



**Architect–Engineer Services II for Dioxin Remediation at Bien Hoa Airbase Area (A&E II) Activity**

To: Offerors

From: Tetra Tech, Inc.

Issuance Date: January 16, 2024

Site Visit Date (optional): TBD

Closing Date: **January 22, 2024 (5:00 PM Bien Hoa, Vietnam Local Time)**

Subject: ***Request for Quotations – RFQ-003 A&E II-2024-001 Pump Station Emergency Generator for Tetra Tech, Inc.***

Dear Offerors:

Tetra Tech, Inc. (Tetra Tech) is implementing the U.S. Agency for International Development (USAID) funded Architect–Engineer Services II for Dioxin Remediation at Bien Hoa Airbase Area Activity (referred to as the A&E II project). The aim of the project is to perform environmental remediation of dioxin at the Bien Hoa Airbase. The environmental remediation dioxin treatment process requires power and water. The project owner is Air Defense – Air Force Command (ADAFC). Civil Works Phase 1 (CW1) Contractor installed a pump station which equipped with 4 submersible pumps with a capacity of 148.3 L/s each in 2023 to transfer the accumulated stormwater from the PTSA sumps into the detention pond. The A&E project is interested to purchase a brand-new emergency generator with adequate capacity equipped with an automatic transfer switch for backup power supply for the pump station.

Tetra Tech is seeking professional supplier to complete the following tasks for both supply and installation of the emergency generator equipped with an automatic transfer switch and required accessories:

1. Furnish and install brand new 100 kVA generator equipped with an automatic transfer switch (ATS) in accordance with the specification including electrical connection to the existing pump station, testing, and spare parts.
2. Construct shelter for generator according to drawings in Appendix C
3. Construct shelter for pumping control panel according to drawings in Appendix C. ***A&E II will decide whether or not to award the construction of shelter for pump control panel later.***
4. Emergency communication system (Optional). A&E II is requesting the Offeror to submit price quote to provide Emergency communication system as listed in the BOQ. ***A&E II will decide whether or not to award the Emergency communication system at the time of subcontract award.***
5. Annual maintenance (optional). A&E II is requesting the Offeror to submit price quote to provide Annual maintenance as listed in the BOQ. ***A&E II will decide whether or not to award the Annual Maintenance at the time of subcontract award.***
6. Extended warranties (optional). A&E II is requesting the Offeror to submit price quote to provide extended warranties as listed in the BOQ. ***A&E II will decide whether or not to award the extended warranty at the time of subcontract award.***

Tetra Tech invites firms to submit their Best and Final Offer (BAFO) for the above listed tasks. All quotes should be valid for a minimum of 60 days.

## Submission Requirements:

1. **Submission of Questions:** Questions may be submitted no later than **January 18, 2024** (5:00 PM Bien Hoa, Vietnam Local Time). Questions should be in both English and Vietnamese. Offerors are invited to address questions via e-mail to: [AEII.ProcureOps@tetrattech.com](mailto:AEII.ProcureOps@tetrattech.com) with a cc to [Nanette.nelson@tetrattech.com](mailto:Nanette.nelson@tetrattech.com)

***Insert in Subject line: RFQ-003 A&E II-2024-001 Pump Station Emergency Generator for Tetra Tech, Inc***

2. **Submission of Quotation:** Responses are due no later than the **Closing date and time** specified in the cover letter above. **All responses must be in English.** Prices shall be quoted in Vietnamese Dong (VND) only. Completed submission documents must be delivered by email to [AEII.ProcureOps@tetrattech.com](mailto:AEII.ProcureOps@tetrattech.com) with a cc to [Nanette.nelson@tetrattech.com](mailto:Nanette.nelson@tetrattech.com). Any late submissions may be disqualified from selection.

***Insert in subject line: RFQ-003 A&E II-2024-001 Wet Well Emergency Generator for Tetra Tech, Inc***

## Appendices:

- Appendix A: Bill of Quantities Price Quotation
- Appendix B: Specifications
- Appendix C: Drawings
- Appendix D: Draft Contract – Example

## SECTION A – QUOTATION INSTRUCTIONS

The Offeror shall ***ONLY*** submit its Best and Final Offer (BAFO)/Quotation in accordance with the format provided under Appendix A, for the Goods/Commodities or Services as specified in Section E below, Appendix A, Appendix B and Appendix C. Completed submission documents must be delivered by email to [AEII.ProcureOps@tetrattech.com](mailto:AEII.ProcureOps@tetrattech.com) with a cc to [Nanette.nelson@tetrattech.com](mailto:Nanette.nelson@tetrattech.com).

Offerors are requested to submit information and documentation with their bid that demonstrates capability and capacity to complete the work in accordance with the health, safety, and environmental requirements of the project and achieve the milestone date for priority areas.

Offerors are required to submit the following as Attachments with their bid submission:

1. **Attachment A - Price Quotation:** The populated Excel file and a signed and stamped PDF copy of “Appendix A Bill of Quantities Price Quotation”
  - a. The Offeror shall complete the Bill of Quantities (BOQ) Price Table
2. **Attachment B - Method Statement:** A detailed method statement on how the Offeror plans to conduct the installation, inspection, and testing.
3. **Attachment C - Personnel and Certifications:** A list of personnel certifications including the years of experience and number of personnel planned to be deployed to complete the work
4. **Attachment D - Business License/Registration:** Copy of Valid Business License/Registration.
5. **Attachment E - SAM UEI / Registration:** A copy of the Offeror’s System for Award Management (SAM) Unique Entity Identification (UEI) / Registration. If the Offeror doesn’t have a UEI number by the time of bid submission, if the Offeror is selected, a UEI number is required prior to award. Information on UEI registration is found here: [SAM.gov](https://sam.gov) | [Duns - Sam UEI](#)
6. **Attachment F - Qualification Statement:** Qualification statement with evidence of past performance and successful completion of similar work
7. **Attachment G - Former Clients:** A list of current or former clients your firm has provided similar services to and their contact information at least (3).
8. **Attachment H - Other:** Any other attachments the Offeror considers necessary.

Offeror is required to submit all RFQ Bid Submission Requirements listed in this Solicitation.

**Appendix A: Bill of Quantities Price Quotation:** The Offerors shall ***ONLY*** submit a signed and stamped electronic copy of their quotes no later than the due date for submission of quotation as specified above.

Offerors are ***required*** to examine all instructions and the specifications contained in this Request for Quotation. **“FAILURE TO DO SO WILL BE AT THE OFFEROR'S RISK.”**

The completion and submission to Tetra Tech of the above item will constitute a Quotation and will indicate the Offeror’s agreement to the terms and conditions in this RFQ and in any attachments/appendices hereto. **“ISSUANCE OF THIS RFQ DOES NOT COMMIT TETRA TECH TO MAKE AN AWARD.”**

Quotations should include a separate line item(s) for any tax(es) and / or shipping/delivery costs of items to Tetra Tech’s office at the Bien Hoa Airbase.

Tetra Tech reserves the right to request references and / or solicit references ourselves, and to include those references in our vendor selection process.

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## **SECTION B - TYPE OF AWARD**

The award will be fixed price to complete the tasks.

This is a single award Contract

The BOQ includes:

1. Furnish and install brand new 100 kVA generator equipped with an automatic transfer switch (ATS) in accordance with the specification including electrical connection to the existing pump station, testing, and spare parts. Prepare and submit an Operation and Maintenance (O&M) Manual and conduct onsite O&M training for all operational Personnel.
2. Construct shelter for generator according to drawings in Appendix C
3. Construct shelter for pumping control panel according to drawings in Appendix C. A&E II will decide whether or not to award the construction of shelter for pump control panel later.
4. Emergency communication system (Optional). A&E II is requesting the Offeror to submit price quote to provide Emergency communication system as listed in the BOQ. A&E II will decide whether or not to award the Emergency communication system at the time of subcontract award.
5. Annual maintenance (optional). A&E II is requesting the Offeror to submit price quote to provide Annual maintenance as listed in the BOQ. A&E II will decide whether or not to award the Annual Maintenance at the time of subcontract award.
6. Extended warranties (optional). A&E II is requesting the Offeror to submit price quote to provide extended warranties as listed in the BOQ. A&E II will decide whether or not to award the extended warranty at the time of subcontract award.

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## **SECTION C - EVALUATION CRITERIA**

Offers will be evaluated based on Lowest Price and Technically

Acceptable. First, quotations will be reviewed for technical

qualifications that will include:

1. Bid submission requirements (all attachments are submitted by the Offeror)
2. Past performance and experience successfully completing similar work. Evaluation will consider Offeror's qualification statement, examples of prior work, company license, and other information demonstrating capability to perform the work under health and safety standards.
3. Method statement demonstrates the Offeror has a thorough understanding of the scope of work, health and safety requirements, and personnel required to successfully complete the work. Evaluation will consider work method statement, proposed personnel, and other information that demonstrates capacity to perform the work within the period of performance.

Second, all Offers that pass the technical requirements (are considered technically acceptable) will be considered for cost evaluation that include:

4. Cost reasonableness (are the proposed costs reasonable for the work to be done).
5. Low price (comparing with the technically acceptable offers)

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## **SECTION D - PERIOD OF PERFORMANCE**

The Offeror shall provide a schedule to complete the work as part of the Work Plan. The schedule shall be submitted at the time of the bid submission and will be finalized upon award of the subcontract.

The period of performance is estimated to be Fifteen (15) days completing no later than March 15, 2024.

Approved working hours are from 7:00 am to 5:00 pm, Monday to Friday. The Subcontractor will not be permitted to perform work without the knowledge and supervision of Tetra Tech.

Site access will be coordinated through Tetra Tech and Air Defense – Air Force Command (ADAF). Subcontractor will be required to provide necessary information that is certified and ready for submission.

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## **SECTION E – SCOPE OF WORK**

### **E.1 General Statement of Work**

Tetra Tech is seeking professional supplier to complete the following task for both supply and installation of the emergency generator equipped with an automatic transfer switch and required accessories:

1. Furnish and install New/Never used 100 kVA generator equipped with an automatic transfer switch (ATS) in accordance with the specification including electrical connection to the existing pump station, testing, and spare parts. Prepare Operation and Maintenance (O&M) Manual and conduct onsite O&M training.
2. Construct shelter for generator according to drawings in Appendix C
3. Construct shelter for pumping control panel according to drawings in Appendix C. A&E II will decide whether or not to award the construction of shelter for pump control panel later.
4. Emergency communication system (Optional). A&E II is requesting the Offeror to submit price quote to provide Emergency communication system as listed in the BOQ. A&E II will decide whether or not to award the Emergency communication system at the time of subcontract award.
5. Annual maintenance (optional). A&E II is requesting the Offeror to submit price quote to provide Annual maintenance as listed in the BOQ. A&E II will decide whether or not to award the Annual Maintenance at the time of subcontract award.

6. Extended warranties (optional). A&E II is requesting the Offeror to submit price quote to provide extended warranties as listed in the BOQ. A&E II will decide whether or not to award the extended warranty at the time of subcontract award.

Subcontractor is required to coordinate with A&E Contractor and or other Project Contractors as required to do these works.

Figure 1. Pump station and current generator site photos

Photo/Description	Photo/Description
 <p>A wide-angle photograph showing a concrete pump station structure on the left with blue pipes. To the right is a green emergency generator. The site is outdoors with a gravel ground and utility poles in the background.</p>	 <p>A close-up view of the green generator connected to a grey ATS box and a control panel. Orange corrugated cables are visible, along with a warning sign on the control panel.</p>
 <p>A photograph showing the green generator and pump station from a different angle, highlighting the orange cables connecting them to a utility pole.</p>	

## E.2 Method Statement

***[The Offeror must provide a detailed method statement with their bid submission. The method statement will become part of the contract documents and scope of work upon contract award of the successful Offeror.]***

The Subcontractor must complete the work in accordance with the contract and approved Method Statement. The Method statement must include a plan to supply, install, wiring, test, and handover of the generator and accessories.

