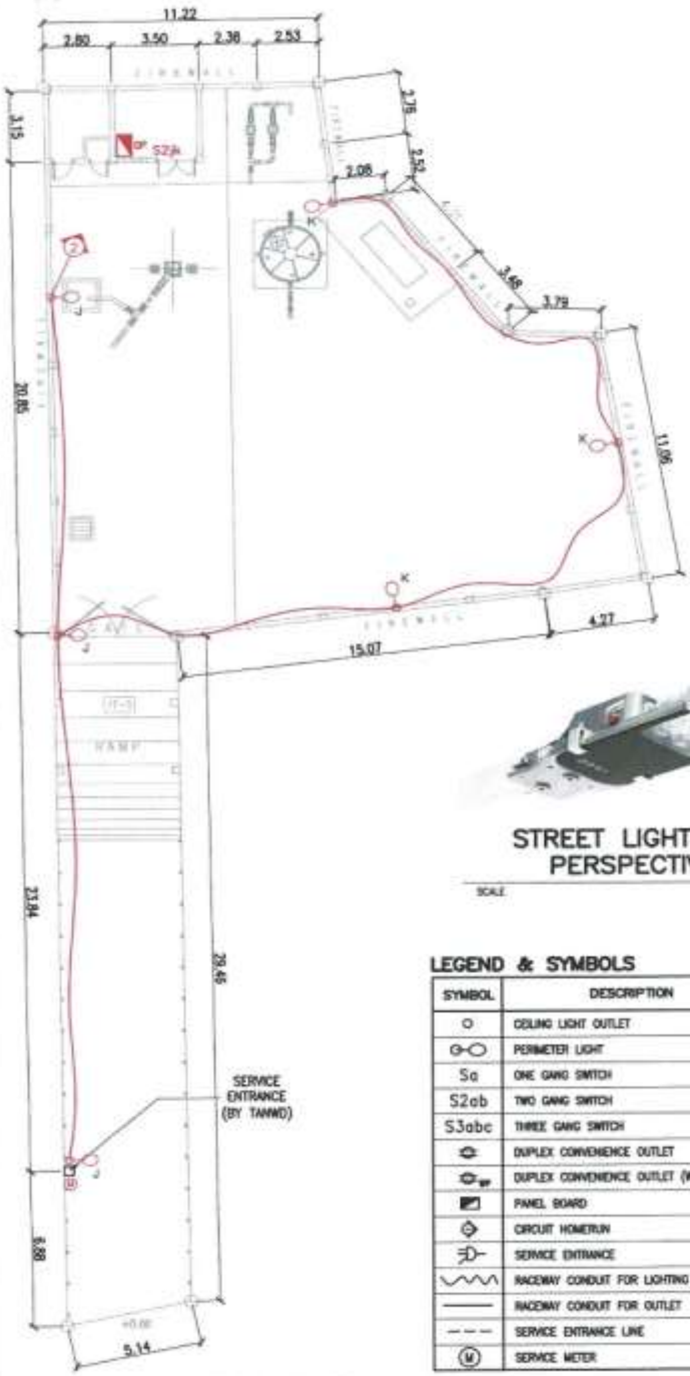
DRAWING TITLE:

STRUCTURAL
(CISTERN TANK PLATFORM LAYOUT & DETAIL)

LOCATION:

Asteria Subdivision, Pantay Rd., Brgy. Tandang Kutyo, Tanay, Rizal

DRAWING NO.	SHEET NO.	REV. NO.
	6 OF 6	00



LIGHTING POST LAYOUT

SCALE 1 : 100

STREET LIGHT LED PERSPECTIVE

SCALE N T S

TYPICAL LOAD COMPUTATION

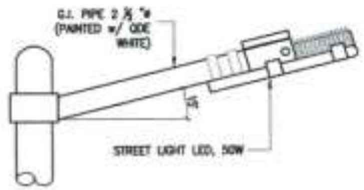
CTK NO.	LOAD DESCRIPTION	NO. OF OUTLET	WATT	VOLTAGE (V)		CURRENT (A)			CIRCUIT BREAKER (A)		SIZE OF WIRE & CONDUIT
				230	460	L1	L2	L3	1Ø	3Ø	
1	LIGHTING OUTLET	7	700	230		3.04	3.04		15		2-3.5mm², THHN CU.WIRE @ 15mm# PVC PIPE
2	LIGHTING OUTLET	6	600	230		2.61	2.61		15		2-3.5mm², THHN CU.WIRE @ 15mm# PVC PIPE
3	CONVENIENCE OUTLET	6	2160	230		9.39	9.39		20		2-3.5mm², THHN CU.WIRE @ 15mm# PVC PIPE
4	SPARE		1500	230			6.52	6.52	20		2-3.5mm², THHN CU.WIRE @ 15mm# PVC PIPE
5	SPARE		1500	230			6.52	6.52	20		2-3.5mm², THHN CU.WIRE @ 15mm# PVC PIPE
6	CHEMICAL FEEDER	1	40	230		0.17	0.17		15		2-3.5mm², THHN CU.WIRE @ 15mm# PVC PIPE
	ELECTRIC HOIST	1	1500	230		4.44	4.44	4.44		20	2-3.5mm², THHN CU.WIRE @ 15mm# PVC PIPE
	TOTAL (I_s)					35.49	34.43	32.19		60	3-3.5mm², THHN CU.WIRE @ 20mm# PVC PIPE
1	SUB. MOTOR	1	26000	230		76.87	76.87	76.87		150	3-38mm², STRANDED CU.WIRE @ 50mm# RSC
2	BOOSTER PUMP MOTOR	1	4350	230		12.71	12.71	12.71		60	2-3-8mm², STRANDED CU.WIRE @ 25mm# RSC
	TOTAL CURRENT PEP PHASE					125.07	124.01	121.77			
	COMPUTED MAXIMUM LOAD:	1.73 X 125.07 X 230 X 0.85 = 42.3 KW									

MAIN CONDUCTOR :

76.87A (1.25) + 12.71A + 35.49A = 144.29A
THEREFORE, USE 3-38mm² THHN, STRANDED CU. WIRE @ 50mm# RSC

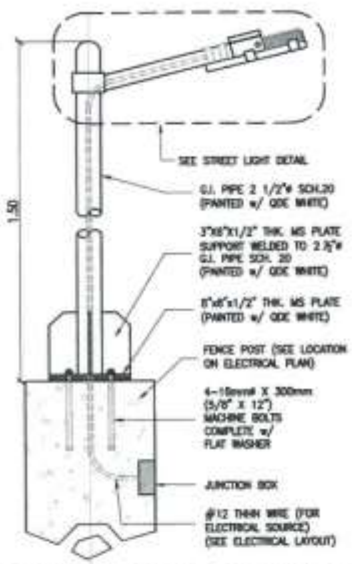
MAIN CIRCUIT BREAKER :

78.87A (2.5) + 12.71A + 35.49A = 240.38A
THEREFORE, USE 250A CIRCUIT BREAKER, 230V 3POLE



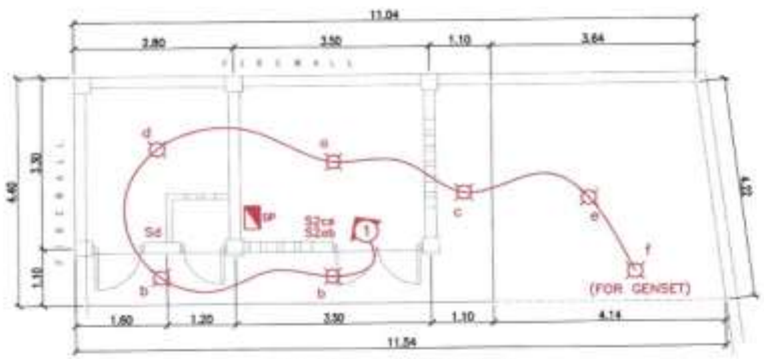
STREET LIGHT DETAIL

SCALE N T S



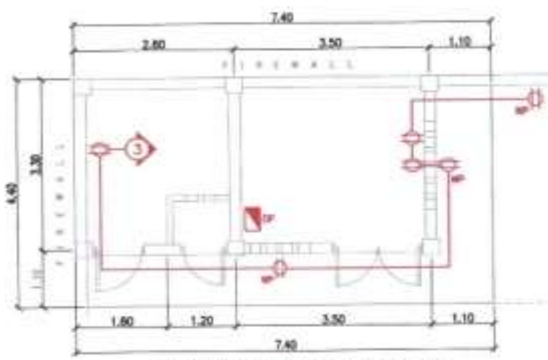
LIGHTING POST ELEVATION

SCALE N T S



LIGHTING LAYOUT

SCALE 1 : 100



CONVENIENCE LAYOUT

SCALE 1 : 100

LEGEND & SYMBOLS

SYMBOL	DESCRIPTION
○	CEILING LIGHT OUTLET
⊖○	PERIMETER LIGHT
Sa	ONE GANG SWITCH
S2ab	TWO GANG SWITCH
S3abc	THREE GANG SWITCH
⊖	DUPLEX CONVENIENCE OUTLET
⊖wp	DUPLEX CONVENIENCE OUTLET (WEATHERPROOF)
◩	PANEL BOARD
⊕	CIRCUIT HOMERUN
⊐D-	SERVICE ENTRANCE
∿∿∿	RACEWAY CONDUIT FOR LIGHTING
———	RACEWAY CONDUIT FOR OUTLET
- - -	SERVICE ENTRANCE LINE
Ⓜ	SERVICE METER

KEY PLAN

PROFESSIONAL ELECTRICAL ENGINEER:

PRC REG NO.: PTR NO.:
DATE ISSUED: TIN NO.:

