PennState
Physical Plant

Office of Physical Plant
Physical Plant Building
University Park, PA 16802-1118

DATE: April 1, 2025

SUBJECT: **Request for Proposals (RFP) - Architect/ Engineer (A/E) Team Selection**
FRONTIER Building Feasibility Study
PSU Project #001009100
University Park, PA

TO: Flad Architects
Gensler / Burns & McDonnell
Goody Clancy
HDR
HOK / Merrick
KieranTimberlake
Page
SmithGroup
Stantec
ZGF Architects

PART 1: PROJECT INFORMATION and OWNER REQUIREMENTS

The Pennsylvania State University (PSU) wants to first thank the 26 submitting teams that expressed interest in this project. After careful review of the submitted Letters of Interest, we congratulate the ten A/E teams who were selected to continue to the next step in the process - invitation to respond to this Request for Proposal (RFP). PSU uses a qualifications-based A/E Team Selection Process with three assessments: Long-list (based on Letter of Interest), Short-list (based on Proposal responses), and Interviews.

Proposal responses are due by **Noon on April 25, 2025.** After review of Proposal responses, the Screening Committee will identify three firms for interviews. The Short-List/ Interview Notice will be posted to the OPP website on **May 20, 2025**. Interviews will occur on **June 13, 2025.** Non-Binding Fees will be requested of the three Short-Listed teams, which will be due just prior to the respective Interview.

PROJECT OVERVIEW

In May 2022, Penn State and Westinghouse entered a groundbreaking partnership to research and develop micro-reactors for clean, sustainable energy. This collaboration is the first of its kind between Westinghouse and a university in the United States, marking a significant step toward integrating nuclear innovations into societal needs. The *eVinci microreactor* is designed to meet diverse energy needs, from large communities to remote applications. Its compact size allows for easy transportation and quick installation, making it a viable solution for areas lacking reliable energy sources.

The Westinghouse 15 MWth eVinci microreactor design will be used for the research platform. The eVinci microreactor design offers continuous power for at least 8 years on a single fuel load. It is expected that the reactor will come online in the 2028 to 2029 timeframe.

Building upon the Penn State legacy of excellence, FRONTIER will establish Penn State and the Centre Region as the destination for nuclear engineering & science, energy, and advanced manufacturing education, research, and workforce development. The microreactor research platform in combination with laboratory, visitor, and education spaces will enable the acceleration of the development and application of microreactors through advanced research and development, outreach, education, and training. The FRONTIER website: https://frontier.psu.edu.

PROJECT GOALS AND BUILDING PROGRAM

The FRONTIER microreactor research platform and visitor center is a comprehensive initiative aimed at advancing nuclear research and community engagement at Penn State. The program goals are encapsulated in the "5-E" framework, which includes “Engineering Research, Engagement with the community, Energy Production, Environmental Sustainability, and Efficiency” of cost and schedule deployment. An important goal of the program is expanding community engagement through the establishment of a visitor center, which will be operational before the actual facility construction begins. This center will provide educational and interactive experiences to the public, fostering a better understanding of nuclear energy and its benefits.

Platform Versatility

- The FRONTIER platform, while designed specifically for the current Westinghouse eVinci reactor design, should also have the flexibility to potentially use updated Westinghouse designs, if the need arises.
- From a functional standpoint, fixed safety and security related facility elements such as shielding and physical barriers should be designed for eVinci and potential updates.
- The variable and reactor specific elements such as controls will be designed based on the eVinci reactor, however these elements should be designed in a modular form to allow for their replacement if necessary.
- A second microreactor bay will be needed for a future microreactor that will be delivered, installed, and prepared in advance of end-of-life for the initial microreactor for transition of operations. The initial microreactor will remain onsite for an extended time following the transition to enable decommissioning and preparation for transport to a Westinghouse processing facility.
- The facility must support compliance with all federal, state, and local regulatory requirements for a research and test reactor facility to include delivery and removal of a microreactor.

Research Adaptability and Building Functionality

The initial concept is to design and construct a new facility bringing together reactor operations, research, outreach, and education. The reactor operations spaces should enable continuous operations using the Westinghouse e-Vinci microreactor technology (with the flexibility outlined above). This would include 2 microreactor bays along with the power conversion and support equipment for an operating microreactor. Additional spaces will house state-of-the-art facilities providing:

- Reactor bays and supporting equipment (25,000 gsf)
- Research laboratories, faculty offices, and the community visitor center with a Digital Twin 3D visualization space (25,000 gsf)

- Optional: Classroom, training spaces (25,000 gsf)

Options for site arrangement might be required to accommodate safety and security requirements for eVinci deployment. Security for research and test reactor facilities and handling radioactive materials with controlled personnel and vehicle access will be required in the site design.