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## **SECTION F - SPECIAL REQUIREMENTS**

### **F.1 Representations of the Offeror**

The Offeror represents that it possesses the necessary professional capabilities, qualifications, capacities, skilled personnel, equipment, experience, expertise and financial resources to perform the work in a safe effective, efficient and timely manner and will complete all work in accordance with the terms and conditions of the Subcontract.

### **F.2 Executive Order on Terrorism Financing**

U.S. Executive Orders and U.S. law prohibits transactions with, and the provision of resources and support to, individuals and organizations associated with terrorism. It is the legal responsibility of the Offeror to ensure compliance with these Executive Orders and laws.

### **F.3 Communications with USAID, Other Agencies, and Subcontractors**

All of Offeror's contractual written or oral communications with or to USAID, local agencies, or other subcontractors relative to the Work under this Request for Quotation must be through or with the authorization of Tetra Tech's Chief of Party (COP), Matt Harder.

### **F.4 Restrictions on Certain Foreign Purchases**

USAID has eligibility rules concerning goods and commodities, commodity-related services, and suppliers of goods and services (other than commodity-related services). These rules are set forth in 22 CFR 228 and Series 300 of USAID's Automated Directives System (ADS-300), as amended from time to time (see the clause entitled "Source, Origin, and Nationality Requirements" [AIDAR 752.225-70]).

The authorized geographic code for procurement of goods and services is 937 for the prime contract and its subcontractors. Associated / Additional Fees or Costs. Prices for the requested goods/services should include all associated fees (such as duties, customs, or shipping fees), taxes (including VAT, if applicable), and related equipment costs, but priced as a separate line item in the submitted quote. Quotes will be inclusive of all applicable fees, duties, or taxes if the Offeror fails to separate.

### **F.5 Terms of Payment**

Tetra Tech will pay the Subcontractor in accordance with the prospective Subcontract's Terms and Conditions.

### **F.6 Local Laws**

All Offerors are required to be registered and comply with all the laws of doing business in Vietnam. Tetra Tech may, at its discretion, require the presumed winner of the procurement to provide a copy of a valid registration certificate and/or tax compliance (i.e. VAT) prior to awarding of the final contract. Failure to provide this information at that time may automatically disqualify an Offeror from selection.

### **F.7 Confidentiality**

All information obtained by Offeror in relation to this RFQ and related prospective future Work, including, but not limited to, any appendices to this RFQ, is the exclusive property of the Client (USAID). Offeror agrees that all information which is or may be obtained through this RFQ or during the performance of Work, shall be kept confidential and shall not be used for the benefit of Offeror nor divulged to third parties without the prior consent of Tetra Tech. This confidentiality obligation shall continue in force and effect during the term of the prospective Subcontract and for five (5) years thereafter and is applicable to all information except that information which lawfully becomes a part of the public domain.

### **F.8 Warranty**

Offeror agrees to perform the prospective Work in a professional and workmanlike manner in accordance with generally accepted practices for the nature of the services provided in furtherance of the Work. Any errors or omissions in the Work which are reported to the prospective subcontractor within one (1) year after completion and acceptance of the Work shall be corrected by the Subcontractor without compensation. The prospective Subcontractor will use its best efforts to assure that related Work performed will be prosecuted with due diligence and any information required hereunder processed in accordance with generally accepted standards for such Work performed by the same or a similar business.

The data and information delivered shall be of acceptable quality and sufficiently complete for Tetra Tech and Client.

**Appendix A: BOQ**

*[The offeror must complete the Price Table which will be used to evaluate reasonableness of the bid]*

<b>Item No.</b>	<b>Item Description</b>	<b>Quantity</b>	<b>Unit</b>	<b>Price (VND)</b>	<b>Total Cost (VND)</b>	<b>Notes</b>
1	Furnish and install new/never used 100 kVA generator equipped with an automatic transfer switch (ATS) in accordance with the specification including electrical connection to the existing pump station, testing, and spare parts. Prepare Operation and Maintenance (O&M) Manual and conduct onsite O&M training for all operational personnel.	1	LS			
2	Construct generator shelter according to design drawings	1	LS			
3	Construct pump control panel shelter according to design drawings (Optional)	1	LS			<i>A&amp;E II will decide whether or not to award the construction of the Control panel shelter.</i>
4	Furnish and install emergency communication system (optional).	1	LS			<i>A&amp;E II will decide whether or not to award the Emergency communication system at the time of subcontract award.</i>
5	Annual maintenance (optional)	1	Year			<i>A&amp;E II will decide whether or not to award the Annual Maintenance at the time of subcontract award.</i>
6	Extension warranties -2 years (optional)	1	2 years			<i>A&amp;E II will decide whether or not to award the Extended Warranties at the time of subcontract award.</i>
7	Extension warranties- 3 years (optional)	1	3 years			<i>A&amp;E II will decide whether or not to award the Extended Warranties at the time of subcontract award.</i>
	VAT (indicate which line items have VAT associated with)					
	<b>Total Price</b>					

## Appendix B: Specifications

## GENERATORS

### PART 1 - NERAL

#### 1.1 RELATED DOCUMENTS

- A. Generator and pump station layout (Appendix C)
- B. Generator electrical connections to pump station (Appendix C)

#### 1.2 SUMMARY

- A. It is the intent of this specification to secure generator systems for standby power supply needs that have been factory built, production tested, site tested, of the latest commercial design, together with all accessories necessary for a complete installation as detailed in the specifications herein. The equipment supplied shall meet the current requirements of NFPA 70 National Electrical Code, latest edition. The generator shall be listed to UL 2200. Where a relevant GVN standard is available for a specified testing or material standard, the GVN standard shall apply.
- B. The work includes furnishing all required labor, materials, tools apparatus and equipment for the complete installation and commissioning of the generator system as shown on the drawings and described in the Specifications including all miscellaneous items incidental to the work.

#### 1.3 MEASUREMENT AND PAYMENT

- A. Generator installation shall be paid upon successful completion of each BOQ line item.

#### 1.4 RELATED WORK

- A. Construction of concrete pad for generator installation.
- B. Furnish and install external fuel tank.
- C. Emergency communication system, and/or operation monitoring system to alert issues related to generator such as but not limited to:
  - 1. Status of operation
  - 2. Output rate and operational parameters
  - 3. Fuel consumption rate and level of fuel in fuel tank
  - 4. Operation history record

#### 1.5 REFERENCES

- A. The generator set shall conform to the following current codes and standards:
  - 1. IEC 8528 Part 4: Control Systems for Generator Sets
  - 2. NFPA 70 – National Electric Code. Equipment shall be suitable for use in systems in compliance with Article 700, 701, and 702.
  - 3. UL 2200 – The genset shall be listed to UL 2200.

4. TCVN 9729-1 to 10:2013 Reciprocating internal combustion engine driven alternating current generating sets.
5. TCVN 4255:2008 Degrees of protection provided by enclosures (IP Code).

#### 1.6 SUBMITTALS

- A. Six sets of submittal data shall include prototype test certification and specification sheets showing all standard and optional accessories to be supplied; schematic wiring diagrams; dimension drawings; and interconnection diagrams identifying by terminal number, each required interconnection between the generator set and an automatic transfer switch for all permanent mounted gensets. Submittal drawings for permanently installed units shall clearly show pad dimensions required and mounting details.
- B. A mark-up copy of this specification with notations clearly showing all deviations and/or exceptions to these Specifications.
- C. Voltage drop calculations under worst case motor starting for loads on the plan. When motor loads are not specified in the bid documents, the bidder shall provide available SKVA @ 25% instantaneous voltage dip.
- D. Testing results.
- E. Manufacturer's Instructions:
  1. Four sets of operating and maintenance instruction manuals specific to the equipment shall be supplied for the engine, generator, governor, voltage regulator, and auxiliary system components as specified herein. No generic manuals will be accepted. Each manual must be clearly marked to identify the site where the generator set is installed.
- F. Qualification Statements:
  1. Submit letter of verification for Manufacturer's Qualifications.
  2. Submit letter of verification for Installer's Qualifications.
- G. Warranty:
  1. The generator systems shall be warranted individually for 1 year or 2,000 hours, whichever occurs first, from the date of the site start-up to be free from defects in material and workmanship in accordance with the manufacturers published warranty. Replacement parts and labor must be furnished at no additional cost to the Owner. Optional 2-year and 5-year warranties shall be available upon request.

## PART 2 - MATERIALS

### 2.1 EQUIPMENT

- A. Generator set shall be factory assembled and tested.
- B. Each standby generator set shall be rated continuous standby (defined as average power output of 70% of the standby power rating) for the duration of any interruption of the normal source power). Each generator shall output at 380V, 3 phase, 4 wire, 50 Hz, 80% power factor at a maximum altitude of 50 feet altitude and 100 degrees F (38 degrees C).
  - 1. Oversized alternators shall be provided as required for motor starting capability.
  - 2. Each generator set shall be capable of starting motor loads as specified in the plans or within the contract documents, with a maximum voltage dip of 25%. Generator will power lift station components with all pumps sequentially started with some miscellaneous loads. Maximum voltage dip shall be determined for Rev worst case scenario (full load demand).
  - 3. Vibration isolators shall be provided between the engine-generators and heavy duty steel bases.
  - 4. Nameplates: For each major system component to identify manufacturer's name and address, and model and serial number of component.

### 2.2 CAPACITY

- A. 100kW generator (100 kVA)
  - 1. Quantity: one
  - 2. Fuel tank (built-in): 225 liters- 250 liters
  - 3. Fuel Consumption: shall be no greater than 20 liters/hr at full load.

### 2.3 ENGINE

- A. Each engine shall operate at a governed speed of 1500 rpm.
- B. Engine-driven or electric fuel transfer pump capable of lifting fuel 1.4 meters, fuel filters, and a fuel distribution system with an electronic isochronous governor capable of +/-0.25% steady-state frequency regulation over an operating temperature range of -40 degree C to +85 degree C.
- C. Cast iron sleeved cylinders.
- D. 2 flexible fuel lines rated 300 degree F (149 degrees C) and 100 psi (6.9 bar) ending in pipe thread.
- E. 12-Volt positive engagement solenoid shift-starting motor.
- F. Automatic battery charging alternator with solid-state voltage regulation, 25 ampere minimum.
- G. Batteries capable of delivering the manufacturer's recommended minimum cold cranking amps required at -20 degrees C, per SAE standard J-537 shall be supplied along with the required battery rack(s) and battery cables mounted within the generator weather protective housing.

