SOUTH DAKOTA BOARD OF REGENTS

Committee on Budget and Finance

AGENDA ITEM: III – L

DATE: December 12-13, 2012

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SUBJECT: SDSU Architecture, Mathematics and Engineering Building Facility Program Plan

South Dakota State University requests approval of the Facility Program Plan to continue planning for the construction of an Architecture, Mathematics and Engineering Building at an estimated cost $17,082,800. This project was originally presented to the Board as part of the 2012 Ten-Year Plan in December 2011. The Preliminary Facility Statement for this project was approved by the Board at their March 2012 Board meeting. This project was authorized as part of HB1051 of the 2012 Legislative Session.

The three-story building will be adjacent to and east of Solberg Hall. The new facility will occupy the site that includes Solberg Annex, Industrial Arts and parking areas for these buildings. Solberg Annex and Industrial Arts will be demolished in the early phase of construction. The gross square footage of the proposed project is 62,000 to 64,000 and will provide program and space needs for four departments: Department of Architecture, Department of Mathematics and Statistics, Department of Engineering Technology Management, and Department of Mechanical Engineering.

The first floor of the building will for the Engineering Technology Management and Mechanical Engineering Departments and include 8,500 square feet for a metal machining and hot metal area, a wood shop, a digital fabrication area, a tool storage area, a layout and assembly area, and a masonry mixing area. About 4,700 square feet on this floor will be for design team prototyping, engine testing and project display. The remaining first floor space will be dedicated as classroom/conference space.

The second floor will be dedicated to the Mathematics and Statistics Department with space for offices, reception and administrative work areas, conference room and testing area. Additionally, there will be six classroom spaces and a Mathematics Help Center area.

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RECOMMENDED ACTION OF THE EXECUTIVE DIRECTOR

Approve SDSU’s Facility Program Plan to develop design plans for construction of an Architecture, Mathematics and Engineering Building at an estimated cost of $17,082,800. Funding for this project will be $10,000,000 from the FY2014 issuance of HEFF bonds and $7,082,800 in gifts guaranteed through the SDSU Foundation. Bond proceeds will not be available until fall 2013 or spring 2014.
The third floor of the building will house the Department of Architecture. This space will be set up with administrative work and support space, offices, a meeting room, a large student studio work space, photography, model building and printing/scanning activity area and seminar classroom or conference room and a student display gallery.

Additional details of this proposed project can be found in SDSU’s Facility Program Plan document, site plan and schematic drawings.

Funding for this project will be $10,000,000 in future HEFF bonds and $7,082,800 in donations guaranteed through the SDSU Foundation.
FACILITY PROGRAM PLAN
FOR
ARCHITECTURE, MATHEMATICS & ENGINEERING BUILDING
SOUTH DAKOTA STATE UNIVERSITY

SDSU requests approval of this Facility Program Plan to continue planning and design of a new building that will provide academic space for the Architecture Department, the Mathematics & Statistics Department, and portions of the Engineering Technology Management (engineering shops) and Mechanical Engineering Departments.

The Preliminary Facility Statement (PFS) was approved at the March 2012 Board of Regents meeting.

A. PROGRAMATIC JUSTIFICATION FOR DISCRETE SPACES:
This project will address program and space needs for four departments.

- The Department of Architecture (DoArch) at SDSU is a new professional degree program. The new building will provide program specific space for students and faculty, including studio spaces, shop, a library, advising areas, offices, etc.

- The Mathematics & Statistics Department is a basic science that provides educational support for all curricula across the University and provides fundamental educational courses required of every student. Faculty also conduct research and provide research support in areas of bioinformatics, biostatistics, decision support statistics, and decision support mathematics. The new building will provide permanent space for the Department and all of its specialized education space in one consolidated location.

