REQUEST FOR QUALIFICATIONS

TO: DesignBuild Contractors

FROM: Pat Donaldson, Administrator
Division of Public Works

SUBJECT: DPW PROJECT NO. 23250
J.W. Martin Lab, Systems Improvements (JWM)
College of Agricultural and Life Sciences (CALS)
University of Idaho (UI)
Moscow, Idaho

RFQ submittal packages will be received at the Division of Public Works (DPW) office, located at 502 N. 4th Street, PO Box 83720 Boise, ID 83720-0072, by 3:00 p.m., Mountain Standard Time Zone, on Tuesday November 1, 2022, for furnishing Design-Build services to the State of Idaho.

All questions must be sent to the DPW Project Manager:

Elaine M. Hill, Project Manager
Division of Public Works
502 N. 4th St.
PO Box 83720
Boise ID 83720-0072
(208) 332-1925
Elaine.Hill@adm.idaho.gov

There will be an informational meeting October 20, 2022; 10am/PT. Reference attached predesign report, reference plan, reference photos and preliminary DSE equipment information.

Modifications (addenda) to this RFQ, if any, will be posted on the Division of Public Works web page at https://dpw.idaho.gov/professional-services/. It is recommended that responders to this RFQ check this page prior to making their submittal.

Funding for the project is from the State. The Division of Public Works (DPW) will administer the project according to the terms and conditions of the award, State laws and guidelines. The Design-Build team will receive general instructions through the State. A Project Manager from DPW will
be assigned to serve as project manager and liaison between the Department of Administration, the Agency, and the Design-Build team.

The Design-Build team shall warrant the following: not knowingly hire or engage any illegal aliens or persons not authorized to work in the United States as required by Title 67, Chapter 79, Idaho Code. The Design-Build team shall take steps to verify that it does not hire or engage any illegal aliens or persons not authorized to work in the United States; and that any misrepresentation in this regard or any employment of persons not authorized to work in the United States constitutes a material breach and shall be cause for the imposition of monetary penalties and/or termination of any Contract resulting from this RFQ.

DESCRIPTION OF PROJECT

The University of Idaho is in the process of creating a Deep Soil Ecotron Research Facility which will support and facilitate long-term research initiatives looking into the microbial ecosystem of soils at levels currently largely unexplored and examined. The Deep Soil Ecotron Research Facility is supported in large part by a National Science Foundation (NSF) grant awarded in 2021. The NSF grant will provide necessary funding to establish the research program, hire staff, support the development of research protocols/ pedagogy, and acquire the Deep Soil Ecotron (DSE) lysimeter units and related equipment. This project will provide infrastructure upgrades and improvements to multiple building systems within the J.W. Martin Laboratory Building to support the research program and University supplied deep soil lysimeter units.

The J.W. Martin Laboratory Building is a preferred location for the Deep Soil Research facility due to the presence of large, high-ceiling bays that have the necessary floor area and volume to contain the 16-foot tall Deep Soil Ecotron lysimeter units. Various building systems will need to be evaluated and upgraded, to potentially include: architectural improvements, HVAC systems (added cooling), electrical systems, emergency power, domestic water systems and structural reinforcement of floor slabs. The scope of work may include seismic bracing of the lysimeter units along with an elevated access platform system to allow service and maintenance of elevated equipment.

Refer to the following attached documents for additional information:
1. Power Engineers Predesign Report, dated August 30, 2022,
2. J.W. Martin Building Reference Plan
3. J.W Martin Existing Building Pictures
4. Preliminary DSE Lysimeter Information (Owner Furnished)

REQUIRED SERVICES

The State of Idaho, through the Division of Public Works is requesting proposals for DesignBuild Services from a team that will work closely and in harmony with the DPW and UI. The team will manage the project’s budget and schedule within the current volatile market with long material procurement. A proactive approach may require early bid packages to address identified long lead items.

A total project budget of $1,500,000.00 has been established to include design fees and construction. A relatively complete construction cost estimate will be required following the Schematic Design Phase and must be updated at each additional phase.
The Design-Builder is required to provide Schematic Design, Design Development, Construction Documents, and Construction. The Design-Build Team shall be prepared to complete a robust Conceptual / Schematic Phase to evaluate necessary infrastructure upgrade options to align scope with the available project budget.

The Design-Build team shall make a minimum of one (1) presentation to the Permanent Building Fund Advisory Council and shall keep in mind that during all phases, code compliance, energy efficiency, and building maintenance concerns should be incorporated into the design.

The Design-Build team will be required to meet, at a minimum, monthly with the Project Manager for the purpose of providing a verbal report regarding the previous month's progress. Such monthly meetings will show funds expended in the completion of the project and specific accomplishments related to the completion of the project.

The Design-Build team shall produce the following major written products for review by the State and/or Permanent Building Fund Advisory Council (PBFAC).

1. A preliminary report to the Division of Public Works and the Agency after Schematic services have been completed.

2. A Design Development Report and update to the Owner, Agency, and the PBFAC, prior to beginning Construction Documents, along with recommended project budget.

PROPOSAL CONTENT

A. Basic Qualifications: (5 Points Max)

1. Provide basic data relative to DesignBuild team size, history, personnel proposed for this project, special expertise for this proposed type of facility, resources available to meet the project schedule and general credits. Individual resumes, awards, associations, etc., may be included. Office brochures should be submitted separately as supplemental data.

2. Provide information that validates the DesignBuild team has had at least 10 years or more of successful experience in commercial / institutional construction. This includes experience in both the design and construction phases of research, science and/or laboratory facilities.

The Division of Public Works reserves the right to investigate and confirm the proposer's financial responsibility. This may include financial statements, bank references and interviews with past consultants, employees, and creditors. Unfavorable responses to these investigations are grounds for rejection of proposal.

B. Specific Qualifications: (10 Points Max)

1. List the actual team expected to accomplish the work. Describe who will perform the various tasks, the amount of their involvement and responsibilities, their qualifications, and relevant special expertise including specific experience and/or familiarity, if any, working on projects on the University of Idaho campus.
2. List the pre-construction team and cost estimator who will provide real-time and projected costs based on market conditions, provide constructability reviews, cost control measures, budget control, risk analysis, value engineering and schedules.