## Dioxin Remediation at Bien Hoa Airbase Area

- H. 10-Ampere automatic float and equalize battery charger mounted inside the weather protective housing with +/-1% constant voltage regulation from no load over +/-10% AC input line variation, current limited during engine cranking and short circuit conditions, temperature compensated for ambiens from -40 degrees C to 60 degrees C, 5% accurate voltmeter and ammeter, fused, reverse polarity and transient protected. Alarm circuit board to meet the requirements of NFPA- 110 for low battery voltage, high battery voltage, and battery charger malfunction shall be provided and wired to provide annunciation on the control panel. Battery charge shall be 3rd party listed.
- I. Positive displacement, full pressure lubrication oil pump, cartridge oil filters, dipstick, and oil drain.
- J. The generator set supplier shall furnish lubricating oil to fill the crankcase as recommended by the manufacturer.
- K. Dry-type replaceable air cleaner elements for heavy duty application. Each naturally aspirated or turbo charged engine shall be fueled with No. 2 diesel, liquid-cooled by a unit-mounted radiator. Blower fan, water pump, thermostat, and radiator duct flange shall properly cool the engines in 40 degrees C ambient with up to 12.7 mm H2O static pressure on the fan. Radiator shall include a duct flange adapter for connection to the discharge air vent.
- L. The generator set supplier shall furnish 50% ethylene glycol antifreeze solution to fill the engines cooling system.
- M. Block heater, minimum 1500-watts, 220 volt. Thermostatically controlled to maintain engine coolant at not less than 32 degree C in 0 degrees C ambient. Block heater(s) shall be 3rd party listed.
- N. Gas proof, stainless steel, flexible exhaust bellows with threaded NPT or flanged connections shall be supplied.
- O. Super critical grade exhaust silencer(s) shall be coated to be temperature and rust resistant with integral condensate drain. Exhaust silencers shall limit noise to 75 dBA @ 7 meter radius from the genset.
- P. Each engine shall be equipped with prealarm switches and safety shutdown switches to protect the engines from the following:
  - 1. Oil pressure prealarm.
  - 2. High coolant temperature prealarm.
  - 3. Low coolant temperature prealarm.
  - 4. High coolant temperature shutdown.
  - 5. Low coolant level shutdown.
  - 6. Low oil pressure shutdown.
  - 7. High/Low Voltage shutdown.
  - 8. High/Low Frequency shutdown.

### 2.4 GENERATOR

- 1. The alternator shall be salient-pole, brushless, 12-lead reconnectable, of 2/3 pitch to eliminate the third harmonic, self-ventilated of drip-proof construction with amortisseur rotor windings and skewed for smooth voltage waveform. The insulation shall meet the NEMA standard (MG1-22.40)/ or TCVN 4255:2008 Degrees of protection provided by enclosures (IP Code) for Class H and be vacuum impregnated with epoxy varnish to be fungus resistant per MIL 1-24092. Temperature rise of the

rotor and stator shall be limited to NEMA Class F, 40 degrees C. The excitation system shall be of brushless construction controlled by a solid-state voltage regulator located in the controller.

2. The voltage regulator must be capable of maintaining voltage within +/- 2% at any constant load from 0 to 100% of rating. The regulator must be isolated to prevent tracking when connected to SCR loads, and provide individual adjustments for voltage range, stability, and volts-per-hertz operation, and be protected from the environment by conformal coating.
  3. Voltage level adjusting rheostat shall be furnished external to the automatic voltage regulator. Minimum adjustment range shall be +/-10%.
- B. Upon 1-step application of any load up to 100% of the rated load at 0.8 power factor, the voltage dip shall not exceed 30% and shall recover to +/-2% of rated voltage within 1 second.
  - C. The generator shall be capable of sustaining at least 250% of rated current for at least 10 seconds under a 3-phase symmetrical short by inherent design or by the addition of an optional current boost system.
  - D. The generator shall be capable of sustaining at least 110% of rated output for at least one hour in a 24 hour period.
  - E. A resettable line current sensing circuit breaker with inverse time versus current response shall be furnished which protects the generator from damage due to its own high current capability. This breaker shall not trip within the 10 seconds specified above to allow selective tripping of downstream fuses or circuit breakers under a fault condition. This breaker shall not automatically reset, preventing restoration of voltage if maintenance is being performed. Field current-sensing breaker will not be acceptable.
  - F. Line circuit breaker, 3 pole, amperes rating as specified on plans, shall be mounted in the generator set outlet box.
  - G. The generator, having a single maintenance-free bearing, shall be directly connected to the flywheel housing with a semi-flexible coupling between the rotor and the flywheel.

## 2.5 FUEL SYSTEM

- A. No additional fuel system required.

## 2.6 ENCLOSURE

- A. Sound attenuated drip-proof, weather protective enclosure shall be constructed of 0.063" (1.6mm) (14 gauge equivalent) marine grade 5052 aluminum alloy. The enclosure shall be primed and finish coated with powder baked paint. The paint color shall be machinery gray. The enclosure shall be fabricated and mounted to the sub-base fuel tank by the generator manufacturer. The enclosure roof shall be peaked to direct water runoff away from all components.
- B. Two doors per side and one rear door shall be provided for operator and service access. Hinges shall allow the doors to swing open or be removed easily for access and service. Access to the controller and main line circuit breaker must meet the requirements of the National Electric Code (current edition). All door locks shall be stainless steel and shall be keyed alike to match the existing county equipment, manufacturer A.L. Hansen, Key #1250.

- C. Exhaust piping and internally insulated super critical grade silencer shall be mounted inside the enclosure.
- D. Cooling and combustion air shall enter the enclosure through wire screened panels. Engine exhaust gases and cooling air shall discharge vertically through a screened opening.
- E. Sound shall be reduced by UL approved polyether acoustic material with protective facing film which is securely attached to the enclosure interior. Sound shall not exceed 75 dBA, 7 meters from the enclosure center with the generator set operating at full load.

## 2.7 CONTROLLER/GAUGE PANEL

- A. Set-mounted and vibration isolated on the generator enclosure. Gauge panel shall include:
  - 1. Panel illuminating lights.
  - 2. Battery charging voltmeter.
  - 3. Coolant temperature gauge.
  - 4. Oil pressure gauge.
  - 5. Running time meter.
  - 6. Local emergency stop button.
- B. The controller shall include:
  - 1. Fused DC circuit.
  - 2. Complete 2-wire start/stop control, which shall operate on closure of a remote contact.
  - 3. Speed sensing and a second independent starter motor disengagement systems shall protect against starter engagement with a moving flywheel. Battery charging alternator voltage will not be acceptable for this purpose.
  - 4. The starting system shall be designed for restarting in the event of a false engine start, by permitting the engine to completely stop and then re-engage the starter.
  - 5. Cranking cyler with 15 second ON and OFF cranking periods.
  - 6. Overcrank protection designed to open the cranking circuit after 75 seconds if the engine fails to start.
  - 7. Circuitry to shut down the engine when signal for high coolant temperature, low coolant level, low oil pressure, low fuel level, or overspeed are received.
  - 8. Engine cooldown timer factory set at 5 minutes to permit unloaded running of the standby set after transfer of the load to normal.
  - 9. 3-position (Automatic-OFF-TEST) selector switch. In the TEST position, the engine shall start and run regardless of the position of the remote starting contacts. In the Automatic position, the engine shall start when contacts in the remote control circuit close and stop 5 minutes after those contacts open. In the OFF position, the engine shall not start even though the remote start contacts close. This position shall also provide for immediate shutdown in case of an emergency. Reset of any fault shall also be accomplished by putting the switch to the OFF position.
  - 10. Indicating lights to signal:
    - a. Not-in-Auto (flashing red)
    - b. Overcrank (red)
    - c. Emergency Stop (red)
    - d. High Engine Temperature (red)
    - e. Overspeed (red)
    - f. Low Oil Pressure (red)
    - g. Air Damper (red)
    - h. Battery Charger Malfunction (red)
    - i. Low Battery Voltage (red)
    - j. Low Fuel (red)

## Dioxin Remediation at Bien Hoa Airbase Area

- k. Auxiliary Prealarm (yellow)
  - l. Auxiliary Fault (red)
  - m. System Ready (green)
  - n. Prealarm High Engine Temp. (yellow)
  - o. Prealarm Low Oil Pressure (yellow)
- 11. Test button for indicating lights.
  - 12. Alarm horn with silencer switch per NFPA 110.
  - 13. Dual element electronic speed switch with crank disconnect contact and overspeed contact shall be controlled by a magnetic pickup mounted radially to the flywheel ring gear.
  - 14. Terminal blocks shall be provided for all engine/generator prealarms safety shutdowns, plus auxiliary functions. Each terminal shall be permanently marked to match the point-to-point wiring diagrams.
  - 15. The controller shall be provided with a RS 485 Modbus port to provide industry standard open communications protocol.
  - 16. Dry contact kit w/10 relays to provide normally open and normally closed contacts in a form C configuration to activate warning devices and other customer provided accessories allowing remote monitoring of the generator set as indicated above.

### PART 3 - EXECUTION

#### 3.1 FACTORY PRODUCTION TEST

- A. Perform the test according to TCVN 9729-6:2013:
  - 1. Item 6.7.4.1. Acceptance test with electrical load.
  - 2. Item 6.7.4.2. Acceptance test using test bench switchgear
  - 3. Item 6.7.4.3. Acceptance testing includes the generator set's switchgear
  - 4. Item 6.7.4.5. Acceptance test without electrical load.
- B. Submit 3 certified copies of report of production test results, and obtain approval before shipment to the site.

#### 3.2 FIELD INSTALLATION

- A. Verify that equipment pads are dimensionally correct and ready to receive the equipment.
- B. Verify that required utilities are available, in proper location and ready for use.
- C. Install equipment in accordance with manufacturer's instructions.
- D. Install safety labels to NEMA 260 and labeling per Division 26 Section "Common Work Results for Electrical".

#### 3.3 CONNECTIONS

- A. Piping installation requirements are specified in other Sections. Drawings indicate general arrangement of piping and specialties.
- B. Connect fuel, cooling system, and exhaust system piping adjacent to packaged engine generator to allow service and maintenance.
- C. Ground equipment per TCVN 9358:2012 and manufacturers recommendations.

### 3.4 SITE TESTING

- A. Test the engine-generator set and ancillary systems at service load to demonstrate durability; verify that heat of extended operation does not adversely affect or cause failure in any part of the system; and check all parts of the system. If the engine load run test is interrupted for any reason, repeat the entire test. Perform the following tests in addition to any manufacturer recommended testing. And the tests according TCVN 9729-6:2013 and TCVN 9729-10:2013.
  - 1. Perform and record engine manufacturer's recommended prestarting checks and inspections. Include as a minimum checking of coolant fluid, fuel, and lube-oil levels
  - 2. Start the engine, make and record engine manufacturer's after-starting checks and inspections during a reasonable warmup period.
  - 3. TCVN 9729-6:2013 Item 6.7.5 Acceptance testing at installation site, Group the test items and measurements to be performed according to Table 3.
  - 4. TCVN 9729-10:2013 Measurements of airborne noise by the enveloping surface methods.

### 3.5 OPERATION AND MAINTENANCE TRAINING

- A. Operating personnel shall be instructed (a minimum of two hours) by the representative in the proper operation and maintenance of the unit on the test day.
- B. Formal operation and maintenance training shall be conducted by the vendor or manufacturer's representatives within two weeks of activation of the equipment. An outline of the proposed program shall be submitted for approval at least two weeks before date of commencement of training.

