



BUSHEY FEIGHT MORIN ARCHITECTS INC.

473 NORTH POTOMAC STREET
HAGERSTOWN
MARYLAND
21740
301/733-5600
FAX: 301/733-5612

BRENT A. FEIGHT, A.I.A.
PRESIDENT

NORMAN E. MORIN, JR., A.I.A.
VICE PRESIDENT

December 16, 2014



ORIGINAL

Evelyn Melton
Department of Administration
WV Purchasing Division
2019 Washington Street E
Charleston, WV 25305-0130

Re: CEOI DBS1500000001
LETTER OF TRANSMITTAL

SUBMITTING FOR: A&E EOI for Existing Projects at the WV Schools for the Deaf

Dear Ms. Melton:

Bushey Feight Morin Architects, Inc. (BFM) looks forward to working with the State of West Virginia to provide professional services as Architects for various construction projects as assigned to the Building Services Division. Our firm is uniquely qualified to provide planning, design, and construction management services for this particular type of projects.

BFM offers the efficiency of fully integrated design resources, expertise in the design of contemporary and historic buildings and structures, LEED-accredited professionals, and the capacity to accomplish this work on time, within budget, and to the quality standards of the State of West Virginia. BFM has a similar record of performance with projects of similar size and complexity in Frederick, Washington, and Allegany County Public School Systems, and Department of General Services for the State of Maryland.

BFM has consistently met fast track project schedules and minimized disruption to normal operations through the use of innovative technologies, smart scheduling, program management tools, and our Quality Program. At the heart of successful projects is our commitment to quality. It is inherently driven into each specific project through our system of controlling costs, schedule, documents, and communications.

We recognize that the success of this project will rely on practical architectural and engineering applications, sound management, and strong communications. We are confident that our firm can handle any task assigned by the State of West Virginia at the WV School for the Deaf.

Should you have any questions or comments, we would be pleased to discuss our proposal in more detail at your convenience. Please contact me at 301-733-5600.

Sincerely,

BUSHEY FEIGHT MORIN ARCHITECTS INC.

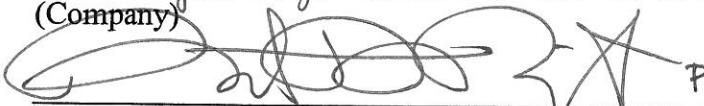
Michael L. Gehr, AIA Principal

12/16/14 09:54:36
West Virginia Purchasing Division

CERTIFICATION AND SIGNATURE PAGE

By signing below, or submitting documentation through wvOASIS, I certify that I have reviewed this Solicitation in its entirety; understand the requirements, terms and conditions, and other information contained 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.

Bushey Feight Morin Architects Inc
(Company)

 PRESIDENT
(Authorized Signature) (Representative Name, Title)

301-733-5600 301-733-5612 12/15/14
(Phone Number) (Fax Number) (Date)

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: CEOI_DBS1500000001

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:

(Check the box next to each addendum received)

<input type="checkbox"/> Addendum No. 1	<input type="checkbox"/> Addendum No. 6
<input type="checkbox"/> Addendum No. 2	<input type="checkbox"/> Addendum No. 7
<input type="checkbox"/> Addendum No. 3	<input type="checkbox"/> Addendum No. 8
<input type="checkbox"/> Addendum No. 4	<input type="checkbox"/> Addendum No. 9
<input type="checkbox"/> Addendum No. 5	<input type="checkbox"/> Addendum No. 10

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

Buskey Feegle Morin Architects Inc
Company

[Signature]
Authorized Signature

12/15/14
Date

NOTE: This addendum acknowledgment should be submitted with the bid to expedite document processing.

BUSHEY FEIGHT MORIN ARCHITECTS INC.

PROJECT AND GOALS

4.1 GOAL/OBJECTIVE 1

Based on discussions from the pre proposal meeting the funding of the 3% grant there is a time limit for these funds to be expended. The first year of a two year period will have been used getting to the point when the design team can start the design leaving what will amount to less than a year to design, bid and construct the project. Our approach needs to be straight forward and documented quickly and concisely so that State approval of the design can be reviewed quickly. Getting the project designed and ready for bid will take a minimum of 45 days which leaves the Contractor a short period of time to complete the project scope.

Upon award we will survey the work areas and gather any available building data. Plans and specifications will be prepared for rood replacement and masonry restoration parapet repair which will address the hidden gutter and fascia issues. Also the Mechanical Engineer will address the failing heat pumps/HVAC units. Installation of the sprinkler system will be designed and time line will be set for team submission. Roofing documentation will be provided within 45 days. A cost estimate will be prepared. We will be working closely with the facilities department and administration to keep the project moving as quickly as possible. The cost estimate will be an itemized list by specification division to develop the costs. This will be reviewed against the available funding limit. Decisions will be made by the team on how to effectively maximize the funding to accomplish the goals of the project.

Discussion of project scope must occur immediately upon award of the project. There are many types of roofs, a balance of cost implications, long term maintenance and durability and warranty expectations for such system needs to be determined before we can start the design. Single ply membranes offer lower cost. There are other advantages and disadvantages. Built up is a little more but have letter warranties and has redundancies but bring installation issues. We need to understand the facilities department's expectations and maintenance routine is handled.

This would be similar for the HVAC equipment and types of discussion for maintenance, using and other operational concerns that need reviewed with agency to make about decisions.

4.2 GOAL/OBJECTIVE 2

In order to meet the regulatory requirements of the stakeholders a few meetings will be required among the parties to understand these requirements. The design of the new roof system to meet current code energy code requirements as well as tailoring of the construction process to integrate with the special needs of the clientele served in the school.

We will specify low VOC and odor type products as part of the roof system. Work will be limited to after hours of normal school operations to lessen the impact to students. These goals need to be conveyed to the contractor during the bidding phase and again at the pre-construction meeting. There needs to be input by staff during design to anticipate scenario and how to address. The project requires team work among all members to accomplish the work of the project. Some comprise will need to be worked out as the contractor will not be able to construct the project as quickly as possible to minimize the impact to student/staff and daily routines yes we need to be able to limit disruptions and specific conditions that will be a potential concern. Flexibility of schedule during construction must be conveyed to the contractor and open dialogue is needed all and between all.

4.3 GOAL/OBJECTIVE 3

Upon receipt of bids we will review and make recommendations for acceptable or rejections. We will contact the lowest responsible bidder to discuss and obtain additional data from including a preliminary schedule of values to compare against the projected budget. Hopefully the design team estimate exceeds the bids provided by the bidders and there would not be a need to review to reduce scope to get project within the budget. If we have approached our design correctly and provided realistic cost projects during the process then the cost and funding questions will be resolved ahead of Contractor bidding.

4.4 GOAL/OBJECTIVE 4

The BFM team will assist the school with services during the construction phase of the project. We will be onsite for the progress meeting on a bi-weekly basis. If additional visits are necessary that will be addressed at that time as needed. We will review all project submittals for projects, materials, shop drawings, etc. We will respond to written RFI questions from Contractor as well the school. We will review schedules, schedule of values and all subsequent payment applications, and change order request. BFM can prepare AIA standard contract forms or other contract as required by WV. We will prepare change order forms for signature as deemed necessary and as approved by schools appropriate person. BFM and team will do a punch list inspection issue substantial completion forms and review closeout documents as provided by the contractor. We will forward all reviewed and approved materials from the contractor including updated design drawing integrating any modification from the as-built drawings as received from the Contractor. We will process the final application for payment when the project is complete. We will be in contact with the designated school representative during the entire project.

4.5 GOAL/OBJECTIVE 5

We will take the Contractors marked as-builts along with any addenda, RFI's, and other sketches as issued and our office set with changes/modifications and update the projects drawings accordingly to provide a final constructed set for the schools use and archival. One set of hard copies would be provided to the school as well as an electronic copy in pdf and CADD formats. This service would be built into the fee structure for the construction administration portion of the project design fees.

TOWER ENGINEERING – MECHANICAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION

With respect to building systems, the goal of the Planning Phase of any project is to identify the MEP/FP scope of work for the project. For the WV School for the Deaf and Blind, one approach would be to move forward with a simple replacement of existing HVAC systems with new equipment. This approach would meet the project requirements stated in the RFP and would minimize the design requirements. However, this approach may not result in the most economical, most practical and most comfortable solution. Our approach to the planning phase is to step back and consider all applicable options.

For example, a viable option to replacing aged and failing residential grade heat pumps in the Elementary School is to consider a variable refrigerant flow (VRF) solution. A VRF solution has the potential to offer multiple benefits that would include but not be limited to improved energy efficiency, occupant comfort,

system reliability and system longevity. On a life cycle basis, VRF is likely to offer a lower overall cost versus residential grade heat pumps.

For the Secondary School, replacement of the existing air handling unit and roof mounted condensing unit with similar equipment will be extremely difficult and costly. We recommend that consideration be given to the installation of a packaged rooftop unit that would replace the condensing unit and be connected to existing ductwork within the building. A packaged rooftop unit would be significantly less expensive and would be far more reliable since all refrigerant piping would be factory installed. Furthermore, it would be more efficient because a heat recovery wheel can easily be included.

The alternatives described above are only our initial thoughts. There are likely to be additional options that should be considered and discussed. Tower Engineering's team of mechanical and electrical engineers and designers address and determine how the final system selection is impacted by such major issues as advancing technology, changes in design standards, higher expectations of comfort levels, greater awareness of environmental concerns, the needs and availability of practical energy conservation costs within budget constraints. For renovation projects, our evaluation involves the visual inspection of existing conditions by a team of engineers. An assessment report, including a description of the present systems, evaluation of existing conditions and defects, recommendations, and an estimate of budget/cost implications is provided to assist in the decision-making process. We then develop a list of applicable MEP system options that can be considered.

These options are compared on a qualitative and quantitative basis using sophisticated energy analysis software. The model will be loaded onto a portable laptop computer, allowing for instantaneous feedback during the critical conceptual team meeting when options are being considered and analyzed.

Every Building Owner is unique, and we will work with you to carry out a process that is systematic, accountable and has clear communication. Tower' staff of 30 includes 15 registered Professional Engineers and nine (9) LEED-Approved Professionals.

