

**UNIVERSITY OF ALABAMA SYSTEM
BOARD RULE 415
BOARD SUBMITTAL CHECKLIST CRITERIA**

**BOARD SUBMITTAL CHECKLIST NO. 3
CAPITAL PROJECT - STAGE III SUBMITTAL ^{/1}
(Architectural Design)**

CAMPUS: The University of Alabama, Tuscaloosa, Alabama

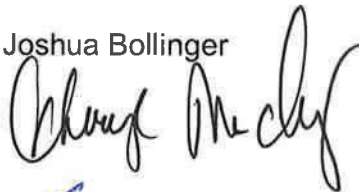
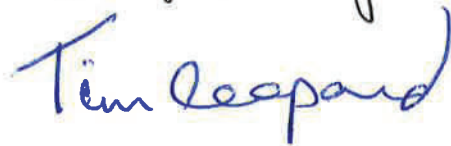
PROJECT NAME: High Performance Computing and Data Center

MEETING DATE: April 11-12, 2024

- ☒ 1. Board Submittal Checklist No. 3
- ☒ 2. Transmittal Letter to Chancellor from Campus President requesting project be placed on the agendas for the forthcoming Physical Properties Committee and Board of Trustees (or Executive Committee) Meetings
- ☒ 3. Proposed Board Resolution requesting approval of Project Design (Architectural Design and authority to proceed with final construction documents) by the Board of Trustees
- ☒ 4. Executive Summary - Proposed Capital Project ^{/2}
- ☒ 5. Architectural rendering of project (Final design prior to the initiation of construction documents on the project)
- ☒ 6. Campus map(s) showing project site

Prepared by: Joshua Bollinger

Approved by:

^{/1} Reference Tab 3H - Board Rule 415 Instructional Guide

^{/2} Reference Tab 3E - Board Rule 415 Instructional Guide



Office of the
President

February 29, 2024

Chancellor Finis E. St. John IV
The University of Alabama System
500 University Boulevard East
Tuscaloosa, Alabama 35401

Dear Chancellor St. John:

I am pleased to send to you for approval under Board Rule 415 the attached documents for a Stage III submittal for the High Performance Computing and Data Center project.

The resolution requests approval of the Architectural Design and a budget reallocation for the project.

The item has been thoroughly reviewed and has my endorsement. With your concurrence, I ask that it be added to the agenda for The Board of Trustees at their regular meeting on April 11-12, 2024.

Sincerely,

A handwritten signature in black ink, appearing to read "Stuart R. Bell". The signature is stylized with large, flowing letters.

Stuart R. Bell
President

Enclosure



THE UNIVERSITY OF ALABAMA

Approving the reallocated project budget and proposed architectural design for the High Performance Computing and Data Center

RESOLUTION

WHEREAS, on September 1, 2023, in accordance with Board Rule 415, The Board of Trustees of the University of Alabama (“Board”) approved a Stage I submittal for the High Performance Computing and Data Center (“HPC”) project (“Project”) to be located at 709 Johnny Stallings Drive; and

WHEREAS, the Project will provide numerous opportunities for students and faculty to engage in and experience a leading-edge computing technology environment and greatly enhance overall institutional research effectiveness, increasing the University’s productivity and innovation in research, scholarship, and creative activities; and

WHEREAS, modeling and simulation on HPC resources are a critical factor in the success of research in science and engineering, and state-of-the-art simulation, such as hydrological modeling, requires computing resources far beyond what is available from the University of Alabama’s (“University”) current HPC platforms; and

WHEREAS, the availability of Petascale-computational resources removes existing bottlenecks to the advancement of research requiring large-scale computational simulations, the training of complex Artificial Intelligence/Machine Learning models, and the development of new data science applications, and as a result, the Project will allow researchers to make scientific and engineering advances that are currently unavailable due to the University’s limited computational capability; and

WHEREAS, the Project entails the construction of an approximately 40,000 GSF two-story HPC that will solidify and propel the advancement of the University’s academic mission and research and development capabilities as an R1 institution; and

WHEREAS, the Project will include space for University support staff offices and work areas as well as shell space for a future secure suite, and the facility will be designed to provide for efficient expansion of computing over time by providing an accessible structure and shell space for both compute and support infrastructure and an additional 5000 gross square feet will be bid as an add alternate to support this as reflected in the proposed renderings; and

