

BIDS AND AWARDS COMMITTEE
2330 Roxas Boulevard, Pasay City
Tel. Nos. 834-4823; Fax No. 831-9584
Email: bac.secretariat@dfa.gov.ph

SUPPLEMENTAL / BID BULLETIN No. 2

Project : Procurement of Repair of the Department of Foreign Affairs Main
Building Sewage Treatment Plant and Sewer Line
Reference No. : PB-IP-01-2019
ABC : PhP 6,000,000.00
Date : 20 May 2019

This supplemental/bid bulletin is issued to provide information to the prospective proponents/bidders on the following changes to the Bidding Documents:

- I. **Technical Specifications (Section VII)** – The Technical Specifications (Section VII) of the Bidding Documents is superseded by ANNEX A of this Supplemental/Bid Bulletin No. 2 after considering inputs from End-User, BAC Members and prospective bidder.

The Bidding Documents is amended accordingly.

For the information and guidance of all concerned.

(Sgd.)
IMELDA M. PANOLONG
BAC Chairperson

ANNEX A

Technical Specifications

Repair of the Department of Foreign Affairs Main Building Sewage Treatment Plant and Sewer Line

Item No.		
I.	<p>Background: The DFA Main Building's Sewage Treatment Plant/ Sequencing Batch Reactor (STP/SBR) treats the building's wastewater using conventional aeration wastewater treatment. It removes contaminants and produces treated wastewater that is safe to discharge to the environment. Due to the condition of the current STP/SBR which is now non-compliant to DENR standards the Department needs a reputable Contractor to repair its STP/SBR as well as other components such as the drainage pipes coming from the building to the STP/SBR.</p>	
II.	<p>Objectives: The Project aims to repair and upgrade the DFA Main Building's existing STP/SBR and Sewer Line. Upon completion, the facility is expected to meet the effluent quality standards provided under DENR Administrative Order No. 08 series of 2016 (Water Quality and General Effluent Standards of 2016).</p>	
		Statement of Compliance
III.	<p>Scope of work</p> <ol style="list-style-type: none"> 1. The project shall consist of, but not be limited to, the preparation of designs, project supervision, civil works (repair), electro-mechanical installation, submission of project methodologies, bill of quantities, testing, and start-up and commissioning of the STP/SBR. 2. Components of the Project: <ol style="list-style-type: none"> a. Preparation of Designs The Contractor shall prepare a process design for the preferred treatment option and detailed engineering design for civil works, mechanical and electrical requirements and coordinate with Office of Asset Management and Support Services-Engineering and Maintenance Division (OAMSS-EMD) for the project. The designs are subject to OAMSS-EMS' approval and are to be submitted together with the bill of quantities prior to 	

	mobilization. See Annex A for the layout of existing STP/SBR.	
	<p>b. Mobilization/Demobilization The Contractor shall:</p> <ol style="list-style-type: none"> i. Execute the necessary mobilization/demobilization of manpower, equipment and materials on site for the repair/ reconstruction of STP/SBR and Sewer Line; ii. Provide project management team for the project; iii. Prepare and pay necessary bonds, insurance and permits including permits from DENR; iv. Deploy/install temporary facilities including office supplies, power supply, water supply and telecommunication service at their expense; v. Provide provisions for temporary piping diversion for temporary storage and daily removal of waste water from the site for disposal for the duration of the project; vi. Board-up/deploy safety elements such as, but not limited to, personal protective equipment (PPEs), personnel identification paraphernalia, safety orientation activities, health and safety provisions and signs, etc.; vii. Conduct site area preparation (upgrade and rehabilitation of STP/SBR and Sewer Line); viii. Clean-up STP/SBR area including sludge hauling; ix. Submit project record documents; x. Prepare and submit progressive As-built plans at intervals to be agreed upon by the Contractor and OAMSS – EMD; and xi. Provide one (1) year warranty for equipment, labor and materials. 	
	<p>c. Civil Works The Contractor shall perform the following works:</p> <ol style="list-style-type: none"> i. Demolition and restoration works as needed in the upgrade and rehabilitation of STP/SBR and Sewer Line; ii. Provide provisions for all necessary formworks, steelworks and concrete works needed for the project; iii. Provide necessary equipment pads; 	

	<p>iv. Provide excavation, hauling, restoration, backfilling, water proofing and rectification of all existing STP/SBR tanks and re-alignment of the sewer lines (including pipes and its fitting); (see Annex A)</p> <p>v. Earth works and installation of catch basin in sewer line;</p> <p>vi. De-sludging and hauling of all wastewater; and</p> <p>vii. De-clogging of storm drainage, floor drainage and mon-o-ject pump.</p>	
	<p>d. Mechanical Works The Contractor shall:</p> <p>i. Supply materials and essential equipment for the STP/SBR and Sewer Line;</p> <p>ii. Perform necessary works for the installation of plumbing equipment such as, but not limited to, air blower, effluent pumps, static airlift, coarse bubble diffusers, chlorine dosing pump, multimedia filler and other necessary piping fixtures; and</p> <p>iii. Provide complete piping works, including but not limited to, supply and installation of PVC pipes and Black Iron Pipes (BIP), fittings, pipe sleeves, gate valves and check valves, equipment pads, pipe hanger/s and supports, tags, labels, directional flow, and appurtenances required for the workable piping system of the STP/SBR and re-alignment of the Sewer Line;</p> <p>iv. Provide piping works (including but not limited to pipes and its fittings) for the sanitary drainage from the Lift Station to the STP.</p>	
	<p>e. Electrical and Instrumentation Works The Contractor shall:</p> <p>i. Complete installation of a new electrical control system (main and branch circuit breakers, panel boards starters, contactors, PVC conduits, liquid-tight conduit, junction boxes, wires and cables including reset button/s, selector switches, push buttons,</p>	

	<p>pilot lights, and circuit control items) for the electrical control or liquid level control of the various electrical components; and</p> <p>ii. Install all new necessary wirings, conduits, fittings and supports including all consumables and other items for STP/SBR and Sewer Line.</p>	
	<p>f. Start-up, Commissioning and Performance Testing</p> <p>The Contractor shall:</p> <p>i. Supervise the initial performance testing and monitoring of the STP/SBR and Sewer Line;</p> <p>ii. Test equipment and facilities for defects or malfunctions and correct them to ensure efficient performance of the STP/SBR and Sewer Line; and</p> <p>iii. Apply for the discharge permit for the STP/SBR and Sewer Line prior to turn over.</p>	
	<p>g. Training of Operators</p> <p>The Contractor shall conduct at least two (2) training and orientation sessions with concerned OAMSS-EMD personnel on basic STP/SBR principles, process flow, trouble shooting, and routine checks, within the warranty period.</p>	
	<p>h. Submission of Operation and Maintenance Manual</p> <p>Prior to turn over of the STP/SBR and Sewer Line, the Contractor shall provide two (2) copies of an Operation and Maintenance Manual. The manual contains discussions on the basic principles of the STP/SBR, guidelines on routine checks, trouble shooting, specifications and illustrations of STP/SBR equipment, for the full and efficient operation of the facilities.</p>	
	<p>3. All works, materials, and services not expressly indicated which may be necessary for the complete and proper design, construction and commissioning of the</p>	

