

REQUEST FOR QUOTE



pennsylvania
DEPARTMENT OF GENERAL SERVICES

**Commissioning
Agent Services**

**MICHAUX STATE
FOREST**

*RESOURCE
MANAGEMENT CENTER
& STORAGE BUILDING*

Project No.
DGS C-0197-0062
Phase 1

Technical Submission

aramark 
ENGINEERING
SOLUTIONS

2400 Market Street
Philadelphia, PA 19103

March 20, 2024

Benjamin Cassidy
PA Department of General Services

Re: Commissioning Agent Services for DGS C-0197-0062 Phase 1

Dear Benjamin,

We are pleased to respond and provide a proposal and cost estimate for Commissioning Agent Services during the design stages of the Department of General Services Project No. DGS C-0197-0062 Phase 1, Michaux State Forest Resource Management Center and Storage Building project.

Aramark is familiar with the DGS requirements for construction and has worked on many projects for DGS. Kevin Barber is slated as the project manager for this project. Kevin's home office is based in York, PA so he is very close to this project geographically, allowing for great efficiency in travel time and any possible expenses. Kevin has two family cabins in the Michaux State Forest so is frequently in the area and has also completed commissioning projects for Penn State University at the Mont Alto campus in the surrounding area. This will allow for great flexibility in minimizing associated expenses.

Kevin will be supported by Allison Bailey, P.E., Frank Snyder, P.E., LEED-AP, CxA, EMP, Manas Vaidya, Boyd Hoats, and Dave Bacco for mechanical, electrical systems, controls, and building envelope commissioning. This team has performed similar tasks for many of our references listed within our response. Tim Sullivan, Director of Commissioning, will provide quality control and support.

Aramark is uniquely qualified for this project with most of our team members originating in the controls field. We have intimate experience with various control systems and many of our people have programmed these systems. Additionally, we are skilled in this type of control and monitoring and will verify that the correct programming and reporting is completed.

We look forward to continuing and strengthening our relationship with the Department of General Services. Should you have any questions, please do not hesitate to contact Tim Sullivan, Director of Commissioning Services at (914) 304-6252 or sullivan-timothy@aramark.com.

Sincerely,



Brian Lee, P.E., Vice President, Engineering Solutions
Authorized Signatory of Aramark Management Services
Limited Partnership



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A. CONTRACTOR PRIOR EXPERIENCE

For more than 40 years, Aramark Engineering Solutions has demonstrated proven expertise in developing and implementing energy management programs that promote sustainability and conserve energy. Whether we're working with higher or primary education clients, we bring a customized approach based on the individual drivers of each organization. Aramark is one of the largest third-party commissioning agents in the United States, and it is our unique operational expertise distinguishes our service from our competitors.

Our commissioning philosophy is guided by the following three tenets:

1. Provide a facility that operates to support the educational program.
2. Verify systems achieve peak efficiency.
3. Confirm building infrastructure is readily maintainable by the operators.

Our services will further facilitate a seamless transition to the operations group and provide a technical resource to support building operations.

Experience At A Glance

Total Projects Commissioned: **900+**

Total GSF Commissioned: **70+ Million**

Constructed Value of Commissioned Projects: **\$11.2 Billion**

Select Aramark Commissioning Clients

- Baylor University
- City University of New York
- Centenary College
- Drew University
- Edinboro University
- Franklin & Marshall College
- George Washington University
- Institute for Advanced Study
- NYS Office of Mental Health
- Ohio State University
- Penn State University
- Princeton University
- Rutgers, State University of New Jersey
- State of Pennsylvania (PADGS)
- University of Pittsburgh
- University of Kentucky
- University of Pennsylvania
- Washington College
- West Chester University
- West Virginia University

FACILITIES COMMISSIONED

- Large office, classroom, academic, and computer facilities
- Heating, cooling plants and major electric infrastructure
- Science, research, vivarium, BSL3 and laboratory
- Recreation centers (athletic & aquatics)
- Campus & performing arts centers
- Museums, libraries & cultural institutions
- Residential halls
- K-12 Schools and Campuses
- Retro-commissioning of existing buildings and systems



ARAMARK HEADQUARTERS – TENANT IMPROVEMENT Philadelphia, PA

CONTACT:

Steve Munz
215-625-8550, ext. 104

GROSS SQUARE FEET:

279,300 Across 3 Floors

CX SERVICES:

MEP Systems Review
Design Review
Installation Inspections
Performance Verification
Operations Training

SCHEDULE:

2017 – 2019



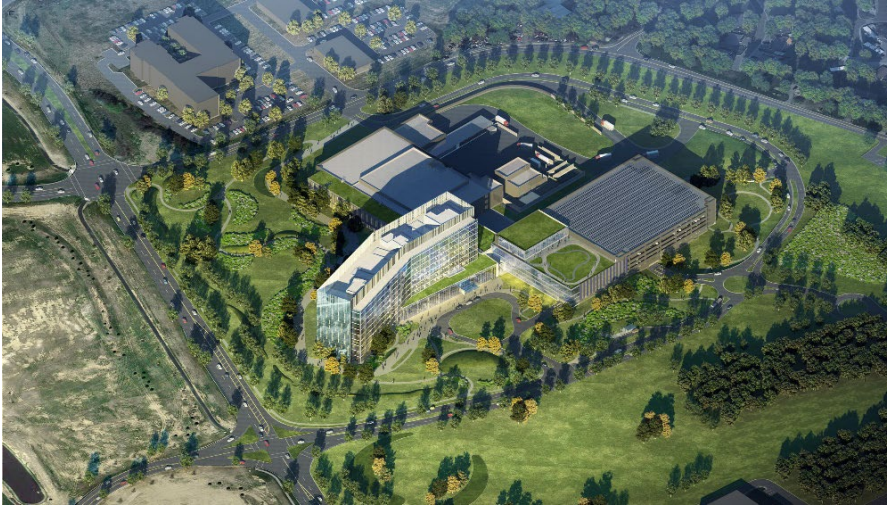
Aramark moved its headquarters to a new building and sought to create a world-class headquarters space that represents Aramark's commitment to food, fitness, and fun. The layout includes offices, open seating, breakout collaboration areas, an interconnecting stair across the five floors, meeting/conference rooms, pantry, print/post rooms, mother rooms, AV/VC, storage, reception, security desk, etc.

