

SDSTA Davis Campus Chiller 3 Replacement RFB

RFB Posted: August 24, 2020
Questions Due: August 28, 2020 2:00 P.M. (MT)
Answers Posted: September 2, 2020 2:00 P.M. (MT)
Bid Due Date: September 9, 2020 2:00 P.M. (MT)

The South Dakota Science and Technology Authority (SDSTA) is requesting a bid for the removal and installation associated with the replacement of an existing 30-ton Multistack chiller system located in the 4850L chiller room of the Davis Campus Facility, near the Yates Shaft (630 East Summit Street Lead, SD 57754). The best value selection process will be used for awarding this contract. Selection will be made based on tradeoffs among price and non-price evaluation factors. These non-price evaluation factors have been detailed in Section 4. Fixed bid prices shall be submitted for all items indicated herein.

Documents included in this Request for Bid include:

- A. This Request for Bid
- B. Terms and Conditions
- C. Reference Materials:
 - i) General Layout Drawings
 - ii) Air Handler Unit 6 Details
 - iii) Chiller 3 and Air Handler Unit Electrical and Metasys Screen Details
 - iv) Ducting Pictures

The RFB is organized as follows:

- Section 1.0 – Introduction
- Section 2.0 – SDSTA Requirements
- Section 3.0 – Scope of Work
- Section 4.0 – Bid Requirements
- Section 5.0 – General Requirements
- Section 6.0 – Bid Submission Requirements
- Section 7.0 – Reference Materials

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1.0 Introduction

Chiller 3, located at the 4850 level Davis Campus, has experienced an increase in cases of downtime in the past year. This unit is an integral part of the dehumidification system that serves the science spaces within the Davis Campus. Maintaining steady state conditions is paramount to the success of various science groups; therefore, replacing Chiller 3 has become a high-priority project.

The layout sketch of the Davis Campus can be seen in Figure 1 below with key project areas annotated. See Reference Material item 7.1 for a more detailed version of this sketch that shows equipment locations.

