



Construct Engineering Signature Building

project 1 of 1

Virginia Polytechnic Institute and State University (208)

General Information

Project Type: Project Code: Start Year:

Agy Priority: Location: Facility:

Building #: Building Name:

Building Function:

Is this an Umbrella Project? OR a higher education blanket project?

Projected time to submit working drawings: months

Projected time to occupy facility or complete project: months

Projected time to award construction contract: months

Included in the existing Six Year Capital Plan

Contact Information

Name:

Email:

Phone:

Agency Narrative

Description

The Engineering Signature Building project was a University top priority request in the 2008 budget session, and the state included the project in Chapter 1, 2008 with \$250,000 of pre-planning funds. The pre-planning funds were allotted under project code 17658 in July 2008 and a pre-planning study was completed and submitted to the Department of General Services in late fall 2008. Subsequently, the state authorized \$2.083 million of detail planning funds for the project in the 2009 budget session under Chapter 781. Under the planning work, the University has determined with a high degree of confidence that an approximately 160,000 gross square foot (GSF) new construction project may be accomplished for a total budget of \$99.914 million.

This project is a high priority item to address severely deteriorated undergraduate academic space for the College of Engineering. The proposed 160,000 gross square foot facility will be a combination of classrooms, class laboratories, and research laboratories to house a number of departments and programs in the college. This will be a state-of-the-art instruction facility focused on undergraduates with highly specialized laboratories that will support hands-on, problem solving oriented learning in the engineering disciplines. The life expectancy of the structure of the proposed project is approximately 50-80 years with proper maintenance.

The project design schedule is on target for a January 2011 construction start and the total project budget is based on escalation to a midpoint of construction in January 2012. In accordance with the capital program outlined in Chapter 1, 2008, and Chapter 781, 2009, the University is requesting state authorization and funding in the 2010 budget session to move forward with the full project.

Justification

Program Description:

Background on the Virginia Tech College of Engineering:

Virginia Tech's College of Engineering is a comprehensive instruction and research program, including 13 departments with approximately 330 faculty, 5,500 undergraduate majors, and almost 2,000 graduate students. "America's Best Colleges 2008" survey released by U.S. News & World Report in August 2008 ranked the Virginia Tech College of Engineering's undergraduate program 14th in the nation among all accredited engineering schools that offer doctorates, and eighth among those at public universities. Seven of the College's undergraduate engineering programs were ranked among the top 25 in the nation.

In the most recent survey (2008) of the Engineering Workforce Commission of the American Association of Engineering Societies, Inc., the Virginia Tech College of Engineering ranked tenth nationally for the total number of degrees awarded, fourth for the number of undergraduate degrees awarded, 26th for the number of master's degrees, and 15th for the number of Ph.D.s. The College is ranked 18th for the total number of degrees awarded to women and 13th for the number of undergraduate degrees awarded to women. Approximately half of all new engineers trained in the Commonwealth of Virginia receive their education from Virginia Tech.

Competition from Peer Institutions

The College of Engineering needs this project in order to remain competitive with the engineering educational facilities that already exist at peer institutions. For example, the University of Maryland has its Jeong Kim Building, the University of Michigan features an Advanced Graphics and Media Classroom, the University of Colorado at Boulder created an Integrated Teaching and Learning Laboratory, and the University of Illinois is powerful with its Beckman Institute.

In the last ten years, Purdue's College of Engineering has built or started construction on eight new buildings, and even they rank second to Georgia Tech, which has brought forth twelve new buildings in the last decade.

At a time when there is urgent need for new graduates to enter the engineering workforce in the Commonwealth of Virginia, it is imperative that Virginia Tech – the State's senior Land Grant Institution and key supplier of engineers – improve the quality of its engineering educational facilities and thereby improve its ability to attract and train future generations of engineers that live and work in Virginia.