NOTES

CADD BY:
MR. ALLEN B. SACRAMENTO
AUTOCAD OPERATOR / DRAFTSMAN

PREPARED BY:
ENGR. TEODULO C. CUSTODIO
WATER RESOURCES DIVISION MANAGER B

CHECKED BY:
ENGR. JENNET S. LORENZO
ENGINEERING DIVISION MANAGER B

RECOMMENDED FOR APPROVAL:
ENGR. ARMANDO H. BONGAT
ENGINEERING & OPERATION DEPARTMENT MANAGER B

APPROVED BY:
MR. EMMANUEL C. CATOLOS
GENERAL MANAGER B

REVISION

NO.	DESCRIPTION	CAD BY	PREP BY	CKD BY	APRD BY		DATE
A	ISSUED FOR APPROVAL	ABS	TCC	JSL	AHB	ECC	

OWNER:
TANAY WATER DISTRICT

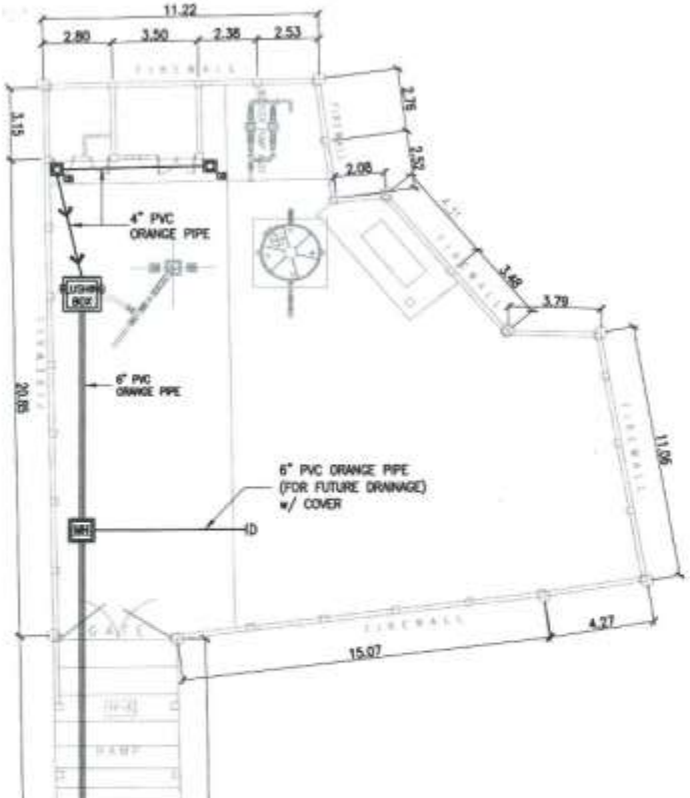
CONTRACTOR:

PROJECT TITLE:
CONSTRUCTION OF MAPUNSO PUMPING STATION

DRAWING TITLE:
ELECTRICAL
(LIGHTING, CONVENIENCE LAYOUT & LOAD COMPUTATION)

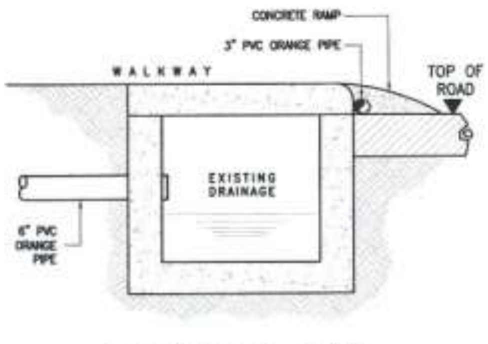
LOCATION:
Sitio Mapunso, Tanay Sampaloc Rd., Brgy. Plaza Aldea, Tanay, Rizal

DRAWING NO.	SHEET NO.	REV. NO.
	1 OF 1	00



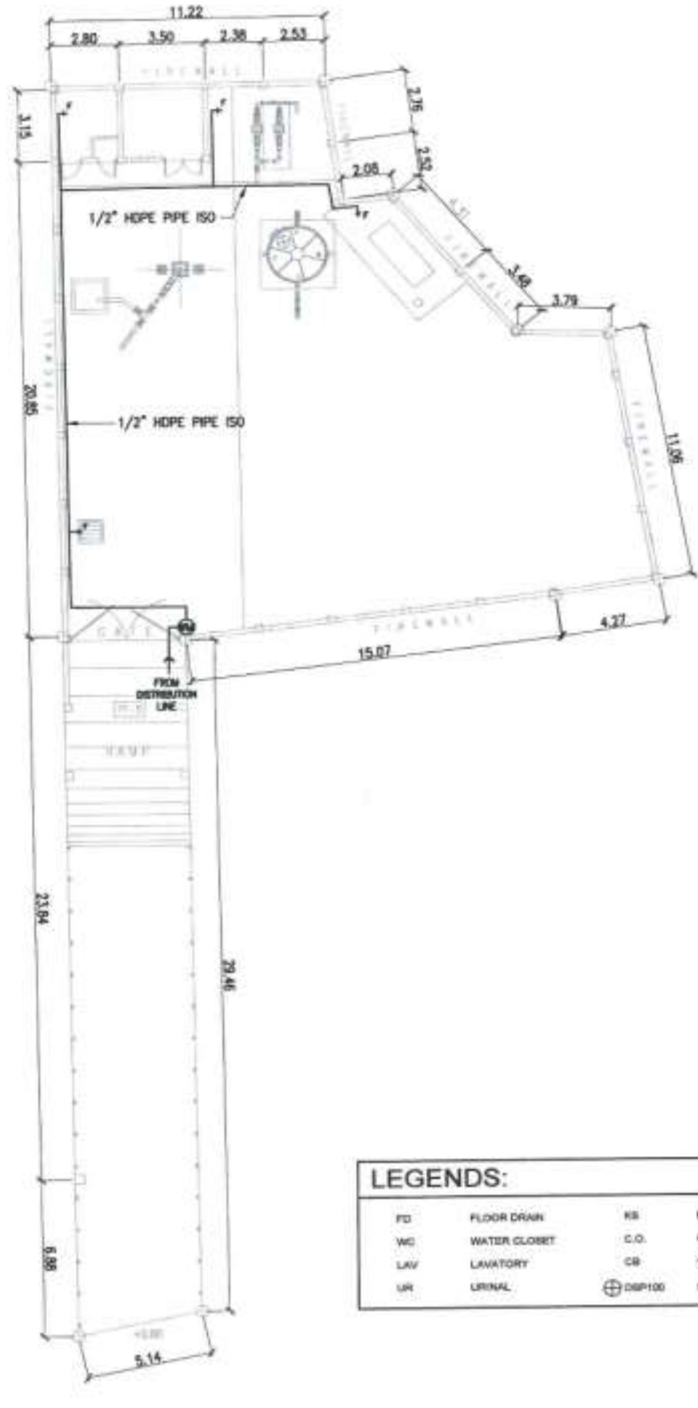
DRAINAGE & SANITARY LAYOUT

SCALE 1:120



SECTION "A"

SCALE NTS



WATER LINE LAYOUT

SCALE 1:120

MATERIAL SPECIFICATIONS:

1. ALL PLUMBING WORKS INCLUDED HEREIN SHALL BE DONE IN CONFORMITY WITH THE PHILIPPINE PLUMBING CODE, THE NATIONAL BUILDING CODE AND THE LAWS / ORDINANCES OF TANAY, RIZAL.
2. COORDINATE THE DRAWINGS WITH OTHER RELATED PLANS AND SPECIFICATIONS. THE ENGINEER AND/OR THE ARCHITECT SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCY FOUND HEREIN FOR CLARIFICATION AND/OR DECISION.
3. ALL PIPES SHALL BE INSTALLED AS INDICATED ON THE PLANS AND SPECIFICATIONS. ANY RELOCATION NECESSARY FOR THE PROPER EXECUTION OF WORK OF OTHER TRADES SHALL BE WITH PRIOR APPROVAL OF THE ENGINEER AND / OR THE ARCHITECT.
4. THE CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES IN SITE, THE EXACT LOCATION, DEPTH AN INVERT ELEVATIONS FOR PROPER COORDINATION WITH THE PROPOSED SANITARY AND STORM DRAINAGE LINES EFFLUENT/ DISPOSAL POINT AND, THE WATER SERVICE CONNECTION OR TAPPING POINT.
5. THE SLOPE FOR HORIZONTAL SANITARY AND STORM DRAINAGE LINES SHALL BE MAINTAINED @ ONE PERCENT (0.01) AND ONE-HALF PERCENT (0.005) MINIMUM RESPECTIVELY UNLESS NOTED OR SPECIFIED OTHERWISE.
6. PROVIDE AIR CHAMBER MADE OF CAPPED 300mm LONG VERTICAL EXTENSION PIPE TO ALL INDIVIDUAL WATER SUPPLY PIPE TO FIXTURES. THE SIZE OF THE WATER SUPPLY PIPE TO FIXTURE SHALL CONFORM WITH THE MANUFACTURER'S RECOMMENDATIONS.
7. ALL WATER LINES SHALL BE HYDROSTATICALLY TESTED @ 100 PSI, SANITARY AND STORM DRAINAGE LINES GRAVITY AND/OR FLOW TESTED FOR A MINIMUM DURATION OF TWO HOURS. THERE SHALL B NO MANIFEST OF LEAK OR LEAKAGES BEFORE PIPING ARE BURIED OR COVERED.
8. ALL WATER LINES SHALL BE DISINFECTED WITH AVAILABLE CHLORINE FOR TWENTY FOUR HOURS AN FLUSHED THOROUGHLY WITH CLEAN/POTABLE WATER BEFORE COMMISSIONING AND/OR NORMAL SYSTEM OPERATION.
9. ALL REVISIONS AND/OR ALTERATIONS MADE DURING CONSTRUCTION SHALL BE PROMPTLY AN ACCURATELY RECORDED. THE PLUMBING CONTRACTOR SHALL FURNISH THE OWNER TWO (2) SET OF WHITE PRINTS OF THE AS-BUILT PLANS AND THE ORIGINAL PLAN INCLUDING A COMPACT DISC (C.D.) COPY TO THE ARCHITECT.
10. PIPE SIZES OF WATER LINES ARE EXPRESSED IN INTERNAL (NOMINAL) DIAMETER THE SAME AS GALVANIZED IRON PIPES. IN CASE ANOTHER KIND OF MATERIAL (PIPE) IS SPECIFIED/USED, THE INTERNAL DIAMETER OF THE NEW PIPING SHALL CONFORM WITH THE REQUIRED SIZE SPECIFIED IN THE PLANS AND/OR SPECIFICATIONS.