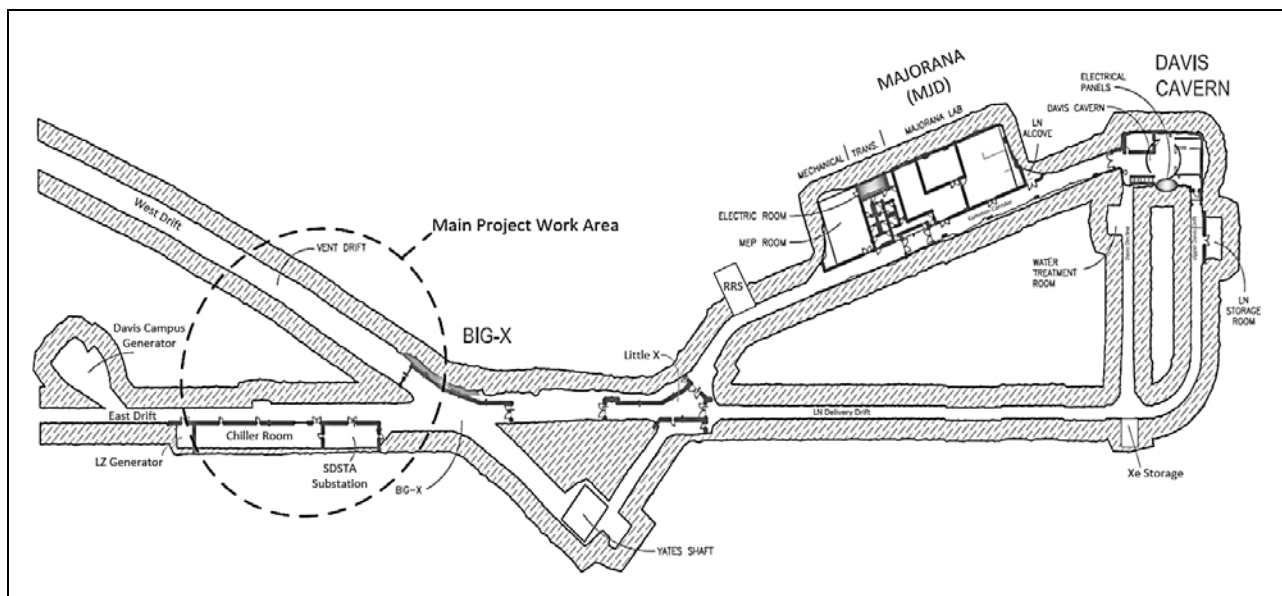


Figure 1: 4850L Davis Campus Layout Sketch for Chiller 3 Replacement

The overall approach for this project is:

- 1.1 Decommission and remove the existing Chiller 3 unit.
- 1.2 Install replacement Chiller 3 unit and required ancillary equipment & devices.
- 1.3 Replace desiccant wheel inside of dehumidification air handler (AHU-6)
- 1.4 Commission new Chiller 3 and required ancillary equipment & devices.

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- 1.5 Transfer all project documents to the SDSTA upon project completion.

The detailed breakdown of the above items is listed in Section 3.0.

2.0 SDSTA Conditions

Chiller 3 System Component Specifications

The original equipment design conditions are as follows:

- **Chiller 3 [CH-3]:** 30-ton Multistack Dedicated Heat Recovery Chiller (DHRC)
 - o Model Number: MS030XC1H1H2AAC-R410A
 - o Serial Number: AD 01-055
 - o Electrical Ratings: 480VAC 3PH 60Hz
 - Minimum Circuit Ampacity: 70 amperes
 - SCCR: 5 kA RMS Symmetrical
 - Integral Compressor Ratings: 15 hp, 460VAC 3PH 60Hz, 31 RLA, 173 LRA
 - Protected by 110A circuit breaker located in separate “480 VOLT CHILLER PANEL” Siemens panelboard
 - o Refrigerant: R-410
 - o Factory Test Pressures: 650 PSI high side – 235 PSI low side
- **Chilled Water Supply Pumps [CWSP-3 & CWSP-4]:** Armstrong 4030 End Suction Pump 3x1.5x8
 - o Electric Motor Ratings: 460VAC 3PH 60Hz
 - Minimum Circuit Ampacity: 6A
 - Controlled by 3 hp variable speed drives
- **Variable Speed Drives for CWSP-3 and CWSP-4 Motors:** Johnson Controls VSD Series II Enclosed IntelliDisconnect Drive
 - o Model Number: VS5D6410B-00000
 - o NEMA Type 1 Enclosure
 - o Electrical Ratings: 480VAC 3PH 60Hz
 - Minimum Circuit Ampacity: 6.75A
 - Interrupt Rating: 65 kAIC
 - Protected by 15A circuit breakers located in separate “480 VOLT CHILLER PANEL” Siemens panelboard
 - o **Chilled Water Supply and Return Piping:** 2-1/2” IPS Carbon steel pipe with grooved end fittings (Victaulic Style 107), flexible couplings used at the pumps (Victaulic Style 177), and EPDM rubber gaskets.
- **Automation Controller Specifications:** Johnson Controls controllers
 - o Field Equipment Controllers (FEC2611) & Input/Output Modules (IOM4711)

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- o Utilizes Field Controller Bus (FCB), Sensor/Actuator Bus (SAB), and discrete wiring for signals.
- o Controllers are interfaced with a Johnson Controls MetaSys building automation system (BAS) for basic remote monitoring and minor control.

