

July 6, 2016

Expression of Interest

HVAC Renovation/Upgrade Design for Dunbar and Bluefield Armories

Solicitation Number: CE01 0603 ADJ1600000002



07/06/16 11:50:28
WV Purchasing Division



submitted to
West Virginia Department of Administration
Purchasing Division
2019 Washington Street East
Charleston, West Virginia 25305-0130

submitted by
Michael Baker International, Inc.

Michael Baker
INTERNATIONAL

Michael Baker

I N T E R N A T I O N A L

We Make a Difference

July 6, 2016

Ms. Crystal Rink
West Virginia Department of Administration
Purchasing Division
2019 Washington Street, East
Charleston, West Virginia 25305

Subject: CEOI 0603 ADJ1600000002
 HVAC Renovation/Upgrade Design for Dunbar and Bluefield Armories

Dear Ms. Rink:

The Charleston office of Michael Baker International, Inc. (Michael Baker) is pleased to respond to the subject Expression of Interest for the WV Army National Guard. We have relevant experience with many of the design elements necessary for this assignment from recent projects including HVAC and Architectural Renovations to the WVARNG Charleston Armory.

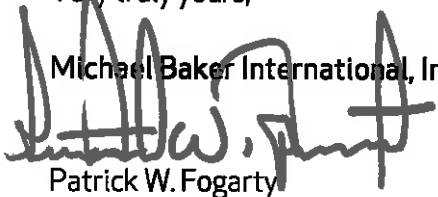
Michael Baker is well positioned to assemble a comprehensive design team (in-house) including: Mechanical, Electrical, Structural, Civil and Architectural expertise. Our diverse team of professionals are well versed in the preparation of construction documents, bid specifications, and the application of required construction permits. Michael Baker can also provide assistance during the Bidding process and the appropriate level of Construction Administration.

We thank you for your consideration and look forward to meeting with the selection committee in person in order to share our thoughts and ideas for this exciting opportunity!

Should you have any questions or require additional information, please feel free to contact me at (304) 769-2132 or by e-mail at pfogarty@mbakerintl.com.

Very truly yours,

Michael Baker International, Inc.



Patrick W. Fogarty

Enclosure

MBAKERINTL.COM

400 Washington Street East, Suite 301 | Charleston, WV 25301

Office: 304.769.0821 | Fax: 304.769.0822



Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

State of West Virginia
 Centralized Expression of Interest
 02 - Architect/Engr

Proc Folder: 221131

Doc Description: HVAC SYSTEM(S) REPLACEMENT EOI DESIGN SERVICES

Proc Type: Central Purchase Order

Date Issued	Solicitation Closes	Solicitation No		Version
2016-06-08	2016-07-06 13:30:00	CEOI	0603 ADJ1600000002	1

BID RECEIVING LOCATION

BID CLERK

DEPARTMENT OF ADMINISTRATION

PURCHASING DIVISION

2019 WASHINGTON ST E

CHARLESTON

WV 25305

US

VENDOR

Vendor Name, Address and Telephone Number:

Michael Baker International, Inc.
400 Washington Street East, Suite 301
Charleston, West Virginia 25301
304.769.0821

FOR INFORMATION CONTACT THE BUYER

Crystal Rink

(304) 558-2402

crystal.g.rink@wv.gov

Signature X

FEIN # 25-1228638

DATE July 6, 2016

All offers subject to all terms and conditions contained in this solicitation

INVOICE TO		SHIP TO	
DIVISION ENGINEERING & FACILITIES ADJUTANT GENERALS OFFICE 1707 COONSKIN DR		DIVISION ENGINEERING & FACILITIES ADJUTANT GENERALS OFFICE 1707 COONSKIN DR	
CHARLESTON	WV25311	CHARLESTON	WV 25311
US		US	

Line	Comm Ln Desc	Qty	Unit Issue
1	HVAC Replacement/Upgrade-EOI Design Services		

Comm Code	Manufacturer	Specification	Model #
81101508			

Extended Description :

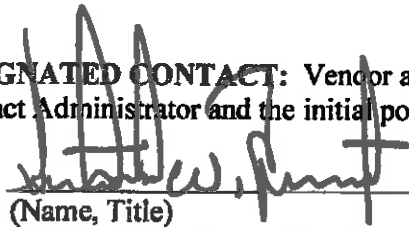
Professional engineering design services to develop construction documents to provide for the replacement/upgrade of HVAC systems as needed, at the Dunbar Armory, located at 605 26th Street, Dunbar, WV 25064, and at the Brushfork Armory, located at 2915 Old Bramwell Road, Bluefield, WV 24701 per the attached documentation.

ADJ1600000002	Document Phase Draft	Document Description HVAC SYSTEM(S) REPLACEMENT EOI DESIGN SERVICES	Page 3 of 3
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ADDITIONAL TERMS AND CONDITIONS

See attached document(s) for additional Terms and Conditions

DESIGNATED CONTACT: Vendor appoints the individual identified in this Section as the Contract Administrator and the initial point of contact for matters relating to this Contract.



(Name, Title)

Patrick W. Fogarty, Practice Manager

(Printed Name and Title)

400 Washington Street East, Suite 301, Charleston, WV 25301

(Address)

304.769.0821 / 304.769.0822

(Phone Number) / (Fax Number)

pfogarty@mbakerintl.com

(email address)

CERTIFICATION AND SIGNATURE: By signing below, or submitting documentation through wvOASIS, I certify that I have reviewed this Solicitation in its entirety; that I understand the requirements, terms and conditions, and other information contained herein; that this bid, offer or proposal constitutes an offer to the State that cannot be unilaterally withdrawn; that the product or service proposed meets the mandatory requirements contained in the Solicitation for that product or service, unless otherwise stated herein; that the Vendor accepts the terms and conditions contained in the Solicitation, unless otherwise stated herein; that I am submitting this bid, offer or proposal for review and consideration; that I am authorized by the vendor to execute and submit this bid, offer, or proposal, or any documents related thereto on vendor's behalf; that I am authorized to bind the vendor in a contractual relationship; and that to the best of my knowledge, the vendor has properly registered with any State agency that may require registration.

Michael Baker International, Inc.

(Company)



(Authorized Signature) (Representative Name, Title)

Russell E. Hall, Vice President

(Printed Name and Title of Authorized Representative)

7/6/16

(Date)

304.769.0821 / 304.769.0822

(Phone Number) (Fax Number)

STATE OF WEST VIRGINIA
Purchasing Division
PURCHASING AFFIDAVIT

MANDATE: Under W. Va. Code §5A-3-10a, no contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and: (1) the debt owed is an amount greater than one thousand dollars in the aggregate; or (2) the debtor is in employer default.

EXCEPTION: The prohibition listed above does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the W. Va. Code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

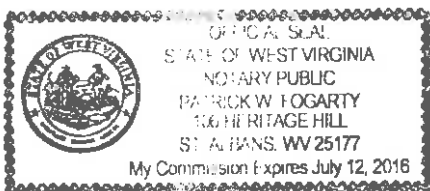
DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Employer default" means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' compensation self-insured employer. An employer is not in employer default if it has entered into a repayment agreement with the Insurance Commissioner and remains in compliance with the obligations under the repayment agreement.

"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceeds five percent of the total contract amount.

AFFIRMATION: By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (W. Va. Code §61-5-3) that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

WITNESS THE FOLLOWING SIGNATURE:Vendor's Name: Michael Baker International, Inc.Authorized Signature: *[Signature]* Date: 7/6/16State of West VirginiaCounty of Kanawha, to-wit:Taken, subscribed, and sworn to before me this 6th day of JULY, 2016My Commission expires JULY 12, 2016**AFFIX SEAL HERE**NOTARY PUBLIC *[Signature]**Purchasing Affidavit (Revised 07/01/2012)*

HVAC Renovation/Upgrade Design for Dunbar and Bluefield Armories

Solicitation Number: CEOI 0603 ADJ1600000002



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PROJECT LOCATION

The proposed sites are located at the Dunbar Armory, 605 26th Street, Dunbar, West Virginia and the Brushfork Armory, 2915 Old Bramwell Road, Bluefield, West Virginia.

PROJECT BACKGROUND

The West Virginia Army National Guard, Construction and Facilities Maintenance Office is seeking a highly qualified architectural/engineering firm to provide design services and bid documents for HVAC renovations/upgrades at both the Dunbar and Bluefield Armories. The existing facilities house WV National Guard troops and the design will comply with all applicable building codes in order to support elements of the WV Army National Guard Command. The firm will be responsible for evaluation of the existing conditions at the sites, to make recommendations, and to prepare the design and construction documents as specified in the Expression of Interest (EOI).

Michael Baker is extremely interested in continuing our professional relationship with the West Virginia Army National Guard, Construction and Facilities Maintenance Office

Michael Baker International, Inc. (Michael Baker) is a highly qualified firm with extensive experience in providing the type of services required for these projects, and we are extremely interested in continuing our professional relationship with the West Virginia Army National Guard, Construction and Facilities Maintenance Office (WVArNG).

QUALIFICATIONS & EXPERIENCE

FIRM/TEAM QUALIFICATIONS

Michael Baker's proposed team of experienced professionals has demonstrated the ability to deliver quality work products to our clients, on-time and within budget. Michael Baker can provide the entire depth of services necessary to complete the project without the need for costly sub-consultants. Each individual on this project team has extensive experience in their field of expertise and have demonstrated success on projects of similar size and scope.

The Principal-In-Charge will ensure that all required resources including staff and equipment are available to the project manager to execute the project successfully. Team resumes and project profiles provide a brief discussion of team member's experience base relevant to this project.

Management and Staffing

Michael Baker International, Inc.

Russell Hall, Vice President | 400 Washington Street East, Suite 301, Charleston WV 25301

304-769-0821 | RHall@mbakerintl.com

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Persons Assigned to the Project (Resumes Provided In Appendix 1)

NAME	ROLE
DAVID HILLIARD, P.E., LEED AP BD+C	Project Manager/Mechanical Engineering
OWEN MILLIGAN, P.E.	Electrical Engineering
NICOLE RILEY	Architectural Design
PATRICK FOGARTY, P.E., P.S., LEED GA	Civil Engineering
WAYNE AIRGOOD, P.E.	Structural Engineering
STEVE FRAZER, P.S.	Surveying and Mapping

According to our understanding of the project scope as stated in the EOI, no additional sub consultants will be required. Michael Baker will execute the entire project with our current Charleston office staff.

FIRM CAPACITY

Michael Baker is a full service A/E firm. Our local office in Charleston, WV is a "single-stop resource" capable of providing comprehensive professional services, from Environmental Studies, Roadway/Bridge, Mechanical/Electrical and Structural Engineering to Architecture, Planning, final design, and construction management through operational support. Michael Baker will provide the hands on services needed for this project, from Client meetings to site surveys, design and construction Administration/Inspection. With over 30 in house professionals locally, Michael Baker can react quickly and efficiently to the needs of your project.

Michael Baker's local clients for facilities development and renovation projects include, but are not limited to, colleges and universities, counties, parishes, cities, townships, local municipalities, state departments of transportation, military facilities, airport complexes, and private sector clients. Michael Baker's geographic location and extensive experience enables us to quickly respond to wide-ranging scopes of service in order to meet our client's needs.

Michael Baker, is a leading global provider of engineering and consulting services which includes planning, architectural, environmental, construction, program management, and full life cycle support services as well as information technology and communications services and solutions. Michael Baker provides its comprehensive range of services and solutions in support of U.S. federal, state, and municipal governments, foreign allied governments, and a wide range of commercial clients. With more than \$1.3 billion in annual revenue, Michael Baker has more than 6,000 employees in over 90 offices located across the U.S. and internationally. Michael Baker seamlessly integrates architecture, planning, landscape architecture, engineering and management. Internationally recognized with a portfolio spanning over half a century, the team provides excellence in solutions: superior technical ability, creative design and collaborative integration.