WHEREAS, the Project will include the purchase of HPC equipment and will provide an appropriate environment for the operation thereof; and

WHEREAS, the proposed site is ideally located adjacent to Alabama Power Company high voltage transmission lines that will provide adequate and resilient

capacity for current use and projected growth, which will require the University to contract with Alabama Power Company for service and to provide easements necessary to accommodate the substation location and service lines; and

WHEREAS, to mitigate the effects of continued industry lead time issues and to deliver the building as timely as possible, the Project is separated into multiple packages: Package A – MV Infrastructure and Substation, Package B – Utility and Infrastructure, and Package C – Main Construction of Building and System, and will also include Owner Furnished Contractor Installed (“OFCI”) Equipment; and

WHEREAS, on November 3, 2023, in accordance with Board Rule 415, the Board approved the top ranked architectural firms and authorized officials of The University of Alabama (“University”) to proceed with negotiations with Davis Architects, Inc. (“Davis Architects”) of Birmingham, Alabama; and

WHEREAS, upon completion of negotiations with Davis Architects, Birmingham, Alabama, the University established a final design fee of 5.6% of the cost of the Construction Packages B-C, Landscaping, and OFCI Equipment, \$77,615 for additional services which includes the fee for the design of Package A, and \$52,477 for reimbursable expenses, for a total fee for Davis Architects of \$2,885,292; and

WHEREAS, the change in the design fee is based on a move from a Group III to Group IV based on the technical complexity of the Project and additional services required to appropriately plan and coordinate the systems and HPC environment and support; and

WHEREAS, on November 3, 2023, in accordance with Board Rule 415, the Board approved the top ranked commissioning agents and authorized officials of The University to proceed with negotiations with Environmental Systems Corporation of Huntsville, Alabama; and

WHEREAS, upon completion of negotiations with Environmental Systems Corporation of Huntsville, Alabama, the University established a final lump sum fee of \$443,039; and

WHEREAS, the University is requesting a Budget Reallocation to reflect the final negotiated design and commissioning fees; and

WHEREAS, responsible officials at the University have received renderings for the Stage III submittal and are recommending approval of said design; and

WHEREAS, the Project is funded from a National Institute of Standards and Technology (“NIST”) Grant in the amount of \$44,550,000 (2023-NIST-CICGP-01), State of Alabama ETF Supplemental Appropriations in the amount of \$46,000,000 (enacted Act 2023-378/SB-87), and University Central Reserves in the amount of \$5,450,000; and

WHEREAS, the Project Budget includes infrastructure associated with supporting Education and General Funded enterprise-level computing systems, and that scope of work will be funded with University Central Reserves; and

WHEREAS, the Project location and program have been reviewed and are consistent with the University Campus Master Plan, University Design Standards and the principles contained therein; and

WHEREAS, the reallocated budget for the project is as stipulated below:

BUDGET:	REALLOCATED
Package A - MV Infrastructure and Substation	\$ 1,287,551
Package B - Utility and Infrastructure	\$ 3,000,000
Package C - Main Construction of Building and Systems	\$ 35,000,000
Landscaping	\$ 200,000
Owner Furnished Contractor Installed (OFCI) Equipment	\$ 11,000,000
Owner Furnished HPC Equipment	\$ 25,000,000
Furniture, Fixtures, and Equipment	\$ 100,000
Security/Access Control	\$ 500,000
Telecommunication/Data	\$ 500,000
Contingency ¹	\$ 2,524,378
UA Project Management Fee ²	\$ 1,855,417
Programming and Grant Preparation	\$ 375,000
Architect/Engineer Fee ³	\$ 2,885,292
Commissioning Agent	\$ 443,039
Other (CMT, Surveys, inspections, advertisement, DCM review, Insurance)	\$ 1,043,609
Escalation ⁴	\$ 10,285,714
TOTAL PROJECT COST	\$ 96,000,000

¹Contingency is based on 5% of the cost of the Packages A-C, Landscaping, and OFCI Equipment.

²UA Project Management fee is based on 3.5% of the costs of the Packages A-C, Landscaping, OFCI Equipment, and Contingency.

³Architect/Engineer Fee is based on 5.6% (Group IV) of the cost of the Packages B-C, Landscaping, OFCI Equipment, \$77,615 for additional services which includes the design fee for Package A, and \$52,477 for reimbursable expenses.