C. **Approach to Project:** (15 Points Max)

1. Include a statement of team’s approach to this specific project including understanding of project scope and schedule, challenges and opportunities as well as alternative concepts and methods for consideration.

2. Identify how the DesignBuilder will participate in value engineering and life cycle costs, as well as analyzing building systems during Schematic Design and into Construction Documents. Present ideas for constructability review. Identify quality control and coordination review efforts during pre-construction services.

D. **DesignBuild Delivery:** (15 Points Max)

1. Identify procurement management and how to address current construction environment, material / labor shortage, long lead times, etc.

2. Identify coordination of the design and installation of infrastructure improvements and building elements as needed to support the installation of Owner Supplied and Owner Installed equipment, specifically the twenty-four DSE Ecotron Lysimeter Units and related equipment.

3. Discuss your procedures for quality control during construction.

E. **Past Performance:** (5 Points Max)

Submit reference letters from prior clients or client representatives. Letters from projects listed in item B are preferable as well as dated within the past five years. In addition, past performance comments will be obtained from DPW and Agency staff.

F. **Examples of Work:** (10 Points Max)

Project schedules, cost estimates, photographs, project dates, size, construction costs, construction delivery method, and other applicable documents may be submitted as examples of your work. Projects relevant with experience in higher education, laboratories and large, specialized equipment packages may be highly considered.

G. **Format:** (5 Points Max)

It is critical to format the RFQ submittal similar to the criteria headings listed above A through G. The submittal should be clear and to the point for each criteria. Emphasis should be placed on specific qualifications of the people who were actually involved with the projects identified and part of this team. Please provide page numbers in the RFQ submittal.
SUBMITTAL

Submit five (5) copies of the submittal; include one USB drive containing a PDF of the submittal. In your RFQ cover letter, include the email address of the primary contact person; failure to provide this information may result in the proposal being nonresponsive.

EVALUATION, FINAL RANKING, INTERVIEW PROCESS

A selection committee consisting of two (2) persons from DPW, two (2) persons from the agency, and an independent Design Professional/Contractor will rank the submittals.

The ranking process is accomplished in two steps: 65 points for the Initial Ranking based on the written submittal, and 35 points for a Final Ranking based on an interview. Step one: the selection committee will score the written submittals based on the criteria in the Proposal Content and the top 2-4 teams will be invited for an interview. Step two: the teams invited for an interview will be given time to present their qualifications, along with a set of questions from the selection committee during the interview. The scores will be based on the tables below.

<table>
<thead>
<tr>
<th>Initial Ranking, Written Point Scoring</th>
<th>Criteria</th>
<th>Maximum Possible Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Basic Qualifications</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>B Specific Qualifications</td>
<td>10</td>
<td></td>
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<tr>
<td>C Approach to Project</td>
<td>15</td>
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<td>D DesignBuild Delivery</td>
<td>15</td>
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<td>E Past Performance</td>
<td>5</td>
<td></td>
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<tr>
<td>F Examples of Work</td>
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<td></td>
</tr>
<tr>
<td>G Format</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td><strong>Written Total</strong></td>
<td><strong>65</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Presentation – Interview Point Scoring</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Competency and abilities to address their qualifications based upon the criteria above.</td>
</tr>
<tr>
<td></td>
<td>Selection Committee’s Q &amp; A</td>
</tr>
<tr>
<td></td>
<td>Presentation – Interview Total</td>
</tr>
</tbody>
</table>
AWARD

Based on the results of the final proposals, DPW will recommend a course of action to the PBFAC at their next regularly scheduled meeting. If recommended, a notice of intent to negotiate will be issued by DPW.

PROPOSED DATES:

<table>
<thead>
<tr>
<th>Event</th>
<th>Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>RFQ Informational Meeting</td>
<td>October 20, 2022; 10am/PT</td>
</tr>
<tr>
<td>UI Facilities Services Building</td>
<td>875 Perimeter Drive, Moscow, ID.</td>
</tr>
<tr>
<td>Join Zoom Meeting</td>
<td><a href="https://uidaho.zoom.us/j/85086301852">https://uidaho.zoom.us/j/85086301852</a></td>
</tr>
<tr>
<td>Receive RFQ Submittals</td>
<td>November 1, 2022</td>
</tr>
<tr>
<td>Design-Build Shortlist Published</td>
<td>November 15, 2022</td>
</tr>
<tr>
<td>Oral Interviews</td>
<td>November 29, 2022</td>
</tr>
<tr>
<td>PBFAC Selection Approval</td>
<td>December 6, 2022 meeting</td>
</tr>
<tr>
<td>Negotiate Contract</td>
<td>December 2022</td>
</tr>
</tbody>
</table>

SELECTION

The State will attempt to select a firm at the next scheduled Permanent Building Fund Advisory Council meeting. Upon selection of a firm, the State will issue a letter of intent. However, final award is contingent upon the successful negotiation of an Agreement.

The contents of the submittal may be used in a legal contract or agreement. Proposers should be aware that methods and procedures proposed could become contractual obligations. The State reserves the right to reject any or all proposals received as a result of this request.

The State may also negotiate separately with any source in any manner necessary to serve the best interests of the State of Idaho. Awards will be made on the basis of submittals resulting from this request and subsequent interviews.

Moscow, ID

J.W Martin Labs
Deep Soil Ecotron Project
Facilities Scope of Work

Revision 3 – Scope of Work

August 30, 2022
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BACKGROUND

The University of Idaho College of Agriculture and Life Sciences, in coordination with the Office of Research and Economic Development, is energetically underway in the realization of a state of the art soil research facility.