	<p>work shall be provided by the Contractor to ensure a functional and efficient system.</p> <p>4. All work items under this contract shall be done in accordance with National Building Code (NBC), National Structural Code of the Philippines (NSCP), Philippine Society of Mechanical Engineer's (PSME) Code, Philippine Electrical Code (PEC), Sanitation Code of the Philippines, DENR requirements and any applicable engineering and environmental standards or practices, as stated in Annex B.</p>																																								
IV.	<p>Technical Specifications</p> <p>1. Project Description of the Proposed Sewage Treatment Plant:</p> <p>Basis of Design</p> <p>The Contractor shall design and build the STP/SBR based on the following recommended maximum design criteria and parameters:</p> <p>a. Design Flowrates</p> <table border="1"> <thead> <tr> <th>Parameters</th><th>Value</th><th>Unit</th></tr> </thead> <tbody> <tr> <td>Flowrate (Peak)</td><td>250</td><td>cu.m./day</td></tr> </tbody> </table> <p>b. STP/SBR Influent Characteristics</p> <table border="1"> <thead> <tr> <th>Parameters</th><th>Value</th><th>Unit</th></tr> </thead> <tbody> <tr> <td>Total Suspended Solids (TSS)</td><td>600</td><td>mg/L</td></tr> <tr> <td>Max. Biochemical Oxygen Demand, BOD₅</td><td>300</td><td>mg/L</td></tr> <tr> <td>Chemical Oxygen Demand (COD)</td><td>600</td><td>mg/L</td></tr> <tr> <td>Oil and Grease</td><td>50</td><td>mg/L</td></tr> <tr> <td>Color</td><td>300</td><td>TCU</td></tr> <tr> <td>pH</td><td>6.75</td><td></td></tr> <tr> <td>Ammonia as NH₃</td><td>25*</td><td>mg/L</td></tr> <tr> <td>Nitrates as NO₃</td><td>100*</td><td>mg/L</td></tr> <tr> <td>Phosphates</td><td>10*</td><td>mg/L</td></tr> <tr> <td>Surfactants (MBAS)</td><td>20*</td><td>mg/L</td></tr> </tbody> </table> <p>*values are based on the typical composition of untreated domestic wastewater, Metcalf and Eddy, Wastewater Engineering: Treatment, Disposal and Reuse 3rd Ed., p. 109</p> <p>2. Treatment and Performance Efficiency</p> <p>The Contractor shall ensure that the new STP/SBR should be able to discharge effluents with qualities conforming to the DENR/LLDA Effluent Quality Standards for “Class SB” Inland Water (based on DAO Administrative Order No. 08 series of 2016) as shown in the table below:</p>	Parameters	Value	Unit	Flowrate (Peak)	250	cu.m./day	Parameters	Value	Unit	Total Suspended Solids (TSS)	600	mg/L	Max. Biochemical Oxygen Demand, BOD ₅	300	mg/L	Chemical Oxygen Demand (COD)	600	mg/L	Oil and Grease	50	mg/L	Color	300	TCU	pH	6.75		Ammonia as NH ₃	25*	mg/L	Nitrates as NO ₃	100*	mg/L	Phosphates	10*	mg/L	Surfactants (MBAS)	20*	mg/L	
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Parameters	DAO 2016-08 (Class SB)	Units
BOD ₅	<30	mg/L
Color (True)	<100	TCU
COD	<60	mg/L
TSS	<70	mg/L
Oil and Grease	<5	mg/L
Total Coliforms	<3,000	MPN/1000mL
pH (range)	6.5-9.0	
Ammonia as NH ₃ -N	<0.5	mg/L
Nitrates as NO ₃ -N	<20	mg/L
Phosphates	<1	mg/L
Surfactants	<3	mg/L

3. Plant Description and Required Facilities
The Contractor shall design all treatment unit processes for the STP/SBR and perform/supply and install civil works, electro-mechanical works, and equipment to meet the required treatment. All installed facilities must employ Activated Sludge Process Technology.

4. Process Description – Sequencing Batch Reactor (SBR)
The Contractor shall make available the following specific facilities of biological system necessary in attaining the desired STP/SBR performance requirements/efficiency:

- Screening (Solids removal)
- Equalization
- Aeration Tank**
- Settling Tank (Sedimentation)**
- Aerobic Sludge Digester**

5. Particulars
The Contractor shall:

- Provide the following services:**
 - Conduct of coordination meetings with OAMSS-EMS team on the upgrade and rehabilitation of STP/SBR;
 - Supervision of the repair of STP/SBR and Sewer Line;
 - Safety orientation/s to the OAMSS-**EMD** team prior to start of work;
 - Preparation and submission of preliminary plans and/or design for approval of the Department prior to mobilization, and as-built plans after project completion; and
 - Secure necessary bonds and permits as needed.

	<p>b. General requirements</p> <ul style="list-style-type: none"> Minimum requirements for the STP/SBR repairs: <ol style="list-style-type: none"> Three (3) units of air rotary blowers; Twenty-three (23) units of fine bubble diffusers; One (1) unit static airlift pump; Chlorinator or its equivalent; Four (4) units non-clog submersible pump; Pipes, valves, fittings, and miscellaneous materials; Electrical materials, relays, circuit breakers; One (1) unit multimedia filtration system; Testing and commissioning; and Three (3) laboratory testing and preparation of report for the wastewater effluent prior to turn over. 	
V.	<p>Contractor's Obligations</p> <p>The Contractor shall:</p> <ol style="list-style-type: none"> Secure and pay the necessary permits (including but not limited to, Building Permit), licenses, clearances and other documents required under the National Building Code and other related laws, rules and regulations, and bear all costs, duties, fees and other charges thereof. Supply materials and labor deemed necessary to complete the works which are inadvertently excluded in the technical specifications, drawings or in other contract documents, without extra cost to the Department. Such materials shall be of the highest quality available, and installed or applied to the satisfaction of the Department. Submit the list of materials, with choices from at least three (3) reputable brands, subject to OAMSS-EMD' approval before implementation of the project. All material cost must be within the awarded contract price. Submit all documents produced as part of the design services to OAMSS-EMD for review and approval, in accordance with the terms of the Contract. Ensure that skilled and experienced craftsmen will undertake the renovation and repair works to assure first 	

	<p>class quality, appearance and durability of the completed work.</p>	
	<p>6. Submit working drawings of any modifications prior to the execution of work for review and approval of the OAMSS- EMD;</p>	
	<p>7. Provide brand new equipment and materials for the STP/SBR and Sewer Line with the same technical specifications as that of existing STP/SBR and Sewer Line, or higher.</p>	
	<p>8. Maintain cleanliness at the work site at all times. At the end of the day's work, all tools, equipment, and unused materials shall be put away in an orderly manner inside the designated areas in the Department;</p>	
	<p>9. Deem to have inspected, and be satisfied as to the suitability and accessibility of the site required to execute and complete all works specified in this contract;</p>	
	<p>10. Provide weekly progress reports to OAMSS- EMD with photographs indicating corresponding dates.</p>	
	<p>11. Submit As-Built Drawings of the STP/SBR in A3 size and electronic copy using the latest editable CAD format, including measurements/tie-ins of all works performed in the project. Tie-ins shall have a minimum of three (3) horizontally measured reference points, which are above-ground and/or on permanent structures, or reference points;</p>	
	<p>12. Submit the methodologies and plans for all phases of the work to the Department for review and approval. Such approval shall not be construed to relieve the Contractor of its responsibilities, liabilities and obligations in the Contract.</p>	
VI.	<p>Contractor's Qualifications</p> <p>The Contractor shall comply with the following minimum requirements:</p> <ol style="list-style-type: none"> 1. Philippine Contractors Accreditation Board (PCAB) member with license category applicable to the project; and 2. With at least ten (10) six (6) years of experience in design, repair and construction of Sewage Treatment Plants (STP/SBR). 3. With good track record. 	

VII.	<p>Contractor's Personnel Qualifications</p> <p>The minimum requirements of Contractor's key personnel to be assigned to the Contract is as follows:</p> <p>1. Project Engineer</p> <p>Qualified Engineering(Environmental/Sanitary/Chemical) expert/s with relevant experience.</p> <p>The qualified expert/s shall be in charge of the design, implementation and supervision of works on the project.</p> <p>For the qualified expert/s and other proposed key members, the Contractor shall provide the following information:</p> <ol style="list-style-type: none"> Professional Qualifications; Relevant Education levels and dates; Chronological employment history, including role in any previous similar project; and At least five (5) years of experience in similar projects. <p>2. Health and Safety Officer</p> <p>Assigned Safety officer will be responsible for the overall safety of the project. He/She shall ensure safe working conditions and compliance with all safe operating procedures in the site.</p> <p>The Contractor shall provide the following information:</p> <ol style="list-style-type: none"> DOLE Certification; Relevant Education levels and dates; Chronological employment history, including role in any previous similar project; and With at least (2) years of experience in similar projects. <p>3. Foreman</p> <p>Assigned foreman will work under the direction of the Contractor/Project Engineer to identify phases of the work. He/She shall be responsible with the timely progress monitoring of the project and ensure workers are knowledgeable and qualified, and assign them according to their skill sets.</p>	
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	<p>The Contractor shall provide the following information:</p> <ol style="list-style-type: none"> Relevant Education levels and dates; Chronological employment history, including role in any previous similar project; and With at least two (2) years of experience in similar projects. 																
VIII.	<p>Contractor's minimum equipment to be used in the project.</p> <table border="1"> <thead> <tr> <th>No.</th><th>Quantity</th><th>Equipment</th></tr> </thead> <tbody> <tr> <td>1</td><td>1 unit</td><td>1-bagger concrete mixer</td></tr> <tr> <td>2</td><td>1 unit</td><td>Utility Truck</td></tr> <tr> <td>3</td><td>1 unit</td><td>Concrete Vibrator</td></tr> <tr> <td>4</td><td>2 units</td><td>Welding Machine</td></tr> </tbody> </table>	No.	Quantity	Equipment	1	1 unit	1-bagger concrete mixer	2	1 unit	Utility Truck	3	1 unit	Concrete Vibrator	4	2 units	Welding Machine	
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IX.	<p>Contract Duration Project duration is within one hundred and fifty (150) days upon receipt of the Building Permit.</p>																
X.	<p>Confidentiality Clause The Contractor shall ensure that all personnel who shall be assigned to the Department shall execute and sign a Non-Disclosure Agreement which is to be submitted to the Department prior to the commencement of the service.</p>																
XI.	<p>Terms of Payment</p> <ol style="list-style-type: none"> Progress billing and payment shall be as follows: <ol style="list-style-type: none"> 5% of the Contract Price: Upon submission of Inception Reports 10% of the Contract Price: Upon complete delivery of engineering design and details. 15% of the Contract Price: Upon mobilization of construction materials 30% of the Contract Price: Upon completion of 50% construction accomplishment and complete delivery of materials. 30% of the Contract Price: Upon completion and acceptance of the Project. 10% of the Contract Price: Retention Fund 																

	<p>The Contractor shall be paid within thirty (30) working days upon the submission of the sales invoice, or its equivalent, and other supporting documents examined by the Office of Financial Management Services-Financial Resource Management Division (OFMS-FRMD). Payments shall be made through List of Due and Demandable Accounts Payable (LDDAP).</p> <p>All payments shall be inclusive of all applicable taxes and other lawful charges.</p>	
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Note:

Bidder must state compliance to each of the provisions in the Terms of Reference/Technical Specifications, as well as to the Schedule to Requirements. The Statement of Compliance must be signed by the authorized representative of the Bidder, with proof of authority to sign and submit the bid for and in behalf of the Bidder concerned. If the Bidder is a joint venture, the representative must have authority to sign for and in behalf of the partners to the joint venture. All documentary requirements should be submitted on or before the deadline for the submission of bids.

