Pennsylvania Historical & Museum Commission

WRIGHT COMMISSIONING

Independent Technical Commissioning Services
DGS Project No. 974-10 Phase 1

Building and Infrastructure Improvements
Erie Maritime Museum
100 Blasco Street
Erie, Erie County, PA

TECHNICAL SUBMISSION

July 26, 2024

1001 Baltimore Pike
Suite 303
Springfield, PA 19064

T. 215.279.5950
F. 215.558.5767

www.wrightcx.com

WRIGHT COMMISSIONING

150 Monument Road, Suite 101
Bala Cynwyd, PA 19004
T 215.279.5950
F 215.558.5767
www.wrightcx.com

July 26, 2024

Richard Lindemon
PA Department of General Services
Arsenal Building
1800 Herr Street
Harrisburg, PA 17103

RE: Independent Technical Commissioning Services
Project No. DGS 974-10 Phase 1
Building and Infrastructure Improvements
Erie Maritime Museum
100 Blasco Street
Erie, Erie County, PA

Dear Richard:

Thank you very much for presenting Wright Commissioning (WCx) with the opportunity to provide independent technical building systems commissioning services for the design and construction stages of the Erie Maritime Museum Building and Infrastructure Improvements project in Erie, Erie County, PA.

WCx strives to be committed and responsive to our clients by meeting their needs and exceeding all expectations. Our team is ideally suited to provide commissioning services for this project and has proven capabilities on programs and projects similar to this one. We are confident that our team will deliver superior, value-added services through our emphasis on team collaboration and a proactive approach to problem-solving.

Our qualifications include:

- We are a truly independent representative whose core business is commissioning. We do not practice design or engage in contracting. Therefore, we have no conflicts with the design or construction. Our focus is to understand the design objectives and deliver sustainable systems that meet and exceed those objectives, while maintaining the highest level of quality.
- WCx is a NEBB certified commissioning firm. As managing member of the firm, I am a NEBB certified Commissioning Professional with over 25 years of building commissioning experience.
- Our experience with the commissioning of various museum, archive and exhibit facilities, some of which are highlighted in this proposal.
- Our experience working within the e-Builder system platform on various Pennsylvania DGS projects.
- WCx is authorized by various agencies to provide professional commissioning services, including being a Federal GSA schedule holder, a commissioning provider for the Pennsylvania DGS and PASSHE (Pennsylvania State System of Higher Education), the New Jersey DPMC and SDA, and the Maryland Stadium Authority (MSA).
- WCx is a certified Minority Business Enterprise (MBE) and Woman's Business Enterprise (WBE).

On behalf of the WCx team, thank you again for your interest and consideration. If you should require additional information, please don't hesitate to contact me directly. My office phone is ext.135, cell phone is 267-414-3150 and e-mail is will.wright@wrightcx.com.

Sincerely,

William A. Wright, LEED AP, ASHRAE CPMP, NEBB CP, CEM, CQM
Commissioning Authority

WRIGHT COMMISSIONING

TABLE OF CONTENTS

SECTION 1: RELEVANT PROJECT EXPERIENCE

Historical Society of Pennsylvania; scope/type/ complexity/size

Philadelphia, Pennsylvania

Owner
Historical Society of Pennsylvania

Architect
SaylorGregg Architects

Size / Dates
88,000 SF / 2018-2019

Project Reference
Bob Rittenhouse
215.687.4454
rrittenhouse@aegispg.com

WCx Team Members
William Wright
Nykia Gantt
Christopher Matczak
Robert Krempasky
Reza Khollari

Founded in 1824, the Historical Society of Pennsylvania (HSP) is one of the nation's principal centers for historical research housing 21 million documents spanning 350 years of American history. HSP predates the National Archives and Smithsonian, and rivals the Library of Congress in material relating to the founding of the nation, such as the first hand written draft of the U.S. Constitution and an original printer's proof of the Declaration of Independence. HSP is the largest repository for ethnic and immigrant history and the third largest archive for genealogy in the United States. Located at 1300 Locust Street in Philadelphia for over one hundred years, HSP's 88,000 SF, four-story red brick building was designed by Addison Hutton and is listed on the City of Philadelphia's Register of Historical Places. The building is formerly the home of John Hare Powell, the founder of the Pennsylvania Agricultural Society, and then General Robert Patterson, a venerable Civil War general.

WCx was hired to provide QA/QC and commissioning services for the facility renovation project. The building serves mainly as archival storage. As part of the project, the electrical equipment in a basement electrical vault, including the main switchgear, transformers and feeders were demolished and replaced with new. A new fire sprinkler and jockey pump, and controls, were provided and were part of the integrated systems testing under emergency power. The entrance lobby and east stair hall were also renovated, and the membership office was converted into a lounge area. The work also included infrastructure upgrades to support new mobile high density storage in the 2nd, 3rd and 4th floor vaults.

Systems QA/QC'd and commissioned by WCx included the electrical systems, including the new switchgear, HVAC, HVAC controls, plumbing, fire suppression and fire alarm.

WRIGHT COMMISSIONING

Research Collections and Preservation Consortium; scope/ type/complexity

Princeton, New Jersey

Owner
Princeton University

Architect
KSS Architects

Size / Dates
22,500 SF / 2018-2020

Building Automation System
JCI Metasys

Client / Project Reference
Bob Rittenhouse
rrittenhouse@aegispg.com
215.687.4454

Research Collections and Preservation Consortium (ReCAP) is a partnership formed by Princeton University, the New York Public Library and Columbia University in order to store the extensive book collections of these institutions. Rare and low-use books form the bulk of the material, necessitating meticulous environmental conditions for storage.

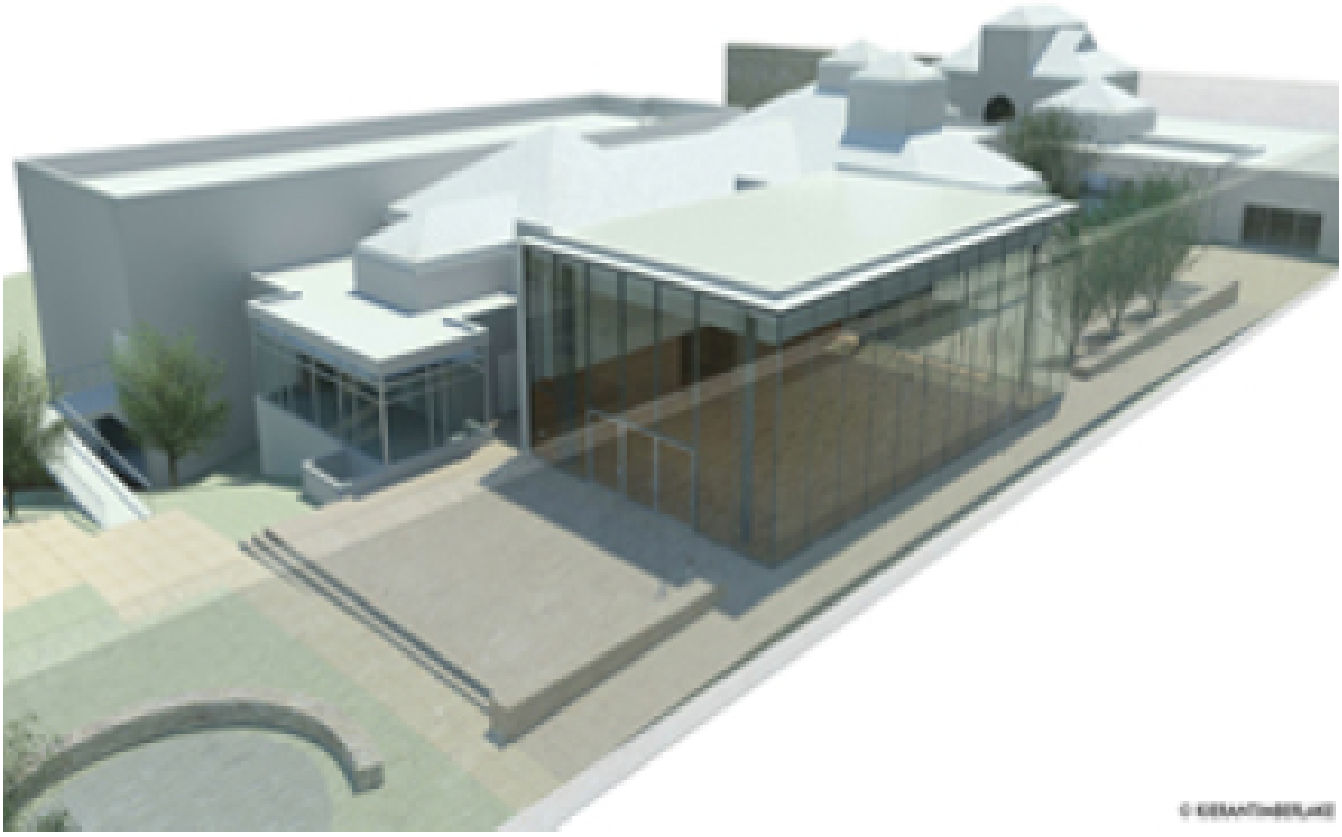
WCx performed retro-commissioning on the HVAC systems serving ReCAP's 18,500 square foot processing center and 4,000 square feet of offices at Princeton University. The project goal was to improve overall occupant comfort and environmental quality through evaluating and testing the HVAC systems, performing "quick fixes" and assisting with the implementation of any corrective actions. Energy conservation measures were also considered.