The Deep Soil Ecotron Research Facility will allow for the identification of interactions between the soil’s biotic and abiotic properties across spatial and temporal scales that regulate ecosystem processes. The Deep Soil Ecotron will address the following major research needs:

1. Determine how deep soil communities and processes affect and interact with surface soils to influence whole ecosystem processes.
2. Determine how deep soils respond to global and land-use change, such as increasing soil temperature and agricultural management practices.
3. Integrate information gained from the Deep Soil Ecotron into earth system models to improve model performance.
4. Develop and design sensors specifically for the in-situ monitoring of deep soils.

The Deep Soil Ecotron Research Facility is supported in large part by a National Science Foundation grant awarded in 2021. The NSF grant will provide necessary funding to establish the research program, hire staff, support the development of research protocols / pedagogy, and acquire the Deep Soil Ecotron (DSE) units and related equipment. Supplemental funding has been awarded via the State of Idaho Permanent Building Fund that is targeted towards completing the necessary infrastructure upgrades to the JW Martin Lab Building as necessary to support the new DSE units and research program.

The University is pursuing the acquisition of the DSE units through a separate purchasing agreement. The intent of this document is to outline the necessary infrastructure and facility upgrades to house and support the equipment package and ongoing research.

This facility will house twenty-four (24) new Deep Soil Ecotron (DSE) Units. The units will be installed at the J.W. Martin (JWM) Lab Building, specifically in the high-bay lab spaces 072, 075, and 076. All other 070-series numbered spaces will contain DSE support offices and wet labs located immediately north of these spaces. The scope of the renovations will encompass all 070 numbered spaces. The existing functions in these spaces, including the Bio-Diesel Research facility, will be relocated to other campus locations as part of a separate project effort.

Each DSE unit has an overall footprint of approximately 5’ W x 7’ D x 17’ H.

The DSE units are composed of two sections. The outer cabinet houses environmental controls and detectors and an inner lysimeter cylinder is fully packed with a soil column. The lysimeter is approximately four feet in diameter and 10 feet in height weighing approximately 9 tons. The lysimeter rests on 3 load cells which provide constant weight measurement. The lysimeter cylinder must therefore be capable of vertical movement as weight changes. The outer cabinet does not provide structural support of the lysimeter; it supports environmental systems and detectors. The soil lysimeter is free standing on load cells, however additional seismic bracing to prevent column tipping in the event of earthquake are
required in the final architectural design. A concept for seismic bracing, tied into a service platform is provided in this packet.

Each Ecotron cabinet will require power, ethernet connections, irrigation water, chilled water, and drainage. Irrigation water supply from domestic sources will require an additional purification system.

An elevated catwalk/platform system is needed to provide research and service access to the upper atmospheric section of each DSE unit. This platform system will need to include seismic bracing for lysimeter cylinders that do not interfere with vertical movement. The layout will need to be evaluated for efficiency and coordinated with the DSE manufacturer and facility staff to ensure that clearances and operational requirements are maintained. It will be necessary to remove and install lysimeters with a lift truck in coordination with removable sections in the platform system. A suitable lift truck has a minimal operating length of 8 feet.

Building renovations will be required for JWM high-bay lab spaces 72, 75, and 76 where the DSE units will be housed. The floor space used for installment of lysimeters must be adequate to support the proposed loads. The wall between room 72 and 75 will be removed to facilitate DSE installation. The HVAC systems for all DSE spaces (070 series rooms) will need to be upgraded to provide air conditioning. Chilled water supply (-5C) is required at all DSE units. All DSE units will require backup power for environmental controls, including chilled water supply to DSE units.

**DELIVERABLES**

The deliverables of the project assessment are record findings from a conceptual study based on POWER Engineer’s understanding of the requirements intended to foster collaboration and ensure alignment between the Project Team and the Deep Soil Ecotron Research Team with regard to: scope, schedule, project execution, deliverables and expectations.

It should be noted that the design concept included does not complete the engineering effort; detailed engineering will be required following the design concept. Once the project is approved and awarded by the State of Idaho Division of Public Works, the following tasks will be executed by the selected Design Team:

1. Complete field verification of all existing building elements and systems.
2. Review and confirm the Conceptual Study / Program with the UI Research Staff and Architectural & Engineering Services.
3. Thoroughly review the specifications and requirements for UI provided DSE equipment package.
4. Review all building / infrastructure requirements with UI Facilities staff.
5. Perform a robust Conceptual / Schematic Phase with cost estimating to confirm program requirements and scope alignment with the project budget.
7. Provide Construction Documents and Specifications including IDOPL code / plan review process.
8. Provide bid period documents and support.
9. Provide Construction Administration services.
EXISTING FACILITY

The existing facility was built in the mid-1980’s. The high bay facility area of work is approximately 4,625 sq ft. The south wall is the low point of the work area at 17 feet. Existing HVAC at the facility only includes heating. Air conditioning (AC) will be required within the targeted DSE research spaces. The facility chiller will support the environmental conditioning in the project areas. The process chiller is to be a separate unit handling DSE water temperature. The existing electrical panels support the required 208VAC 3Ø power required by each DSE. Design Engineers shall conduct a load study confirming capacity is adequate. All 70’s numbered rooms are allocated to the Deep Soil Ecotron project for equipment, storage, and workstations.

Rooms 75 and 76 are currently classrooms or experimental labs. These classrooms have cable trays supported by the ceiling structure and power dropped from the ceiling. The University of Idaho ITS Department will be responsible for the communication cable demo and rerouting.

Room 72 is currently a multi-use lab and is situated between rooms 75 and 76. The multi-use lab currently has biodiesel and auto testing equipment which will be relocated by the University of Idaho.

PROJECT DESIGN SCOPE

GENERAL TIMELINE for INFRASTRUCTURE UPGRADES

- Division of Public Works Design Team Selection Process: August 2022 - October 2022
- Conceptual Review / Scoping / Schematic Design Phase: November 2022 - December 2022
- Design Development Phase: January 2023
- Construction Document Phase: February 2023 - April 2023
- State of Idaho IDOPL Plan Review / Permit Process: May 2023
- Bid Period and Construction Contract Award: June 2023 - July 2023
- Construction Phase: August 2023 - May 2024
- DSE Equipment Package Delivery, Installation and Integration: March 2024 - May 2024
- Commissioning and Closeout: June 2024 - July 2024
SCOPE FOR DESIGN TEAMING

1. ARCHITECTURE

The Deep Soil Ecotron Laboratory general scope consists of the following facility upgrades and modifications:

1. Rooms 72, 75, and 76 will be remodeled to facilitate DSE operations. The work area is approximately 4,625 sq. ft. The slab in these areas will be removed, replaced, and remaining walls are to receive paint.