Our project management team will regularly review drawings, and coordinate the necessary work across all disciplines. We will prepare opinions of probable cost at strategic intervals to keep close control on budget and schedule, and make design decisions with your project manager and your stakeholder group so that you have an understanding of the options and their effect on the overall project.

Our reputation rests on our clients' confidence in our relationship to each project, whatever the size.

BUSHEY FEIGHT MORIN ARCHITECTS INC.



The firm of Bushey -Burrey Architects Inc. was formed in 1968, and was the origin of today's firm of Bushey Feight Morin Architects Inc. In 1977, the firm reorganized as Bushey Associates Inc., which it remained until 1994 when Mr. Feight purchased the firm and renamed it, Bushey Feight Architects Inc. 1998 brought reorganization, when Mr. Norman Morin joined Mr. Feight and formed the firm of Bushey Feight Morin Architects Inc. (BFM). The firm has always been regarded within the industry as a firm specializing in educational facilities.

Bushey Feight Morin Architects Inc. (BFM) is a full service twenty (20) person architectural firm located in Hagerstown, Maryland. BFM has maintained a continuous practice of architecture since 1968 providing service throughout Maryland, Virginia, Pennsylvania, and West Virginia. On staff, Bushey Feight Morin has six (6) registered architects, two (3) of which are Principals. Brent A. Feight, AIA, President/Owner, and Norman E. Morin, Jr., AIA, Vice President, Michael L. Gehr, AIA, all principals, are involved in all projects serving as Principal-in-Charge or Quality Control Coordinator. The firm has provided architectural services throughout the State of Maryland and parts of West Virginia, Pennsylvania, and Virginia.

Bushey Feight Morin Architects takes pride in the fact that we have received repetitive work from our varying client base. We credit this repeat work to the quality product and service that we deliver to our client. BFM has an impressive project record with the Maryland Department of General Services, and the Inter-Agency Committee as well as the Boards of Education of Allegany, Washington, and Frederick Counties. Other educational clients include repetitive work for Shepherd University, Hagerstown Community College, and University of Maryland at College Park, Allegany College of Maryland and Frostburg State University. In addition, we also have completed many projects for the Maryland Department of Public Safety and Correctional Services, the Washington County Hospital, and Potomac Edison.

At Bushey Feight Morin, emphasis will be placed on providing the Client personalized design services for the various projects that may arise. Our objective will be to achieve the balance between imaginative user friendly design and compliance with the project budget. The established system of co-coordinating team management and project scheduling is the foundation which will ensure quality design, budget control, and timely response. BFM uses computerized drafting systems as well as advanced production technology to efficiently produce all required documents. Our technical library is extensive in its scope, and, coupled with the computerized specifications and cost estimating, results in the most accurate and complete bid documents possible. In addition, BFM Inc. exchanges drawing files on an as needed basis with the consultants via the Internet. This permits document updates to be shared with the team immediately. During design, BFM will maintain involvement of the design committee and the design consultants. This effort insures a project which incorporates the Owners desires and needs.

The Construction Phase is a critical effort in the design/construction process which requires communications and expertise from all parties involved. At BFM, the Principal-in-Charge for

the projects will be Brent A. Feight, AIA. Mr. Feight will administer the project site meetings and the day to day administration. We have found this to be both time and cost effective for the client so that job site decisions and/or recommendations are made promptly to avoid cost incurred due to delay that may be created in the decision making process.

BFM'S ABILITY TO COMPLETE PROJECTS ON SCHEDULE AND WITHIN BUDGET

Maintaining project schedules and budgets are essential in projects which are dependent upon fiscal funding/appropriations and scheduled dates for coming "on-line" to serve the designated clientele. The BFM Team can offer this expertise to the Client. Our experience has been honed, having completed many projects for the State of Maryland and various educational facilities and campuses.

PROJECT SCHEDULES: Upon receipt of the Notice-to-Proceed, BFM will develop a time schedule indicating start and completion calendar dates for all task milestones in pre-design, schematic, design development, and construction documents phases. In addition, each task is identified as to which party or team member is responsible for its completion. This schedule is then regularly monitored in order to maintain due dates and deliveries.

BUDGETS: When designing, the Team, inclusive of the Owner/Using Agency and Design Consultants, must be aware of the budget envelope that the project must be delivered. Delays caused by the need to delete program space or rebid create unnecessary work and expense by all concerns. BFM provides cost estimating at each phase of design. At the schematic phase, a square foot cost is provided based upon the most recent R.S. Means and recently bid projects that are in the BFM data base.

SPECIAL QUALIFICATIONS AND ABILITIES THAT MAKE THE FIRM UNIQUELY QUALIFIED

The Bushey Feight Morin Architects offers a unique Team comprised of designers and consultants which will most certainly benefit the Client. Several of the more dominant qualifications and our abilities are as follows:

ARCHITECTURE

BFM Architects prides itself for the quality of design and completeness of its documentation. This is realized by the low percentage of change orders that occur during construction. BFM is quick to provide data demonstrating this prestigious record of our past performance. Recently, BFM has expanded their services which we offer the client, by the creation of an Interior Design Department.

The "look" and "flow" of the building will be developed by extensive work sessions with the Owner/User. Through these sessions, the design will develop into a product that blends with the campus and is compatible with the Owner/User's vision of the final product. Choice of finish materials will be both aesthetically pleasing, but will also endure the test of time and use/exposure experienced in Maryland.

INSURANCE

Bushey Feight Morin Architects Inc. carries insurance to protect the Client against errors and omissions by providing our projects with professional liability insurance in the amount of \$3,000,000. Bushey Feight Morin Architects is in excellent standing with our insurers.

CORPORATE INFORMATION / REFERENCES

Established in 1968, Bushey Feight Morin (BFM) Architects is a twenty (20) person firm located in Hagerstown, Maryland.

BFM has an established reputation for quality architecture and personal service to our client base. Our design philosophy is based on creating buildings that meet our clients' aesthetic, environmental, LEED, and functional program requirements. Each of our projects is designed to be visually appealing. It should be apparent that all of the elements in our designs were thoughtfully selected, composed, and detailed by a skillful designer to fulfill the desires of the client.

We have adopted a practical approach to our planning efforts that result in project documents that incorporate the concerns and hopes of those involved, along with detailed information that assists the implementation of the project.

The basis of our success is listening, understanding, and communicating the client's vision to the contractor which results in a successful project for all.

Name of Firm: Bushey Feight Morin Architects Inc. Website: www.bfmarchitects.com
473 North Potomac Street
Hagerstown, Maryland 21740

Telephone No: 301-733-5600
Fax No: 301-733-5612

Type of Ownership: S-Corporation, State of Maryland, 1978
Owners: Brent A. Feight, AIA (75%) Pamela J. Tetlow (25%)

Firm Licensed in: Maryland, West Virginia, Virginia, Pennsylvania

Size of Firm: Twenty (20) Registered Principal Architects (2)
Registered Project Architects (4)
Project Manager, USGBC LEED Accredited (1)
Construction Administration Specialists (1)
Interior Designer, NDICQ (1)
Project Managers and Technical Staff (7)
Administration Staff (4)

Principal Contacts of Firm: Brent A. Feight, AIA bfeight@bfmarchitects.com
Pamela J. Tetlow ptetlow@bfmarchitects.com
Michael Gehr mgehr@bfmarchitects.com
Telephone: 301-733-5600

Financial Statement: BFM is in a strong financial position which may be confirmed with our accountants, Albright, Crumbacker, Moul and Itell of Hagerstown, Maryland. A copy of our Financial Statement can be provided, if desired.



Statement of Insurance: BFM Architects maintains \$3,000,000 of Professional Liability Insurance. A certificate of insurance confirming these policy limits, carrier, claims made or occurrence can be provided upon request.

CLIENT REFERENCES

Martinsburg Housing Authority

Ms. Catherine Dodson, Executive Director, 304-263-8891

State of Maryland (DGS) Dept. of General Services, Baltimore, MD

Mr. Barry Miller, Project Manager/Capital Projects Team Leader, 410-767-4446

Shepherd University Shepherdstown, WV

Debra Langford-Hiergest, Executive Director of Purchasing, 304-876-5216

Washington County Central/Regional Library, Hagerstown, MD

Mary C. Baykan, Executive Director, 301-739-3250

Frederick County Public Schools, Frederick, MD

Mr. Roger Fritz, Director of Facilities, 301-644-5153



a. Name & Title:

MICHAEL L. GEHR, AIA / Principal

b. Project Assignment:

Project Architect

c. Name of Firm:

BFM BUSHEY FEIGHT MORIN ARCHITECTS INC.

d. Years experience:

with this Firm:..... 12.0

with other Firms:..... 14.0

e. Education - Degree(s) / Year:

Carnegie Mellon University – Bachelor of Architecture 1988

f. Active Registration - Year First Registered / Discipline:

MD/1994/

PA/1998/

ME/1999/

NJ/2002/

VA/1998/

WV/1998/

DE/1999/

NCARB Certificate

g. Other experience and qualifications:

Upon graduation, Mr. Gehr began his architectural profession in 1988 with BFM. In 1998, Mr. Gehr resigned from BFM to serve as principal and Owner of BMGM Architects. In 2012, Mr. Gehr returned to BFM as a principal of the firm. His design focus has been directed to developing a variety of project types, which include educational, commercial, industrial, correctional, retail, warehousing, food processing and religious facility design. As a principal, his expertise is directed to project management. He has experience in planning/programming to construction phase services. He recently served as a CIP project manager for two projects at Shepherd University.

Professional and community involvement includes: American Institute of Architects, Chamber of Commerce, City of Hagerstown Historic District Comm., Washington Co. Homebuilders, Student Trades Foundation, Construction Specification Institute, HCC Booster Leadership Group and Treasurer for the Hagerstown Suns Fan Club.

