



Republic of the Philippines  
**ZAMBOANGA CITY WATER DISTRICT**  
*Pilar Street, Zamboanga City*

**TECHNICAL SPECIFICATIONS**

**FOR THE**

**PROPOSED LABORATORY RENOVATION**  
**AT ZCWD PASONANCA WATER**  
**TREATMENT PLANT**

**JANUARY 2022**



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***BILL OF QUANTITIES***



## BACKGROUND

The ZCWD Laboratory has been constructed together with the Water Treatment Plant Phase II at Barangay Pasonanca in year 1991. Its primary purpose is to check and monitor the raw water that comes in the treatment plant and the treated water that is being distributed to the customers to ensure the safety of the public's drinking water in compliance with the ZCWD mandate.

To comply with the Presidential Decree No. 856 or the Sanitation Code of the Philippines which requires the initial and periodic examination of drinking water to be done by a DOH-Accredited water testing laboratory and DOH A.O. No. 2006-0024 known as the "*Rules and Regulations Governing the Accreditation of Laboratories for Drinking Water Analysis*", the said laboratory has to be renovated in accordance with the DOH Administrative Order No. 2020-0031 known as "*Revised Rules and Regulations Governing the Accreditation of Laboratories for Drinking Water Analysis*", particularly Section B. "Technical Requirements", this is in order to comply with the Physical Plant requirement as stipulated thereon.

As a result, the Water Quality Division in collaboration with the Engineering & Construction Department proposed the renovation of the existing Laboratory in accordance with the DOH AO No. 2020-0031.



## **I. BIDDING REQUIREMENTS**

- 1.1. All eligibility documents shall conform to the requirements stipulated in the Republic Act 9184 & its Implementing Rules and Regulation.
- 1.2. For single contractor, PCAB LICENSE shall be at least Small B with License Category C & D for General Engineering/General Building
- 1.3. For Joint Venture bidders, the JV bidders shall submit a JVA in accordance with RA 4566 and its IRR. Each partner of the Joint Venture shall submit their respective PhilGEPS Certificates of Registration in accordance with Section 8.5.2 of RA 9184 & its IRR. The submission of Technical and financial eligibility documents by any of the joint venture partners constitute compliance: Provided, that the partner responsible to submit the NFCC shall likewise submit the Statement of all its ongoing contracts and Audited Financial Statements.
- 1.4. All subcontracting arrangements should be disclosed at the time of bidding, and subcontractors shall be identified in the bidding documents submitted by the eligible bidder. Subcontractors should also pass the eligibility check for the portions of the contract that they will undertake.



## II. GENERAL SPECIFICATIONS

- a. Procurement & Implementation of Contracts for this Item shall be in accordance with RA 9184 (An act providing for the modernization, standardization, and regulation, of the procurement activities of the government and for other purposes.)
- b. It is recommended that the bidder will conduct a site inspection at the ZCWD Laboratory located at Barangay Pasonanca together with the ZCWD's representative prior the bid preparation. This is to determine the extent of the installation activity.
- c. The winning bidder/contractor shall be liable for restoration on any damages occurred on the existing ZCWD facilities as a result of the implementation of works thereon.
- d. Material Testing for construction materials shall be in accordance with the DPWH (Department of Public Works & Highways) blue book.
- e. Winning bidder/contractor shall provide the required manpower, materials, tools, equipment, transport, supplies and other necessary services required for the completion of the renovation works.
- f. Winning bidder/contractor shall supply the necessary materials, fittings, accessories, tools and equipment for the completion of item of works as specified in the BOQ.
- g. Permits are part of contractor's obligation and are included in the contract. It is the sole responsibility of the winning bidder to coordinate with other concerned agency in securing the necessary permits before engaging with the actual implementation of the project.
- h. The ZCWD has the right to stop the work if the ongoing activities are detrimental to the existing ZCWD facilities.
- i. The renovation works at Third Floor shall commence at Bacteriological Preparation /Testing/Decontamination Rooms and prior the renovation works, the Biosafety Cabinet, Oven and other sensitive equipment thereon shall be moved to portion of the proposed Physical Chemical Laboratory Area where renovation work shall not be started until the Bacteriological Rooms are completed.



### III. TECHNICAL SPECIFICATIONS

#### **3.1 TECHNICAL SPECIFICATIONS AND GUIDELINES FOR PREPARATION OF BILL OF QUANTITIES AND DETAILED ESTIMATE**

*In filling up the Bill of Quantities (BOQ), neither deletion nor augmentation of item of works is hereby prescribed. All items of works, contingencies and others necessary in the implementation of the project are deemed stipulated in the BOQ.*

##### **3.1.1 PERMITS AND ENVIRONMENTAL COMPLIANCE CERTIFICATE**

3.1.1.1 This item shall form part of the OCM, hence, all necessary permits (building permit), clearances and performance bond with the DPWH, city office, local and national government clearances and other documents necessary for the implementation of the project including incidental expenses shall be processed and borne by the contractor.

3.1.1.2 All permits and clearances including Environmental Compliance Certificate (ECC) shall be tangibly acquired by the contractor before the project implementation commences. Permit application on account nor on-going processing for the same will not be considered.

##### **3.1.2 MOBILIZATION/ DEMOBILIZATION**

Mobilization/ Demobilization shall include the necessary arrangement to mobilize initial activities on site such as; preparation of the working area at site, establishing of communication facilities, on-site office administration office, on-site storage facilities, implementing security requirements and health protocols in the project site as required for the proper performance and completion of the work. Upon demobilization, all restored area must be cleared from debris, tools, equipment, barricades, excavated materials and all other supplies that were used during project implementation. Dismantling all temporary storage facilities, scaffoldings, and all other temporary office facilities for further arrangement and turnover. The Contractor shall haul or move the equipment, tools and demolished materials from the laboratory (project site) to the destination which is to be determined by the ZCWD Engineer to clear the site and shall return only the necessary items to its origin upon project completion.



### 3.1.3 **CONSTRUCTION SAFETY AND HEALTH**

The implementation of the said project shall be in accordance with the revised *Construction Safety Guidelines* issued by DPWH through Department Order No. 30, Series of 2021 dated March 29, 2021. The guidelines shall apply to allowed government and private construction projects as stated in the Omnibus Guidelines for the Implementation of Community Quarantine in the Philippines in areas under Enhanced Community Quarantine, Modified Enhanced Community Quarantine, General Community Quarantine and Modified General Community Quarantine.

