CapitalBudgetRequest

Agricultural Research and Extension Center Improvements- Eastern Shore

Overview

Agency	Virginia Cooperative Extension and Agricultural Experiment Station (229)
Project Code	18759
Project Title	Agricultural Research and Extension Center Improvements- Eastern Shore
Project Type	New Construction/Improvement
Biennium	2024-2026
Budget Round	Amended Bill
Bill Version	Regular Session
Request Type	Previously Approved
Project Location	Hampton Roads
Facility/Campus	Eastern Shore AREC
Source of Request	Agency Request
Infrastructure Element	Agricultural Facility
Contains O & M costs? Yes	
Contains significant technology costs? No	
Contains significant energy costs? No	
Possible that project will be used by other than a state or local governmental entity, or for research under sponsored programs (higher education)? No	

Agency Narrative

Agency Description

Executive Summary:

The Commonwealth's private agriculture industry accounts for one in every five jobs in Virginia, generating more than 381,800 jobs in the Commonwealth, and creating an economic impact of $82.3 billion annually. The industries of agriculture and forestry together have a total economic impact of over $105 billion and provide more than 490,000 jobs in the Commonwealth. Every job in agriculture and forestry supports 1.6 jobs elsewhere in Virginia's economy.

The Virginia Tech Cooperative Extension/Agricultural Experiment Station agency, Agency 229, impacts are vast, diverse, and touch every sector of Virginia's agriculture and forestry economy. The innovative and applied research, education and training, and direct assistance provided to Virginians by Agency 229 have led to nationwide recognition of Virginia as a producer of superior agricultural products, better business management practices, and environmental stewardship that improves quality of life for all Virginians.

This agency is the Commonwealth's most substantial and wide-reaching source for production and operation research to advance and protect a multitude of industries in the state. Agency 229 activity creates jobs, promotes new investments, produces a new generation of leaders in agriculture and natural resources, and helps to grow Virginia's critically important exports of agricultural commodities and forest products.

The agency includes 11 sites dispersed throughout the Commonwealth. The sites are known collectively as Agriculture Research and Extension Centers (ARECs), and each focus on industries particular to a geographic location. This request focuses on facility improvements at the Eastern Shore AREC. The faculty of the Eastern Shore AREC generates cutting-edge research for industries to improve the production of vegetable, grain, oilseed, and fiber crops and then disseminate training and skills to producers using innovative technologies.

The Eastern Shore AREC facilities are outdated, too small, and have accumulated more deferred maintenance than can be addressed with repairs or renovations. Modern research facilities are needed to continue the research and outreach expected by the Commonwealth's agricultural businesses.

The State authorized a Capital planning authorization for this project in Item C-48 in Chapter 2 of Special Session I of the 2024 General

Assembly. The planning and design process is currently getting underway. The Improve Eastern Shore AREC project seeks $14.5 million to renew 14,000 GSF of aging and deteriorating facilities and construct 25,000 GSF of new facilities at the Eastern Shore AREC. The current programs and economic impact of this AREC is described in the Program Description section below.

Project Description:

The Eastern Shore AREC requires specific infrastructure to conduct its research and outreach, including facilities, utilities, and equipment. This project will address the top-priority infrastructure and renovation needs for the Eastern Shore AREC.

Graduate student research at the Eastern Shore AREC (ESAREC) greatly impacts our stakeholders, growers, and industry on a local, national, and global level. The work done at the ESAREC yields tangible benefits to both small and large farming operations in its locality, advancing Agency 229's principal mission of supporting the Commonwealth. To continue fulfilling its part in Agency 229's mission, ESAREC is in dire need of both new and refurbished facilities. Some of these critical facilities included in the subproject scope include:

AREC Support Services Complex: A 13,500 square foot complex (single building or multiple) consisting of the following:

- Washing, Chemical Storage, and PPE Storage: No facility exists to safely store pesticides nor to fill and clean spray equipment, dispose of wastewater and residual products, and to meet safety requirements of pesticide storage and application (2,500 GSF).

- Farm Services Complex: Due to the increasing size of agricultural equipment and the diverse nature of activities and programs at this AREC, it is necessary to have a new Farm Services Complex (9,000 GSF) that includes large volume shop space available with conditioned office space and restroom facilities for farm staff.