The Envisioned Building

Virginia Tech's College of Engineering envisions a facility that has teaching laboratories and classrooms at the core of the building. Surrounding the instructional core will be office clusters and research labs. A large auditorium will be available for high-profile visitors and events. All would be designed to foster collaboration in teaching, learning, research, and service.

Several of the classrooms will be equipped with the most modern communications equipment. The entire building will support wireless computers. Cameras, microphones, and computers will foster web-based communications for distance and asynchronous learning. Desks will be reconfigurable for multiple uses.

The building structure will serve as a learning laboratory with instrumentation included throughout so that students may directly study the building's structural behavior, water usage, power systems, air quality, etc. The instrumentation will include instructional displays to assist visitors, especially K-12 students.

The instructional laboratories will include specialized-use and flexible facilities for design and fabrication activities. These areas will support group work in open areas to promote on-going observation, including large window observatories for controlled work.

Faculty, staff, and graduate students working in a common area will be organized in clusters to enhance communication and collaboration. Whenever possible, research laboratories will be open and flexible including large windows for students to observe cutting-edge work being done inside. Interactive kiosks will provide information to visitors.

These are the types of engineering facilities that already exist at our peer institutions, and are necessary to keep Virginia Tech competitive.

Alignment with the Virginia Tech Strategic Plan

The College of Engineering has recently updated its strategic facilities plan with a proposed series of actions - renovations, new construction, and demolitions - that would serve to transform the college's old and increasingly dysfunctional space into modern facilities that will support the college's expanding programs. This project is positioned as an initial phase in this multi-biennia program to respond to the College's space needs. Without this project, the College of Engineering cannot deliver the instructional program expected by the students.

The mission statement of Virginia Tech as a public land-grant University serving the Commonwealth of Virginia, the nation, and the world community includes discovery and dissemination of new knowledge central to its mission. Through its focus on teaching and learning, research and discovery, and outreach and engagement, the University creates, conveys, and applies knowledge to expand personal growth and opportunity, advance social and community development, foster economic competitiveness, and improve the quality of life.

The University's strategic plan includes three scholarship domains: Learning, Discovery, and Engagement; and three Foundational Strategies: Development of the Organization, Investment in the Campus Infrastructure, and Effective Resource Development, Allocation, and Management. This project supports several key domains and strategies of the strategic plan, and the specific goals of each area addressed by this project are listed below.

Learning: (1) Increase student involvement in discovery and engagement by creating more opportunities for undergraduates to be involved in research capstone experiences, education abroad, and experiential learning; (2) Strengthen and integrate all aspects of the undergraduate academic experience, including the academic experience for transfer students; (3) Invest in departmental and university-level support for undergraduate education; (4) Enhance quality graduate and professional education; (5) Establish a graduate education portfolio reflective of a 21st century university; (6) Strengthen the role of distance and distributed eLearning in achieving the university's goals in learning, discovery and engagement; (7) Develop and integrate advanced technology and information systems applications that assist collaboration, reflection, assessment, and sharing among faculty members, students, and staff members; (8) Strengthen the ability of the library systems to acquire, preserve, and manage research-level collections and user services that advance Virginia Tech's research capabilities; (9) Contribute to the holistic and transformative educational experiences of Virginia Tech undergraduate and graduate students; and (10) Improve the capital assets that underpin student learning and support programs.

Discovery: (1) Strengthen research activities with a focus on energy; (2) Strengthen research activities with a focus on materials; (3) Strengthen research activities with a focus on the environment; (4) Initiate PK-12 enhancements in science, technology, engineering and mathematics (STEM); and (5) Achieve research strength in the areas of innovative technologies and complex systems through the strategic integration and support of critical research areas.

Engagement: (1) Connect the University's discovery, learning, and engagement assets through partnerships with both the public and private sectors to advance the economic vitality of the commonwealth and the quality of life of its citizens; and (2) Engage students, at the undergraduate and graduate levels, in opportunities for service learning and experiential education that prepare them to serve a diverse and complex marketplace and society while building the capacity of communities.