MATERIAL SPECIFICATIONS:

SANITARY DRAINAGE LINES (SEWER/WASTE AND VENT)		POLYVINYL CHLORIDE (PVC) PIPES & FITTINGS, SERIES-1000 A/OR CLASS-35, BELL & SPIGOT, SOLVENT CEMENT JOINTS, ASTM-D2729 AND/OR ISO-4435. BRAND: "NELTEX" OR APPROVED EQUAL.
STORM DRAINAGE LINES (DOWNSPOUTS, DRAIN PIPES, COLLECTOR PIPES, ETC.)		150mm & SMALLER: POLYVINYL CHLORIDE (PVC) PIPES & FITTINGS, SERIES-1000 A/OR CLASS-35, BELL & SPIGOT/SOLVENT CEMENT JT., ASTM-D2729 AND/OR ISO-4435. BRAND: "NELTEX" OR APPROVED EQUAL.
		200mm AND LARGER: CONCRETE AND/OR REINFORCED CONCRETE PIPES, TONGUE AND GROOVED CEMENT MORTAR JOINTS, ASTM-C14-82 OR ASTM-C76-85. BRAND: "CUSTOMBUILT" OR APPROVED EQUAL.
WATER SUPPLY & DISTRIBUTION LINES (COLD & HOT)		CROSS-LINKED HIGH DENSITY POLYETHYLENE PIPES, COMPRESSION SLEEVE TYPE JOINTS, CONFORMING TO DIN 16892 AND DIN 16893. BRAND: REHAU OR APPROVED EQUAL.
		COMPRESSION SLEEVE TYPE FITTINGS/JOINTS. POLISHED BRONZE. BRAND: "REHAU" OR APPROVED EQUAL.
CONTROL VALVES (GATE VALVES, CHECK VALVES, ETC.)		BRONZE BODY, SCREWED FEMALE CONNECTION. 200 # W.O.G. MINIMUM RATING BRAND: "CRANE", "KITZ" OR APPROVED EQUAL.
ROOF DRAINS, DECK DRAINS, GUTTER DRAINS	REINF. CONC. GUTTER OR ROOF DECK	CAST IRON BODY, STAINLESS STEEL OR BRASS DOME TYPE STRAINER WITH STAINLESS STEEL MOUNTING/LOCK SCREWS. BRAND: "METMA" OR APPROVED EQUAL.
	STAINLESS STEEL OR GALVANIZED STEEL GUTTER	STAINLESS STEEL OR BRONZE WIRE BASKET CONTRACTOR SHALL SUBMIT "FABRICATED" SAMPLE FOR APPROVAL.
FLOOR DRAINS/ SHOWER DRAINS, ETC. (FD's/SD's)		CAST IRON BODY WITH 100mm X 100mm BRASS OR STAINLESS STEEL STRAINER WITH STAINLESS STEEL MOUNTING/LOCK SCREWS. BRAND: "METMA", "HAA" OR APPROVED EQUAL.
PLUMBING FIXTURES/ EQUIPMENT		REFER TO THE ARCHITECTURAL SPECIFICATIONS REGARDING PLUMBING FIXTURES AND EQUIPMENT.

LEGENDS:

FD	FLOOR DRAIN	KS	KITCHEN SINK		GATE VALVE
WC	WATER CLOSET	C.O.	CLEAN OUT		SEWER LINE
LAV	LAVATORY	CB	CATCH BASIN		CLEAN WATER LINE
UR	URINAL	DSP100	DOWNSPOUT PIPE 100mm	HP	HIGH POINT

KEY PLAN

MASTER PLUMBER:

ENGR. ... CUSTODIO

PRC REG NO.: 0047947 | PTR NO.: 21047564

DATE ISSUED: 1-2-24 | TIN NO.: 252-090-472

NOTES

CADD BY:

MR. ALLEN B. SACRAMENTO

PREPARED BY:

ENGR. NAPOLEON T. CUSTODIO

PRINCIPAL ENGINEER

CHECKED BY:

ENGR. JENNET S. LORENZO 3/7/24

ENGINEERING DIVISION MANAGER B

RECOMMENDED FOR APPROVAL:

ENGR. ARMANDO H. BONGAT

ENGINEERING & OPERATION DEPARTMENT MANAGER B

APPROVED BY:

MR. EMMANUEL C. CATOLOS

GENERAL MANAGER B

REVISION

NO.	DESCRIPTION	CHK BY	PREP BY	CKD BY	APPR BY	DATE
A	ISSUED FOR APPROVAL	ABS	NTC	JSL	AHB	ECC

OWNER:

TANAY WATER DISTRICT

CONTRACTOR:

PROJECT TITLE:

CONSTRUCTION OF MAPUNSO PUMPING STATION

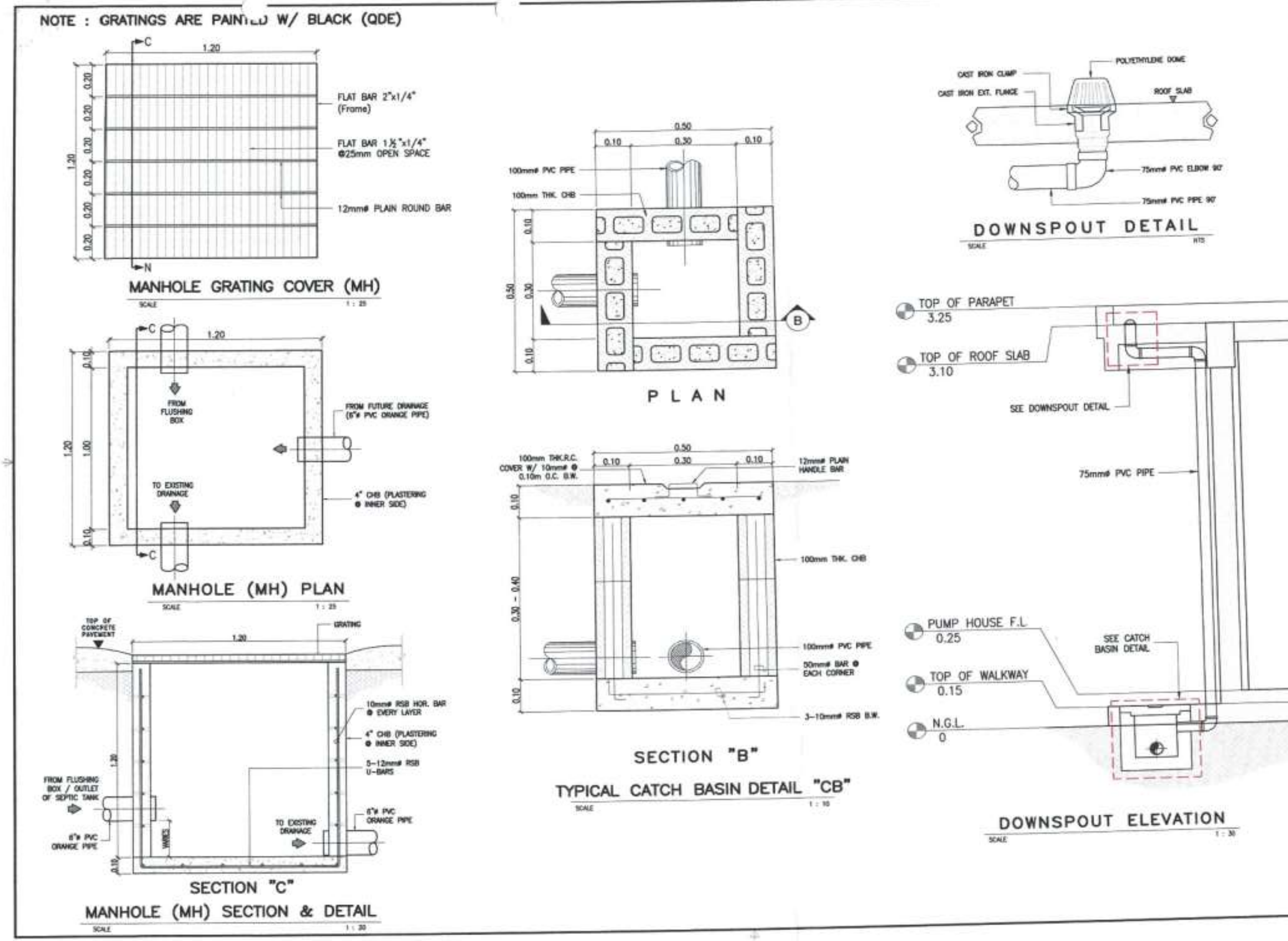
DRAWING TITLE:

PLUMBING LAYOUT

LOCATION:

Sitio Mapunso, Tanay Sampaloc Rd., Brgy. Plaza Aldea, Tanay, Rizal

DRAWING NO.	SHEET NO.	REV. NO.
	1 OF 2	00



MASTER PLUMBER:
ENGR. N... CUSTODIO
PRC REG NO.: 007997 PTR NO.: 2104 7526
DATE ISSUED: 1-2-24 TIN NO.: 258-090-982

NOTES

CADD BY:
MR. ALLEN ... SACRAMENTO

PREPARED BY:
ENGR. ... CUSTODIO

CHECKED BY:
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ENGINEERING DIVISION MANAGER B

RECOMMENDED FOR APPROVAL:
ENGR. ARMANDO H. BONGAT
ENGINEERING ... DEPARTMENT MANAGER B

APPROVED BY:
MR. EMMANUEL C. CATOLOS
GENERAL MANAGER B

REVISION

NO.	DESCRIPTION	CAD BY	PREP BY	CHKD BY	APPROVED BY		DATE
A	ISSUED FOR APPROVAL						

OWNER:
TANAY WATER DISTRICT

CONTRACTOR:

PROJECT TITLE:
CONSTRUCTION OF MAPUNSO PUMPING STATION

DRAWING TITLE:
MANHOLE, CATCH BASIN & DOWNSPOUT DETAILS

LOCATION:
Sitio Mapunso, Tanay Sampaloc Rd., Brgy. Plaza Aldea, Tanay, Rizal

DRAWING NO.	SHEET NO.	REV. NO.
	2 OF 2	00

Section VIII. Bill of Quantities

BILL OF QUANTITIES

Pay Item No.	**Description**	Unit	Qty.	**Unit Price** (Pesos)	**Amount** (Pesos)
1.0: General Requirements					
1.A	Fencing Permit, Building Permit & Occupancy Permit	lot	1.00	In words: Pesos _____ _____ _____ _____ _____ In figures: Php	In words: Pesos _____ _____ _____ _____ _____ In figures: Php

1.B	Fabrication of Project Billboard	lot	1.00	In words: Pesos _____ _____ _____ _____ _____ In figures: Php	In words: Pesos _____ _____ _____ _____ _____ In figures: Php
1.C	Health and Safety	lot	1.00	In words: Pesos _____ _____ _____ _____ _____ In figures: Php	In words: Pesos _____ _____ _____ _____ _____ In figures: Php
				SUB-TOTAL FOR PART 1:	
2.0: Mobilization / Demobilization					
	Mobilization / Demobilization	lot	1.00	In words: Pesos _____ _____ _____ _____ _____ In figures: Php	In words: Pesos _____ _____ _____ _____ _____ In figures: Php
				SUB-TOTAL FOR PART 2:	
3.0 Temporary Facilities					

	Temporary Facilities	lot	1.00	In words: Pesos _____ _____ _____ _____ _____	In words: Pesos _____ _____ _____ _____ _____
				SUB-TOTAL FOR PART 3:	
4.0 Civil with Related Works					
4.A	Clearing Works	lot	1.00	In words: Pesos _____ _____ _____ _____ _____ In figures: Php	In words: Pesos _____ _____ _____ _____ _____ In figures: Php
4.B	Construction of Pump House	sqm	45.50	In words: Pesos _____ _____ _____ _____ _____ In figures: Php	In words: Pesos _____ _____ _____ _____ _____ In figures: Php
4.C	Construction of Concrete Fence & Steel Gate	lm	89.50	In words: Pesos _____ _____ _____ _____ _____ In figures: Php	In words: Pesos _____ _____ _____ _____ _____ In figures: Php

4.D	Construction of Fence at Right of Way	lm	60.00	In words: Pesos _____ _____ _____ _____ _____ In figures: Php	In words: Pesos _____ _____ _____ _____ _____ In figures: Php
4.E	Construction of Booster Pump Pedestal, Genset Pad & Shed	lot	1.00	In words: Pesos _____ _____ _____ _____ _____ In figures: Php	In words: Pesos _____ _____ _____ _____ _____ In figures: Php
4.F	Construction of Cistern Tank Platform	cum	3.15	In words: Pesos _____ _____ _____ _____ _____ In figures: Php	In words: Pesos _____ _____ _____ _____ _____ In figures: Php
4.G	Drainage Works & Flushing Box	lot	1.00	In words: Pesos _____ _____ _____ _____ _____ In figures: Php	In words: Pesos _____ _____ _____ _____ _____ In figures: Php

4.H	Concreting of Ground & Ramp, Embankment & Gravel Filling	lot	1.00	In words: Pesos _____ _____ _____ _____ _____ In figures: Php	In words: Pesos _____ _____ _____ _____ _____ In figures: Php
4.I	Electrical Works	lot	1.00	In words: Pesos _____ _____ _____ _____ _____ In figures: Php	In words: Pesos _____ _____ _____ _____ _____ In figures: Php
4.J	Painting Works	sqm	936.00	In words: Pesos _____ _____ _____ _____ _____ In figures: Php	In words: Pesos _____ _____ _____ _____ _____ In figures: Php
4.K	Fabrication & Installation of Stainless Steel TanWD Logo & Signage	lot	1.00	In words: Pesos _____ _____ _____ _____ _____ In figures: Php	In words: Pesos _____ _____ _____ _____ _____ In figures: Php
				SUB-TOTAL FOR PART 4:	
				Total Amount in Figures	

Total Amount in words: _____ _____ _____

Submitted by: Contract Duration: _____ Calendar Days

Name_____in the capacity of _____

Signed_____Date _____

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

DETAILED ESTIMATES

PROJECT:	Proposed Construction of Mapunso Pumping Station (Civil Works)	DATE:	
LOCATION:	Sampaloc Road Sitio Mapunso, Brgy. Plaza Aldea, Tanay, Rizal	REV. NO:	

ITEM NO.	NAME OF ITEM	QUANTITY	UNIT OF MEASUREMENT
1.a	Permits and Licenses	1.00	lot

	NO.	NAME AND SPECIFICATIONS OF MATERIALS	QTY	UNIT	UNIT RATE	COST
MATERIALS						
	1.0	Fencing Permit, Building Permit & Occupancy Permit		lot		-
					TOTAL of MATERIALS:	-

	NO.	NAME AND CAPACITY OF EQUIPMENT / TOOLS	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
EQUIPMENT						
					TOTAL of EQUIPMENT:	-

	NO.	DESIGNATION OF PERSONNEL	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
LABOR						
					TOTAL of LABOR:	-

ESTIMATED DIRECT COST (EDC)	
OVERHEAD CONTINGENCIES & MISC. 15% (OCM)	
CONTRACTOR'S PROFIT 10% (CP)	
VALUE ADDED TAX 5% of (EDC+OCM+CP)	
ESTIMATED INDIRECT COST	
TOTAL COST	-
UNIT COST	-
ADJUSTED TOTAL COST	

Prepared by:

DETAILED ESTIMATES

PROJECT:	Proposed Construction of Mapunso Pumping Station (Civil Works)	DATE:	
LOCATION:	Sampaloc Road Sitio Mapunso, Brgy. Plaza Aldea, Tanay, Rizal	REV. NO:	

ITEM NO.	NAME OF ITEM	QUANTITY	UNIT OF MEASUREMENT
1.b	Fabrication of Project Billboard	1.00	lot

	NO.	NAME AND SPECIFICATIONS OF MATERIALS	QTY	UNIT	UNIT RATE	COST
MATERIALS						
	1.0	Tarpaulin 4'x8'		pc		-
	2.0	Good Lumber 2"x1/2"x8' (Lintel)		pc		-
	3.0	Coco Lumber 2"x2"x10"		pc		-
	4.0	CWN #4		kg		-
	5.0	CWN #3		kg		-
	6.0	CWN 1 1/2"		kg		-
	7.0	GI Tie Wire #16		kg		-
					TOTAL of MATERIALS:	-

	NO.	NAME AND CAPACITY OF EQUIPMENT / TOOLS	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
EQUIPMENT						
					TOTAL of EQUIPMENT:	-

	NO.	DESIGNATION OF PERSONNEL	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
LABOR						
	1.0	Skilled				-
	2.0	Labor / Helper				-
					TOTAL of LABOR:	-

ESTIMATED DIRECT COST (EDC)	-
OVERHEAD CONTINGENCIES & MISC. 15% (OCM)	-
CONTRACTOR'S PROFIT 10% (CP)	-
VALUE ADDED TAX 5% of (EDC+OCM+CP)	-
ESTIMATED INDIRECT COST	-
TOTAL COST	-
UNIT COST	-
ADJUSTED TOTAL COST	

Prepared by:

DETAILED ESTIMATES

PROJECT:	Proposed Construction of Mapunso Pumping Station (Civil Works)	DATE:	
LOCATION:	Sampaloc Road Sitio Mapunso, Brgy. Plaza Aldea, Tanay, Rizal	REV. NO:	

ITEM NO.	NAME OF ITEM	QUANTITY	UNIT OF MEASUREMENT
1.c	Health & Safety	1.00	lot

MATERIALS

NO.	NAME AND SPECIFICATIONS OF MATERIALS	QTY	UNIT	UNIT RATE	COST
1.0	Hard Hat (1pc: White, 5pcs:Yellow)		pcs		-
2.0	Safety Vest (V-Type)		pcs		-
3.0	Safety Glass (Clear)		pcs		-
4.0	Cotton Gloves with Orange Latex Rubber Padding		pairs		-
				TOTAL of MATERIALS:	-

EQUIPMENT

NO.	NAME AND CAPACITY OF EQUIPMENT / TOOLS	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
				TOTAL of EQUIPMENT:	-

LABOR

NO.	DESIGNATION OF PERSONNEL	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
				TOTAL of LABOR:	-

ESTIMATED DIRECT COST (EDC)	-
OVERHEAD CONTINGENCIES & MISC. 15% (OCM)	-
CONTRACTOR'S PROFIT 10% (CP)	-
VALUE ADDED TAX 5% of (EDC+OCM+CP)	-
ESTIMATED INDIRECT COST	-
TOTAL COST	-
UNIT COST	-
ADJUSTED TOTAL COST	