Bidders must state here either “Comply” or “Not Comply” against each of the individual parameters of each Specification stating that the corresponding performance parameter of the equipment offered. Statements of “Comply” or “Not Comply” must be supported by evidence in a Bidder’s Bid and cross-referenced to that evidence. Evidence shall be in the form of manufacturer’s un-amended sales literature, unconditional statements of specification and compliance issued by the manufacturer, samples, independent test data etc., as appropriate. A statement that is not supported by evidence or is subsequently found to be contradicted by the evidence presented will render the Bid under evaluation liable for rejection. A statement either in the Bidder’s statement of compliance or the supporting evidence that is found to be false either during Bid evaluation, post-qualification or the execution of the Contract may be regarded as fraudulent and render the Bidder or supplier liable for prosecution subject to the provisions of the **ITB** Clause 3.1(a)(ii)) and/or **GCC** Clause 2.1(a)(ii).

Conformé:

[Signature/s]

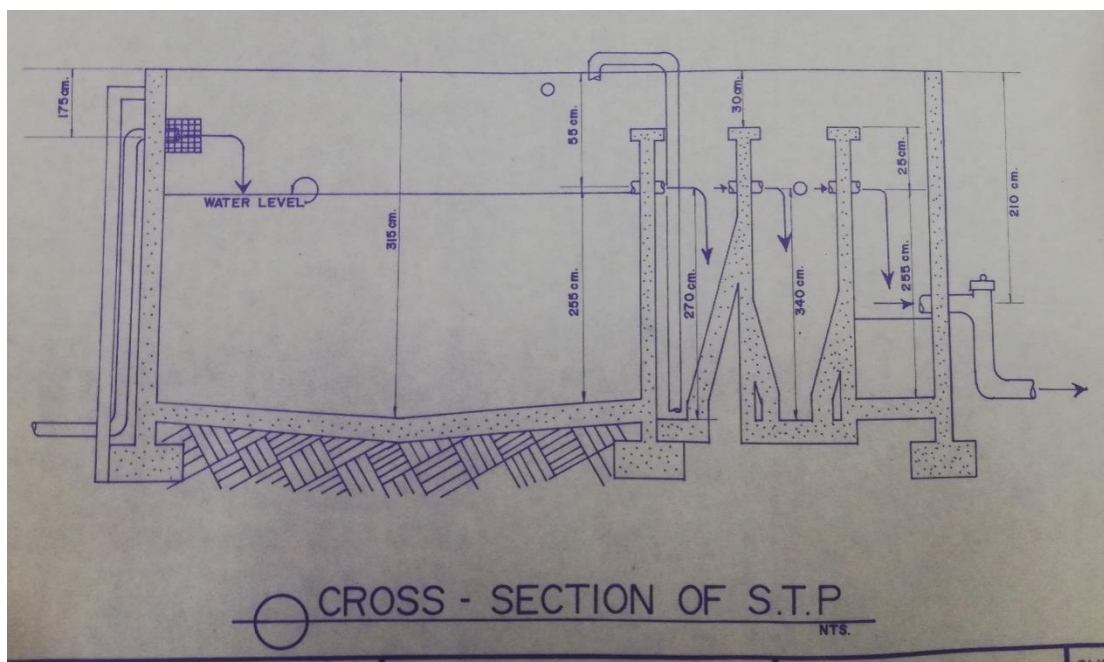
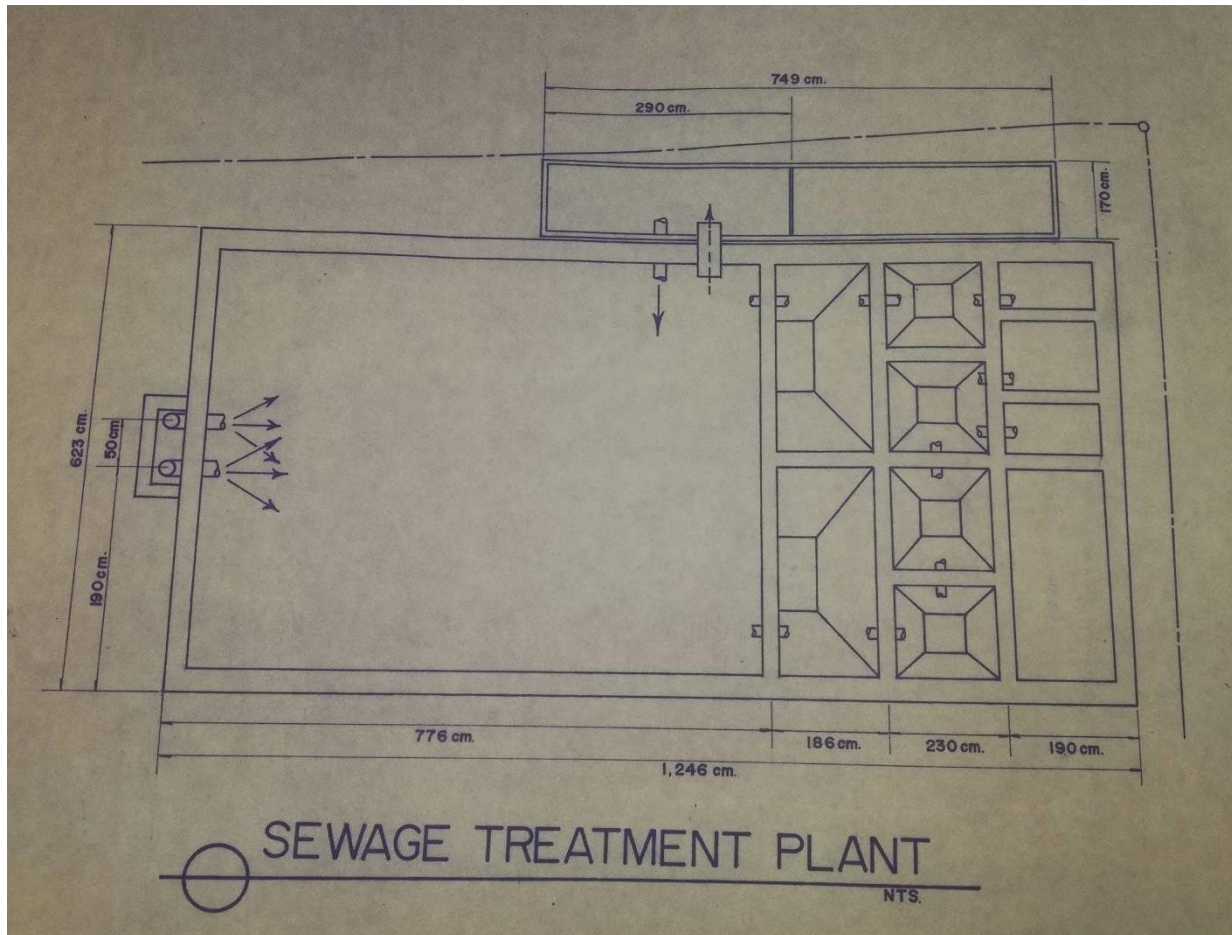
[Name of Bidder’s Authorized Representative/s]