- Growth Chamber and Sampling Processing Facility: A building (2,000 GSF) that will include built-in growth chambers, a full-size autoclave, walk-in cold room, walk-in dryer, and a liquid nitrogen tank with a dispenser. This facility will be used by weed science, horticulture, entomology, soil science, and pathology programs.

Main Building Renovation: This AREC also requires renovation to existing laboratories, offices, kitchen, roof, and restrooms in the main building for modernization, repair, code compliance, asbestos abatement, and to meet ADA mandates (14,000 GSF). The laboratory spaces are currently outdated, have been extended beyond their functional life, and are no longer able to meet the research needs of the AREC without redesign due to inadequate size, configuration, and condition of spaces.

Extension Conference/Meeting Space: A facility that adds 100 seats at tables in air-conditioned space as a 5,000 GSF ADA-accessible pre-engineered metal building with slab on grade situated near the main administration building. The new space will be sub-dividable to allow for concurrent training and can be transitioned to an open-space environment to allow for various educational setups and demonstrations.

Smart Greenhouse: Controlled environment growth facilities are a critical component of the research program in a number of rapidly evolving fields supporting vegetable producers, the pest management industry, and vertical farming. State-of-the-art plant-growing facilities areas are necessary for researchers to remain current with industry partners and find innovative solutions to current world problems. This AREC requires a new Smart Greenhouse (3,500 GSF) equipped with advanced technology and complete environmental control (BSL-2) as a critical feature of the AREC's work with the Smart Farm Innovation Network™.

In summary, the collective items above represent an overall strategy to conduct vast improvements across the Eastern Shore AREC facilities, bringing these portions of the AREC fully up to current standards and providing room for growth in new areas of study. In total, this project totals approximately 39,000 gross square feet of greatly needed modern research space and programmatic facilities.

Justification

Program Description:

The Virginia General Assembly established the Virginia Agricultural Experiment Station (VAES) on March 1, 1886, in anticipation of the Federal Hatch Act of 1887, which created a network of state agricultural experiment stations nationwide as part of the land-grant higher education mission. This system links experiment station research to cooperative extension programs and college academic programs. The State Agricultural Experiment Stations were charged with conducting research and development projects on behalf of farmers, in forestry, animal health and disease, and multistate research programs.

The mission of the Agricultural Research and Extension Center (AREC) system is to utilize innovative research techniques to discover new scientific knowledge and create and disseminate practical applications that ensure the wise use of agricultural, natural, and community resources. Research is designed to provide knowledge that will enhance the quality of individual and family life and the social and economic vigor of Virginia. Researchers utilize qualitative and quantitative research methods to expand the knowledge base and to further the mission of the land-grant university. The expertise gained from this research is broadly applied to improve Virginia's animal, plant, and seafood harvest industries while conserving natural resources, which ultimately benefits all citizens of the Commonwealth.

Faculty and staff deliver research and extension programs at these widely dispersed sites across the Commonwealth, in order to take advantage of the unique agricultural characteristics and challenges found in each location.

Today, VAES research projects and activities encompass the work of more than 350 scientists in five colleges at Virginia Tech: College of Agriculture and Life Sciences, College of Natural Resources and Environment, College of Liberal Arts and Human Sciences, College of Science, and Virginia-Maryland College of Veterinary Medicine. The VAES research network also includes 11 field stations located throughout the state. Known as Agricultural Research and Extension Centers (ARECs), these field stations emphasize the close working relationships between the Virginia Agricultural Experiment Station and Virginia Cooperative Extension.

VAES research directly supports agriculture, the state's largest private industry, accounting for one in every five jobs, providing an economic impact of $82.3 billion annually, generating more than 381,800 jobs in the Commonwealth, and creating $43.8 billion in value-added impact. The industries of agriculture and forestry together have a total economic impact of over $105 billion and provide more than 490,000 jobs in the Commonwealth. Every job in agriculture and forestry supports 1.6 jobs elsewhere in Virginia's economy.

The existing AREC facilities do not support demand for the program activities and require improvements and expansion. This project will help bring the ESAREC up-to-date and provide the capacity to meet client demand for services. Each AREC has minimum requirements to meet the basic needs of research/support, extension/outreach, housing, and infrastructure. This project will address those minimum requirements and work towards maintaining and enhancing productivity, research output, and community engagement in the Eastern Shore region. An improved ESAREC is also essential for the new Center for Advanced Innovation in Agriculture, which is establishing Virginia Tech as a comprehensive and innovative global research leader in smart and secure agriculture technologies and data analytics for informed decisions.