Related Projects:

- **Baltimore County Public Schools:** Roof Replacements from 2006 through 2012, Baltimore, MD (BMGM/ BFM)

Martinsburg Housing Authority: HUD Projects –

- Roof replacement – Shingles – Horatio Gates(WV6-1) & Adam Stephens (WV 6-2) BMGM
- Roof Replacements - BUR – Stonewall Haven (WV6-6) Ambrose Towers (WV6-5) BMGM
- Elevator upgrade - Stonewall Haven (WV6-6) Ambrose Tower (WV6-5) BMGM
- Kitchen - Ambrose Towers (WV6-5) BFM / BMGM
- Bathroom Replacement – Leeland Apartments (WV6-3) BFM
- Bathroom Replacement – Ambrose Towers (WV6-5) BFM
- Fire Alarm and Intercom Replacement - Stonewall Haven (WV6-6) & Ambrose Towers (WV6-5) BMGM

Washington County Housing Authority: HUD Projects –

- Elderly Housing Complex Expansion – Springfield Manor – Williamsport, MD - BMGM
- Blue Mountain Estates, New 16 Unit Senior Housing Unit, Smithsburg, MD – Not built BMGM
- Feasibility studies for Townhomes in Boonsboro, MD – BMGM
- Monterey House – Hancock, MD – BFM

City of Hagerstown Housing Authority

- **Frederick Manor Modernization**
- **Douglas Courts Modernization**
- **Westview Homes Modernization**

Washington Co. Public Schools: Various Projects. Duties Included: Principal, Project Manager, Specification Writer & Construction Observation Services

- Clear Spring Elementary - Addition & Renovations, Clear Spring, MD (BMGM)
- Salem Avenue Elementary - Addition & Renovations, Hagerstown, MD (BMGM)
- Smithsburg Elementary School- Addition & Renovations, Smithsburg, MD (BFA)

Garrett Co. Board of Education: (1998-2010) Roof projects, addition/renovation projects. Duties include: principal, project manager, and specification writer & construction observation

- Northern Garrett Middle School - Addition & Renovations (BMGM)
- Grantsville Elem. School - Head Start Addition & Renovations (BMGM)
- Rt. 40 Elementary School - Addition & Renovations (BMGM)
- Northern High School- Gym Addition & Gym Lobby Addition (BMGM)

7. Brief resume of key persons, specialists, and individual consultants anticipated for this project.

a. Name & Title:

Brent A. Feight, AIA
President

b. Project Assignment:

Principal-in-Charge/QA/QC

c. Name of Firm with which associated:

Bushey Feight Morin Architects Inc.

d. Years experience: With This Firm 34 With Other Firms 3

e. Education: Degree(s)/Year/Specialization

Bachelor of Architecture, 1974 Pennsylvania State University

f. Active Registration: Year First Registered/Discipline

1989, Maryland Registered [REDACTED]
Also Registered in Pennsylvania, West Virginia, Virginia
NCARB

g. Other Experience and Qualifications relevant to the proposed project:

Mr. Feight has been active in the general practice of architecture for the past 37 years, Mr. Feight has been responsible for numerous projects with a strong emphasis on education, commercial office facilities, detention institutions, and industrial facilities with special emphasis on re-roofing projects. Being a "working principal" his involvement includes all phases from Programming/Design, Construction Documents and providing Construction Administration including shop drawing reviews and Post Construction services

Mr. Feight has been personally responsible for the BFM Contracts for Re-Roofing completed for Frederick County Public Schools, Allegany County Public Schools, Shepherd University as well as numerous private and public governmental clients. Mr. Feight's successful management experience has been demonstrated on his projects by the repeat projects requested by his clients. The following clients and a listing of the re-roofing projects which Mr. Feight has been the Principal-in-Charge are as follows:

Frostburg State University – Ort Library Roof Replacement
Washington County Courthouse – Roof Replacement
Washington County Health Department – Roof Replacement
Longmeadow Shopping Center – Roof Replacement

Mr. Feight was the Project Manager for the preparation of the roofing design documents including preparation of the bid documents including specifications, assisting in bidding and provided construction administration of the roofing process on the following project facilities.

Frederick County Public Schools, Fredrick, Maryland (Roofing Projects)

- Walkersville Middle School
- North Frederick Elementary School
- New Market Middle School
- Myersville Elementary School
- Middletown Elementary School
- Waverly Elementary School
- Green Valley Elementary School
- Career Technical Facility
- Carroll Manor Elementary School

Allegany County Public Schools, Cumberland, Maryland (Roofing Projects)

- Westmar High School
- Mt. Savage K-8 School
- George's Creek Elementary School
- Beall Elementary School
- South Penn Elementary School
- Maintenance Building
- Oldtown School
- Beall High School

Shepherd University, Shepherdstown, West Virginia (Roofing Projects)

- Center for Performing Arts
- Butcher Center
- Sara Cree Hall
- Gardiner and Turner Halls
- Dining Hall
- Stutzman/Slonaker Halls
- Kenamond Hall, Knuitti Hall and Miller Hall

Allegany College of Maryland, Cumberland, Maryland (Roofing Projects)

- Library
- Automotive Technologies Building and Maintenance Building
- Humanities Building
- College Center Building
- Continuing Education Building

8. Work by firm or joint-venture members which best illustrates current qualifications relevant to this project (list not more than 10 projects).

A. PROJECT NAME & LOCATION	B. NATURE OF FIRM'S RESPONSIBILITY	C. OWNER'S NAME AND ADDRESS	D. COMPLETION DATE (ACTUAL OR ESTIMATED)	E. ESTIMATED COST (IN THOUSANDS)	
				ENTIRE PROJECT	WORK FOR WHICH FIRM WAS/ IS RESPONSIBLE
Baltimore County Public Schools Various Roof Replacements 2006 thru 2013 Baltimore County, Maryland	BMGM & BFM Architects provided roof design and construction observation services.	Mr. Anthony Cucina ('06-'11) Ms. Ann Kramer ('12-'14) Project Admin. Office of Engineering & Construction Baltimore Co. Public Schools 9610 Pulaski Park Drive, Suite 231 Baltimore, Maryland 21220 (410) 887-6326 x431	2006 2007 2008 2009 2010 2011 2102 2013 2014	\$ 5,412 \$19,945 \$11,532 \$ 8,913 \$ 2,648 \$10,049 \$11,134 \$ TBD \$ TBD	\$ 5,412 \$19,945 \$11,532 \$ 8,913 \$ 2,648 \$10,049 \$11,134 \$ TBD \$ TBD



Perry Hall MS

BMGM Architects p.c. & BFM Architects Inc.

BMGM & BFM Architects has been working with the Baltimore County Public Schools for roof designs since 2006 having teamed with Tremco / Waterproofing Technologies Inc. through a national consortium that the County participates in obtaining services.

BMGM / BFM have provided architectural design services by developing the roof replacement plans and standard details based on the specified manufacturers' roof system. We have developed the specifications for each of the projects and prepared the IAC / PSCP forms necessary to gain the state's IAC approval. We address any state review comments and subsequently revise the documents as necessary. We have provided the following designs for the listed schools. We have also provided construction observation services including shop drawing review, payment application review and progress meeting and minutes.

2006	Sq Ft	Cost
Dundalk ES:	36,832 sf	\$ 451
Carroll Manor ES:	40,666 sf	\$ 461
Baltimore Highlands ES:	58,365 sf	\$ 800
Pine Grove MS:	150,039 sf	\$2,000
Hebbville ES:	60,171 sf	\$1,050
Bedford ES:	49,371 sf	\$ 650

2007	Sq Ft	Cost
Parkville MS	85,000 sf	\$1,670
Eastern Tech HS	172,000 sf	\$2,966
Maiden Choice ES	55,000 sf	\$1,270
Cockeysville MS	168,000 sf	\$2,967
Old Court MS	108,000 sf	\$2,098
Pikesville MS	123,000 sf	\$2,512
Deer Park MS	126,000 sf	\$ on hold
Perry Hall MS	142,000 sf	\$3,798
Deep Creek MS	134,000 sf	\$2,365
ESS Building	13,700 sf	\$ 299

2008	Sq Ft	Cost
Arbutus ES	35,332 sf	\$ 800
Battlegrove ES	75,409 sf	\$1,597
Joppa View ES	65,967 sf	\$1,483
Kingsville ES	53,920 sf	\$ 834
Ridgely MS	93,832 sf	\$1,871
Riderwood ES	60,377 sf	\$1,286
Western Technical HS	104,240 sf	\$2,390
Woodbridge ES	53,870 sf	\$1,271

2009	Sq Ft	Cost
Bear Creek ES	72,189 sf	\$1,696
Colgate ES	26,325 sf	\$1,621
Loch Raven MS	145,466 sf	\$2,791
Halstead Academy (ES)	64,637 sf	\$ 1,940
Prettyboy ES	34,405 sf	\$ 623
Carney ES	72,040 sf	\$ 709
Pot Springs ES	60,345 sf	\$1,473
Seventh District ES	54,855 sf	\$ 1,371
Woodlawn MS	127,290 sf	\$ 2,485



Dundalk ES



Loch Raven MS

8. Work by firm or joint-venture members which best illustrates current qualifications relevant to this project (list not more than 10 projects).

A. PROJECT NAME & LOCATION	B. NATURE OF FIRM'S RESPONSIBILITY	C. OWNER'S NAME AND ADDRESS	D. COMPLETION DATE (ACTUAL OR ESTIMATED)	E. ESTIMATED COST (IN THOUSANDS)	
				ENTIRE PROJECT	WORK FOR WHICH FIRM WAS/ IS RESPONSIBLE
Baltimore County Public Schools Various Roof Replacements 2006 thru 2013 Baltimore County, Maryland	BMGM & BFM Architects provided roof design and construction observation services.	Mr. Anthony Cucina ('06-'11) Ms. Ann Kramer ('12-'14) Project Admin. Office of Engineering & Construction Baltimore Co. Public Schools 9610 Pulaski Park Drive, Suite 231 Baltimore, Maryland 21220 (410) 887-6326 x431	2006	\$ 5,412	\$ 5,412
			2007	\$19,945	\$19,945
			2008	\$11,532	\$11,532
			2009	\$ 8,913	\$ 8,913
			2010	\$ 2,648	\$ 2,648
			2011	\$10,049	\$10,049
			2102	\$11,134	\$11,134
			2013	\$ TBD	\$ TBD
			2014	\$ TBD	\$ TBD

BMGM Architects p.c. & BFM Architects Inc.