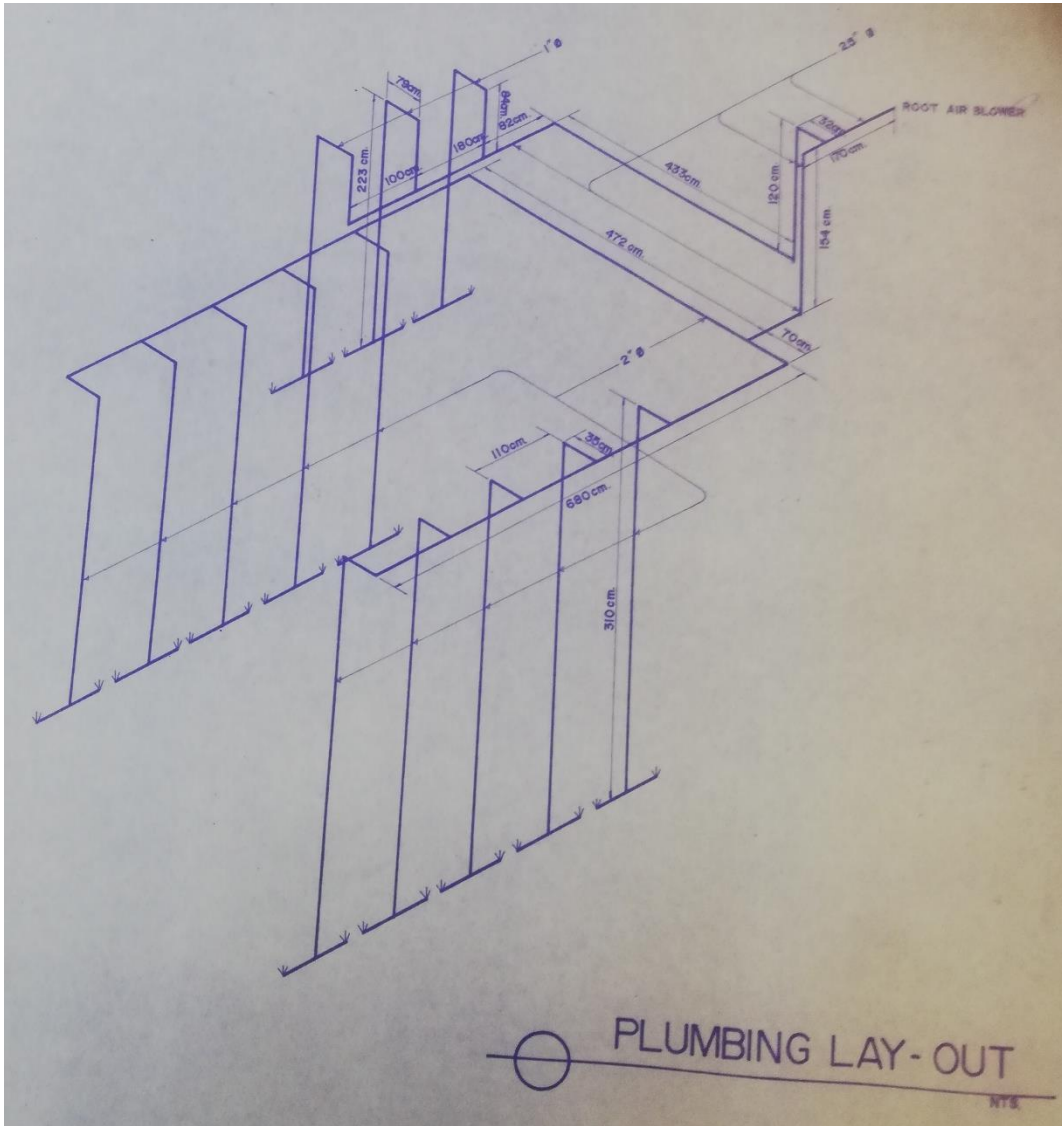
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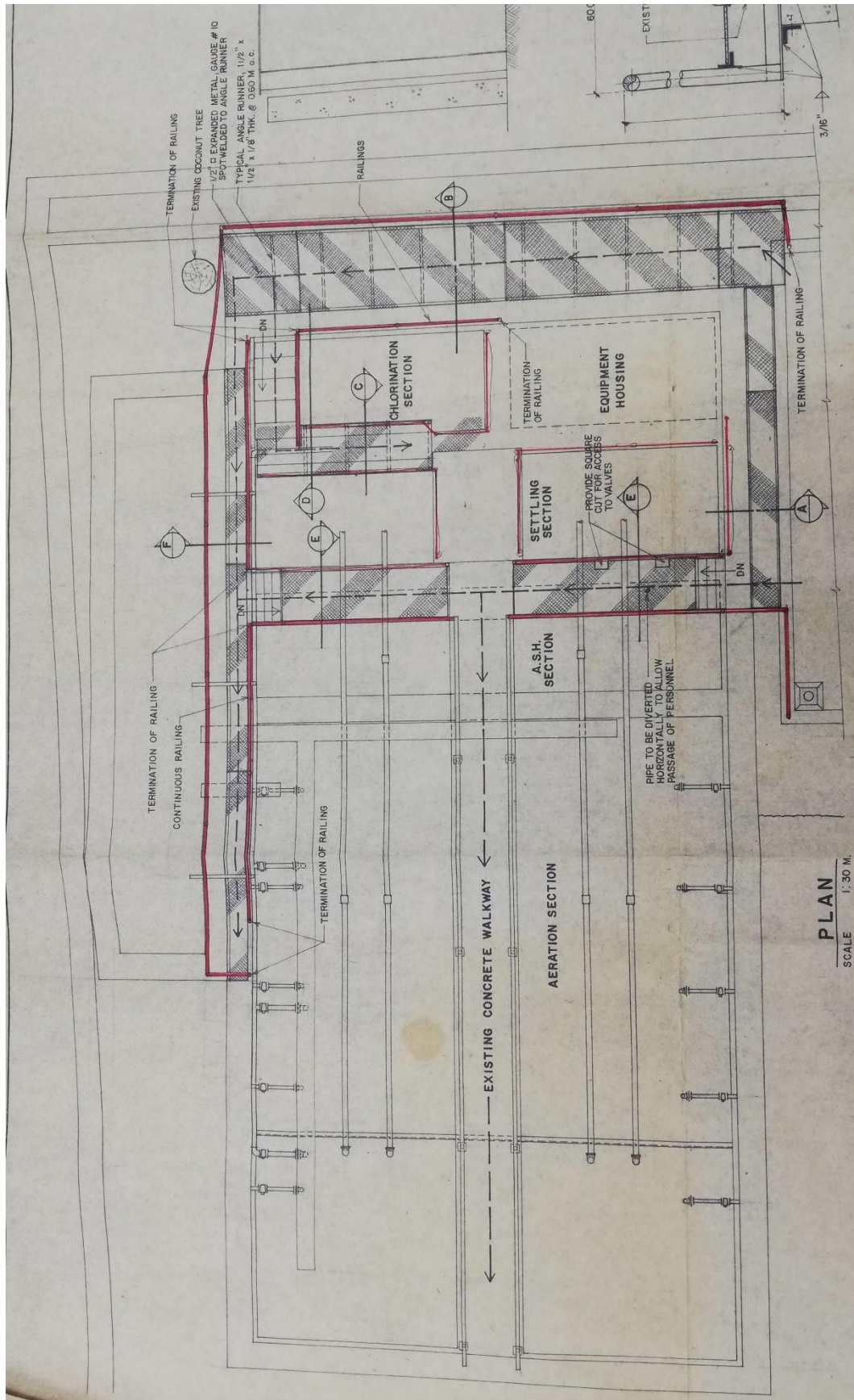
Annex A