The FRONTIER platform will provide the potential for integrated energy systems research by inclusion of renewable energy infrastructure into the FRONTIER platform.

- Support the development of microreactor technology by enabling end-users to test the possibility of employing the generated heat, radiation, electricity or a combination thereof for their specific use-case.
    - Efficient energy storage systems
    - turbine for electricity delivery
    - Isotope production
- The FRONTIER project may include associated space adjacent to the reactor:
    - Laboratory space*
    - Faculty offices
    - Student classrooms
    - External research space (PIMA members / other industry collaborators)
    - Training simulator (digital twin) to be designed to emulate a real operating unit. This will include utilizing real data from equipment qualification and computer simulations. The simulator will also include stochasticity to reflect real operating data point uncertainties.
    - Visitor Center for community engagement providing educational and interactive experiences for a wide range of audiences.

    *The following technical considerations should be accounted for in laboratory space design, including size, layout and number of separate areas required:
        - Process heat utilization research to provide thermal coupling capability
        - Neutron beam research for material studies and non-destructive examination.
        - Neutron activation analysis to measure minute quantities of an element.
        - Radioisotope production for medical and industrial use.
        - Hot cell facilities required.
        - Small animal lab for testing medical use of isotopes.
        - Medical imaging facilities.
        - Ready access to radiochemistry labs without the need for transporting radioactive materials.
        - Neutron irradiation for materials testing for fission and fusion reactors.
        - Neutron transmutation doping of silicon, gemstone coloration, etc.
        - Education and training in all nuclear technology areas for operators, maintenance and operational staff of nuclear facilities, radiation protection personnel, regulatory personnel, students, and researchers.
        - For design purposes, it should be assumed that the research facility users may potentially perform activities simultaneously.

- The research conducted at FRONTIER will drive advancements in microreactor technology, including:

- Developing applications for microreactor-generated heat and electricity to decarbonize industrial processes.
- Supporting the production of medical radioisotopes for advanced treatments.
- Advancing materials science to enable innovations in clean energy.
- Test and evaluation of unique aspects of microreactor facilities such as delivery, installation, and removal of microreactor designs (inert fuel), security, and safeguards.
- Connect to existing steam plant facility or electrical grid to give excess heat or electricity generation.

The University desires to hire an architectural and engineering consultant team to develop a feasibility study for this proposed new facility. The preliminary scope of work will include:

- Meet with the University's Building Committee to confirm the scope and program (virtual when possible)
- Meet with users to develop a basic program document (virtual when possible)
- Assist with developing and then summarizing the mission and vision of the project.
- Site analysis of multiple locations (Identify and investigate potential siting options) – identify adjacencies. Provide an assessment of the proposed sites.
- Establish optional program scopes with flexibility and options described above.
- Establish a preliminary budget. Review the budget and provide a high-level breakdown of costs and fees with the committee.
- Renderings of options to support engagement and outreach.
- Utilize e-Builder processes for this study.
- Determine a high-level schedule that includes design and construction durations.
- Review the progress of the scope, program, and related data with specific OPP stakeholders prior to submitting the first draft.
- Prepare and submit a draft report and final report for review and comment by the University.
- Assist the project leader with the preparation of graphics and metrics for PDRB Gate 1 Programming

The study may be used as the initial basis of design and for procurement of the design professional. <u>This study needs to define multiple potential options for advancement of the project. The study should not make a final design/program recommendation nor make final recommendations about advancing the project.</u>

PROJECT SCOPE

It is critically important that the Architectural/Engineering team have experience with:

1. Complex research environments and laboratories to include the use and storage of radioactive materials with complex federal, state, and local regulatory requirements.
2. Integrated, controlled security access to enable operations and researcher access to authorized personnel only while also providing controlled access for visitor center spaces.
3. Creation of flexible research facilities that are cost effective, well thought-through design solutions.

Task 1: Building & Site Assessment and Existing Conditions Analysis:

The Building Assessment task is to focus primarily on the existing building and surrounding site.

- Assess and evaluate the existing site, potential new facility sites and how the area surrounding the existing facility might best be planned and utilized.