2. The new slab will be designed to perform to traffic loads for Ecotron Soil Cylinder handling/transport as well as seismic and dead/live loads of the Ecotron units.

3. A new 12’x12’ Coiling Overhead Door, in an existing shear wall, between rooms 72 and 76. This will require wall demolition, wall framing, patching, trim, paint, building shear analysis, and potential shear reinforcement. Record drawings identify the wall as a shear wall.

4. 1 partition wall will be removed, between rooms 75 and 72, requiring 1 existing built-up column in the wall to remain.

5. Roof insulation will be replaced and upgraded with R-30, rooms 72, 75, and 76.

6. All rooms will receive air conditioning provided by a new air handling unit, re: Figure A.

7. Demolition and wall repair is required for existing wall mounted A/C units located in rooms 073, 074, and 078.

8. Reuse of the existing casework and storage cabinets, to the greatest extent possible, is desired. The Design Team will evaluate the existing casework, and explore options for reuse, relocation or new casework as may be needed to accomplish programmatic needs.

9. Conditioned air, chilled water for DSE operations, and human environment will require a new water chiller, air conditioning unit, and delivery systems.

10. The DSE unit systems requirements consist of chilled water supply, irrigation water supply, power supply with emergency backup, data, and drains. Filtration and treatment of irrigation water is required.

11. Elevated service walks are required for upper level DSE service and maintenance. DSE cylinders require removal and seismic reinforcement. Coordination between the service walks, seismic bracing, and Lysimeters will require additional solution and coordination with the DSE manufacture. See FIGURE A and seismic bracing proposal in architectural concept.
See Attachment i for supplementary description of Scope.

13. Provide design documents for the demolition of the wall separating room 72 and room 75.
14. Provide layout and elevations for new service walks.
15. Provide design for a new 12’x12’ roll up door between room 72 and room 76.
16. Provide architectural drawings, and specifications for renovations.
17. Provide finish plans and schedules

2. STRUCTURAL
Each DSE soil cylinder weighs approximately 9 tons and supported on 3 load cells. Lift truck traffic is required throughout the space for changing of the loaded soil cylinders. The existing floor slab is 6” thick with 4-gauge welded wire mesh at 12” spacing.

Elevated service platforms will provide double purpose of lysimeter access/maintenance and seismic bracing. The Design Team will coordinate service/access/seismic bracing design with the DSE unit manufacturer.

The DSE manufacturer is in design phase which allows for some revision in outer cabinet to optimize space for seismic bracing. The final design team will be responsible to incorporate seismic bracing for compliance in the Moscow, ID area. See Figure A for supplementary description of Scope. Also see initial concept for seismic bracing.

Itemized structural design for DSE units includes the following:
1. Coordinate seismic bracing, structural slab, and service access with DSE unit manufacturer and UOI.
2. Provide design for replacement of slab throughout the DSE areas, addressing DSE loads, and required seismic bracing.
3. Provide design for new service walks.
4. Evaluate existing shear wall and provide design for new Overhead Door opening.
5. Provide structural drawings, calculations, and specifications for renovations.

Note to Project Delivery Team:
1. Verify delivery weights of the DSE units. Surface replacement of driveway or temporary dunnage may be required.

3. MECHANICAL

The existing rooms, 72, 75, and 76, currently do not have Air Conditioning (AC). Interviews conducted have described the rooms to be in excess of 90 to 100 °F during the summer months. The DSE unit manufacturer advises that temperature regulation is paramount to experimental success. Preliminary engineering identifies the following findings:

1. Provide new Mechanical plan drawings for HVAC and utilities to serve new DSE facility.
2. Provide Mechanical analysis of equipment, piping schedules, details, and schematic necessary for installation support systems.

3. Conduct analysis of cooling and humidity requirements for the DSE rooms. The equipment space must be regulated at or below 25°C and no lower than 15°C. The DESI unit manufacturer recommends temperatures should not fluctuate and a steady state is critical to operational success.
   a) Include analysis for heat controllability/regulation of existing equipment for maintaining temperatures during cold months.
   b) Each DSE will require chiller support for built in heat exchangers at -5°C/-1°C/1.0 m³/h. Power to this chiller is a consideration for facilities electrical support.
   c) The DSE equipment is estimated to require 216 kw (61.4 tons) of cooling for the 24 machines total assuming a temperature change of 4°C, mass flow of 2.2 m³/h and 30% glycol coolant. A chiller system will handle this load and interface with the DSE’s built-in, liquid cooling system.
   d) There will be an additional radiant heat load of 48kw radiated into the surrounding space from the DSEs. This 48kw load, combined with the cooling requirements of the building, will require an additional 42.5 tons of cooling to maintain 25°C throughout the 070 series office rooms and the two rooms housing DSE equipment. This 42.5 tons of cooling may be provided by a DX air handler or may be combined with the DSE cooling load into one load of 103.9 tons to be serviced by a single chiller.
   e) The 070 Series Office Spaces are estimated to require 10.5 tons of cooling with an airflow of 4,000 CFM.
   f) The combined load of the lysimeter rooms is estimated to require 32 tons of cooling with an airflow of 21,000 CFM.
   g) It is assumed that the best location for the chiller or multiple chillers will be on the south side of the building in the concrete service yard area. The Design Teams shall work with the University to evaluate best locations based on clearances, access, efficiency and maintaining vehicular access to the building.
   h) Analyze and determine best strategy for meeting temperature and humidity requirements (DX AHUs, Chilled Water, Glycol, ETC). If the coolant chosen is compatible with the DSE equipment, determine if a single system can be used to meet both the 42.5-ton space cooling requirements as well as the 61.4-ton chiller load from the DSEs.