### 3.6 FINAL SUBMITTALS

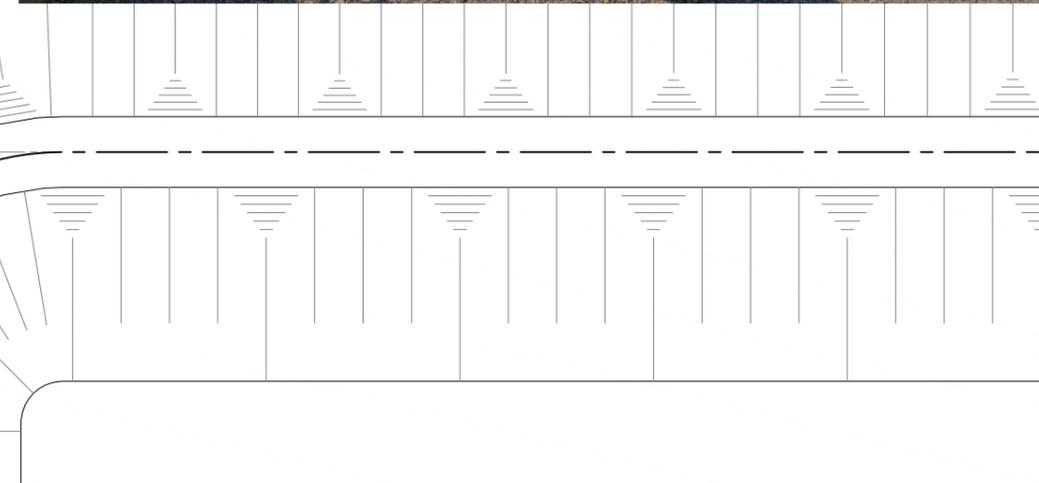
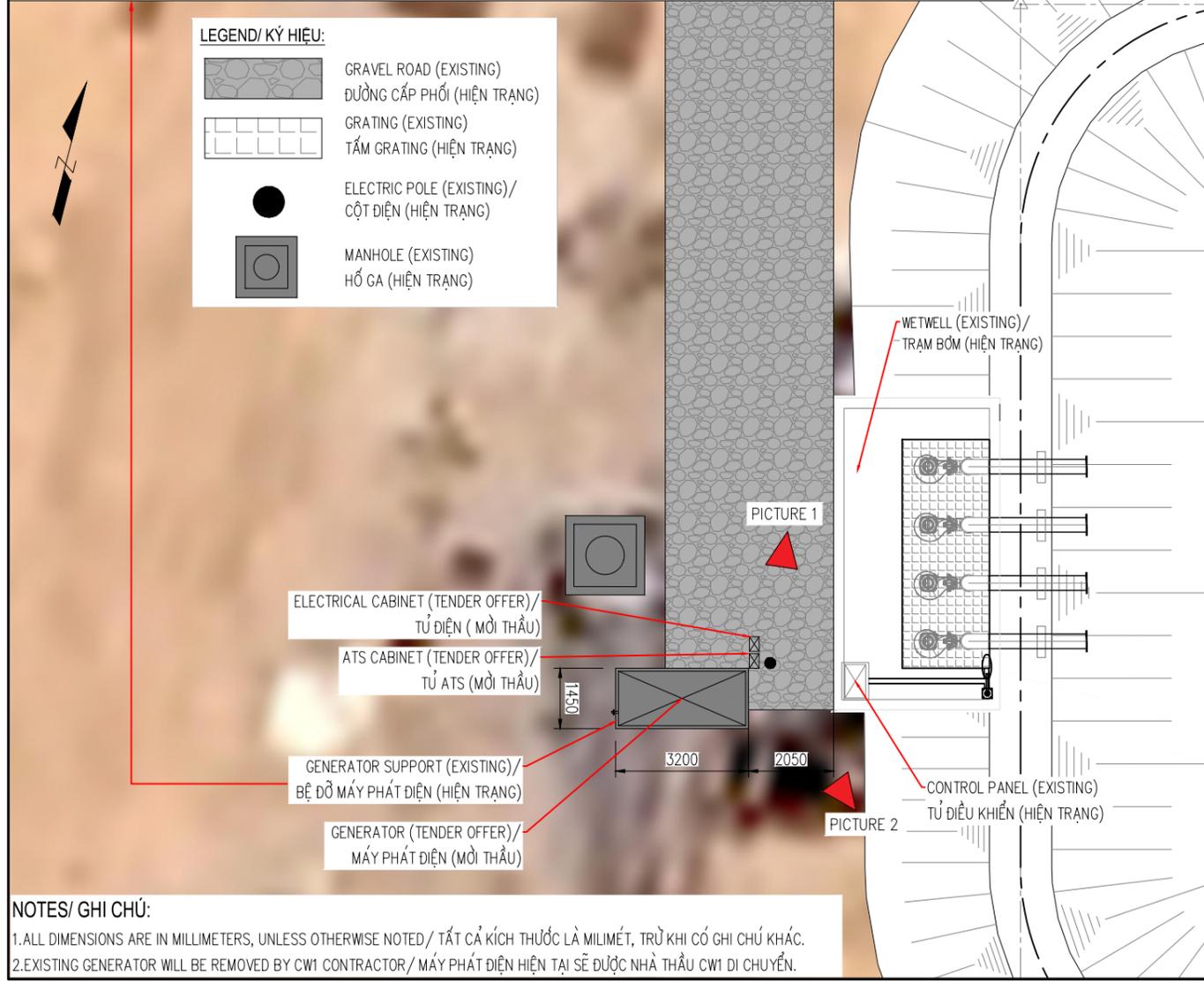
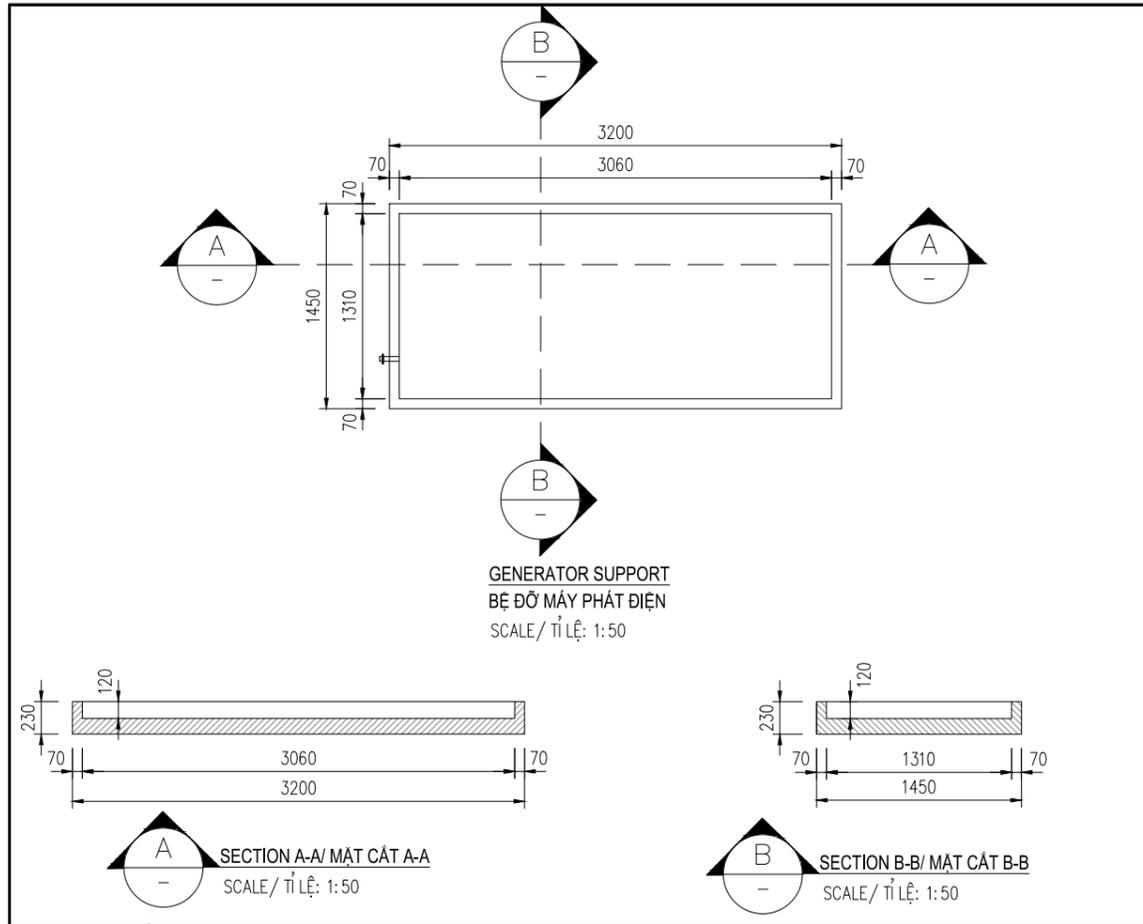
- A. Five sets of bound copies of text and illustrations, delineating maintenance and repair procedures for engine, generator, engine-generator control, radiator, fuel oil day tank assembly, fuel oil tank gage, and other equipment related to the engine-generator set installation. Assemble data on like equipment in clearly identified and indexed three-ring binders or equal. Include the following:
  - 1. Lubrication charts showing types of lubricant, locations of lubrication points, and recommended lubrication frequency for all equipment.
  - 2. Parts list of replaceable parts and any special tools required.
  - 3. Lists of component items not the product of the manufacturer of equipment on which used, with local source of supply, catalog cuts, and all necessary information for ordering replacements.
  - 4. Complete AS-BUILT electrical schematic and connection diagrams with all internal and external connection points identified to match identification on equipment.
- B. Furnish a written guarantee that the equipment will meet the specified performance. In addition, the guarantee shall cover the equipment against any defects in design, workmanship and material for one year from date of start-up. Also, a one-year labor and material guarantee shall be provided which will be twelve (12) months from date of start-up.
- C. Posted Operating Instructions: Submit proposed operating instructions which shall be laminated between matte-surface thermoplastic sheets and be suitable for placement adjacent to applicable equipment. After approval, operating instructions shall be returned to the Subcontractor for installation where directed by the Project Manager.

## Dioxin Remediation at Bien Hoa Airbase Area

- D. Test Reports: Submit certified test and inspection reports for all work performed in Paragraphs 3.2 & 3.4. A certified report verifying proper installation of all of the system shall be provided to the Project Manager and shall be approved prior to start-up of equipment.

END OF SECTION

## Appendix B: Drawings



REV BẢN	DESCRIPTION ĐIỀU CHỈNH	DATE NGÀY	BY BỒI

PREPARED FOR  
CHỦ ĐẦU TƯ

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FROM THE AMERICAN PEOPLE

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**LE THI THANH THUY**

QA:

**NGUYỄN THANH BÌNH**

DESIGNER OF RECORD  
CHỦ NHIỆM THIẾT KẾ:

**MATTHEW R. HARDER**

PROJECT NAME/ TÊN DỰ ÁN:  
DIOXIN REMEDIATION AT BIEN HOA AIRBASE AREA PROJECT - PHASE 1  
DỰ ÁN XỬ LÝ Ô NHIỄM DIOXIN KHU VỰC SÂN BAY BIỂN HÒA - GIAI ĐOẠN 1

ITEM/ HÀNG MỤC:  
PUMP CONTROL PANEL AND GENERATOR SHELTER  
MÁI BẢO VỆ TỦ ĐIỀU KHIỂN TRẠM BƠM VÀ MÁY PHÁT ĐIỆN

DRAWING TITLE/ TÊN BẢN VẼ:

**WETWELL PLAN MẶT BẰNG TRẠM BƠM**

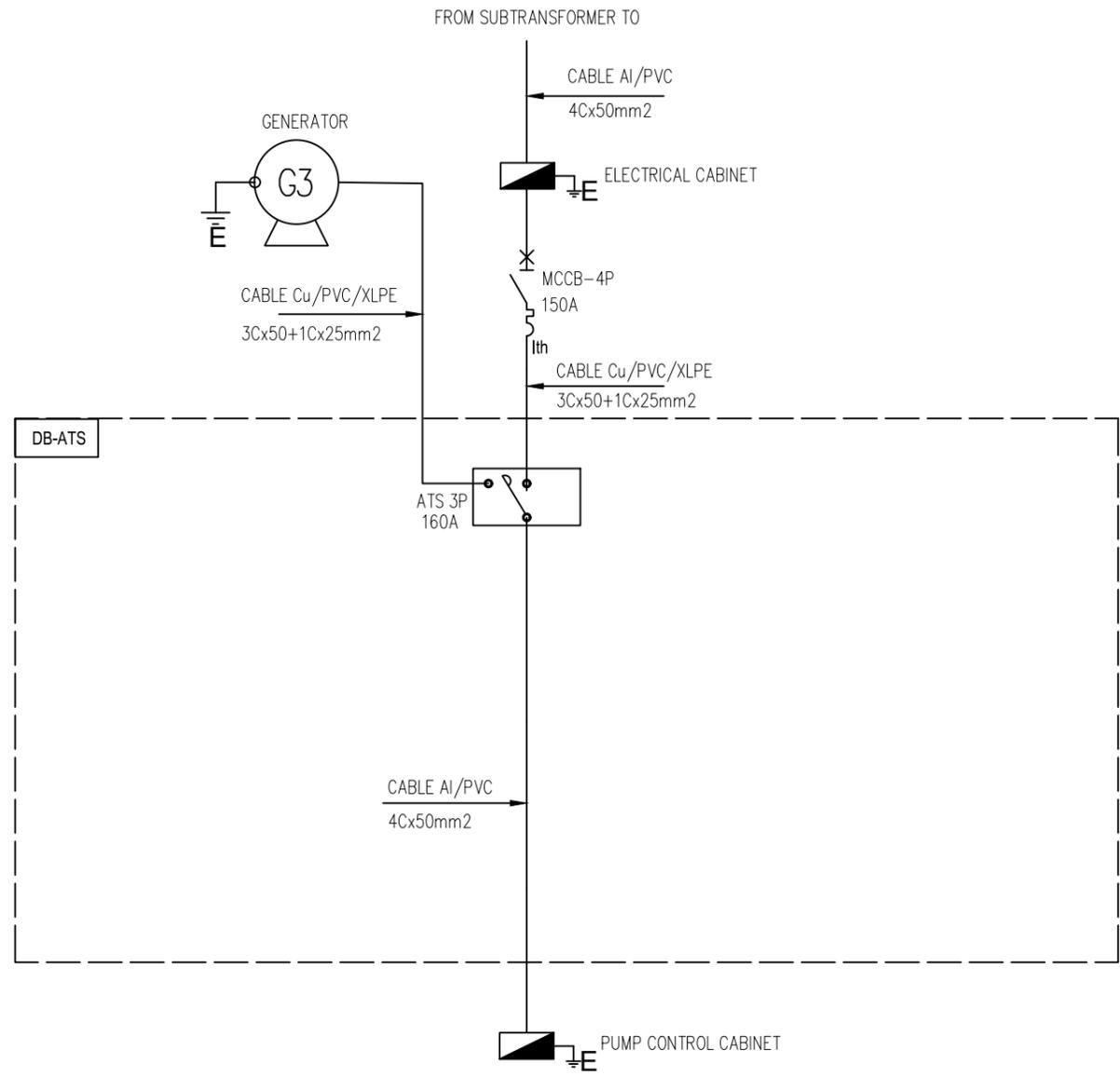
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DRAWING NO/ BẢN VẼ SỐ: 10G-01	SHEET TỜ: 01	OF CỬA: 06

**NOTES/ GHI CHÚ:**

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE NOTED/ TẤT CẢ KÍCH THƯỚC LÀ MILIMÉT, TRỪ KHI CÓ GHI CHÚ KHÁC.

2. EXISTING GENERATOR WILL BE REMOVED BY CW1 CONTRACTOR/ MÁY PHÁT ĐIỆN HIỆN TẠI SẼ ĐƯỢC NHÀ THẦU CW1 DI CHUYỂN.

WIRING DIAGRAM OF CURRENT EMERGENCY POWER SUPPLY



NOTES/ GHI CHÚ:

THIS DIAGRAM IS FOR REFERENCE ONLY. CONTRACTOR MUST PROVIDE CONNECTION WIRING DIAGRAM AS PART OF THEIR METHOD STATEMENT/  
SƠ ĐỒ NÀY CHỈ MANG TÍNH CHẤT THAM KHẢO, NHÀ THẦU PHẢI CUNG CẤP SƠ ĐỒ ĐẦU NỐI NHƯ MỘT PHẦN BIỆN PHÁP CỦA NHÀ THẦU.

REV BÀN	DESCRIPTION ĐIỀU CHỈNH	DATE NGÀY	BY BỞI

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CHỦ ĐẦU TƯ



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LE THI THANH THUY

QA:  
NGUYỄN THANH BÌNH

DESIGNER OF RECORD  
CHỦ NHIỆM THIẾT KẾ:  
MATTHEW R. HARDER

PROJECT NAME/ TÊN DỰ ÁN:  
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DỰ ÁN XỬ LÝ Ô NHIỄM DIOXIN KHU VỰC SÂN BAY BIỂN HÒA - GIAI ĐOẠN 1

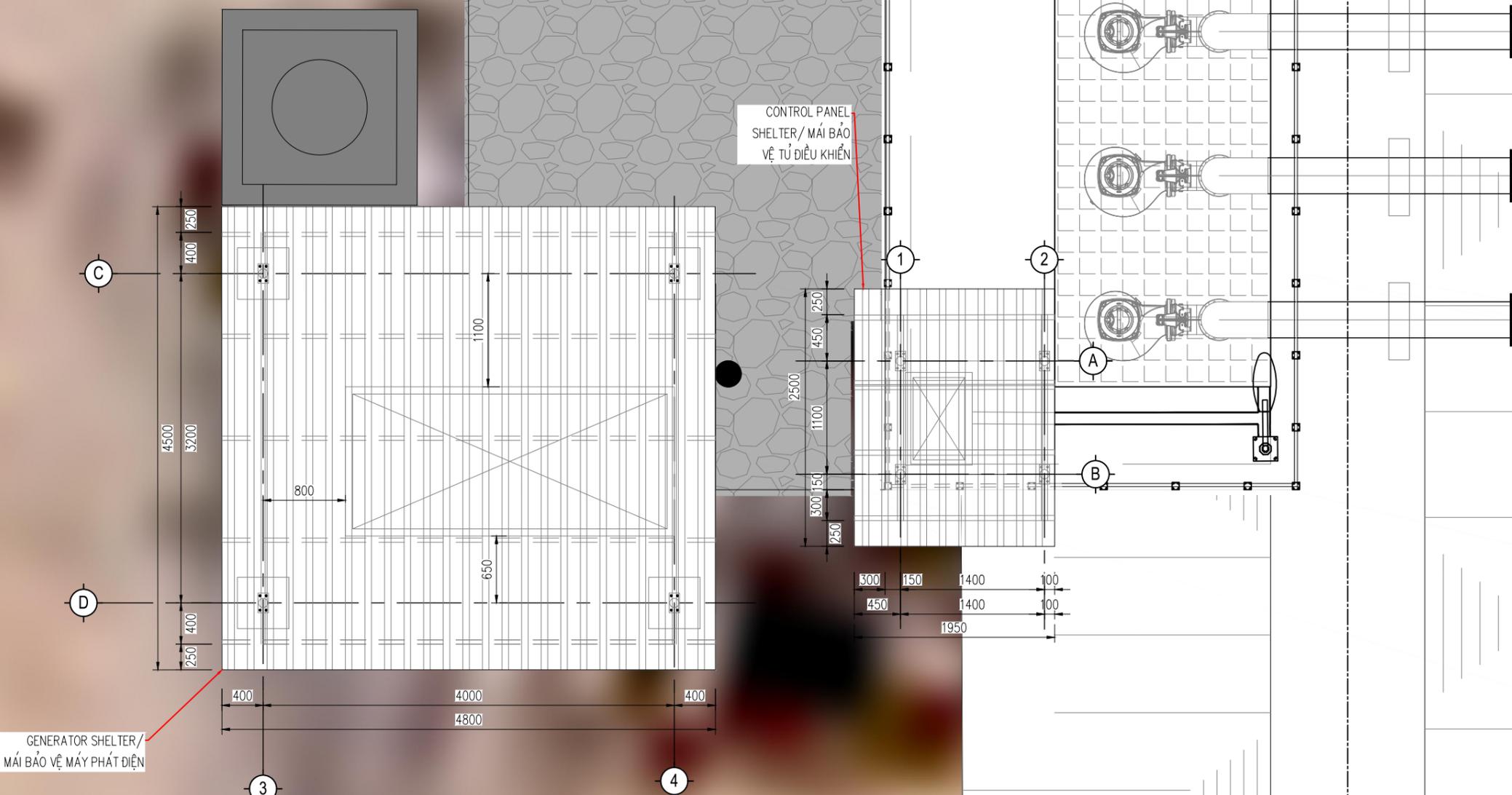
ITEM/ HẠNG MỤC:  
PUMP CONTROL PANEL AND GENERATOR SHELTER  
MÁI BẢO VỆ TỦ ĐIỀU KHIỂN TRẠM BƠM VÀ MÁY PHÁT ĐIỆN

DRAWING TITLE/ TÊN BẢN VẼ:  
GENERATOR CONNECTION DIAGRAM  
SƠ ĐỒ ĐẦU NỐI MÁY PHÁT ĐIỆN

DATE/ NGÀY: 15-Jan-2024	SIZE/ KHỔ: A3	SCALE/ TỈ LỆ: AS NOTED/ ĐÃ GHI
DRAWING NO/ BẢN VẼ SỐ: 10G-02	SHEET OF TỜ: 02	OF CỬA: 06

LEGEND/ KÝ HIỆU:

-  GRAVEL ROAD (EXISTING)  
ĐƯỜNG CẤP PHỐI (HIỆN TRẠNG)
-  GRATING (EXISTING)  
TẦM GRATING (HIỆN TRẠNG)
-  CORRUGATED IRON ROOF (NEW)  
MÁI TÔN SÓNG (MỚI)
-  ELECTRIC POLE (EXISTING)/  
CỘT ĐIỆN (HIỆN TRẠNG)
-  MANHOLE (EXISTING)  
HỐ GA (HIỆN TRẠNG)



WETWELL (EXISTING)/  
TRẠM BƠM (HIỆN TRẠNG)

CONTROL PANEL  
SHELTER/ MÁI BẢO  
VỆ TỦ ĐIỀU KHIỂN

GENERATOR SHELTER/  
MÁI BẢO VỆ MÁY PHÁT ĐIỆN

REV	DESCRIPTION	DATE	BY
BẢN	ĐIỀU CHỈNH	NGÀY	BỘ

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CHỦ ĐẦU TƯ



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LE THI THANH THUY

QA:

NGUYỄN THANH BÌNH

DESIGNER OF RECORD  
CHỦ NHIỆM THIẾT KẾ:

MATTHEW R. HARDER

PROJECT NAME/ TÊN DỰ ÁN:

DIOXIN REMEDIATION AT BIEN HOA  
AIRBASE AREA PROJECT - PHASE 1  
DỰ ÁN XỬ LÝ Ô NHIỄM DIOXIN KHU VỰC  
SÂN BAY BIỂN HÒA - GIAI ĐOẠN 1

ITEM/ HẠNG MỤC:

PUMP CONTROL PANEL AND  
GENERATOR SHELTER  
MÁI BẢO VỆ TỦ ĐIỀU KHIỂN TRẠM BƠM VÀ  
MÁY PHÁT ĐIỆN

DRAWING TITLE/ TÊN BẢN VẼ:

SHELTER PLAN  
MẶT BẰNG MÁI BẢO VỆ

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15-Jan-2024	A3	AS NOTED/ ĐÃ GHI
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10C-01	TỜ:	CỦA:
	03	06

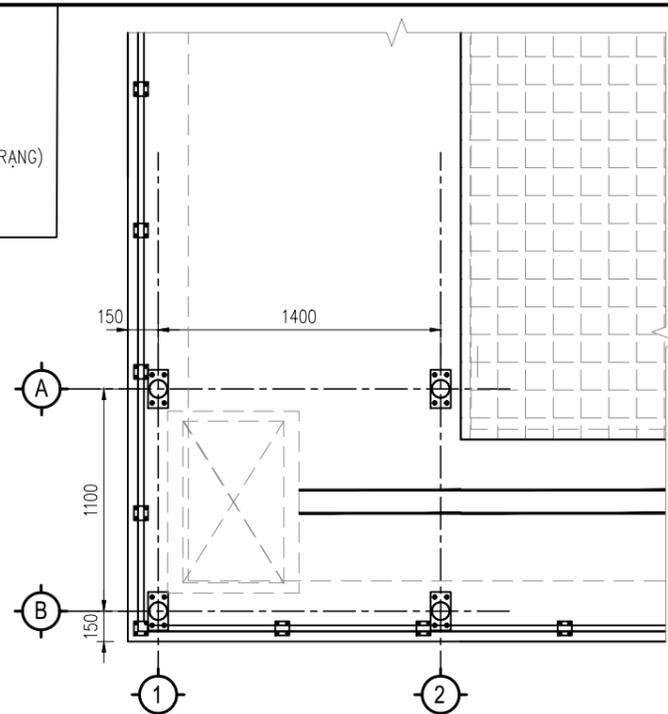
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OTHERWISE NOTED / TẤT CẢ KÍCH THƯỚC LÀ MILIMÉT,  
TRỪ KHI CÓ GHI CHÚ KHÁC.