⁴Escalation is based on an anticipated 12% inflation through the estimated bid date of September 2024.

NOW, THEREFORE, BE IT RESOLVED by The Board of Trustees of The University of Alabama that:

1. The Stage III submittal for the Project is hereby approved.
2. The Budget Reallocation for the Project is hereby approved as stipulated above.

**EXECUTIVE SUMMARY
PROPOSED CAPITAL PROJECT
BOARD OF TRUSTEES SUBMITTAL**

MEETING DATE: April 11-12, 2024

CAMPUS: The University of Alabama, Tuscaloosa, Alabama

PROJECT NAME: High Performance Computing and Data Center

PROJECT NUMBER: 008-23-3287

PROJECT LOCATION: 709 Johnny Stallings Drive, Tuscaloosa, AL

ARCHITECT: Davis Architects, Inc., Birmingham, AL

THIS SUBMITTAL:

- ☐ Stage I
- ☐ Stage II
- ☐ Campus Master Plan Amendment
- ☒ Stage III
- ☐ Stage IV

PREVIOUS APPROVALS:

September 1, 2023

November 3, 2023

PROJECT TYPE	SPACE CATEGORIES	PERCENTAGE	GSF
<input checked="" type="checkbox"/> Building Construction	Laboratory Facilities	~ 1.5%	588
<input type="checkbox"/> Building Addition	Office Facilities	~4.9%	1,958
<input type="checkbox"/> Building Renovation	Special Use Facilities	~ 0.4%	147
<input type="checkbox"/> Equipment	Central Service/ Support	~ 24.8%	9,941
	Residential Facilities	~2.7%	1,090
	Circulation Area	~12.5%	4,996
	Building Service Area	~ 0.5%	213
	Mechanical Area	~52.7%	21,067
	TOTAL	100%	40,000

BUDGET	CURRENT	REALLOCATED
Package A - MV Infrastructure and Substation	\$ 1,287,551	\$ 1,287,551
Package B - Utility and Infrastructure	\$ 3,000,000	\$ 3,000,000
Package C - Main Construction of Building and Systems	\$ 35,000,000	\$ 35,000,000
Landscaping	\$ 200,000	\$ 200,000
Owner Furnished Contractor Installed (OFCI) Equipment	\$ 11,000,000	\$ 11,000,000
Owner Furnished HPC Equipment	\$ 25,000,000	\$ 25,000,000
Furniture, Fixtures, and Equipment	\$ 100,000	\$ 100,000
Security/Access Control	\$ 500,000	\$ 500,000
Telecommunication/Data	\$ 500,000	\$ 500,000
Contingency ¹	\$ 2,524,378	\$ 2,524,378
UA Project Management Fee ²	\$ 1,855,417	\$ 1,855,417
Programming and Grant Preparation	\$ 375,000	\$ 375,000
Architect/Engineer Fee ³	\$ 2,271,940	\$ 2,885,292
Commissioning Agent	\$ 700,000	\$ 443,039
Other (Surveys, inspections, advertisement, DCM review, Insurance)	\$ 1,400,000	\$ 1,043,609
Escalation ⁴	\$ 10,285,714	\$ 10,285,714
TOTAL PROJECT COST	\$ 96,000,000	\$ 96,000,000
Total Construction Cost per square foot		
\$1,325		

¹Contingency is based on 5% of the cost of the Packages A-C, Landscaping, and OFCI Equipment.

²UA Project Management fee is based on 3.5% of the costs of the Packages A-C, Landscaping, OFCI Equipment, and Contingency.

³ Architect/Engineer Fee is based on 5.6% (Group IV) of the cost of the Packages B-C, Landscaping, OFCI Equipment, \$77,615 for additional services which includes design fee for Package A, and \$52,477 for reimbursable expenses.

⁴Escalation is based on an anticipated 12% inflation through the estimated bid date of September 2024.

ESTIMATED ANNUAL OPERATING AND MAINTENANCE (O&M) COSTS:

(Utilities, Housekeeping, Maintenance, Insurance, Other)

40,000gsf x ~\$24.90/sf \$ 995,939

Total Estimated Annual O&M Costs*: \$ 995,939

*Annual O&M Cost estimated for 2MW operating load in Year 1, increasing to 8MW by Year 6 at an estimated Annual O&M Cost of \$3,423,379.