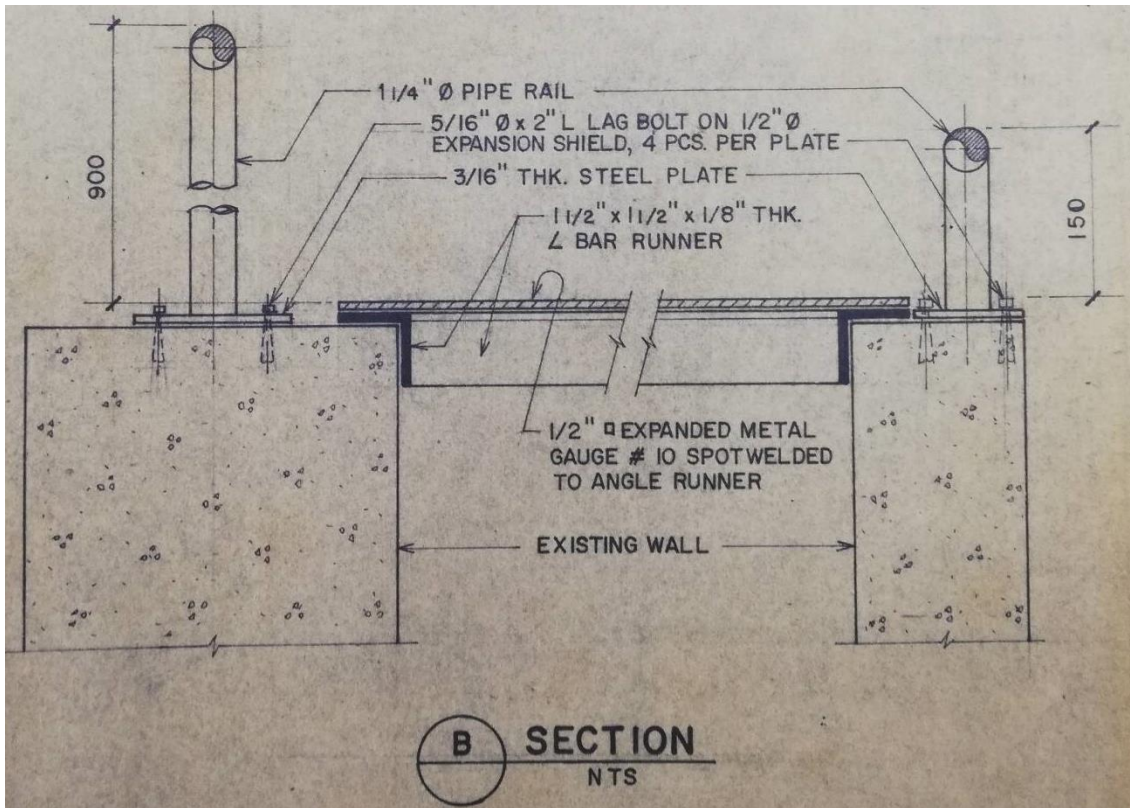
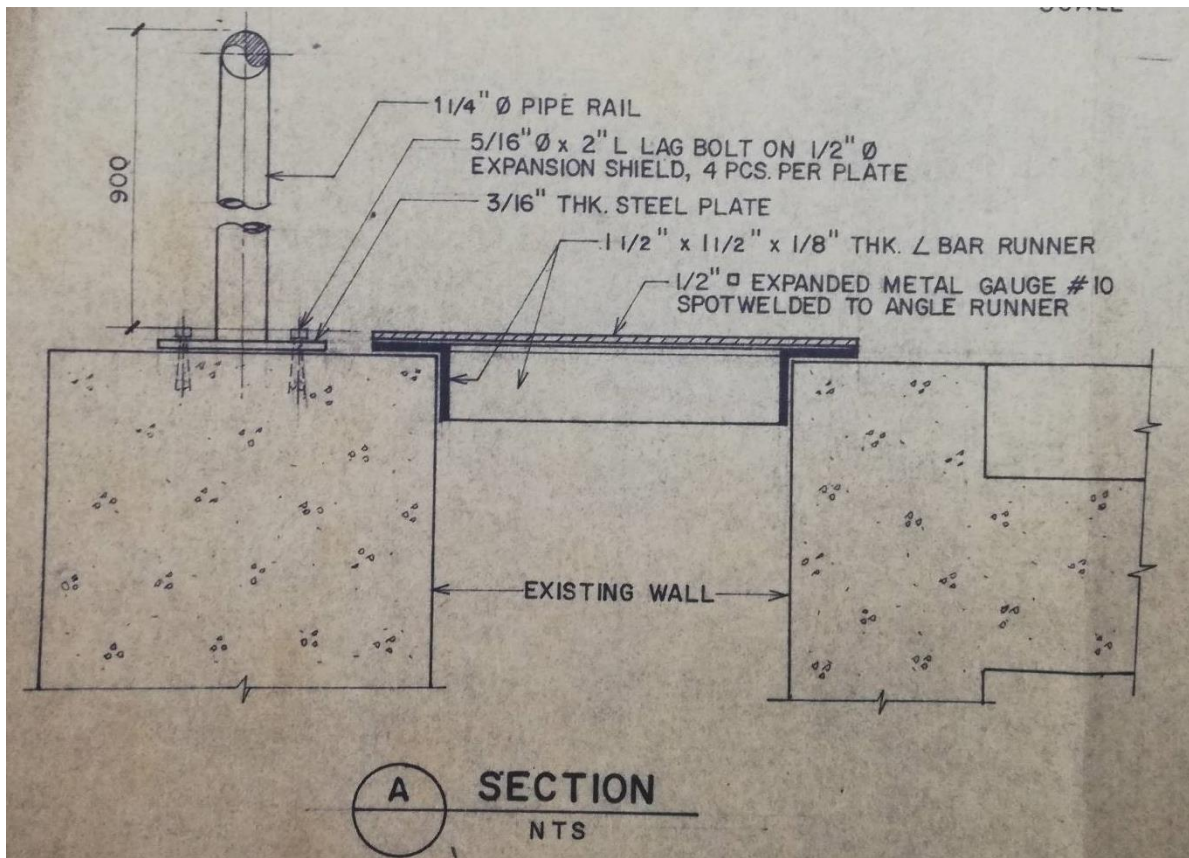
EXISTING SEWAGE TREATMENT PLANT DESIGN

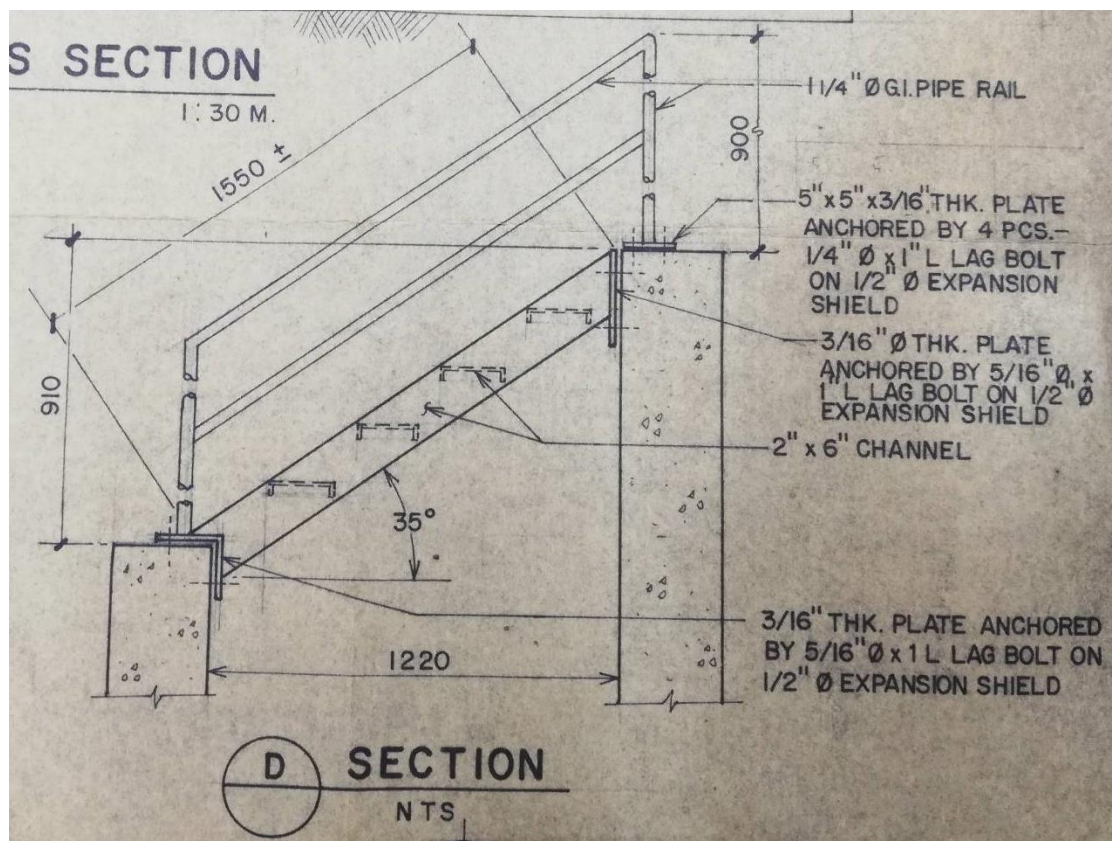
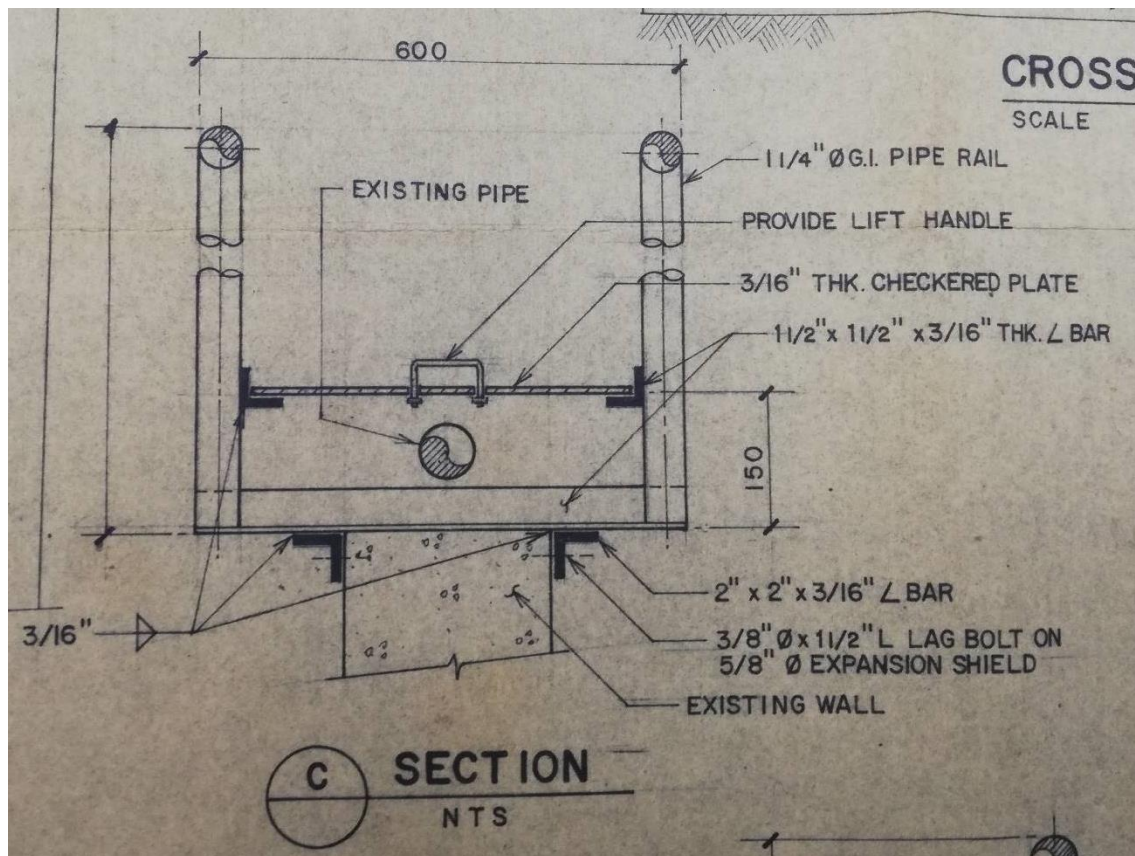