4. Provide HVAC analysis, schedules, details, and plan drawings for ventilation cooling system to serve new DSE area and support spaces. Re: FIGURE B
5. PLUMBING

1. Assumed water requirements identify that the maximum irrigation water requirements are to be less than 200 gallons per day with a maximum flow capacity for all DSE units to be 10.6 gallons per minute.
2. Water filtration is required. Current research leans toward a system consisting of softener, carbon filter, RO membrane, UV and final particulate filter. Specifications for a suitable system can be provided.
3. Filtered water will be supplied to a ½” connection for irrigation and an additional ½” connection for humidity control at each ecounit.
4. The filtration system will require connection to the existing domestic water supply and will be housed inside of room 72.
5. Waste from this filtration process is to be accounted for and disposed of.
6. The filtered water will be stored inside the building awaiting the final formula mixing before delivery to the DSE units.
7. Water will be delivered to DSE’s by a pressurized system through flexible hose routed above the units.
8. Trench drains are to be provided for adaptive service connection locations.
9. Provide condensate drains at the exterior air handling unit and chiller unit.
10. Water connections at each ecounit also will require valving to switch to a separate tank supply.
FIGURE C

University of Idaho DSE Project
Scope of Work, 8/30/22, Rev. 3

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4. ELECTRICAL

The main electrical service at the existing facility is a 1600 Amp (A) 480/277 VAC 3-phase (3Ø) main switchboard (MSB) supplied by a 1000 kVA 13.2kV to 480/277 VAC 3Ø outdoor pad mounted transformer. The 1600A MSB is divided into two 800A 480/277 VAC 3Ø buss sections. The two 800A buss sections supply various 208/120 VAC 3Ø transformer loads, a 200A Motor Control Center (MCC) and other 480 VAC panelboards. The main electrical service equipment is assumed to be approximately 40 years old.

There is an existing stand-by generator with an automatic transfer switch (ATS), connected to one of the 800A buss sections. Backup power to support essential Ecotron/DSE systems (power and chilled water) is required. Additional design is necessary to determine if the existing generator, ATS, and related system components meet the backup power requirements of the Ecotron/DSE systems.

The power required for each DSE is rated at 208 VAC 3Ø at a peak demand of 14.5 kW. There will be a total of 24 DSE units. Diversity factors for the DSE units are unknown at this time and must be coordinated with the OEM.

A new chiller for the facility air conditioning and a new chiller for process support must be considered for load calculation. A new uninterrupted power supply (UPS) will be required to provide backup power to the chiller control system during outages. The wall between rooms 72 and 75 will be removed and a roll up door will be installed on the wall between room 72 and 76. Therefore, existing electrical or data communications, located within or on these wall sections, must be demolished or relocated.

Table 1 below shows a preliminary electrical load estimate for the project. Based on the metering information provided by University of Idaho and the additional load estimated for miscellaneous electrical loads, the estimated total load is nearing the utility transformer capacity. Additional load studies will need to be performed to determine if upgrades or modifications are required for the main service equipment and utility transformer.
Table 1: Preliminary Electrical Load Estimate

<table>
<thead>
<tr>
<th>Description</th>
<th>Load</th>
</tr>
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<tbody>
<tr>
<td>Maximum load from meter data provided by UI with power factor of .687 (shown at 125% per NEC 220.87)</td>
<td>178 kVA</td>
</tr>
<tr>
<td>Estimated load for 24 DSE Units (14.5kW per unit)</td>
<td>348 kVA</td>
</tr>
<tr>
<td>Estimated Chiller Load (DSE Units@216kW, Space Cooling @ 131 kW)</td>
<td>347 kVA</td>
</tr>
<tr>
<td>Estimated miscellaneous electrical loads (general purpose lighting and receptacles for 6400 sq. ft. at 3 VA per sq. ft., HVAC at 10 VA per sq. ft. for 6400 sq. ft.)</td>
<td>60.1 kVA</td>
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<td><strong>Estimated Total Electrical Load</strong></td>
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<td><strong>Estimated Remaining Utility Transformer Capacity</strong></td>
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</table>

A one-line diagram has also been provided as a supporting document illustrating the conceptual electrical buildout to support the project.

See below for a description of the electrical scope of work.

1. Provide electrical design to support process equipment loads, and controls.
   a) Each DSE is estimated to require support for 14.5 kW / 208 VAC 3-phase power.
   b) Assess current electrical loading and infrastructure to provide design direction to support new lab equipment.
2. Provide a load study of existing electrical loads at the 1000 kVA main transformer, 1600A Main Switchboard (MSB), and 800A MSB buss sections to determine the remaining load capacity of the existing electrical service.
   a) Provide electrical design to support any necessary upgrades to the existing electrical service, to support the addition of 24 DSE units, Chiller units, and other associated loads.
3. Verify the existing 1000 kVA main transformer, including primary and secondary feeder conductors, are within the manufacture’s serviceable life cycle.
4. Verify the existing 1600A MSB, 800A MSB buss sections, kilowatt hour meter, and associated overcurrent devices are within the manufacture’s serviceable life cycle.
5. If necessary, verify the existing MCC has the capacity for additional electrical loads and is within the manufacture’s serviceable life cycle.
   a) Provide electrical design to support any necessary upgrades to the existing MCC.
6. Provide electrical design to support the replacement of all obsolete equipment.
7. Verify the existing electrical service grounding and bonding systems comply with current local electrical codes and/or current National Electrical Code.
   a) Provide Electrical design for any required changes to the electrical service grounding and bonding systems.
8. Provide lighting design/modifications as necessary.
9. Provide electrical design for modifications of low voltage systems (networking/telecom, security, fire alarm, etc.) as necessary.
10. Provide electrical design to supply power to chiller, HVAC, miscellaneous loads and related equipment.
11. Provide electrical design to support the installation of a new UPS for the Chiller controls.
   a) Coordinate with University of Idaho for runtime requirements of the UPS.
12. Coordinate with University of Idaho to evaluate backup power requirements for essential Ecotron/DSE systems.
   a) Provide electrical design to support backup power to essential Ecotron/DSE systems.
13. Provide electrical design for demolition, renovation or relocation of any electrical equipment or loads within the scope of this project.