- Assess and evaluate existing utilities to the existing building and determine capabilities and capacities for new construction and/or major renovations.
- Develop space assessment and program analysis.
- Determine which programs are best suited in the new building construction versus programs/function left or moved into heavy- or light-renovated facilities. Consultant to study options based on programmatic drivers/needs, overall facility process and workflows, programmatic adjacencies, existing building conditions, and other factors to be defined.
- Determine of overall "building suitability", respective to factors, such as: capital and life cycle cost, long term phasing scenarios, ability to address maintenance backlog in different planning scenarios, ability to achieve university accessibility, energy efficiency, and building shell and structure (vibration, floor to floor, ability to change, code/ seismic upgrades that could be triggered, etc.), MEP/FP systems, etc.
- Consider strategic facility improvements to existing facility to enhance ability to support current and future research functions.
- Provide an assessment of the existing and proposed sites.

Task 1 Meetings:
Anticipate monthly meetings through this phase. When possible, according to the University Guidelines, interview sessions should be conducted in-person and on campus and should be conducted with Academic Department representatives, on-site facilities department and University Park OPP representatives. Other meetings could be held virtually as warranted.

Task 1 Deliverables
Building & Site Analysis and Assessment Findings

Task 2: Space Needs Analysis & Program Development & Site Selection
Evaluate and assess space usage, office requirements and related data in the existing buildings to determine if there is space to support the current activities and programs.

- The study will work closely with Planning, Design and Properties to evaluate and assess research space usage, space requirements and related data.
- Meet with users to develop a basic program document.
- Summarize the mission and vision of the project.
- Work with administration to finalize overall space projections and needs for new or renovated facilities including the identification of facility's needs and programming gaps for present and future.
- Organize existing data analytics and utilize data as planning and design drivers.
- Provide the estimated space requirements for future activities and programs.
- Develop the initial program space document for new space.
- Perform site selection analysis to determine the best placement and arrangement of the building on campus. Review of impact to University Planned District (UPD), zoning, and related permitting. Provide a summary of expected permits should this project advance to design.
- Site utility scope. Understand what site utilities and capacities the building needs.
- Provide a summary list of permits that will or may be required for this project to advance to the design stage.
- Provide assessment and evaluation of process flow including materials, systems, people, and waste.
- Provide an assessment and evaluation of maintenance and operational efficiencies and costs.

Task 2 Meetings:
Anticipate monthly meetings through this phase. When possible, per University Guidelines, interview sessions should be conducted in-person and on campus and should be conducted with Academic Department representatives, on-site facilities department and University Park OPP representatives. Other meetings could be held virtually as warranted.

Task 2 Deliverables
Space Needs Analysis and Program Summary

Task 3: Planning Scenarios and Concept Design:

- Work with PSU OPP to develop planning drivers and priorities
- Apply the established space and facility projections and growth needs to create, develop, and analyze planning scenarios
- Develop a clear and feasible strategic, prioritized and phased framework for the planning and development of capital investments. Identify multiple scenarios for capital project investments.
- Provide multiple planning scenarios that address the findings from Tasks 1 and 2. Provide an understanding of cost and logistical complications with each scenario along with other pros and cons. Utilize stacking diagrams to help illustrate the options. Additionally, address short- and long-term opportunities with each option.
    - Develop basic concept level floor plans and building massing to help convey design ideas presented in the planning scenarios which may include any additions and renovations that are required to meet future space needs,
    - Design and sequence improvements whereby faculty, students, and staff may be relocated in whole or in part to other facilities required to accommodate this effort.
- Develop Conceptual Design for building and site. Include concept level building/engineering/site/civil/utility/landscape scope. Calculate the impervious surface and green space addition/loss.

Task 3 Meetings:
Anticipate monthly meetings through this phase with the core working group consisting of the Administration, Academic Department representatives, on-site facilities department and University Park OPP representatives. Meetings may consist of both in-person and virtual platforms.

Task 3 Deliverables
Planning Scenarios findings
Draft report outline

Task 4: Cost Estimate and Schedule
Develop a conceptual cost estimate and schedule for any proposed planning scenario.

- Review the budget and provide a high-level breakdown of costs and fees.
- Determine a high-level schedule that includes design and construction durations.

Task 4 Meetings:
At least two meetings with the core working group that may be combined with other agenda tasks. If held separately, these meetings can be on a virtual platform.

Task 4 Deliverables
Cost Estimate and Schedule

Task 5: Final Presentation
Provide a final presentation to administration and physical plant representatives on scenarios and costs to implement the building program study. This study should not make any recommendations about advancing the project or make any recommendations about various programmatic options.

- Review progress of the scope, program, and other data with specific OPP stakeholders prior to submitting the first draft.
- Prepare and submit a draft report and final report for review and comment by the University.
- Assist the PSU project leader with preparation of graphics and metrics for PDRB Gate 1 Programming

Task 5 Meetings:
At least one virtual meeting with the core working group and several virtual work sessions with the PSU Project Manager.