FUNDING SOURCE:

Federal NIST Grant (2023-NIST-CICGP-01) \$ 44,550,000

State Appropriation (Act 2023-378/SB-87) \$ 46,000,000

UA Central Reserves \$ 5,450,000

O&M Costs: Recharge to the User and F&A \$ 995,939
recovered funds from ORED*

*Annual O&M Cost estimated for 2MW operating load in Year 1, increasing to 8MW by Year 6 at an estimated Annual O&M Cost of \$3,423,379.

NEW EQUIPMENT REQUIRED

OFCI Equipment:* \$11,000,000

Generators

Supervisory Control and Data Acquisition and
Substation Switchgear

HVAC Equipment

HPC Equipment \$25,000,000

Total Equipment Costs: **\$36,000,000**

*identified long lead equipment as appropriate to efficiently deliver the project

PROJECT SCOPE:

The UA High Performance Computing and Data Center project, located at 709 Johnny Stallings Drive, Tuscaloosa, AL, will consist of new construction of an approximately 40,000 gross square feet (“gsf”) building to serve the campus academic needs, the Office of Research and Economic Development (ORED), and strategic partners.

The Project will consist of the new construction of a 2-story space for the HPC equipment that will include people space for UA staff office and work areas as well as shell space for a future secure suite. The facility will be designed to provide for efficient expansion of computing over time by providing an accessible structure and shell space for both compute and support infrastructure.

The building will have an aesthetic and massing to complement the surrounding architecture and promote education of next generation HPC systems to staff, students, and visitors. The project includes a dedicated chiller plant located adjacent to the new building and all necessary vehicular access for deliveries, service vehicles, and emergency vehicles.

The Project will include the purchase of HPC equipment and will provide an appropriate environment for the operation thereof.

The Project will also include a new approximately 22,500 gsf electrical substation yard. The proposed site is ideally located adjacent to Alabama Power high voltage transmission lines which will provide adequate and resilient capacity for current use and projected growth. As these lines also serve a nearby hospital, their operation and reliability are considered critical and would be addressed as a priority in case of a major outage. This will help ensure the continuity of operations for the facility and support an efficient cost of initial construction due to the close proximity.

The selected site aligns with the UA Master plan. The proposed site was chosen considering multiple factors, chiefly the availability of high capacity and resilient electrical service, availability and capacity of other support infrastructure and utilities and environmental resiliency. The site and layout will also consider any needed future expansion of the Capstone College of Nursing.

PROJECT STATUS

SCHEMATIC DESIGN:	Date Initiated	Nov 2023
	% Complete	100%
	Date Completed	December 2023
PRELIMINARY DESIGN:	Date Initiated	Jan 2024
	% Complete	100%
	Date Completed	March 2024
CONSTRUCTION DOCUMENTS:	Date Initiated	Apr 2024
	% Complete	0%
	Date Completed	August 2024
SCHEDULED BID DATE:		September 2024

**N/A on Stage I Projects*

RELATIONSHIP AND ENHANCEMENT OF CAMPUS PROGRAMS

High Performance Computing (“HPC”) plays a vital role in many scientific, industrial, and societal advancements due to the complexity of the questions and problems at hand. The creation of the UA Center for High Performance Computing (“Center”) will utilize HPC resources to answer our biggest questions related to water, mobility, and power technologies. These areas also provide profound economic development opportunities for the state of Alabama. The Center will enable current and future UA researchers, students, and other scientists from around the state and world to collaborate with UA and partners to promote research & development, economic development, and talent and workforce development in areas critical to the future of the state of Alabama, water, and transportation.

The University of Alabama has become a nexus for water research with the colocation of strategic partners at the National Oceanic and Atmospheric Administration National Water Center and at the U.S. Geological Survey Hydrological Instrumentation Facility. These partners will benefit from the Center as we all seek to advance a new generation of improved products for effective decision making in protecting life and property related to water security, water excess, water scarcity, water potability, etc. The establishment of the Center will enable groundbreaking scientific discoveries translatable to operational water modeling. The Center will enable UA principal investigators and their partners to utilize new HPC tools and either widen or deepen their research foci. A new, dedicated HPC center with a focus on water will speed the timeliness and efficiency of moving research into operations as they develop new products, all while reducing production costs.