5. CONTROLS

Each DSE will have a PLC control unit requiring an ethernet connection. Each DSE will also have a video connection. Reengineering furnishes switches and controls at each unit. An area in room 82, marked in red below, has an enclosure/closet identified as an ideal area to install the network switches/equipment. The University of Idaho will coordinate network connections with the manufacturer.

1. Each DSE will require two ethernet ports.
2. Coordinate Network requirements with OEM and UI.
3. Equipment expected to be provided by the OEM:
   a) Controls Server
   b) Controls Software
   c) Ethernet Switches (copper)
   d) Patch Panel
   e) 19” Rack Mount
SUPPORTING DOCUMENTS / ATTACHMENTS

1. ATTACHMENTS
   
   i. *Construction Cost Estimate*
   
   ii. *Architectural Concept*
   
   iii. *Conceptual Electrical One-Line Diagrams*
POWER Engineers Summary Estimate Report

Title: University of Idaho DSE Lab

Subject: GMP Class IV Estimate

Estimate No.: 2022.002

Date: 08/04/2022

Report Total: $2,517,211

The information and data contained in this document is proprietary and confidential to POWER Engineers. Use or disclosure of this information or data, except for purposes of evaluation, is prohibited without the written permission of POWER Engineers.

Project Notes: Location: Moscow, ID
Wages: Davis-Bacon Act #ID20220065 Latah Co.
Productivity: 5/8's

> 01 General Requirements
  - Estimate valid for 30 days
  - AACE Class IV Estimate with accuracy range:
    L: -15% to -30%
    H: +20% to +50%
  - Mechanical general contractor w/ electrical subcontractor
  - Price is current as of 08/04/2022, and excludes escalation
  - Price excludes material price volatility due to shortages, COVID-19, shipping delays, war, etc
  - Includes 20 cy dumpster & sani-can for craft
  - Includes 2 aerial man-lifts

> 02 Existing Condition
  - 6" Building floor thickness allowance
  - Existing walls are common construction

> 03 Concrete
  - Includes 16" thick slab on grade with structural fill
  - Includes water stop

> 05 Metals
  - Includes structural steel platforms
  - Includes allowance for misc. metals for building modifications

> 07 Thermal & Moisture Protection
  - IMP walls are 4" thick with plastic surfaces
  - Includes fire proofing between ceiling and existing walls

> 08 Openings
  - Reuse existing man walk doors
  - Roll-up door is steel, manual, 12' x 12', motor operated

> 09 Finishes
  - Concrete floor assumed to be epoxy coated with primer, intermediate, and topcoat
- Insulation included R-19 walls, R-30 ceiling

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- Price includes $/sf for FP subcontractor to remove/re-install sprinkler piping and alarm/detection equipment

> 22 Plumbing
- Includes Class C trench drain that connects to existing floor drain at the center of space

> 23 HVAC
- Price includes $/sf for HVAC subcontractor to modify existing system to meet new room needs
- Price includes the addition of a chilled water system to keep the laboratory at a consistent temp.

> 26 Electrical
- Price includes $/sf for electrical subcontractor
- Excludes wiring new equipment
- Replace existing transformer
- 750 kW Generator w/ 8 hr run time day tank
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**POWER Engineers, Inc.**
Title: University of Idaho DSE Lab  
Subject: GMP Class IV Estimate  
Estimate No.: 2022.002

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Project Notes: Location: Moscow, ID
  Wages: Davis-Bacon Act #ID20220065 Latah Co.
  Productivity: 5/8's

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  - Includes water stop

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  - Includes structural steel platforms
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> 08 Openings
  - Reuse existing man walk doors
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> 09 Finishes
  - Concrete floor assumed to be epoxy coated with primer, intermediate, and topcoat
Insulation included R-19 walls, R-30 ceiling

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- Price includes $/sf for electrical subcontractor
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- Replace existing transformer
- 750 kW Generator w/ 8 hr run time day tank
## Detail Report - Draft

**Power Engineers Estimating and Cost Management System**

**Title:** University of Idaho DSE Lab  
**Subject:** GMP Class IV Estimate  
**Reported From:** University of Idaho

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Report Total: **$2,517,211**
## Concrete Demo

Building Foundation Demo, 6" Thick w/ rod reinforcement

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<td>6,915.0 sf</td>
<td>671</td>
<td>$38,139</td>
<td>$0</td>
<td>$0</td>
<td>$4,922</td>
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Subtotal:

| 671 | $38,139 | $0 | $0 | $4,922 | $0 | $0 | $43,061 |

Level Markups:

| 671 | $25,270 | $0 | $0 | $2,579 | $0 | $0 | $27,849 |

**TOTAL Concrete Demo**

| 671 | $63,409 | $0 | $0 | $7,501 | $0 | $0 | $70,910 |

## Wall Demo

Building Demo

<table>
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<tr>
<th>QTY</th>
<th>LABOR</th>
<th>MATRL</th>
<th>EQUIPMENT</th>
<th>CONSTR. EQUIPMENT</th>
<th>SUB-CONTRACT</th>
<th>OTHER</th>
<th>TOTAL</th>
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<tbody>
<tr>
<td>1,500.0 sf</td>
<td>67</td>
<td>$3,806</td>
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<td>$491</td>
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Subtotal:

| 67 | $3,806 | $0 | $0 | $491 | $0 | $0 | $4,297 |

Level Markups:

| 67 | $2,522 | $0 | $0 | $257 | $0 | $0 | $2,779 |

**TOTAL Wall Demo**

| 67 | $6,327 | $0 | $0 | $748 | $0 | $0 | $7,076 |

## Remove, Load, & Haul Non-Hazardous Materials

12 CY Truck, 15 min wait, Cycle 8 miles

<table>
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<tr>
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<th>LABOR</th>
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<tr>
<td>362.0 cy</td>
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Demo Crew w/ loader