Prepared by:

DETAILED ESTIMATES

PROJECT:	Proposed Construction of Mapunso Pumping Station (Civil Works)	DATE:	
LOCATION:	Sampaloc Road Sitio Mapunso, Brgy. Plaza Aldea, Tanay, Rizal	REV. NO:	

ITEM NO.	NAME OF ITEM	QUANTITY	UNIT OF MEASUREMENT
2.0	Mobilization/Demobilization	1.00	lot

MATERIALS

NO.	NAME AND SPECIFICATIONS OF MATERIALS	QTY	UNIT	UNIT RATE	COST
				TOTAL of MATERIALS:	-

EQUIPMENT

NO.	NAME AND CAPACITY OF EQUIPMENT / TOOLS	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
				TOTAL of EQUIPMENT:	-

LABOR

NO.	DESIGNATION OF PERSONNEL	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
				TOTAL of LABOR:	-

ESTIMATED DIRECT COST (EDC)	-
OVERHEAD CONTINGENCIES & MISC. 15% (OCM)	-
CONTRACTOR'S PROFIT 10% (CP)	-
VALUE ADDED TAX 5% of (EDC+OCM+CP)	-
ESTIMATED INDIRECT COST	-
TOTAL COST	-
UNIT COST	-
ADJUSTED TOTAL COST	

Prepared by:

DETAILED ESTIMATES

PROJECT:	Proposed Construction of Mapunso Pumping Station (Civil Works)	DATE:	
LOCATION:	Sampaloc Road Sitio Mapunso, Brgy. Plaza Aldea, Tanay, Rizal	REV. NO:	

ITEM NO.	NAME OF ITEM	QUANTITY	UNIT OF MEASUREMENT
3.0	Temporary Facilities	1.00	lot

	NO.	NAME AND SPECIFICATIONS OF MATERIALS	QTY	UNIT	UNIT RATE	COST
MATERIALS						
	1.0	Coco Lumber 2"x3"x12'		pcs		-
	2.0	Corrugated GI Sheet Ga 26 (10ft/pc)		pcs		-
	3.0	Phenolic Board, 1/2"x4'x8'		pcs		-
	4.0	Coco Lumber 2"x2"x12'		pcs		-
	5.0	CWN #4		kgs		-
	6.0	CWN #3		kgs		-
	7.0	CWN 1 1/2"		kgs		-
	8.0	Umbrella Nail 3"		kgs		-
	9.0	Electrical (Temporary)		lot		-
	10.0	Water (Temporary)		lot		-
					TOTAL of MATERIALS:	-

	NO.	NAME AND CAPACITY OF EQUIPMENT / TOOLS	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
EQUIPMENT						
			-	-	-	-
					TOTAL of EQUIPMENT:	-

	NO.	DESIGNATION OF PERSONNEL	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
LABOR						
	1.0	Supervisor / Foreman				-
	2.0	Skilled				-
	3.0	Labor / Helper				-
					TOTAL of LABOR:	-

ESTIMATED DIRECT COST (EDC)	-
OVERHEAD CONTINGENCIES & MISC. 15% (OCM)	-
CONTRACTOR'S PROFIT 10% (CP)	-
VALUE ADDED TAX 5% of (EDC+OCM+CP)	-
ESTIMATED INDIRECT COST	-
TOTAL COST	-
UNIT COST	-
ADJUSTED TOTAL COST	

Prepared by:

DETAILED ESTIMATES

PROJECT:	Proposed Construction of Mapunso Pumping Station (Civil Works)	DATE:	
LOCATION:	Sampaloc Road Sitio Mapunso, Brgy. Plaza Aldea, Tanay, Rizal	REV. NO:	
ITEM NO.	NAME OF ITEM	QUANTITY	UNIT OF MEASUREMENT
4.a	Clearing Works	1.00	lot

	NO.	NAME AND SPECIFICATIONS OF MATERIALS	QTY	UNIT	UNIT RATE	COST
MATERIALS						
					TOTAL of MATERIALS:	-

	NO.	NAME AND CAPACITY OF EQUIPMENT / TOOLS	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
EQUIPMENT						
					TOTAL for EQUIPMENT:	-

	NO.	DESIGNATION OF PERSONNEL	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
LABOR						
	1.0	Supervisor / Foreman				-
	2.0	Labor / Helper				-
					TOTAL for LABOR:	-

ESTIMATED DIRECT COST (EDC)	-
OVERHEAD CONTINGENCIES & MISC. 15% (OCM)	-
CONTRACTOR'S PROFIT 10% (CP)	-
VALUE ADDED TAX 5% of (EDC+OCM+CP)	-
ESTIMATED INDIRECT COST	-
TOTAL COST	-
UNIT COST	-
ADJUSTED TOTAL COST	

Prepared by:

DETAILED ESTIMATES						
PROJECT:	Proposed Construction of Mapunso Pumping Station (Civil Works)				DATE:	
LOCATION:	Sampaloc Road Sitio Mapunso, Brgy. Plaza Aldea, Tanay, Rizal				REV. NO:	
ITEM NO.	NAME OF ITEM				QUANTITY	UNIT OF MEASUREMENT
4.b	Construction of Pump House				45.50	sq.m.
	NO.	NAME AND SPECIFICATIONS OF MATERIALS	QTY	UNIT	UNIT RATE	COST
MATERIALS						
	I. Civil Works					
	A. Concreting Works					
	1.0	Cement		bag		-
	2.0	Sand		cu.m.		-
	3.0	Gravel, 3/4"		cu.m.		-
	B. Masonry Works					
	1.0	CHB 6"		pc		-
	2.0	CHB 4"		pc		-
	3.0	Cement		bag		-
	4.0	Sand		cu.m.		-
	5.0	Louver Blocks		pc		-
	C. Rebar Works					
		Structural Framing				
	1.0	10mmØ x 6m. Deformed Steel Bars		pc		-
	2.0	12mmØ x 6m. Deformed Steel Bars		pc		-
	3.0	GI Tie Wire #16 (25kg/roll)		roll		-
		Masonry				
	1.0	10mmØ x 6m. Deformed Steel Bars		pc		-
	2.0	GI Tie Wire #16		kg		-
	D. Carpentry & Form Works					
	1.0	Phenolic Board, 1/2" x 4' x 8'		pc		-
	2.0	Coco Lumber 2"x2"x12'		pc		-
	3.0	Coco Lumber 2"x3"x12'		pc		-
	4.0	CWN (Assorted)		kg		-
	E. Doors and Windows					
	1.0	Aluminum Louver Door, D-3 (0.80 x 2.10); incldluing jamb, hardware & accessories		set		-
	2.0	Aluminum Louver Door, D-2 (0.70 x 2.10); incldluing jamb, hardware & accessories		set		-
	3.0	Metal Louver Door, D-1 (1.60 x 2.10); incldluing jamb, hardware & accessories		set		-
	4.0	Ordinary Welding Rod (E6013)		kg		-
	5.0	Cutting Disc 4"Ø (Ultra Thin)		pc		-
	II. Plumbing Works					
	A. Waterline System					
	1.0	MTA ISO 20mmØ		pc		-
	2.0	PUC 20mmØ NLC (ISO)		pc		-
	3.0	HDPE Pipe, 20mmØ ISO		m		-
	4.0	GI Pipe 13mmØ (1/2") x 6m, Sch 40 Std.		pc		-
	5.0	GI Nipple 1/2"Ø x 3", Std 40, 2.77mm wall thk		pc		-
	6.0	GI Coupling 1/2"Ø, Sch 40		pc		-
	7.0	Brass Faucet (Threaded)		pc		-
	8.0	Plastic Tee ISO NLC 20mm		pc		-
	9.0	Plastic Elbow ISO NLC 20mm		pc		-
	10.0	GI Elbow 1/2"Ø, Sch 40		pc		-
	11.0	CI Saddle Clamp 100mmx20mm		pc		-
	12.0	Teflon Tape, 1/2"		pc		-
	B. Drainage (Downspout) System					
	1.0	PVC Pipe 2"Ø x 3m (S1000), Orange		pc		-
	2.0	PVC Pipe 3"Ø x 3m (S1000), Orange		pc		-
	3.0	PVC Pipe 4"Ø x 3m (S1000), Orange		pc		-
	4.0	PVC Pipe 6"Ø x 3m (S1000), Orange		pc		-
	5.0	PVC Elbow 2"Ø (90deg), Orange		pc		-
	6.0	PVC Elbow 3"Ø (90deg), Orange		pc		-
	7.0	PVC Elbow 4"Ø (90deg), Orange		pc		-
	8.0	PVC Tee, 2"Ø, Orange		pc		-
	9.0	PVC Coupling 4"Ø		pc		-
	10.0	PVC Coupling 2"Ø		pc		-
	11.0	PVC Clean Out 4"Ø		pc		-
	12.0	Vulcaseal		L		-

MATERIALS	**III. Roof Finish & Waterproofing Works**					
	1.0	Cementitious Waterproofing, 5coats (5sqm/gal)		gal		-
	2.0	Waterplug Hydraulic Cement		gal		-
		For Concrete Topping, 1"-2" THK :				
	1.0	Sahara Cement		bag		-
	2.0	Cement		bag		-
	3.0	Sand		cu.m.		-
					TOTAL of MATERIALS:	-

	NO.	NAME AND CAPACITY OF EQUIPMENT / TOOLS	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
EQUIPMENT						
	1.0	One Bagger Mixer (including fuel)				-
	2.0	Tampering Machine / Plate Compactor (including fuel)				-
	3.0	Grinder				-
	4.0	Electric drill				-
	5.0	Welding Machine				-
					TOTAL of EQUIPMENT:	-

	NO.	DESIGNATION OF PERSONNEL	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
LABOR						
	1.0	Supervisor / Foreman				-
	2.0	Carpenter				-
	3.0	Mason				-
	4.0	Steel Man				-
	5.0	Plumber				-
	6.0	Welder				-
	7.0	Labor / Helper				-
					TOTAL of LABOR:	-

ESTIMATED DIRECT COST (EDC)	-
OVERHEAD CONTINGENCIES & MISC. 15% (OCM)	-
CONTRACTOR'S PROFIT 10% (CP)	-
VALUE ADDED TAX 5% of (EDC+OCM+CP)	-
ESTIMATED INDIRECT COST	-
TOTAL COST	-
UNIT COST	-
ADJUSTED TOTAL COST	

Prepared by:

DETAILED ESTIMATES

PROJECT:	Proposed Construction of Mapunso Pumping Station (Civil Works)	DATE:	
LOCATION:	Sampaloc Road Sitio Mapunso, Brgy. Plaza Aldea, Tanay, Rizal	REV. NO:	

ITEM NO.	NAME OF ITEM	QUANTITY	UNIT OF MEASUREMENT
4.c	Construction of Concrete Fence & Steel Gate	89.50	li.m.