For mobility and power, our partners are universities in The University of Alabama System, industry in Alabama and K-12, community colleges, and other universities. The Center will be closely aligned with the Alabama Mobility and Power Center (“AMP Center”), a highly unique

and timely public-private partnership with state and national importance. The Center will allow and support the AMP Center to address problems transforming highway transportation as electric vehicles achieve mass deployment. These problems involve large scale network optimization that will enable overall management of energy distribution, routing of vehicles to optimize energy utilization, and analyses of network traffic to support cybersecurity of electric vehicles.

This project is a critical step in the advancement of the University's research and development capabilities as an R1 institution. Modeling and simulation on HPC resources are a critical factor in the success of research in science and engineering. State-of-the-art simulation, such as hydrological modeling, requires computing resources far beyond what is available from UA's current HPC platforms. This project will drive substantial innovation and effectiveness of research by:

- Supporting the University's role as national water and transportation leader through expanding the advanced computing capacity essential for state-of-the-art research in those critical Alabama centers of economic investment
- Enhancing existing programs in STEM fields such as chemistry and biochemistry; astrophysics and cosmology; geology, geography, and environmental engineering; biology, especially genomics analysis; chemical engineering, materials engineering, physics for materials properties analysis, design, and engineering; and psychology, especially for image analysis
- Providing a competitive advantage to the University in the procurement of federal and private industry grants and contracts
- Driving student workforce development in skills and knowledge essential for an agile 21st century Alabama workforce including software engineering, mobility and power technologies, hydrology and water security, Artificial Intelligence and Machine Learning, and computational sciences

The project greatly enhances overall institutional research effectiveness, increasing the University's productivity and innovation in research, scholarship, and creative activities. The availability of Petascale-computational resources removes existing bottlenecks to the advancement of research requiring large-scale computational simulations, the training of complex Artificial Intelligence/Machine Learning models, and the development of new data science applications. As a result, the project will allow researchers to make scientific and engineering advances that are currently unavailable due to the University's limited computational capability. Furthermore, this project:

- Enhances efforts to recruit and retain outstanding and diverse research faculty and staff engaged in fields requiring advanced computing resources commensurate with leader-level R1 research institutions
- Helps attract and retain STEM students by engaging them in state-of-the-art computational research at a scale available only at leader-level research institutions
- Enhances the University's ability to engage in federal grants and contracts involving International Traffic Arms Regulation (ITAR) and Controlled Unclassified Information (CUI) security compliance requirements and other controlled research data and processes
- Will lead to peer-reviewed publications in a wide range of areas including those of interest to the Alabama public such as water management, mobility, and power technologies for electrical vehicles

This project affirms the University's commitment to increasing productivity and innovation in research, scholarship, and creative activities. The UA Center for High Performance Computing project aligns with existing university investments in facilities and programming for mobility and power technology, hydrology and water security, and computational sciences and engineering. Current investments include the establishment of UA's Research Institutes including Water, Transportation, Cybersecurity, and Life Sciences as well as existing capital projects such as the Smart Community and Innovation Building, the US Geological Survey Hydrologic Instrumentation Facility project, the Renovations for Materials Characterization Service and Support of Academic Programs, and the Gordon Palmer Data Center Renovation project.

Furthermore, this project

- Increases the geographic, educational, and societal reach of HPC research infrastructure within the state of Alabama by providing HPC educational and computational resources to researchers at other higher education institutions without significant HPC assets
- Broadens the diversity of participants using HPC in Alabama by providing opportunities for collaborations among researchers and students within and outside of the institution
- Advances the University's ability to provide a premier undergraduate and graduate education by offering students a global perspective characterized by outstanding teaching supported by the advanced research computing concepts and skills of their field