Dehumidification Air Handler Units [AHU-6] Component Specifications

The Chiller 3 system's primary purpose is to support the operation of the dehumidification air handler unit (AHU-6) for the Davis Campus. The dehumidification provided by this air handler effectively lowers the dew point of all outside air entering the Davis Campus to 44 degrees Fahrenheit. Warm condenser water is pumped from Chiller 3 to the reheating coils in this air handler unit. Chilled water is pumped from Chiller 3 to the cooling coils in the supply side of this air handler unit. The original equipment design conditions of this air handler are as follows:

- **Dehumidification Air Handler Unit [AHU-6]:** Trane size 14 Performance Climate Changer, model #CSAA014UA, consisting of the following sections:
 - o Coil Section: heating, Type UW
 - o Diffuser Section: 4818 cfm
 - o Supply Fan Section: 4818 cfm
 - Electrical Ratings: 5 hp 480VAC 3PH 60Hz Motor controlled by FVNR motor starter. 1800 rpm, controlled by equipment-mounted variable frequency drive
 - o Coil Section: heating, Type 5W
 - o Filter Section: angled filter
 - o Exhaust Fan Section: 7168 cfm
 - Electrical Ratings: 7.5 hp 480VAC 3PH 60Hz. 1800 rpm, controlled by equipment-mounted variable frequency drive
 - o Diffuser Section: 7168 cfm
 - o Coil Section: cooling, Type UW
 - o Desiccant Wheel: CDQ wheel, Dual path application, 7000 cfm, regeneration bypass damper, fractional hp motor starter
 - Electrical Ratings: 120V
 - o Spare Access Section

Onsite Equipment and Personnel

The following onsite equipment and personnel are available to assist in the removal and transport of components between the contractor's trucks and the 4850L Davis Campus Chiller Room.

- **Forklift:** A Lull forklift rated at 10,000 lbs. and a trained SDSTA operator will be available to load and unload components on the surface (Yates Headframe).

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- **Mine Hoist:** Trained mine hoist operators will lower and raise project equipment, materials, tools, and personnel to/from the 4850 level underground. Available hoisting times will be communicated with the Contractor/Subcontractor and hoist usage times will be reserved by the SDSTA Project Manager. Transit duration between the surface and the 4850L is approximately 10 minutes.
- **Flatbed, Caged, and Cylinder Transporting Mine Carts:** Various rail carts are available to move equipment, materials, and tools underground via a rail system. When loads are delivered or ready to be raised from the 4850 level, the Contractor/Subcontractors will be responsible for unloading and loading the rail cars.
- **Bobcat MT85 Mini Track Loader:** A mini track loader with a rated capacity of 850 lbs and a trained SDSTA operator will be available to move items around on the 4850 level.
- **Qualified Electrical Worker:** A SDSTA qualified electrical worker, who is knowledgeable in the construction and operation of the 4850L power distribution equipment, will be available to assist the Contractor/Subcontractors in de-energizing and re-energizing portions of the power distribution system during planned electrical outages.

3.0 Scope of Work

- 3.1 Attend onsite project kickoff meeting (approx. one hour).
- 3.2 Attend an underground walk-through pre-project meeting to review project specifications with SDSTA staff. A 30-minute safety orientation session will be needed prior to going underground.
- 3.3 Prior to the commencement of onsite work, the following planning documents shall be provided to SDSTA for approval:
 - **Project Schedule**
 - Shows onsite tasks and key milestones that will take place during project execution.
 - Shows major quality checks and inspection tasks.
 - **Contractor/Subcontractor Project Organizational Chart**
 - Notes key personnel directly involved with managing and performing the onsite work.
 - Notes contract information and in-case-of-emergency contacts.

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- o Notes expected times onsite (may be noted on project schedule instead)
- **Safety Plan**
 - o Notes who the contractor's ESH representative will be.
 - o Includes a copy of the contractor's safety program that would apply to this project.
 - o Includes completed Job Hazard Analysis (JHA) forms and applicable permits (e.g. energized work permits and hot work permits). Templates are available by SDSTA.
- **Environmental Plan**
 - o Includes Safety Data Sheets (SDS) of hazardous chemicals/materials that will be brought onsite and/or handled onsite during the project.
 - o Includes details of how workers will handle the hazardous chemicals/materials and any special training required.
- **Quality Control Plan**
 - o Notes who the contractor's QC representative will be.
 - o Summarizes or outlines the procedures, instructions, and reports that will be used to ensure quality.
 - o Summarizes procedure with how nonconforming items will be dealt with.
 - o Includes a submittal register detailing what submittals and deliverables will be made while tracking approval dates.