BMGM has provided roof replacement plans and standard details for both hot and cold applied built-up roofing system with flood coat and gravel or SBS cap sheets, metal roofing, shingles, single ply membrane and refurbishing both existing metal and single ply membrane systems.

2010	Sq Ft	Cost
Norwood ES:	57,393 sf	\$1,358
Wellwood ES:	58,752 sf	\$1,350
Sudbrook Magnet MS:	71,537 sf	\$1,520
Lutherville Laboratory S	51,875 sf	\$1,315
Westowne ES	59,700 sf	\$1,307

2012	Sq Ft	Cost
Jacksonville ES:	73,765 sf	\$1,004
Woodlawn HS:	139,283 sf	\$3,250
Franklin HS:	173,687 sf	\$4,280
Grange ES:	62,978 sf	\$1,512
Hawthorne ES	44,587 sf	\$1,089

2014	Sq Ft	Cost
Chesapeake Terrace ES:	50,172 sf	\$1,140 Proj.
Deer Park ES:		\$ on hold
Oliver Beach ES:	51,300 sf	\$1,120 Proj.

2011	Sq Ft	Cost
Elmwood ES	52,183 sf	\$ 1,262
Warren ES	54,864 sf	\$ 1,321
Franklin Middle MS	90,010 sf	\$ 2,026
Middle River MS	133,933 sf	\$ 2,922
Seven Oaks ES	62,500 sf	\$ 1,278
Catonsville Alt School	36,164 sf	\$ 741
Randallstown ES	39,737 sf	\$ 500

2013	Sq Ft	Cost
Cromwell Valley ES	75,637 sf	\$ 1,360 Proj.
Chapel Hills ES	60,868 sf	\$ 1,819
Glenmar ES	61,628 sf	\$ 1,350 Proj.
Middleborough ES	51,075 sf	\$ 1,299
Riverview ES	50,900 sf	\$ 1,350 Proj.
Scotts Branch Magnet S	57,471 sf	\$ 1,230 Proj.



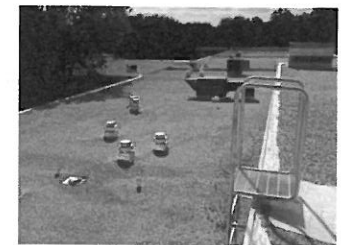
Bear Creek ES



Pot Springs ES



Norwood ES



Halstead Academy

8. Work by firms or joint-venture members which best illustrates current qualifications relevant to this project (list not more than 5 projects).

Project Name & Location	Nature of Firm's Responsibility	Owner's Name, Address and Telephone No.	Actual Completion Date for Completion	Estimated Cost (in thousands)	
				Actual Construction Cost	Work for Which Firm is Responsible
Open-End Contracts Washington County Public Schools Hagerstown, Maryland	Various A/E Services	Washington County Public Schools 820 Commonwealth Avenue Hagerstown, Maryland 21740 Mr. Chad Criswell, Facilities Manager 301-766-2817	On Going		

Bushey Feight Morin Architects has recently been awarded projects with the Board of Education of Washington County, Maryland for various Open-End Contracts for A/E Services. The following is a listing of the projects BFM has completed.



- Clear Spring Middle School Roof
- Maugansville Elementary, New School
- North Hagerstown High, Mike Callas Stadium and Press Box
- Western Heights Middle, Cafeteria & Lobby Floor Replacement
- Western Heights Middle, Renovation and Alterations
- Western Heights Middle, Wellness Center
- Williamsport High, Windows & Doors Replacement
- Clear Spring Middle, Windows & Doors Replacement
- Funkstown Elementary, Windows & Doors Replacement
- Emma K. Doub Elementary, Window & Door Replacement
- Fountaindale Elementary, Window and Door Replacement
- Boonsboro High, Roof Replacement
- Smithsburg Elementary, Roof Replacement
- Pleasant Valley Elementary, Roof Replacement
- Boonsboro High, Security Fencing & ADA Improvements
- Boonsboro High, Windows & Doors Replacement
- Tech High, Roof Replacement
- Clear Spring Middle, Roof Replacement
- Fountaindale Elementary, Roof Replacement
- Northern Middle, Replacement of the Suspended Acoustical Ceilings, Associated Light Fixtures and Reconfiguration of HVAC and Return Air Diffuser
- Eastern Elementary, Replacement of Gymnasium Floor
- Cascade Elementary, Lighting, Air Conditioning and Electrical Upgrades. BFM is a sub-consultant to RHL Engineering Co.
- Washington County Board of Education, Facilities Department Offices, Design and construction administration for the renovation of new offices located at 701 Frederick Street, Hagerstown, MD.

8. Work by firms or joint-venture members which best illustrates current qualifications relevant to this project (list not more than 5 projects).

Project Name & Location	Nature of Firm's Responsibility	Owner's Name, Address and Telephone No.	Actual Completion Date for Completion	Estimated Cost (in thousands)	
				Actual Construction Cost	Work for Which Firm is Responsible

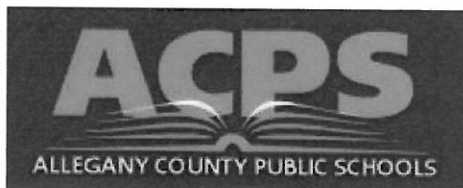
Open-End Contracts
Allegany County Public Schools
Cumberland, Maryland

Various A/E Services

Allegany County Public Schools
108 Washington Street
Cumberland, Maryland 21502
Mr. Vincent Montana, Facilities Director
301-759-2830

On-Going since 1980

Bushey Feight Morin Architects has worked on a continuing basis with the Board of Education of Allegany County, Maryland for the past thirty (30) years. The following is a listing of the projects BFM has completed.



- Westmar Middle School Roof Replacement
- Washington Middle School Roof Replacement
- Mt. Savage Elementary School Roof Replacement
- Frost Elementary School Roof Replacement
- Westernport Elementary, Playground Equipment
- Administration Building, Roof Replacement
- Cresaptown Elementary, Canopy Replacement
- Fort Hill, Roof – Phase 2
- Culinary Arts Renovations, Career Center for Technical Education
- South Penn Elementary School, Kindergarten Classrooms Addition
- Renovations and Additions to Greenway Stadium – Field House, Bleachers, Field Replacement with Artificial Turf
- Roof Replacement at Ft. Hill High School
- New Playground Equipment, Westernport Elementary School
- Exterior Freezer Enclosure, Northeast Elementary School
- Roof replacement at Westmar High School

- Roof replacement at Mt. Savage K-8 School
- IT Department Renovations for Administration Building
- South Penn Elementary School, Playground Equipment Replacement
- John Humbird Elementary School, Renovation and Addition for Pre-K
- Maintenance Building Roof Replacement
- George's Creek Elementary School Roof Replacement
- Cash Valley Elementary School, Boiler Replacement
- Braddock Middle School, Tech Cable and Fire Alarm Upgrades
- Eckhart Elementary School, Miscellaneous Upgrades
- Mt. Savage High School, Renovations
- Westmar High School, Renovations
- Ft. Hill High School, Renovations
- Allegany High School, Science Laboratory Classroom Addition
- Westernport Elementary School, Renovations
- Northeast Elementary School, Renovations and Addition
- Cresaptown Elementary School, Renovations
- Center for Career and Technical Education, New Addition and Various Renovations to Existing
- Oldtown Elementary School, Renovations
- Bel Air Elementary School, New and Addition

FEASIBILITY STUDIES COMPLETED

Beall High School Feasibility Study
South Penn Elementary School Feasibility Study
Westernport Elementary School Feasibility Study

8. Work by firms or joint-venture members which best illustrates current qualifications relevant to this project (list not more than 5 projects).

Project Name & Location	Nature of Firm's Responsibility	Owner's Name, Address and Telephone No.	Actual Completion Date for Completion	Estimated Cost (in thousands)	
				Actual Construction Cost	Work for Which Firm is Responsible
Open-End Contract Frederick County Public Schools Frederick, Maryland	Architectural Services	Frederick County Public Schools 7446 Hayward Road Frederick, Maryland 21702 Joe Datolli, Facilities Director 301-664-5149	On-going Services		

Bushey Feight Morin Architects has worked on a continuing basis with the Board of Education of Frederick County, Maryland with various Open-End Contracts for A/E Services for both Miscellaneous Projects and Roofing Open-End Projects. The following is a partial listing of the projects BFM has completed.



Re-Roofing Projects:

- Woodsboro Elementary School
- Hayward Road Warehouse
- Carroll Manor Elementary School
- Walkersville Middle School
- Rock Creek School
- Career Technical Facility
- Green Valley Elementary School
- Middletown Elementary School
- Myersville Elementary School
- New Market Middle School
- North Frederick Elementary School

Other Open-End Projects Recently Completed:

- Seclusion Room Renovations
- New Market Elementary School, Balcony Repairs
- Middletown Middle School, Fuel Tank Vault Access
- Myersville Elementary School, Multi-purpose Room and Classroom Addition
- Thurmont Middle School, Doors/Window Replacement

In addition to the above, BFM Architects has been awarded contracts for Frederick County Public Schools for design and construction administration for various new and renovated facilities.

- 2011 Oakdale Elementary School, Addition
- 2010 West Frederick Middle School Renovations, \$27M
- 2010 Carroll Manor Elementary School, Addition/Renovation \$6.7M
- 2010 Walkersville Elementary School, Addition/Renovation \$7.3M
- 2005 Centerville Elementary School, \$1.3M - New Elementary School
- 2004 Tuscarora Elementary School, \$1.3M - New Elementary School
- 2001 Oakdale Elementary School, \$10M - New Elementary School
- 1998 Whittier Elementary School, \$8.2M - New Elementary School
- 1997 Deer Crossing Elementary School, \$7.9M - New Elementary School

8. Work by firms or joint-venture members which best illustrates current qualifications relevant to this project (list not more than 5 projects).

