

# South Dakota School of Mines & Technology

## Facility Design Plan

### New Mineral Industries Building

#### **Introduction:**

The South Dakota School of Mines & Technology requests approval of the revised Facility Design Plan for the construction of a new Mineral Industries building. The Preliminary Facility Statement, Program Plan, and original Facility Design Plan were approved at the June 2014, March 2021, and December 2021 BOR meetings, respectively.

The Facility Design Plan is being resubmitted because the construction site location has changed. The current construction environment is volatile, and prices continue to increase. At the direction of our Construction Manager at Risk (CMAR) and Architect, a new location has been determined. This location was noted in our master plan but was not originally chosen as a building site in the next 10 years. The change in site was estimated to save at least \$2M. The internal layout for the building has stayed the same. The main office areas and approximately 8,000 square feet of labs will be bid out as shelled space. The plan would be to use the \$2.8M of contingency to finish out the spaces. Further reduction in square footage will not meet the needs of all the departments housed in the current building.

The new building will be 63,800 sq ft. It will provide classroom space used by the entire university as well as laboratory and administrative space for the Departments of Geology and Geological Engineering, Mining Engineering and Management, and Materials and Metallurgical Engineering. The building also supplies space for multi-user research laboratories such as the Engineering and Mining Experiment Station (EMES). South Dakota Mines is one of only five universities in the nation that retain a core expertise in all the areas that support the development of critical resources and minerals. The need for modernized space is even more pressing now that the Caterpillar Minestar Research Consortium has been announced as this is the first step in creating a world class industries resource research center at the university. Additionally, the building will help increase the research enterprise and recruitment of talented students and faculty. The new building will support the mission of the university by providing efficient and modern facilities that meet the needs of the campus now and into the future.

#### **a. Architectural, mechanical, and electrical schematic design:**

##### **Architectural:**

The new Mineral Industries building will be 63,800 sq ft located between Classroom building and Electrical Engineering/Physics building and across the street from the O’Harra administrative building. The building will consist of masonry, metal panes and aluminum curtain

wall glazing systems supported by a structural steel column, beam and joist system. The roofing will be a combination of rubber membrane and metal roofing. The project will be striving to achieve LEED (Leadership in Energy and Environmental Design) Certified rating or equivalent Green Globes and therefore will be utilizing building materials that have low VOC (volatile organic compounds) materials and high performance mechanical and electrical systems.

In considering the design as a whole, the building is organized with three driving factors in mind: 1) efficient space utilization 2) efficient MEP distribution and 3) incorporation of highly collaborative areas. With those criteria in mind, each of the building floorplates are organized with a double loaded east-west corridor that connects each program area to the atrium as well as outdoor areas on the East and West. Office areas are located on the 2nd and 3rd floors. Teaching and research areas make up all three floors. Vibration sensitive and heavy floor loading requirement equipment are located on the first floor where isolated slab areas will be utilized to accomplish the needed vibration criteria. Reference Attachment A for building plans.

**Mechanical:**

The mechanical systems for this building will be connected to the campus chiller and steam/condensate loops unless a more cost-effective strategy is needed in the current construction climate. The mechanical systems will be designed to be efficient.

Other utilities to be noted include the extension of the domestic water. The sanitary sewer will be connected near the building site with relocation of some existing sanitary sewer in the building footprint. Gas tie in available for the building generator, if required.

All mechanical equipment will be tied into the University building automation system for monitoring of equipment and addressing heating/cooling issues within the building remotely if needed.

A NFPA 13 compliant wet-pipe sprinkler system will provide full coverage for the building. Quick-response sprinklers will be used throughout the facility. Offices and classrooms will be classified as light hazard. Laboratories, storage rooms, custodial closets, and mechanical rooms will be classified as Ordinary Hazard, Group 1 or Group 2, depending on the specific requirements.

**Electrical:**

The new site provides for several options for the electrical service to the facility and will most likely come from the west unless a more cost-effective route is determined. The new transformer will be connected to an existing utility pad mounted switch. Service entrance cabling will be copper and will be routed outside the building from the service transformer to a single-ended, main service switchboard located in the main electrical room on the first floor. All necessary

metering and switching requirements will be provided as required. All site electrical equipment including the pad mounted transformer and stand by generator will be located away from main building entries.

Lighting throughout the building will be LED (Light Emitting Diode) type fixtures and lighting levels will comply with applicable standards and energy code requirements. Lighting will be a combination of 2x2, 2x4, and Linear LED light fixtures. Lighting in offices, meeting rooms, labs, study rooms, and classrooms will be fully dimmable, and the building will have occupancy sensor controls to reduce energy consumption while providing flexibility to the occupants.

Voice and data systems will include jacks, cabling, conduit, racks, patch panels, testing, camera's, TV's, projectors, and card access.

A digital, addressable type, fire alarm control system with voice evacuation capabilities will be provided to satisfy all Life Safety and Code requirements. The system will be designed in accordance with all current codes and standards and will also satisfy all current accessibility guidelines. In addition, all necessary connections will be made for 24-hour fire alarm system monitoring.

**b. Changes from Facility Program Plan/Design Plan:**

The building site is changing to reduce overall project costs to meet budget. Building has already been reduced in size from 90,000 sq ft to 63,800 sq ft. Reducing overall square footage any further would not provide a building that can replace the current Mineral Industries building. To ensure that the building is within budget, the office areas and approximately 8,000 square feet of the lab spaces will be bid as shelled space.

**c. Impact to existing building or campus-wide heating/cooling/electrical systems:**

The building will be connected to the existing campus chiller, steam/condensate, and electrical loops providing the most cost-effective operating methods for this building unless a more cost effective alternative is found. Studies have been completed to ensure capacity within each loop.

**d. Total project estimates:**

Funding Sources –

- \$19M General Funds
- \$12M Private Funds
- \$3M University Funds

The funding available is \$34M. The following is the breakdown of the project estimate:

Construction Cost Estimate	\$28,586,949
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Commissioning	\$99,100
OSE Fees	\$100,000
Architect/Engineer Fees and Expenses	\$2,220,000
Pre-Construction Fee	\$70,000
Testing	\$30,000
Construction Contingency	\$1,405,500
Inflation Contingency	\$1,375,660
FF&E/Moving (including IT/BIT)	\$1,900,000
<b>TOTAL ESTIMATED PROJECT COSTS</b>	<b>\$35,787,209</b>
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ALTERNATE TO SHELL SPACE	<b>(\$1,787,209)</b>
<b>TOTAL PROJECT BUDGET</b>	<b>\$34,000,000</b>

To ensure the project is within budget there will an alternate or base bid to shell space (office areas on 2<sup>nd</sup> and 3<sup>rd</sup> floor and ~8,000 square feet of lab space). The project is holding ~\$2.8M in contingency and the plan would be to finish space as contingency allows.

**e. Changes from cost estimate for operation or M&R expenses:**

No changes.