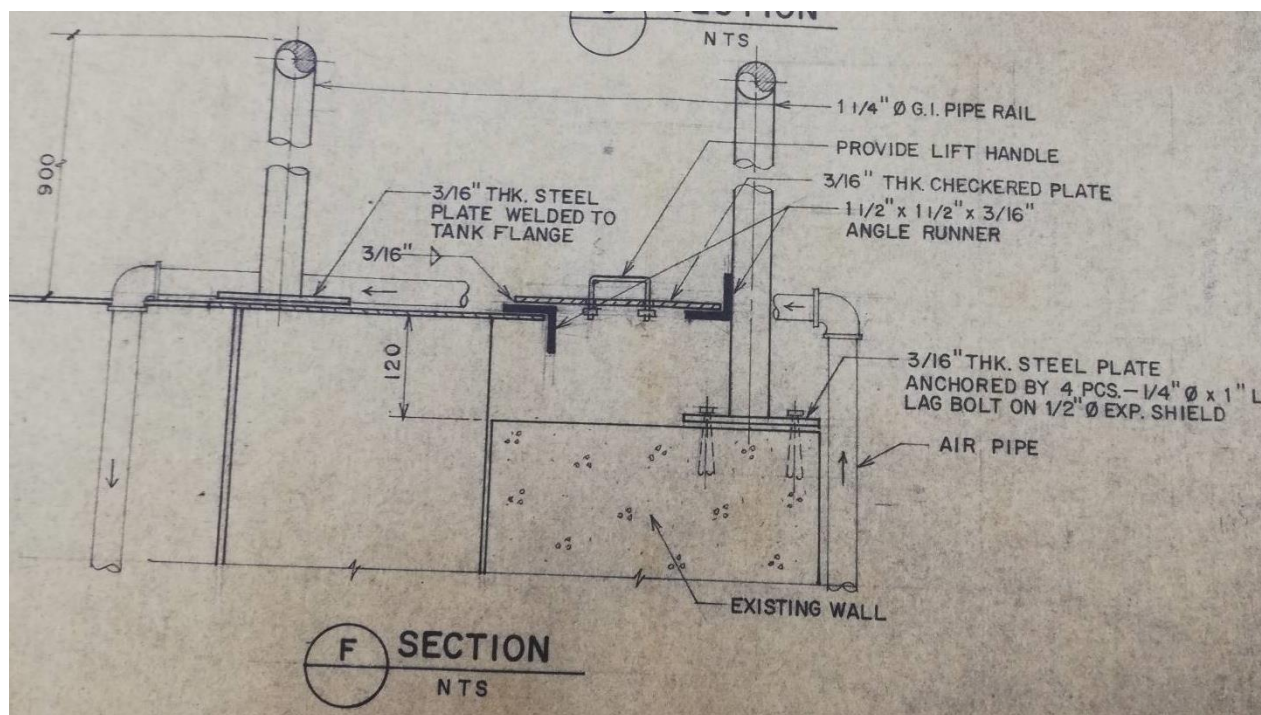
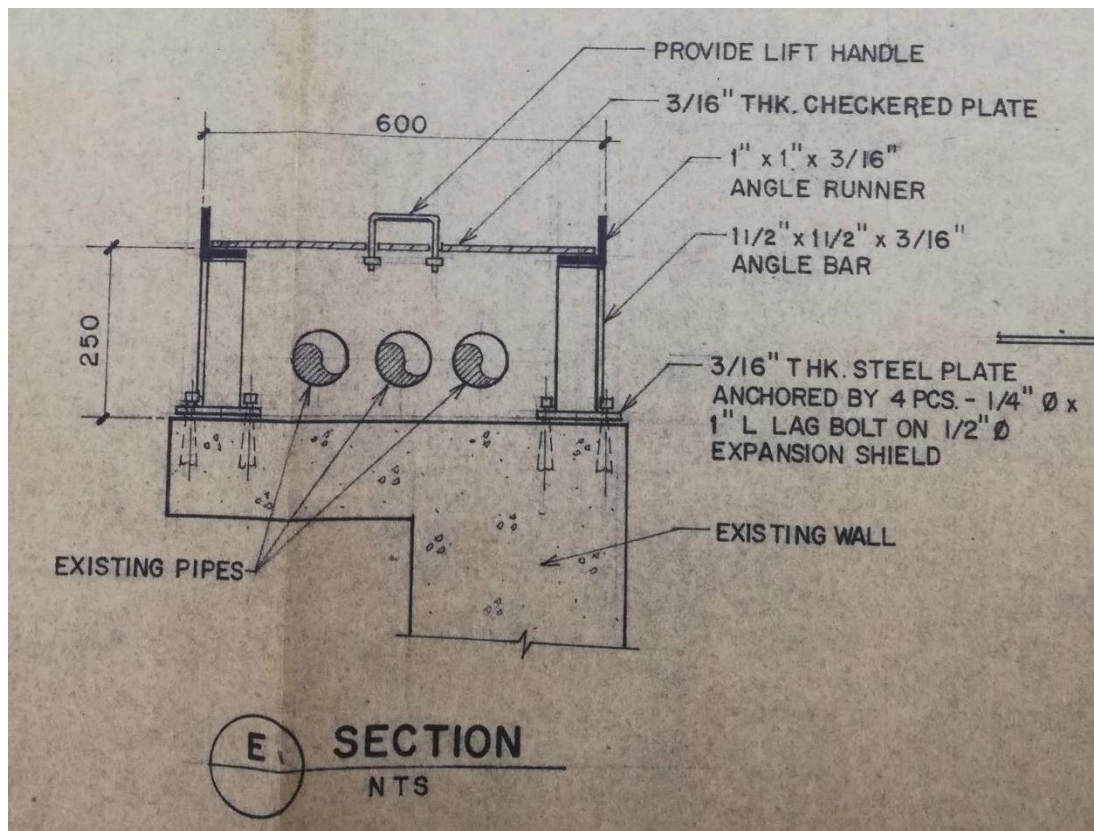