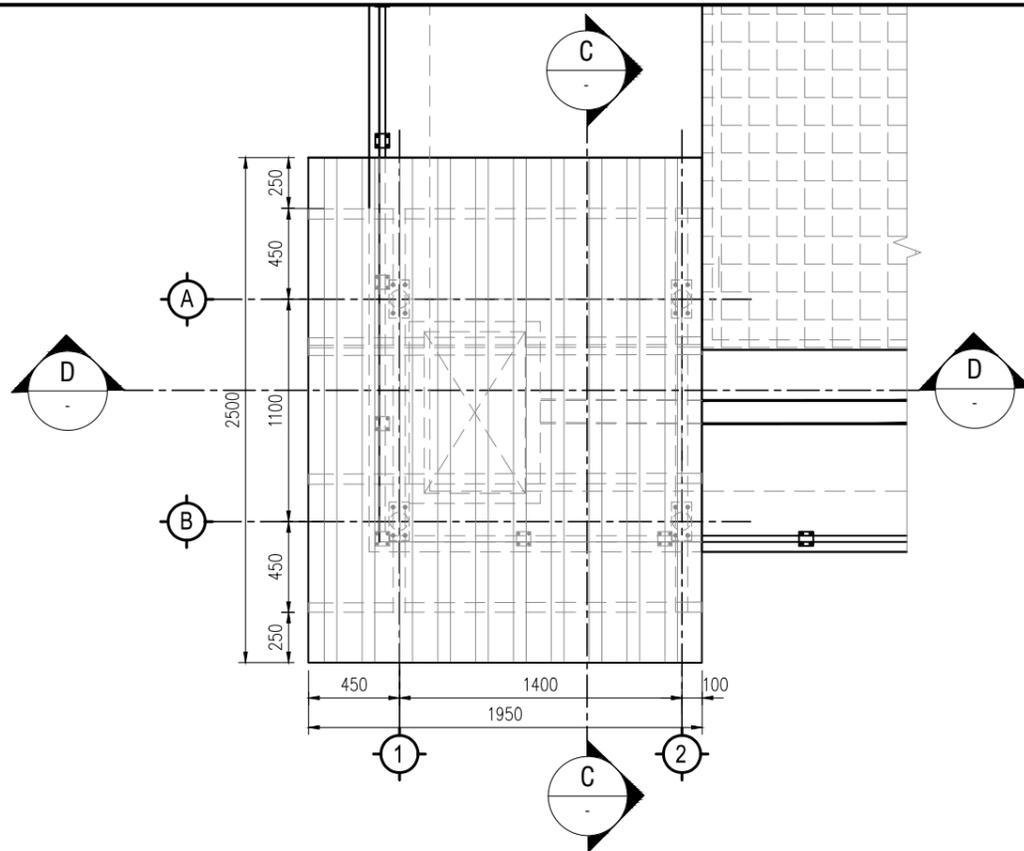
LEGEND/ KÝ HIỆU	
	CONCRETE BÊ TÔNG
	GRATING (EXISTING) TẤM GRATING (HIỆN TRẠNG)
	CORRUGATED IRON TÔN SÓNG

**NOTES / GHI CHÚ:**

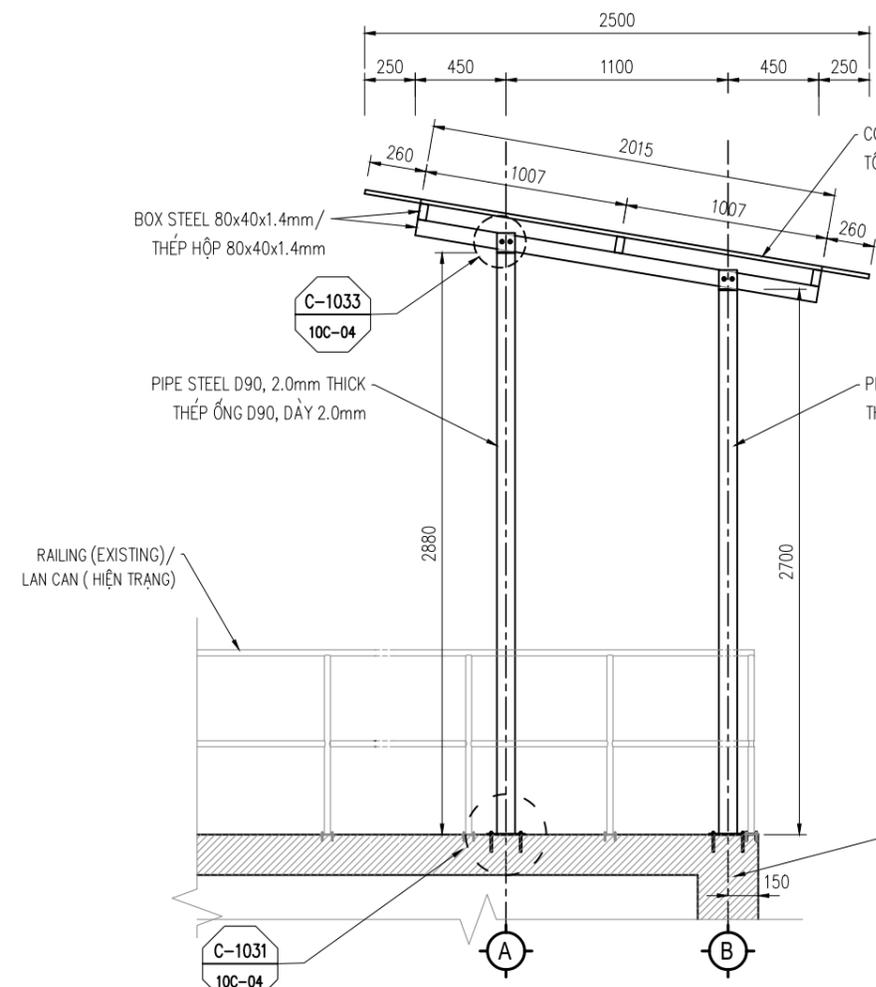
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3. ALL BOX STEEL AND CIPHERTEXT ARE GALVANIZED STEEL / TẤT CẢ THÉP HỘP VÀ BÀN MÃ ĐỀU LÀ THÉP MẠ KẼM



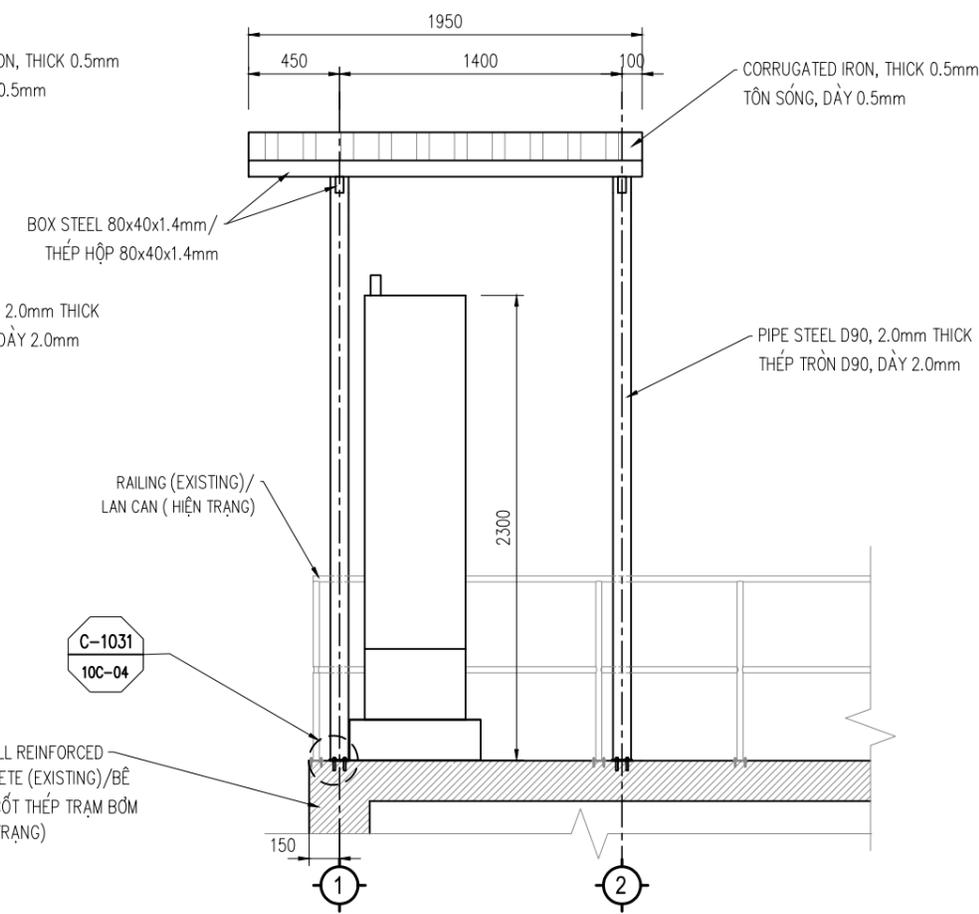
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SCALE/ TỈ LỆ: 1/35