The success of our multidisciplinary approach to *built* environments results from the expertise of our design professionals. We solve challenges from multiple vantage points providing unsurpassed holistic, sustainable and innovative solutions that benefit our diverse clients, including institutions, governmental agencies, corporations, developers and builders.

Michael Baker has extensive resources and the required qualifications to provide planning, engineering and design services for the WVA²NG on this important project. We have local and nationally recognized experts with the technical experience necessary for this assignment. In addition, Michael Baker's team of experienced professionals have an established record of delivering quality work products to our clients, on schedule and within budget.

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In summary, Michael Baker's staff can provide documentation of our extensive experience in the following areas for this project:

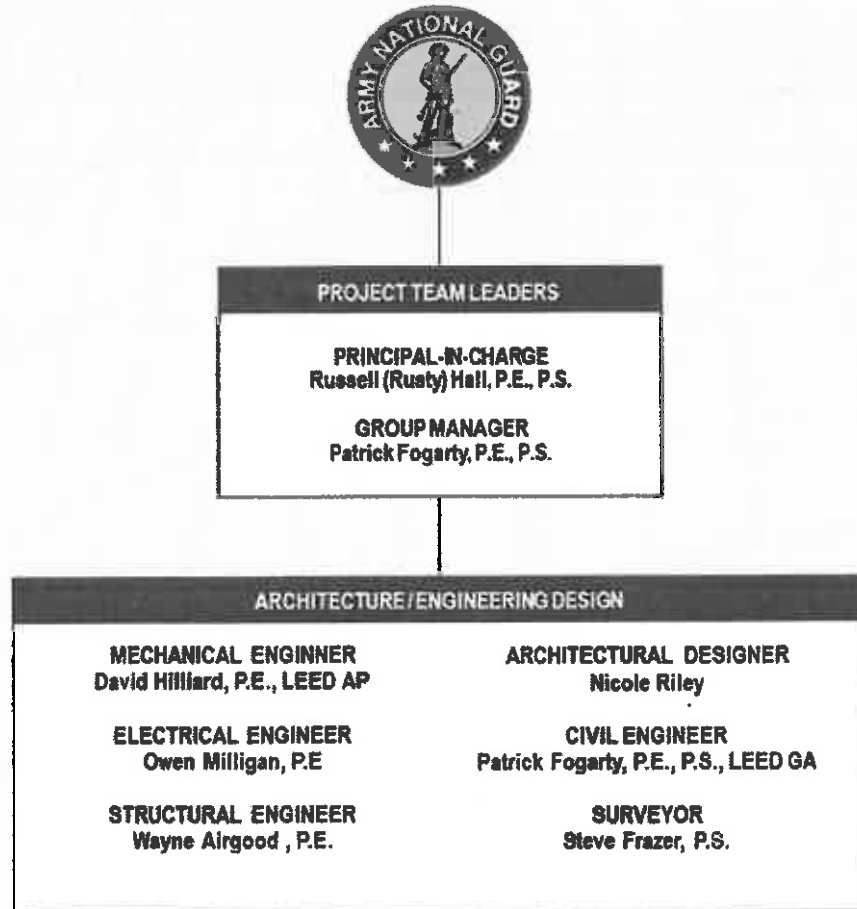
- Nationally recognized expertise in Assessing, Programming and Planning
- Facilities Engineering (Transportation, Civil, Mechanical, Structural and Electrical)
- Construction Administration and Construction Monitoring
- Coordination with State and Federal Agencies, as required

From major new or renovated building facilities, infrastructure and aviation, to oil and gas pipeline design, bridges and roadway designs, and water resource projects, Michael Baker has evolved into one of the leading engineering and energy services firms by consistently providing targeted solutions for its clients most complex challenges.

STATEMENT OF FIRM'S ACCEPTANCE AND FULL UNDERSTANDING THAT ANY AND ALL WORK PRODUCED AS A RESULT OF THE CONTRACT WILL BECOME PROPERTY OF THE AGENCY AND CAN BE USED OR SHARED BY THE AGENCY AS DEEMED APPROPRIATE

Michael Baker will provide to the WVArNG or other appropriate agencies, electronic copies of all required submittals through the various design stages and will provide final AutoCAD drawings at the completion of the project if requested.

PROJECT ORGANIZATION



HVAC Renovation/Upgrade Design for Dunbar and Bluefield Armories

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STATEMENT OR EVIDENCE OF THE FIRM OR TEAM'S ABILITY TO PROVIDE SERVICES

This team was selected based on the current Project understanding. Additional team support members can be engaged on an as needed basis

See Resumes for more details on team members in **Appendix 1**.

DEMONSTRATED EXPERIENCE IN COMPLETING PROJECTS OF A SIMILAR SIZE AND SCOPE

Project Profiles are included in **Appendix 2**. They were selected as a representative group of various kinds of related Department of Defense projects. These include various projects in-state and from across the country.

Additionally, we have included five (5) References which are provided in **Appendix 3**.

PROJECT GOALS and OBJECTIVES

METHODOLOGY FOR MEETING GOALS AND OBJECTIVES

It is Michael Baker's understanding that HVAC renovations/upgrades at both the Dunbar and Bluefield Armories are desired by the WVArNG. The completed project may include Heating, Air Conditioning, Fresh Air/ Exhaust Air, Heat Exchangers, HVAC Control Systems and will incorporate all provisions for security and Anti-Terrorism / Force Protection (AT/FP).

We recommend that an initial meeting be held to help us understand the WVArNG project requirements, criteria, schedule and budget. From the information gathered at this meeting, Michael Baker will develop a formal Scope of Work, AIA Agreement and Fee Proposal for review and negotiation. Once these elements have been approved, a Purchase Order will be issued which will constitute Notice to Proceed (NTP).

Once the NTP has been issued, we recommend a formal Kick-Off meeting with the WVArNG, the Dunbar and Bluefield Army administrators and any other appropriate Stake Holders. During this meeting, Michael Baker will introduce key project team leaders, get a clearer understanding of the particular tasks to be undertaken, establish point(s) of contact for each facility, and gather any available information for each site. The approach methodology for the project will be holistic in nature, combining the vision of the WVArNG, the mission of each of the Dunbar and Bluefield Armories, the building opportunities and limitations, and the applicable code and design guidance documentation.

In order to meet the goals and objectives of the WVArNG, Michael Baker will proceed in accordance with all current Federal, State and local building codes and permit requirements as well as DoD design guides. The design requirements include compliance with all applicable sections of the *Unified Facilities Criteria (UFC)* system as prescribed by *MIL-STD 3007* for planning, design, construction, sustainment, restoration, and modernization criteria which applies to Military Departments, Defense Agencies, and DoD Field Activities in accordance with *USD (AT&L) Memorandum*, dated 29May2002.

Michael Baker is very familiar with the UFC system having recently completed a Tactical Equipment Maintenance Facility, an Army Reserve Center (both out of state), and the Coonskin Complex Perimeter Fence and new Base Access Control Facility projects for the WVNG Joint Forces Headquarters in Charleston.

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GOAL/OBJECTIVE 1: DEVELOP DRAWINGS AND SPECIFICATIONS

Michael Baker will conduct a site investigation as follows: A survey team will be responsible for identifying existing building condition and renovation issues, building and room measurements, location of utilities and other pertinent components in the project area. This team will be led by a Licensed Professional Engineer. The survey data, photos and measurements will be studied, and then developed into a base map drawings with floor plans and building sections. This documentation will include the location of affected existing on-site equipment, utilities, structural components or remaining service lines.

Based on the site investigation and facility-specific information, Michael Baker will develop schematic design concepts for review and approval by the WVAirNG. A general code review would also be undertaken to determine State and Local Codes that would affect specific concept selections. The project will be studied in a systematic way to analyze the existing conditions, Client needs, and the facility's projected HVAC loads. Appropriate solutions will then be defined to meet all these requirements. Analyzing multiple solutions provides the Client the ability to choose the most cost effective and sustainable approach for the project.

Upon approval of the concept, Michael Baker will provide all necessary design documents in accordance with UFC directives and all applicable codes for all aspects of the design. Specifications for the installation of all required products or components will be provided as part of the Design submittals.

Baker regularly designs buildings to exceed ASHRAE 90.1 2007 by 20% to 30% and can design to achieve LEED certification if desired. Some of the options could include Variable Refrigerant Flow (VRF) or Loop Pipe Systems. Energy Recovery Units can be a way of limiting electric utility costs while achieving the fresh air requirements to meet ASHRA 62.1. Many other options will be considered if desired by the Client, including Geothermal Heat Pumps. Roof Top Units which typically have a lower up front cost will likely be one of the concepts presented.

GOAL/OBJECTIVE 2: FULL DESIGN SERVICES

Michael Baker will provide Mechanical/Electrical and Structural Engineering along with Architectural support. Plumbing and Fire protection engineering can be included as part of Baker's full design services. If building exterior work is necessary or desired, civil engineering and landscape architecture services can also be provided.

For each design submittal, a separate cost opinion will be provided for review and in order to keep the project within budget.

GOAL/OBJECTIVE 3: CONSTRUCTION DOCUMENTS AND BIDDING ASSISTANCE

Upon approval of the Design Development submittal, Michael Baker will finalize the Construction Documents including Construction Plans, Details and Specifications and submit for review and approval. The documents will be of sufficient detail to bid and construct all elements of the work. If required, a project phasing plan will be included with the construction documents, which will include preservation and protection of existing elements and temporary barricades and devices as necessary. Consideration will be given to partial or full Owner occupancy as required. Demolition drawings will be provided for the removal of existing components affected by the design including the temporary removal/replacement of existing elements designated to remain.

A final unit price cost opinion will be prepared and included with the submittal of the Construction Documents (100%).

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Michael Baker personnel will provide assistance during the bidding process by attending the Pre-Bid Meeting and preparing responses to technical questions that arise for incorporation into Addenda.

GOAL/OBJECTIVE 4: CONSTRUCTION ADMINISTRATION

Once the construction contract is awarded, Michael Baker will provide support to the WVArNG for the duration of construction. Shop drawings provided by the Contractor will be reviewed by Michael Baker to ensure that they meet all code requirements, specification criteria and are appropriate for the project. All products intended to be installed on the project shall be submitted to and approved by Michael Baker. The products will be approved based on meeting the prepared specifications, current code requirements and contract requirements. Michael Baker will also provide review for progress payment applications, requests for information (RFIs), work directive changes and change order requests. Michael Baker will attend regular progress meetings and provide as-needed site inspections.

After the installations are complete and systems have been tested and balanced, Michael Baker will perform a final inspection and develop a corrective measure Punch List.

As-built drawings will be prepared in AutoCAD format. The as-built drawings and operation and maintenance manuals will be provided to the Client upon completion of the project for future use. The documents will be 'bound', such that the files will not require external references and allows for easy future use and alteration. Paper and electronic format documents will be provided to the Client with all copyright control for the documents.

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APPENDIX 1 – Resumes

Russell E. Hall, P.E., P.S.

Assistant Vice President and Charleston Office Manager

General Qualifications

Mr. Hall currently serves as an Assistant Vice President of Michael Baker International as well as Office Manager of our Charleston, WV office. He is an experienced transportation engineer who has been involved in numerous bridge and highway design projects in West Virginia for over 28 years. His project management responsibilities involve overseeing staff from project inception through completion, and ensuring that the clients' needs and requirements are met.

He also has over nine years of office management experience. His office management responsibilities include financial oversight and accountability for a staff of over 30 engineers, scientists, and administrative personnel for Michael Baker's Charleston office. His major strengths include organizing and managing a project team, quality control and quality assurance, and problem resolution. He provides overall direction and maintains direct communications with all clients. Mr. Hall is very proud of the fact that he has been able to spend his entire career in West Virginia working to address West Virginia's transportation and infrastructure needs.