CATWALK AND SAFETY RAILS AT STP/SBR

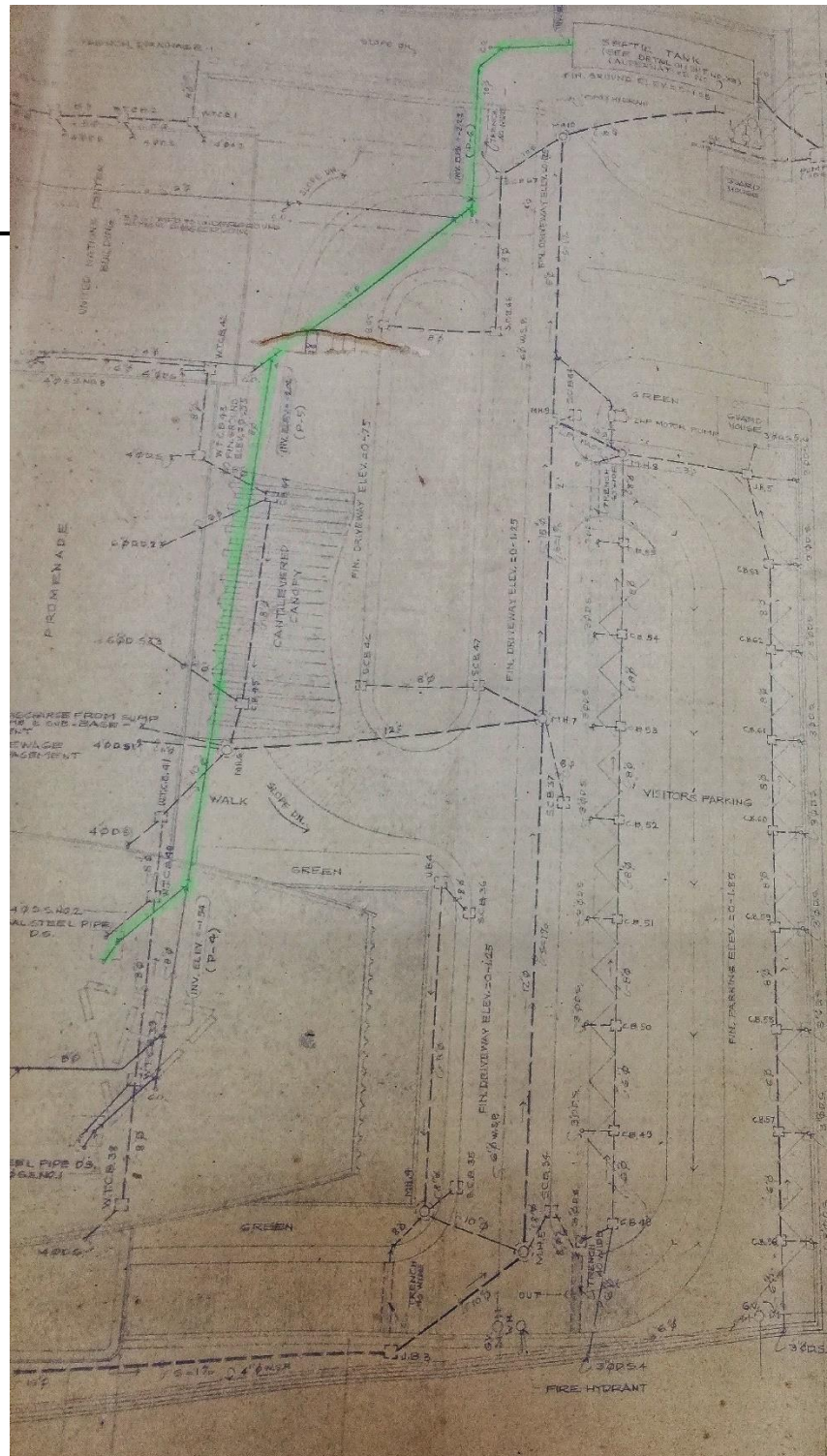








Existing Sewerline



STATUS CERTIFIED: *[Signature]*

DATE: 12-29-76

SYMBOL

_____	_____	SANITARY DRAINAGE
_____	_____	STORM WATER DRAINAGE
_____	_____	TRENCH
_____	_____	TRENCH DRAINAGE
○	M.H.	MANHOLE
□	J.B.	JUNCTION BOX
□	W.T.J.B.	WATER TIGHT JUNCTION BOX
□	C.B.	CATCH BASIN
□	W.T.C.B.	WATER TIGHT CATCH BASIN
□	S.C.B.	STREET CATCH BASIN
□	W.T.S.C.B.	WATER TIGHT STREET CATCH BASIN
—	G.V.	GATE VALVE
—	C.V.	CHECK VALVE
○	W.M.	WATER METER
□	S.D.B.	SURFACE DRAIN BOX
—	—	WATER SUPPLY PIPE

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NOTES

1. SIZES OF WATER SUPPLY PIPES TO FIXTURES SHALL BE IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS
2. ALL G.I. PIPES AND OTHER PLUMBING FITTINGS SHALL CARBOLINE COATED (UNDERGROUND OR CONCRETE EMBEDDED)
3. MAINTAIN 1% SLOPE FOR ALL SANITARY DRAINAGE PIPING INSTALLATION.
4. USE CAST IRON PIPES FOR ALL HORIZONTAL RUNS OF SANITARY DRAINAGE AND WROUGHT IRON PIPE OF MEDIUM WEIGHT FOR ALL VERTICAL SOIL PIPES UNLESS OTHERWISE INDICATED OR SPECIFIED:

Annex B

Minimum Specifications, Requirements and Standards (MPSS)

1. Governing Codes, Specifications, Regulations and Standards:

The installation, quality of work and equipment shall conform to good engineering practices and, in particular, comply with the requirements laid down in the following or their equivalent which are mandatory and modified only by specific agreement:

1. Architectural:

- a) National Building Code of the Philippines (R.A. 6541)
- b) American Society for Testing and Materials (ASTM)
- c) Philippine National Standards (PNS)
- d) Philippine Trade Standards (PTS)

2. Structural:

- a) National Structural Code of the Philippines (NSCP)
- b) American Society for Testing and Materials (ASTM)

3. Electrical:

- a) Philippine Electrical Code (PEC)
- b) Fire Code of the Philippines (R.A. 9514)
- c) Local Utility Power Company
- d) Underwriters' Laboratory, Inc. (UL)
- e) National Electrical Manufacturers Association (NEMA)

4. Sanitary and Plumbing Works:

- a) Revised National Plumbing Code of the Philippines (R.A. 1378).

5. Fire Protection:

- a) Fire Code of the Philippines (R.A. 9514)

6. Others:

- a) DENR Administrative Order No. 08 series of 2016 (Water Quality and General Effluent Standards of 2016)

2. Temporary Site Facilities

1. These shall all have temporary lighting, power, water supply and all necessary facilities for the simultaneous use of all possible fields of work to complete the project.
2. These shall have the necessary number of warehousemen to ensure security of the construction site.
3. These must have the necessary number of units of fire extinguishers.
4. These shall also have displayed on-site billboards as precautions for public safety.
5. These shall have areas for storage and filing of materials:
 - a. Delivery: All materials shall be properly turned over and delivered on-site in good quality and condition. There shall be time and delivery records.
 - b. Storage: Storage of materials and for erection of sheds and tool houses if deemed necessary, shall have designated spaces for this purpose. Materials must be arranged properly in terms of size, quality, quantity, category and time of use.
 - c. Storage area must be properly maintained by a designated person of the Contractor.
 - d. Cement, lime and other materials affected by moisture shall be stored on platforms and protected from damage due to inclement weather. Materials shall be stored to ensure the preservation of its quality. Storage facilities shall be conveniently located to facilitate access and prompt inspection.
 - e. Necessary precautions to avoid fire must be observed by removing oily rags, waste, etc. at the end of daily work.

3. Civil Works

a. Painting works

- 1) All paint materials shall meet the requirements of the Standard Specifications of the International Organization for Standardization (ISO) on supplies.
- 2) All paint materials shall be delivered on the job-site in their original containers with labels and unbroken seals.
- 3) Manufacture or brand of painting materials proposed to be used by the Contractor shall first be submitted to OAMSS-EMS for approval to ensure the quality of materials.
- 4) All exposed hardware, lighting fixtures and accessories, plumbing fixtures and accessories, glass works and the like shall be appropriately protected to prevent paint stains and damage from painting materials.
- 5) All paints and other coatings shall be mixed and applied strictly **in accordance with the manufacturers printed instructions**.
- 6) Surface preparations and cleaning standard practices must be properly followed before application of painting products. These include metal, concrete, plasters and wood surfaces and materials. Voids, cracks, and all other defects, shall be repaired with proper patching materials and flush finished with the surrounding surfaces.
- 7) Accessories and other items of works to be painted and not specified herein, but necessary to complete the work, shall be approved by OAMSS-EMS and must

besuited to the nature of the surface and materials. These items shall be of the same brand as the paint to be used.

- 8) No painting and varnishing works shall be done during rainy or damp weather.
- 9) All hardware shall be protected or removed prior to painting and varnishing works.
- 10) Kerosene shall not be used as paint thinner.
- 11) Paints of different manufacturers shall not be mixed together.

b. Concrete Works

- 1) Portland cement, proposed to be used, shall conform to ASTM C-150 or higher standards, and shall first be submitted to OAMSS-EMS for approval. Only one (1) brand of cement shall be used for the whole masonry works.
- 2) Sand or fine aggregate shall be clean, clear, sharp river sand and well graded and free from dust, clay, lumps, shale, alkali, surface coatings, organic matter and other deleterious substances.
- 3) Coarse aggregate shall be river run gravel or broken stones. The maximum size shall be $\frac{1}{5}$ of the nearest dimension between sides of forms of the concrete, or $\frac{3}{4}$ of the minimum clear spacing between reinforcing bars, or between re-bars and forms whichever is smaller.
- 4) Water to be used shall be fresh and clean, free from ruinous amount of oil, acids, alkali, organic materials, and other deleterious substances.
- 5) All air-entraining admixtures if used, shall conform to ASTM C-260 standard. Water reducing admixtures, retarding admixtures, and water reducing and accelerating admixtures, if used, shall conform to the requirements of ASTM C-494 standard.
- 6) The minimum requirements for deformed steel bars shall conform to ASTM A-305 standard.
- 7) Wire reinforcement shall also conform with ASTM A-82 standard.
- 8) Reinforcement shall be clean and free from loose, rust, scales and any coatings that will reduce bond.
- 9) Concrete shall consist of Portland Cement, fine aggregates, water, and where specified, Admixtures, proportioned mixed placed, cured and finished as hereinafter specified.
- 10) All provisions of the Specifications shall apply the seven (7) day compressive strength equal to the 28-day strength required for normal concrete. Admixture used in concrete shall be produced by a reputable manufacturer and used in accordance with the manufacturer's printed directions.
- 11) All concrete work shall be protected from drying out after removal of forms by covering with waterproof paper, polyethylene sheeting, burlap, with a coating of approved membrane curing compound having a moisture retention equal to 90% based on the ATM C-309 and C-156 standards, applied in accordance with the manufacturer's instructions for use.