Project Name & Location	Nature of Firm's Responsibility	Owner's Name, Address and Telephone No.	Actual Completion Date for Completion	Estimated Cost (in thousands)	
				Actual Construction Cost	Work for Which Firm is Responsible
Frostburg State University Open-End Contract Projects 101 Braddock Road Frostburg, Maryland 21532	Complete	University of Maryland System A/E Services Frostburg State University Frostburg, Maryland Mr. John Brewer, Facilities Manager 301-687-4125			Various "On-Call" Services 2011 and continuing

Bushey Feight Morin Architects Inc. has provided on-call services to Frostburg State University for the following projects:

- Bobcat Stadium Press Box and Bleachers
- Pre-Engineered Building for Stadium Use
- Architectural Building Plans for 150 Park Avenue and 7 American Avenue
- Architectural Building Plans for Dunkle Hall, 1st, 2nd, and 3rd Floors
- Concepts for Dance Studio
- Lane Center, Dining Room and Storage Room
- Lane Center, Coffee Bar
- Cordts Gymnasium, Leake Hospitality Suite
- Dunkle Hall – Classroom and Office Reconfiguration
- Hitchins Administration Building – Roof Replacement
- Performing Arts Center, Coping and Waterproofing
- Chesapeake Dining Hall, Roof Replacement
- Fine Arts Building, Roof Replacement
- Pullen Hall, Roof Replacement



8. Work by firms or joint-venture members which best illustrates current qualifications relevant to this project (list not more than 5 projects).

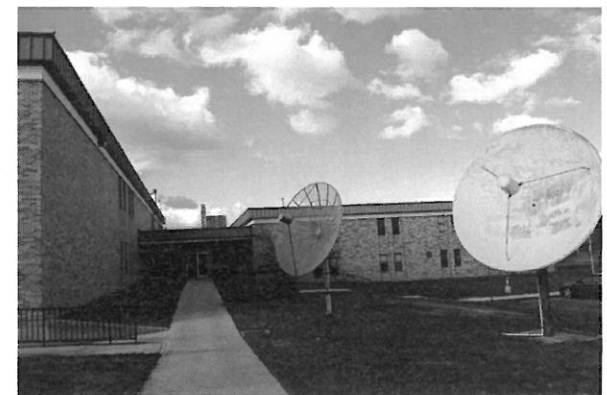
Project Name & Location	Nature of Firm's Responsibility	Owner's Name, Address and Telephone No.	Actual Completion Date for Completion	Estimated Cost (in thousands)	
				Actual Construction Cost	Work for Which Firm is Responsible
Allegany College of Maryland 12401 Willowbrook Road, SE Cumberland, Maryland 21502	Complete A/E Services	Allegany College of Maryland 12401 Willowbrook Road, SE Cumberland, Maryland 21502 Ms. Mona Clites 301-784-5252	Various "On Call"		

The Allegany College of Maryland Physical Education Building Renovations and Addition was constructed and open in the spring, 2006. The existing 39,664 square foot facility was completely renovated with a 10,618 square foot addition. Features of the renovation and addition included a stand-alone pool lobby with visitor lockers, new pool circulation system and pool sound control, renovated general and varsity lockers, fitness area, re-configured administration area, air conditioned gymnasium with new motorized bleachers and four-sided scoreboard, and the addition of two (2) classrooms, public toilet rooms, gymnasium lobby and concession areas. The replacement HVAC system and pool heating system was supplemented by a new geo-thermal well field, which will offset operational costs. The existing facility was completely renovated through three (3) phases of construction.



The Allegany College of Maryland Library Addition and Renovation BFM provided a comprehensive architectural design package for partial demolition of the existing building and construction of a new 11,000-sf addition. The 26,828-gsf. Library is the first on campus to have a geo-thermal heating and cooling system and also the first to have wireless computer access both inside and outside the building. The building includes 4 small study rooms, 2 large conference rooms, and a student study/computer space for all students. BFM's design provided for a state-of-the-art computer laboratory with 30 student computers and a teaching station which has software to control all the student computers.

Bushey Feight Morin Architects (BFM) was commissioned by Allegany College of Maryland to provide a study for renovation of the existing **Technology Building** and/or the construction of a new building on campus in order to provide for the additional square footage required due to the growth of staff, students, and expansion of programs that are currently offered. This impacted the availability of space and services that could be offered by the College. BFM Architects provided six (6) options and associated costs were developed. Options ranged from a major renovation of the existing building including mechanical, electrical, and finish systems, along with ADA accessibility, and swing space options to a new three (3) story facility complete with new 149 vehicle parking area.



8. Work by firms or joint-venture members which best illustrates current qualifications relevant to this project (list not more than 5 projects).

Project Name & Location	Nature of Firm's Responsibility	Owner's Name, Address and Telephone No.	Actual Completion Date for Completion	Estimated Cost (in thousands)	
				Actual Construction Cost	Work for Which Firm is Responsible
Miscellaneous Projects at Shepherd University Shepherdstown, West Virginia	Complete A/E Services	Shepherd University Shepherdstown, West Virginia 25443 Mr. Don Nuckols, Facilities Director 304-876-5383			Continuing contracts since 1995

Miscellaneous Projects at Shepherd University completed thru Open-End Contracts

2014 – Frank Arts Center Roof Replacement
 2014 – Butcher Center Roof Replacement
 2014 – Dining Hall Roof Replacement
 2013 – Ikenberry Hall Roof Replacement
 2013 – Thatcher Hall Roof Replacement
 2012 – Ikenberry Hall – IT Office/HVAC Replacement
 2012 – CCA Phase II Inspections
 2011 – Ikenberry Hall – Window Replacement
 2011 – HR Ramp Study
 2011 – Stutzman HVAC Replacement
 2010 – Knutti Hall – Production Studio
 2010 – McMurrin Hall – Boiler Replacement
 2010 – Snyder Hall – Window Replacement
 2010 – Byrd Science Center – Stair Tower Window Replacement
 2010 – White Hall – Window Replacement
 2010 – Stutzman/Sloanker Hall – Window Replacement
 2010 – Crosswalk
 2010 – Butcher Center Plaza – Leaking Report
 2009 – Keller Residence
 2009 – Dining Hall Feasibility Study
 2009 – Bookstore Renovations
 2009 – Stutzman/Slonake Hall – Cooking Lab Renovations
 2009 – Energy Audit, Butcher Hall and Snyder/Byrd Science Halls
 2008 – Kunitti Hall HVAC Replacement
 2008 – Frank Arts Center HVAC Replacement
 2007 – Center for Performing Arts Building Roof Replacement
 2007 – Reynolds Hall Structural Repairs
 2007 – McMurrin Hall Exterior Lead Paint Abatement and Upgrades
 2007 – Maintenance Building Feasibility Study
 2007 – Dining Hall Electrical Distribution Study
 2007 – Synthetic Turf Stadium Field – Conceptual Designs
 2007 – Stormwater Management Study and Testing for CCA Project



TOWER ENGINEERING OVERVIEW AND SERVICES



Tower Engineering has been providing innovative mechanical, electrical, plumbing, and fire protection solutions since 1931. While Tower is a generalist firm, it primarily serves the K-12 and higher education, healthcare, senior living, hospitality and recreation sectors in both renovations and new construction.

Tower Engineering's highly-trained staff of project managers, designers, and technical support personnel is capable of providing consulting services for every type of project - from a small, single-family residence to a high tech research facility incorporating redundant mechanical and electrical systems, DDC energy management and thermal storage.

Our engineers utilize state-of-the-art software programs for the design of lighting, electrical power and mechanical systems. Lighting analysis includes point-by-point calculations, ESI analysis, exterior lighting analysis, and life cycle cost comparisons. Electrical power analysis includes fault current and load flow analysis.

Mechanical design and analysis services include energy economy analysis, thermal storage analysis, heating and cooling load calculations, refrigerant piping design, water system designs, along with BIM modeling. Our professional staff utilizes computer selection of air handling units, coils, pumps, terminal devices, fans, cooling towers, chillers, heat exchangers, kitchen hoods, hydronic and steam specialties, humidification equipment and heat recovery equipment.

Sustainability principles are considered at every design point, and firm principals personally lead every project.

SPECIFIC ENGINEERING SERVICES

HVAC

- Heating and cooling system design
- Ventilation system design
- Building automation systems
- Control systems and energy monitoring
- Geothermal heat pumps
- Heat recovery systems
- Kitchen and laboratory exhaust systems
- Smoke evacuation systems
- Computer room environmental control systems
- Building commissioning services

ELECTRICAL

- Interior and exterior lighting design and studies
- Lighting controls
- Primary and secondary voltage power distribution systems
- Fire detection and alarm systems
- Computer data and power systems
- Uninterruptible power supply systems
- Reinforced and masking sound systems
- Lightning protection systems
- Fault current studies
- System over-current protection coordination

TELECOMMUNICATIONS

- Voice communication systems
- Data network systems

PLUMBING

- Water resource efficiency analysis
- Sanitary drainage systems
- Storm water management
- Domestic water systems
- Waste water treatment systems
- Hospital and laboratory piping systems
- Fuel oil piping systems
- Irrigation systems

FIRE PROTECTION

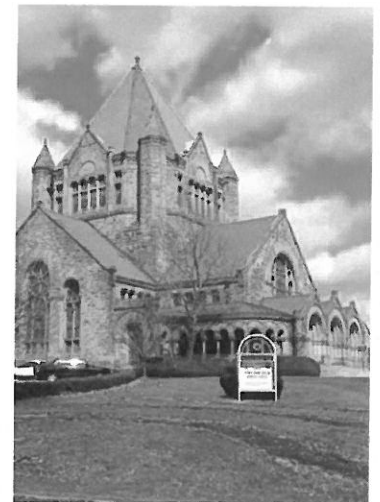
- Standpipe and sprinkler systems
- Fire protection systems



DESIGN EXPERIENCE

- Agricultural & Science Buildings
- Airport Terminals & Hangars
- Athletic Facilities & Stadiums
- Auditoriums & Theaters
- Call Centers
- Classrooms
- Clean Rooms & Special Environments
- DataCenters
- Dining Halls
- Dormitory Buildings
- Environments for the Aging
- High-Rise & Low-Rise Office Buildings
- Historic Preservation & Adaptive Reuse
- Hotels/Motels
- Judicial & Courtroom Facilities
- Manufacturing & Industrial
- Movie Theaters
- Municipal Complexes

- Museums, Galleries & Libraries
- Nuclear Facilities
- Outpatient & Hospital Facilities
- Parking Garages
- Postal Facilities
- Prisons & Correctional Institutions
- Public Safety Buildings
- Recreational Facilities
- Religious Facilities
- Research/Laboratories
- Residential & Multi-Unit Housing
- Retail & Shopping Centers
- Schools
- Student Unions
- TV/Radio Stations
- Vehicle Maintenance Facilities
- Warehouses & Depots



Tower Engineering maintains full CAD capabilities utilizing AutoCAD Release 2013, which is compatible with most micro and mini based computer systems. Our AutoCAD software has been modified in-house to further enhance productivity per discipline. Our QA/QC policies mean that every project undergoes rigorous scrutiny.