#### **Revised Construction Safety Guidelines for the implementation of Infrastructure Projects during the Covid-19 Public Health Crisis:**

##### **A. PRIOR TO DEPLOYMENT:**

1. Most-at-risk population (MARP) for COVID-19 in the workplace (e.g. senior citizens, pregnant women, individuals with underlying health conditions) and those below 18 years of age shall continue to observe work-from-home arrangements. Should they be needed to occasionally report to work, they may be allowed to, provided a Certificate of Fit to Work is secured from the Occupational Health Personnel (qualified first aider, nurse, dentist, or physician engaged by the employer to provide occupational health services in the establishment, project, site, or workplace). They must stay in the workplace only for a specified number of hours and must limit physical contact inside the premises.
2. Employers are encouraged to collaborate with the national and/or local government testing efforts and follow the expanded testing strategy and rules, as provided in DOH DM No. 2020-0258, DOH DM No. 2020-0258-A, and other relevant issuances.
3. Should mandatory testing be implemented by the employer, it should not constitute as an added cost to the employee. All individuals who are at risk of contracting COVID-19 shall be tested, and these include the following groups: (1) suspect cases, (2) individuals with relevant history of travel and exposure (or contact), whether symptomatic or asymptomatic, and (3) healthcare workers with possible exposure, whether symptomatic or asymptomatic.
4. Testing of Symptomatic and Close Contacts
  - a. All employees experiencing symptoms of COVID-19 and those who are close contacts must undergo RT-PCR testing. Employers shall inform the LGU/s having jurisdiction over the workplace and the respective





- residences of the symptomatic employees and close contacts before testing for monitoring purposes.
- b. Symptomatic employees with close contact exposure shall undergo fourteen (14) days quarantine. Upon its completion and prior to resumption of work, the employee shall present a Certificate of Quarantine Completion from the stepdown care facility or local health office, per Philippine Society for Microbiology and Infectious Disease (PSMID) Guidelines on Return-to-Work. A step-down care facility refers to a DOH or LGU identified facility, such as Temporary Treatment Mega Facility (TTMF), for recovering COVID-19 patients who have been hospitalized, but have not yet been certified as COVID-free and transferred to the TTMF.
5. Testing of Asymptomatic Employees Returning to Work
    - a. RT-PCR or antibody-based or antigen tests are NOT required for asymptomatic employees returning to work.
    - b. Employees physically reporting to work shall be screened for COVID-19 symptoms, including fever, cough, colds, and other respiratory symptoms, and/or determination of travel or exposure to COVID-19 cases within the last 14 days.
  6. Asymptomatic employees, prior to physically returning to work, may be cleared by the local health officer or Occupational Safety and Health (OSH) physician.
  7. Rapid antibody-based or antigen test kits shall not be used as stand-alone tests to definitively diagnose or rule out COVID-19, as these must be used in conjunction with RT-PCR. COVID-19 testing shall be in accordance with DOH DM No. 2020-0258 and DOH DM No. 2020-0258-A.
  8. Concessionaires, contractors, and subcontractors shall ensure that their projects are compliant with DOLE D.O. No. 13, Series of 1998. Cost of COVID-19 prevention and control measures such as, but not limited to, testing, disinfection facilities, hand sanitizers, PPEs, signages, and proper orientation and training, as well as the provision of finance, transportation, food, and other services, as needed, shall be provided and be for the account of the employers/contractors. For private construction projects, the provisions of DOLE Labor Advisory No. 18-20 shall apply.
  9. Concessionaires, contractors, and subcontractors shall provide disinfection facilities at their respective project sites, in compliance with pertinent DOH and IATF Guidelines, to be placed at strategic locations to ensure the safety and



welfare of all personnel. The use of disinfection tents, misting chambers, or sanitation booths for individuals is strictly prohibited.

10. Proper information dissemination regarding COVID-19 construction protocols, on top of existing construction safety practices, shall be conducted by Safety Officers on all personnel.

## **B. DURING DEPLOYMENT**

1. Bona fide IDs issued to employees by construction companies, concessionaires, contractors, and sub-contractors allowed to operate during the relevant community quarantine classification shall constitute as sufficient identification and pass for persons/workers/employees of said permitted establishments/offices, pursuant to IATF Resolution No. 106-B, S. 2021, dated 28 March 2021, and relevant IATF guidelines.
2. Construction workers are likewise exempt from the uniform curfew hours imposed by LGUs, pursuant to Section B (15) of IATF Resolution No. 106-B, S. 2021.
3. Back offices of construction companies, concessionaires, contractors, and subcontractors permitted to operate during the relevant community quarantine classification, being necessary for the efficient and coordinated implementation of priority public and private construction projects, may adopt skeleton workforce or alternative work arrangements permitted under ECQ and MECQ, subject to pertinent rules that may be provided therefor by DOLE.
4. Company policies on prevention and control of COVID-19 should be aligned with existing minimum public health standards and guidelines issued by DOH and other regulatory agencies.
5. The employer shall conduct an inventory of works for the construction sequencing to be followed and undertaken to uphold the required social distancing.
6. All persons are mandated to wear full-coverage face shields together with face masks, earloop masks, indigenous, reusable, or do-it-yourself masks, or other facial protective equipment which can effectively lessen the transmission of COVID-19, whenever they go out of their residences (and to be worn at all times in the workplace), pursuant to existing guidelines



issued by the national government, subject to fair and humane penalties or punishments that may be imposed by LGUs or implemented by law enforcement agencies, respectively, and in accordance with the rules on face masks and face shields provided under DTI-DOLE Joint Memorandum Circular No. 20-04-A.

7. All employees must be subjected to temperature checks prior to entering the building/site/office spaces. Proper referral to the appropriate facility shall be done in cases of symptomatic employees.
8. All employees, upon entering the building premises/workplaces, shall be required to accomplish the Health Declaration Form (ANNEX "A-Iff of DTI-DOLE Joint Memorandum Circular No. 20-04-A), or any digital iteration thereof. The security staff or other responsible personnel shall immediately screen the accomplished form and perform a temperature check (ANNEX "B" DTI-DOLE Joint Memorandum Circular No. 20-04-A).
  - a. If "Yes" to any item is answered or if with a  $T > 37.5$  degrees Celsius, the employee shall be denied entry and referred to the workplace isolation area for further evaluation by the Safety Officer.
  - b. If "No" to all items are answered and temperature is  $< 37.5$  degrees Celsius, the employee shall be permitted entry.
  - c. The security staff or other responsible personnel on duty shall immediately give the accomplished health declaration form to the company's Human Resources (HR) Department for appropriate action and storage.
  - d. Should an online health declaration form be used, the form should be electronically submitted to Human Resource.
  - e. The Health Declaration Form shall be handled and processed in accordance with the Data Privacy Act and related issuances to ensure that:
    - i. Data collected should only include such necessary data proportional to the purpose of contract tracing;
    - ii. . The processing of personal data shall be transparent, and the data subjects shall be apprised of the reasons for such collection;
    - iii. Reasonable and appropriate security measures and safeguards shall be implemented to protect the personal data collected;
    - iv. The personal data collected shall be considered highly confidential; and



- v. The personal data shall be stored only for a limited period and shall be disposed of properly after thirty (30) days from date of accomplishment.

Employers shall direct symptomatic individuals through appropriate health system entry points such as the primary care facility (e.g. Barangay Health Center, Infirmary, Private Clinics / hospitals) or telehealth consultation. Referral networks shall be established. Employers may contact the DOH through its hotline 1555 for guidance on the handling and referring of symptomatic employees.