3.4 Decommission, disconnect, and remove the existing Multistack Chiller 3 and transport it to the Big-X, where SDSTA personnel will then load it onto the Yates Shaft conveyance. Once hoisted to the surface, the Contractor/Subcontractors shall transport the existing Chiller 3 offsite. The removed chiller will become the property of the Contractor/Subcontractors to dispose or refurbish as the Contractor considers appropriate.

3.5 Replace the original Multistack Chiller 3 unit with a new Contractor provided chiller of comparable capacity and performance. The Contractor/Subcontractor will be responsible for connecting the piping and electrical power & control wiring to the new chiller.

- When choosing a replacement, emphasis should be placed on the unit's ability to handle changes in load (e.g. with variable drives, tiered stages, and/or soft starting) to help reduce the stresses of ON/OFF cycles on equipment.

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- The replacement unit shall have the capability for remote monitoring and control via the facility building automation system (BAS). This functionality is not currently in place with the existing Chiller 3. At a minimum, the new chiller system shall have the following remote monitoring and control features implemented and tested during commissioning:
 - o Viewing running status
 - o Viewing and clearing faults
 - o Properly responding to start and stop commands

3.6 Evaluate existing ratings and sizes of circuit breakers, conductors, and conduit sizes and adjust as needed to safely provide electrical power to the new equipment. See Reference Material item 7.3 for existing documentation on the power distribution portion supporting Chiller 3. Equipment, labor, materials, engineering oversight, and project management oversight for adjusting the electrical system shall be provided by the Contractor/Subcontractors.

3.7 Evaluate existing ratings and sizes of water and refrigerant handling pipes and adjust as needed to provide optimal performance of the new chiller. See Reference Material items 7.1 & 7.2 for existing documentation on pipe sizes and routing. Equipment, labor, materials, engineering oversight, and project management oversight for adjusting the piping system shall be provided by the Contractor/Subcontractors.

- All added or modified chilled water piping shall be insulated with 2" thick cellular glass insulation. All other added or modified water piping may be insulated with 1" rigid fiberglass. The lines are to have protective covers.

3.8 Extend the 32" exhaust duct outlet of the dehumidification air handler unit [AHU-6] by 100 feet down the East Drift. This outlet is presently in close proximity to the main air intake of the Davis Campus Chiller Room. The heated air exhaust from AHU-6 is warming the intake air of Chiller 1, Chiller 2, and Chiller 3 and has a negative impact on the efficiencies of this equipment. The duct will be 20-gauge, spiral-wound duct that is insulated and suspended in same fashion as existing. See Reference Material item 7.4 for pictures of the existing ducting installation.

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- 3.9** Replace desiccant wheel in the dehumidification air handler (AHU-6)
- 3.9.1** Remove desiccant wheel from AHU-6 and package for transport and cleaning (cleaning is not part of this scope)
- 3.9.2** Replace desiccant wheel with new like in kind replacement (see Section 2 and Document F for details) provided by the Contractor
- 3.9.3** Reseal AHU-6 and return to service
- 3.10** Commission new Chiller 3, associated equipment, and devices.
- Test run the system and provide balancing adjustments as necessary, and provide a report listing the water flow balance test results.
 - Develop (or modify), implement, and test interface between the new chiller system and the facility's building automation system (BAS).
- 3.11** Attend project closeout meeting to review warranty limitations, exchange project performance feedback, and turn over system documentation to SDSTA staff.
- **Transfer Records:** All records (project reports, warranty information, meeting notes, data files, project data, original tracings, maps, field sketches, lab reports, test data, etc.) generated shall be the property of SDSTA and shall be turned over to SDSTA upon completion of the contract or as directed. All deliverables shall be required to be delivered to SDSTA in hardcopy and electronic (original software and PDF) format.
- 3.12** Provide basic staff training on new items added to MetaSys and on proper maintenance of new equipment