MATERIALS

NO.	NAME AND SPECIFICATIONS OF MATERIALS	QTY	UNIT	UNIT RATE	COST
I. Fence					
A. Concreting Works					
1.0	Cement		bag		-
2.0	Sand		cu.m.		-
3.0	Gravel, 3/4"		cu.m.		-
B. Masonry Works					
1.0	CHB 6"		pc		-
2.0	Cement		bag		-
3.0	Sand		cu.m.		-
C. Rebar Works					
	Structural Framing				
1.0	10mmØ x 6m. Deformed Steel Bars		pc		-
2.0	12mmØ x 6m. Deformed Steel Bars		pc		-
3.0	GI Tie Wire #16 (25kg/ roll)		roll		-
	Masonry				
1.0	10mmØ x 6m. Deformed Steel Bars		pc		-
2.0	GI Tie Wire #16 (25kg/ roll)		roll		-
D. Carpentry / Form Works					
1.0	Phenolic Baord 1/2" x 4' x 8'		pc		-
2.0	Coco Lumber 2"x2"x12'		pc		-
3.0	Coco Lumber 2"x3"x12'		pc		-
4.0	CWN (Assorted)		kg		-
E. Metal Works					
1.0	GI Pipe, 2"Ø x 6m, Sch 20 Std.		pc		-
2.0	Barbed Wire (150m/roll)		roll		-
3.0	Ordinary Welding Rod (E6013)		kg		-
4.0	Grinding Disc 4"Ø		pc		-
5.0	Cutting Disc 4"Ø (Ultra Thin)		pc		-
II. Steel Gate					
1.0	Pillow Block Bearing, 3"Ø		pc		-
2.0	Foot Lock, 16mmØ (Fabricated)		pc		-
3.0	Barrel Bolt, 12mmØ (Fabricated)		pc		-
4.0	Tubular 2"x4"x6m, 1.2mm THK		pc		-
5.0	Tubular 2"x2"x6m, 1.2mm THK		pc		-
6.0	Ordinary Welding Rod (E6013)		kg		-
7.0	Grinding Disc 4"Ø		pc		-
8.0	Cylindrical Hinge 16mmØ x 4"		pc		-
9.0	Drill Bit (for concrete) 1/2"Ø		pc		-
10.0	Cutting Disc 4"Ø (Ultra Thin)		pc		-
III. Lighting Post (6units)					
1.0	GI Pipe, 2 1/2"Ø x 6m, Sch 20 Std.		pc		-
2.0	MS Plate, 8" x 8" x 1/2" thk		pc		-
3.0	MS Plate, 3" x 6" x 1/2" thk		pc		-
4.0	Machine Bolt complete with Flat Washer, 16mmØ x 300mm (5/8"x12")		pc		-
				TOTAL of MATERIALS:	-

EQUIPMENT

NO.	NAME AND CAPACITY OF EQUIPMENT / TOOLS	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
1.0	One Bagger Mixer (including fuel)				-
2.0	Welding Machine				-
				TOTAL of EQUIPMENT:	-

	NO.	DESIGNATION OF PERSONNEL	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
LABOR	1.0	Supervisor / Foreman				-
	2.0	Carpenter				-
	3.0	Steel Man				-
	4.0	Mason				-
	5.0	Welder				-
	6.0	Labor / Helper				-
					TOTAL of LABOR:	-
ESTIMATED DIRECT COST (EDC)						-
OVERHEAD CONTINGENCIES & MISC. 15% (OCM)						-
CONTRACTOR'S PROFIT 10% (CP)						-
VALUE ADDED TAX 5% of (EDC+OCM+CP)						-
ESTIMATED INDIRECT COST						-
TOTAL COST						-
UNIT COST						-
ADJUSTED TOTAL COST						

Prepared by:

DETAILED ESTIMATES						
PROJECT:	Proposed Construction of Mapunso Pumping Station (Civil Works)				DATE:	
LOCATION:	Sampaloc Road Sitio Mapunso, Brgy. Plaza Aldea, Tanay, Rizal				REV. NO:	
ITEM NO.	NAME OF ITEM				QUANTITY	UNIT OF MEASUREMENT
4.d	Construction of Fence at Right of Way				60.00	li.m.

	NO.	NAME AND SPECIFICATIONS OF MATERIALS	QTY	UNIT	UNIT RATE	COST
MATERIALS						
		A. Concreting Works				
	1.0	Cement		bag		-
	2.0	Sand		cu.m.		-
	3.0	Gravel, 3/4"		cu.m.		-
		B. Masonry Works				
	1.0	CHB 4"		pc		-
	2.0	CHB 6"		pc		-
	3.0	Cement		bag		-
	4.0	Sand		cu.m.		-
		C. Rebar Works				
		Structural Framing				
	1.0	10mmØ x 6m. Deformed Steel Bars		pc		-
	2.0	12mmØ x 6m. Deformed Steel Bars		pc		-
	3.0	GI Tie Wire #16		kg		-
		Masonry				
	1.0	10mmØ x 6m. Deformed Steel Bars		pc		-
	2.0	GI Tie Wire #16		kg		-
		D. Carpentry / Form Works				
	1.0	Phenolic Board, 1/2" x 4' x 8'		pc		-
	2.0	Coco Lumber 2"x2"x12'		pc		-
	3.0	Coco Lumber 2"x3"x12'		pc		-
	4.0	CWN (Assorted)		kg		-
		E. Metal Works				
	1.0	GI Pipe, 2"Ø x 6m, Sch 20 Std.		pc		-
	2.0	GI Cyclone Wire Mesh (3mmØ, 60mm x 60mm hole), 5ft x 6m per set		set		-
	3.0	12mmØ Plain Round Bar		pc		-
	4.0	Ordinary Welding Rod (E6013)		kg		-
	5.0	Grinding Disc 4"Ø		pc		-
	6.0	Cutting Disc 4"Ø (Ultra Thin)		pc		-
					TOTAL of MATERIALS:	-

	NO.	NAME AND CAPACITY OF EQUIPMENT / TOOLS	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
EQUIPMENT						
	1.0	One Bagger Mixer (including fuel)				-
	2.0	Welding Machine				-
					TOTAL of EQUIPMENT:	-

	NO.	DESIGNATION OF PERSONNEL	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
LABOR						
	1.0	Supervisor / Foreman				-
	2.0	Carpenter				-
	3.0	Steel Man				-
	4.0	Mason				-
	5.0	Welder				-
	6.0	Labor / Helper				-
					TOTAL of LABOR:	-

ESTIMATED DIRECT COST (EDC)	-
OVERHEAD CONTINGENCIES & MISC. 15% (OCM)	-
CONTRACTOR'S PROFIT 10% (CP)	-
VALUE ADDED TAX 5% of (EDC+OCM+CP)	-
ESTIMATED INDIRECT COST	-
TOTAL COST	-
UNIT COST	-
ADJUSTED TOTAL COST	

Prepared by:

DETAILED ESTIMATES

PROJECT:	Proposed Construction of Mapunso Pumping Station (Civil Works)	DATE:	
LOCATION:	Sampaloc Road Sitio Mapunso, Brgy. Plaza Aldea, Tanay, Rizal	REV. NO:	
ITEM NO.	NAME OF ITEM	QUANTITY	UNIT OF MEASUREMENT
4.e	Construction of Booster Pump Pedestal, Genset Pad & Shed	1.00	lot

	NO.	NAME AND SPECIFICATIONS OF MATERIALS	QTY	UNIT	UNIT RATE	COST
MATERIALS						
		Concrete Works				
	1.0	Portland Cement (40kgs./bag)		bag		-
	2.0	Sand		cu.m.		-
	3.0	Gravel, 3/4"		cu.m.		-
		Rebar Works				
	1.0	10mmØ x 6m. Deformed Steel Bars		pc		-
	2.0	12mmØ x 6m. Deformed Steel Bars		pc		-
	3.0	GI Tie Wire #16		kg		-
		Carpentry & Formworks				
	1.0	Phenolic Board, 1/2" x 4' x 8'		pc		-
	2.0	Coco Lumber 2"x2"x12'		pc		-
	3.0	CWN (Assorted)		kg		-
		Metal and Roofing Works				
	1.0	Longspan Ribtype Ga24 (Pre-Painted: Royal Blue)		li. m.		-
	2.0	GI Wall Flashing Ga26 (2.5m/pc)		pc		-
	3.0	GI Gutter (Pre-Painted: Royal Blue) Ga26 (2.5m/pc)		pc		-
	4.0	C-Purlins, 2"x3"x1.2mm thk x 6m		pc		-
	6.0	C-Purlins, 2"x6"x1.5mm thk x 6m		pc		-
	7.0	Tubular, 2"x6"x1.5mm thk x 6m		pc		-
	8.0	Sag Rod, 10mmØ (Plain Round Bar)		pc		-
	9.0	Roof Screw 2"		pc		-
	10.0	Expansion Bolt, 3/8"x2 1/2"		pc		-
	11.0	GI Pipe 2 1/2"Ø x 6m, Sch 40 Std.		pc		-
	12.0	MS Plate 6"x6"x1/4" THK		pc		-
	13.0	Machine Bolt complete with Flat Washer, 16mmØ x 300mm (5/8"x12")		pc		-
	14.0	Welding Rod (special 2.5mmØ)		kg		-
	15.0	Cutting Disc 4"Ø (Ultra Thin)		pc		-
	16.0	Drill Bit (for Steel) 5/16"Ø		pc		-
	17.0	Drill Bit (for Concrete) 10mmØ x 100mm		pc		-
	18.0	Vulcaseal		Li		-
					TOTAL of MATERIALS:	-