9. All personnel must practice respiratory etiquette at all times. They must use tissue or the inner portion of the elbow to cover the nose and mouth when sneezing/coughing. Proper disposal of tissue after use should be observed.
10. Flexible dining policy shall be adapted (e.g. staggered breaks). The number of workers who can eat in the pantry/dining area at a given time should be limited. Eating alone by workers in their respective workstations is highly encouraged.
11. Employers shall provide their employees with psychosocial support, especially those presenting mental health concerns. If this is not available, a referral system to mental health specialists must be in place, either through establishing a network with an accredited health facility, through telemedicine services, or through the National Center for Mental Health Crisis Hotline. Further, employers shall promote work-life balance, especially in these trying times, through proper scheduling of activities and workforce rotation.
12. Employers classified as large and medium-sized private establishments (i.e. those with total assets above PHP15M) are encouraged to provide shuttle services to their employees. Minimum public health standards should be enforced in the shuttle services. All vehicle types, as long as not expressly prohibited by the Department of Transportation (OOTr) through an issuance, may be used for shuttle services.
13. As smoking is a risk factor for COVID-19, smoking and the use of e-cigarettes or vaping are strictly prohibited in the workplace/construction sites and premises.



14. As COVID-19 is spread through respiratory droplets, spitting in public places can contribute to the transmission of COVID-19. Employers shall implement policies and other applicable guidelines which prohibit spitting.
15. All personnel must wash their hands with soap and water regularly, or use hand disinfectants. Employers should place hand-washing stations with soap and water, hand sanitizers, and/or dispensers with an alcohol-based solution in all entrances, exits, and areas with high foot traffic. Employers must ensure daily monitoring and availability of hand soaps, sanitizers, and disinfectants.
16. Employers must ensure disinfection and routine cleaning of frequently touched surfaces and objects using 0.5% bleach solution (100mL bleach, 900mL water) at least once a day. Disinfection is encouraged between shifts. Disinfection shall be in accordance with DOH DM Nos. 2020-0157 and 2020-0157-A on disinfection protocols.
17. Physical distancing of at least one (1) meter apart from each co-worker should always be practiced in the construction site, if possible. Employer may install temporary barriers, where applicable.
18. Face-to-face meetings should be limited, as much as possible. Tool box or gang meetings for safety should still be conducted, but following minimum public health standards.
19. Employers classified as large and medium-sized private establishments (i.e. those with total assets above PHP15M) shall provide for employees' temporary lodging or quarters for the duration of the project. The minimum public health standards and protocols enshrined in DOH AO No. 2020-0015 and other relevant issuances shall be also implemented within the temporary lodging or quarters. If the employer is unable to provide for his employees' temporary lodging or quarters, the returning employees shall be subjected to the pre-deployment procedures upon every entrance into the workplace/construction sites and premises. This shall in no way be construed as a right by the employer to limit or prevent his employees' from leaving the work premises, to access essential goods or otherwise, subject to the conduct of pre-deployment procedures upon the employees' return or upon every entry by said employees into the work premises.
20. Field offices, employees' quarters, and other common areas shall be regularly maintained, including the daily disinfection of such facilities.



21. Employers shall establish Occupational Safety and Health (OSH) Committees in accordance with Republic Act No. 11058, its IRR, and DOLE Department Order No. 198, Series of 2018, which took effect on 25 January 2019. The OSH Committee and/or Safety Officer of the workplace shall oversee enforcement and monitoring of the minimum public health standards for COVID-19 prevention in the workplace and of DTI-DOLE Joint Memorandum Circular No. 20-04-A.
22. Large and medium private establishments (i.e. with total assets of above PHP15M) are mandated to designate an isolation area of one room for every 200 employees, which must be situated near the entrance/s or in a nearby facility, for employees needing further assessment due to elevated temperature, presence of flu-like symptoms, any "yes" answer to the Health Declaration, or exposure history to a COVID-19 case or probable case.
23. The designated isolation area shall have adequate ventilation and shall have sufficient provision of PPEs for the health personnel and symptomatic patients (e.g. face shields and medical-grade face masks). The isolation area shall be provided with chairs and must have a dedicated restroom. It shall be disinfected once every two (2) hours and/or immediately after any infected or confirmed COVID-19 employee leaves the area.
24. Private establishments unable to establish an isolation area may make arrangements with a temporary treatment and monitoring facility nearby or with the Barangay Local Government Unit, for immediate referral of employees who fulfill the criteria for isolation.
25. For off-site employees' quarters, transport service, duly disinfected before and after use, shall be provided, and social distancing shall likewise be observed therein at all times.
26. Should employees leave the construction site and return, they shall be subject to the necessary and applicable pre-deployment procedures, in line with the established minimum public health standards and protocols.
27. Sharing of construction and office equipment is discouraged. However, if necessary, the shared equipment must be disinfected in between transfers amongst personnel.
28. All material and equipment delivery and disposal shall be conducted by a specific team of personnel on an isolated loading/unloading zone while



limiting contact with the delivery/disposal personnel. All material and/or equipment entering the construction site shall be duly disinfected as much as possible.

29. Non-essential personnel, visitors, and the general public shall be restricted from entering the construction site, isolation site, employees' quarters, and field offices. Otherwise, all personnel entering the construction site premises on a temporary basis (e.g. delivery truck drivers, inspectors, etc.) shall be properly logged and checked for symptoms. Gatherings, liquors, and/or merry-making are strictly prohibited within the construction site premises.
30. Clustered and staggered deployment of employees within the construction site shall be observed to minimize personnel contact and for easier contact tracing.
31. Proper waste disposal shall be provided for infectious waste, such as PPEs and other waste products coming from outside the construction premises.
32. If one confirmed case of COVID-19 is detected in the construction site/workplace, such place shall be disinfected with an appropriate disinfectant solution (0.5% bleach solution). The conduct of a comprehensive disinfection by specialists is recommended.
33. The site must be locked down for 24 hours prior to disinfection to lessen transmission to sanitation personnel. During the disinfection process, all doors and windows should be opened to maximize ventilation. The site may only be opened 24 hours after the disinfection process.
34. Employers shall ensure that the temporary closure of their establishments for disinfection purposes will be done in accordance with the National Task Force Against COVID-19 Memorandum Circular No. 2 dated 15 June 2020 on the Operational Guidelines on the Application of Zoning Containment Strategy in the Localization of the National Action Plan against COVID-19 Response.
35. Reporting of COVID-19 test results to the DOH shall be done in accordance with DOH Administrative Order No. 2020-0013, entitled "Revised Guidelines for the Inclusion of COVID-19 in the List of Notifiable Diseases for Mandatory Reporting to the Department of Health."



36. Employers shall ensure strict compliance with the protocols established by the DOH and LGUs for contact tracing of employees in close contact with a COVID- 19 case, as specified in DOH Memorandum No. 2020-0189 entitled, "Updated Guidelines on Contact Tracing of Close Contacts of Confirmed Coronavirus Disease (COVID-19) Cases".
37. Other applicable provisions of DTI-DOLE Joint Memorandum Circular No. 20-04-A or the "DTI and DOLE Supplemental Guidelines on Workplace Prevention and Control of COVID-19", issued on 15 August 2020, are hereby deemed incorporated in these Guidelines.