Foundational Strategies: (1) Effectively manage the University's space and land resources for learning, living, and work; (2) Enhance health, safety, and security operations to support the University's discovery, learning, and engagement endeavors; and (3) Promote robust and integrated information technology strategies that advance Virginia Tech's excellence.

Existing Facilities:

Randolph Hall is the current home of much of the college's undergraduate academic service with several departments, including Aerospace and Ocean Engineering, Chemical Engineering, Engineering Education, and Mechanical Engineering. Randolph Hall is a 166,000 gross square foot building constructed in 1952 with a facility condition index of 23 percent. The building is critically deteriorated, outdated, and does not meet the expectations of students or faculty. The building's structural constraints (floor-ceiling heights and support widths) and environmental control systems constrain modifying the building to adequately accommodate modern instructional practices and research instruments. The departments in Randolph Hall will largely be relocated to the proposed building and the relocation will permit Randolph Hall to undergo future renovations for other instructional uses. The inferior quality of instructional space in Randolph Hall is a serious concern and is negatively impacting engineering's educational and research programs. The Randolph Hall renovation is a high priority project in the out years of the University's capital plan and may be advanced to the state's six-year capital plan after the Engineering Signature Building is complete and occupied.

Funding Plan:

The estimated total project cost is \$99.914 million, and the program for the project is 100 percent educational and general, with an estimated program allocation of 75 percent instruction and 25 percent research. While the normal state funding guidelines would compute an 87.5 percent General Fund support and 12.5 percent nongeneral fund support for the project, the University is proposing \$49.957 million of General Fund support and \$49.957 million of nongeneral fund support from private gifts. The project is a high priority, and the University is willing to provide more than the guideline share of the project costs to expedite the overall project funding. The project is not envisioned to impact student fees.

Options Considered

Other options considered but not selected include leasing, renovating existing space, or delaying the project to a later biennium. Constructing a new facility is the selected option because of the significant student dissatisfaction with the outdated academic facilities.

Leasing is not a feasible option because it is not programmatically viable for the academic programs of the college to be located away from the engineering program.

Renovating an already existing facility is not a viable option because the University currently operates with a shortage of academic space, especially engineering and science space. Thus, no existing space is available to allocate for renovation to accommodate this program.

Delaying the project to a future funding session is not a viable option because the University must address student and faculty expectations in a reasonably short time frame. Addressing the student academic expectations in the college of engineering is a top University priority.

Costing Methodology

The costs are based on pre-planning cost estimates from professional consulting services. Virginia Tech has secured the services of Zimmer Gunsul Frasca Architects to perform architectural and engineering services for the construction of a new facility to house programmatic space for the College of Engineering. The project is nearing the completion of the pre-planning phase. Originally, two conceptual level estimates were completed to provide a project based on 160,000 gross square feet. The University has secured the services of a third party cost estimating services to validate and confirm the consultant's estimates. Project costs are estimated to the mid-point of construction using three percent escalation in accordance with the instructions for developing the Six-Year Capital Outlay Plan.

Project Costs

1. Aquisition of Property:	\$0
2. Acquisition of Plant	\$0
3. Building and Built-in Equipment	\$65,612,000
4. Sitework and Utilities	\$5,415,000
5. Architectural and Engineering Fee	\$6,986,000
6. Loose Furnishings and Equipment	\$9,172,000
7. Contigencies	\$2,394,000
8. Project Inspection	\$2,130,000
9. Other Costs	\$8,205,000
Total Cost	\$99,914,000

The following items (10, 11, 12) are included in above costs

10. Estimated Total Planning Costs:	\$7,453,000
11. Estimated New Construction Costs:	\$75,938,000
12. Estimated Improvements Costs:	\$0

Itemized "9. Other Costs"

1. Project Management In Capital Project Budget:	\$968,000
2. Special Consultants (if not included in A & E fees):	
A. Scheduling Consultant	\$0
B. HVAC Commissioning	\$655,000
C. Furniture Design	\$0
4. Asbestos abatement:	\$0