4.0 Bid Requirements, Acceptability Criteria, and Pricing Breakdown

Bid Requirements

Your bid should be provided in digital format as a pdf file with standard letter size format. Please note there is a 30-page limit for your response to bid requirements. Bids must contain the following:

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- 4.1** Provide the contact information, including an email address, for the Offeror's designated contact person who can receive and distribute RFB information.
- 4.2** Provide the contractual relationship, name, and a brief description of the role of each subcontracting organization that would be involved in the performance of this project. Note that the named subcontractors and outside associates or consultants must be used, and any change must be approved by the SDSTA.
- 4.3** Note exceptions to the draft contract or other RFB materials.
- 4.4** Disclose any existing relationships and previous work with SDSTA/SURF.
- 4.5** Provide demonstrated evidence of meeting the acceptability criteria (subsections 4.6.1 through 4.6.4) for this contract.

Acceptability Criteria: The best value source selection process will be used for awarding this contract. Selection will be made based on tradeoffs among price and non-price evaluation criteria. The non-price evaluation criteria detailed below, when combined, will be considered as being equally important as the bid price.

4.5.1 Evaluation Criterion #1

Offeror shall have an effective worker safety and health program established for all work performed under this contract at the Sanford Underground Research Facility (SURF).

Evaluation Factors:

- Provide a description of the safety programs of contractors and subcontractors who would be performing work at SURF under this contract.
- Provide safety records for the past three years (incident/injury records, OSHA300 logs and EMR data) of contractors and subcontractors who would be performing work at SURF under this contract.

4.5.2 Evaluation Criterion #2

Offeror shall have an effective quality control (QC) program established for all services offered under this contract.

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Evaluation Factors:

- Provide a description of the QC programs of contractors and subcontractors who would be performing work under this contract. QC manuals will not count towards the 30-page limit.

4.5.3 **Evaluation Criterion #3**

Offeror shall have experience installing commercial/industrial HVAC equipment.

Evaluation Factors:

- Describe at least two example projects with a heat recovery chiller that the Contractor/Subcontractor has installed and commissioned within the past 10 years. The nominal capacity of the chiller should be at least 30 tons. Example(s) should note the customer, the location, and the date of the project(s).
- Provide resumes for all key project staff that would be working on this project. Resumes shall note qualifications, certifications and experience with similar, relevant projects.

4.5.4 **Evaluation Criterion #4**

Offeror shall have experience interfacing new HVAC equipment with MetaSys building automation software.

Evaluation Factors:

- Describe at least one example of a project where the Contractor/Subcontractor has had to incorporate new HVAC equipment into a customer's existing MetaSys building automation system (BAS). Example(s) should note the customer, the location, and the date of the project(s). Example(s) should also detail the extent of the incorporation.

Each non-price criterion will be rated using the following point-scoring method:

Acceptable (2 points)	<i>Meets criteria for acceptability/evaluation required under the technical provisions. Weaknesses are correctable.</i>
Marginal (1 point)	<i>Fails to meet criteria for acceptability/evaluation. Any significant deficiencies are correctable. Lacks essential information to define a bid package.</i>

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Unacceptable (0 points)	<i>Fails to meet a criterion for acceptability or an acceptable evaluation standard and the deficiency is uncorrectable. Bid package would have to undergo a major revision to become acceptable. Demonstrated lack of understanding of SDSTA's requirements or omissions of major areas.</i>
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- 4.6** Provide a bid sheet with the pricing breakdown detailed below. The Offeror may submit a marked up copy of Section 4.7. Alternatively, the Offeror may submit a custom bid sheet, so long as the same line items are used as shown in the breakdown below.