COMMISSIONING SUCCESS:

Commissioning was incorporated into the project early on in design phase in June 2017 and continued into the Warranty phase through July 2019. The higher priority issues found and reviewed via commissioning meetings and team collaboration and resolution include the following:

- VRF System on 5th-7th Floors – About 20% of the VRF tested experienced performance issues with not meeting expected temperatures in heating or cooling mode. Generally, there were power or alarming issues on some of the VRF and also some graphical issues and temperature set point or mode issues that will cause confusion amongst operations staff and occupants.
- Perimeter Hot Water System, Boiler, Pumps, Control Valves – Temperature control tuning issues were observed by Aramark. Other variables impacting temperature control are the nine (9) zone valves controlling to perimeter zones based on an average of thermostatic zones on multiple floors. Additionally with elevated temperature set points of 73 or higher this is limiting the valve operation and impacting system control.
- Air Conditioning Units AC-1,2; Rooftop Unit RTU-1 serving 7th Floor Fitness Center – AC-1,2 experienced issues with cooling operation during testing and contractor has planned to review. The RTU-1 that serves as an energy recovery ventilation unit for the Fitness Center has many discrepancies from design equipment schedule, sequence of operation, and controls that were corrected by the mechanical and controls contractors and verified.
- Thermal Comfort – Aramark found that 15% of zones have temps outside of temperature set points and several temperature complaints are received daily.
- Energy Inefficient System Operation – Aramark observed that all HVAC systems are operating 24/7 without occupancy schedules implemented as required per LEED, basis of design, and owners project requirements. The controls contractor implemented the occupancy schedule to resolve this issue.

AIR PRODUCTS AND CHEMICALS - GLOBAL HEADQUARTERS BUILDING Allentown, PA



Air Products is a world leader in supplying gases and chemicals for industrial uses and in the supply of liquefied natural gas process technology and equipment. The global headquarters is a place that they want to drive innovation of products that improve the environment and make their customer's processes better. Their goal was to create a first-class office environment for their employees to enjoy coming to work and are proud of what they do.

The project consists of a campus comprised of three major components: a 10-story administration building office tower (9 stories above grade and a basement level), a 130,000 square foot Research & Development Building, and a parking garage for 1800 cars. A Well-Being Center with Fitness Center and outdoor track is located on a portion of the upper level of the parking garage.

This scope was unique in that they requested to test 100% of terminal units in the Admin/Office building where typically a 25% sampling rate is used on similar building projects reflecting Air Products comprehensiveness.

COMMISSIONING SUCCESS:

The design review process identified issues related to energy efficiency system operation, thermal comfort, and operations and maintenance that were integrated into the construction process. The submittal process helped identify discrepancies in submittal conformance with design that were reviewed with design team and allowed updates by construction team. Project construction is about 50% complete and a sampling of issues identified to support project team in correction are noted below. These issues were proactively identified and communicated with the team using the construction manager project software for quick resolution by the construction team.

- Building envelope issues related to incorrect curtain wall installation; curtain wall testing identified remediation of sections and missing panels.
- HVAC variable air volume box reheat coils were found piped backwards, volume dampers were not installed, etc.
- Hot water boiler plant testing ensured correct sequencing of condensing boilers and pumping schemes and identified a bad transformer in boiler control panel requiring replacement and flow switch operation.
- Electrical issues related to safety were identified with arc flash labeling, installation issues with transformers, switchgear, grounding bonding jumpers, wiring methods were identified.

Aramark Engineering Solutions

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CONTACT:

Mara Thorne
Project Engineer
(610) 481-5338
thornema@airproducts.com

CONSTRUCTION COST:

\$350 Million

GROSS SQUARE FEET:

460,000

CX SERVICES:

Installation Inspections
Performance Verification
Operations Training and
Coordination
Building Envelope

SCHEDULE:

2019 - 2021

SAINT GOBAIN NORTH AMERICAN HEADQUARTERS Malvern, PA

CONTACT:

Joanne (Jo) Walter
Facilities Manager
484-680-8664
joanne.s.walter@saint-
gobain.com

GROSS SQUARE FEET:
286,000

CX SERVICES:

RCx of the following
sampled systems and
primary source-side
equipment assets:

- Air Handling Units (x10)
- Terminal Air Distribution Equipment (sampled)
- Chilled and Condenser Water Systems
- Steam and Hot Water Systems
- Building Automation System

SCHEDULE:
2021 – 2022



Aramark was tasked with retro-commissioning the roughly 286,000 GSF North American Headquarters LEED Platinum facility. This process was energy focused with emphasis on documenting current usage and improved usage allowing for metrics of overall energy savings. This process sought to improve upon the usage and operation of the primary systems, ultimately reducing the site's EUI and utility spend through scheduling, tuning, repairs, deferred maintenance, and sequence adjustments.

COMMISSIONING SUCCESS:

Through on-site evaluations, functional testing, and remote building automation system review, Aramark identified a total of 94 measures. Of these, 26 were Energy Conservation Measure (ECM) opportunities with a potential annual cost savings of \$64,000 and a total of 4,464,392 kBtu per year energy savings (includes 770,940 kWh electric energy savings and 1,876 MCF gas savings per year). This is an approximate 15% reduction for the facility and equates to approximately 643 metric tons of greenhouse gas emissions and 140 cars off the road or planting 29,462 matured trees. Contractor quotes were obtained on behalf of the Owner for implementation of the identified ECMs and return on investment was calculated to have an overall project payback of -1.3 years. The remainder of the measures identified were Facility Improvement Measures (FIMs) for continuous enhancements.