- The Engineering Technology Management and Mechanical Engineering Departments include class labs and resources to demonstrate and model the practical application of engineering sciences and manufacturing processes. Classroom laboratory spaces are required for student projects and instruction of welding technologies, foundry operations, machine testing, control testing, machine assembly, metal fabrication, model building, and machine design that are housed in a machine shop environment. The new facility will provide superior replacement educational environments to those that currently exist in Solberg Annex and elsewhere on campus. The new spaces will also replace the ME assembly project space currently housed in a storage shed on the far west side of campus, disconnected from the rest of the ME program. It will also provide design team space that does not currently exist for the required curriculum for senior design projects.
The first floor will address the space needs of the Engineering Technology Management (ETM) and Mechanical Engineering (ME) Departments. It will include some space that will have shared use by the Department of Architecture. All of the ETM spaces are shared with ME and DoArch and include an overall allocation of about 8,500 square feet of what is referred to collectively as Fabrication Lab space. The specific components include: a wood shop (about 850 square feet), a metal machining and hot metal area (about 2,000 square feet), a digital fabrication area (about 500 square feet), a tool storage area with workstation for a shop supervisor (about 300 square feet), a large layout and assembly area (about 4,800 square feet), and a small masonry mixing area with access to the outside (about 50 square feet). This space will have overhead doors to access a loading dock and a screened outdoor yard for additional project work area and for material storage.

Additional space, about 4,700 square feet, on the first floor is dedicated to the ME program. This includes about 3,400 square feet for design team prototyping workbenches, project layout and assembly, engine testing, and project display. The remaining space will be partitioned and setup as classroom/conference space for student design teams to meet and collaborate on their projects.

The second floor will be comprised solely of the Mathematics & Statistics Department. The spaces include about 7,700 square feet for 45 offices for teaching and research faculty, post-doctoral or adjunct faculty, and the Department Head. Also contained in this space are two offices for staff, a reception and administrative work areas, a conference room, and an area to administer tests to students. About 1,500 additional square feet is allocated for approximately 36 graduate students. A Mathematics Help Center is planned to occupy about 400 square feet. This floor will include three classrooms, totaling about 2,600 square feet. Two classrooms will be approximately 1,000 square feet each, with a student occupancy of about 40 students in each space. The third room will be about 600 square feet for a class size of 30 students.

The third floor will contain the Department of Architecture. Administrative work/support space, two administrative/staff offices, the Department Head office, and nine Faculty offices will comprise about 2,500 square feet. Within the department space is a room dedicated for meeting with potential students and for program accreditation purposes (display and storage of student work and accreditation materials). The large majority of the floor, about 8,200 square feet, will be for student “studio” work space. This will be open and flexible space and contain allocated work areas for students of each of the six years of the program. About 2,600 square feet is needed and planned for building small scale models, for photographing work, and for printing/scanning/cutting activities, a dedicated seminar classroom or conference room (about 800 square feet), and a gallery space to display student work.
B. GROSS SQUARE FOOTAGE:
The facility will be three stories tall plus a mechanical penthouse, totaling approximately 62,000 to 64,000 gross square feet.

C. SITE ANALYSIS:
The site is adjacent to and east of Solberg Hall. The building will occupy the site that includes Solberg Annex, Industrial Arts, and the parking areas adjacent to these buildings. Solberg Annex and Industrial Arts will be demolished early in the construction phase of this project. Solberg Hall will be retained. The new Architecture, Mathematics, and Engineering building will be an addition to Solberg Hall. The first floor of both buildings will be directly connected. Other floor to floor connections will not be made due to significant differences in the floor to floor heights, the amount of construction and space necessary to create these connections, and the lack of programmatic connections between the functions in the conjoined buildings. The Communications Building will also be demolished during the course of the project.

Administration Lane will be removed and 12th Avenue between 8th and 9th Streets will also be removed at the conclusion of the project. This will be replaced with landscaping and pedestrian sidewalks. During the construction of the project, these streets will be closed and utilized for construction staging. Access to the campus will be maintained utilizing 13th Avenue and Rotunda Lane.

Campus utility lines in and around the site are of adequate size and capacity to serve the new building. The utilities will be modified as necessary to construct the AME building. The electrical utilities (transformer & switchgear) serving Solberg Hall and Solberg Annex will be expanded to include the new building. Existing water and sanitary sewer utilities will be extended to serve the AME building. Storm drainage will utilize existing surface and subsurface drainage systems and provide new subsurface piping connecting to roof drains.

The existing steam tunnel extending under Solberg Annex that serves the south half of campus will remain in place. The AME building will be constructed over the top of this utility tunnel. Steam service lines to Solberg Hall will be rerouted and modified to serve both AME and Solberg Hall.