K-12 SCHOOL EXPERIENCE

As our nation struggles through educational crises, every factor that could have an effect on learning is open for examination including school design. In addition to the traditional concern for providing electrical and mechanical systems that are functional and flexible, engineers are now concerned with such issues as durability, maintenance costs, energy efficiency, acoustics, fire and safety features, accessibility, and instructional technology.

Tower Engineering specializes in the design of educational facilities, having served as the mechanical/electrical engineering consultant for more than 50 school districts in Pennsylvania and 49 counties in West Virginia. We have the expertise to design facilities for today...and tomorrow.

Providing engineering services for an average of 18 primary and secondary schools each year, Tower Engineering has experience with the design of a wide variety of educational facilities.

The telecommunications industry moves at the speed of light. Voice. Video. Interactive Multimedia. Data networks. The choices are many and the technology changes daily. At Tower Engineering, we understand and the importance of technology in schools. For more than fifteen years, we have been combining our knowledge of new and established technology with design and engineering expertise to offer solutions that meet the needs of numerous school districts in Pennsylvania and West Virginia. Helping schools to incorporate this technology to meet their present and future needs is one of our most rewarding challenges. **Past projects have included:**

■ Classrooms	■ Auditoriums	■ Libraries	■ Cafeterias
■ Gymnasiums	■ Natatoriums	■ Vocational-Technical	■ Administrative Offices
■ Stadiums	■ Computer Rooms	■ Science Labs	

K-12 Education Clients Include:

Pennsylvania:

- Allegheny Valley School District
- Ambridge Area School District
- Avonworth School District
- Baldwin-Whitehall School District
- Beaver Area School District
- Bentworth School District
- Bethel Park School District
- Blackhawk School District
- Carlynton School District
- Chartiers Valley School District
- Chestnut Ridge School District
- Conneaut School District
- Corry Area School District
- Deer Lakes School District
- East Allegheny School District
- Elizabeth Forward School District
- Erie County School District
- Fairview School District
- Fort Cherry School District
- Fort LeBoeuf School District
- Fox Chapel School District
- Franklin Regional School District
- Freedom Area School District
- Gateway School District
- General McLane School District
- Girard School District
- Greensburg-Salem School District
- Hampton Area School District
- Harbor Creek School District
- Hopewell Area School District
- Jamestown Area School District
- Jefferson Morgan School District
- Marion Center Area School District
- Mars Area School District
- Millcreek Township School District
- Montour School District
- Moon Area School District
- Mt. Lebanon School District
- North Allegheny School District
- North East School District
- North Hills School District
- Northwestern School District
- Norwin School District
- Penn Cambria School District

- Penn Hills School District
- Penncrest School District
- Pine Richland School District
- Pittsburgh Public Schools
- Quaker Valley School District
- Riverview School District
- Seneca Valley School District
- Shaler Area School District
- Slippery Rock School District
- South Allegheny School District
- South Fayette School District
- Southmoreland School District
- Spring Cove School District
- Steel Valley School District
- Sto-Rox School District
- Union City School District
- Upper St. Clair School District
- Warren Area School District
- Washington Area School District
- Wattsburg Area School District
- West Greene School District
- West Middlesex School District
- Woodland Hills School District

West Virginia:

- Barbour County
- Berkeley County
- Brooke County
- Calhoun County
- Clay County
- Doddridge County
- Gilmer County
- Grant County
- Hampshire County
- Hardy County
- Harrison County
- Jackson County
- Jefferson County
- Lewis County
- Marion County
- Marshall County
- Mercer County
- Mineral County
- Mingo County
- Monongalia County

- Monroe County
- Morgan County
- Pendleton County
- Pleasant County
- Preston County
- Putnam County
- Ritchie County
- Roane County
- Taylor County
- Upshur County
- Warren County
- Webster County
- Wirt County

Private Schools:

- Allegheny Academy
- Aquinas Academy
- Cathedral School
- Diocese of Greensburg
- Diocese of Pittsburgh
- Eden Christian
- Erie County Vo-Tech
- Mother of Sorrows School
- Pressley Ridge School
- Oakland Catholic
- Scotland School for Veterans' Children
- Sewickley Academy
- Shadyside Academy
- St. Alphonsus School
- St. Gertrudes School
- Trinity Episcopal School
- Watson Institute
- Winchester Thurston

FACILITY MASTER PLANS FOR SCHOOLS K-12

Tower Engineering has extensive experience providing professional assessments of building systems for educational facilities planning. A large portion of our work is associated with the renovation and expansion of existing facilities. Through comprehensive assessment of existing facilities, our engineering staff is constantly exposed to what works and what doesn't work. This practical experience is beneficial for new construction projects as well.

As part of an overall Facility Master Plan, Tower Engineering has completed mechanical/electrical system assessments for over 30 school districts, boards of education and private/parochial schools in Pennsylvania and West Virginia. Our approach takes into consideration many facets, including energy efficiency, equipment condition, system suitability, acoustics and code deficiencies. A typical scope of work would include:

- Site visits to document existing HVAC, Electrical, Plumbing, Fire Protection and Technology systems
- Review of available documentation
- Review energy consumption data for each building and compare with typical K-12 facilities through the use of Energy Star Portfolio Manager
- Author detailed system assessments for each building
- Develop recommendations that address system deficiencies and provide for improved system operation and efficiency
- Develop recommendations that correlate to any programmatic changes that are being considered
- Develop opinions of probable construction cost related to our recommendations

Tower Engineering has completed Facility Master Plans for the following School Districts:

- | | |
|--------------------------------------|--|
| ■ Allegheny Academy | ■ Morgan County Board of Education |
| ■ Ambridge School District | ■ Monongalia County Board of Education |
| ■ Beaver Area School District | ■ Montour School District |
| ■ Chartiers Valley School District | ■ North Allegheny School District |
| ■ Conneaut School District | ■ North Hills School District |
| ■ Cory School District | ■ Northeast Area School District |
| ■ Deer Lakes School District | ■ Norwin School District |
| ■ Erie County Technical School | ■ Penn Hills School District |
| ■ Fayette County Vo-Tech | ■ Pine Richland School District |
| ■ Freedom Area School District | ■ Pittsburgh Public Schools |
| ■ General McLane School District | ■ Reynolds School District |
| ■ Girard School District | ■ Ritchie County Board of Education |
| ■ Grant County Board of Education | ■ Riverview School District |
| ■ Hampton Township School District | ■ Seneca Valley School District |
| ■ Harbor Creek School District | ■ Sewickley Academy |
| ■ Hardy County Board of Education | ■ Shadyside Academy |
| ■ Hopewell Area School District | ■ Shaler Area School District |
| ■ Jefferson Morgan School District | ■ Slippery Rock Area School District |
| ■ Marshall County Board of Education | ■ Spring Cove School District |
| ■ Millcreek Township School District | ■ Union City Area School District |
| ■ Mineral County Board of Education | ■ Warren County School District |
| | ■ Wattsburg Area School District |



CHILDREN'S HOME OF PITTSBURGH

PITTSBURGH, PA

YEAR COMPLETED:

2007, 2014

SQUARE FOOTAGE

65,000

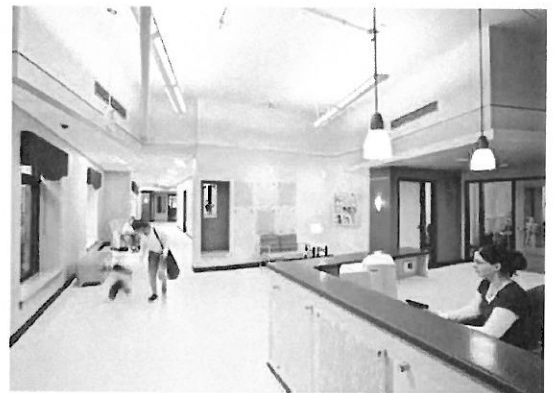
TOTAL CONSTRUCTION COST

\$14.8 million



Tower Engineering provided mechanical, electrical, plumbing and fire protection design engineering services for a 65,000 square foot facility that cares for children with medically complex conditions in a transitional care hospital for 20 children, PTU for 8 children, a day care program for 60 children, adoption services and family support services have all been relocated to the building.

In 2013, Tower was on the team for a two story addition on top of the existing one story (with basement) portion of the building. The addition added 14 new resident rooms to the facility. Our work included a new domestic water main connected into the existing water service, a new sanitary service connected to the existing sanitary main out on site, a new gas main connected to the existing gas service, new gutters and downspouts connected into the existing storm service, a new hot water heat exchanger with storage tank and recirculation system to provide the hot water needs. The original medical systems were not sized for this addition, so a new medical vacuum pump and medical air compressor was provided just to handle the loads. Oxygen tanks were added to the existing system to provide the overall oxygen needs of the facility. For fire protection, a new wet fire protection system was provided to handle the addition adjacent to the existing system and a new dry system was provided in the mechanical penthouse since this area was not heated.