### **C. MONITORING AND ENFORCEMENT**

- a. For DPWH infrastructure projects, the head of the concerned DPWH Implementing Office (10) shall monitor compliance with these Guidelines.
- b. For LGU implemented projects and private construction projects, the LGU concerned, through its City/Municipal Engineering Office, shall monitor compliance with these Guidelines.
- c. For infrastructure projects implemented by other national government agencies, Government-Owned and Controlled Corporations (GOCC), and other government instrumentalities, the head or representative of the agency, GOCC, or government instrumentality concerned shall monitor compliance with these guidelines.
- d. Concessionaires, contractors, and subcontractors shall submit to the DPWH 10, LGU, or Implementing Government Agency, GOCC, or Instrumentality, as the case may be, a certification under oath that they have complied and shall continue to comply with the provisions of these Guidelines within fifteen (15) days from commencement of work.
- e. The allowed government and private construction projects are subject to the visitorial and enforcement powers of the DOLE and the DTI in order to ensure compliance with the provisions on minimum health standards and protocols in accordance with the Omnibus Guidelines.
- f. The Offices of the Building Officials (OBO) shall also conduct inspections in their respective jurisdictions, in order to ensure strict compliance with these Guidelines. In case of violation of minimum health standards and protocols, the OBO shall report such violation to the DOLE, DTI, or other relevant agency.





#### 3.1.4 **DEMOLITION WORKS**

This item of work includes the manpower, equipment/tools and material components needed for the demolition and removal of existing walls on the Laboratory which are excluded in the proposed floor plan. The demolition shall be done without damaging the existing wall which are to be retained as per proposed floor plan. The debris shall be disposed by the contractor in ZCWD premises to be determined by ZCWD Engineer.

#### 3.1.5 **6.0MM. THICK FIBER CEMENT BOARD ON METAL FRAME DOUBLE WALL PARTITION**

Double wall partition shall comprise of 0.4mm. thick Metal Stud as wall joists at 600mm. clear spacing from the face of the stud. The double wall covering shall be 6mm. thick Fiber Cement Board riveted/screwed unto the metal stud frames. Installation shall be in accordance with the detailed engineering plan.

#### 3.1.6 **100MM. CONCRETE HOLLOW BLOCK (CHB) NON LOAD BEARING (INCLUDING REINFORCING STEEL)**

Masonry walls are specified to use 100mm. thick CHB (Concrete Hollow Blocks) and should correspond to the detailed plans/drawings provided.

Masonry units - each course shall be solidly bedded in Portland cement mortar. All units shall be damped when laid; units shall be showed into place not laid in full bed of un-furrowed mortar. All horizontal and verticals points shall be completely filled with mortar when aid in full bed of un-furrowed mortar. All horizontal and vertical points shall be bonded at corners and intersections. No cells shall be left open in face surfaces. All cells shall be filled up with mortar for exterior walls. Units terminating against beams or slab shall be wedged tied with mortar. Do not lay cracked, broken or defaced block.

#### 3.1.7 **CEMENT PLASTER FINISH**

Plastering Works requires minimum of 12mm. thickness with Class mixture of 1:3 for internal and external wall plastering (Cement and Fine Sand Ratio). This covers both sides of the walls having smooth surface finish ready for painting.



### 3.1.8 **CONSTRUCTION OF MANUAL ELEVATOR WITH PEDESTAL, FLAT FORMS, LADDER AND RAILINGS**

Materials to be used shall be cut accurately by the oxy-acetylene process or equivalent cutting tools. Extra care shall be exercised in the cutting of long or deformed materials to ensure that no deformation develops.

The procedure of welding shall be approved by the ZCWD Engineer before the work commences. Before welding, all the surfaces to be welded and the adjacent area shall be thoroughly cleaned of rust, paint, slag and dirt and wiped dry. During welding, the materials to be welded shall be firmly held together in correct position by means of jig or tack welding. The tack welding shall be limited to the minimum possible extent. No welding work shall be done in the rain or storm except the underwater welding system. Welding may be carried out with the approval of the ZCWD Engineer where adequate protective measures are taken against the effects of such weather conditions.

The Contractor shall be responsible for making good all unsatisfactory welds including air bubbles, overlaps, undercuts, excess or shortage of the throat thickness or size.

All metal surfaces shall be painted with metal primer and finished with Enamel paint.

The contractor shall supply and install **200-kgs Capacity Electric Hoist** with the following Specifications:

- Power Rated: at least 500 Watts
- Approximately 12m Lifting Height (verify actual height)
- 220V/ 60Hz
- Steel Rope/Chain
- Lifting Capacity of at least 200 kgs.

### 3.1.9 **ROOF FRAMING WORKS (w/ PEDESTAL)**

#### 3.1.9.1 **Post and lateral beams**

Posts are specified as 75mm. Ø G.I. Pipe PNS 26 Heavy Gauge welded unto the bottom chord of the truss. Lateral beams shall be



of 25mm. Ø G.I. Pipe PNS 26 Heavy Gauge for top and bottom chords and 12mm. Ø G.I. Pipe PNS 26 Heavy Gauge for web members. Application of anti- corrosion paint is mandatory. *Refer to drawings for details.*

#### **3.1.9.2 Trusses**

Top and bottom chord are specified as 50mm. Ø G.I. Pipe PNS 26 Heavy Gauge. Web member are specified to be 25mm. Ø G.I. Pipe PNS 26 Heavy Gauge welded unto the top and bottom chord of the truss. Trusses shall be supported diagonally by 10mm. Ø Plain tension rod w/ 10mm. Ø x 100mm. hook and eye turnbuckle. Application of anti- corrosion paint is mandatory. *Refer to drawings for details.*

#### **3.1.9.3 Purlins**

Ga. 14 – 50mm x 100mm C-purlins at 6 equally spaced in both directions with 10mmØ sag rod for bracing support. Also, application of anti-corrosion paint/ metal primer is mandatory. Purlins shall be installed and welded with angular cleat. *Refer to drawings for details.*

#### **3.1.9.4 Pedestal**

Pedestal shall be 250mm. x 250mm. x 100mm. w/ 12mm. thick MS plate anchored to the existing wall and slab by 16mm.Ø x 200mm MS Anchor Bolt. *Refer to drawings for details.*

### **3.1.10 CORRUGATED METAL ROOFING**

Roofing shall be of at least 0.40mm Thick Pre-Painted Corrugated G.I. Sheet. The Contractor shall verify the correct gauge/thickness of the metal roof sheet and all bended accessories with caliper upon actual inspection of materials witnessed by ZCWD Engineer. All bended accessories should be matching the specified color of the metal roof sheet. It shall conform to the detailed plan provided. G.I. Roof Sheet shall be installed with at least 1-3/4" Tekscrew driven with electrical handrill.



### 3.1.11 **PLUMBING WORKS**

Material's specifications such as sizes, materials and thickness and installation details shall conform with the provided detailed plans adhering to the National Plumbing Code of the Philippines. All plumbing installation shall be tested to ensure it is watertight.

### 3.1.12 **CONSTRUCTION OF POLYCARBONATE SHEET RAIN BARRIER**

This item of work covers the construction of structural framing for rain barrier and supply and installation of 6mm. thick Polycarbonate sheet other accessories as reflected in the diagram of the detailed engineering plans. The color shall be determined by ZCWD Engineer. Sheets can be cut using a fine tooth circular saw, a jigsaw, or even with a good pair of scissors. When using the power tools, the sheet must be clamped as close to the end as possible to stop the vibration and allow for some overhang to ensure that water from the sheet will fall into the intended location.

Purlin tape can be used to stop creaking of the sheet with expansion and contraction. Flashings shall also be installed to seal the edges of the sheet. Use screw that is compatible with the polycarbonate.