The equipment in these areas consists of two Trane Voyager rooftop air handling units, 18 VAV boxes, two exhaust fans, three electric and two gas unit heaters. WCx evaluated the HVAC systems, including RTUs, VAV boxes, thermostats, controls and airflow measurements. Building automation system schedules and sequences were also investigated. Performance of the VAV boxes, including actuator and controller operation, was tested. The space temperature thermostats were checked for operation and calibration. The RTUs were functionally tested, including sequences of operations. As-found balancing readings were taken to verify airflows.

In addition to providing technical retro-commissioning services for the project, WCx was engaged by Princeton University to oversee and commission the implementation of WCx's recommended corrective actions and capital improvements stemming from the retro-commissioning. WCx has also been engaged by the University to provide facility oversight services as part of ReCAP's ongoing systems operations & maintenance program, including the addition of two new large archive storage modules.

James A. Michener Art Museum; scope/type/ complexity

Doylestown, Pennsylvania



Owner

James A. Michener Art Museum

Architect

KieranTimberlake

Construction Cost / Dates

$13.2 Million / 2019-2021

Building Automation System

JCI Metasys

WCx Team Members

William Wright
Nykia Gantt
Christopher Matczak
Robert Krempasky
Reza Khollari

The James A. Michener Art Museum is an independent, non-profit institution dedicated to preserving, interpreting and exhibiting the art and cultural heritage of the Bucks County, Pennsylvania region. In addition to hosting a changing schedule of exhibitions from around the country, the museum is home to the largest public collection of Pennsylvania Impressionist paintings.

A team led by KieranTimberlake was selected to design the Edgar Putman Event Center, a 2,700 square-foot space for concerts, lectures and exhibition openings, as well as private functions. Plans also included the renovation of the museum's Ann and Herman Silverman Pavilion into an education complex with two classrooms, a larger museum shop and café, and a dedicated children's gallery.

The new event center is a light-filled, all-glass structure with a solid roof and sliding doors on its east and west sides. Extending into the north side of the museum's Patricia D. Pfundt Sculpture Garden, it is accessible by indoor connection to the galleries and by a separate entrance behind the museum to allow multiple programs to function simultaneously.

WCx providing MEP/FP and Building Envelope commissioning services on the project, conducted an energy audit of the entire museum and prepared an RFP for a preventive maintenance contract that the museum issued to HVAC service contractors in order to obtain competitive bids for the work.

Cliveden of the National Trust; scope/type/ complexity

Philadelphia, Pennsylvania

Owner
National Trust for Historic Preservation

Architect
Farewell Mills Gatsch Architects

Size / Dates
5,900 SF / 2020-2022

Historic Registration
U.S. National Register of Historic Places

NPS National Historic Landmark

NPS National Historic Landmark District Contributing Property

Building Automation System
JCI Metasys

WCx Team Members
William Wright
Nykia Gantt
Christopher Matczak
Robert Krempasky
Reza Khollari

Cliveden is the revolutionary period house of Benjamin Chew, a chief justice of Pennsylvania's Supreme Court. Constructed between 1763 and 1767, the house served as a British stronghold in the Battle of Germantown where, on October 4, 1777, George Washington was defeated and forced to retreat to Valley Forge for the winter. In addition to its historic significance, Cliveden i s o ne o f t he b est preserved Georgian Colonial style mansions of the period and houses a collection of fine art, furniture, china and manuscripts.

The environmental systems upgrade project required a balanced approach: preservation needs versus the building envelope's ability to withstand temperature and humidity fluctuations; achievement of uniform heating and cooling conditions throughout with minimal intrusion of mechanical systems; and weighing budget constraints against the preservation and interpretive needs of this historic site and its collections.

Systems commissioned by WCx included a chilled water loop with chiller and pumps, a hot water loop with boiler, primary and secondary pumps, an air handling unit with return fan, dehumidification cycle, humidification cycle and humidistatic heating sequence, several secondary radiation loops, and a card access control system.

Retro-Cx LEED Points Sought / Achieved:

Temple University Charles Library and Rare Books; scope/type/complexity/size

Philadelphia, PA

Owner

Temple University

Size / Dates

215,000 SF / 2018-2020

Client/Project Reference

Bill Barnes
609.525.0948
william.barnes@temple.edu

The project involved design and construction of a New Library on the main campus of Temple University in North Philadelphia. The new facility is comprised of approximately 215,000 square feet, with four levels of interior space plus a basement level. The building houses student study, research and reference areas, special collections, exhibit and event spaces, administrative and support space, as well as a café. The rooftop contains a green roof area as well as terrace space.

The facility also contains a state of the art Automated Storage and Retrieval System (ASRS) for the building's book collection, as well as a rare books archive space served by a custom, low temperature chiller.

WCx was hired to provide independent technical commissioning services, and special inspection and testing services for the specialized Atrium smoke control system.

WRIGHT COMMISSIONING

Museum of the American Revolution; scope/type/ complexity/size

Philadelphia, Pennsylvania

Rendering courtesy of the Museum of the American Revolution

Client / Owner
Museum of the American Revolution

Owner's Representative
Dan Bosin Associates

Architect
Robert A.M. Stern

Engineers
Keast & Hood, Structural
Altieri Sebor Wieber, MEP

Contractor
Intech

Size / Dates
118,000 SF / 2018-2020

Construction Cost
$120,000,000

Building Automation System
JCI Metasys

WCx Team Members
William Wright
Nykia Gantt
Christopher Matczak
Robert Krempasky
Reza Khollari

Wright Commissioning provided commissioning services for Philadelphia's Museum of the American Revolution at Third and Chestnut Streets in Philadelphia, PA.

WCx ensured that specialized building systems, such as the atrium smoke control system, functioned as they were designed.

The building, which achieved LEED Gold certification, features a climate-controlled room that houses the actual tent that George Washington used at Valley Forge, a novel water-recapture system that uses graywater from a detention basin piped to the cooling tower, and a fire protection system that pumps water and nitrogen in a rapid mist to deprive a fire of oxygen. A chilled water plant from the previous structure on the site was repurposed for the new building.