BERKELEY COUNTY BOARD OF EDUCATION

MARTINSBURG, WEST VIRGINIA

Tower Engineering has been providing mechanical and electrical consulting engineering services for the Berkeley County Board of Education since 1995. Berkeley County serves a student population of approximately 16,000, with three high schools, five middle schools, six intermediate schools and fourteen elementary schools. Previous projects for the Berkeley County Board of Education include:



High School Projects:

- Hedgesville High School Addition/Renovation
- Hedgesville High School Renovation
- Martinsburg High School Gym Addition
- Musselman High School (New)
- Musselman High School Classroom Addition

Middle School Projects:

- Hedgesville Middle School Renovation/Addition
- Martinsburg South Middle Dining Room Addition
- Musselman Middle School Addition/Renovation
- Musselman Middle School Band Room Addition
- South Middle School Renovation/Addition
- Spring Mills Middle School (new)



Intermediate School Projects:

- Eagle School Intermediate (new)
- Mill Creek Intermediate Media Center & Dining Room Addition
- Mill Creek Intermediate School Renovation/Addition
- Mountain Ridge Intermediate School (new)
- Orchard View Intermediate School (new)
- Potomack Intermediate School (new)

Elementary School Projects:

- Back Creek Elementary School Addition/Renovation
- Bunker Hill Elementary School Addition/Renovation
- Hedgesville Elementary School Classroom Addition
- Hedgesville Elementary School Renovation/Addition
- Rooftop Unit Replacements at Four Elementary Schools
- Rosemont Elementary School MEP Systems Replacement
- Spring Mills Primary School (new)
- Tuscarora Elementary School Addition/Renovation
- Winchester Avenue Elementary School Renovation/Addition



MONONGALIA COUNTY BOARD OF EDUCATION

MORGANTOWN, WEST VIRGINIA



Tower Engineering has provided services for several new construction and renovation projects resulting from a \$50 million bond issue – the largest to be approved in West Virginia's history. Projects Included:

Morgantown High School:

The \$5 million construction project involved a 13,000 s.f. addition and 6,000 s.f. renovation, including new classrooms and a new media center. This project was completed in 2004.

University High School and Sports Complex:

This \$29.3 million new 217,438 s.f., two-story building houses 1500 students. In addition to the school with 1500 seat gymnasium, auxiliary gymnasium and 700 seat auditorium, Tower Engineering provided services for the construction of a 2000 seat stadium for field sports, as well as multiple athletic and physical education fields. Construction of the new high school was completed in 2006 and the sports complex was completed in 2009.



Skyview Elementary School and Mylan Park Elementary School:

Completed in 2007, these schools are 73,806 s.f. each. Construction costs for Skyview Elementary were \$10.9 million. Construction costs were \$9.4 million for Mylan Park.



Clay-Battelle Middle School

This \$10.2 million expansion/renovation project was phased to facilitate the contractor's work while classes were still underway. The project was completed in 2007. A new two-story addition constructed at the front of the existing building houses administrative offices, a new cafeteria and upstairs classrooms. An expanded kitchen, new auditorium and gymnasium are located in the rear of the building.

Mason-Dixon Elementary

Tower Engineering provided services for a \$1.3 million addition of six new classrooms and a reconfigured cafeteria. This project was completed in 2006.



SPRING MILLS PRIMARY SCHOOL

BERKELEY COUNTY BOARD OF EDUCATION
SPRING MILLS, WEST VIRGINIA

YEAR COMPLETED:

2011

SQUARE FOOTAGE

63,380

TOTAL CONSTRUCTION COST

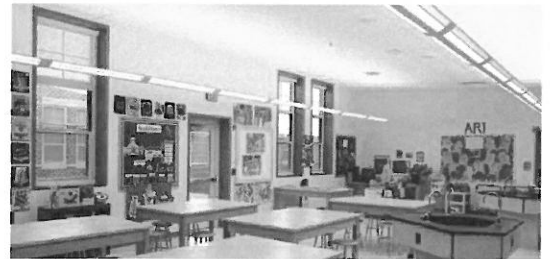
\$12.7 million



Spring Mills Primary School is the first new building in West Virginia to earn a LEED Gold certification from the US Green Building Council (USGBC). Tower Engineering has incorporated many green features into our mechanical and electrical engineering design, including a geothermal water source heat pump system consisting of 90 wells to be drilled to a depth of 275 feet; innovative wastewater technologies; daylighting and energy efficient lighting; and optimized energy performance.

Features Include:

- Geothermal heat pump system
- 72 geothermal holes, drilled to a depth of approximately 400 feet
- Insulated concrete form (ICF) wall system
- Anticipated 25%+/- energy savings
- On-site bioretention learning area
- Anticipated 20% water use reduction
- High recycled and regional material content
- Daylighting and views in more than 90% of occupied spaces



PITTSBURGH PUBLIC SCHOOLS

PITTSBURGH, PA

Tower Engineering has provided mechanical and electrical consulting engineering services for nearly forty projects for the Pittsburgh Board of Public Education. The scope of work for these projects, dating back to the 1970's, has ranged from feasibility studies to design of the mechanical and electrical systems for the new Helen S. Faison Arts Academy. For example, Tower Engineering was awarded an On-Call Electrical Services Agreement, which resulted in the design of electrical power upgrades at nine schools as Phase 1 of the District's Technology Plan. Our services for this agreement included field surveys, recommendations, cost estimates, preparation of contract bidding documents (plans and specifications), and electrical inspection services for miscellaneous projects including door monitoring systems, LAN systems and related electrical work as directed by the Board of Education. **Our experience with the Pittsburgh Public Schools includes:**

- | | |
|---------------------------------|---------------------------------|
| ■ Arlington Elementary | ■ Northview Heights Elementary |
| ■ Arlington Middle | ■ Oliver High |
| ■ Beechwood Elementary | ■ OVT Center |
| ■ Brookline Elementary | ■ Prospect Multicultural Center |
| ■ Central Food Service Facility | ■ Ridge Avenue Gifted Program |
| ■ DataCenter | ■ Rogers CAPA |
| ■ Dilworth Traditional Academy | ■ Schenley High |
| ■ Fairywood School | ■ Service Center |
| ■ Fort Pitt School | ■ Weil Technology Institute |
| ■ Langley High School | ■ Westinghouse High School |
| ■ Millions Technology Academy | ■ Whittier Elementary |
| ■ Murray Elementary | |



CENTRAL FOOD SERVICES FACILITY FOR PITTSBURGH PUBLIC SCHOOLS

Tower Engineering provided engineering services for the design of the mechanical and electrical systems for this extensive renovation and new construction project. Highlights of the HVAC system included design of a gas-fired boiler system to provide water for summer-time heating purposes. Tower designed new burners, as well as replacement of the entire steam system back to the existing steam boilers for winter heating. Air conditioning is provided by a new water cooled packaged rotary screw chilled water system. Central station air handling units, including variable and constant, were provided. Floor mounted computer room air conditioning units were designed specifically for computer room environmental control. These units automatically monitor and control heating, humidification, dehumidification, and filtration functions for the data processing facility. Mechanical engineering services were also provided for the placement of the existing 5000 gallon underground fuel oil storage tank with a new 5000 gallon double-wall fiber glass storage tank.

Electrical system highlights included design of the power distribution system, interior and exterior lighting, fire alarm and detection system, and power for the mechanical and kitchen equipment. Complete plumbing/fire protection systems were designed, including sanitary, waste, vent, hot water and cold water, air and natural gas piping, as well as extension of the existing plumbing systems with new fixtures, piping, specialties and equipment. Fire protection design included dry pipe sprinkler systems for the freezer and cooler areas, a preaction system for the computer room, and wet pipe sprinkler systems for the office, kitchen areas, and the high rack storage areas.

PENN HILLS SCHOOL DISTRICT

PENN HILLS, PA

YEAR COMPLETED:

2012

SQUARE FOOTAGE

303,000

TOTAL CONSTRUCTION COST

\$105 million



Tower Engineering was selected in 2008 to provide consulting engineering services for a feasibility study of the Penn Hills School District's eight buildings to provide options to address over crowding conditions in the District and for the most economical method of making those renovations.

As a result of the feasibility study, the District has begun the process of reconfiguring their school system, with a long-term, \$105 million plan of building construction and closure. Tower Engineering is providing mechanical and electrical engineering services for:

- New High School (LEED Silver) 303,000 SF
- Renovations to Linton Middle School/District Administration
- New Elementary School (LEED Silver)
- Renovation of Shanendoah Elementary
- Relocation of the District WAN



CORRY AREA SCHOOL DISTRICT MULTIPLE PROJECTS

CORRY, PA

Tower Engineering performed a study of three District facilities to determine condition of existing systems, as well as provide recommendations for replacement and repairs. Our report included a description of the systems, code violations and safety concerns, the expected life of the systems, and recommendations in support of future plans for the buildings. Tower Engineering provided engineering services for two district elementary school projects as follows:



Corry Elementary School

Tower Engineering provided mechanical and electrical engineering services for the new 85,100 square foot Corry Elementary School, completed in 2008. Total construction costs were \$11.4 million.



Columbus Elementary School

Tower Engineering provided mechanical and electrical engineering services for the renovation of the existing 26,300 square foot school, and an 34,750 square foot addition. Total construction costs for this project were \$8 million. This project was completed in 2008.



MOON AREA SCHOOL DISTRICT MOON TOWNSHIP, PA



New Moon Area High School (2010):

Tower Engineering provided engineering services for the construction of a new 300,000 s.f. high school for the Moon Area School District. This \$62 million, state-of-the-art high school includes many amenities for district students as well as the community. A new eight-lane swimming pool, auditorium with 1,000 seats, and gymnasium with a capacity to accommodate the entire student body of 1200 are included in this three-story building. Separate entrances to allow access for public events and meetings are located from a main hallway. The district's central administration office is located on the ground floor of the building and also has its own separate entrance.

Environmentally-friendly features are incorporated into the design and exceed most requirements used to determine 'green' buildings. A new energy-efficient heating, ventilation and air conditioning unit circulates cool and warm air throughout the building. Carbon dioxide detectors, which allow more fresh air when more students are in any given space, are also utilized as well as motion-detection light sensors.



Additional Moon Area School Projects:

- Bon Mead Elementary School Commissioning
- J.H. Brooks Elementary School
- McCormick Elementary School
- McCormick Elementary School Commissioning
- Moon Area High School Commissioning
- Moon Area Middle School Commissioning
- Moon Area Middle School Renovations
- Moon Area Middle School Technology



DEER LAKES SCHOOL DISTRICT

RUSSELLTON, PA

YEAR COMPLETED:

1999

SQUARE FOOTAGE

140,000

TOTAL CONSTRUCTION COST

\$14 million

Tower Engineering provided mechanical and electrical engineering services for the renovation and new construction of three schools in the Deer Lakes School District. Construction costs for these schools, completed in 1999, were nearly \$14 million.