The AME building will be connected to the central chilled water system. Existing piping has the capacity for this building with spare capacity for future construction or the addition of existing buildings to the central system. Central chiller capacity will not be adequate for the new building. An additional 500 ton chiller will be added within the chiller plant for the AME building and for future connected loads.

D. DESCRIPTION OF KEY BUILDING FEATURES:
The facility will be three stories with a mechanical penthouse. The main floor is at grade level and will include a commons/lobby space for student/faculty collaboration, building mechanical and electrical equipment, and a combination of individual and shared shop space for teaching and student projects for Mechanical Engineering, Architecture, and Engineering Technology and Management Programs. The shop space will be accessible by a loading dock and will be adjacent to a screened outdoor location for material storage and additional workspace. The second floor will house the Mathematics & Statistics Department including three classrooms. Floor three will be occupied by the Department of Architecture and include offices, student studio spaces, reception, and associated program spaces. Restrooms will be located on every floor.

The building structure is planned as a conventional steel frame, with cast in place concrete at grade level, and precast concrete core planks for the upper levels. The roof framing will be steel joists and a metal deck with insulation and a fully adhered roof membrane. The exterior walls will be insulated steel studs with masonry and cast/natural veneers. The exterior wall finish will complement Solberg Hall and consist of precast concrete insulated panels and/or brick masonry. Windows will be punched openings with an aluminum thermally broken storefront system. Portions of the facades will be an aluminum thermally broken curtain wall system. Double pane, low-E insulated glazing is planned. Overhead doors in the shop area will be glass panel insulated garage doors.

The facility will be fire sprinklered. Vertical circulation will be by an elevator up to the penthouse and concrete filled metal pan stairs. Interior construction will consist of metal stud framing with CMU or shaft-wall gypsum assemblies at vertical shafts.

E. ILLUSTRATIVE FLOOR PLANS:
The following attachments are included:
- Site Plan
- Floor Plan - Level 1
- Floor Plan - Level 2
- Floor Plan - Level 3
- Floor Plan - Roof/Penthouse Level
- Exhibit II.A Exterior Perspective Images

F. INITIAL COST ESTIMATES:
Estimated total project costs to develop the site, build the facility, and complete site utilities are estimated at $17,082,000. A breakdown of estimated of costs is as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Cost</th>
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<tbody>
<tr>
<td>Construction</td>
<td>$13,252,000</td>
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<tr>
<td>Utility (Chiller) Infrastructure</td>
<td>$1,125,000</td>
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<tr>
<td>Equipment/Furnishings</td>
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The construction costs include project contingency allowance.

<table>
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<tr>
<th>Architect/Engineer</th>
<th>$1,845,000</th>
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<tbody>
<tr>
<td>SDSU/OSE Project Management Survey</td>
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</tr>
<tr>
<td>Asbestos Abatement Commissioning Materials Testing/Inspection</td>
<td>$310,000</td>
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**G. IMPACT TO M&R:**

All of the proposed changes to campus square footage will be categorized in the academic/administrative type of building as recorded on SDSU’s facilities inventory. Therefore the square footage changes will be reflected in SDSU’s HEFF M&R allocation. Based on recognized industry standards, the annual funding for maintenance and repair/capital renewal funding should be equal to 1.5-3% of the project costs or the building replacement value. The annual M&R allocation should be between $132,386 and $264,773 based on the value calculated after adjusting the project cost estimate of $17,082,800 with the replacement values of the buildings to be demolished as part of this project. At actual HEFF M&R funding levels, the annual M&R allocation for the net additional square footage of building is $33,149.

**H. BUDGET FOR ONGOING OPERATIONAL COSTS:**

The additional utility expenses are estimated at $31,587. This represents only utility consumption and does not include the costs of utility connections, which will be included in the cost of construction. For routine maintenance expenses, a minimum of $85,619 should be allocated each year.

**I. PROPOSED FUNDING SOURCES FOR COSTS OF:**

1. **CONSTRUCTION**
   The project will be funded from a combination of Higher Education Facility Funds (HEFF) and private gifts made to the University through the SDSU Foundation. Full project costs have been estimated as $17,082,800. Of this $10,000,000 will be HEFF and $7,082,800 will be private gifts.

2. **ONGOING OPERATIONS**
   The utility and operating costs of the facility will be funded from University operating budgets.

3. **MAINTENANCE AND REPAIR**
   The maintenance and repair costs for this facility will be funded through HEFF.