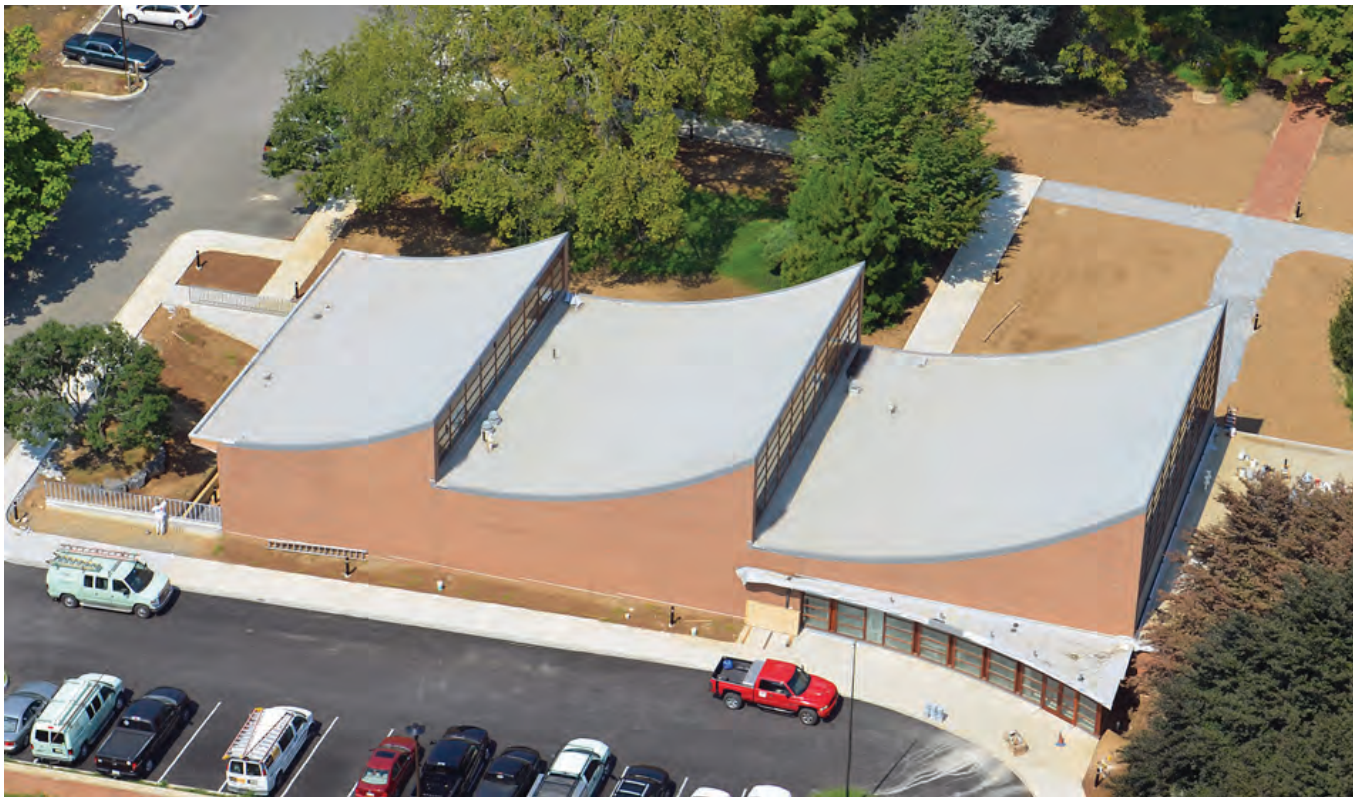
Opened in the Spring of 2019, the Museum of the American Revolution was designed by Robert A.M. Stern Architects.

Enhanced Cx LEED Points Sought / Achieved:

6 / 6

Campus of History; scope/type/complexity

Lancaster, Pennsylvania



Owner

LancasterHistory.org

Architect

Centerbrook Architects

Size / Dates

30,000 SF / 2019-2021

Building Automation System

JCI Metasys

WCx Team Members

William Wright
Nykia Gantt
Christopher Matczak
Robert Krempasky
Reza Khollari

LancasterHistory.org is a community-based, non-profit organization established to educate the public on the history of Lancaster County and its place in the history of Pennsylvania and the United States.

Centerbrook Architects was engaged by the Lancaster Historical Society to conduct a master planning process that addressed its facility needs on several adjacent properties. Following a collaborative design workshop attended by various stakeholders, a plan emerged to unify the properties and operate them as one place. The organizations followed suit and became a combined institution: LancasterHistory.org.

The project consists of a new lower level and ground level addition of 18,000 square feet connected to the existing 12,000 square foot building. The sustainable library addition provides a new street presence around the corner from its original entrance, which in turn creates a grander setting for Wheatland and positions the Historic Society building as the public entry to the entire site.

WCx was hired by LancasterHistory.org to perform building systems commissioning for the following components: HVAC, electrical, plumbing, life safety, automatic controls and electronic access control.

Enhanced Cx LEED Points Sought / Achieved:

3 / 3

USPTO Data Center Infrastructure Upgrades scope/complexity/size

Alexandria, Virginia

Owner

LCOR Incorporated

Size / Dates

800,000 SF / 2018-2019

Client/Project Reference

Jay Neiditch
703.535.5326
jneiditch@lcor.com

Commissioning and QA/QC of electrical and HVAC upgrades to an active data center campus for the United States Patent and Trade Office in Alexandria, VA. The project involved renovations to existing office space on the concourse level to provide a new generator room next to the loading dock. A new fuel oil pump was provided in the fuel oil pump room to serve the new generator. Existing ductwork was replaced and additional humidifiers provided on the 3rd Floor. An additional cooling tower and chiller were provided in the mechanical penthouse along with the associated piping and support infrastructure.

Commissioning and QA/QC services addressed electrical systems, including the emergency generator, a temporary generator, automatic transfer switching, the main switchboard and load bank testing, as well as building controls, campus chilled water controls, power monitoring systems, HVAC systems and equipment, HVAC test and balance verification, and fuel oil systems.

Aurobindo Pharmaceutical Manufacturing North Fit-Out scope/complexity/size

East Windsor Township, New Jersey

Owner
Aurobindo Pharma USA

Contractor
ARCO Design/Build NE

Size / Dates
90,000 square feet / 2018-2019

Construction Cost
unknown

Client / Project Reference
Jon Zuk
610.234.0070
jzuk@arcodb.com

The project involved design and construction fit-out of approximately 90,000 square feet of manufacturing space within an existing core and shell warehouse facility for Aurobindo Pharma USA, Inc. The fitout was comprised of six packaging lines and support areas, one liquid line and support areas, one injectables support area for an injectables manufacturing module, and a mezzanine area for supporting the various utilities serving all manufacturing spaces.

WCx was hired to provide engineering support, commissioning, qualification and validation services for the new fit-out.

SECTION 2: PROJECT UNDERSTANDING AND APPROACH

WRIGHT COMMISSIONING

PROJECT UNDERSTANDING

Erie Maritime Museum is a maritime museum located on Presque Isle Bay which rests on the waterfront in downtown Erie, Pennsylvania. It is managed by the Pennsylvania Historical and Museum Commission (PHMC). The building is owned by Erie County and leased to the museum for 99 years (1994). It is also shared with the Erie County Planning Commission and the Erie County Library as tenants.

In November 2017, Penn State Facilities Engineering Institute (PSFEI) conducted an assessment of the water-to-air terminal heat pumps serving the museum. As a result of the assessment, it was determined that the existing heat pumps serving the museum are at the end of their expected service life and are failing, and the commitment to continuous maintenance of the heat pump units is exceeding their value.

The purpose of this project is to replace twenty-three (23) existing water-to-air terminal heat pumps and associated infrastructure components to ensure the reliability of the system for the foreseeable future. The equipment to be replaced serves approximately 110,000 square feet of floor space within the facility.

Goals to ensure a successful project include minimizing impact to visitor experience and staff resources during periods of construction in a safe and comfortable environment; providing a discernable decrease in energy consumption through the proper design and coordination of terminal equipment selection and updated automatic controls within the constraints of the operation of the existing external plant; delivering and filing complete and pertinent project closeout documentation, in a consistent manner, that can be efficiently retrieved by site administrators post-construction.

The project will remove and replace twenty-three (23) existing water-to-air heat pump terminal units, associated air distribution, piping connections, and integrate them into the PHMC Automated Logic (ALC) based control system, interoperable Web Accessible Control System (iWACS) with confirmation that programming and systems integration are operational as required.

The purpose of the independent technical commissioning services is to provide systematic documented confirmation that the building systems and assemblies achieve the highest level of functional integrity and reliability and are in compliance with the design intent and performance requirements of the owner and occupants. This process covers design, installation, start-up and operation of the building's systems and assemblies, and is accomplished through coordination and efforts of the owner, designers, contractors and commissioning authority.

SYSTEMS TO BE COMMISSIONED

- **Plumbing Systems pertaining to the new HVAC equipment, including condensate drain system**
- **Building Automation System (BAS)** – the HVAC/R system controls will be tested and verified, including calibration of devices, point mapping, verification of sequences of operation and graphics
- **HVAC/R Equipment, Components and Systems**
- **Exhaust Equipment, Components and Systems**
- **Air and Hydronic Test and Balance Verification**

WRIGHT COMMISSIONING

DESIGN PHASE

1. Develop the Owner's Project Requirements (OPR) document and criteria provided to the design team.

2. Review the Basis of Design (BOD) document for consistency with the OPR. Provide written comments.

3. Prepare a preliminary commissioning plan that outlines the extent of the commissioning process to accomplish the OPR.

4. In coordination with the project design professionals, prepare and format the required specification sections for systems to be commissioned and submit to the design professionals for inclusion in their final submission.