Pricing Breakdown: Prices shall be broken down based on grouped scope of work (SoW) items from Section 3. These groups include decommissioning & removal, installation, and commissioning & startup. Pricing shall be based on meeting an overall project execution duration of 40 working days (M-F), with Chiller 3 being down for 10 of those workdays. All line items listed below shall account for all materials, labor, tools, equipment, lodging, per diem, overhead, and all Contractor/Subcontractor expenses directly related to planning and executing this project.

- **Chiller Decommissioning & Removal (SoW item 3.4)**

Chiller Decommissioning & Removal Lump-Sum Price
\$ _____

- **New Chiller Installation (SoW items 3.5, 3.6, and 3.7)**

New Chiller Component Price
\$ _____

Mechanically Install New Chiller (SoW items 3.5 and 3.7) Lump-Sum Price
\$ _____

Electrically Install New Chiller (SoW items 3.5 and 3.6) Lump-Sum Price
\$ _____

- **New Chiller Commissioning (SoW items 3.10 and 3.12)**

New Chiller Commissioning Lump-Sum Price
\$ _____

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- **Desiccant Wheel Removal (SoW item 3.9.1)**

- Desiccant Wheel Decommissioning & Removal Lump-Sum Price
\$ _____

- **New Desiccant Wheel Installation (SoW item 3.9.2)**

New Desiccant Wheel Component Price
\$ _____

Install New Desiccant Wheel (SoW item 3.9.2) Lump-Sum Price
\$ _____

- **Desiccant Wheel Commissioning (SoW item 3.9.3)**

Desiccant Wheel Commissioning Lump-Sum Price
\$ _____

- **Duct Extension Installation (SoW item 3.8)**

Duct Extension Installation Lump-Sum Price
\$ _____

Options and Alternatives: The SDSTA shall consider options and alternatives proposed by the Offeror. Included in the pricing for the options/alternatives shall be detailed descriptions that would allow the Selection Committee to weigh the benefits and prices of the options and to determine if the options would be a more appropriate solution to maintain steady state conditions in the Davis Campus.

5.0 General Requirements

- 5.1 All personnel working onsite must first attend SURF orientation safety training (approx. 30 minutes). All personnel working underground for more than 40 hours must also attend General Safety Basic training (approx. 4 hours).
- 5.2 Chiller replacement should be planned to limit downtime as much as possible to decrease the impact to science. In the event downtime is required, a minimum of two weeks advance notification must be given to the SDSTA.

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- 5.3** All work and parts supplied shall be guaranteed for a minimum of one year from the date the new chiller has been commissioned against defects in materials or workmanship supplied by the Contractors and Subcontractors. Any warranted failures shall be corrected at no cost to the SDSTA including transportation to and from SURF.
- 5.4** All added pipelines, ducts, and conduits passing through rated firewalls shall be sealed to the appropriate level to maintain the fire protection.
- 5.5** Submittals for all purchased equipment and materials shall be sent to the SDSTA Project Manager and approved prior to purchase.
- 5.6** To be eligible for contract award, the Contractor and Subcontractors performing work within the state of South Dakota must be registered as business entities with the South Dakota Secretary of State.
- 5.7** The Contractor/Subcontractors shall abide by all applicable federal, state, and local laws and ordinances, as amended from time to time. Including but not limited to, the applicable local laws and ordinances.
- 5.8** The Contractor/Subcontractors shall be responsible for the proper handling of all waste resulting from this project's tasks.
- 5.9** The SDSTA may at its sole and absolute discretion reject any and all, or parts of any and all submissions; re-advertise this solicitation; postpone or cancel at any time this solicitation process; or waive any irregularities in this solicitation or in the submittals received as a result of this solicitation.
- 5.10** All expenses involved with the preparation and submission of materials to the SDSTA, or any work performed in connection therewith, shall be borne by the Offeror(s). No payment will be made for any responses received, nor any other effort required of or made by the Offeror(s) prior to commencement of work as defined by a contract approved by SDSTA.
- 5.11** The bid package materials will be evaluated by the Selection Committee appointed by the SDSTA. The Selection Committee will recommend an Offeror by consensus based on the Selection Criteria described in this RFB.
- 5.12** The SDSTA reserves the right to enter contract negotiations with the selected Offeror. If the SDSTA and the Offeror do not agree to terms of a Contract, the SDSTA may elect to terminate negotiations and begin negotiating with other vendors. This process will continue until a contract has been executed, or, all submittals have been rejected. No Offeror shall have any claims and/or rights against the SDSTA arising from such negotiation and/or the qualification process.

