

SOUTH DAKOTA BOARD OF REGENTS

Committee on Budget and Finance

AGENDA ITEM: III – I

DATE: April 1-2, 2015

SUBJECT: South Dakota State University McFadden Northern Plains Biostress Laboratory HVAC Repairs – Preliminary Facility Statement

South Dakota State University requests approval of its Preliminary Facility Statement to complete maintenance and repair projects to the heating, ventilation, and air conditioning systems within McFadden Northern Plains Biostress Laboratory. Current cost estimates are projected to be \$1,581,398.

The project will include the replacement of the chiller with system connections to the chiller plant, replace the Variable Air Volume (VAV) units, Direct Digital Control (DDC) replacement for HVAC controls, exhaust system replacement and maintenance, and HVAC M&R project planning.

SDSU requests that a selection process for a design consultant be established. This will allow design services for schematic design and project cost estimates. Due to the project being primarily a maintenance and repair project, SDSU requests this project be exempt from the remainder of the Capital Improvement Project process. The Office of the State Engineer (OSE) has agreed to this request on this project. The Board president may wish to assign a committee member to assist in the design consultant selection process.

Funding for this project will come from FY15 and FY16 HEFF M&R project funds. The funds will be combined for all phases of this project.

RECOMMENDED ACTION OF THE EXECUTIVE DIRECTOR

Approve SDSU's Preliminary Facility Statement to complete HVAC repairs to the McFadden Northern Plains Biostress Laboratory at an estimated project cost of \$1,581,398. The five phase project will require the selection of a design consultant. The Board president should appoint a building committee representative to assist in the selection of the design consultant. After that has been completed, OSE has agreed to exempt the project from the remainder of the capital improvement process. Funding for the project will come from FY15 and FY16 HEFF M&R project funds.

**PRELIMINARY FACILITY STATEMENT
FOR
MCFADDEN NORTHERN PLAINS BIOSTRESS LABORATORY – HVAC REPAIRS
SOUTH DAKOTA STATE UNIVERSITY**

DATE: March 9, 2015

SDSU requests approval of this Preliminary Facility Statement to complete a series of maintenance and repair projects to components of the heating, ventilation, and air conditioning systems within the McFadden Northern Plains Biostress Laboratory. SDSU requests that the Board of Regents participate in the selection process of a design consultant that will be obtained to provide the services for schematic design and cost estimation of these projects. SDSU also requests exemption from the Capital Improvement Project process.

1. GENERAL PROGRAMMATIC NEEDS TO BE ADDRESSED:

The five following work requests have been identified to complete repairs within the McFadden Northern Plains Biostress Laboratory. All projects are identified in FY2015 and FY2016 HEFF M&R lists approved by the Board of Regents.

Project	HEFF#	Dollar Amount
Replace Chiller w/System Connected to Chiller Plant	3H1606	\$ 390,000
Replace VAV Units	3H1505	\$ 610,000
DDC Replacement for HVAC Controls	3H1506	\$ 237,398
Exhaust System Replacement & Maintenance	3H1613	\$ 284,000
HVAC M&R Project Planning	3H1605	<u>\$ 60,000</u>
Total		\$1,581,398

All projects are maintenance and repair projects. South Dakota State University requests one design firm be procured to design all projects. Although the projects can be designed and constructed independently of each other, SDSU would prefer to have them designed and managed together. The total value of the projects exceeds \$1,500,000, putting the aggregate work into the category of a capital improvement. Due to the maintenance and repair nature of the work, and the relative independence of the individual projects, SDSU requests that upon selection of the design consultant by the building committee, the aggregate project be exempted from the remainder of the Capital Project process.

Construction would be undertaken to allow the most efficient phasing and least disruption to the building occupants. The HVAC building controls replacement is a project that involves multiple mechanical subsystems of the building, and SDSU believes that some redundancy can be avoided if this project is integrated with the others. A summary description of each project is shown below.

Replace Chiller w/System Connected to Chiller Plant

The building chiller is 23 years old. It has been rebuilt once and received normal repairs throughout its use. This chiller has reached the end of its expected life and replacement should be planned. In lieu of replacement with a new independent chiller, SDSU would connect replace this chiller by connecting the building chilled water distribution system to the new chiller plant and chilled water distribution system to be constructed through the infrastructure improvements project that will be under construction in 2015 and

2016. The planned new chiller plant will include the capacity that can serve all the research buildings in the northwest quadrant of campus.

The scope of this project would be to remove the existing chiller from the penthouse, provide branch chilled water supply and return piping connecting the laboratory to the piping mains outside of the building, and install the primary and secondary pumps and piping to the air handling units scattered throughout the building.