5. Perform back-check and design review of MEP/FP concepts for the Design Development submission (drawings, specifications).

6. Perform back-check and design review of MEP/FP concepts for the Construction Document submission (drawings, specifications).

CONSTRUCTION AND ACCEPTANCE PHASES

1. Prepare and submit a construction phase commissioning plan to the owner and the project commissioning team, before the first construction phase commissioning meeting. Execute the commissioning process as described in the contract documents and approved commissioning plan. This includes preparation of agendas, attendance lists, arrangements for meeting facilities and advance notice to participants for each commissioning event. The commissioning authority will act as chair at commissioning events and ensure execution of the agenda items. The commissioning authority shall prepare meeting minutes for commissioning events and send a copy to the owner, commissioning team members and attendees within five business days of the event.

2. Schedule the construction phase commissioning coordination meeting at the owner or construction field office at a time that is suitable to the contractors, the design professionals and the owner. At this meeting, the complete commissioning process and construction phase commissioning plan will be reviewed in detail. Tentative schedules will be established for building systems orientation and installation verifications, O&M submittals, owner training seminar, pipe and duct system flushing and testing requirements, start-up, test and balance (TAB) work and performance verification testing.

3. Receive and review the equipment submittals for systems to be commissioned. Provide written comments.

4. Receive and review the installation, operations and maintenance (O&M) manuals submitted by the contractors for systems to be commissioned. Ensure that they follow the specified outline and format. Request revisions to achieve accuracy. Provide written comments.

5. Check equipment installation against contract documents for adequate accessibility for maintenance and component replacement or repair. Provide and complete field installation verification reports for each component and system. Maintain a master issues log and

installation record, indicating status for each item. Provide written progress reports. Provide assistance in issue resolution.

6. Witness equipment, subsystem and system installation, start-up and testing for systems to be commissioned. Develop and perform functional performance test reports for start-up of systems to be commissioned.

7. The functional performance tests will include point-to-point tests for automatic control systems. Prior to these tests, the controls contractor shall complete the installation and conduct a test and calibration of each point on the system. The commissioning authority and controls contractor shall verify the system point-to-point test. Each point shall be verified as to its operational status and recorded on the functional test report.

8. Maintain a master issues log for any deficiencies, indicating status for each item. Provide written progress reports. Provide assistance in issue resolution.

9. Prior to the field test and balance work, meet with the TAB contractor. The TAB contractor is to outline the TAB procedures and get agreement from the HVAC design professional and the commissioning authority. Ensure that the TAB contractor has the forms required for proper data collection and understands their importance and use. Ensure that the TAB contractor is certified and will be using calibrated instrumentation. Ensure that the TAB contractor is clear on the expectations for commissioning TAB observation and reporting.

10. The commissioning authority will select up to 100 percent of the balance readings for repeatability by the TAB contractor. If more than three of the first ten readings on any system do not repeat, the TAB contractor shall rebalance the system before re-verification of the TAB work. The TAB contractor shall mark all damper settings, record all pressure settings and mark all target grilles used in proportional balancing to assure repeatability of the readings. The TAB contractor shall be prepared to provide current calibration certificates for all instrumentation used in the TAB work.

11. Develop and conduct the performance verification tests for systems to be commissioned. The test data, along with the installation verification, start-up and functional test sheets, will be included in the commissioning report. The performance verification tests are designed to demonstrate that each system performs to the design intent and owner's requirements. Each test includes data trends or data logs that record operating conditions during set point and other changes to the system. Tests are documented on the performance verification reports.

12. Receive and review record drawings for accuracy with respect to the installed and commissioned systems. Request revisions to achieve accuracy. Provide written comments.

13. Attend bi-weekly job conferences (approximately 30 meetings).

OCCUPANCY AND OPERATIONS PHASES

1. Ensure that O&M manuals and other as-built records for commissioned systems have been updated to include modifications made during the construction phase. Request revisions to achieve accuracy. Provide a report detailing any discrepancies found.

2. Training coordination for commissioned systems and documented verification of operator training. The training sessions are to be attended by the facilities staff and end users, the

commissioning authority and the contractors and equipment vendors as required by the contract documents. The format will follow the outline in the specifications and commissioning plan, with partial classroom and partial hands-on training in the field.

3. Assist in the development of the Systems Manual for commissioned systems. This manual provides for a standardized arrangement of O&M documents verified for application to the actual equipment installed. The documentation is integrated into one package to facilitate building operation and maintenance. The commissioning authority shall issue a complete electronic, bookmarked PDF book of the Systems Manual for use by the facilities staff.

4. Prepare a commissioning report for commissioned systems. Installation, start-up, functional test and performance verification reports shall be included in the report, along with an up-to-date commissioning issues log. The report will also contain an executive summary.

POST OCCUPANCY/WARRANTY PHASE

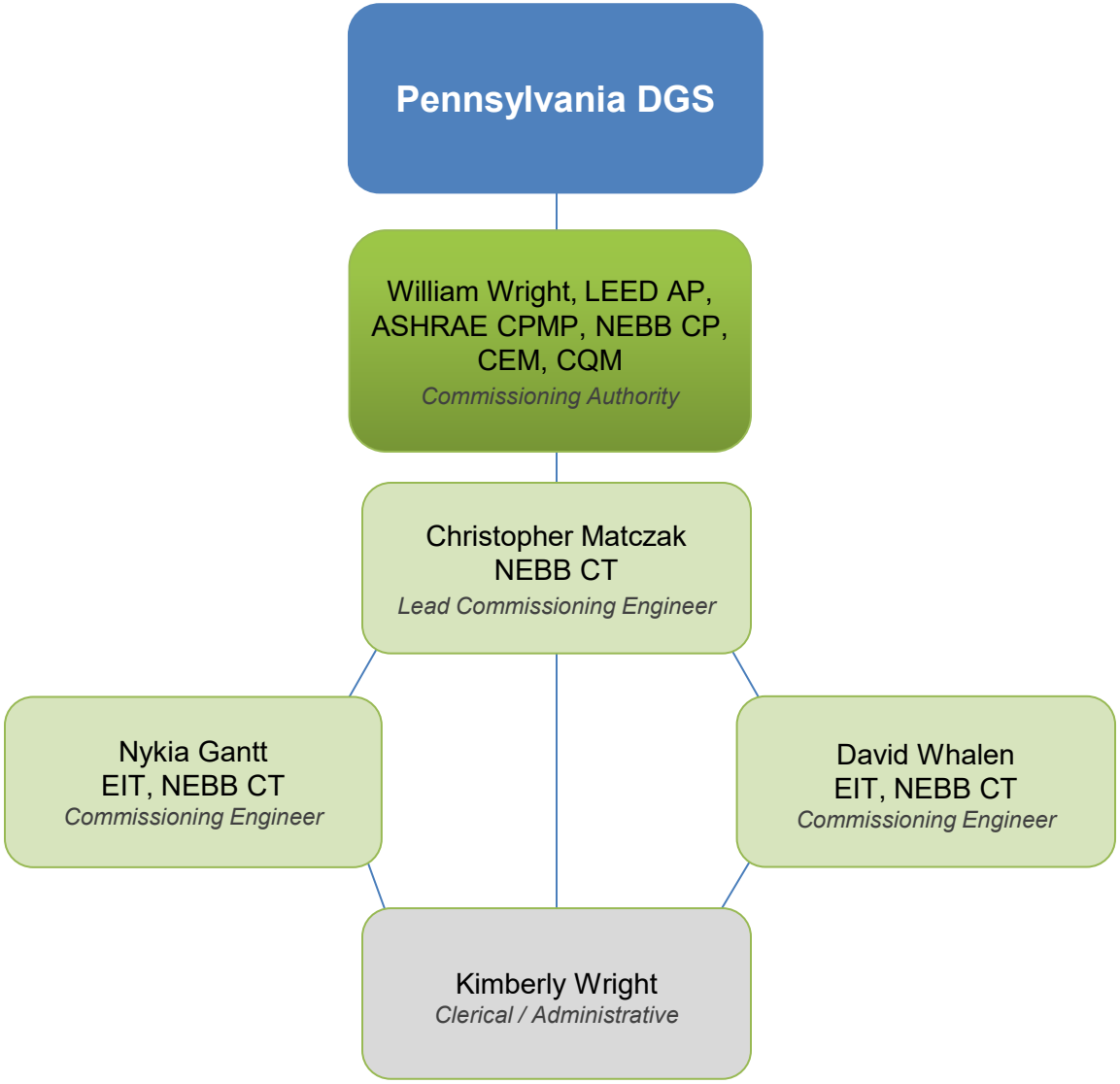
1. Repeat performance verification tests to accommodate opposite-season testing and supervise any corrections of performance deficiencies. Publish an addendum to the commissioning report.