Experience

Kanawha River Bridge, Charleston, West Virginia. *Brayman Construction Company.* Principal-In-Charge. Responsible for oversight of Project Management. Michael Baker's Charleston, West Virginia office redesigned seven piers for the contractor and performed a complete analysis of the superstructure and substructure to properly size the piers.

US 35/I-64 Interchange Post Design, West Virginia. *West Virginia Department of Transportation, Division of Highways.* Principal-In-Charge. The design phase of this project provided for the preparation of construction and right of way plans for approximately three miles of 4-lane divided highway. The construction plans were separated into three construction contracts and included the design of two interchanges, two bridges, numerous box culverts and a vehicular underpass. The post design phase of this project provided for the review and approval of shop drawings and responding to Requests for Information. Michael Baker designed the original post-tensioned concrete box bridge. Contractor value engineered the superstructure to a steel girder bridge. Foundation for piers and abutments were as designed. Michael Baker reviewed pile testing, mass concrete results, and MSE wall calculations provided by the contractor.

Fort Pleasant Access Road Project, Moorefield, West Virginia. *Fort Pleasant Farms, Inc.* Principal-In-Charge. Responsible for oversight of project finances, schedules and quality control. Michael Baker prepared contract construction plans and related documents for a 3-lane access road connecting Corridor H to private property in Moorefield, WV.

Years with Michael Baker: 11

Years with Other Firms: 18

Degrees

B.S., 1985, Civil Engineering, West Virginia University Institute of Technology

Licenses/Certifications

Professional Engineer -
Civil/Structural, West Virginia,
1990

Professional Surveyor, West
Virginia, 1996

WVDOH Six-Year Bridge Inspection Program, Various Locations, West Virginia. *West Virginia Department of Transportation, Division of Highways.* Principal-In-Charge. Responsible for oversight of project finances, schedules and quality control. Michael Baker was responsible for performing the inspection services and report writing for the New River Gorge Bridge, Veteran's Memorial Bridge, Fort Hill Bridge, Fort Henry Bridge and Wheeling Tunnels.

Fort Pleasant Farms Two Lane Road Design, Moorefield. *Fort Pleasant Farms, Inc.* Principal-In-Charge. Responsible for oversight of project finances, schedules and quality control. This project involved the study, design and final construction plan development for a new two-lane access road approximately 1500' in length. This access road was designed to connect a commercial/residential development to the Moorefield Interchange on Corridor H in Moorefield, West Virginia.

Town of Moorefield-Maple Avenue Streetscape, Moorefield. *Town of Moorefield.* Principal-In-Charge. Responsible for oversight of Project Management. The Town of Moorefield was in need of a pedestrian-friendly way of connecting the downtown area with the highly utilized nearby community park. Maple Avenue was a secondary street connecting the two areas, but had no sidewalks and deep ditches along most of the corridor. Moorefield tasked Michael Baker with the planning and design of improvements that would both upgrade existing facilities and create a unified community linking the downtown with the community park.

Blennerhassett Island Bridge, Appalachian Corridor D, Washington County, Ohio and Wood County, West Virginia. *West Virginia Department of Transportation, Division of Highways.* Principal-In-Charge. Responsible for oversight of project finances, schedules and quality control. The 878' - 6" long network tied arch was ranked as the longest of its type in the United States and one of the longest in the entire world. Michael Baker provided project management, environmental and location studies, permitting, preliminary and final design as well as construction phase services.

Town of West Milford Sidewalk Improvements, West Milford, West Virginia. *Town of West Milford.* Principal-In-Charge. Responsible for oversight of Project Management. Michael Baker performed complete planning, design and construction management services for new sidewalks along U.S. Route 270 (Main Street) for the Town of West Milford. The improvements included concrete sidewalks with integral concrete curbs, driveway curb cuts, ADA accessible curb ramps with truncated domes, "ladder-style" crosswalks and storm drainage design. Michael Baker provided Construction Administration and resident inspection services as well as periodic site review during construction.

City of Charleston Bridges-Engineering Consulting Services, Charleston, West Virginia. *City of Charleston, West Virginia.* Principal-In-Charge. Responsible for oversight of Project Management. Michael Baker's Charleston, West Virginia office provided various services for the City of Charleston. Michael Baker reviewed existing inspection reports, performed bridge inspections and recommended and prioritized repairs for 13 bridges owned by the city.

Kanawha-Putnam Bike/Pedestrian Plan, Phase I, South Charleston. *Regional Intergovernmental Council.* Principal-In-Charge. Responsible for oversight of Project Management. Michael Baker performed a cursory inventory of existing bicycle and pedestrian facilities, identified areas with a high level of bicycle and pedestrian activity, collected existing resources and performed a broad base public outreach effort to identify bicycle and pedestrian issues in Kanawha and Putnam Counties for the Regional Intergovernmental Council (RIC). All data, survey results and preliminary findings were compiled for analysis and incorporation into the final plan during Phase II of the study.

Patrick W. Fogarty, P.E., P.S., LEED®GA

Civil Engineer, Facilities Practice Manager

General Qualifications

Mr. Fogarty has over 29 years of civil engineering project design and management experience. He is responsible for the technical and management aspects of civil design and surveying projects within Baker's Charleston, West Virginia office. Mr. Fogarty has designed and managed projects in numerous disciplines including civil, structural, and transportation engineering; site development planning; and surveying. These projects have included retail/commercial site preparation, airports, streets/highways, bridges, parking lots, buildings, retaining walls/foundations, sanitary systems and structures, as well as boundary and topographic and photogrammetric surveys. Duties included field surveying, drawings and specification preparation, design, design drafting, construction inspection, quality control testing, shop drawing review, project management, contract administration and report preparation.

Experience

West Virginia State Capitol Restroom Renovations. *State of WV General Services Division.* Project Manager. Responsible for the overall management of the project including the coordination of the subconsultant. Baker is leading a planning study for the renovation of 31 restrooms in the historic West Virginia Capitol Building. The planning study will assess the facilities and their conformance to current code requirements and code-required capacities, compliance with Americans with Disabilities Act (ADA) requirements, quantification of the building occupancy during normal and peak periods, and an evaluation of gender distribution of restrooms within the capitol. Baker will provide design, construction sequence, and scheduling recommendations. Upon approval of the design, Baker will prepare construction documents and provide construction administration services for the renovation of three restrooms on the basement level.

Nitro Bank Street Streetscape Improvements, Nitro, West Virginia. *City of Nitro.* Project Manager. Responsible for concept planning, detailed design, construction document generation, and construction administration. Baker provided design, bid-phase support, and construction services for streetscape improvements to Bank Street, located in the city's business district. Baker's services include base mapping, background data collection, design plans, construction document preparation, bid-phase support, construction management, and construction inspection.

Years with Michael Baker: 10

Years with Other Firms: 20

Degrees

B.S., 1985, Civil Engineering, West Virginia University Institute of Technology

Diploma, 1993, Surveying and Mapping, International Correspondence Schools

Coursework, Business Administration, Heriot-Watt University, Edinburgh College of Art

Licenses/Certifications

Professional Engineer - Civil/Structural, West Virginia, 1990
Professional Surveyor, West Virginia, 1993

Construction Documents Technologist, 1996

A/E Services for the Office of the Adjutant General, West Virginia Army National Guard, Division of Engineering and Facilities, Charleston, West Virginia. *State Army National Guard Headquarters.* Project Manager. Responsible for the management and coordination of all activities. The Facilities Management Officer (FMO) for the State of West Virginia, Division of Engineering and Facilities (DEF), West Virginia Army National Guard (WVARNG) selected Baker for a lump sum/fixed fee contract for architectural and engineering services. Baker was selected by the Division of Engineering and Facilities to provide complete design and construction administration services for the renovation of the first floor of the entire wing of the Office of the Adjutant General (TAG). The Owner requested the need for modernization of approximately 12,000 square feet of existing outdated office space - project elements included new acoustical ceilings, flooring, energy-saving light fixtures, duplex outlets, communications jacks, alterations to the existing floor plan, exterior door replacements, new interior doors and hardware, new wall finishes and asbestos removal.

Lost Creek Train Depot Rehabilitation, Lost Creek, West Virginia. *Town of Lost Creek.* Project Manager. Responsible for the management and coordination of all activities as well as all engineering design. The Town of Lost Creek retained Baker for the planning and design of the rehabilitation of a historic train depot adjacent to the Harrison County Rail Trail. Baker prepared a plan to raise the structure, make repairs to the deteriorated timber, excavate and place the concrete foundation system, then lower the structure to rest on the new foundation. Baker provided construction administration and inspection services as well as periodic site review during construction.

Little Kanawha Bus Facility, Calhoun County, West Virginia. *WV Division of Public Transit.* Project Manager. Responsible for the civil, site and structural engineering components of the project. Baker is providing architectural and engineering services, landscape architecture, and construction-phase support for a new, 9,900-square foot, pre-engineered, metal and brick bus maintenance and transit operations facility. The 5,100-square-foot administrative area will include offices, a conference room, a money-counting room, and a driver-training room, and the 4,800-square-foot bus maintenance area will include storage for seven buses. The facility will be ADA-compliant and is being designed to achieve LEED® certification. Services include site survey and design, geotechnical testing, environmental compliance, utility coordination, bid documents, bid-phase support, and as-built drawings.

West Virginia Army National Guard - TAG Wing Improvement, Charleston, West Virginia. *State Army National Guard Headquarters.* Project Manager. Engineer of Record responsible for the coordination of all activities. Baker performed complete planning, design, and construction management services for renovations to the Office of the Adjutant General at the State Army National Guard Headquarters in Charleston, West Virginia. Project elements included new acoustical ceilings, flooring, energy-saving light fixtures, duplex outlets, communications jacks, several new wall partitions, exterior door replacements, new interior doors and hardware, new wall finishes and asbestos removal. Baker provided Construction Administration and inspection services as well as periodic site review during construction.

David J. Hilliard, P.E., LEED® AP**Mechanical/Electrical/Plumbing Engineer****General Qualifications**

Mr. Hilliard has a wide range of "hands on" design, engineering, and construction experience. From his beginnings as a carpenter he has expanded his professional abilities to a senior engineer for Baker. His recent design experience has included the design of new campus water lines and other service utilities at West Virginia State University, the complex mechanical design of such projects as a large Charleston, West Virginia hospital, a Bus Maintenance Garage and office building for the West Virginia Department of Transportation, an Army National Guard Armory HVAC/Electrical renovation, Master Planning and engineering at the West Virginia Capitol Complex including plumbing renovation design on the historic State Capitol Building. His resume covers over 30 years of real world work in engineering, design, fabrication and construction in the mechanical, electrical and general trades.

Over the years, while practicing his profession, Mr. Hilliard continued his education by studying mathematics, civil and mechanical engineering, finally taking degrees in both mathematics and mechanical engineering. He has continued his professional development through his involvement with ASME, ASHRAE, ASPE, USGBC, and other pertinent organizations

Experience

Army National Guard Headquarters Renovations, Charleston, West Virginia. State Army National Guard Headquarters. Mechanical Engineer. Responsible for all mechanical design oversight and construction management. Baker performed complete planning, design, and construction management services for renovations to the Office of the Adjutant General at the State Army National Guard Headquarters in Charleston, West Virginia. Project elements included a complete renovation and replacement of the HVAC system with a Loop Heat Pumps, new acoustical ceilings, flooring, energy-saving light fixtures, several new wall partitions, new interior doors and hardware, new wall finishes and asbestos removal. Baker provided Construction Administration and inspection services as well as periodic site review during construction.