	NO.	NAME AND CAPACITY OF EQUIPMENT / TOOLS	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
EQUIPMENT						
	1.0	Welding Machine				-
					TOTAL of EQUIPMENT:	-

	NO.	DESIGNATION OF PERSONNEL	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
LABOR						
	1.0	Supervisor / Foreman				-
	2.0	Steel Man				-
	3.0	Carpenter				-
	4.0	Mason				-
	5.0	Welder				-
	6.0	Labor / Helper				-
					TOTAL of LABOR:	-

ESTIMATED DIRECT COST (EDC)	-
OVERHEAD CONTINGENCIES & MISC. 15% (OCM)	-
CONTRACTOR'S PROFIT 10% (CP)	-
VALUE ADDED TAX 5% of (EDC+OCM+CP)	-
ESTIMATED INDIRECT COST	-
TOTAL COST	-
UNIT COST	-
ADJUSTED TOTAL COST	

Prepared by:

DETAILED ESTIMATES

PROJECT:	Proposed Construction of Mapunso Pumping Station (Civil Works)	DATE:	
LOCATION:	Sampaloc Road Sitio Mapunso, Brgy. Plaza Aldea, Tanay, Rizal	REV. NO:	

ITEM NO.	NAME OF ITEM	QUANTITY	UNIT OF MEASUREMENT
4.f	Construction of Cistern Tank Platform	3.15	cu.m.

	NO.	NAME AND SPECIFICATIONS OF MATERIALS	QTY	UNIT	UNIT RATE	COST
MATERIALS						
		Concrete Works				
	1.0	Portland Cement (40kgs./bag)		bag		-
	2.0	Sand		cu.m.		-
	3.0	Gravel, 3/4"		cu.m.		-
		Rebar Works				
	1.0	12mmØ x 6m. Deformed Steel Bars		pc		-
	2.0	GI Tie Wire #16		kg		-
		Carpentry & Formworks				
	1.0	Phenolic Board, 1/2" x 4' x 8'		pc		-
	2.0	Coco Lumber 2"x2"x12'		pc		-
	3.0	CWN (Assorted)		kg		-
					TOTAL of MATERIALS:	-

	NO.	NAME AND CAPACITY OF EQUIPMENT / TOOLS	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
EQUIPMENT						
	1.0	One Bagger Mixer (including fuel)				-
					TOTAL of EQUIPMENT:	-

	NO.	DESIGNATION OF PERSONNEL	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
LABOR						
	1.0	Supervisor / Foreman				-
	2.0	Steel Man				-
	3.0	Carpenter				-
	4.0	Mason				-
	5.0	Labor / Helper				-
					TOTAL of LABOR:	-

ESTIMATED DIRECT COST (EDC)	-
OVERHEAD CONTINGENCIES & MISC. 15% (OCM)	-
CONTRACTOR'S PROFIT 10% (CP)	-
VALUE ADDED TAX 5% of (EDC+OCM+CP)	-
ESTIMATED INDIRECT COST	-
TOTAL COST	-
UNIT COST	-
ADJUSTED TOTAL COST	

Prepared by:

DETAILED ESTIMATES					
PROJECT:	Proposed Construction of Mapunso Pumping Station (Civil Works)			DATE:	
LOCATION:	Sampaloc Road Sitio Mapunso, Brgy. Plaza Aldea, Tanay, Rizal			REV. NO:	
ITEM NO.	NAME OF ITEM			QUANTITY	UNIT OF MEASUREMENT
4.g	Drainage Works & Flushing Box			1.00	lot
	NO.	NAME AND SPECIFICATIONS OF MATERIALS	QTY	UNIT	UNIT RATE	COST
	I.Flushing Box					
	A. Civil Works					
	A.1 Concreting Works					
	1.0	Cement		bag		-
	2.0	Sand		cu.m.		-
	3.0	Gravel, 3/4"		cu.m.		-
	A.2 Masonry Works					
	1.0	CHB 6"		pc		-
	2.0	Cement		bag		-
	3.0	Sand		cu.m.		-
	A.3 Rebar Works					
		Structural				
	1.0	10mmØ x 6m. Deformed Steel Bars		pc		-
	2.0	12mmØ x 6m. Deformed Steel Bars		pc		-
	3.0	GI Tie Wire #16		kg		-
		Masonry				
	1.0	12mmØ x 6m. Deformed Steel Bars		pc		-
	2.0	GI Tie Wire #16		kg		-
	A.4 Carpentry Works					
	1.0	Phenolic Board, 1/2" x 4' x 8'		pc		-
	2.0	Coco Lumber 2"x2"x12'		pc		-
	3.0	CWN (Assorted)		kg		-
	II. Drainage System (Manhole, Catch Basin & PVC Piping)					
	A. Civil Works					
	A.1 Concreting & Masonry Works					
	1.0	Cement		bag		-
	2.0	Sand		cu.m.		-
	3.0	Gravel, 3/4"		cu.m.		-
	4.0	CHB 4"		pc		-
	A.2 Rebar Works					
	1.0	12mmØ x 6m, Deformed Steel Bars		pc		-
	2.0	10mmØ x 6m, Deformed Steel Bars		pc		-
	3.0	GI Tie Wire #16		kg		-
	A.3 Metal Works (Manhole Grating)					
	1.0	Flat Bar, 2" x 1/4" THK		pc		-
	2.0	Flat Bar, 1 1/2" x 1/4" THK		pc		-
	3.0	12mmØ Plain Round Bar		pc		-
	4.0	Ordinary Welding Rod (E6013)		kg		-
	5.0	Grinding Disc 4"Ø		pc		-
	6.0	Cutting Disc 4"Ø (Ultra Thin)		pc		-
	B. Piping Works					
	1.0	PVC Pipe 6"Ø x 3m (S1000), Orange		pc		-
	2.0	PVC Pipe 3"Ø x 3m (S1000), Orange		pc		-
	3.0	PVC Coupling 6"Ø		pc		-
	4.0	PVC Coupling 3"Ø		pc		-
	5.0	PVC Elbow 3"Ø (90deg), Orange		pc		-
	6.0	Vulcaseal		Li		-
MATERIALS					TOTAL of MATERIALS:	-

	NO.	NAME AND CAPACITY OF EQUIPMENT / TOOLS	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
EQUIPMENT						
	1.0	Welding Machine				-
					TOTAL of EQUIPMENT:	-

	NO.	DESIGNATION OF PERSONNEL	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
LABOR						
	1.0	Supervisor / Foreman				-
	2.0	Mason				-
	3.0	Steel Man				-
	4.0	Plumber				-
	5.0	Welder				-
	6.0	Labor / Helper				-
					TOTAL of LABOR:	-

ESTIMATED DIRECT COST (EDC)	-
OVERHEAD CONTINGENCIES & MISC. 15% (OCM)	-
CONTRACTOR'S PROFIT 10% (CP)	-
VALUE ADDED TAX 5% of (EDC+OCM+CP)	-
ESTIMATED INDIRECT COST	-
TOTAL COST	-
UNIT COST	-
ADJUSTED TOTAL COST	

Prepared by:

DETAILED ESTIMATES

PROJECT:	Proposed Construction of Mapunso Pumping Station (Civil Works)	DATE:	
LOCATION:	Sampaloc Road Sitio Mapunso, Brgy. Plaza Aldea, Tanay, Rizal	REV. NO:	

ITEM NO.	NAME OF ITEM	QUANTITY	UNIT OF MEASUREMENT
4.h	Concreting of Ground & Ramp, Embankment & Gravel Filling	1.00	lot

	NO.	NAME AND SPECIFICATIONS OF MATERIALS	QTY	UNIT	UNIT RATE	COST
MATERIALS						
		Concrete Works				
	1.0	Portland Cement (40kgs./bag)		bag		-
	2.0	Sand		cu.m.		-
	3.0	Gravel, 3/4"		cu.m.		-
	4.0	Gravel, G1 *(for gravel filling @ 50mm THK)*		cu.m.		-
		Rebar Works				
	1.0	10mmØ x 6m Deformed Steel Bars		pc		-
	2.0	GI Tie Wire #16		kg		-
		Carpentry Works				
	1.0	Phenolic Board, 1/2" x 4' x 8'		pc		-
	2.0	Coco Lumber 2"x2"x12'		pc		-
	3.0	CWN #3		kg		-
		Earth Works				
	1.0	Soil / Earth Fill Material ('Panambak')		cu.m.		-
					TOTAL of MATERIALS:	-

	NO.	NAME AND CAPACITY OF EQUIPMENT / TOOLS	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
EQUIPMENT						
	1.0	One Bagger Mixer (including fuel)				-
	2.0	Tampering Machine				-
					TOTAL of EQUIPMENT:	-