2. Perform ongoing post-occupancy visits as required to address space use needs, system issues, and to verify performance of commissioned systems. These scheduled visits will be coordinated with facilities personnel in order to review any issues, function of the systems, and to continue to optimize the systems based on end-usage and seasonal affects.

3. Publish a 10-month-post-occupancy warranty report detailing current status of the commissioned systems, including any performance issues.

SECTION 3: PROJECT TEAM

WRIGHT COMMISSIONING



WILLIAM WRIGHT, LEED AP, ASHRAE CPMP, NEBB CP, CEM, CQM
Commissioning Authority

William has more than 25 years of direct industry experience in building systems commissioning and retro-commissioning, LEED commissioning and administration, HVAC test and balance and energy management. His experience includes testing and certifying Class 1 cleanrooms for one of the world's largest semiconductor manufacturers, as well as operating a commissioning and HVAC test and balance franchise in Hawaii. Previously, Will held a management position at a prominent engineering firm in Dallas, Texas that performed building commissioning, IAQ testing and HVAC test and balance for major construction projects.

Project Experience

Comcast Center, Philadelphia, PA - Provision of retro-commissioning and facility oversight services to the building engineer and operations and maintenance staff at this 1.25 million SF, 58-story tower, the tallest in Philadelphia. (Ongoing)

Monaco, Jersey City, NJ – Retro-commissioning of a newer building that has two 55-story, approximately 860,800 square foot residential towers with a total of 611 rental apartments. (Ongoing)

Rutgers University Business School, Piscataway, NJ - $85 Million, 155,000 SF Business School building. WCx was hired to provide its retro-commissioning platform of investigating and optimizing HVAC systems throughout the building to improve comfort and operation, indoor air quality and energy efficiency, as well as providing discovery and recommendations, which will include any remedial repairs and schematic basis of design and scope of work for any capital improvements. (Ongoing)

Marbella South, Jersey City, NJ - Commissioning for a new, 39-story, 360,800 SF residential tower. Commissioning services will address building controls, HVAC systems and equipment, HVAC test and balance verification, lighting controls and the domestic hot water system. (Ongoing)

The Wistar Institute, Philadelphia, PA - Commissioning services for the HVAC and building automation systems, electrical and emergency power systems, lighting controls, UPS systems, life safety systems, plumbing systems and security system. (2014)

West Pharmaceutical Services, Exton, PA - Commissioning of new 170,000 SF global corporate headquarters containing administrative and R&D space. The project is LEED registered. (2012)

1919 Market Street (project currently in construction phase)
The project involves construction of a new, mixed-use luxury multifamily tower of approximately 473,000 gross square feet. The building will have 30 floors, an attached six level parking garage and 321 residential units.

Journal Square Plaza 3 (project currently in construction phase)

The project involves constructing a new 13-story building, approximately 221,000 square foot multi-family residential tower. A total of 240 rental units are planned.

Education and Certification
Pacific University, Bachelor of Arts
ASHRAE Commissioning Process Management Professional; Associated Air Balance Council (AABC) Certified Test and Balance Technician; National Environmental Balancing Bureau (NEBB) Certified Building Systems Commissioning Professional; National Balancing Council (NBC) Certified Test and Balance Professional

Memberships
ASHRAE; Association of Energy Engineers; Building Commissioning Association; Delaware Valley Green Building Council; Green Building Association of Central Pennsylvania; NEBB Mid-Atlantic Chapter; Pennsylvania Energy Services Coalition; U.S. Green Building Council

CHRISTOPHER MATCZAK, NEBB CT
Lead Commissioning Engineer

Chris has 10 years of professional and commissioning experience. He is experienced as a project manager and engineer, and has provided construction and start-up support on commissioning projects. Prior to joining the WCx team, Chris held a position as a controls specialist and programmer at Honeywell International, where he installed and programmed projects, reviewed drawings and specifications and coordinated with clients to design building automation systems to meet their specifications. Chris graduated from the Pennsylvania College of Technology with a B.S. in Building Automation Technology.

Project Experience

Independence Blue Cross Tower, Philadelphia, PA – Retro-Commissioning services for variable air volume, packaged air handling units and BAS. (2015-2016)

1919 Market Street, Philadelphia, PA - The project involves construction of a new, mixed-use luxury multifamily tower of approximately 473,000 gross square feet. The building will have 30 floors, an attached six level parking garage and 321 residential units. *LEED Registered* (2015-2016)

TD Bank Atrium Building, Cherry Hill, NJ – Retro-Commissioning services on two 120-ton split system rooftop air handling units, fan powered VAV terminal units, split system A/C units and BAS controls. (2016)

SugarHouse Casino Phase 1A Expansion, Philadelphia, PA – Commissioning services for a 160,000 SF casino and ballroom expansion, plus 560,000 SF parking garage facility. Systems commissioned include the automatic temperature control system, HVAC equipment, exhaust equipment, plumbing equipment, electrical systems as well as air test and balance verification. (2015-2016)

NTM Engineering, Philadelphia, PA – Commissioning services for a 15,000 SF office fit-out. Commissioning of HVAC, BAS, exhaust equipment, air and hydronic TAB verification, and electrical systems and plumbing systems, during the design, construction and post-occupancy phases. *LEED Registered with LEED Platinum Goal* (2015-2016)

PHA Collegeview, Philadelphia, PA – Commissioning services for mechanical and electrical upgrades project. Systems commissioned include new BAS, new HVAC equipment and new plumbing equipment during the construction and post-occupancy phases. (2015-2016)

400 Arlington Boulevard, Logan Township, NJ – Commissioning of HVAC, exhaust equipment, air TAB verification, electrical systems and plumbing systems in a new 210,600 SF warehouse. Services provided throughout design, construction and post-occupancy phases. *LEED Registered* (2015-2016)

Education
Pennsylvania College of Technology, Bachelor of Science in Building Automation Technology

NYKIA GANTT, EIT, NEBB CT
Commissioning Engineer

Nykia has 18 years of mechanical systems design experience, commissioning and retro-commissioning, construction methodology and trades, facilities operations and forensic investigations of critical building systems gained through hands-on experience as well as project oversight and delivery. Prior to joining the WCx team, Nykia held a position as a mechanical design engineer at CRB Consulting Engineers, where he gained extensive experience designing HVAC and plumbing systems. Nykia graduated from Drexel University with a B.S. in Mechanical Engineering.

Project Experience

Rowan Hall HVAC Retro-Commissioning, Glassboro, NJ – to optimize systems' performance of this complex building after several years' use, Rowan engaged WCx to provide technical retro-commissioning, testing and balancing, and energy consulting services. We reviewed the existing operations and maintenance documentation; interviewed users of the building; physically tested the systems under a variety of extreme conditions; and then issued a report with recommended solutions to optimize the efficiency of the building. (2016)

Princeton University Peyton Hall Renovation, Princeton, NJ – Peyton Hall houses Princeton's Department of Astrophysical Sciences, including laboratories, faculty offices, lecture and seminar rooms, a library and two telescopes on the roof. The University recently expanded the modern two-story building within the original footprint, and engaged WCx to commission improvements to life safety, and mechanical / electrical / plumbing systems. (2015)

Swarthmore College NPPR Residence Hall, Swarthmore, PA – WCx is providing commissioning services for the college's 120-bed suite-style residence hall consisting of three connected "cubes" of three, four and five stories. Commissioning services include the BAS, HVAC, normal and emergency power, lighting, plumbing, fire protection, renewable energy and conveying systems. (Current)

Rutgers University Business School, Piscataway, NJ – Retro-commissioning platform of investigating and optimizing HVAC systems throughout the building to improve comfort and operation, indoor air quality and energy efficiency. B+W is providing discovery and recommendations, which will include any remedial repairs and schematic basis of design and scope of work for any capital improvements. (Current)