Tobyhanna Army Depot, Tobyhanna, Pennsylvania. Army Corp of Engineers, Baltimore District. Mechanical Engineer. Responsible for the Mechanical design and engineering for the renovations to Building 5, Bay 1 and Information Assurance Vulnerability Alerts (IAVA) building. The Building 5, Bay 1 project was designed to increase cooling and add humidification in various work rooms. Individual dedicated air-conditioning systems were designed for the TYQ-23 testbed room and two TYQ-23 mobile shelters to replace the field HVAC units. The TYQ-23 mobile shelters are box-truck-sized field trailers to be refurbished. The testbed room is a permanent mock-up of the

*Years with Michael Baker: 6
Years with Other Firms: 20*

Degrees

B.S.M.E., 2005, Mechanical Engineering, West Virginia University Institute of Technology

B.S., 2002, Mathematics and Science, West Virginia State College

Licenses/Certifications

Professional Engineer, West Virginia 2011

LEED AP, bd+c, 2010

Professional Affiliations

American Society of Plumbing Engineers

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

American Society of Mechanical Engineers

shelter used for component testing. A dedicated air-handling unit to serve the MIG room was installed to replace the existing through-the-wall air conditioning units.

The second project was a complete HVAC system renovation using a 4 pipe system to serve two Air Handlers and a separate two pipe hot water design for VAV reheat.

Homewood Army Reserve Center, Homewood, Illinois. *Army Corp of Engineers, Louisville District.* Mechanical Engineer. Responsible for the Mechanical engineering and final inspection and commissioning oversight. The building was designed to meet a LEED Silver certification.

Fort McCoy, Fort McCoy, Wisconsin. *Army Corp of Engineers, Omaha District.* Mechanical Engineer. Responsible for the Mechanical engineering and final inspection and commissioning oversight. **The Project was a Design-build** delivery of an approximately 58,000-square-foot, two-story modified large Tactical Equipment Maintenance Facility (TEMF) and an approximately 44,000-square-foot, one-story Equipment Concentration Site (ECS) Warehouse. The building was designed to meet a LEED Silver certification

Advanced Individual Training Barracks and Company Operations Facility, Fort Gordon, Richmond, Jefferson, McDuffie, and Columbia Counties, Georgia. *U.S. Army Corps of Engineers, Fort Worth District.* Mechanical Engineer. Responsible for exhaust & outdoor air system review and development. Baker served as the designer of record for the design-build for a new, design-build, 93,000-gross-square-foot advanced individual training barracks and a three-story training barracks that is designed to house 300 single soldier trainees. The facility is designed to meet achieve Gold LEED® rating. Baker's services included architectural, engineering, landscape, and interior design services.

Little Kanawha Bus, Calhoun County, West Virginia. *WV Division of Public Transit.* Mechanical Engineer. Responsible for the Mechanical, Electrical and Plumbing Design, MEP Document Preparation, and Construction Administration for a new bus maintenance and office facility for Gilmer County. Duties include the design of the vehicle storage, cleaning and maintenance mechanical systems, as well as oil pumping and collection systems. The design of an energy efficient HVAC system for the entire building is also part of his responsibilities. The facility was designed as a LEED® project.

Good News Mountaineer Garage, Charleston, West Virginia. Mechanical Engineer. Responsible for the Mechanical, Electrical and Plumbing Design, MEP Document Preparation, and Construction Administration for newly renovated Auto Repair garage and administrative office facility for this non-profit organization. The Good News Mountaineer Garage accepts donations of vehicles that are repairable for a reasonable amount of money. These donated cars are then distributed to families with low incomes for transportation to work.

West Virginia State Capitol Restroom Renovations. *State of WV General Services Division.* Mechanical Electrical and Plumbing Engineer. Mr. Hilliard provided the State of West Virginia General Services Division a comprehensive MEP plan for the renovation and renovation of the 33 restrooms of the West Virginia State Capitol Building. He helped provide design, construction sequence, and scheduling recommendations. And will provide Construction Administration during construction

Nicole Riley

Associate Architect / Project Manager

General Qualifications

Ms. Riley brings more than 17 years of design and project coordination experience to the project. While at Baker, Ms. Riley has focused most of her time on design and coordination with the client while maintaining a close relationship with the design team, from the early assessment of project planning stages to the construction administration. Ms. Riley's project design experience includes facilities for entrepreneurs, correctional, educational, institutional, military installations, commercial, residential, and religious facilities. She is experienced with the submittal and construction process for various state agencies including the WV State Fire Marshal and West Virginia State Police.

Years with Baker: 1

Years with Other Firms: 16

Education

Bachelor of Architecture, Virginia Tech

Licenses/Certifications

Associate A.I.A.

Experience

Multi- Purpose Facility for the West Virginia State Police Academy, Institute, West Virginia
Designer and Project Manager. Responsibilities included site investigation, cost estimate, architectural design and collaboration with geotechnical engineer as well as the West Virginia State Police staff overseeing the project. The facility employs a skylight system in the main gym, intended to provide natural light to the user as well as lowering electricity expense. Special consideration was given to the underground foundation and location of the facility at the Academy.

Glenn Jean Armed Forces Reserve Center/ Military Entrance Processing Station, Glen Jean, West Virginia. West Virginia Army National Guard/ U.S. Department of Defense. Designer and Project Manager. Responsibilities included complete design package and collaboration with staffs from both the state and federal entities for the 110,000 S.F. facility. Special consideration given to force protection, geotechnical challenges, helipad design and location, vehicle repair and petroleum storage, adequate mustering space, as well as medical office spaces.

Economic Development Center, Charleston, West Virginia. West Virginia State University Gus R. Douglass Extension, Designer and Project Manager. Responsibilities included: feasibility study, budget development and construction documents and construction administration services for total renovation of a 5,000 S.F. facility. Diverse use of facility lent to consideration for recording studios, digital green studio, office space for entrepreneurs, and public gathering space.

Owen Milligan, P.E.

Electrical Engineering Manager

General Qualifications

Mr. Milligan is an electrical engineer who is experienced working with consulting engineering firms in the study and design of electric distribution and control systems, emergency power for process plants and facilities, water/wastewater treatment plants, government and commercial projects, ASHRAE energy-efficient building design, coordination with vendor and contractors, and approval of vendor drawings. He has a strong knowledge of distribution equipment and designs, motor control center layouts and design, and start-up and services during construction. He is capable of handling multiple projects from conception to final design, working as a team member toward meeting project goals. His work includes management of Baker's electrical engineering department, supervising and providing technical advice to designers and coordinating design and construction work with engineers, contractors, vendors, and clients.

Experience

Design/Build SATOC for Military Facilities in the Southwest Region, Various Locations in Southwestern U.S., AR,AZ, CA, LA, NM, NV, OK, TX. *U.S. Army Corps of Engineers, Tulsa District.* Electrical Engineer. Provided design assistance to the electrical engineering subconsultant, and performed a technical quality review of the construction documents for the TEMFs located at Fort Bliss. Electrical systems included lighting, lightning protection and grounding, power distribution, telecommunications, fire alarm, and unique voltage and frequency requirements. Designs were required to meet UFC and military design standards. Projects constructed under this contract include Brigade Combat Team (BCT) Tactical Equipment Maintenance Facilities (TEMF). TEMFs provide facilities for the purpose of maintaining and repairing vehicles, complete with equipment and parts storage, and administrative offices. Task orders awarded to date include the following: Two TEMFs at Fort Bliss in El Paso, Texas to be shared by five Battalions and one Company; and a Unit Operations Facilities consisting of a TEMF and an Organizational (Deployment) Storage facility, at Fort Bliss in El Paso, Texas. Facility designs are required to meet or exceed a Silver LEED® certification.

On-Call Multi-Discipline Services, Pittsburgh International, and Allegheny County Airports (PIT/AGC), Pittsburgh, Pennsylvania. *Allegheny County Airport Authority.* Technical Advisor. Provided technical direction to electrical design staff and performed a technical quality review of the construction documents. Designs were required to meet NEC standards. Since 1989, Baker has provided multidiscipline, on-call services to the Allegheny County Airport Authority (ACAA). The ACAA owns and operates Pittsburgh International Airport (PIT) and Allegheny County Airport (AGC). Baker acted as an extension to the ACAA's staff, providing the depth of resources and experience of the entire company when called upon by the ACAA. Baker provided a full range of services to ACAA on an "On-Call/As-Needed" basis, including architecture, civil, structural, mechanical, electrical and environmental engineering, general engineering administration, construction support, and other areas.

Years with Michael Baker: 7

Years with Other Firms: 20

Degrees

B.S., 1988, Electrical Engineering,
Gannon University

Computer Aided Drafting, Putnam
County Technical Center, 1995

Licenses/Certifications

Professional Engineer, California,
2003

Professional Engineer,
Pennsylvania, 1999

Professional Engineer, Montana,
2001

Professional Engineer, Kentucky,
2005

Professional Engineer, Oklahoma,
2008

Rescue Swimmer Training Facility, U.S. Coast Guard Support Center, Elizabeth City, North Carolina. *U.S. Coast Guard, Facilities Design & Construction Center Atlantic.* QA/QC. Performed a technical quality review of the electrical design for this building renovation project, including lighting and electrical receptacles. Baker prepared Design/Build RFP Documents for a new Rescue Swimmer Training Facility (RSTF) for the Aviation Technical Training Center (ATTC), a tenant of and located on the SC Elizabeth City, NC. The \$13.3 million RSTF is a dedicated aquatic trainer for the purpose of supporting the Aviation Survival Technician (AST) School and recurrent water survival training requirements. Sized appropriately for the curriculum and student loading, the RSTF contained elevated platforms, pool temperature controls, adequate wet and dry storage, male and female locker/shower facilities, classrooms, and office space.

Gymnasium Locker Room Rehabilitation, USCG Training Center Cape May, New Jersey. *U.S. Coast Guard.* QA/QC. Performed a technical quality review of the electrical design for this building renovation project, including lighting and electrical receptacles. Baker prepared the design, construction documents, and cost estimate for the interior rehabilitation of an existing facility to combine two women's locker rooms into one large room.

Relocation and Improvements to the Front Gate, USCG Training Center Cape May, New Jersey. *U.S. Coast Guard.* QA/QC. Performed a technical quality review of the electrical design for this building renovation project, including lighting and electrical receptacles.

Route 52, Contract - "B", Somers Point & Ocean City, New Jersey. *New Jersey Department of Transportation.* Electrical Engineer. Responsible for the electrical systems design to meet NEC standards for a new Visitor's Center, bridge and site lighting, power distribution, and a supplemental photovoltaic solar system.

Non-Baker Project Experience

Siemens Government Services, Inc (formerly SD Engineers), Pittsburgh, Pennsylvania. Senior Electrical Project Engineer. Responsibilities included Senior Electrical Engineer in charge of all electrical work at the Department of Energy's Naval Reactor Facility in West Mifflin, Pennsylvania. Duties included complete electrical design including multiple new office building designs and construction, light industrial type facilities for confidential DOE projects, retrofitting and relocation of existing laboratories, power studies, arc flash calculations, and site power distribution.

Chester Engineers / US Filter Corporation, Pittsburgh, Pennsylvania. Electrical Project Engineer. Responsibilities included the following:

- Lead electrical engineer for multiple site water and wastewater treatment projects for a large automobile manufacturer.
- Lead electrical engineer for design of water treatment plants for several large steel manufacturers.
- Lead electrical engineer on design of numerous remote cellular telephone communication sites for a large, wireless Telecommunications Company.
- Assisted a Senior Electrical Engineer on a Short Circuit and Coordination Study using CAPTOR/DAPPER analysis program.
- Responsible for several large detailed constructions cost estimates.
- Lead Electrical Engineer to many local municipalities for wastewater and water pumping/filtration upgrades.

Industrial Design Corporation, Pittsburgh, Pennsylvania. Electrical Engineer III. Responsibilities included the following:

- Staff engineer for a large, Class-1 single-level clean space fabrication building, designing all motor control centers, building and equipment grounding, roadway lighting, and generator and UPS sizing.
- Lead electrical engineer for a chemical distribution center of a large electronics manufacturer. Responsibilities included client meetings, bill of materials, budget proposals, project staffing and producing detailed construction drawings where in-house tradesmen could build right from the prints, no shop drawings required.
- Lead electrical engineer for a \$30 million upgrade to a new semiconductor manufacturing facility. Responsibilities included design staff supervision, unit substation and motor control center modifications, scheduling of critical process tool shutdown, client coordination, and replacement of approximately 160 existing panelboards.