Task 5 Deliverables
Final presentation and final report

PROJECT DELIVERY METHOD, and OWNER REQUIREMENTS
The following supplemental documents are relevant to this RFP:

- Form of Agreement. Included is the link to our Form of Agreement 1-S: https://oppwiki.atlassian.net/wiki/spaces/OPPDCS/pages/5409499/Division+00+-+Procurement+and+Contracting+Requirements?preview=/5409499/5409260/Form%20of%20Agreement%201-S.pdf%20Division%2000%20-%20Procurement%20and%20Contracting%20Requirements%20-%20OPP%20Design%20and%20Construction%20Standards%20-%20Confluence

  Please review this agreement to ensure that your firm accepts all terms and conditions as written. In submitting a proposal for this project, you acknowledge that you concur, without exception, with all terms, conditions and provisions of Form of Agreement 1-S.

- Office of the Physical Plan (OPP) Standards. The web sites www.opp.psu.edu and https://oppwiki.atlassian.net/wiki/spaces/OPPDCS/overview provide information regarding specific design submission requirements and standards, of the University.

- OPP High Performance Standards. The University has a commitment to environmental stewardship and requires the maximum possible use of sustainable and energy-efficient designs and specifications, for architectural, site, utility, structural, mechanical, electrical, and plumbing work. Refer to the following link for the University's high performance standards that exceed

building code minimum requirements:
https://oppwiki.atlassian.net/wiki/spaces/OPPDCS/pages/5409436/01+80+00+PERFORMANCE+REQUIREMENTS

Apart of this is PSU's High-Performance Building Design Standards: Building projects shall comply with ASHRAE Standard 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings, 2010 version AND as superseded by more stringent requirements of ASHRAE Standard 189.1 Standard for the Design of High-Performance Green Buildings, 2011 version. The standard defines a minimum requirement of LEED Certified for this project.

PART 2: PROPOSAL REQUIREMENTS

CONTACT

Contact Neil Sullivan, nsullivan@psu.edu or Julie Patrick, jat280@psu.edu directly if you have any contract, programming or design related questions.

PROPOSAL REQUIREMENTS

Please answer all the questions in the order requested. Limit the entire document to twenty (20) 8-1/2 x 11, portrait formatted, single-sided pages. Submit the Technical Proposal in PDF form electronically to Neil Sullivan with a copy to Julie Patrick. Late submissions will not be considered.

FORM OF AGREEMENT

The successful team will be contracted through the University's Form of Agreement 1-S. The link to this form is above. Please review this agreement to ensure that your firm accepts all terms and conditions as written. In submitting a proposal for this project, you acknowledge that you concur, without exception, with all terms, conditions and provisions of the Form of Agreement 1-S.

PROPOSAL DOCUMENT FORMAT

Proposals shall follow the format below in the order stated to ensure that all pertinent information necessary for evaluation is included and easily comparable by the Selection Committee. OPP encourages you to be as brief as possible without sacrificing accuracy and completeness.

Note 1: As applicable throughout the Proposal, provide professional credit to architectural partners (including design architect, architect of record, academic/planning partners) for all projects discussed within the Proposal and for all project images shown.

Introductory Letter

The cover letter should be two pages maximum. The cover letter should include at least the following:

- Legal name of the Prime Planning Team.
- Contact information for the Planning Team's primary point of contact (name, address, phone, and email
- A concise summary as to why the Team is best suited for this project
- Statement of certification that all information provided in the submittal is accurate

Section 1.0 –TEAM STRUCTURE

Identify prime firm and key consultant firms, size of prime firm, each firm's role on this project, and each firm's qualification and experience on similar projects. Identify past collaboration between prime firm and key consultants.

A. Provide team organizational chart. Include prime and key consultant firms and provide the name and role of key team members. Clearly identify which team members are designated for leadership positions on the team. Please highlight any Diverse Business Enterprise program (DBE) representation on your team.

B. Provide role descriptions and resumes of key team members identified in the organizational chart. Include registrations/ certifications, educational background, years of experience, and relevant project experience. Relevant project experience should include size, budget, program type, project overview, and define what each team member's role was on each project listed on their resume. Emphasize each team member's most relevant experience and ideally highlight that the team member has had comparable roles on similar projects. Include at least two client references for each key team member. **If possible, please avoid using Penn State employees as references.**

C. Include resumes for, at least, the following key team members:
    a. Principal in Charge (Project Team Lead)
    b. Project Manager (PSU's day-to-day point of contact)
    c. Lead Programmer/Laboratory Programmer/Planner
    d. Nuclear facility expert
    e. Campus Planner, Site Designer and/or Landscape Architect
    f. Lead MEP Engineer(s)
    g. Cost Estimator

    Note: If any individual(s) is fulfilling multiple project roles, identify multiple roles on the organizational chart and within individual resumes.