Select issues observed:

- All AHUs in need of re-balancing and sequences tuned.
- Plant staging logic in need of revision – simultaneous heating/cooling occurring.
- Cooling tower fan VFDs in need of integrations.
- Plant pumps in need of VFDs; some in need of repair.
- Loop bypass valves found to be compromised.
- Loop heat exchangers in need of cleaning.
- Global OAT/RH sensor found to be installed in direct sunlight falsifying data.

SHAVERS CREEK ENVIRONMENTAL CENTER Penn State University, State College, PA

Located in the heart of central Pennsylvania, Shaver's Creek provides educational and recreational opportunities for families, schools, corporate groups, and Penn State students.

The Shaver's Creek Environmental Center Additions and Renovations project consisted of approximately 10,400 square feet of new construction and 2,400 square feet of renovations. The Main Building and new Lower Classroom Building utilizes a Variable Refrigerant Split System. The Main building also contains an Energy Recovery Ventilator.

COMMISSIONING SUCCESS:

Aramark generated several issues from static inspections and functional testing. Some of the commissioning finds include:

- VRF in the main building had a power issue and was not working at time of inspection.
- VRF in the main building in one of the rooms moved air but did not heat or cool.
- Final tie-in of the condensate drains for select VRF units to the downspouts was necessary upon installation.
- Domestic HW was slow in getting to the hand sinks.
- BAS graphics were incorrectly linked to VRFs in several spaces. Revision of graphics was required.
- Infrared testing was conducted early morning under cloudy/rainy weather conditions and included all external elevations and the roof surfaces as viewed from ground level. Although the internal temperature of the facility was approximately 70+°F with an external air temperature of 38+/- degrees, however, the buildings could not be pressurized.

CONTACT:

Doug Wenger
814-863-9622
jdw132@psu.edu

GROSS SQUARE FEET:
12,800

CX SERVICES:

Installation Inspections
Performance Verification
Operations Training and
Coordination
Building Envelope

SCHEDULE:

2019 - 2021



PENN STATE MONT ALTO – ALLIED HEALTH BUILDING

Mont Alto, PA

The University constructed a LEED certified, 22,000-square-foot facility that serves as a state-of-the-art learning hub for the campus' Allied Health programs: Nursing, Physical Therapist Assistant (PTA) and Occupational Therapy Assistant (OTA). The facility includes simulation laboratories and an ambulance port for the Nursing program, enhanced clinical space and equipment for the PTA program, and a simulated living space for the OTA program. This was the first new building on the campus in 20 years.

COMMISSIONING SUCCESS:

Throughout the design, construction, turnover and warranty phases of the project, Aramark identified 300+ issues. Below is a list of select critical issues identified that were successfully resolved. We estimate that costs to remedy the MEP issues after the contractors had left would have been \$94,955 with an additional annual energy savings of \$520 resulting in a 0.53-year program payback.

- Suggested addition of VFD to ERV-1 for better unit control and turndown for recurring fan energy savings.
- Suggested monitoring addition to CU-1 to be able to know cooling staging operation and failure alarming for associated compressors/fans.
- Incorporated accessibility of level 3 above ceiling recirculation pump HWP-3 and associated bypass valves operation conflict with ductwork and cable tray for ongoing maintenance.
- Assured that 30+ missing assets were included into the Owner's CMMS asset ID import matrix.
- Confirmed that VAV boxes were scheduled to be at their minimum for UNOCC airflow setpoints. This ensured that full airflow turndown could be achieved during UNOCC hours achieving greater energy savings.
- Recommended relocation of global OA T/RH sensor from ALC to a better location to provide more satisfactory readings and better overall economizer/reset control.
- Performed above ceiling inspections and ensured work completion for items such as: duct/pipe labelling, valve handle extensions/tags, no access issues, no bent/pinched restrictive flex duct, fireproofing, insulation shield installs, etc.
- Recommended that the fire/smoke dampers be designated with unique identifiers and individually tagged out/documentated as maintainable assets.
- Recommended a hydrant be added to the roof for cleaning equipment/washable filters.
- Observed that the lighting occupancy control was not properly tied in for VAV unit control. Benefit to the University: The proper control and monitoring of the lighting control devices allows for reduced energy usage.
- Observed that the water level alarm in the elevator pit was not properly located inside of the sump well and inoperable.

CONTACT:

Douglas Wenger
Project Manager
814-360-7272
jdw132@psu.edu

GROSS SQUARE FEET:
22,000

CONSTRUCTION COST:
\$9.75 Million

CX SERVICES:

Design Reviews
Installation Inspections
Performance Verification
Operations Training and
Coordination

SCHEDULE:
2019 – 2022

LEED STATUS:
Certified



ADMINISTRATIVE AND RESEARCH BUILDING Nemours Children's Health, Wilmington, DE

CONTACT:

Tiffany Arnold
302-333-9530
Tiffany.Arnold@nemours.org

GROSS SQUARE FEET:
147,700

PROJECT COST:
\$7 Million

CX SERVICES:
Design Review
Installation Inspections
Performance Verification
Operations Training

SCHEDULE:
2010-2011



The ARB (Administrative & Research Building) was constructed circa 1940 with subsequent building expansions over the years. The building is a three-story structure with a basement and is adjacent to the main hospital building and central utility plant (CUP) building. The building will support administrative and office functions with plans for a 10,000 gross square foot SIM Center for medical and OR simulations and, potentially, a large conference area in the current

Auditorium space. Existing building utilities include a steam and condensate service from the CUP, natural gas service from the CUP, chilled water piping service from the CUP, and electrical service from the DuPont Pavilion. Emergency power is currently fed from an existing generator.

Aramark evaluated and analyzed mechanical and electrical system options for the future based on several criteria including cost, system characteristics, spatial, and energy categories.

COMMISSIONING SUCCESS:

From the evaluation and analysis, Aramark came back with multiple options for the systems and offered a recommendation for each as seen below. Nemours hired a design team of Tevebaugh Architects with their consultant MEP engineer and based their design on the recommendations.