Continuing Education/Training

Ground Fault and Short Circuit Analysis, offered by CJL Engineering, January 2004, 7 week course.

Grounding Course, offered by CJL Engineering, March 2004, 6 week course.

Power Distribution Course, offered by Duquesne Light, September 2000, 12 week course.

Computer Skills

Autodesk AutoCAD
Bentley MicroStation
Dr. Checks
Microsoft Excel
Microsoft Outlook
Microsoft Windows
Microsoft Word
SKM PowerTools

Wayne Airgood, P.E.

Structural Engineer

General Qualifications

Mr. Airgood is a practicing structural engineer with experience in the design of commercial, institutional, light industrial building structure, and foundation systems.

Experience

Design of Central Issue Facility, Fort McCoy, Wisconsin. U.S. Army Corps of Engineers, Louisville District. Mr. Airgood was the senior structural engineer of record responsible for design of the building structure and foundation systems from concept through construction of an approximate 62,553-square-foot large-sized Central Issue Facility (CIF) to expedite the shipping and receiving, distribution, processing, and exchange of soldier equipment. The structural system consisted of steel joist and girder framing supported by interior steel columns and exterior precast, insulated concrete load-bearing walls. Foundations were soil supported, isolated and continuous, reinforced spread footings.

Container-Loading Facility Design, Fort McCoy, Wisconsin. U.S. Army Corps of Engineers, Louisville District. Mr. Airgood was the senior structural engineer of record responsible for the design of a clear span steel roof framing system to achieve column-free interior warehouse space of a 30,862-square-foot Container-Loading Facility. Roof framing system is supported by interior steel columns and exterior precast, insulated concrete load-bearing walls. Foundations were soil supported, isolated and continuous, reinforced spread footings.

Montgomery County Public Schools Foodservices Facility. Montgomery County, Department of General Services. Mr. Airgood was the senior structural engineer of record responsible for the development and design of structural framing and foundation systems for 70,000-square-foot food production, warehouse and distribution facility. His responsibilities included coordination with owner/user and other engineering disciplines throughout design, performing and overseeing of production structural design calculations and documents and construction administration services such as review of structural product submittals and periodic site visits.

West Haven Commuter Rail Station Engineering Design, West Haven, Connecticut. Connecticut Department of Transportation. Mr. Airgood was the senior structural engineer responsible for the structural framing and foundation design of a two story passenger train station building. The station building featured a two story, glass curtain wall enclosed passenger waiting area with exposed to view curved roof structure. The design also included a 75 foot span, glass curtain wall enclosed pedestrian bridge spanning over the four rail line track bed to connect the station building with a new two story stair and elevator tower. His responsibilities included coordination with engineering and architectural disciplines during design, performing and overseeing of production structural design calculations and documents, and review of fabrication shop drawings and other construction administration services as related to the building structural systems.

Years with Michael Baker: 8

Years with Other Firms: 23

Degrees

B.S.C.E., 1984, Structural Engineering, Geneva College

Licenses/Certifications

Professional Engineer, Pennsylvania, 1999, [REDACTED]

Professional Engineer, Maryland, 2013, [REDACTED]

Professional Engineer, North Carolina, 2014, [REDACTED]

Penn Hills Operations Center Addition, Penn Hills, Pennsylvania. *Duquesne Light Company.* Mr. Airgood was the senior structural engineer of record responsible for the development, design, and detailing of a load bearing masonry wall and steel framing addition to an existing facility.

Design-Build Tactical Equipment Maintenance Facilities, 31st ADA Brigade, Fort Sill, Oklahoma. *U.S. Army Corps of Engineers, Tulsa District.* Mr. Airgood was the senior structural engineer responsible for the design of the foundation systems to support an 18,000-square-foot, 35,200-square-foot, and 57,031-square-foot pre-engineered steel Tactical Equipment Maintenance Facilities (TEMF), and a 20,000-square-foot Supply Support Activity facility supply support activity warehouse (SSA). Because of existing expansive soil conditions, the ground floors of each building were designed as reinforced concrete floor systems with a void space between the expansive soil and floors. The concrete floor system and PEMB structural columns were supported by a deep foundation system of drilled concrete piers extending to rock. His responsibilities included review of structural fabrication drawings, attending design coordination meetings and periodic site visits during construction.

Buildings 200 & 250 of Imperial Business Park, Imperial, Pennsylvania. Mr. Airgood was the lead structural engineer responsible for the development and design of the structure and foundation systems for two, 250,000-square-foot warehouse facilities. Responsibilities also included construction administration services such as review of structural product submittals and periodic site visits. Each building consisted of steel joist and joist girder roof framing supported by interior steel columns and exterior precast concrete bearing and shear walls. Foundations were soil supported, isolated and continuous, reinforced spread footings.

ABB Manufacturing and Office Facility, Mt. Pleasant, Pennsylvania. Mr. Airgood was the lead structural engineer of a high-bay manufacturing, testing and warehouse facility for electric transformer equipment, including an attached two-story office area. The structural systems consisted of precast concrete wall panels enclosing a steel framed interior column and roof structure, including the support of numerous under-hung crane systems throughout the facility ranging from 5- to 20-ton capacities. The lateral framing system was a combination of steel braced and moment frames, and foundations were soil supported isolated and continuous, reinforced spread footings.

Fuel Cell Facility, Pittsburgh, Pennsylvania. *Siemens Westinghouse.* Mr. Airgood was the lead structural engineer of a high-bay manufacturing facility, warehouse and two-story attached office area. The structural systems consisted of precast concrete wall panels enclosing a steel framed interior column and roof structure. The lateral framing system was a combination of steel braced and moment frames, and the structural design included support of various top running bridge crane systems ranging from 10- to 40-ton capacities. The foundations were soil supported isolated and continuous, reinforced spread footings.

J. Steve Frazer, P.S.

Surveyor/Civil Associate

General Qualifications

Mr. Frazer is currently employed as a Civil Associate and Surveyor at the Charleston, West Virginia office. Mr. Frazer has over 26 years of diverse surveying experience that includes geomatics, topographic, aerial mapping control, research, boundary, right of way, construction stake-out, site development, volumetric, pipeline and forensic surveys.

Experience

West Virginia Army National Guard – Coonskin Complex Perimeter Fence, Charleston, West Virginia. *Construction and Facilities Management Office.* Project Surveyor. Responsible for project control, topographic mapping, utility locations, construction stake-out. Michael Baker performed complete planning, design, and construction management services for the installation of approximately 5,000 linear feet of chain link security fence including gates, cable reinforcement, removable vehicle barriers, card reader access points, security lighting, and road widening for the Coonskin Complex in Charleston, West Virginia. Michael Baker provided Construction Administration and inspection services as well as periodic site review during construction.

130th Airlift Wing West Virginia Air National Guard – Force Protection/Relocate Coonskin Drive, Charleston, West Virginia. *USPFO for West Virginia.* Project Surveyor. Responsible for project control, topographic mapping, core boring locations, utility locations, construction stake-out. Michael Baker performed complete planning, design, and construction management services for the relocation of Coonskin Drive which will serve as the new entry point into the Joint Forces National Guard Base in Charleston, WV. The project includes concrete and asphalt pavement roadway and parking areas, designated vehicle inspection area, guardhouse, lighting, signage, landscaping, site utilities, chain link security fence including gates, cable reinforcement, ornamental gate, vehicle barriers, and card reader access points. Michael Baker provided Construction Administration and inspection services as well as periodic site review during construction.

Sidewalk and Streetscape Improvements Projects, West Virginia. *Various Locations.* Professional Surveyor/Crew Chief. Coordinated and executed the development of base mapping, project control, utility location, right of way and property boundary, construction stakeout and monitoring.

Notable locations include:

Town of West Milford	City of Winfield	Town of Alderson
Town of Mason	City of Madison	
Town of Parsons	City of Nitro	

Years with Michael Baker: 4

Years with Other Firms: 22

Degrees

A.S., 1984, Civil Eng. Technology,
West Virginia Institute of
Technology

B.S., 1986, Civil Eng. Technology,
West Virginia Institute of
Technology

Licenses/Certifications

Professional Surveyor, West
Virginia, 1996

Mart Whitt Branch Property Survey, Elliott County, Kentucky. *Kentucky Department of Fish and Wildlife Resources.* Project Surveyor. Provided complete services for a 400 Acre Boundary Survey. Services included field surveying, courthouse research, final monumentation and assessment of the Title Commitment for the subject property.

Various Projects. *NiSource Corporate Services Company.* Project Surveyor.

- Gas Pipeline Survey and Mapping, Kentucky. Responsibilities included determining survey methods, cost estimates, survey coordination, and gathering and processing survey data.
- NiS Kentucky ILI Site Survey. Responsibilities included coordinating survey efforts for forensic investigation, gathering and processing survey data, preparing deliverables, and client relations.
- CPG – PM3 and NiS Phase II - Clendenin Cobb. Responsibilities included coordinating survey efforts, gathering and processing of survey data, preparing deliverables, and client relations.
- NiSource - PM-17 Line and SM80 ILI Surveys. Responsibilities included gathering and processing field data, survey coordination, and client and contractor relations.
- CPG – Clendenin Cobb. Responsibilities included coordinating survey efforts, gathering and processing of survey data, preparing deliverables, and client relations.

Expression of Interest

HVAC Renovation/Upgrade Design for Dunbar and Bluefield Armories

Solicitation Number: CEOI 0603 ADJ160000002



APPENDIX 2 – Project Profiles

WVARNG Charleston Armory HVAC & Architectural Renovations

Charleston, West Virginia

The existing building/facility started as the Coonskin Armory constructed in 1961. The Headquarters Building was constructed simultaneously with the Coonskin Armory and occupied the second floor. Also in 1961, as a separate structure, the Adjutant General's Wing (TAG Wing) was constructed nearby. Later, in 1984 the Coonskin Armory/Headquarters Building was physically connected to the TAG Wing with an area of administrative offices. This final major construction project connected all the buildings into one major facility of over 50,000 square feet, referred to as the Charleston Armory. The West Virginia Army National Guard (WVARNG) Construction and Facilities Management Office (C&FMO) requested a study be conducted of the consolidated mechanical and electrical components of the consolidated facility known as the Charleston Armory. Such items were considered as the condition of existing HVAC/MEP systems and design improvements or upgrades to those systems and examination of the existing building envelope and recommend possible improvements to the Envelope, HVAC, Electrical and Plumbing systems.

A loop pipe water source heat pump system determined the most cost effective for this situation, with fewer pipes, smaller space requirements and a lower installation cost. Various HVAC components included a Fluid Cooler, Boilers, Pumps, Wall Consoles, above ceiling HPs, along with some Rooftop Units and Energy Recovery Units. During the renovation process, mold was discovered growing in certain areas of the building. An investigation was undertaken, building humidity was logged and measures were implemented to install dehumidification in existing equipment in the building, building leaks were sealed and existing mold was remediated. Baker's design also addressed the repair of the existing roofing system, addition and repairs of roof curbs for HVAC equipment, repositioning of blocking and walk pads around the roof, and installation, repair and patching of the existing EDPM roofing system and maintaining the existing warranty.

Client

West Virginia Army National Guard
Division of Engineering and
Facilities
1703 Coonskin Drive
Charleston, WV 25311-1085

Major Michael J. Beckner
304-561-6333

Contract Completion Date

2013

Baker's Role

- Architecture
- Mechanical Engineering
- Feasibility studies
- Cost estimates
- Civil engineering
- Electrical Engineering
- Structural engineering
- Environmental Permitting



Squadron Operations Building 249 Renovation Design

*McEntire Joint National Guard Base, Eastover,
South Carolina*

Michael Baker provided architectural services for the complete renovation of the 23,000-square-foot Building 249, Squadron Operations Center, at McEntire Joint National Guard Station.