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- 5.13** The SDSTA reserves the right to contract for all or part of the work program described in this RFB.
- 5.14** Offeror(s) submitting materials should not submit any information in response to this solicitation which the Offeror(s) considers to be a trade secret or confidential. The submission of any information in connection with this solicitation shall be deemed conclusively to be a waiver of any trade secret or other protection, which would otherwise be available to the Offeror. In the event that the Offeror submits information in violation for this restriction, either inadvertently or intentionally and clearly identifies that information in the submission as protected or confidential, the SDSTA will endeavor to redact and return that information to the Offeror. The Selection Committee will then evaluate the balance of the submission. The redaction or return of information pursuant to this clause may render a submission nonresponsive.
- 5.15** Bid security: Bids over \$50,000 must be accompanied by a bid security as follows:
- Bid Bond: A bid bond of ten percent (10%) of the total amount of the bid including all add alternatives, shall be furnished by the Contractor. A form of Bid Bond is included with the bid documents.
 - Certified Check or Cashier's Check: In lieu of a Bid Bond, a certified check or cashier's check for five percent (5%) of the amount of the bid, including all add alternates, may be furnished. Such check shall be certified or issued by either a state or national bank and payable to the South Dakota Science and Technology Authority.
 - Payment and Performance Bond: Upon award of contract, Contractor shall provide a Payment and Performance Bond produced by a South Dakota licensed insurance producer (agent) and issued by a South Dakota licensed surety in an amount not less than the amount of the awarded contract. The Payment and Performance Bond surety or sureties shall meet all requirements of South Dakota law. This bond is to secure the faithful performance of the contract and the payment of those to whom the offeror may become legally indebted for labor, materials, tools, equipment, or services of any kind used or employed by the offeror in performing the work. The surety bond shall be on a form similar to the form of Payment and Performance Bond in the time state shall be cause for consideration by the Owner of awarding the contract to another responsible and responsive offeror, and retention of the bid deposit.

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- Power of Attorney: Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

6.0 Bid Submission Requirements

The contractor shall submit an electronic copy (.pdf format) of the bid no later than **September 9, 2020 2:00 P.M. (MT)**, to: mbaumann@sanfordlab.org. Late submissions will not be accepted.

The bid period may be extended at the discretion of SDSTA based on the quantity and/or complexity of questions. Any notices of extension of time to respond will be distributed to all prospective offerors by the SDSTA.

7.0 Reference Materials

- 7.1 General Layout Drawings** (*General Layout.pdf*) – This PDF contains plan view drawings of the main project area and piping details for Chiller 3.
- 7.2 Air Handler Unit 6 Details** (*AHU6 Details.pdf*) – This PDF notes the sectional layout and submittal specs of Air Handler Unit 6.
- 7.3 Chiller 3 and Air Handler Unit Electrical and MetaSys Screen Details** (*Electrical_Metasys.pdf*) – This PDF contains Metasys screenshots and a one-line diagram showing the key power distribution feeds for both Chiller 3 and Air Handler Unit 6.
- 7.4 Ducting Pictures** (*Ducting.pdf*) – This PDF contains pictures of the existing AHU6 exhaust duct, its insulation, and how it is suspended.