System	Option #	Option Description	Recommendation
HVAC	1	AHU with heating and cooling coils serve VAV & HW reheat coils.	Option 1
	2	VRF with DOAS with energy recovery, HW & CHW coils	
	3	AHUs with chilled beam.	
CUP Heating	1	Utilize existing CUP boiler capacity	Option 2
	2	Decentralized gas fired high efficiency condensing boilers	
CUP Cooling	1	Utilize existing CUP chiller capacity	Option 1
	2	Decentralized air cooled chiller(s)	
	3	Utilize Existing CUP capacity & Optimize existing CUP chiller plant loads	
Electrical	1	Replace 5kV switchgear and Emergency Generator & ATS', reuse 2001 Switchgear, ATS, transformers, panelboards	Option 1
Solar	1	Consider a minimum of 35.7 kW system for max funding from Green Energy Program grant	Option 1

LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES – OFFICE RENOVATIONS Philadelphia, PA

Langan Engineering's 15,000 square foot "industrial look" office includes open floorplans with a number of private offices and conference spaces, project rooms, and workspaces.

Aramark commissioned the project from construction phase through substantial completion to verify that the installation and operation of the systems and equipment met design intent. We focused our efforts on the building systems and their ability to reliably maintain an environment that is supportive of a research and learning facility. Emphasis was placed on the ability of the systems to function efficiently, reliably, and have the capability to be maintained in top working order minimizing overall life cycle costs. During the turnover stage of the project, we helped facilitate the completion of the Automatic Temperature Controls & HVAC Systems and enabled the project team to understand critical issues which otherwise may have gone undetected. This position showed a value-added initiative towards the goal to provide a building that ultimately has met the performance criteria as established in the basis of design.

COMMISSIONING SUCCESS:

The cost analysis associated with these items yielded a conservative estimate of \$18,270 immediate cost avoidance savings. These savings represent the cost of correcting the issues found during the commissioning process individually after project completion. Based on the contract commissioning cost of \$12,575, the simple payback of the building commissioning services is 0.7 years or 8 months.

From the start of construction until the end of functional testing there were a total of 25 deficiencies noted. Examples of issues discovered are noted below.

- Thermal Comfort and Indoor Air Quality: A good portion of issues discovered (62%) were Thermal Comfort and Indoor air quality deficiencies. These issues affect the space temperature control and quality of ventilation air provided throughout the building.
- Operations & Maintenance: Issues that were categorized as 'Operations and Maintenance Issues' (32%) were deficiencies that involved the possibility of future costs associated with repair, labeling, and/or investigation.
- Equipment/System Failure: A number of issues (16%) were noted for equipment / system failures that require a replacement of equipment due to reduced life cycle costs or improper control /installation.

CONTACT:

Sarah Paddock,
Project Manager,
Avison Young
973-898-6360

GROSS SQUARE FEET:
15,000

CX SERVICES:

Installation Inspections
Performance Verification
Operations Training and
Coordination

SCHEDULE:

2015 – 2016



CHILDREN'S SOUTH FAYETTE MEDICAL OFFICE BUILDING University of Pittsburgh Medical Center, Bridgeville, PA



Resembling Children's Hospital of Pittsburgh in Lawrenceville, UPMC constructed the Children's South facility in Bridgeville. This facility has 60,000 square feet of medical office space provides pediatric outpatient services, primary care, and after hours care. The facility includes an MRI and caters to many pediatric sub-specialty care. There is also a 15,000 SF open gym and exam room space for rehabilitation services. The project obtained LEED certification.

COMMISSIONING SUCCESS:

Aramark identified over 123 issues during design and construction relating to the building envelope and mechanical, electrical and plumbing systems.

Some of the more significant finds of building envelope commissioning included:

- During design reviews many items were found to be lacking a great deal of detail concerning the installation of fluid applied vapor barrier. This greatly affected the installation of gyp board terminations at the tops and bottoms of flashing. Greater detail was issued in the form of an architectural supplemental instruction reducing change order costs and the possibly of a poor installation.
- An infrared scan of this building indicated that it was extremely tight and energy efficient. This report has been included as a sample report in this proposal. The scan was coordinated utilizing mechanical systems to pressurize and heat the interior structure while the outside of the building was shot with an infrared camera.
- Coordinated efforts between the local onsite commissioning project manager and the building envelope specialist allowed for a frequent detailed look at the building.

CONTACT:
Jim Froehlich
Project Manager
froehlichj@upmc.edu
412-578-9586

GROSS SQUARE FEET:
60,000

CONSTRUCTION COST:
\$24 Million

CX SERVICES:
Design Review
Installation Inspections
Performance Verification
Operations Training
Building Envelope

SCHEDULE:
2013-2014



JACOBSBURG STATE PARK VISITOR'S EDUCATION & ADMINISTRATIVE FACILITY Nazareth, PA

CONTACT:

Paul Ebright, P.E.
717-783-7929
pebright@state.pa.us

GROSS SQUARE FEET:

11,000 GSF

SCHEDULE:

2013-2015

CX SERVICES:

Design Review
Installation Inspections
Performance Verification
Operations Training
Building Envelope

CONSTRUCTION COST:

\$3.3 Million

Jacobsville Environmental Education Center is a 1,168-acre Pennsylvania state park offering environmental education from preschool to high school-level environmental programs, historical programs, teacher workshops, and public interpretive programs.

COMMISSIONING SUCCESS:

Aramark identified a total of 118 issues, including 50 found during design and 68 during construction. From the commissioning activities we can attribute an estimated \$53,500 in cost savings and an estimated \$7,500 in energy savings.