B249 provides the 169th fighter wing with a consolidated pilot and mission support center. The existing building dates back to 1975 and subsequently has been expanded three times as mission support operations have expanded. The building houses life support operations, mission planning, flight operations, weather center, training, office support, and additional space for staff on reserve weekend. The facility was deemed inadequate to continue support operations and contained a significant amount of wood framing in violation of current facilities guidelines.

The project will remove all wood framing and existing hazardous materials. New space planning will increase accessibility for the disabled, upgrade work flow and occupant comfort, and improve morale by increasing the amount of windows to allow for views and daylight. The building envelope will be renovated by a complete roof replacement, cleaning and repair of the masonry veneers, and replacement of aging doors and windows. The exterior improvements will increase energy efficiency and the interior acoustic environment.

Deficiencies also existed in the energy efficiency of the existing mechanical equipment and subsequent indoor air quality. As part of the renovation, a new variable refrigerant flow mechanical system will be installed. The system will allow for better control of the air quality and adjustment to meet the demands of the environment during peak and drill weekend occupancies. A completely new lighting, electrical, and communication systems will further improve the operations of the facility. The project will also add fire protection systems to the building and make antiterrorism and force protection (ATFP) improvements to the building and surrounding site.

The goal is to provide a facility that improves daily operations for the support staff of the 169th as well as operational effectiveness and cost. LEED® Silver Certification is desired.

Client

USPFO for South Carolina
9 National Guard Road
Columbia, South Carolina 29201-
4763

Completion Date

Estimated: 2016

Michael Baker's Role

- Building renovation design
- Mechanical and electrical engineering
- Energy efficiency design



Renovations to Building 5, Bay 1 *Tobyhanna, Pennsylvania*

Michael Baker served as the designer of record on a design-bid-build project to renovate Building 5, Bay 1 at the Tobyhanna Army Depot. Work was performed under a three-year indefinite delivery-indefinite quantity contract.

The scope of work involves adding HVAC capacity, installing a drop-ceiling system, expanding existing restrooms, and enhancing door systems.

Michael Baker prepared design and construction plans and construction cost estimates for the project.

Michael Baker investigated options to enhance HVAC performance and increase cooling and add humidification in work room 155 of Building 5. Individual dedicated air-conditioning units were designed for the TYQ-23 testbed room and two TYQ-23 mobile shelters to replace the field HVAC units. The TYQ-23 mobile shelters are box-truck-sized field trailers to be refurbished. The testbed room is a permanent mock-up of the shelter used for component testing. A dedicated air-handling unit to serve the MIG room will be installed to replace the existing through-the-wall air conditioning units. The MIG room is where various types of small electronic components are tested and refurbished. Michael Baker's design also included provisions for painting of the high-bay ceiling of the warehouse area that contains the TYQ-23 shelters and MIG room. A drop-ceiling system with T8 lighting fixtures was designed for work room 170 of Building 5. Michael Baker designed an air-handling unit that provides full HVAC and humidity control for the work room to replace the existing unit heater that serves the space. Restroom renovation design involved the installation of additional fixtures to increase capacity and replace the existing fixtures. The new plumbing fixtures meet or exceed the conservation requirements of the Energy Policy Act of 2005.

Michael Baker reconfigured the double vestibule at the main north entrance and the adjoining office and corridor to maximize usable space. The existing overhead rollup doors along the south wall and east and west ends of the corridor will be replaced with new automatic sliding doors. The manually operated sliding freight and fire doors at the south end of work room 170 will be replaced with new automatic sliding doors and an automatic fire shutter.



Client

Tobyhanna Army Depot
11 Hap Arnold Boulevard
Building 18
Tobyhanna, Pennsylvania 18466

Completion Date

2013

Michael Baker's Role

- Architecture
- Interior design
- Mechanical engineering
- Electrical engineering
- Construction cost estimation

Design of U.S. Army Reserve Center Renovation and Expansion

Homewood, Illinois

As designer of record, Michael Baker provided architectural and engineering services for the renovation of a 400-member U.S. Army Reserve Center (ARC) and construction of two single-story additions totaling 35,694 square feet—a 34,294-square-foot Training Building and a 1,400-square-foot ancillary structure—along with a 3,500-square-foot Unheated Storage Building. The project also includes parking spaces for 140 privately owned vehicles (POV) and approximately 22,000 square yards for military equipment parking (MEP).

Tasks were performed under an indefinite quantity-indefinite delivery engineering agreement.

The project involved complete renovation of the 24,680-square-foot, single-story Vietnam Veterans' Memorial ARC, which was erected in 1985, using the existing footprint. While the ARC had reliably served south Chicago, the structure's building systems were nearing the end of their design life. Replacement was required to enable the facility to accommodate growing U.S. Army Reserve Unit Brigade Combat Team training needs, optimize operations, and achieve mission goals. The client chose renovation as it was a much more cost-effective alternative than replacement.

The 34,294-single-story Training Building addition accommodates core training functions and establishes the main point of entry for the ARC. This new structure includes offices and administrative areas, an assembly hall, classrooms, a library, a learning center, and an assembly hall with a kitchen. The approximately 1,400-square-foot ancillary addition houses a mail room and staging area. The renovated portion of the ARC houses utilitarian areas, including unit storage and heated storage spaces, a physical readiness room that features a 1,643-square-foot fitness center with a full complement of athletic equipment and is served by adjacent showers and locker rooms, a weapons simulator room, an arms vault, mechanical and electrical rooms, and a janitor's closet. A free-standing wash rack is provided near the Unheated Storage Building to meet vehicle cleaning needs.

The Unheated Storage Building provides space for storage of user operational equipment that requires no temperature or humidity control.

Client

U.S. Army Corps of Engineers,
Louisville District
Room 972
600 Dr. Martin Luther King, Jr.
Place
P.O. Box 59
Louisville, Kentucky 40202

Completion Date

2015

Michael Baker's Role

- Planning
- Environmental investigation
- Hazardous materials surveys
- Sustainable design
- Site and civil engineering
- Geotechnical investigation
- Architecture
- Interior design
- Structural engineering
- Mechanical engineering
- Plumbing design
- Fire protection engineering
- Electrical engineering
- Communications design
- Cost estimation
- LEED® credit template documentation

Supporting project elements include environmental investigation prior to renovation of the existing ARC; grading, paving, fencing, and signage; force protection measures; exterior lighting; utility and storm drainage system connections; fire protection and fire alarm and mass notification systems; and security lighting. Structures provide access for disabled individuals. The project expanded existing parking facilities by approximately 68,800 square feet to accommodate equipment and serve reservists and visitors.

Michael Baker designed the ARC reconfiguration to meet LEED® NC 2009 Silver certification. Tasks for which Michael Baker was responsible include engineering feasibility evaluation, architecture, surveys, hazardous waste investigation of the existing ARC and remediation recommendation, geotechnical investigation oversight, all site and building engineering, cost estimating, value engineering, and LEED® credit template documentation. Michael Baker convened a design charrette and collaborated with the client in identifying needs and preferences and preferred design alternatives.

Designs comply with applicable federal, state, and local codes and standards, including the following: Unified Facilities Criteria ([UFC] 4-171-05); International Building Code; International Plumbing Code; International Mechanical Code; National Fire Protection Association (NFPA) standards; Uniform Federal Accessibility Standards; the Americans with Disabilities Act; the Environmental Protection Agency Clean Water and Clean Air acts; and the requirements of ASHRAE, American National Standards Institute, American Society for Testing and Materials, and OSHA.

Site Reconnaissance and Geotechnical Investigation

Before work commenced, the Michael Baker team evaluated and documented existing surface and subsurface conditions, which entailed making several visits to the site.

Michael Baker also conducted an environmental building survey of the existing ARC. Michael Baker performed a hazardous material investigation, prepared an environmental report, and developed designs to remediate issues.

To evaluate geologic conditions, Michael Baker oversaw a geophysical survey, which involved time-domain electromagnetic technology, ground-penetrating radar, and radio detection. The team identified underground utilities and excavated test pits to expose unmarked utilities, which helped to avoid project schedule delays and complications during construction. Geotechnical evaluations confirmed that shallow spread footings would be an acceptable foundation type for the Training Building and Unheated Storage Building.

Overall Building Construction

The Training Building addition is of permanent construction and includes reinforced concrete foundations, concrete masonry load-bearing walls and concrete floor slabs; structural steel framing; mechanical, electrical, information, security, and fire suppression sprinkler systems; automated building HVAC mechanical and lighting system controls; energy-efficient lighting; interior finishes; window systems; standing-seam metal roofing; and exterior finishes consisting of attractive masonry facades.

The Unheated Storage Building is a pre-engineered metal building supported by a reinforced concrete foundation with a cast-in-place concrete on-grade floor and sloped roof.

The vehicle wash rack also has a sloped roof supported by a pre-engineered metal building with steel purlins spanning between steel girders. The girders form steel rigid frames with the building columns.

Exterior Systems

Building Envelope

A structural steel framing system supported by load-bearing concrete masonry walls and steel columns, beams, and joists forms the exterior envelope of the Training Building additions and supports gravity loads. The exterior wall system of the building additions is brick masonry veneer with rigid cavity wall insulation and concrete masonry backup, and the foundation system is slab-on-grade concrete.

A concrete masonry shear wall system will resist lateral loads imposed by wind and seismic forces. The exterior walls are designed to distribute lateral forces to the roof diaphragms and then to the shear walls and foundation system.

The roofing system of each building addition consists of a modified bitumen membrane roof with one-inch-in-12 pitch, sloped towards roof drains that are connected to the site stormwater system. Each roofing system is supported on a one-inch galvanized metal roof deck spanning between open-web joists. Joist members are supported by steel girders and masonry load-bearing walls.

An expansion joint separates the existing ARC from the primary building addition; the smaller addition is directly attached to the existing ARC.

The roofing system and underlying insulation on the low-slope roof of the existing ARC were replaced with new polyisocyanurate insulation with an R-28 value and a low-slope, modified bitumen roofing system. The roofing system over the primary building addition is a low-slope roof with a modified bitumen membrane. The roof sections of the primary and ancillary building additions have integrally manufactured white reflective coating to minimize the heat island effect. The new ARC roof light monitors have standing-seam metal roofs.

The Training Building additions incorporate thermally broken, anodized aluminum, fixed windows with aluminum storefront assemblies for large expanses of glazing and light at the major building entry point. Insulated, painted metal doors in hollow metal frames serve all utilitarian areas.

The Unheated Storage Building is a pre-engineered metal building with insulated metal wall and roof panels, non-insulated exterior walls, and a slab-on-grade concrete floor.

Interior Systems

The interior design of the reconfigured ARC supports the client's functional and aesthetic needs. Painted gypsum wallboard is used for the majority of interior partitions in the Training Building. Exceptions are the vault, which consists of painted reinforced concrete walls in accordance with UFC, and the unit storage, kitchen, and mail screening room, which incorporate painted concrete masonry units. Wall color and floor coverings comply with UFC 4-171-05.

HVAC

The HVAC systems reflect an array of design solutions to serve a variety of spaces and building functions.

The Training Building is served by a central, modular, water-to-water heat pump plant, which is tied to a closed-loop geothermal wellfield, along with a closed-circuit fluid cooler for loop-heat rejection; high-efficiency, natural gas-fired boilers; variable-flow hydronics; an HW/CHW VAV air handling system; and a Unit Storage area ventilation unit

featuring direct-fired gas heating. Carbon dioxide and occupancy sensors vary the outside air quantities based on real-time occupancies for energy savings.

The design also features an antiterrorism and force protection-rated mail processing area, humidified TERs, and direct digital controls, which will regulate and monitor all building HVAC systems and monitor all building utilities.