	NO.	DESIGNATION OF PERSONNEL	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	
LABOR						
	1.0	Supervisor / Foreman				-
	2.0	Mason				-
	3.0	Steel Man				-
	4.0	Labor / Helper				-
	5.0	Tampering Machine Operator				-
					TOTAL of LABOR:	-

ESTIMATED DIRECT COST (EDC)	-
OVERHEAD CONTINGENCIES & MISC. 15% (OCM)	-
CONTRACTOR'S PROFIT 10% (CP)	-
VALUE ADDED TAX 5% of (EDC+OCM+CP)	-
ESTIMATED INDIRECT COST	-
TOTAL COST	-
UNIT COST	-
ADJUSTED TOTAL COST	

Prepared by:

DETAILED ESTIMATES

PROJECT:	Proposed Construction of Mapunso Pumping Station (Civil Works)	DATE:	
LOCATION:	Sampaloc Road Sitio Mapunso, Brgy. Plaza Aldea, Tanay, Rizal	REV. NO:	

ITEM NO.	NAME OF ITEM	QUANTITY	UNIT OF MEASUREMENT
4.i	Electrical Works	1.00	lot

	NO.	NAME AND SPECIFICATIONS OF MATERIALS	QTY	UNIT	UNIT RATE	COST
MATERIALS						
	1.0	Branch Circuit Breaker Panel Board, with 6-branches, plug-in type, 460VAC, 3pole		pc		-
		1 - 60ACB, 3Pole, 230VAC, plug-in (main) 4 - 20ACB, 230VAC, 2-pole plug-in 3 - 15ACB, 230VAC, 2-pole plug-in				
	2.0	Electrical Wire 5.5 mm² THHN		box		-
	3.0	Electrical Wire 3.5 mm² THHN		box		-
	4.0	Electrical PVC Pipe, 15mmØ x 3m		pcs		-
	5.0	Electrical PVC Short Elbow, 1/2"Ø x 3m		pcs		-
	6.0	Electrical PVC Locknut & Bushing 1/2"Ø		pcs		-
	7.0	Plastic Socket 4"Ø		pcs		-
	8.0	PVC Utility box, 2" x 4"		pcs		-
	9.0	Universal outlet with cover and plate (2-gang)		pcs		-
	10.0	Weatherproof convenience outlet (2-gang)		pcs		-
	11.0	Switch with cover and plate (2-gang)		pcs		-
	12.0	Switch with cover and plate (1-gang)		pc		-
	13.0	Compact flourescent lamp (CFL) 18W, 220VAC		pcs		-
	14.0	Street Light LED Type, 50 W		pcs		-
	15.0	PVC Junction Box with Cover, 4" x 4"		pcs		-
	16.0	Ordinary Electrical Tape (big)		pcs		-
	17.0	Electrical wire insulator (for 3.5mm2 electrical wire)		m		-
					TOTAL of MATERIALS:	-

	NO.	NAME AND CAPACITY OF EQUIPMENT / TOOLS	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
EQUIPMENT						
	1.0	Grinder				-
	2.0	Electric Drill				-
					TOTAL of EQUIPMENT:	-

	NO.	DESIGNATION OF PERSONNEL	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	
LABOR						
	1.0	Supervisor / Foreman				-
	2.0	Electrician				-
	3.0	Labor / Helper				-
					TOTAL of LABOR:	-

ESTIMATED DIRECT COST (EDC)	-
OVERHEAD CONTINGENCIES & MISC. 15% (OCM)	-
CONTRACTOR'S PROFIT 10% (CP)	-
VALUE ADDED TAX 5% of (EDC+OCM+CP)	-
ESTIMATED INDIRECT COST	-
TOTAL COST	-
UNIT COST	-
ADJUSTED TOTAL COST	

Prepared by:

DETAILED ESTIMATES

PROJECT:	Proposed Construction of Mapunso Pumping Station (Civil Works)	DATE:	
LOCATION:	Sampaloc Road Sitio Mapunso, Brgy. Plaza Aldea, Tanay, Rizal	REV. NO:	

ITEM NO.	NAME OF ITEM	QUANTITY	UNIT OF MEASUREMENT
4.j	Painting Works	936.00	sq.m.

	NO.	NAME AND SPECIFICATIONS OF MATERIALS	QTY	UNIT	UNIT RATE	COST
MATERIALS		***Coverage of Painting Works: Pump House, Fence, Flushing Box, Lighting Post & All Metal Works***				
	1.0	Concrete Neutralizer		gal		-
	2.0	Skim Coat (20kg/bag)		bag		-
	3.0	Flat Latex		Tins		-
	4.0	Latex Gloss Paint (Off-White)		gal		-
	5.0	Elastomeric Paint (Off-White)		gal		-
	6.0	Elastomeric Paint (Royal Blue)		Tins		-
	7.0	Elastomeric Paint (Aqua Blue)		Tins		-
	8.0	Paint Thinner		gal		-
	9.0	Lacquer Thinner		gal		-
	10.0	Epoxy Primer Gray w/ Catalyst		gal		-
	11.0	Quick Dry Enamel (Royal Blue)		gal		-
	12.0	Quick Dry Enamel (White)		gal		-
	13.0	Quick Dry Enamel (Silver)		gal		-
	14.0	Epoxy Primer (for flooring)		gal		-
	15.0	Rubberized Floor Coating (Gray)		gal		-
	16.0	Paint Brush 1"		pc		-
	17.0	Paint Brush 2"		pc		-
	18.0	Paint Brush 4"		pc		-
	19.0	Palette 4"		pair		-
	20.0	7" Roller Brush w/ Handle & Tray		pc		-
	21.0	Baby Roller		pc		-
	22.0	Masking Tape #2		pc		-
	23.0	Sand Paper #80		pc		-
	24.0	Steel Brush		pc		-
					TOTAL of MATERIALS:	-

	NO.	NAME AND CAPACITY OF EQUIPMENT / TOOLS	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
EQUIPMENT						
					TOTAL of EQUIPMENT:	-

	NO.	DESIGNATION OF PERSONNEL	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	
LABOR						
	1.0	Supervisor / Foreman				-
	2.0	Painter				-
	3.0	Labor / Helper				-
					TOTAL of LABOR:	-

ESTIMATED DIRECT COST (EDC)	-
OVERHEAD CONTINGENCIES & MISC. 15% (OCM)	-
CONTRACTOR'S PROFIT 10% (CP)	-
VALUE ADDED TAX 5% of (EDC+OCM+CP)	-
ESTIMATED INDIRECT COST	-
TOTAL COST	-
UNIT COST	-
ADJUSTED TOTAL COST	

Prepared by:

DETAILED ESTIMATES

PROJECT:	Proposed Construction of Mapunso Pumping Station (Civil Works)	DATE:	
LOCATION:	Sampaloc Road Sitio Mapunso, Brgy. Plaza Aldea, Tanay, Rizal	REV. NO:	

ITEM NO.	NAME OF ITEM	QUANTITY	UNIT OF MEASUREMENT
4.k	Fabrication & Installation of Stainless Steel TanWD Logo & Signage	1.00	lot

MATERIALS

NO.	NAME AND SPECIFICATIONS OF MATERIALS	QTY	UNIT	UNIT RATE	COST
1.0	TanWD Logo (Fabrication & Installation)				
	Chemical Etching with paint				
	304 Stainless Steel @ 1.2-1.6mm thk				
	Metal Dowel				
	Dimension: 18"Ø				
			set		-
2.0	Outdoor Steel Signage (Fabarication & Installation)				
	MAPUNSO PUMPING STATION				
	Mirrored 304 Stainless Steel				
	1.12-1.6mm thk front & 0.8-1.0mm sidings				
	Metal Dowel				
	1.5" Siding Height				
				TOTAL of MATERIALS:	-

EQUIPMENT

NO.	NAME AND CAPACITY OF EQUIPMENT / TOOLS	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	COST
				TOTAL of EQUIPMENT:	

LABOR

NO.	DESIGNATION OF PERSONNEL	NO. OF UNITS	NO. OF HOUR/S	HOURLY RATE	
					-
				TOTAL of LABOR:	-

ESTIMATED DIRECT COST (EDC)	-
OVERHEAD CONTINGENCIES & MISC. 15% (OCM)	-
CONTRACTOR'S PROFIT 10% (CP)	-
VALUE ADDED TAX 5% of (EDC+OCM+CP)	-
ESTIMATED INDIRECT COST	-
TOTAL COST	-
UNIT COST	-
ADJUSTED TOTAL COST	

Prepared by:

Section IX. Checklist of Technical and Financial Documents

Checklist of Technical and Financial Documents

I. TECHNICAL COMPONENT ENVELOPE

Class "A" Documents

Legal Documents

☐ (a) Valid PhilGEPS Registration Certificate (Platinum Membership) (all pages) in accordance with Section 8.5.2 of the IRR;

Technical Documents

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

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

☐ (d) Special PCAB License in case of Joint Ventures **and** registration for the type and cost of the contract to be bid; **and**

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

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

☐ a. Organizational chart for the contract to be bid;

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

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

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

Financial Documents

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

Class "B" Documents

☐ (i) 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

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

Other documentary requirements under RA No. 9184

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

☐ (l) 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**

☐ (m) Cash Flow by Quarter.

Section X. Bidding Forms

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 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 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

l. 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

---

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

Procuring Entity*]*.

m. 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: _____

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

REPUBLIC OF THE PHILIPPINES)
CITY/MUNICIPALITY OF _____) S.S.

BID SECURING DECLARATION

Project Identification No.: *[Insert number]*

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

I/We, the undersigned, declare that:

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

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

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

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

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

[Insert NAME OF BIDDER OR ITS AUTHORIZED REPRESENTATIVE]

[Insert signatory's legal capacity]

Affiant

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

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]


Republic of the Philippines
gppb
Government Procurement Policy Board