ROOF PLAN/ MẶT BẰNG MÁI  
SCALE/ TỈ LỆ: 1/35



SECTION C-C/ MẶT CẮT C-C  
SCALE/ TỈ LỆ: 1:35



SECTION D-D/ MẶT CẮT D-D  
SCALE/ TỈ LỆ: 1:35

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QA:  
NGUYỄN THANH BÌNH

DESIGNER OF RECORD  
CHỦ NHIỆM THIẾT KẾ:  
MATTHEW R. HARDER

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DỰ ÁN XỬ LÝ Ô NHIỄM DIOXIN KHU VỰC  
SÂN BAY BIÊN HÒA - GIAI ĐOẠN 1

ITEM/ HANG MỤC:  
PUMP CONTROL PANEL AND  
GENERATOR SHELTER  
MÁI BẢO VỆ TỦ ĐIỀU KHIỂN TRẠM BƠM VÀ  
MÁY PHÁT ĐIỆN

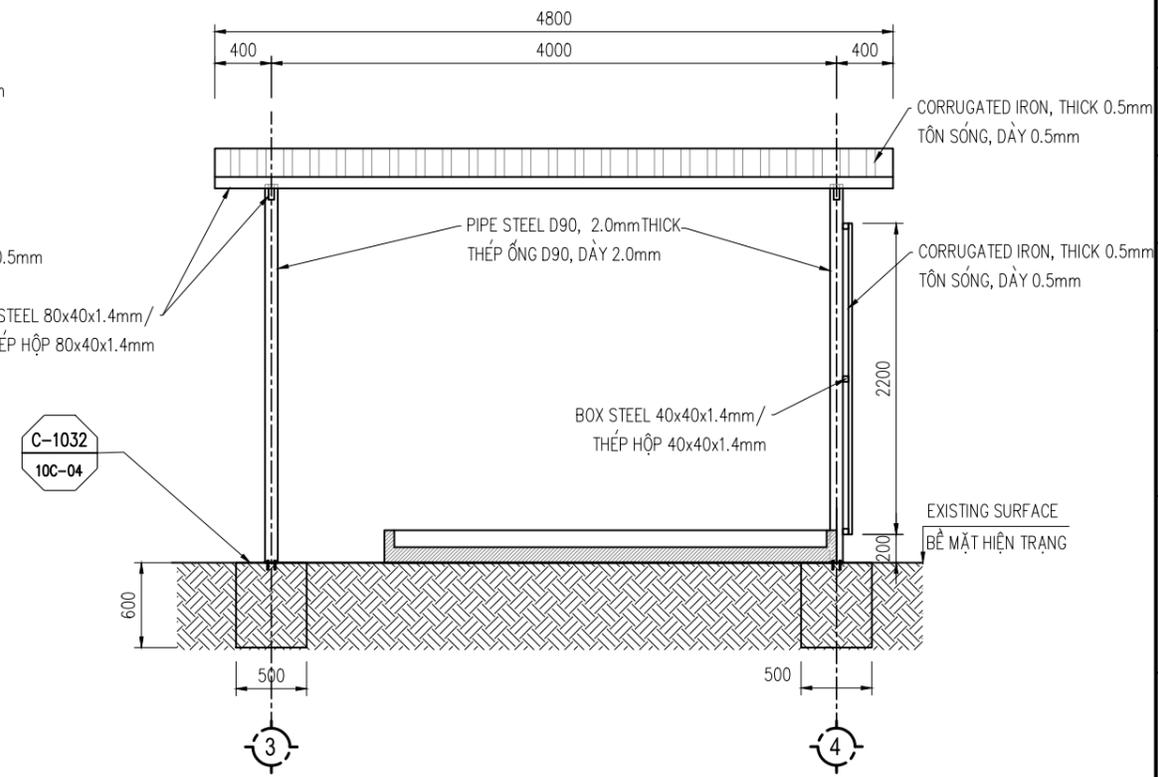
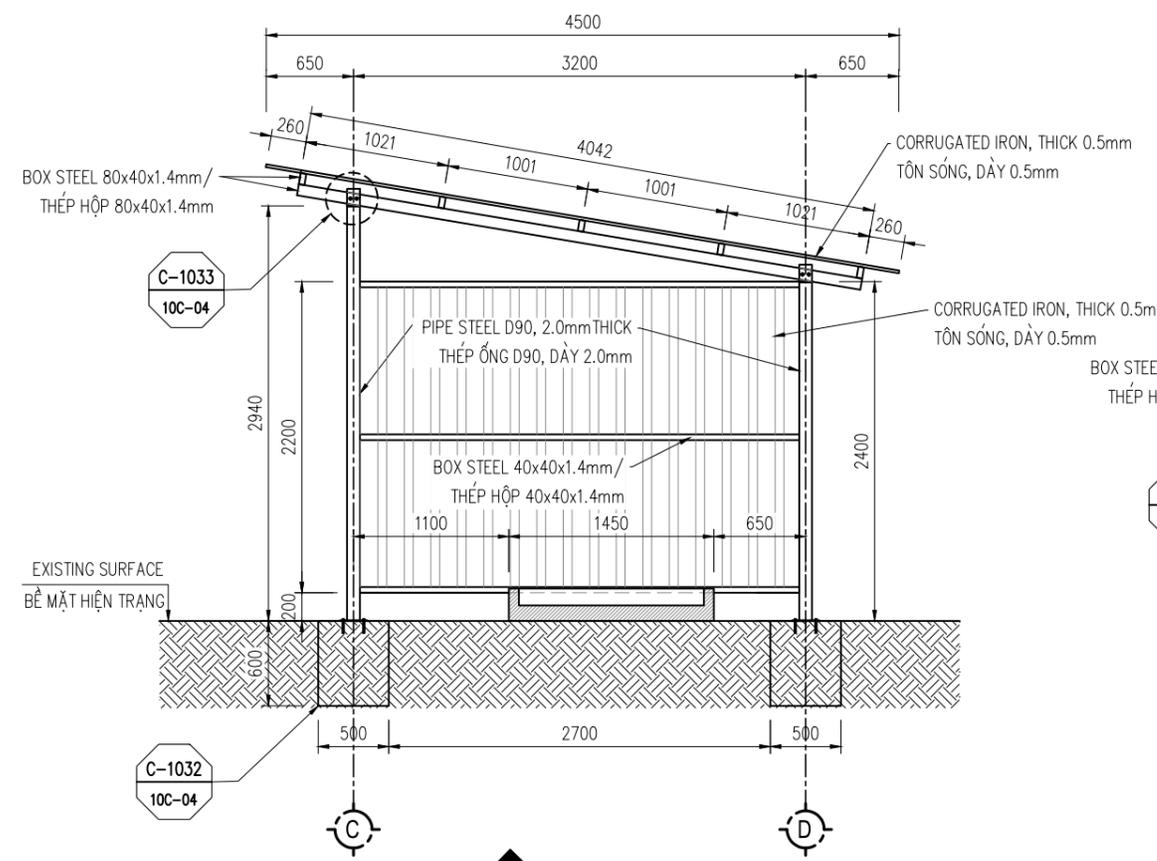
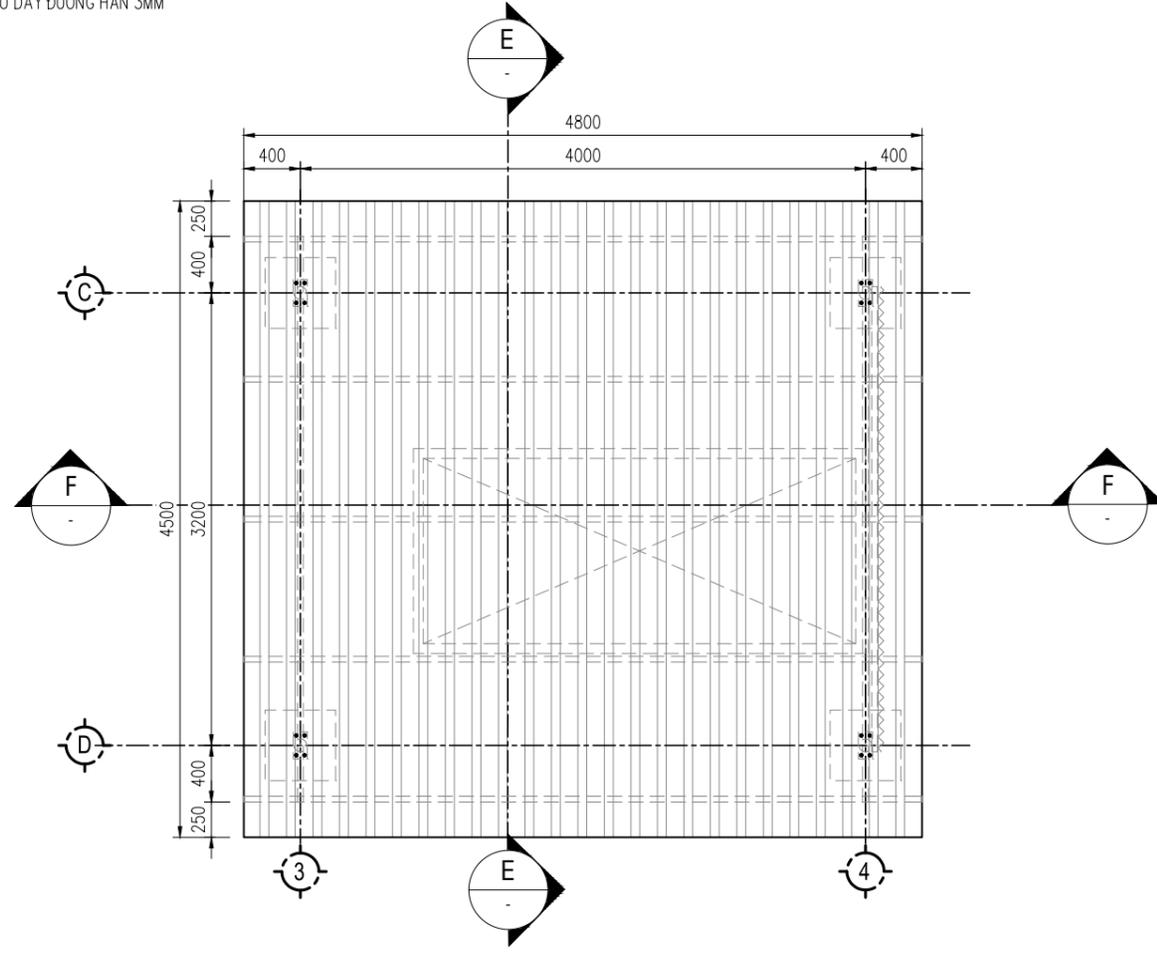
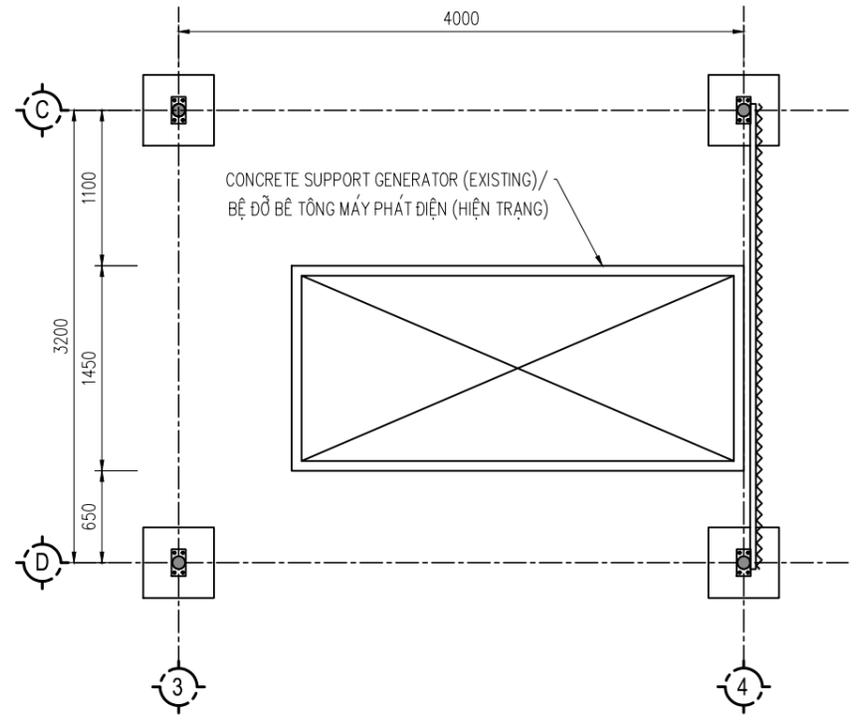
DRAWING TITLE/ TÊN BẢN VẼ:  
PLAN AND SECTION OF  
CONTROL PANEL SHELTER  
MẶT BẰNG VÀ MẶT CẮT CỦA MÁI BẢO VỆ  
TỦ ĐIỀU KHIỂN

DATE/ NGÀY: 15-Jan-2024	SIZE/ KHỔ: A3	SCALE/ TỈ LỆ: AS NOTED/ ĐÃ GHI
DRAWING NO/ BẢN VẼ SỐ: 10C-02	SHEET TỜ: 04	OF CỦA: 06