### 3.1.13 **CONSTRUCTION OF SECONDARY FIRE EXIT**

The construction shall be in accordance with the detailed engineering plan. Angle & flat bar materials and Galvanized Iron (GI) pipes shall be in accordance with ASTM A36 Standard and PNS 26 Heavy Duty, respectively. All materials thickness shall be as specified in the plan.

Metal work shall be fabricated carefully and accurately to ensure compliance with design and performance requirements, using types and grades of metal as specified for the purpose. The finished work must be free from distortion and cracks. Cutting may be by shearing, cropping, sawing or machine flame cutting. Holes through more than one thickness of material for members such as compound stanchion and grider flanges shall where possible be drilled after the members are assembled and tightly clamped or bolted together.

The contractor shall be responsible for ensuring that the capacity of welding instruments, cables and accessories is adequate and suitable for the welding procedure to be used and for maintaining all welding and ancillary



equipment in good working order. The contractor shall also take all necessary safety precautions in connection with the work. All electrical plant in connection with the work shall be adequately earthed. The welding return lead from the work shall be adequate in cross section and shall be correctly connected and earthed. ZCWD may reject the work for any deficiencies in workmanship.

#### **FIRE EXIT SIGNAGES ON ALL EXITS**

The contractor shall supply and install 0.12m x 0.34m Exit Signage (LED Edge Lit Exit Sign) in all exits as reflected in the floor plan and doors schedule of the detailed engineering plan and shall be part of this item of work.

### **3.1.14 3.5MM. THICK FIBER CEMENT BOARD ON METAL FRAME CEILING**

#### **3.1.14.1 Ceiling Frames**

All carrying channels/hangers and ceiling joist are specified to be 0.4mm x 13mm x 50mm Aluminum Metal Furring fastened and joined with at least 1/8" blind rivets. Ceiling joist shall be constructed at 0.60-m spacing for both ways. Moreover, ceiling joist shall adopt and allow the installation of the proposed fixtures (if any) on the ceiling such as fluorescent casement among others.

#### **3.1.14.2 Boards**

The specified ceiling board is Fiber Cement type having 3.50mm bare thickness and to be installed using 1/8" blind rivet. The number of blind rivets to be installed shall be enough to carry the weight of the ceiling board.

#### **3.1.14.3 Mouldings**

Ceiling Wooden Mouldings shall have a size of 3" and shall be treated. Design shall be submitted to ZCWD Engineer for further approval. The installation shall be made by using screws driven by electric handrill.



### 3.1.15 **GRANITE TILES AND TRIMS**

All tiles shall be installed by competent tradesman and in accordance with the best practices of the trade. Room floors shall be of 600mm. x 600mm. Granite tiles and toilet walls and floors shall be of 200mm. x 200mm. Granite tiles with application of 12mm floor topping before tile installation. Tile grout color shall conform to the color of granite tiles. 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 secured.

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 edges of area. Joints of uniform standard width and in true alignment shall be maintained throughout; completely fill width grouting or pointing mortar and finish smooth and flush with tile. The contractor shall submit a sample to ZCWD engineer for conformity before purchasing the tiles.

### 3.1.16 **FABRICATION OF COUNTERS AND SHELF**

All counter top and shelf are on site fabricated and its wood surface shall be painted with Quick Dry Enamel. *Materials specifications and detailing shall be in accordance with the detailed plans provided.*

#### 3.1.16.1 **Materials**

**Quality of Lumber:** Lumber shall be the approved species. Lumber shall be of the respective kinds for the various parts of the work, well-seasoned, thoroughly dry, and free from large, loose or unsound knots saps, shakes, and other imperfections impairing the strength, durability or appearance. All finishing lumber to be used shall be completely dry and shall not contain more than 14% moisture.

**Marine Plywood:** The plywood must have a solid surface without open defects. The Moisture content of the plywood must fall between 6% and 14%. The boards shall be equally sanded on both sides. The thickness shall be in accordance with the detailed engineering plan.

**Granite Slab** - Edges of the Granite slab shall be Full Bullnose or Half Bullnose. The granite slab must have smooth finish using polishing abrasives. The contractor shall consult to the ZCWD engineer for conformity before purchasing the granite slab. The



preferred color for granite is upon the discretion of the ZCWD engineer.

**Stainless Kitchen Sink:** (Grade 304)

Single Bowl shall have a minimum dimension of 0.38m (width) x 0.52m (Length), Drop In Mount Type.

Long Single Bowl shall have a minimum dimension of 0.38m (width) x 1.1m (Length), Drop In Mount Type.

**Stainless Countertop:**

All exposed surfaces shall be 16-gauge stainless steel reinforced on the underside by 16- gauge galvanized-steel channels, so spaced as to prevent twisting or buckling.

**Marine Plywood with White Epoxy Resin with Heat & Chemical Resistant**

Countertop wood surface and floors at Bacteriological & PhyChem Room shall be applied with Epoxy Resin following the product's recommendations. Surface shall be free from dirt and any objects that might prevent adhesion. Dew point temperature has to be observed. Components resin and hardener are applied and adjusted mixing ratios. Mix the resin and hardener as per product's recommendation.

**3.1.16.2 Workmanship**

Execute rough carpentry in best, substantial, and workmen like manner. Erect framing true to line and dimensions, squared, aligned, plumbed and well spliced, nailed and adequately braced, properly fitted using mortise and tenon joint.

**3.1.17 SUPPLY AND INSTALLATION OF DOORS WITH DOOR KNOB AND ACCESSORIES**

This item of work consists of the supply and installation of doors with door knobs/panic door bar/exit devices and other accessories needed as per schedule of doors.

All fire exit door shall be installed with LED Fire Exit Signage as specified in the detailed engineering plan.



#### 3.1.17.1 **Wooden Flush Type Door**

Flushed Type Doors w/ 6mm. thick Clear glass for side vision are to be fabricated. *Dimensions and measurement shall conform to the provided detailed plans.* The preferred good lumber to be used for flushed type door is Mahogany, Gmelina and Lauan.

#### 3.1.17.2 **Casement Type Swing Door**

Casement Type Swing Doors shall be of atleast 6mm. thick Clear glass and with handle on both sides. *Dimensions and measurement shall conform to the provided detailed plans.*

#### 3.1.17.3 **Casement Type Sliding Door**

Casement Type Sliding Doors shall be of 6mm. thick Clear glass. *Dimensions and measurement shall conform to the provided detailed plans.*

#### 3.1.17.4 **PVC Flush Type Louver Door**

Prefabricated PVC doors are of 600mm x 2100mm and 900mm x 2100mm size with bottom louver. PVC doors are mainly utilized for toilets. The PVC shall be installed with complete accessories such as hinges & door knobs.