3. Asbestos and lead based paint survey and design:

5. Independent Cost Estimates:

6. Value engineering

7. Subsoil investigations:

8. Construction testing services:

9. Printing

10. Advertisements

11. Work by owner

12. Signage

13. Miscellaneous utility charges

14. Moving expenses

15. Miscellaneous other costs (itemize):

A. Upgrade Central Plant Alloc

B. Native Stone

C. Review Process

D. Other

Operating and Maintenance Costs

	1st Year	2nd Year
1. Personal Services	<input type="text" value="\$284,309"/>	<input type="text" value="\$568,618"/>
2. Nonpersonal Services	<input type="text" value="\$868,047"/>	<input type="text" value="\$1,736,094"/>
3. Equipment	<input type="text" value="\$50,000"/>	<input type="text" value="\$7,500"/>
Total O and M	<input type="text" value="\$1,202,356"/>	<input type="text" value="\$2,312,212"/>

4. FTE Employees:	<input type="text" value="14.00"/>	<input type="text" value="14.00"/>
5. One Time Costs:	<input type="text" value="\$42,500"/>	<input type="text" value="\$0"/>
6. Cost Savings	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>
7. FTE Savings	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>

8. Planned start date of new O and M costs (if different than the beginning of the fiscal year)

Funding Requests

F Year	GF	NGF	Tax Debt	9c Debt	9d Debt	Total Request
2011	<input type="text" value="\$48,607,000"/>	<input type="text" value="\$48,974,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$97,581,000"/>

Funding Phase: Construction

Prior Funding

Biennium	Appropriation Act	Act Item	Funding Source	Project Code	Amount
2008-10	Chapter 781	Chapter 781 C-91.20	Nongeneral Fund	17658	<input type="text" value="\$983,000"/>
2008-10	Chapter 781	Chapter 781 C-91.20	General Fund	17658	<input type="text" value="\$1,100,000"/>
2008-10	Chapter 1	Enactment 3 - Sec. 2	General Fund	17658	<input type="text" value="\$250,000"/>

Project Scope

1. Acquisition - Property Sq. Ft. / Acres Cost per Sq. Ft. or Acre

<input type="text" value="0"/>	<input type="text" value="n/a"/>	2. Acquisition - Plant	<input type="text" value="0"/> Sq. Ft.	Cost per Sq. Ft.	<input type="text" value="n/a"/>
3. New Construction	<input type="text" value="160,000"/>	Sq. Ft.		Cost per Sq. Ft.	<input type="text" value="\$475"/>
4. Improvements	<input type="text" value="0"/>	Sq. Ft.		Cost per Sq. Ft.	<input type="text" value="n/a"/>
5. Capacity	<input type="text" value="0"/>	Beds/Units		Cost per bed/unit	<input type="text" value="n/a"/>

Capital Lease

Name of Lessor:

Space Requirements:

Need for Leased Space:

Time Period

Proposed Effective Date of Lease: Proposed Duration: months

Include Periodic Renewal: Renewal at option of: Renewal Extension Period: months

Lease payments that would be made during the six year capital planning period

Fund	Year1	Year2	Year3	Year4	Year5	Year6
	\$0	\$0	\$0	\$0	\$0	\$0
	\$0	\$0	\$0	\$0	\$0	\$0
	\$0	\$0	\$0	\$0	\$0	\$0
<i>subtotals</i>	\$0	\$0	\$0	\$0	\$0	\$0

Total lease payments for six year period:

Total payments for the duration/terms of the lease:

Energy Component

Energy Component Description

Annual Energy Operating Costs by Energy Type and Fund Source

Energy Type	Fund Source	Cost
Total		\$0

Cost Estimate for Energy Component

Subcomponent	Cost
Materials Cost	\$0
Labor Cost	\$0
Engineering & Design Cost	\$0
Total	\$0

Annual Cost Savings for Energy Component	
Fund	Savings
	\$0
Total	\$0

PID: 5549