LEGEND/ KÝ HIỆU	
	CONCRETE BÊ TÔNG
	SOIL ĐẤT
	CORRUGATED IRON TÔN SÓNG

NOTES: / GHI CHÚ:

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE NOTED / TẤT CẢ KÍCH THƯỚC LÀ MILIMÉT, TRỪ KHI CÓ GHI CHÚ KHÁC.
2. ALL JOINTS MUST BE WELDED WITH 3 MILLIMETER WELDS / TẤT CẢ CÁC MỐI NỐI LIÊN KẾT BẰNG ĐƯỜNG HÀN VÀ CHIỀU DÀY ĐƯỜNG HÀN 3MM
3. ALL BOX STEEL AND CIPHERTEXT ARE GALVANIZED STEEL / TẤT CẢ THÉP HỘP VÀ BẢN MÃ ĐỀU LÀ THÉP MẠ KẼM



**E** SECTION E-E/ MẶT CẮT E-E  
SCALE/ TỈ LỆ: 1:35

**F** SECTION F-F/ MẶT CẮT F-F  
SCALE/ TỈ LỆ: 1:35

REV	DESCRIPTION	DATE	BY

PREPARED FOR  
CHỦ ĐẦU TƯ



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CHECKED BY  
NGƯỜI KIỂM TRA:  
LE THI THANH THUY

QA:  
NGUYỄN THANH BÌNH

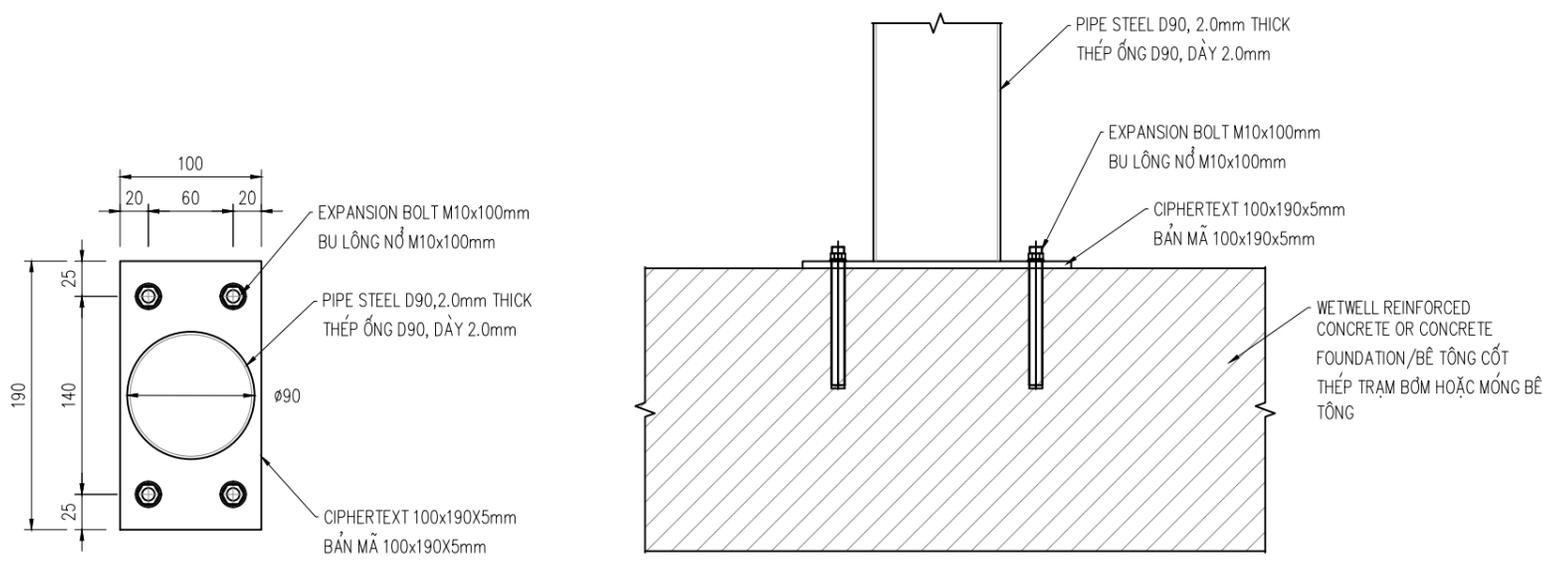
DESIGNER OF RECORD  
CHỦ NHIỆM THIẾT KẾ:  
MATTHEW R. HARDER

PROJECT NAME/ TÊN DỰ ÁN:  
DIOXIN REMEDIATION AT BIEN HOA  
AIRBASE AREA PROJECT - PHASE 1  
DỰ ÁN XỬ LÝ Ô NHIỄM DIOXIN KHU VỰC  
SÂN BAY BIÊN HÒA - GIAI ĐOẠN 1

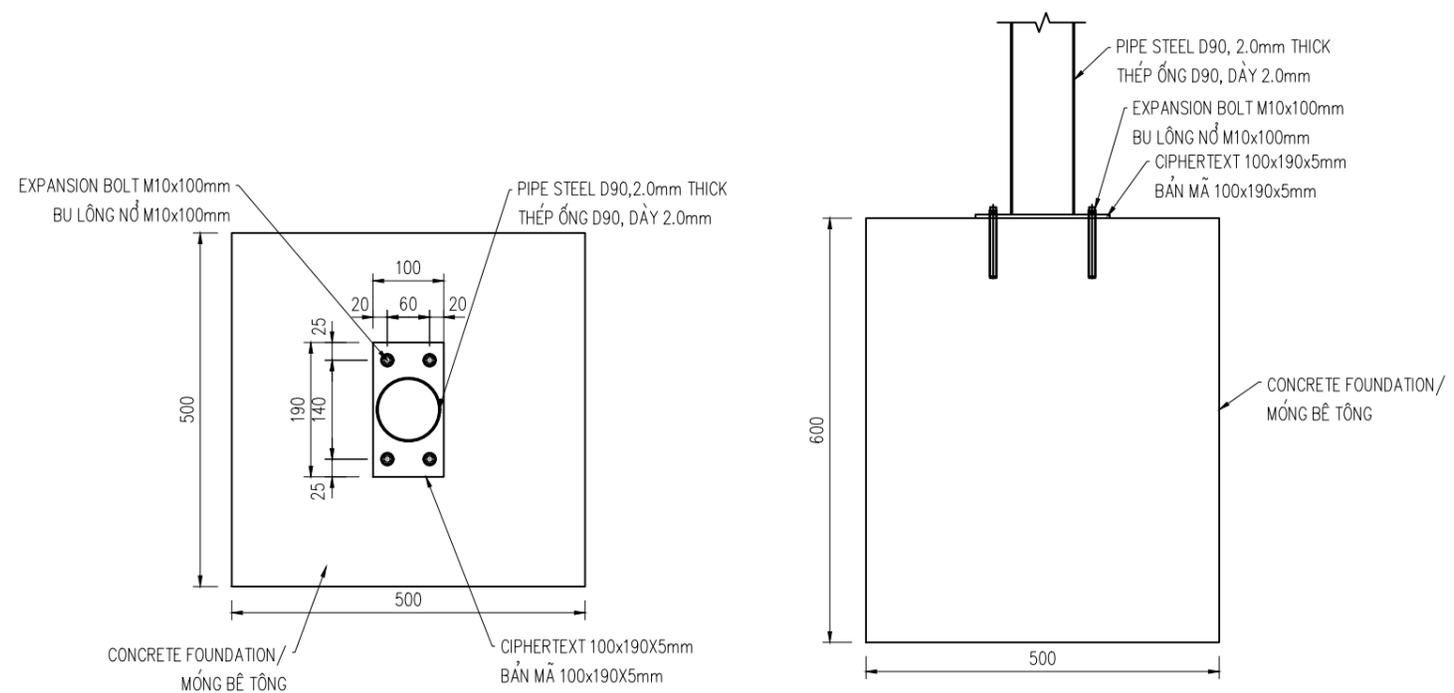
ITEM/ HANG MỤC:  
PUMP CONTROL PANEL AND  
GENERATOR SHELTER  
MÁI BẢO VỆ TỦ ĐIỀU KHIỂN TRẠM BƠM VÀ  
MÁY PHÁT ĐIỆN

DRAWING TITLE/ TÊN BẢN VẼ:  
PLAN AND SECTION OF GENERATOR SHELTER  
MẶT BẰNG VÀ MẶT CẮT CỦA MÁI BẢO VỆ  
MÁY PHÁT ĐIỆN

DATE/ NGÀY: 15-Jan-2024	SIZE/ KHỔ: A3	SCALE/ TỈ LỆ: AS NOTED/ ĐÃ GHI
DRAWING NO/ BẢN VẼ SỐ: 10C-03	SHEET TỜ: 05	OF CỦA: 06



**C-1031** CIPHERTEXT 1 DETAIL/ CHI TIẾT BẢNG MÃ 1  
SCALE/ TỈ LỆ: 1:5



**C-1032** CONCRETE COLUMN FOUNDATION/ MÓNG CỘT BÊ TÔNG  
SCALE/ TỈ LỆ: 1:10

LEGEND/ KÝ HIỆU	
	CONCRETE BÊ TÔNG

REV BẮN	DESCRIPTION ĐIỀU CHỈNH	DATE NGÀY	BY BỞI

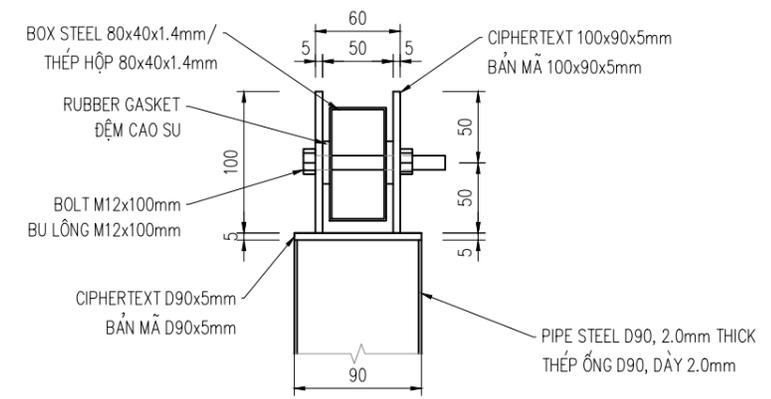
PREPARED FOR  
CHỦ ĐẦU TƯ

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TETRA TECH

TETRA TECH, INC  
100 NICKERSON ROAD, 2ND FLOOR,  
MARLBOROUGH, MA 01752  
WWW.TETRA TECH.COM



**C-1033** CIPHERTEXT 2 DETAIL/ CHI TIẾT BẢNG MÃ 2  
SCALE/ TỈ LỆ: 1:5

NOTES: / GHI CHÚ:

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PREPARED BY  
NGƯỜI THỰC HIỆN:

PHAN THANH LUAN

CHECKED BY  
NGƯỜI KIỂM TRA:

LE THI THANH THUY

QA:

NGUYỄN THANH BÌNH

DESIGNER OF RECORD  
CHỦ NHIỆM THIẾT KẾ:

MATTHEW R. HARDER

PROJECT NAME/ TÊN DỰ ÁN:

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ITEM/ HANG MỤC:

PUMP CONTROL PANEL AND GENERATOR SHELTER  
MÁI BẢO VỆ TỦ ĐIỀU KHIỂN TRẠM BƠM VÀ MÁY PHÁT ĐIỆN

DRAWING TITLE/ TÊN BẢN VẼ:

CIVIL DETAILS  
CHI TIẾT XÂY DỰNG

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**Appendix D: Draft Contract – Example – Submitted under separate cover**