Some of the more notable issues included:

- **Thermal Comfort and Indoor Air Quality:** There were 19 issues identified affecting the temperature control and ventilation air. During site inspection, it was observed that the ductwork was not being protected as stated in LEED EQ 3. The ductwork was originally planned to be cleaned prior to balancing, but upon review, Aramark recommended that the ductwork be cleaned prior to system start-up.
- **Operations and Maintenance:** There were 31 issues identified that impacted O&M. A good example is that the supply and exhaust fans for AHU-1 were continuously shown as in alarm while energized. If not addressed, this would have created numerous nuisance alarms for on-site personnel.
- **System Performance:** During system testing, 7 failure issues were identified where systems or equipment were not fully operational per the design intent. One example was the short cycling of the heat pumps caused by the ground source loop control. The sequence of operation called for ground source supply and return valves V-2 and V-3 to operate in a 2-position manner with V-1 modulating respectively. This did not maintain constant source water temp to the heat pump and resulted in premature component failure in addition to comfort issues. Aramark recommended that bypass valve V-3 be reconfigured as modulating (while keeping V-1/V-2 open), and the unit now operates appropriately.
- **Life Safety:** Eight issues were found during testing, including the main breaker that tripped when the time clock associated with light control was switched to the 'off' position. This was due to the sensitivity of the main breaker being set too low in respect to the current installation.
- **Energy:** Three issues were discovered including the observation during testing that exhaust fans EF-3 & EF-4 were running continuously during occupied mode and controlling to temperature in unoccupied mode, rather than control to temperature 24/7. This item was corrected, and the exhaust fans now stage to control to respective room temperature.

B. PROJECT UNDERSTANDING AND APPROACH

PROJECT UNDERSTANDING

The current Michaux State Forest District Office has reached the end of its usefulness to support the mission and needs. It has limited the appropriate staffing for current and future needs and has made it difficult to efficiently meet operational needs, as well as provide opportunity for public engagement. There is land made up of the South Mountain Golf Course and Brock Seed Orchard that has been flagged as the location for a new resource management center to meet these needs. A new resource center (9,899 GSF), separate Storage Building (8,154 GSF), and site improvements including site access, parking, utility extensions, and all other components needed to develop the site will be constructed.

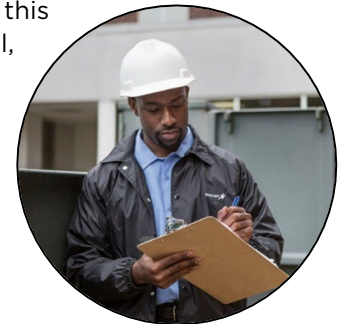
The new facilities will provide for forestry management and administrative functions, forest ranger operations, forest visitor contact point, staff and public meetings, presentations, training, educational opportunities and outreach, and equipment and vehicle storage.

The goal is for the facility and site development to incorporate proven, economical sustainable techniques and technologies that result in an energy efficient and environmentally sustainable facility, supports visitor connections with the outdoors, and demonstrates responsible stewardship of the natural environment. The project should also consider future development opportunities for trail connectivity and RMC complex growth. The design and construction of the RMC will be in accordance with USGBC LEED green building rating system for new construction and will target a minimum Certified rating.

PROJECT APPROACH

It is evident that in order to truly assist in the short- and long-term success of this project, our commissioning plan requires a unique and varied blend of technical, operational, and engineering expertise. The challenges involved in the construction of this project focus around:

1. Project schedule
2. Complex building systems
3. Increased integration of systems and components
4. MEP technical expertise
5. Project turnover and operations expectations



We are familiar with these significant challenges through our extensive commissioning, operations backgrounds, and experience with capital and operation teams. Our focus is to “bridge the gap” between the construction teams, design teams, project management, and operations groups. Our solution to these challenges is to develop and integrate a unique commissioning program that will provide collaboration between teams, verify that the design intent (installation and performance) is met, establish parameters for acceptance of the construction/end users, and integrate turnover/operations smoothly and effectively.

A summary of the solutions are outlined in the following bullets.

- Creating partnerships and leading collaboration within the project and construction teams.
- Providing “on-site” representation to focus and coordinate the commissioning efforts.
- Coordinating and integrating teams of professionals in supporting corrective actions.
- Establishing parameters and testing requirements for system acceptance as opposed to component acceptance.
- Exercising the systems throughout operating ranges, safety, and emergency conditions.

Aramark will develop a program specifically geared towards the Michaux State Forest Resource Management Center and Storage Building project. Aramark will work directly for the PADGS and provide an unbiased, objective view of the systems installation, operation, and performance. As part of the owner's building systems commissioning process, Aramark will cooperate with and coordinate all commissioning activities with the project manager, design professionals, construction manager, and contractors. This process is not to take away or reduce the responsibility of the design team or installing contractors, but to provide a finished and fully operational product in accordance with design intent.

Our scope of services consists of the following focused efforts:

PROFESSIONAL COMMISSIONING SERVICES – PHASE APPROACH

DESIGN PHASE

Past experience has demonstrated that collaboration, communication, and proper planning are the keys to verifying that the commissioning program is fully integrated into the normal design and construction process. This integration process for the program begins very early by initially employing a carefully prepared kick-off meeting, commissioning plan, and schedule that will guide the effort in and around the construction schedule. The commissioning team leader will develop, organize, implement, observe, document, and lead the commissioning effort in a manner that furthers the success of the project. This effort will not only minimize the impact on project schedule, but also promote efficient system startup and turnover.



A summary of activities in this phase consists of:

- **Owner's Project Requirements (OPR)** – Working with the DGS Design Project Manager, Design Professional, and the Client Agency facilities maintenance staff conduct an OPR workshop early in the concept design stage to develop the project goals, measurable performance criteria, cost considerations, benchmarks, success criteria, and supporting information. Provide descriptions of the following: a) primary purpose of Project, b) environmental and sustainability goals, c) energy efficiency goals, d) indoor environmental quality requirements, e) desired equipment/system quality, reliability, and maintenance requirements, f) facility operation and maintenance requirements including requisite personnel training and orientation.
- **Commissioning Plan (Cx Plan)** – Provide written document that outlines the overall process, organization, responsibilities, schedule, allocation of resources, and documentation requirements of the Commissioning Process to verify and document that the design, construction, and operation of the facility meet the Owner's Project Requirements (OPR).
- **Design Review** – Provide a review and comments of the Professional's design documents and Basis of Design (BoD) narrative for compliance with the Owner's Project Requirements. Design review includes a back-check of Commissioning Design Review Comments at subsequent Design Submission.
- **Commissioning Specifications** – Provide Commissioning Specifications for all systems/assemblies being commissioned for inclusion within the Project Construction Documents.