M1 Retro-Commissioning, Jersey City, NJ – Retro-commissioning of the 55-story East and West towers of the M1 residence buildings. Services include evaluation, testing, adjusting and correcting system operations to meet the owner's current facility requirements. Recommendations will be geared toward optimizing operating efficiency, indoor comfort and environmental quality as well as recommendations for minimizing future cost events. (Current)

Education and Certification
Drexel University, Bachelor of Science in Mechanical Engineering

DAVID CHARLES WHALEN, EIT, NEBB CT

EDUCATION

University of Vermont - Burlington Bachelor of Science in Mechanical Engineering ’16

PROFESSIONAL EXPERIENCE

Commissioning Engineer: Wright Commissioning, Philadelphia, PA 2024-present

Project List:
- KIPP North Philadelphia Academy Retro-Commissioning
- University of Delaware New McKinly Lab Building
- PA DGS Perry County Maintenance Facility and Stockpile
- Duke Farms Retro-Commissioning

Commissioning Engineer: Genesis AEC, Blue Bell, PA 2021-2024

Completed checklists for various fields including HVAC, security, plumbing, BMS, fire protection, telecom, structural, piping, lab gas, and more.
- Furthered proficiency in understanding mechanical and architectural design plans
- Ensured equipment was working to specification
- Proactively planned startup activities and executed functional testing
- Reviewed vendor and contractor submittals and O&Ms
- Prepared routine status reports for multiple coincidently ongoing projects
- Preformed hands-on functional testing and inspection
- Completed checklists in CxAlloy and on paper

Project Manager/Engineer: Clean Air Quality Service, Hawthorne, NY 2016-2020

Gained exposure to a multitude of different fields including HVAC, sheetmetal work, plumbing, BMS, service/maintenance, project management, estimating, billing and more.
- Managed a $1M project in Grand Central, NYC while on additional projects
- Became proficient in understanding mechanical and architectural design plans
- Approved and managed the time log of employees for billing purposes
- Cemented AutoCAD and Revit knowledge in creating, optimizing and fabricating ductwork
- Pioneered new 3D scanner to measure site of installation
- Took hands on approach to assist fabrication, direct installation and balancing

PROJECT EXPERIENCE

Senior Design Project: *Free Ride* Project, UVM, VT Sept 2015 - May 2016
- Collaborated with small team to simulate driving to promote driver safety
- Utilized micro-controllers and servos to translate programing language

Eagle Project: Removal of Invasive Plants, Westborough, MA 2011-2012
- Took a leadership role to plan and direct workers
- Planned out specific geographic areas to tackle and met deadlines

OTHER EXPERIENCE

Desk Assistant Manager: McAuley Hall, UVM, VT 2012-2016
- Assisted hundreds of residents with their various needs
- Sorted and distributed mail and packages

Assistant Karate Instructor: *Metrowest Martial Arts*, MA 2009-2010

- Helped students learn forms and instilled the values of Respect, Self-Discipline and Self-Control

SKILLS & ACCOMPLISHMENTS

Hardware: Lathe, 3D Printer, Vicon Plasma Cutting Table, 3D Laser Scanner
Software: Revit, Fabrication CAD MEP, Navisworks, Vista by Viewpoint, AutoCAD, Matlab, Mathematica, Solidworks, C-Programming, Python, and office software for Google/Mac/Windows
Certifications: OSHA 30 - Hour, Certified Eagle Scout and Member of the Order of the Arrow (Scouting's Honor Society) Second Degree Black Belt – Shaolin Kempo Karate

SECTION 4: CERTIFICATIONS AND CREDENTIALS

CITY OF PHILADELPHIA

COMMERCE DEPARTMENT
1515 Arch Street, 12th Floor
Philadelphia, PA 19102
P: 215-683-2055
F: 215-683-2085

LYNN T. NEWSOME
Deputy Commerce Director
Office of Economic Opportunity
Lynn.T.Newsome@phila.gov

January 31, 2024

Kim Wright
Wright Commissioning LLC DBA Wright Commissioning
1001 Baltimore Pike
Suite 303
Springfield, PA 19064

RE:

CERTIFICATION DATE: January 31, 2024
EXPIRATION DATE: April 22, 2025
CERTIFICATION STATUS: Minority/Women Business Enterprise (MWBE)
REGISTRATION NUMBER: 111794

Dear Kim Wright:

CONGRATULATIONS!!! We are pleased to inform you that Wright Commissioning LLC DBA Wright Commissioning has been placed in the City of Philadelphia Office of Economic Opportunity (OEO) Registry. Wright Commissioning LLC DBA Wright Commissioning will remain on the City's Registry as long as the certification is current and your firm remains in good standing. Please note, it is imperative that the certification/registration be renewed no later than three months after the certification expires. OEO will deactivate your OEO Registry listing three months after the certification expires. (Example - certification/registration expires 1/1/22, on 4/1/22 your business profile will be deactivated from the OEO Registry).

Your placement in the OEO Registry offers you the following competitive advantages:

1. Free Advertisement 365 days a year. Now that your company is part of the OEO Registry, your company will be viewed by over 50 City of Philadelphia departments, in addition to for-profit, non-profit and private industries.
2. The Office of Business Services (OBS) is the City's one-stop-shop for all business related services. OBS can assist you with a wide range of issues, from navigating the permit process to identifying loan programs for which you may qualify. Please call 215-683-2100 for more information on how OBS may be of service.
3. When your firm is competitively selected and utilized for City of Philadelphia contracts, based on how you are certified (either MBE,WBE or DSBE) your certification can be counted towards the MBE/ WBE/DSBEs participation ranges.
4. Contractors, subcontractors, and professionals who are seeking vibrant and capable MBE/WBE/DSBEs for contracting opportunities, use the OEO Registry. Being part of the OEO Registry increases your ability to compete for private and public procurement opportunities.

Please inform us if there are any material changes to your certification. These changes may include but are not limited to:

1. your company name;
2. contact information;
3. change in ownership, sale or dissolution of your business;
4. NAICS Codes/services that you are **certified** to provide; and/or
5. loss of certification

Please note that OEO will not list NAICs Codes for your firm unless those codes have been provided by your approved certifying entity. If you desire additional NAICs codes, you must obtain them from your approved certifying entity that will evaluate whether your firm has demonstrated requisite control and legitimate capacity for the additional type of work or supply effort. If your firm is identified for work or supply effort on a City bid without the corresponding NAICs Code in the OEO Registry, the work/supply effort will not receive credit.

In addition to being part of the OEO Registry, if your business is headquartered in Philadelphia, we strongly encourage you to apply to the City's Procurement Department to become a certified Local Business Entity (LBE) with the City of Philadelphia. Being a certified LBE provides Philadelphia based businesses with the advantage of as preferred vendor status and being eligible for a bid preference on some City contracts.

Your company will be located in our OEO Registry under the following North American Industry Classification System (NAICS) Codes:
NAICS 541990: ALL OTHER PROFESSIONAL, SCIENTIFIC, AND TECHNICAL SERVICES

For more information about what OEO and the Philadelphia Department of Commerce can do for you, please visit our website at www.phila.gov/business. Also, please visit the https://contracts.phila.gov/#/ for current City of Philadelphia contracting opportunities.

If you have any questions, feel free to give us a call at 215-683-2071.