Electrical Design

The electrical system includes power, lighting, fire alarm and mass notification, structured cabling raceway, public address, cable television distribution, telecommunications, and security systems. Michael Baker selected the main switchboard, distribution panelboards, and lighting and appliance panelboards for the Training Building for high reliability, low maintenance, efficiency, and maximum flexibility. As well, Michael Baker selected the step-down transformers for low-energy loss and short-term overload capability.

Electrical service is also provided from the reconfigured Training Building to the existing Organizational Maintenance Shop via a 480v feeder circuit and a 480v feeder circuit to the new Unheated Storage Building.

Conserving energy in interior and exterior lighting was Michael Baker's design priority for the Training Building. Interior lighting design incorporates low-maintenance fluorescent fixtures with energy-efficient electronic ballasts and T8 lamps. Interior systems include occupancy sensors and lighting control panels to turn off lights and conserve energy in office areas, corridors, and restrooms. Exterior lighting included building-mounted and site pole security lighting with energy-efficient, long-life LED lamp sources. The parking area hardstand and roadways include pole-mounted security lighting.

Michael Baker designed a photovoltaic energy system consisting of ground-mounted solar panels and DC-to-AC inverter to produce equivalent annual kilowatt hours (kWh) consumed by the site lighting system. The photovoltaic system was designed to produce a nominal peak output power of 15 kW. This "green power" was connected to backfeed the building power distribution system and supplement the utility grid power source to the site, thereby reducing peak power demand from the utility.

Michael Baker also prepared specifications for a complete building lightning protection system with UL master labeling for the Training Building. The system consists of air terminals located at the roofline with grounding cables and down-conductors and a ground loop buried below grade and routed along the building exterior. Building grounding is accomplished by an underground perimeter grounding loop with bonding of the lightning protection

system, metal underground utilities, building steel, and additional code-required items with a single neutral-ground connection point at the main switchboard grounding busbar.

Security and Communication Systems Design

Michael Baker designed separate intrusion detection systems for the arms vault and SIPRNET Caf, including raceways, junction boxes, device boxes, electrical power, and communications infrastructure. The project design included an access control system with head-end server, work station, local control panels, card readers at the site security gate and building entrances, and door contacts at all entrances and exits for the Training Building. The building entrances with card readers include electric strike and request-to-exit devices. Michael Baker designed the infrastructure for four telecommunication networks, including voice, within the Training Building, Organizational Maintenance Shop, and Unheated Storage Building and three data networks: ARNET, CAPOC, and SIPRNET. Each network involved the design of raceways, including cable tray, ladder racks and conduits, backbone cabling consisting of single-mode fiber and multi-pair copper, horizontal cabling consisting of CAT 6, outlets with RJ-45 jacks, consolidation points, racks, cabinets, protected entrance terminals, patch panels, 110 blocks, and grounding. The design of the telecommunications systems included outside-plant and inside-plant systems. A CATV system, including amplifiers, taps, splitters, RG-11 and RG-6 cabling, and outlets, was designed for the Training Building and Organizational Maintenance Shop.

Plumbing and Fire Protection

Tankless, high-efficiency, natural gas-fired water heaters located in the Training Building mechanical room and manifold provide the flow rate required for the fixtures served. The water heaters incorporate multiple controllers, a temperature and pressure-relief valve, pressure regulators, shut-off valves, and drain valves. In compliance with manufacturer instructions, a small, electrically fired water heater was installed in the re-circulating water line to maintain loop water temperature at 120 degrees F. An in-line circulating pump controlled by a time clock and aqua stat maintains water temperature in the loop to the fixtures.

To fully protect the Training Building in the event of fire, an automatic wet-pipe sprinkler system was installed in accordance with UFC 3-600-01, NFPA 72, and UFC 4-021-01. Michael Baker specified a fully addressable, intelligent fire alarm and mass notification system to serve each of the primary facilities. The annunciated system is configured for manual as well as automatic operation and electronic supervision. The signaling, initiating, and notification circuits are served by a Class B looped system. Fire alarm circuit wiring is installed in conduit.

Antiterrorism and Force Protection

Michael Baker integrated protective measures into the ARC renovation design that meet U.S. Department of Defense antiterrorism and force protection setback requirements. These include locating the ARC on the site to achieve the maximum feasible standoff distance from roads, parking areas, and vehicle loading areas; the use of blast-resistant doors and windows; and the incorporation of an emergency shutdown switch to disable all HVAC air distribution systems.

Sustainable Design

Sustainability initiatives were implemented throughout building design. Building design incorporates materials and features to reduce environmental effects, save energy, and minimize costs. Materials that are locally available and products with 20-percent recyclable content were used. Occupancy sensors reduce lighting energy consumption.

Interior building water-saving features, such as low-flow plumbing fixtures to reduce water consumption, will be used. Ozone-friendly refrigerants and refrigerant quantities will minimize ozone depletion.

Michael Baker coordinated the installation of a solar photovoltaic array and inverter system, which provides electrical energy to supplement utility provider-supplied electricity. The solar panels will offset the annual energy consumed by the new exterior lighting.

Landscaping includes native, low-maintenance, drought-tolerant plants and preserves existing trees. The landscaping design minimizes the use of potable water.

Michael Baker specified the use of measures during construction to prevent soil loss, sedimentation, and air pollution. In addition, construction waste was diverted from landfills to meet LEED® requirements. This project has achieved LEED certification.



Building 355 Renovation Design

Joint Base McGuire-Dix-Lakehurst, Lakehurst, New Jersey

Michael Baker provided construction documents for all work necessary to selectively demolish and renovate the first floor, perform exterior renovations, and construct a new elevator core/tower of the south side lean-to of Building 355 in the NAVAIR Test Area along Taxiway Four.

The building was built as a hangar in 1957 and was converted to Test Department operation and labs. The three floors of the lean-to were carved up in to a warren of small dysfunctional spaces. This project included exterior renovations, first floor renovations, and a new elevator/stair/egress tower to comply with Americans with Disabilities Act (ADA) Standards for Accessible Design and Department of Defense regulations. It also included new restroom facilities and replacement of finishes, floors, walls, electrical, plumbing, fire protection, windows, and telephone and computer networking systems. The first floor included a coffee bar area/kitchenette sized for the occupants of all three floors.

Michael Baker developed construction documents for the demolition of all first floor interior spaces and all vertical exiting elements to accommodate a new "collaborative" type open office space on the first floor, and pre-planned elements to facilitate renovations on the upper floors in an upcoming project. Michael Baker provided designs for all systems to be removed and replaced and for construction of a new hydraulic and pit-less elevator core with emergency egress.

Michael Baker designed interior office spaces; structural systems, including live loads and wind loads; heating, ventilation, and air conditioning (HVAC) systems; and electrical systems. Michael Baker's designs also included energy efficient LED lighting throughout all spaces, exit and emergency lighting, fire alarm systems, telephone systems, and local area network (LAN) systems.

Michael Baker developed construction documents in compliance with all applicable state and federal regulations and Air Force instructions regarding environmental and occupational safety and health to address areas of known asbestos-containing floor tile on the first floor in accordance with all regulations. Michael Baker also coordinated required permits regarding air quality, land use, waters and water supply, and fuel storage.

Value-Added

Based upon the client's budget limitations, Michael Baker designed a three-story addition with alterations to the full exterior plus a complete renovation of the existing first floor office space. With budgeting for the 2nd and 3rd floors available in the near future, Michael Baker designed utility runs and finalized exit pathways for the future renovations of the upper floors. This was accomplished within the project budget and will save both construction time and dollars during the next and final phase of the project.

Client

U.S. Army Corps of Engineers,
Philadelphia District
Wanamaker Building, 100 Penn
Square East
Philadelphia, Pennsylvania 19107

Completion Date

2015

Michael Baker's Role

- Construction documents
- Structural engineering
- Demolition design
- Office space design
- HVAC design
- Electrical design
- Lighting design
- Fire alarm system design
- Telephone and computer systems design
- Environmental health and safety compliance permitting

Design of Tactical Equipment Maintenance Facility and Equipment Concentration Site Warehouse

Fort McCoy, Wisconsin

Michael Baker was the designer of record for the design-build delivery of an approximately 58,000-square-foot, two-story modified large Tactical Equipment Maintenance Facility (TEMF) and an approximately 44,000-square-foot, one-story Equipment Concentration Site (ECS) Warehouse, along with 30 acres of gravel hardstand designated for organizational parking. Tasks were performed under an indefinite quantity-indefinite delivery engineering agreement.

The new TEMF, ECS Warehouse, and additional hardstand will enable ECS-67 at Fort McCoy, the largest ECS in the world, to support the Army Force Generation training initiative, including Warrior Exercises and the installation's Combat Support Training and Regional Training, by storing and maintaining more vehicles and furnishing all required equipment for training units. This will eliminate the need for training units to ship their own equipment to and from the installation and related costs.

Used for military vehicle maintenance and repair, the TEMF consists of two main types of functional areas: repair bays, which include repair and maintenance areas, and a core area. Spaces and features include an overhead bridge crane, equipment and parts storage rooms, secure arms and Comsec vaults, and administrative support and training areas.

The repair bays are single-story, ground-floor, column-free garage areas used to service and repair the full range of Army tactical equipment. They contain maintenance and repair work spaces, separate welding bays, a 10-ton traveling-bridge crane, and data connection points for NIPRNet and SIPRNet. A vehicle exhaust evacuation system serves each repair work area. Repair and maintenance areas are equipped with hose reels for the dispensing of oil and other lubricants and fluids required during inspection and maintenance procedures. The maintenance pit is designed with a removable cover and grated sections that are in place during periods of nonmaintenance to protect personnel from potential fall hazards, as well as to shorten access across the pit for personnel when the pit is not in use. Emergency stations for eye washing, hand washing, and showering that meet OSHA standards are provided.

The core area contains the following functional spaces: administrative and shop-control office space; a break-training room; production control area; storage areas; a supply area, which replaces the consolidated bench; a tool room; restrooms, showers, and locker rooms for men and women; an armory vault; a communications security vault; a nonsensitive secure storage room; a telecommunications equipment room for voice and data systems; common

Client

U.S. Army Corps of Engineers,
Louisville District
Room 972
600 Dr. Martin Luther King, Jr.
Place
P.O. Box 59
Louisville, Kentucky 40202

Completion Date

2016

Project Costs

Michael Baker's Role

- Planning
- Sustainable design
- Site development
- Hazardous waste investigation
- Civil engineering
- Architecture
- Interior design-space planning
- Structural engineering
- Mechanical engineering
- Plumbing design
- Fire protection engineering
- Electrical engineering

circulation and waiting areas; mechanical and electrical rooms; a flammable storage room; and a fluid distribution room.

The ECS Warehouse consists of general warehouse space with a staging area; a receiving office; a classroom-breakroom; two vault areas to handle the separate U.S. Army Reserve and ECS missions; and a mechanical room, an electrical room, and a telecom room. The vaults and warehouse have a clear height of 25 feet. This clearance enables forklift access throughout the vaults—a unique design feature of this ECS facility. In addition, there is a tent-drying area that is accessed via an overhead door from the north side of the building.

Supporting project elements include field investigation for the presence of wild lupine, which attracts threatened-and-endangered species; grading, paving, fencing, and signage; force protection measures; exterior lighting; utility and storm drainage system connections; fire protection and fire alarm and mass notification systems; and security lighting. Structures provide access for disabled individuals. The project expanded existing parking facilities by approximately 30 acres to accommodate equipment and serve military personnel.

Michael Baker designed the new TEMF and ECS Warehouse to meet LEED® NC 2009 Silver certification. Tasks for which Michael Baker was responsible include architecture, surveys, hazardous waste investigation and remediation recommendation, geotechnical investigation oversight, all site and building engineering, cost estimating, value engineering, and LEED® certification administration. Charrette participation was critically important to project development. Michael Baker convened a design charrette and collaborated with the client in identifying needs and preferences and preferred design alternatives. In addition, Michael Baker held a special energy charrette to target materials and approaches to promote sustainability and conserve energy, with the goal to exceed ASHRAE 90.1 2007 performance criteria by 40 percent.