CONSTRUCTION PHASE

A pivotal aspect of our commissioning program is enabling team reviews and inspections of the systems in their area of expertise (i.e., mechanical, electrical, and plumbing). Deficiencies and outstanding issues are documented in the commissioning database. The intent of the database is to generate a comprehensive list for the project manager to distribute to the design and construction teams for response

Aramark Engineering Solutions

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and action. Subsequent to each focused inspection, a progress report will be issued detailing the deficiencies, resolution actions, and status of each item. We will maintain a current status for each item on the deficiency list as well as document the resolution actions in the final report. The commissioning team leader will act as the point person and bring up issues to the construction and design teams.

The focus of the construction installation phase will include the following:

- **Submittal Review** - Identify and review Contractor submittals applicable to systems/assemblies being commissioned. Identify issues that might result in rework or change orders. Verify the following: a) conformance with Owner's Project Requirements (OPR) and Basis of Design (BoD), b) achievement of operations and maintenance requirements, c) enablement of performance testing. All submittal reviews and correspondence must take place in eBuilder.
- **Job Construction Meetings** - CxA shall attend regular job construction meetings as necessary to ensure the systems are properly installed, operated and tested, and are functioning correctly to meet the design intent.
- **Commissioning Meetings** - CxA shall hold regularly scheduled jobsite Commissioning Meetings with all project stakeholders to review important aspects of equipment, metering system, and Controls System installation. Review and document necessary installation details, system testing procedures, and documentation requirements. Keep meeting minutes and include in the Cx Report.
- **Construction Observation and Testing** - Verify that the performance of the systems/assemblies being commissioned, as installed, meet the Owner's Project Requirements (OPR), Sustainability Criteria, Basis of Design (BoD), and Contract Documents. Furnish test procedures and checklists prior to equipment installation. Produce a Pre-functional test for each test. Test procedures shall list the entities responsible for executing each test. Provide installation inspections. Direct, witness, and document tests. Evaluate test results and verify that installed systems/assemblies meet the criteria for the Project.
- **Issues and Resolution Log** - Develop a commissioning issues log containing open and continuing items, status, and name of person/organization responsible for resolution.
- **Systems Manual** - During the design and construction of the project, the design and construction documents should be assembled into the systems manual. This assembly of documents provides the details and history of the design and construction of the building and information needed to properly operate the building. The systems manual includes the project final OPR, BOD, construction record documents, submittals, completed startup, verification checklists, functional and performance checklists, verified sequence of operation, facility guide, training records, and commissioning report. The systems manual should be used in the initial and subsequent training of the building operations staff and occupants. The systems manual should be updated throughout the life of the building.
- **Pre-Functional and Functional Performance Testing** - Confirm (but not necessarily witness) manufacturer's startup of individual equipment components (Pre-Functional Performance Testing). Write, direct completion of, witness, and document full Functional Performance Testing of each system and system component. Confirm proper operation of all control sequences for each season operation. Document in Cx Report.
- **Training Plans and Records** - Review, pre-approve, and verify training of the Client Agency personnel by the Contractor, to operate and maintain systems/assemblies being commissioned. Include training plan, training materials, and records in final Systems Manual.
- **End of Warranty Cx Report** - Provide post-occupancy operation commissioning, including incomplete, delayed, and seasonal testing, as well as warranty issues. Post-occupancy operations shall begin at Substantial Completion and shall continue through to the end of the warranty period.
- **Preliminary and Final Cx Report** - A preliminary commissioning report should be prepared that shows the commissioning progress and equipment performance to date at the time the Certificate

of Occupancy is issued. At the completion of the project the final commissioning report should be assembled and provided to the owner and others as required by the OPR and local jurisdiction requirements. This report includes the final commissioning plan, copy of design and submittal review reports, all startup, inspection, verification, functional and performance test forms and reports, the verified sequence of operation, the final Issues and Resolutions log, and summary of the performance of commissioned systems.

SYSTEMS TO BE COMMISSIONED

- Building Assembly Systems including Building Shell, Exterior Wall Assemblies, and Roof Assemblies.
- Protective Systems including Fire Suppression and Fire Alarm Systems.
- Plumbing Systems including Domestic Hot Water Systems.
- Heating, Ventilating, Air Conditioning and Refrigeration Systems (HVAC) including Heat Generation, Refrigeration, Ventilation, and HVAC Control Systems.
- Electrical Systems including Power Distribution, Lighting, and Controls, and Emergency Generator Systems.

C. GEOGRAPHIC LOCATION

The proposed Project Manager, Kevin Barber, is located in York, PA with his remote office being just 35 miles from the project site in Fayetteville. Additionally, Kevin has a family cabin right off of Pine Grove Road only 5 minutes from the job site. Travel time will not be necessary for reimbursement.

D. PROJECT WORK PLAN

Schedule of Milestones

DESIGN PHASE - AWARD OF PROJECT THROUGH SUMMER/FALL 2025

- Conduct Owner's Project Requirements (OPR) workshop and develop OPR.
- Develop and provide the Cx Plan.
- Review and comment on design documents and BOD.
- Conduct design phase Cx meeting.
- Develop and provide Cx specs for all systems/assemblies being commissioned.

CONSTRUCTION PHASE - SPRING 2026 THROUGH SUMMER 2027

- Perform submittals review.
- Conduct Cx kick-off meeting with contractors.
- Attend construction meetings as needed.
- Hold regular commissioning meetings.
- Develop pre-functional test forms and provide to contractors.
- Conduct construction observation and testing.
- Develop and maintain issues and resolution log.