Sincerely,

Alice Dungee-James, MCA
Director of Registration and Outreach

C: Michelle Price, Director, Office of Business Services (OBS)
LaShawnda Tompkins, Director of Administration, Procurement Department
Marla Hamilton, Vice President, Philadelphia Industrial Development Corporation (PIDC)

NOTICE OF SMALL DIVERSE BUSINESS VERIFICATION

pennsylvania
DEPARTMENT OF GENERAL SERVICES

The Department is pleased to announce that

WRIGHT COMMISSIONING LLC

has successfully completed the Pennsylvania Department of General Services' process for self-certification as a small business under the Commonwealth's Small Business Contracting Program, and is verified as a Small Diverse Business with the following designation(s):

BUSINESS TYPE(s):

Building Design Services

CERTIFICATION NUMBER: **410911202311-SDB-MW**

CERTIFCATION TYPE: **SMALL DIVERSE BUSINESS**

ISSUE DATE: **11/17/2023** EXPIRATION DATE: **11/14/2025**

RECERTIFIED DATE:

Kerry L. Kirkland

Kerry L. Kirkland, Deputy Secretary
Bureau of Diversity, Inclusion & Small Business Opportunities

NOTICE OF SMALL BUSINESS SELF-CERTIFICATION

pennsylvania
DEPARTMENT OF GENERAL SERVICES

The Department is pleased to announce that

WRIGHT COMMISSIONING LLC

has successfully completed the Pennsylvania Department of General Services' process for self-certification as a small business under the Commonwealth's Small Business Contracting Program, with the following designation:

BUSINESS TYPE(s):

Building Design Services

CERTIFICATION NUMBER: **410911202311-SB**

CERTIFCATION TYPE: **SMALL BUSINESS**

ISSUE DATE: **11/14/2023** EXPIRATION DATE: **11/14/2025**

RECERTIFIED DATE:

Kerry L. Kirkland

Kerry L. Kirkland, Deputy Secretary
Bureau of Diversity, Inclusion & Small Business Opportunities

THIS CERTIFIES THAT

Wright Commissioning, LLC

NMSDC
National Minority Supplier Development Council

* Nationally certified by the: **EASTERN MINORITY SUPPLIER DEVELOPMENT COUNCIL**

*NAICS Code(s): 541330; 238220; 541350; 561210

* Description of their product/services as defined by the North American Industry Classification System (NAICS)

03/31/2024		PT01853
Issued Date		**Certificate Number**
	Joset B. Wright-Lacy	
03/31/2025		
Expiration Date		**Valarie J. Cofield, President/CEO**

By using your password (NMSDC issued only), authorized users may log into NMSDC Central to view the entire profile: http://nmsdc.org

Certify, Develop, Connect, Advocate.

* MBEs certified by an Affiliate of the National Minority Supplier Development Council, Inc.®

WBENC
WOMEN'S BUSINESS ENTERPRISE NATIONAL COUNCIL
JOIN FORCES. SUCCEED TOGETHER.

hereby grants

National Women's Business Enterprise Certification

to

Wright Commissioning LLC DBA Wright Commissioning

who has successfully met WBENC's standards as a Women's Business Enterprise (WBE).
This certification affirms the business is woman-owned, operated and controlled and is valid through the date herein.

Certification Granted: April 22, 2024
Expiration Date: April 22, 2025
WBENC National Certification Number: WBE2200912

WBENC National WBE Certification was processed and validated by Women's Business Enterprise Center - East, a WBENC Regional Partner Organization.

Elizabeth M Walsh

Authorized by Elizabeth M. Walsh, President
Women's Business Enterprise Center - East

WBEC EAST
WOMEN'S BUSINESS ENTERPRISE CENTER
JOIN FORCES. SUCCEED TOGETHER.

NAICS: 541990
UNSPSC: 72154000

Center for Women & Enterprise · Great Lakes Women's Business Council · Greater Women's Business Council · Women's Business Council Southwest · WBEC Metro NY · WBEC Greater DMV · WBEA · WBEC Florida · WBEC ORV · WBEC Pacific · Women's Business Development Center · WBEC South · WBEC West

Firm Certification

WRIGHT COMMISSIONING, LLC

HAS MET ALL REQUIREMENTS FOR NEBB CERTIFIED STATUS IN THE FOLLOWING DISCIPLINE

Whole Building Technical Commissioning of New Construction

3452

NEBB Certification Number

December 31, 2024

Expiration Date

NEBB President

NEBB President-Elect

Certification

WILLIAM A. WRIGHT

HAS MET ALL REQUIREMENTS FOR NEBB CERTIFIED PROFESSIONAL STATUS IN THE FOLLOWING DISCIPLINE

Whole Building Technical Commissioning of New Construction

This Certificate, as well as individual affiliation with a NEBB Certified Firm and associated NEBB Certification Stamp are REQUIRED to provide a NEBB Certified Report. Participation in the NEBB Quality Assurance Program requires the Certificant be affiliated with a NEBB Certified Firm

CP-23651

NEBB Certification Number

December 31, 2024

Expiration Date

NEBB President

NEBB President-Elect

Firm Certification Number: 3452

Firm Name: Wright Commissioning, LLC

Certification: Whole Building Technical Commissioning of New Construction

Certified Professional Name: WILLIAM A. WRIGHT

Expiration Date: 12/31/24

GBCI

GREEN BUILDING CERTIFICATION INSTITUTE

HEREBY CERTIFIES THAT

William Anson Wright

HAS ACHIEVED THE DESIGNATION OF

LEED® ACCREDITED PROFESSIONAL

BY DEMONSTRATING THE KNOWLEDGE OF GREEN BUILDING PRACTICE REQUIRED FOR SUCCESSFUL IMPLEMENTATION OF THE LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN (LEED®) GREEN BUILDING RATING SYSTEM™.

LEED AP™

Robert L. Flora
Chairman

October 31, 2008
Date Issued

S. Richard Fedrizzi, President and CEO

ASHRAE

American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

To all whom these presents shall come
Greetings:
Be it known that

WILLIAM A. WRIGHT

having successfully completed all requirements and criteria has been certified as a

Commissioning Process Management Professional

and has accordingly been awarded all the rights, honors, and privileges thereunto appertaining.

Gordon Holness
ASHRAE President 2009-2010

Jeff Littleton
Executive Vice President

August 4, 2009

Date

The Association of Energy Engineers

certifies that

William A. Wright

has completed the prescribed standards for certification,
has demonstrated a high level of competence and ethical fitness
for energy management, and is hereby granted the title of

CERTIFIED ENERGY MANAGER®

Valid

February 4, 2019 to December 31, 2024

CEM

21947

ASSOCIATION OF ENERGY ENGINEERS CORPORATE SEAL GEORGIA

CEM Board Chairman

Helen Johnson

CEM Director

ANSI

ANSI Accredited Program
PERSONNEL CERTIFICATION
#1088

U.S. ARMY CORPS OF ENGINEERS

USACE LEARNING CENTER
HUNTSVILLE, ALABAMA

NAVFAC

CERTIFICATE

William Wright

NAB-08-20-09051

has completed the Corps of Engineers and Naval Facility Engineering Command Training Course

CONSTRUCTION QUALITY MANAGEMENT FOR CONTRACTORS - #784

Beltsville	02/06/2020	NAB /WA 1CEU:0.8 LU:8POH:8	Salvatore Vitale
Location	Training Date(s)	Instructional District/ NAVFAC	CQM-C Manager

Jason Hummel / Paula Furman	Salvatore.Vitale@usace.army.mil	410-962-2967	VITALE.SALVATORE.1094560566 Digitally signed by VITALE.SALVATORE.1094560566 Date: 2019.08.12 07:22:57 -04'00'
acilitator/Instructor	Email	Telephone	Facilitator/Instructor Signature

THIS CERTIFICATE EXPIRES FIVE YEARS FROM DATE OF ISSUE

Jeffrey D. Dziedzic

Chief, USACE Learning Center

City of Philadelphia
Department of
Licenses & Inspections
P.O. Box 53310
Philadelphia, Pa. 19105

DISPLAY PROMINENTLY
if required by law

WRIGHT COMMISSIONING LLC
1001 BALTIMORE PIKE, SUITE 303
SPRINGFIELD, PA 19064
USA

3702 Commercial Activity License

Activity License Type: Commercial Activity

LICENSE CODE	LICENSE NO.	COMMERCIAL ACTIVITY LIC.	EXPIRES AT END OF	EFFECTIVE DATE
3702	575500	575500		10/11/2012

ACTIVITY LICENSE

Interpreter services available. |خدمات الترجمة الشفهية متوفرة لدينا |អាចទទួលបានសេវាកម្មអ្នកបកប្រែភាសា ។ |提供口译服务 |Services d'interprétation disponibles. |통역이 제공됩니다 |Предоставляются услуги устного переводчика. |Se brindan servicios de interpretación. |Có sẵn dịch vụ thông dịch.

City of Philadelphia
Department of
Licenses & Inspections
P.O. Box 53310
Philadelphia, Pa. 19105

DISPLAY PROMINENTLY
if required by law

WRIGHT COMMISSIONING LLC
1001 BALTIMORE PIKE, SUITE 303
SPRINGFIELD, PA 19064
USA

3541 Special Inspection Agency

WRIGHT COMMISSIONING LLC

THIS LICENSE IS GRANTED TO THE PERSON OR COMPANY FOR THE PURPOSE STATED ABOVE. IT IS SUBJECT TO IMMEDIATE CANCELLATION BY THIS DEPARTMENT FOR VIOLATIONS OF CITY ORDINANCES AND REGULATIONS.