This project interfaces with the planned controls project as new controls will be required for the primary chilled water pumps and control valves. The existing controls for the existing chiller would be removed. When the existing chiller is removed from the penthouse, space will become available for other mechanical equipment when the existing chiller is removed, possibly the new exhaust fans required by another project.

Replace VAV Units

The heating and cooling air handling units, building exhaust subsystem, and the laboratory exhaust subsystem comprise the heating, cooling, and ventilation system of the building. The ductwork to each laboratory and group of offices is connected to a variable-air-volume (VAV) unit that provides air of the proper temperature and quantity to the spaces. Each of the VAV units is connected to the ductwork, the hot water supply and return piping, and the building automation controls. The project would replace all existing VAV units. The existing units have poor reliability as compared to similar equipment in other laboratory buildings and are requiring increased maintenance due to sticking control valves, leaking coils, and air leakage. This project will involve the building controls, but is not directly related to the other projects.

DDC Replacement for HVAC Controls

The existing central building automation control system is an electrical/pneumatic system. SDSU intends to replace this with a direct digital control system. The central building control modules would be replaced throughout the building. Pneumatic piping and pneumatic control valves that are connected to the central modules would be replaced by digital electronic controls. This system is tied to the chiller, all air handling units, exhaust fans, thermostats, pumps, meters, and VAV units. Digital controls provide increased reliability, and the potential for more refined HVAC systems control, enabling the University to improve energy performance of existing systems and also enabling the University to remotely monitor and diagnose problems with the heating, cooling, and ventilation system components. This project is related to all the other projects.

Exhaust System Replacement & Maintenance

The existing laboratory and building ventilation subsystems is composed of multiple exhaust fans, each independently controlled and operated. None are redundant and support each other in the event of failure.

All fans are reaching the end of their useful life and have been in nearly continuous operation since the building was occupied in 1992. Failure of any one laboratory exhaust fan will suspend or redirect research activities in the connected fume hoods. SDSU intends to replace individual fans with a more centralized exhaust system. The intent is to replace the multiple laboratory exhaust fans with two variable drive Strobic exhaust fans. These fans could be cycled alternately, providing redundancy, and the ability to perform maintenance without shutting down laboratory space. The non-laboratory building exhaust fan would be replaced as well. The project will require ductwork modifications to centralize the exhaust air streams from the laboratories within the building. This project will involve the building laboratory controls and the building automation controls system. Space within the penthouse vacated by the chiller may be used to for the new exhaust fan ductwork. Otherwise, this project is unrelated to other projects mentioned.

HVAC M&R Planning

This budgeted allocation provides funding for the schematic design services, cost estimating, and construction sequencing.

2. ANALYSIS OF THE STUDENT BODY OR CONSTITUENTS TO BE SERVED:

These projects are all maintenance and repairs to the building heating, ventilating, and air conditioning subsystems and equipment. These systems, in turn support the classroom, teaching, and research activities conducted within the building.

3. ADDITIONAL SERVICES TO BE OFFERED:

No additional services will be offered through this project. However, some benefits should be realized. The new replacement equipment and controls will offer the possibility of improved energy efficiency, either in a direct fashion due to the improved efficiency of the equipment, the ability to operate the systems according to the variations of building and laboratory use, and the ability to monitor and control the subsystems.

4. COMPLIANCE WITH CAMPUS MASTER PLAN:

These projects are identified in the 2015 and 2016 M&R project lists. They have also existed on the 10 year M&R planning lists prior to these years.

5. ANALYSIS OF NEEDS ASSESSMENT BASED ON THE FACILITIES UTILIZATION REPORT:

The projects are maintenance and repair projects by nature.

6. LOCATION:

The McFadden Northern Plains Biostress Laboratory is in the northwest quadrant of campus at the corner of Rotunda Lane and North Campus Drive. Most of the work anticipated for the projects will take place within the mechanical room at the west end of the basement, the mechanical penthouse, and on the roof level. VAV unit replacement and some ductwork modifications will take place above the ceilings of numerous rooms throughout the building.

7. REALLOCATION OF OLD SPACE, IF ANY:

No space will be reallocated as part of the project. When the chiller is removed from the penthouse, the space the chiller occupies will become available for use for other mechanical equipment or building support systems. There is a possibility that some vertical duct or piping chases will be required. These chases will remove small amounts of space from selected labs, classrooms, or offices.

8. PROPOSED FUNDING SOURCE/SOURCES:

HEFF M&R from FY2015 and FY2016 will be the source of funding for these projects. The funds for the projects will be combined and utilized to accomplish the design and construction of the projects.

9. BUDGET FOR DEVELOPMENT OF A FACILITY PROGRAM PLAN:

SDSU requests exemption from the remainder of the Capital Improvement Project process due to the nature of the projects being maintenance and repairs. The planning funds identified at the beginning of this report should provide an adequate allowance for a schematic design and cost estimating for the scope of the work.