Section 2.0 – TEAM QUALIFICATIONS

A. Provide a summary of the qualifications and expertise of the firms with specific emphasis on:
    a. Planning/Programming/ Design Excellence
    b. Distinguishing factors of team differentiation
    c. Experience delivering projects of a similar scope, scale, and complexity
    d. Leading edge integrated practices/processes for project delivery, stakeholder engagement and alignment. Experience applying LEAN principles to improve processes.
    e. Expertise in the programming, planning, design, and delivery of nuclear science facilities.

B. Identify a maximum of five (5) example projects and/or studies within the last ten (10) years, which BEST exemplify qualifications and expertise listed above for the proposed team. Include brief description of each project, project gross square feet, project budget, final project cost, and completion date of project. If a project is under construction, list the scheduled date of completion.

C. Project Relevancy Matrix. Develop a matrix that illustrates the similarities between the example projects and this project. Please be as specific to our project, as possible.

D. People-Projects Matrix. Develop a matrix to show the participation of key individuals from your proposed team on the example projects. List individual's role on example projects.

E. Acknowledgment of your review and acceptance of the attached Form of Agreement 1-S, ensuring that your firm accepts all terms and conditions as written.

Section 3.0 – PROJECT APPROACH AND SCHEDULE

A. Describe the approach your team will take for planning, managing, and executing the study process.

B. Discuss your approach to helping the client through the decision-making process(es), approach to meeting project goals and expectations, and the approach to programming/planning/design process.

C. Provide a statement validating the proposed project schedule and your entire team's availability to appropriately staff the anticipated workload.

D. Approach to developing project visioning and project mission/goal setting. And your approach to establishing a design process that works to achieve the project vision and goals.

E. Approach to leveraging/developing building planning options and/or overall campus planning or site selection options.

Section 4.0 – PROJECT-SPECIFIC KEY DRIVERS AND IDEAS

A. Project Understanding. Briefly demonstrate your understanding of the project. Provide any observations of the project program or other provided information.

B. To indicate your understanding of the project, describe key project drivers and/or critical design elements that your team has identified as a priority for this specific project. For instance, what issues or drivers, beyond purely functional issues, constitute the essence of this project? If not done previously in your Proposal, discuss how you addressed similar issues on similar projects.

C. Describe your unique knowledge about nuclear science facilities and labs. What makes them unique, what are the programmatic or design drivers? Very briefly summarize your understanding of whether or how the mechanical and electrical systems may influence the design of this facility.

D. Describe how you would assess and evaluate the process flow (materials, people, waste) within a nuclear science facility then how you would use this information to inform the programming/design/arrangement of a new facility.

E. Describe how you would assess the maintenance and operational costs and develop criteria to use for providing a facility that will be easy to maintain and function on a low operating budget.

F. Provide any final considerations regarding the project. Considerations may include your thoughts/opinions related to the project site, program elements, and/or any other design considerations.

ARCHITECT/ENGINEER (A/E) TEAM SELECTION PROCESS SCHEDULE

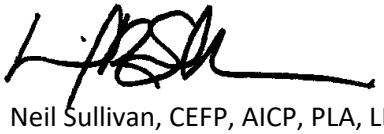
- Proposal responses from the Long-listed teams are due in my office at **Noon EST on April 25, 2025**
- Up to three short-listed firms will be chosen from the RFP respondents. The short-list results and interview notice will be posted to this website by the end-of-day on **May 20, 2025**
- Video interviews (Zoom), if needed, will be scheduled for **June 13, 2025.**

You may visit the public areas of the campus/site during this A/E Selection process. But guided campus/ site tours are not provided at this stage.

Participation in this A/E Team Selection process is voluntary and at no cost or obligation to Pennsylvania State University. PSU reserves the right to waive any informality, in any or all submissions, and to reject any submission or portion thereof. PSU reserves the right to modify dates as/if it deems necessary. News releases pertaining to this project will not be made without prior approval from PSU, and then only in coordination with PSU. All information, documents, and correspondence shared within the A/E selection process are to remain confidential, and as such, are not to be made public in any manner. Additionally, the University may hold all proposals for up to 45 days.

Please contact me or project manager Julie Patrick (814.865.8768 or jat280@psu.edu) with any questions regarding the projects or the A/E Selection process.

Respectfully,



Neil Sullivan, CEFP, AICP, PLA, LEED AP
University Planner
The Pennsylvania State University
814.863.3158
nsullivan@psu.edu

CC: Screening Committee