All designs comply with applicable federal, state, and local codes and standards, including the Unified Facilities Criteria (UFC; [UFC 4-171-05]); International Building Code; International Plumbing Code; International Mechanical Code; National Fire Protection Association (NFPA) standards; Uniform Federal Accessibility Standards; the Americans with Disabilities Act; the Environmental Protection Agency Clean Water and Clean Air acts; and ASHRAE, American National Standards Institute, American Society for Testing and Materials, and OSHA requirements.

Site Reconnaissance and Geotechnical Investigation

Before work commenced, Michael Baker and its team evaluated and documented existing surface and subsurface conditions. Tasks included conducting a geotechnical investigation to characterize subsurface conditions and a geophysical survey to verify results and identify underground utilities and subsurface anomalies.

Overall Building Construction

The TEMF and the ECS Warehouse are pre-engineered metal buildings of permanent construction, with reinforced concrete foundations and reinforced concrete floor slabs; structural steel framing; mechanical, electrical, information, security, and fire suppression sprinkler systems; automated building HVAC mechanical and lighting system controls; energy-efficient lighting; interior finishes; window systems; low-sloped roofing; and exterior finishes consisting of attractive masonry facades.

Exterior Systems

Building Envelope

The exterior building envelope of the TEMF and the ECS Warehouse constitutes a pre-engineered structural steel framing system, with steel columns, beams, and joists, to support gravity loads. The exterior wall systems consist of concrete masonry units (CMU) at variable heights and prefinished insulated metal panels. The foundation system of each structure is slab-on-grade concrete.

Structural Steel Framing System

The steel framing system of the buildings will resist lateral loads imposed by wind and seismic forces. The exterior walls are designed to distribute lateral forces to the roof and floor diaphragms and then to the foundation system. Both structures incorporate CMU exterior and partition walls in the lower wall areas to ensure durability and resist impacts.

The roofing system of each building consists of a modified bitumen membrane roof. The TEMF roof has a two-inch-per-foot pitch, and the ECS Warehouse has a inch-per-foot pitch; both roofs are sloped towards drains that are connected to the site stormwater system.

The exterior walls and roof heights for the TEMF correspond to the high-bay/low-bay configuration required for the building functions. The TEMF incorporates a 7'-0" band of reinforced split-faced CMU at the base which varies in height, with insulated metal building system panels above.

The ECS Warehouse also has a base of four-inch split-faced CMU with insulated metal panels above. The metal wall portion includes a clerestory with a translucent insulated fiberglass system to optimize thermal performance and daylighting of work and storage areas. The thermal performance of the sectional overhead doors is superior to that of overhead coiling doors.

Insulation

Insulation was designed to comply with Energy Policy Act of 2005 requirements. Roof insulation for the TEMF and ECS Warehouse consists of fiberglass batt insulation that satisfies the ASHRAE 90.1 R-19 requirement for metal buildings. An air barrier was constructed in the TEMF that encompasses the mezzanine, but excludes the stairwells, which are separated by sealed doors. The air barrier consists of a drywall shell constructed at the exterior walls and the wall at the high-bay area and the roof, and masonry at the stair towers. Windows and other penetrations were also sealed. The team tested the air barrier when building construction was completed, using the depressurization method. The building performed above the minimum U.S. Army Corps of Engineers air barrier requirements.

Interior Systems

HVAC

The HVAC system includes an array of design solutions to serve a variety of spaces and building functions. Office space for typical administrative functions in both buildings is served with a DX cooling-hot water boiler system and a variable air volume air distribution system that provides airside recovery. Carbon dioxide (CO₂) sensors are used to vary the outside air quantities based on real-time occupancies for energy savings.



Gas-fired infrared unit heaters paired with hot-water in-floor radiant heaters provide space heating, and gas-fired makeup units provide ventilation air for the high-bay area and maintenance corridor in the TEMF. Heating, cooling, and ventilation for TEMF second-floor offices, classrooms, and training-break-conference rooms is regulated by individual variable air volume boxes with hot water reheat coils to meet the unique ventilation and conditioning requirements of those spaces, based on actual occupancy and existing CO₂ levels.

Hot-water unit heaters provide space heating, and direct gas-fired makeup air units provide ventilation for the ECS Warehouse storage area.

In electrical and fluids dispensing rooms, wall-mounted outdoor air intake louvers with motorized dampers and associated exhaust fans provide thermostatically controlled ventilation, and wall-mounted or ceiling-hung electric unit heaters provide heat for these spaces. Mechanical rooms are heated with hot water unit heaters.

The TEMF includes a direct digital-control automatic temperature control system to regulate and monitor all building HVAC systems.

As part of antiterrorism and force protection measures, an emergency shutdown pull-switch is provided in both buildings to disable all of the HVAC air distribution systems, in accordance with UFC-4-010, Appendix B-4.3.

Electrical Distribution System

Electrical distribution for the TEMF and ECS Warehouse includes power, lighting, fire alarm and mass notification, structured cabling raceway, public address, cable television distribution, telecommunications, and security systems. The main switchboard, distribution panelboards, and lighting and appliance panelboards were selected for high reliability, low maintenance, efficiency, and maximum flexibility. Step-down transformers were selected for low-energy loss and short-term overload capability.

Energy conservation was Michael Baker's design priority for interior and exterior building lighting. Building systems include occupancy sensors to turn off lights and conserve energy in office areas, corridors, and restrooms. Lighting design incorporates fluorescent fixtures with energy-efficient electronic ballasts and T8 lamps.

Plumbing and Fire Protection

The building plumbing systems provide connections for water, oily waste, and sanitary sewer services, including all pipes, fixtures, and equipment.

Domestic hot water for both buildings is produced by a single gas-fired water heater to reduce maintenance. The water heater incorporates multiple controllers, a temperature and pressure-relief valve, pressure regulators, shut-off valves, and drain valves. In compliance with manufacturer instructions, a small, electrically fired water heater was installed in the re-circulating water line to maintain loop water temperature at 120 degrees F. An in-line circulating pump controlled by a time clock and aqua stat maintains water temperature in the loop to the fixtures.

An industrial water system is provided for the TEMF vehicle repair and maintenance bays and is supplied from the domestic water system through a reduced pressure-type backflow preventer feed from the domestic water system. Compressed air and POL distribution systems are provided throughout the maintenance and repair areas.

To fully protect the TEMF and ECS Warehouse in the event of fire, Michael Baker's design integrated an automatic wet-pipe sprinkler system, designed in accordance with UFC 3-600-01, NFPA 13 and International Building Code 2006. Michael Baker specified a fully addressable, intelligent fire alarm and mass notification system to serve both facilities. The annunciated system is configured for manual as well as automatic operation and electronic supervision. Fire alarm circuit wiring is installed in conduit. Fire alarm system features for the TEMF passenger elevator include smoke detection and elevator recall.

In addition, the TEMF is served by two double-walled, 500-gallon aboveground storage tanks for waste engine oil and waste coolant, located adjacent to the structure.

Antiterrorism and Force Protection Measures

Michael Baker integrated protective measures into the project design that meet antiterrorism and force protection requirements. These include the locating of the TEMF and ECS Warehouse to meet setback requirements, the use of blast-resistant doors and windows, and the incorporation of an emergency shutdown switch to disable all HVAC air distribution systems, as previously described.

Energy Charrette and Sustainable Design

The energy charrette was a key part of project development. As mentioned previously, the overall goal was to reduce building energy consumption by 40 percent compared to ASHRAE 90.1 2007.

Michael Baker and its team identified potential initiatives and processes to promote energy efficiency, minimize environmental effects, and reduce immediate and long-term operating costs. Energy charrette participants evaluated renewable energy sources, including solar, wind-powered, and geothermal-ground source heating and cooling, as well as passive and active energy-saving measures. These included structure siting and physical orientation, internal layout, R-value enhancements, low-emissivity windows, daylight harvesting measures, energy-saving lighting options, and high-efficiency HVAC systems.

Building design and construction incorporated materials and approaches to achieve sustainability goals. Materials that are locally available and products with 20-percent recyclable content were used. Occupancy sensors reduce lighting energy consumption. Water-saving features, such as low-flow plumbing fixtures to reduce water consumption, are provided. Ozone-friendly refrigerants and refrigerant quantities will minimize ozone depletion.

Michael Baker also designed an 18-foot-high solar wall for the TEMF that captures heat from the sun and passes it into the building during the winter months.

The elimination of exterior light pollution was extremely important for this project. Michael Baker designed the perimeter security lighting to minimize light pollution and avoid disruption of night maneuver training, which is conducted on an adjacent site.

Landscaping includes native, low-maintenance, drought-tolerant plants and preserves existing trees. The landscaping design minimizes the use of potable water.

Michael Baker specified the use of measures during construction to prevent soil loss, sedimentation, and air pollution. In addition, construction waste was diverted from landfills to meet LEED® requirements.



Little Kanawha Bus Administrative and Maintenance Facility

Grantsville, West Virginia

Baker provided general Architectural and Engineering services to the West Virginia Division of Public Transit for the Little Kanawha Administrative/Maintenance Facility located in Grantsville, West Virginia.

The WV Division of Public Transit selected Baker to provide complete design and construction administration services to include the construction of a pre-engineered metal and brick building, sited on the available property allowing for future expansion needs. Parking for the buses and employee vehicles will surround the building. The site is approximately 4.55 acres.

The operations facility has approximately 10,000 square feet of which 4,500 square feet houses five offices, a conference room, and money counting room, office storage space, copier and supply room, and a driver training room that accommodates approximately 25 individuals. The remaining 5,500 square feet is dedicated to the maintenance functions and includes a Wash Water Reclaim System. **The building is provided with selective stand-by electrical power from a 50 KW natural gas generator with an automatic switch gear system.** The garage structural roof the overall eave height will be about 18 feet. This area also includes space for indoor bus storage for approximately seven (7) vehicles. The building is designed so that the vehicles can pull through the facility. The building was designed to employ green building practices, but was not LEED (Leadership in Energy & Environmental Design) Certified.

Client

State of West Virginia
Department of Transportation
Division of Public Transit
Building 5, Room 906
1900 Kanawha Blvd, East
Charleston, WV 25305-0432

Contract Completion Date

2013

Baker's Role

- Architecture
- Renovation design
- Feasibility studies
- Cost estimates
- Civil engineering
- Surveying
- MEP engineering
- Structural engineering



Expression of Interest

HVAC Renovation/Upgrade Design for Dunbar and Bluefield Armories

Solicitation Number: CE01 0603 ADJ1600000002



APPENDIX 3 – References

Each of the Project Profiles found in Appendix 2 lists Michael Baker's client and contact information for your use as a reference. Additionally, we offer the following diverse list of past or current clients and contact information:

- **130th Airlift Wing West Virginia Air National Guard**
1679 Coonskin Drive, Unit 18
Charleston, WV 25311-5005
Captain Harry Netzer, P.E., Deputy Base Civil Engineer
(304) 341-6649
- **West Virginia State University**
P.O. Box 1000
Institute, WV 25112-1000
Mr. Marvin Smith, Facilities Director
(304) 550-2839
- **West Virginia Department of Transportation – Division of Highways**
1900 Kanawha Boulevard East,
Building 5, Room A-109
Charleston, WV 25305
Mr. Ryan Burns, Grant Administration Project Manager
(304) 558-3304
- **City of Nitro**
2009 20th Street
Nitro, WV 25143
Honorable David Casebolt, Mayor
(304) 419-3322
- **City of Winfield**
1 Main Street
Winfield, WV 25213
Honorable Randy Barrett, Mayor
(304) 586-2122