LICENSE CODE	LICENSE NO.	COMMERCIAL ACTIVITY LIC.	EXPIRES ON	ISSUED ON
3541	051322	575500	2/15/2027	1/10/2024

LICENSE

City of Philadelphia
Department of
Licenses & Inspections
P.O. Box 53310
Philadelphia, Pa. 19105

DISPLAY PROMINENTLY
if required by law

WILLIAM WRIGHT

3541 Special Inspector

THIS LICENSE IS GRANTED TO THE PERSON OR COMPANY FOR THE PURPOSE STATED ABOVE. IT IS SUBJECT TO IMMEDIATE CANCELLATION BY THIS DEPARTMENT FOR VIOLATIONS OF CITY ORDINANCES AND REGULATIONS.

LICENSE CODE	LICENSE NO.	COMMERCIAL ACTIVITY LIC.	EXPIRES ON	ISSUED ON
3541	051228		1/28/2027	12/18/2023

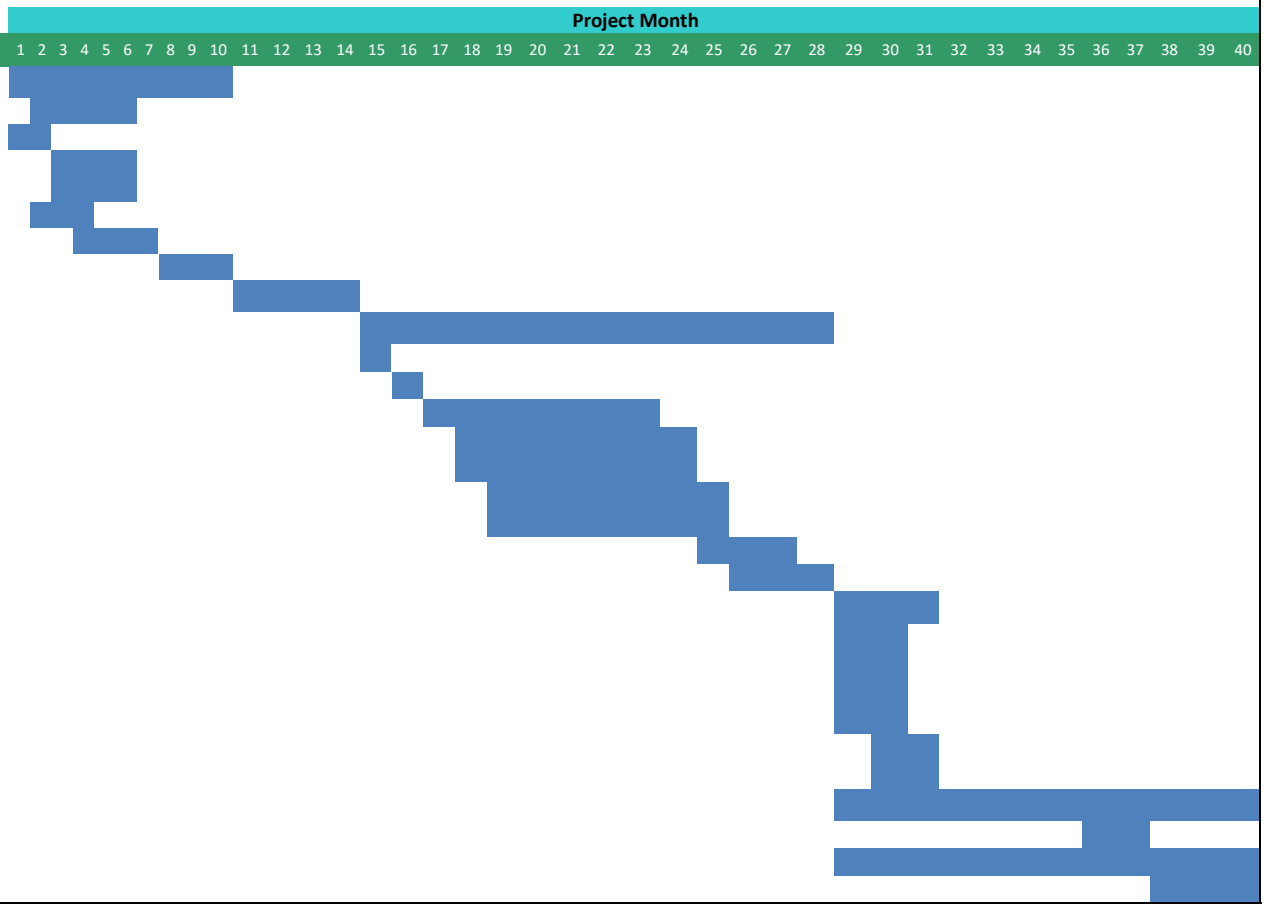
LICENSE

SECTION 5: WORK PLAN/SCHEDULE

Erie Maritime Museum Building and Infrastructure Improvements Preliminary Commissioning Schedule

Project Start Date: August, 2024

Cx Phase / Activity	Start Month	End Month
Design Phase	**1**	**10**
Develop OPR	2	6
Review BOD	1	2
Preliminary Cx Plan	3	6
Cx Specs	3	6
SD Review	2	4
DD Back-Check and Review	4	7
CD Back-Check and Review	8	10
Bidding	**11**	**14**
Construction and Acceptance Phases	**15**	**28**
Cx Plan	15	15
Cx Kick-Off	16	16
Submittal Review	17	23
Field Installation Verification	18	24
Static Testing	18	24
Start-Ups	19	25
Functional Testing	19	25
TAB Verification	25	27
Performance Verification	26	28
Occupancy and Operations Phases	**29**	**31**
Record Drawing Review	29	30
O&M Review	29	30
Training	29	30
Lessons Learned	29	30
Systems Manual	30	31
Cx Report	30	31
Post Occupancy/Warranty Phase	**29**	**40**
Opposite Season Testing as required	36	37
Ongoing Commissioning	29	40
End of Warranty Review	38	40



COMMISSIONING HOURS MATRIX -- Erie Maritime Museum Building and Infrastructure Improvements		
Phase / Activity	**Staff**	**Hours**
PRE-CONSTRUCTION PHASE		
Develop OPR	Commissioning Authority	18
Review BOD	Lead Commissioning Engineer	34
Preliminary Cx Plan	Commissioning Engineer	30
Cx Specs	Clerical/Administrative	14
SD Review		
DD Back-Check and Review		
CD Back-Check and Review		
	Design Phase Hours:	**96**
CONSTRUCTION AND ACCEPTANCE PHASES		
Develop construction phase Cx plan	Commissioning Authority	38
Cx kick-off meeting	Lead Commissioning Engineer	178
Equipment submittal review	Commissioning Engineer	178
Field installation verification	Clerical/Administrative	38
Ductwork and piping static testing		
Equipment start-up		
Maintain issues log		
Functional performance testing		
Air and hydronic TAB verification		
	Construction and Acceptance Phases Hours:	**432**
OCCUPANCY AND OPERATIONS PHASES		
Record drawing and O&M manual review	Commissioning Authority	4
Owner training seminar	Lead Commissioning Engineer	10
Develop systems manual	Commissioning Engineer	10
Prepare Cx report	Clerical/Administrative	4
	Occupancy and Operations Phases Hours:	**28**
POST OCCUPANCY/WARRANTY PHASE		
Opposite-season testing	Commissioning Authority	4
Ongoing commissioning	Lead Commissioning Engineer	10
10-month warranty review visit	Commissioning Engineer	10
	Clerical/Administrative	4
	Post Occupancy/Warranty Phase Hours:	**28**
	TOTAL HOURS:	**584**

SECTION 6: GEOGRAPHIC PROXIMITY

WRIGHT COMMISSIONING

GEOGRAPHIC PROXIMITY

Wright Commissioning's office in Ashtabula, OH, 4205 Gulf Ridge Place, is approximately 40 miles from the project site. The drive is approximately 45 minutes, depending on traffic. As WCx is close in proximity, travel time will not be billed.

1001 Baltimore Pike
Suite 303
Springfield, PA 19064

T. 215.279.5950
F. 215.558.5767

www.wrightcx.com