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Tipping Fees, recycled concrete

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<tr>
<td>31.0 ea</td>
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Subtotal:

| 97 | $6,266 | $0 | $0 | $6,486 | $0 | $0 | $16,266 |

Level Markups:

| 97 | $4,152 | $0 | $0 | $3,399 | $0 | $0 | $7,550 |

**TOTAL Remove, Load, & Haul Non-Hazardous Materials**

| 97 | $10,417 | $0 | $0 | $9,885 | $0 | $0 | $23,837 |
**Demo Existing Transformer**

<table>
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<tr>
<th>QTY</th>
<th>LABOR HOURS</th>
<th>LABOR</th>
<th>MATRL</th>
<th>ENGINEERED EQUIPMENT</th>
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Subtotal: $2,199

Level Markups: $1,457

**TOTAL Demo Existing Transformer**

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**Concrete**

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Subtotal: $122,864

Level Markups: $81,406

**TOTAL Concrete**

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**Generator Equipment Pad**

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<th>MATRL</th>
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**REPORT TOTAL**: $2,517,211
Title: University of Idaho DSE Lab  
Subject: GMP Class IV Estimate  
Reported From: University of Idaho

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<th>MATRL</th>
<th>EQUIPMENT</th>
<th>CONSTR.</th>
<th>SUB-</th>
<th>OTHER</th>
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<tr>
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<tr>
<td>03 Place Concrete (Salmon Bay Sand &amp; Gravel Price)</td>
<td>5.3 cy</td>
<td>11</td>
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<td>$773</td>
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<td>31.23.23.16.0050 Bedding w/ compaction</td>
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<td>03 Misc Metals (5 man crew for 1 month)</td>
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<td>16</td>
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<tr>
<td>Overhead Rollup Door</td>
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</tr>
<tr>
<td>03 Coiling Service Door, Steel, Manual, 20 GA, 12’ x 12” high</td>
<td>1.0 ea</td>
<td>10</td>
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</tbody>
</table>
**University of Idaho DSE Lab Class IV Estimate**

**Report Total:** $2,517,211

### Interiors

- **Interior Improvements, laboratory, per sf cost**
  - QTY: 6,915.0 sf
  - LABOR: $0
  - MATRL: $0
  - EQUIPMENT: $0
  - CONTR. EQUIPMENT: $373,410
  - SUB-CONTRACT: $0
  - OTHER: $0
  - TOTAL: $373,410

- **Subtotal:** $373,410
- **Level Markups:** $0
- **Total:** $373,410

### Building Insulation

- **Insulation, Ceiling, R-30, Expanded Polystyrene, 7.74" thick**
  - QTY: 6,915.0 sf
  - HOURS: 34
  - LABOR: $2,313
  - MATRL: $15,006
  - EQUIPMENT: $0
  - CONTR. EQUIPMENT: $0
  - SUB-CONTRACT: $0
  - OTHER: $0
  - TOTAL: $17,318

- **Insulation, Walls, R-19, vinyl faced, 6" thick**
  - QTY: 5,108.0 sf
  - HOURS: 35
  - LABOR: $2,673
  - MATRL: $2,912
  - EQUIPMENT: $0
  - CONTR. EQUIPMENT: $0
  - SUB-CONTRACT: $0
  - OTHER: $0
  - TOTAL: $5,585

- **Subtotal:** $22,903
- **Level Markups:** $0
- **Total:** $22,903

### Fire Protection Subcontractor

- **Fire detection & suppression, laboratory, per sf**
  - QTY: 6,915.0 sf
  - LABOR: $0
  - MATRL: $0
  - EQUIPMENT: $0
  - CONTR. EQUIPMENT: $26,554
  - SUB-CONTRACT: $0
  - OTHER: $0
  - TOTAL: $26,554

- **Subtotal:** $0
- **Level Markups:** $0
- **Total:** $26,554

### Trench Drain System

- **Traps, Running P-Trap, w/out vent, 4"**
  - QTY: 2.0 ea
  - HOURS: 2
  - LABOR: $150
  - MATRL: $388
  - EQUIPMENT: $0
  - CONTR. EQUIPMENT: $0
  - SUB-CONTRACT: $0
  - OTHER: $0
  - TOTAL: $538
## University of Idaho DSE Lab

### GMP Class IV Estimate

**Reported From:** University of Idaho

**Report Total:** $2,517,211

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<tr>
<th>LEVEL</th>
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<th>LABOR</th>
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<th>ENGINEERED EQUIPMENT</th>
<th>CONSTR. EQUIPMENT</th>
<th>SUB-CONTRACT</th>
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<tbody>
<tr>
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<tr>
<td>1 Deep Soil Ecotron Laboratory</td>
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### Trench Drain System

- **Mechanical Coupling, 4"**
  - QTY: 2.0 ea
  - HOURS: 1
  - LABOR: $65
  - MATRL: $36
  - EQUIPMENT: $0
  - CONTRACT: $0
  - OTHER: $0
  - TOTAL: $101

- **PVC DWV Clean-out adapter fitting, 4"**
  - QTY: 2.0 ea
  - HOURS: 1
  - LABOR: $65
  - MATRL: $29
  - EQUIPMENT: $0
  - CONTRACT: $0
  - OTHER: $0
  - TOTAL: $94

- **PVC DWV Clean-out plug fitting, 4"**
  - QTY: 2.0 ea
  - HOURS: 1
  - LABOR: $65
  - MATRL: $7
  - EQUIPMENT: $0
  - CONTRACT: $0
  - OTHER: $0
  - TOTAL: $71

- **PVC DWV Elbow, 45 deg, 4"**
  - QTY: 2.0 ea
  - HOURS: 1
  - LABOR: $65
  - MATRL: $41
  - EQUIPMENT: $0
  - CONTRACT: $0
  - OTHER: $0
  - TOTAL: $105