Eastern Shore AREC:

Established in 1956, the Eastern Shore AREC grows more than 25 agricultural crops annually for research and Extension studies. To ensure that the Eastern Shore remains a leader in commercial agriculture production, it is essential that new, state-of-the-art applied research is conducted that is relevant to local large and small-scale farming operations.

The ESAREC is situated on a 220-acre farm, with three BSL 2 laboratories, greenhouses, modern equipment facilities, and onsite housing available for students, researchers, and visiting scholars. Current disciplines at the ESAREC include Soils & Nutrient Management, Weed Management Technologies, Integrated Pest Management, Horticultural Cropping Systems, Foodborne Illness Research & Prevention, and Vegetable Disease Epidemiology. The following innovative technologies are currently utilized at the ESAREC: Unmanned Aerial Vehicles (UAVs) for assessing plant health & weed management, fertilizer source and application technologies, and Molecular Identification of Plant & Human Pathogens, and advanced pollinator habitats.

Industry Partners currently working with the ESAREC include:

- Commercial Fruit and Vegetable Producers and Packers
- Potato, Vegetable, Corn, Small Grains and Soybean Associations
- Agricultural Fertilizer, Technology, and Chemical Companies
- Virginia Master Gardeners
- USDA-Natural Resources Conservation Services
- Soil & Water Conservation Districts

The ESAREC's faculty, staff, and students serve to create, integrate, and disseminate knowledge to stakeholders through using innovative technologies to improve vegetable, grain, oilseed, and fiber crop production and sustainability, protect land, air, and water resources, as well as foster undergraduate and graduate education through applied and basic research coupled with experiential learning and community outreach. Research includes eliminating foodborne human pathogens in packing houses, conversion of chicken litter ash into comparable phosphorus fertilizer sources, and decreasing weed pressure using new, innovative modes of action including the usage of drones and robotics. Concepts that are explored include horticultural cropping systems, soil and nutrient management, as well as vegetable disease epidemiology, all widely considered to be crucial areas of research in maximizing both farming efficacy and resource efficiency.

Strategic Planning:

The university's strategic plan includes the following goals and objectives that will be supported by this project:
- Increase extramural research expenditures.
- Achieve top US public land-grant ranking.
- Increase graduate student enrollment.
- Advance the rural Virginia initiative.
- Increase and sustain excellence in research, discovery, and creativity.
- Increase institutional impact and visibility.
- Increase representational diversity, cultural competency, and address critical societal issues impacting humanity and equity.
- Attract, retain, and develop the talents of students, faculty and staff prepared to serve both the local and global communities while also supporting lifelong engagement and learning.
- Continue to develop the physical campus and technology infrastructure.

Existing Facilities:

This project will help bring the ESAREC up-to-date and provide capacity to meet client demand for services. The existing research laboratories and support facilities are in poor condition, have reached their functional life expectancy, are no longer ideal for conducting experiments required to respond to modern agricultural issues, and cannot support demand for the program activities. The ESAREC has inadequate means to meet safety requirements, conduct appropriate experiments, and support their ongoing research and extension programs.

Although they are still used as laboratory and office space because of current space limitations, structures at the AREC have reached their functional life expectancy and present concerns in safety and research efficacy. Laboratory spaces in these buildings are also outdated and do not provide the functionality needed to support modern laboratory and fieldwork in their respective agricultural sciences. Additionally, greenhouse space is imperative to carrying out VAES objectives. Controlled environment growth facilities are a critical component of both research programs. Having state-of-the-art plant-growing facilities is necessary for researchers to remain current with industry partners and find innovative solutions to current world problems.

Funding Plan:

The program for this project is 100 percent Educational and General for the Agricultural Research and Extension Center Improvements project; thus, the funding plan calls for 100 percent General Fund support for this $14.5 million project.

Options Considered:

Options considered and not selected include elimination or reduction of the research programs and deferring the project to a future biennium. Elimination or reduction of the program is not feasible because of the significant negative impact on the program's support to industry and government. Deferring the project is not recommended because the facilities are no longer in a position to adequately support the research programs.