#### 3.1.17.5 **Wooden Flush Casement Type Louver Door**

Fabricated Wooden Flush Casement Type door with bottom louver is mainly utilized for Gas cylinder compressor room. *Dimensions and measurement shall conform to the provided detailed plans.* The preferred good lumber to be used for flushed type door is Mahogany, Gmelina & Lauan. The supplied wooden door shall be straight

### 3.1.18 **SUPPLY AND INSTALLATION OF GLASS WINDOWS**

#### 3.1.18.1 **Casement Type Aluminum Framing Sliding Windows**

The frames shall be of Aluminum Frames with 6mm. thick Bronze glass. *Dimensions and Measurements, to verify at site.*





### 3.1.18.2 **Aluminum Framing Awning Type Window**

The frames shall be of Aluminum Frames with 6mm. thick Bronze glass. *Dimensions and Measurements, to verify at site.*

### 3.1.18.3 **Aluminum Fixed Glass Windows**

The frames shall be of Aluminum Frames with 6mm. thick Clear glass. *Dimensions and Measurements, to verify at site.*

## 3.1.19 **PAINTING WORKS**

### 3.1.19.1 **Concrete Surfaces**

For concrete surfaces, the initial application of concrete neutralizer is set to purposely clean and even the surface before applying paint. Solvent-based Acrylic Primer is then applied to the concrete surface. Body filler/ patching compound and Solvent based acrylic cast is then applied on cracks and uneven surfaces which will be then undergo abrasive polishing (sand paper). After the surface has been smoothen and free from dusts specks, solvent based acrylic primer is reapplied before the Semi-Gloss Solvent Based Acrylic paint is applied as final finish.

### 3.1.19.2 **Wood Surfaces**

Clean any wooden surface, making it free from dust and any other agent that makes the wooden surface unsmooth. Apply Enamel Primer to the surface by either roller or brush. Putty filler /Body Filler are then applied to bulges caused by rivets, screws, finishing nails and even joints. After which, abrasive polishing using sand paper is then treated making the surface even. Quick Drying Enamel (Semi-Gloss) will serve as the final coat of the wooden surface.

### 3.1.19.3 **Fiber Cement Board Surfaces**

Similar procedure to that of concrete surfaces is being applied to these types of surfaces except for the application of concrete neutralizer.



#### **3.1.19.4 Metal Surfaces**

Formations of rusts are removed by using steel brush. Red oxide primer is being applied rust proofing the all metal surface. Final finish shall be the Quick dry enamel paint as top coat.

#### **3.1.19.5 Surfaces for application of epoxy resin**

This item of work shall cover the application of epoxy resin to counter top 4-7 and floors for Bacte room and Phychem room. Surfaces ready for coating should be clean, dry and free from any contamination. Sand down the surface and vacuum up any extra dust to avoid any bubbles, blisters or other damage to the quality of your coating. Apply multiple thin coats using a foam roller and tip off the surface after each coat. Whilst the epoxy cures, gently apply a dry heat source, such as a hot air blower to remove any air bubbles.

#### **3.1.20 SUPPLY AND INSTALLATION OF MAIN PROTECTION, PANELBOARD & ACCESSORIES**

Diagram and other details for this item are provided in the engineering detailed plan. Materials to be used herein and the manner of installation shall be in accordance with the Philippine Electrical Code.

#### **3.1.21 LIGHTINGS INSTALLATION FOR SECOND FLOOR AND THIRD FLOOR**

This item of work calls for the supply and installation of lighting connection such as installation of electrical wire with conduit, utility boxes, junction boxes, socket for fixtures, light fixtures as reflected in the detailed engineering plan, switches and other necessary fittings and accessories to complete this item.

Minimum technical specification of materials for wire & conduit and type of lighting fixtures such as bulb, fluorescent among others are provided in the detailed engineering plan.



The installation manner, the procedures and the standard dimensions shall be in compliance with the Philippine Electrical Code.

The contractor shall seek first approval from ZCWD Engineer prior the installation of any electrical fixtures.

### 3.1.22 **POWER OUTLET INSTALLATION FOR SECOND FLOOR AND THIRD FLOOR**

This item consists of supply and installation of electrical wire with conduit, outlet with complete accessories, junction boxes, utility boxes flowing the electrical diagram in the detailed engineering plan.

Minimum technical specification of materials for wire & conduit and power outlet are stipulated in the detailed engineering plan. Installation method and dimensions shall be in accordance with Philippine Electrical Code.

### 3.1.23 **SUPPLY, INSTALLATION AND TESTING OF SPLIT TYPE AIR CONDITIONING UNIT**

This item includes the supply, installation and testing of Wall Mounted Split Type Air Conditioning Unit.

All installation works shall be in accordance with the air condition manufacturer's instruction or procedure.

The contractor shall supply the copper tubing and other necessary accessories, tools, equipment to complete the installation at the satisfaction of the ZCWD Engineer.

The minimum technical specification for Split Type Air Condition Unit are as follows:

- For indoor installation
- Cooling Capacity: 3 Hp
- Cooling Capacity Rated: 31,018-11,332 Btu/h (Max-Min)
- Rated (Max-Min): 32,724-11,955Kj/h
- Power Consumption Rated : at least 1,700-2000 Watts
- Rated Current: 9A-9.5A
- Voltage: 230V
- Frequency: 60Hz
- Phase: 1Ph (Single Phase)



- Indoor Noise: 39-50dB(A)
- Outdoor Noise: at least 56 dB(A)
- With LED display
- With Self Clean Function

### 3.1.24 **SUPPLY AND INSTALLATION OF LAN CABLE CONNECTION**

This item of work covers the supply and installation of cables, cable tray and other accessories as reflected in the diagram of the detailed engineering plan.

Materials and accessories, and installation method shall be in accordance with the Philippine Electronic Code and Philippine Electrical Code.

### 3.1.25 **INSTALLATION OF GROUNDING SYSTEM**

The contractor shall furnish the required materials, equipment, tools for the completion of this item. Material specifications and installation method shall be in accordance with Philippine Electrical Code.

### 3.1.26 **SUPPLY AND INSTALLATION OF FIRE SPRINKLER SUPPLY PIPES, FITTINGS, ALARM CHECK VALVE, SWING CHECK VALVE, DRAIN VALVE, WATER FLOW ALARM SWITCH W/ RETARD, BODY GATE VALVE, PENDENT TYPE SPRINKLER HEAD, PRESSURE GAUGE, FIRE DEP'T. CONNECTION AND FIRE HOSE REEL AND CABINET**

Materials and equipment's specification shall comply with NFPA Standards; UL/FM (Underwriters Laboratories/Factory Mutual) approved and complies with Engineering Standards and Material Specifications as follows:

#### 3.1.26.1 **SUPPLY & INSTALL STEEL PIPE AND FITTINGS**

Specification:

- PNS 26, Schedule 40, seamless steel pipe for sprinkler systems. Wet Sprinkler Systems and standpipe system: Threaded-End, Standard-Weight Schedule 40 Black Steel Pipe
- Steel Threaded Pipe Nipples: PNS 26



### **3.1.26.2 SUPPLY AND INSTALL FIRE-PROTECTION VALVE OS&Y GATE VALVE**

Specification:

- Meets or exceeds all applicable requirements of UL 262 and FM 120/1130, specifications and complies with NSF-61.
- Iron body with fusion epoxy coated interior and exterior surfaces.
- Flanged end dimensions and drilling.
- 200 PSIG working pressure and 400 PSIG test pressure.
- Iron wedge, symmetrical and fully encapsulated with molded rubber; no exposed iron.
- Epoxy coating meets or exceeds ANSI/AWWA C550 and complies with NSF- 61.