- **PVC DWV Reducing Sanitary Tee, 6"x4"**
  - QTY: 2.0 ea
  - HOURS: 1
  - LABOR: $65
  - MATRL: $350
  - EQUIPMENT: $0
  - CONTRACT: $0
  - OTHER: $0
  - TOTAL: $414

- **PVC DWV Piping, sch 40, 4"**
  - QTY: 40.0 lf
  - HOURS: 12
  - LABOR: $763
  - MATRL: $91
  - EQUIPMENT: $0
  - CONTRACT: $0
  - OTHER: $0
  - TOTAL: $854

- **Trench Drain, Load Class C, 6" wide, 12.5" deep**
  - QTY: 200.0 lf
  - HOURS: 97
  - LABOR: $6,076
  - MATRL: $25,000
  - EQUIPMENT: $0
  - CONTRACT: $0
  - OTHER: $0
  - TOTAL: $31,076

- **Hydro Testing**
  - QTY: 40.0 lf
  - HOURS: 4
  - LABOR: $243
  - MATRL: $40
  - EQUIPMENT: $0
  - CONTRACT: $0
  - OTHER: $0
  - TOTAL: $283

- **Pipe Tie-in to Existing**
  - QTY: 1.0 Ea
  - HOURS: 0
  - LABOR: $0
  - MATRL: $0
  - EQUIPMENT: $0
  - CONTRACT: $1,500
  - OTHER: $0
  - TOTAL: $1,500

- **Piping Bedding w/ compaction**
  - QTY: 1.8 cy
  - HOURS: 0
  - LABOR: $26
  - MATRL: $24
  - EQUIPMENT: $0
  - CONTRACT: $6
  - OTHER: $0
  - TOTAL: $56

---

Subtotal: $7,582

Level Markups: $5,023

**TOTAL Trench Drain System**

<table>
<thead>
<tr>
<th>QTY</th>
<th>LABOR</th>
<th>MATRL</th>
<th>EQUIPMENT</th>
<th>CONTRACT</th>
<th>OTHER</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>121</td>
<td>$12,605</td>
<td>$39,047</td>
<td>$0</td>
<td>$9</td>
<td>$1,650</td>
<td>$0</td>
</tr>
</tbody>
</table>

---

### Modifications to Existing System

- **HVAC, laboratory, per sf**
  - QTY: 6,915.0 sf
  - HOURS: 0
  - LABOR: $0
  - MATRL: $0
  - EQUIPMENT: $0
  - CONTRACT: $691,500
  - OTHER: $0
  - TOTAL: $691,500

---

Subtotal: $0

Level Markups: $0

**TOTAL Modifications to Existing System**

<table>
<thead>
<tr>
<th>QTY</th>
<th>LABOR</th>
<th>MATRL</th>
<th>EQUIPMENT</th>
<th>CONTRACT</th>
<th>OTHER</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$760,650</td>
<td>$0</td>
</tr>
</tbody>
</table>
### General Electrical Work

Electrical, laboratory, per sf  

<table>
<thead>
<tr>
<th>QTY</th>
<th>LABOR</th>
<th>MATRL</th>
<th>EQUIPMENT</th>
<th>CONSTR. EQUIPMENT</th>
<th>SUB- CONTRACT</th>
<th>OTHER</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,915.0 sf</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$243,823</td>
<td>$0</td>
<td>$243,823</td>
</tr>
</tbody>
</table>

Replace Existing Transformer, 1,000 kVA

<table>
<thead>
<tr>
<th>QTY</th>
<th>LABOR</th>
<th>MATRL</th>
<th>EQUIPMENT</th>
<th>CONSTR. EQUIPMENT</th>
<th>SUB- CONTRACT</th>
<th>OTHER</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 ea</td>
<td>$4,740</td>
<td>$29,000</td>
<td>$0</td>
<td>$0</td>
<td>$243,823</td>
<td>$0</td>
<td>$33,740</td>
</tr>
</tbody>
</table>

### New Generator

750 kW Diesel Generator, incl. battery, charger, muffler, xfer switch, 3 phase,480V

<table>
<thead>
<tr>
<th>QTY</th>
<th>LABOR</th>
<th>MATRL</th>
<th>EQUIPMENT</th>
<th>CONSTR. EQUIPMENT</th>
<th>SUB- CONTRACT</th>
<th>OTHER</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>750.0 kW</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$210,863</td>
<td>$0</td>
<td>$210,863</td>
</tr>
</tbody>
</table>

8 hr day tank adder

<table>
<thead>
<tr>
<th>QTY</th>
<th>LABOR</th>
<th>MATRL</th>
<th>EQUIPMENT</th>
<th>CONSTR. EQUIPMENT</th>
<th>SUB- CONTRACT</th>
<th>OTHER</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>750.0 kW</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$11,250</td>
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<td>$11,250</td>
</tr>
</tbody>
</table>

### Backfill & Compaction

Structural Backfill & Compact Foundations

<table>
<thead>
<tr>
<th>QTY</th>
<th>LABOR</th>
<th>MATRL</th>
<th>EQUIPMENT</th>
<th>CONSTR. EQUIPMENT</th>
<th>SUB- CONTRACT</th>
<th>OTHER</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>175.0 cy</td>
<td>$1,196</td>
<td>$5,425</td>
<td>$0</td>
<td>$276</td>
<td>$0</td>
<td>$0</td>
<td>$6,897</td>
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</tbody>
</table>

## Estimate Tree Structure Rollups

1 Deep Soil Ecotron Laboratory  
26-ELECTRICAL

**Report Total:** $2,517,211
Existing 1000 KVA Main Transformer

Generator, ATS, and related system components, to support essential ecolotron system loads and existing emergency loads.

New 480 VAC Switchboard for emergency loads.

Possible Motor Control slots for small chiller A/C loads.

New 480/208/120V Transformer for DSE Units.

Existing generator loads

Chiller unit
1,7 m

2,1 m
small gap required!

- posts of catwalk
- removable
- adjustable spacer
- seismic bracing

L75i meter
Seismic bracing side view
Proposed Sroka lift truck