- 12) Wet burlap as often as required to keep concrete wet throughout each day for a period of at least seven (7) days where normal Portland cement is used and three (3) days where high early strength cement is used.
- 13) Reinforcing bars shall conform to ASTM Specifications A-615. All mild steel for columns, shear wall, footings and footing beams shall be high grade deformed bars. $F_y=413.7$ Mpa.
- 14) Forms shall conform to the shape, lines and dimensions shown on the drawings. They shall be substantial and designed to resist the pressure and weight of the concrete.
- 15) Forms shall be properly tied and braced or shored so as to maintain their position and shape. Forms shall be sufficiently tight and strong to prevent leakage of mortar.
- 16) Forms shall be designed and constructed to facilitate early removal without damage to exposed surfaces of the concrete, free of offset, and square corners true to lines and profiles as detailed.
- 17) The mixing and measuring equipment shall be approved by the supervising Architect or Engineer of the Contractor. Unless otherwise authorized, concrete shall be machine mixed at the site or by ready-mixed concrete.
- 18) All ready mixed concrete shall conform with the requirements of ASTM C-94 standard, placed in forms within one hour after adding water or not more than $\frac{1}{2}$ hours if a retarder is used. It shall be kept constantly agitated during the transit period.
- 19) Any concrete which is not formed on level or alignment, or shows defective surfaces shall be considered as not conforming with the intent of these specifications and shall be removed at the expense of the Contractor, unless OAMSS-EMS grants permission to patch or otherwise correct the defective areas.
- 20) Exposed concrete finish surface where no finishing applied as called for on the drawings shall be finished with a steel trowel as required to produce a hard, dense finish free from surface imperfections.

c. Masonry works (Cement plaster, cement overlay, concrete hollow blocks and grout)

- 1) Portland cement, proposed to be used, shall conform with ASTM C-150 or higher standards and shall first be submitted to OAMSS-EMS for approval. **Only one (1) brand of cement shall be used for the whole masonry works.**
- 2) Sand or fine aggregate shall be clean, clear, sharp river sand and well graded and free from dust, clay, lumps, shale, alkali, surface coatings, organic matter and other deleterious substances.
- 3) Water to be used shall be fresh and clean, free from ruinous amount of oil, acids, alkali, organic materials, and other deleterious substances.
- 4) Skim coat shall be pre-mixed cement-based filling and leveling plaster for concrete surface.
- 5) Surface preparations and cleaning standard practices must be properly followed before application of cement mixture.

- 6) All cement materials shall be mixed and applied strictly in accordance with the manufacturer's printed instructions.
- 7) Cement plaster shall consist of one (1) part Portland cement and two (2) parts clean, washed sand measured by volume.
- 8) Materials shall be delivered in the manufacturer's original unbroken packages or containers labeled plainly with the manufacturer's name and trademark. All cement materials shall be kept dry until ready for use. It shall be stored off the ground, under cover and away from sweating walls and other damp surfaces.
- 9) Cement plaster shall not be applied on concrete and masonry surface that had been coated with bituminous compound and other surfaces that has been painted or previously plastered.
- 10) Plaster work shall be finished, leveled, plumbed, squared and true to line within tolerance of 3mm in 3 meters-span without waves, cracks, blisters, pits, crazing, discolorations, projections and other imperfections. Plaster work shall be formed carefully around contours, angles, and well screened. Special care shall be taken to prevent sagging and consequent dropping of mortar during applications. There shall be no visible junction marks on the final coat.
- 11) All loose, cracked, damaged or defective parts shall be repaired and re-plastered in an acceptable and approved workmanlike manner.
- 12) The under-bed mixture shall be spread to bring mortar under-bed to a level of 16 mm below the finish floor line.
- 13) For concrete masonry walls, columns, etc., the surface to be applied shall be first rendered a scratch coat and made true to plane, leveled plumbed and squared then allowed to cure for seven (7) days.
- 14) Mixture shall be in approved containers to ensure that the specified materials are controlled and accurately measured. Mixture measured by shovel or shovel counts will not be permitted.
- 15) The aggregates introduced and mixed in such a manner that the material will be uniformly distributed throughout the mass.
- 16) Mortar boxes, pans etc., where mixtures are mixed shall be kept clean and free from debris or dried mortar.
- 17) The finish surface shall be firmly, evenly, and monolithically applied.

4. Waterproofing works

- a. Cracks surfaces must be plastered with a mixture of concrete and cementitious water proofing acrylic polymer.
- b. Concrete slab shall be properly graded to drain rainwater. A minimum pitch of one percent (1%) is satisfactory to drain rain water freely into drain lines.
- c. All waterproofing materials, primer and topcoat, and other coatings shall be mixed and applied strictly **in accordance with the manufacturers printed instructions**.

- d. All loose areas shall be refitted and well secured. Cracks, breaks and open seams shall also be repaired. Where required or as directed in the membrane waterproofing product instruction manual, prepared surface shall be primed coated.
- e. Areas to be waterproofed must be cleaned and all traces of water, dirt, protruding materials, and other contaminants shall be removed first.
- f. Areas to receive waterproofing should be dried prior to priming.
- g. Waterproofing primer (primer, for concrete application only) as primer, will be applied by paint brush or roller brush. Drying time is 30-40mins., depending on the condition of the surface before applying the 1st coat of Waterproofing top coat (waterproofing film).
- h. Waterproofing top coat waterproofing film by paint or roller brush. 40mins-1hr. drying time before applying the 2nd coat of Waterproofing top coat.
- i. Waterproofing top coat as 2nd coat. (Application of 3rd & 4th coat must also be done if necessary or if required by OAMSS-EMS).
- j. Application of waterproofing on extruded surfaces one (1) foot or 300 millimeters from the horizontal surface of the waterproofing top coat will also be included.
- k. All loose areas shall be refitted and well secured. Repair cracks, breaks and open seams. Where required or as directed in the membrane waterproofing product instruction manual, prepared surface shall be primed coated.
- l. Flood testing after the application of waterproofing must also be performed.

5. Plumbing works

- a. All piping materials, fixtures and appliances fitting accessories whether specifically mentioned or not but necessary to complete this item shall be furnished and installed.
- b. For rigid type of connections, the following shall be used: Polyvinyl Chloride (PVC); Chlorinated Polyvinyl Chloride (CPVC); Unplasticized Polyvinyl Chloride (uPVC); Black Iron Pipe (BIP); Acrylonitrile Butadiene Styrene (ABS); Polypropylene (PP0 and Styrene Rubber Plastic (SR).
- c. Plastic pipe shall be of quality made by reputable manufacturers free from defects, and shall be true, smooth and cylindrical, their inner and outer surfaces being as nearly concentric as practicable.
- d. They shall be in all aspect, sound and perfectly molded free from laps, pin holes or other imperfections and shall be neatly dressed with its end finished reasonably square to their axes.
- e. Pipes and fittings shall be made of virgin materials conforming to Specification requirement defined in ASTM D-2241 and PNS 65:1986.
- f. Fittings shall be molded type and designed for solvent cement joint connection for water lines and rubber O-ring seal joint for sanitary lines.
- g. Inlet and outlet pipes shall conform to the latest addition of the National Plumbing Code.
- h. Gutters and downspouts shall be free of leaves, branches, pine needles and other foreign materials.

- i. Horizontal waste line receiving the discharge from two or more fixtures shall be provided with end vents unless separate venting of fixtures is noted on the Plan.
- j. All changes in pipe sizes such as soil and waste lines shall be made with reducing fittings or recessed reducers.
- k. Cleanouts at the bottom of each soil stack, waste stack, interior downspout, and where else indicated shall be the same size as the pipe lines.
- l. Upon completion of the work, the Contractor shall submit two (2) sets of prints with all As-Built changes shown on the drawings in a neat workmanship manner.
- m. Such prints shall show changes or actual installation and conditions of the plumbing system in comparison with the original drawings.