Methodology

Cost Explanation and Methodology:

A. Methods Used to Estimate Costs:

The method for estimating costs for the Agricultural Research and Extension Center Improvements project includes: 1) using unit costs in the Division of Engineering and Building's Construction Costs Database updated July 2024 with a regional market multiplier and a multiplier for soft costs; and 2) comparable university historical costs as shown in the CR-1; 3) cost data from the College based upon site-specific knowledge through the Renovation process. These methods are escalated to a construction midpoint of 2027 in accordance with the instructions for developing the Six-Year Capital Outlay Plan and the rate utilized in the most recent CR-1 Project Planning form.

On a total project cost basis, inclusive of design, construction, and equipment, the unit costs are $372 per gross square foot. The unit construction costs of the project are $283 per gross square foot. The building types in this request include portions of wet laboratory, dry laboratory, and office in the Division of Engineering and Building's Virginia Construction Costs Database. The costs also include barns, equipment storage, and feed storage spaces.

Design-Bid-Build is the intended delivery method for this project.

The geographic location will require DEQ permitting. These increased soft costs for DEQ-related expenses have been incorporated into the project budget.

Funding Request

Phase	Year	Subobject	Fund	Agency Request
Full Funding	2026	2411 - Unallotted Capital Amount	01000 - General Fund	$14,500,000
			Total	$14,500,000

Project Costs

Cost Type	Requested Funding
Acquisition Cost	$0
Building & Built-in Equipment	$11,042,388
Sitework & Utility Construction	$0

Construction Cost Total	**$11,042,388**
DESIGN & RELATED SERVICE ITEMS	
A/E Basic Services	$664,926
A/E Reimbursables	$6,435
Specialty Consultants (Food Service, Acoustics, etc.)	$13,942
CM Design Phase Services	$16,087
Subsurface Investigations (Geotech, Soil Borings)	$55,768
Land Survey	$3,217
Archeological Survey	$0
Hazmat Survey & Design	$214
Value Engineering Services	$19,304
Cost Estimating Services	$3,217
Other Design & Related Services	$52,552
Design & Related Services Total	**$835,662**
INSPECTION & TESTING SERVICE ITEMS	
Project Inspection Services (inhouse or consultant)	$277,768
Project Testing Services (conc., steel, roofing, etc.)	$79,362
Inspection & Testing Services Total	**$357,130**
PROJECT MANAGEMENT & OTHER COST ITEMS	
Project Management (inhouse or consultant)	$270,839
Work By Owner	$63,275
BCOM Services	$4,290
Advertisements	$6,435
Printing & Reproduction	$6,435
Moving & Relocation Expenses	$4,290
A/V Cabling	$0
IT Cabling	$0
Telephone Cabling	$0
A/V Equipment	$0
IT Equipment	$107,246
Telephone Equipment	$0
Signage	$32,174
Demolition	$0
Hazardous Material Abatement	$1,072
Utility Connection Fees	$54
Utility Relocations	$3,217
Commissioning	$60,058
Miscellaneous Other Costs	$239,159
Project Management & Other Costs Total	**$798,544**
Furnishings & Movable Equipment	$948,887
Construction Contingency	$517,389
TOTAL PROJECT COST	**$14,500,000**

Size and Scope

Cost Type	Cost	Unit of Measure	Units	Cost Per Unit
Acquisition Cost			0	$0
Construction Cost	$14,500,000	GSF	39,000	$372
New Construction Cost		GSF	0	$0
Improvement Cost		GSF	0	$0

Operating and Maintenance Costs

Cost Type	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030
GF Dollars	$0	$0	$0	$579,064	$602,227	$626,316
NGF Dollars	$0	$0	$0	$0	$0	$0
GF Positions	0.00	0.00	0.00	2.05	2.05	2.05
NGF Positions	0.00	0.00	0.00	0.00	0.00	0.00
GF Transfer	$0	$0	$0	$0	$0	$0
GF Revenue	$0	$0	$0	$0	$0	$0
Layoffs	0	0	0	0	0	0

Planned start date of new O&M costs (if different than the beginning of the fiscal year):---

Supporting Documents

File Name	File Size	Uploaded By	Upload Date	Comment
Eastern Shore AREC Program Chart.pdf	78,002	Matthew Digman	8/23/2024	
CR-1 ESAREC Improvements 8.14.24.xlsx	1,791,133	Rob Mann	8/23/2024	