### **3.1.26.3 SUPPLY & INSTALL SWING CHECK VALVE**

Specification:

- Flange ends – Rubber disc facing and bronze seat ring.
- With 175 PSI working pressure and pressure test of 350 PSI

### **3.1.26.4 SUPPLY AND INSTALL TEST AND DRAIN VALVE**

Specification:

- Complies with all requirements of NFPA-13, NFPA-13R, and NFPA-13D.
- UL/FM approved
- Locking kit available which provides superior vandal resistance and prevents unintentional alarm activation
- Ball valve that is light weight and compact includes a tamper resistant test orifice, Integral tamper resistant sight glasses and is 300 PSI pressure rating.

### **3.1.26.5 SUPPLY AND INSTALL ALARM CHECK VALVE**

Specification:

- UL and ULC listed as well as FM approved.
- Working pressure rating range 20 to 350 PSI.
- Body is ductile iron, hand wheel cover is ductile or cast iron and the seat ring is bronze.
- Threaded port connections for the AV-1-300.
- Class 125 ANSI B16.1/ Class 150 ANSI B16.5
- Alarm valve includes trim packages valves, gauges, pressure switch, fittings and nipple to provide retard chamber.
- Attached with hydraulically driven mechanical gong that automatically sounds a continuous when the sprinkler system activate.



### **3.1.26.6 SUPPLY AND INSTALL WATERFLOW ALARM SWITCH WITH RETARD**

Specification:

- UL listed FM and LPC (Loss Prevention Council) approved.
- Up to 450 PSI pressure rating.
- Suitable for indoor or outdoor use with factory installed gasket and die cast housing.
- National Electrical Manufacturers Association (NEMA 4/IP54) rated enclosure use with appropriate conduit fittings.
- Temperature range from 40 deg F- 120 deg F.
- Non- corrosive sleeve factory installed in saddle.

### **3.1.26.7 SUPPLY AND INSTALL SPRINKLERS**

Specification:

- UL and FM approved.
- Maximum working pressure of 175 PSI with factory test pressure of 500 PSI. And temperature rating of 155 deg. F (Red Bulb).
- Quick response upright sprinkler 1/2" NPT, 5.6 k Factor.

### **3.1.26.8 SUPPLY AND INSTALL FIRE DEPARTMENT CONNECTIONS**

Specification:

- Fire Department Connection- cast brass with single clapper 3" x 2 1/2" x 2 1/2" Siamese type. The clapper design allows for one or both inlets to be pressurized during operation and provide supplementary water supply connection for automatic sprinkler systems as per NFPA 13. The word "AUTO SPKR" and "F.D. Conn." are cast in raised letters.
- The wall plates are constructed of corrosion resistant aluminum alloy and brass plated.
- UL listed and FM approved.
- With caps 2 1/2" brasses coupling with chain.
- Maximum working pressure of 300 PSI and test pressure of 600 PSI.

### **3.1.26.9 SUPPLY & INSTALL PRESSURE GAGES**

Specification:

- All corrosion resistant, the indication is accurate and distinct for reading.
- UL listed.
- 250 PSI maximum reading.
- Nominal size of 3 1/2" at 1/4" BSPT.

### **3.1.26.10 SUPPLY AND INSTALL FIRE HOSE REEL AND CABINET**



Specification:

- Manufacture steel or stainless steel, with thickness of 2 mm.
- UL and FM listed or listed.
- Rubber hose with maximum pressure of 15 Bar and burst pressure of more than 50 bar.
- Hose reels in cabinet are fully equipped with landing valve and nozzle.
- Cabinet door handle are of stainless steel and turn handle chrome plated.
- Cabinet must be used for surface mounted.
- Cabinet dimensions of 800 x 800 x 250 mm.
- Nozzle is a 3 way control and chrome plated without handle.
- Hose reel must be 30M and diameter of 1" at red color.

**3.1.27 SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF 1 UNIT 25 HP CENTRIFUGAL HORIZONTAL PUMP W/ COMPLETE ACCESSORIES**

**FIRE PUMPS AND CONTROLLER**

Specification:

- Horizontal split case fire pump, multistage, single-suction, UL448, factory assembled and -tested, electric-drive fire pump.
- Characteristics: Capable of furnishing not less than 150 percent of rated capacity at not less than 65 percent of total rated head. Shutoff head is limited to 120 percent of total rated head.
- Casing Construction: Axially split case, centrifugal design; cast-iron pump casing with suction and discharge flanges machined to ASME B16.1 dimensions.
- Impeller Construction: Statically and dynamically balanced, of construction to match fire pump type, fabricated from cast bronze, keyed to shaft.
- Wear Rings: Replaceable, bronze.
- Pump Shaft and Sleeve: Steel shaft with bronze sleeve.
- Pump Shaft Bearings: Grease-lubricated ball bearings contained in cast-iron Pump Shaft Bearings: Grease-lubricated ball bearings contained in cast-iron housing.
- Seals: Stuffing box with minimum of 4 rings of graphite-impregnated braided yarn with bronze lantern ring between center.
- 2 graphite rings, and bronze packing gland.
- Pump Couplings: Flexible, capable of absorbing torsional vibration and shaft misalignment, with metal coupling guard.
- Finish: Manufacturer's standard red paint applied.
- Nameplates: Complete with capacities, characteristics, and other pertinent data.



- **Controller Description:** Combined automatic and non-automatic operation, complying with UL 508, UL listed and FM approved, factory assembled and wired, factory tested for capacities and electrical characteristics, and with features indicated. **Enclosure:** NEMA ICS 6, Type 2, drip-proof, indoor, except where special-purpose enclosure is indicated. Include controls, devices, alarms, Functions and operations listed in NFPA 20 as required for driver and controller types used, and specific items listed for each controller type. **Nameplates:** Provide nameplate complete with capacity, characteristics, approvals and listings, and other pertinent data on enclosure door. **Fire-Pump-Controller Enclosure Mounting:** Floor-stand mounting, as indicated, for field electrical connections.
- **Finish:** Manufacturer's standard red paint applied.

### 3.1.28 **SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF 1 UNIT 3 HP CENTRIFUGAL VERTICAL IN-LINE JOCKEY PUMP W/ COMPLETE ACCESSORIES**

- The Jockey pump shall be of electrically motor driven, vertical in line multi stage pump with rated capacity 10 psi higher with the main fire pump rated head. No standard for approved pump is set for the jockey pump; it means that any pump that meets the required pressure maintenance of the system may be used. One guideline that has been successfully used to size pressure maintenance pump or the "Jockey Pump" is to select a pump that will make up the allowable leakage rate in 10 minutes or 1 gpm whichever is larger. (NFPA 20, 2016 Edition, Section A.4.26.2.1). Flow rate must not exceed the water demand of a single sprinkler as per NFPA standard. Controller shall be an across the line type motor starter with built-in pressure switch for automatic start and stop.

### 3.1.29 **SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF SMOKE ALARM DETECTOR**

- Smoke Detector shall be third party approved to EN54 part 7 (Fire detection and fire alarm system mandatory standards).
- Built-in magnetic detector sensitivity test feature. Meets NFPA 72, Chapter 7, Inspection, Testing and Maintenance requirements
- The Detectors shall be ceiling-mount and shall include a twist-lock base.
- The Detectors shall provide dual bi-colour LED's. Both LED's enable red, amber and green local status indication also indicating that the Detector is operational and in regular communication with the C.I.E.