ACCEPTANCE PHASE - SUMMER 2027 THROUGH SPRING/EARLY SUMMER 2028

- Perform functional performance testing of Cx systems.
- Conduct Cx meetings as needed.

- Develop and deliver Systems Manual.
- Review, pre-approve and verify training of personnel.
- Develop End of Warranty Cx report.

I. **Indicate all resources need to complete the assignment including staff assignments, consultants, and reimbursements.**

Aramark will perform all commissioning activities with its own personnel. Staff assignments are indicated in the organizational chart. Reimbursements will be submitted for mileage only which is detailed in Section C above.

II. **Note inefficiencies or risks to successful implementation, and any planning efforts to mitigate issues such as travel distance, schedule conflicts and required coordination.**

Aramark has no scheduling conflicts associated with performing the commissioning requirements of this project.

III. **Indicate the anticipated number of hours required for completion of the work described in the Scope of Work (Attachment A).**

The estimated number of hours per phase are as follows:

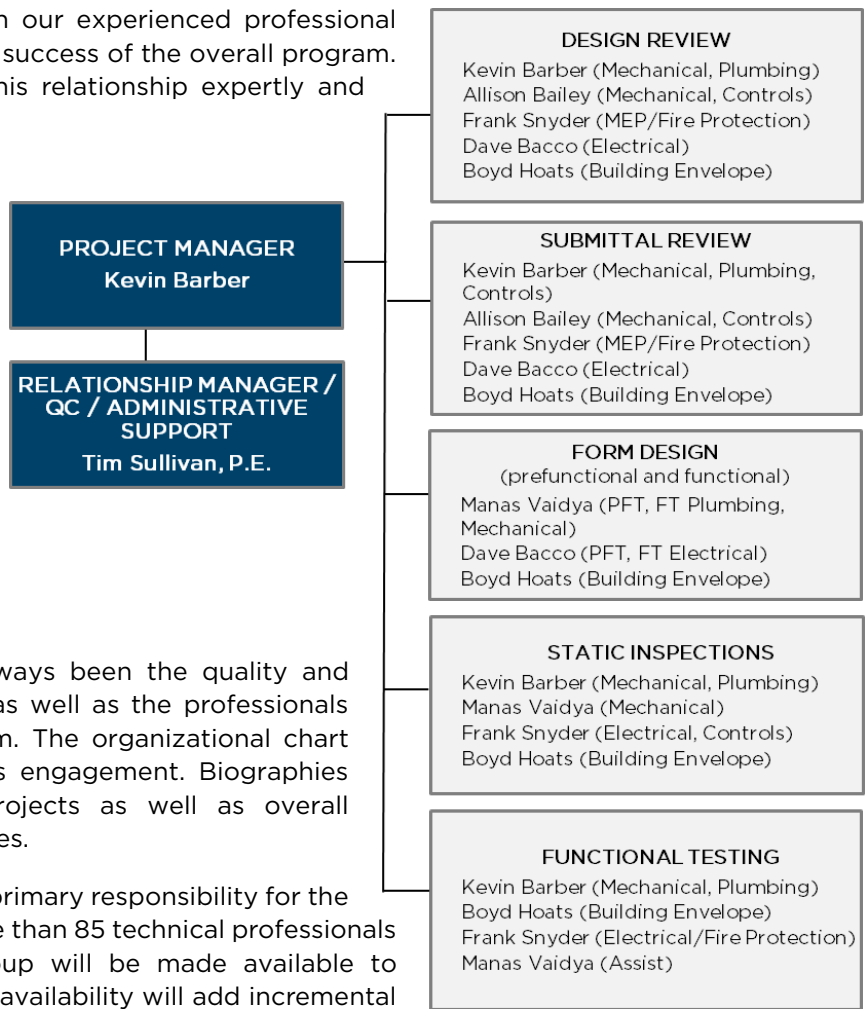
Design Phase:	76
Construction Phase:	234



E. PROJECT PERSONNEL AND QUALIFICATIONS

All of Aramark’s engagements rely on our experienced professional staff to function as the catalyst for the success of the overall program. Our staffing strategy for managing this relationship expertly and efficiently is straightforward:

- Provide PADGS with a qualified commissioning agent to lead the overall program and serve as the primary contact person.
- Support PADGS with a core technical team comprised of individuals with the requisite technical experience and skill sets.
- Provide experienced “quality assurance” resources to verify that the highest level of quality services is provided.



The success of our approach has always been the quality and consistency of our senior leadership as well as the professionals that comprise the core technical team. The organizational chart illustrates the proposed team for this engagement. Biographies including experience with similar projects as well as overall expertise are included on the next pages.

Although the proposed staff will have primary responsibility for the proposed engagement, any of the more than 85 technical professionals within the Engineering Solutions group will be made available to PADGS if their skills, expertise, and/or availability will add incremental value to this engagement.

Aramark’s Engineering Solutions group consists of more than 85 technical professionals including: Professional Engineers (PE) Certified Commissioning Professionals (CCP), LEED Accredited Professionals (LEED AP) and other technical designations. We verify that each facility’s operating, maintenance, and program support requirements are met during construction and renovation.

- | | |
|---|---|
| (17) Professional Engineers (PE) | (9) LEED Accredited Professionals (LEED AP) |
| (13) Certified Energy Managers (CEM) | (2) LEED Green Associates |
| (2) Commissioning Process Management Professionals (CPMP) | (2) Project Management Professionals |
| (5) Certified Measurement Verification Professionals (CMVP) | (2) Certified Building Commissioning Professionals (BCxP) |

KEVIN BARBER**Cx Manager**

- 4.0 Million GSF Commissioned
- 50 Commissioning Projects
- Penn State World Campus MiPS Certification Renewable Energy & Sustainability Systems – Solar Energy
- Penn State University Bachelor of Science Energy Engineering

Mr. Barber is an energy engineer with over eight years' experience as a lead commissioning agent. On behalf of Aramark, Mr. Barber provides professional services to various clients in the Mid-Atlantic region while focusing on close collaboration and quality assurance with our Aramark team. Prior to joining Aramark, Mr. Barber successfully managed and/or supported the execution as the lead Commissioning Agent on Pennsylvania projects for Penn State University, State College Area School District, Allegheny Health Network, Geisinger, PA Air National Guard, PA Department of General Services, and the Defense Logistics Agency, as well as many other Mid-Atlantic region clients.