HIGH PERFORMANCE COMPUTING AND DATA CENTER

Vantage Points



HIGH PERFORMANCE COMPUTING AND DATA CENTER

View 1 – Front of building facing east



HIGH PERFORMANCE COMPUTING AND DATA CENTER

View 2 – Side of building facing south



HIGH PERFORMANCE COMPUTING AND DATA CENTER

View 3 – Back of building facing west



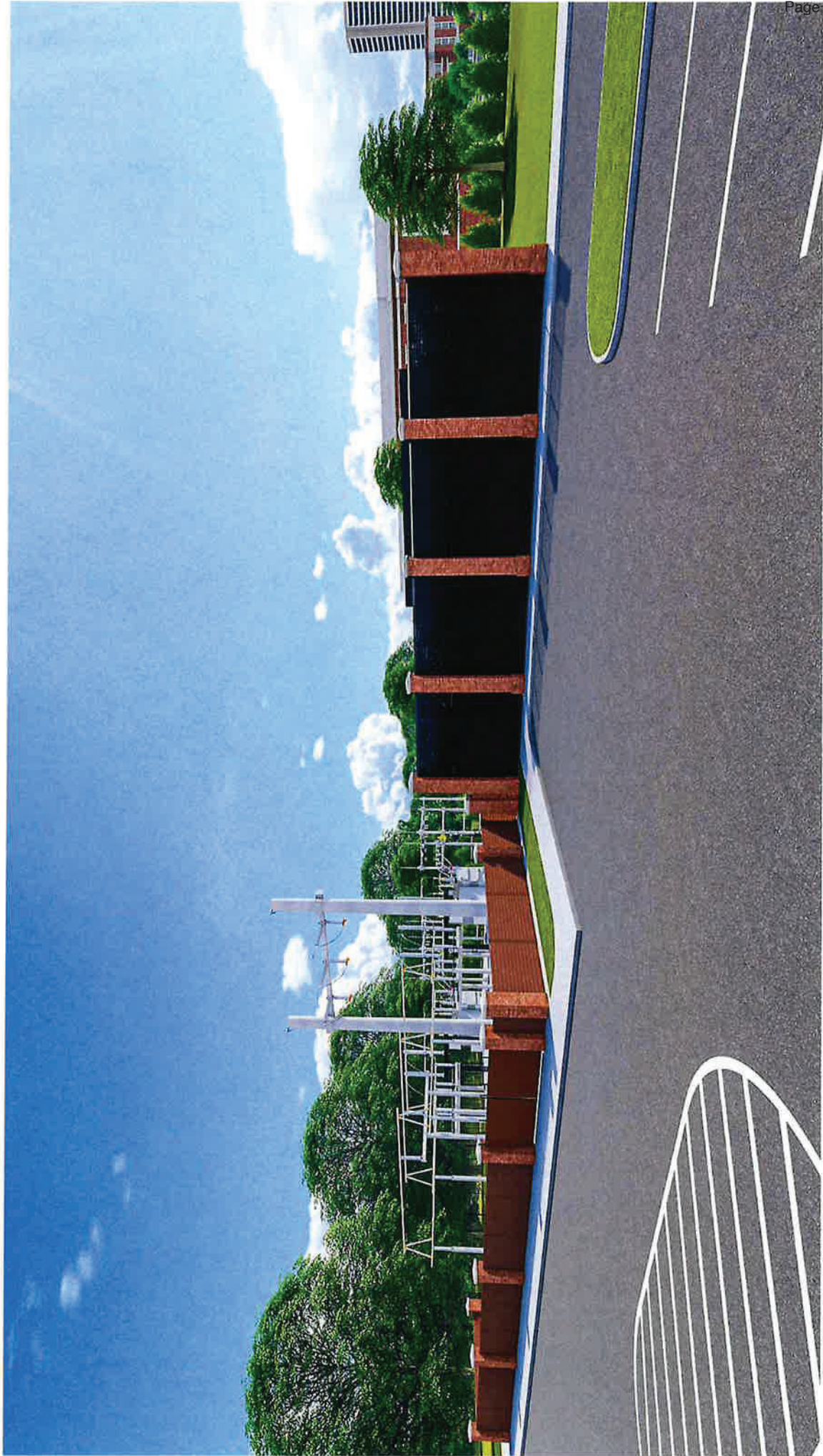
HIGH PERFORMANCE COMPUTING AND DATA CENTER

View 3 (Alternate) – Back of building facing west



HIGH PERFORMANCE COMPUTING AND DATA CENTER

View 4 – New electrical substation facing south



HIGH PERFORMANCE COMPUTING AND DATA CENTER

View 5 – McFarland Blvd facing West



HIGH PERFORMANCE COMPUTING AND DATA CENTER

Massing Study

Name of Building	Height from Finished Floor to Roof Ridge	Width	Depth
High Performance Computing	43'-8"	208'-0"	176'-7"
Capstone College of Nursing	62'-0"	364'-0"	125'-0"
700 Building	12'-5.5"	312'-0"	252'-0"

HIGH PERFORMANCE COMPUTING AND DATA CENTER

LOCATION MAP