The LED's shall be configurable from the C.I.E (Control and Indicating Equipment )to give visual indication of:

- Device Healthy
- Fire
  - Fault – Isolation in use
- Detector Dirty
- Test Mode
- Chamber Fault

### **3.3 MANPOWER REQUIREMENT**

Engineering Assistant/Construction Foreman	1
Safety Officer	1
Carpenter	4
Mason	5
Plumber	1
Welder	3
Laborer	12
Painter	4
Master Electrician	1

### **3.4 MINIMUM EQUIPMENT REQUIREMENT**

Electric Handrill	1
Angular Grinder	1
Generator Set/ Welding Machine w/ complete accessories	2
Grinding Machine & Accessories	2
Cutting Output	2
Tile Cutter	1
Portable Steel Cutter	1
Portable Pipe Threader	1



### **3.5 SCHEDULING**

The total project duration for implementation is 150 calendar days excluding the acquisition of all required permits and clearances.



## **BILL OF QUANTITIES**



**BILL OF QUANTITIES**

**Project Title: PROPOSED LABORATORY RENOVATION AT ZCWD PASONANCA WATER TREATMENT PLANT**

WORK ITEM/DESCRIPTION		ESTIMATED QUANTITY	UNIT	UNIT PRICE (Taxes Included)	Total Prize (Including Taxes)
SPL - 1	MOBILIZATION/DEMOBILIZATION	1.00	LOT		
SPL - 2	CONSTRUCTION SAFETY & HEALTH PROGRAM	1.00	LOT		
SPL - 3	DEMOLITION WORKS (LIGHT MATERIALS)	32.55	SQ.M.		
1003(2)	6.0mm. THICK FIBER CEMENT BOARD ON METAL FRAME DOUBLE WALL PARTITION	189.83	SQ.M.		
1046	100MM CHB NON LOAD BEARING/LOAD BEARING (INCLUDING REINFORCING STEEL)	48.50	SQ.M.		
1027(1)	CEMENT PLASTER FINISH	97.00	SQ.M.		
SPL - 4	CONSTRUCTION OF MANUAL ELEVATOR/LIFTER WITH PEDESTAL, FLAT FORMS, LADDER AND RAILINGS	1.00	LOT		
SPL - 5	ROOF FRAMING WORKS (w/ PEDESTAL)	1.00	LOT		
1013(1)	CORRUGATED METAL ROOFING	91.27	SQ.M.		
SPL - 6	PLUMBING WORKS	1.00	LOT		
SPL - 7	CONSTRUCTION OF POLYCARBONATE SHEET RAIN BARRIER	1.00	LOT		
SPL - 8	CONSTRUCTION OF SECONDARY FIRE EXIT	1.00	LOT		
1003(1)	3.5mm. THICK FIBER CEMENT BOARD ON METAL FRAME CEILING	179.15	SQ.M.		
101	GRANITE TILES	190.61	SQ.M.		
SPL - 9	FABRICATION OF COUNTER 1 (C-1)	1.00	UNIT		
SPL - 10	FABRICATION OF COUNTER 2 (C-2)	1.00	UNIT		
SPL - 11	FABRICATION OF COUNTER 3 (C-3)	1.00	UNIT		
SPL - 12	FABRICATION OF COUNTER 4 (C-4)	1.00	UNIT		
SPL - 13	FABRICATION OF COUNTER 5 (C-5)	1.00	UNIT		
SPL - 14	FABRICATION OF COUNTER 6 (C-6)	1.00	UNIT		
SPL - 15	FABRICATION OF COUNTER 7 (C-7)	1.00	UNIT		
SPL - 16	FABRICATION OF COUNTER 8 (C-8)	1.00	UNIT		
SPL - 17	CONSTRUCTION OF REINFORCED CONCRETE COUNTER 9 (C-9)	1.00	UNIT		
SPL - 18	FABRICATION OF COUNTER 10 (C-10)	1.00	UNIT		
SPL - 19	FABRICATION OF COUNTER 11 (C-11)	1.00	UNIT		
SPL - 20	FABRICATION OF SHELF 1 (S-1)	1.00	UNIT		
SPL - 21	SUPPLY AND INSTALLATION OF DOORS WITH DOOR KNOB AND ACCESSORIES FOR LABORATORY RENOVATION	1.00	LOT		
SPL - 22	SUPPLY AND INSTALLATION OF GLASS WINDOWS	25.08	SQ.M.		
1032(1)a	PAINTING WORKS (MASONRY)	686.90	SQ.M.		
1032(1)b	PAINTING WORKS (WOOD) - ACRYLIC SOLVENT BASED	751.76	SQ.M.		
1032(1)c	PAINTING WORKS (METAL PAINTING)	132.23	SQ.M.		
SPL - 23	PAINTING WORKS USING EPOXY RESIN FOR COUNTER TOP 4-7, BACTE ROOM (FLOOR) AND PHYCHEM ROOM (FLOOR)	26.37	SQ.M.		
SPL - 24	SUPPLY AND INSTALLATION OF MAIN PROTECTION, PANELBOARD & ACCESSORIES	15.00	OUTLETS		
SPL - 25	LIGHTINGS INSTALLATION FOR SECOND FLOOR	26.00	OUTLETS		
SPL - 26	LIGHTING INSTALLATION FOR THIRD FLOOR	40.00	OUTLETS		
SPL - 27	POWER OUTLET INSTALLATION FOR SECOND FLOOR	17.00	OUTLETS		
SPL - 28	POWER OUTLET INSTALLATION FOR THIRD FLOOR	41.00	OUTLETS		
SPL - 29	SUPPLY, INSTALLATION AND TESTING OF SPLIT TYPE AIR CONDITIONING UNIT	7.00	UNITS		
SPL - 30	SUPPLY AND INSTALLATION OF LAN CABLE CONNECTION	10.00	OUTLETS		
SPL - 31	INSTALLATION OF GROUNDING SYSTEM	3.00	OUTLETS		
SPL - 32	SUPPLY AND INSTALLATION OF FIRE SPRINKLER SUPPLY PIPES, FITTINGS, ALARM CHECK VALVE, SWING CHECK VALVE, DRAIN VALVE, WATER FLOW ALARM SWITCH W/ RETARD, BODY GATE VALVE, PENDENT TYPE SPRINKLER HEAD, PRESSURE GAUGE, FIRE DEPT. CONNECTION AND FIRE HOSE REEL AND CABINET	1.00	LOT		
SPL - 33	SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF 1 UNIT 25 Hp CENTRIFUGAL HORIZONTAL PUMP W/ COMPLETE ACCESSORIES	1.00	UNIT		
SPL - 34	SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF 1 UNIT 3 Hp CENTRIFUGAL VERTICAL IN-LINE JOCKEY PUMP W/ COMPLETE ACCESSORIES	1.00	UNIT		
SPL - 35	SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF SMOKE ALARM DETECTOR	17.00	SETS		
				<b>TOTAL COST</b>	

Prepared and Submitted by:

\_\_\_\_\_  
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Checked by:

  
**REX D. SALE JR.**  
Supervising Engineer A  
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Submitted by:

**EDITO M. BAUTISTA JR.**  
Officer-In-Charge  
*Design Division*

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Recommending Approval for Implementation:

**MARLI P. ACOSTA – DE FIESTA**  
*Department Manager – Engineering & Construction Department  
Officer In-charge, Technical Services Group*

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Approved for Implementation:

**LEONARDO REY D. VASQUEZ**  
General Manager