Kevin is slated as the Project Manager for this project. His primary responsibility is to ensure that all of the commissioning tasks as described within this response are completed. Kevin will lead the design team; review mechanical, plumbing, and controls submittals; design the functional test forms for mechanical and plumbing systems; perform static inspections; and perform functional testing.

TIM SULLIVAN, P.E., BCxP, CEM, LEED AP, G.B.E.**Director, Commissioning**

- 20 Million GSF Commissioned
- 60+ Commissioning Projects
- Manhattan College Bachelor of Science Mechanical Engineering
- Professional Engineer (New York)
- Building Commissioning Professional

Mr. Sullivan has accumulated 35 years of experience in the HVAC industry, including design engineering, installation, programming, commissioning, project management, and service operations. As Director of Commissioning, Mr. Sullivan oversees the commissioning program. Primarily advising on commissioning services with both proposal development and successful execution, Tim is involved in quality control of the commissioning group as well as higher level elevation of issues. His background and hands-on experience as a commissioning agent provides him with expertise in building automation systems, central utility plants, and laboratory control systems including BSL3.

Tim will be responsible for quality control as well as major issue resolution on this project.

ALLISON BAILEY, P.E.**Senior Cx Manager**

- 10 Million GSF Commissioned
- 50+ Commissioning Projects (Project Manager)
- Ohio State University Bachelor of Science Mechanical Engineering
- Professional Engineer (KY, OH, and WV)

Ms. Bailey possesses more than 28 years of experience in HVAC design, DDC control programming, HVAC system troubleshooting, project management, and project coordination.

Currently, Allison supports commissioning programs throughout the region and is involved in all design reviews as the design lead and mechanical systems reviewer. She is also project manager for the new Twin Valley Behavioral Health Hospital in central Ohio. Allison performs over 40 design reviews per year and has most recently reviewed multiple projects for Nemours, renovations at M&T Bank Stadium and various other projects for Penn State University. She has been the design leader for all of the reference projects listed within this proposal and is familiar with the Penn State standards of design for mechanical systems.

Allison is proposed in a support role for this project. She will provide design reviews and submittal reviews of mechanical and controls systems.

DAVID BACCO**Cx Manager**

- 6.3 Million GSF Commissioned
- 250+ Commissioning Projects (Electrical Lead)
- University of Pittsburgh Bachelor of Science Electrical Engineering

Mr. Bacco possesses more than 30 years of electrical building design, project management, evaluations, and engineering experience. Currently, Dave supports all electrical commissioning programs throughout the region. He is frequently in State College and has performed the same duties on all of the reference projects listed within this proposal. Dave is familiar with both the written Penn State electrical standards as well as the electrical construction Penn State standards, and his value to the commissioning process and the University is undeniable. Many of the issues he presents in design review comments and static inspections are of the highest return on investments for our clients.

Dave is proposed in a support role for the project. He will conduct design reviews, provide submittal reviews, and design the pre-functional and functional test forms for the electrical systems.

BOYD HOATS, JR**Project Manager**

- University of Tennessee - Knoxville Bachelor of Architecture
- Luzerne County Community College Associates Degree in Architectural Engineering

Mr. Hoats is a project manager with 32 years of comprehensive project management experience. Currently, he is performing project management for Samsung Electronics and Thomas Jefferson University Hospital projects.

Mr. Hoats is also the architectural CPM with Aramark's Facility Condition Assessment and Commissioning teams, where he utilizes his extensive expertise in assessing building envelope conditions, recommending solutions to correct deficiencies, and insuring the proper implementation of the design documents. He is currently providing building envelope commissioning services to several of our clients in the PA area, including projects for Allegheny Health Network. He has also worked on projects for Penn State University and Penn State Health.

Boyd is proposed in a support role for the project. Boyd will provide design reviews, conduct submittal reviews, design the forms, and perform static inspections and functional testing of the building envelope.

FRANKLIN R. SNYDER, JR., P.E.**Cx Manager**

- Penn State University Bachelor of Science Mechanical Engineering Technology
- Penn State University Associate of Arts Mechanical Engineering Technology
- Professional Engineer
- USGBC LEED AP BD+C
- Certified CxA, AABC / ACG

Mr. Snyder has more than 37 years' experience including building commissioning, sustainable design consulting, and mechanical, electrical and fire protection engineering services.

His typical project responsibilities include planning, scheduling, conducting, and coordinating all phases of facility related MEP/FP system design and commissioning work. Previous project experience includes the Penn State Indoor Sports Complex.

Frank is proposed in a support role for this project. He will perform static inspections and functional testing of the electrical systems.

MANAS VAIDYA**Cx Manager**

- Lamar University
Master of Engineering
Industrial Engineering
- Rajiv Gandhi
Technical University
Bachelor of Engineering
Mechanical Engineering
- Certified Six Sigma
Green Belt Professional

Mr. Vaidya is a mechanical and industrial engineer with over ten years' experience and a background in plant maintenance engineering, systems analysis, energy management, and BAS/energy management end devices. On behalf of Aramark, Mr. Vaidya provides professional commissioning services to various clients in the south-central Pennsylvania region.

Prior to Aramark, Mr. Vaidya was most recently a Systems Specialist for Siemens where he performed installation, startup, troubleshooting, commissioning, and repair on computerized temperature control systems which control HVAC equipment such as roof top units, air handlers, VAV boxes, heat pumps, chillers, pumps, cooling towers, boilers, and heat exchangers.

Manas is proposed in a support role for the project and will assist with the static inspections and functional testing for mechanical systems.