Deer Lakes Middle School

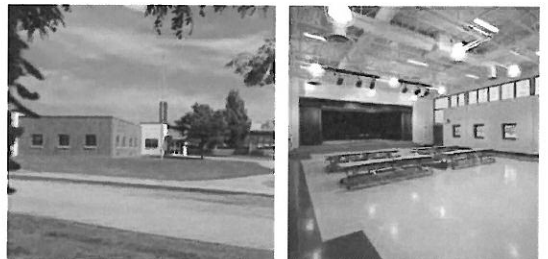
At 80,300 s.f., this Middle School for grades 5 and 6 includes a gymnasium with stage, locker areas, an office suite, a full cooking kitchen, cafeteria, technology shop areas, computer rooms, and classrooms. A new entry and administrative/health suite were constructed at first floor level, with a new Resource Center above. A new Tech Wing and Home Economics Wing were constructed at the north face of the existing building. Construction costs were \$6.2 million.



East Union Intermediate Center

This \$4 million project involved the renovation and expansion of the former Old Junior High Annex to house grades 3-5. The original classroom building was upgraded and improved. The old multipurpose room was converted to a library/computer center. New additions included:

- Classrooms, Special Education
- Multipurpose Room & Kitchen
- Administrative Office & Lobby



Curtisville Primary Center Renovations/Addition

This \$3.4 million project involved the renovation and expansion of a vacant, decommissioned school to serve grades K-2. The original classroom building was upgraded and improved. The old multi purpose room was converted to a library and computer center. New additions included:

- Classrooms, Art, Special Education
- Administrative Offices
- Multipurpose, Kitchen & Music



K-12 SCHOOL ATHLETIC FACILITIES

Tower Engineering has provided mechanical/electrical engineering services for the following Athletic Projects:

STADIUMS AND OUTDOOR ATHLETIC COMPLEXES

- Allegheny Valley School District Springdale Jr./Sr. High Athletic Field Lighting
- Chartiers Valley School District High Football Field and Lighting
- Elizabeth Forward School District High Stadium
- Franklin Regional School District Senior High Stadium
- Ft. LeBoeuf School District Outdoor Athletic Complex
- Lewis County Board of Education High Athletic Facility & Concessions
- Mercer County Board of Education Montcalm High Athletic Facility
- Mercer County Board of Education Princeton High Athletic Facilities
- Mineral County Board of Education Keyser High Athletic Facilities
- Mingo County Board of Education Kemit K-8 Athletic Building
- North Allegheny Senior High Baseball/Softball Field Lighting
- Pine Richland School District High Stadium
- Southmoreland School District High Field House & Athletic Field



NATATORIUM DESIGN



- North East Elementary School
- Hopewell Junior High School
- Pine Richland High School
- Union City Elementary School
- Carlynton Jr./Sr. High School
- Prospect Multicultural Center
- Fox Chapel High School
- McCreery Middle School

AUDIO VISUAL AND MULTIMEDIA

The audio and video conference market continues to explode with newer, better technology. The use of low speed video conferencing via the Internet makes it possible for businesses to make use of the latest technology at affordable prices. Video conferencing is becoming an ideal way for employees who telecommute or work at client locations to participate on corporate meetings. Whether your needs include high-quality audio only, or audio/video conferencing, the proper equipment, networking and training will ensure that your conference will be of the utmost quality.

Tower Engineering offers expertise for conferencing solutions, including:

- Audio conferencing equipment evaluation and recommendation
- Evaluation of multi-faceted teleconferencing options via LAN and internet connections
- Video conferencing code evaluation and recommendation
- Desktop conferencing
- Mid-size and mobile systems
- Conference room systems
- Specification of all network requirements for audio/video conferencing from site to site
- Evaluation of ISDN applications for desktop video conferencing and WAN applications
- Design/specification and evaluation of internet based video conferencing options



LEED RATED DESIGN

Working together with our clients, Tower Engineering takes great pride in implementing environmentally conscious solutions to building issues. To sustain our environment, we design building systems that use material, energy and water resources efficiently, minimize site impacts and address health issues relating to the indoor environment.

Over the last decade, various groups have worked to develop strategies to promote and facilitate the design of sustainable, high performance buildings. One such organization, The **U.S. Green Building Council**, has created a nationally recognized certification process for evaluating sustainable and high performance buildings, a program called "**Leadership in Energy and Environmental Design**," commonly known by its acronym "**LEED**". In addition to being a member of the U.S. Green Building Council (USGBC), Tower Engineering's staff includes LEED accredited professionals.

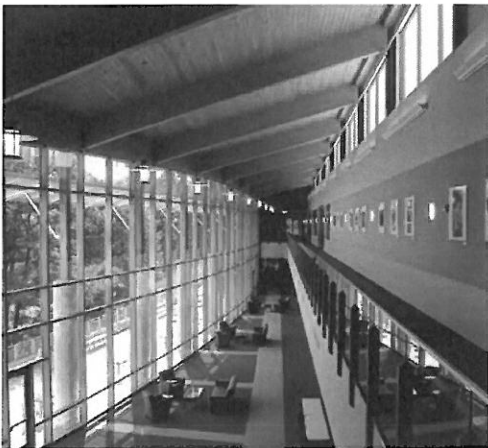
The LEED certification process rates the levels of sustainability achieved in a building: LEED Certified, LEED Silver, LEED Gold, and the highest rating, LEED platinum. Awards are based upon achieving "sustainability points" in the areas of Site, Water, Energy & Atmosphere, Materials and Resources, Indoor Environmental Quality, and Innovation & Design Process.



Our LEED Project Experience Includes:

Felician Sisters Motherhouse, Coraopolis, PA (LEED Gold)

- Super-high efficiency modular boilers to maintain 60 degrees F low-end water temperature.
- Carefully sized individual heat pumps to provide adequate compressor runtimes to ensure summer dehumidification and cooling without short cycling.
- Specification of premium efficient motors for pumps and larger RTU fans.
- Specification of Ventilation Heat Pump Rooftop Units with factory-installed energy recovery sections.
- Utilization of carbon dioxide sensors to reduce outside air quantities in multi-use spaces when not fully occupied.
- Specification of fully automated temperature controls system to provide computerized monitoring and control of mechanical equipment for maximum energy savings and systems optimization.
- Engineered lighting levels to exceed ASHRAE 90.1-1999 using the most efficient lamp and fixture combinations.



Regional Learning Alliance (LEED Silver)

Tower Engineering provided mechanical and electrical consulting engineering services for the Regional Learning Alliance, an innovative educational and workforce development facility just north of Pittsburgh. This \$18 million, "educational mall" is a highly-adaptive, full-service training facility, combining 12 institutes of higher learning under one roof. In addition to high-tech classrooms, the facility houses specialty-manufacturing training centers, flexible meeting rooms to accommodate groups of up to 400, and a tiered seminar room with wireless, touch-panel audio-visual controls. The facility also contains a cafeteria, computer labs, wireless Internet and a workout center that offers wellness planning.

LEED RATED DESIGN CONTINUED



Pittsburgh Children's Museum (LEED Silver)

Tower Engineering recently provided mechanical and electrical engineering services for the 80,000 square foot renovation/expansion of the Children's Museum of Pittsburgh. This project included the construction of a facility to link a 1897 Post Office building with a 1939 Art Deco Planetarium.

It was the goal of the Museum, as well as the design team to make this facility the first LEED Silver children's museum in the country, along with the priority of preserving two important historic buildings.

Green features incorporated into the design of this project include:

- Occupancy light sensors
- Dual Flush Toilets
- "Fuzzy Logic" controlled low flow urinals
- Motion sensor faucets
- Heat recovery wheels
- Heat exchangers
- 3 Kwh photovoltaic system
- Carbon dioxide sensors
- Two week fresh air flush out prior to occupancy
- Humidity control
- DDC Controls



ADDITIONAL LEED-CERTIFIED PROJECT EXPERIENCE INCLUDES:

- | | |
|--|--|
| ■ Three Rivers Rowing Association Boat Storage & Maintenance Building (LEED Certified) | ■ Berkeley County Board of Education New Spring Mills Primary School (LEED Gold) |
| ■ Carnegie Mellon University Henderson House (LEED Silver) | ■ Canaan Valley Institute New Headquarters/Education Building (LEED Certified) |
| ■ Carnegie Mellon University Posner Conference Center Rare Books Room (LEED Certified) | ■ Department of Energy Morgantown Record Storage (LEED Gold) |
| ■ West Virginia Army National Guard - Buckhannon Readiness Center (LEED Certified) | ■ Fairmont State Office Building (LEED Silver) |
| ■ Carnegie Science Center (LEED Certified) | ■ Allegheny College Carr Hall (LEED Silver) |
| ■ Monongalia County BOE New Primary School (LEED Silver) | ■ Allegheny Energy Operations Center (LEED Certified) |
| | ■ Kaufman Program Center (LEED Certified) |

PROJECTS DESIGNED IN ACCORDANCE WITH LEED RATING, BUT DID NOT PURSUE LEED CERTIFICATION:

- | | |
|---|---|
| ■ Millcreek School District J.S. Wilson Middle | ■ Pine Township Recreation Center |
| ■ Corry School District New Elementary School | ■ Pittsburgh Children's Home |
| ■ Holy Sepulcher Parish Church | ■ Sisters of St. Joseph New Office Building |
| ■ National Guard Stryker Center | ■ Southwest Butler County YMCA (Cranberry) |
| ■ North Hills McIntyre & Highcliff Elementary Schools | ■ Upper St. Clair Community Center |
| ■ Pine Richland Upper Elementary School | ■ Watson Institute, Craig Academy |
| ■ West Virginia Army National Guard - Fairmont Readiness Center | |

SUSTAINABLE BUILDING DESIGN

U.S. BUILDINGS USE ABOUT 1/3 OF ALL U.S. ENERGY FOR HEATING, COOLING, LIGHTING AN OPERATION. IN ADDITION THEY PRODUCE MORE THAN 35% OF ALL GREENHOUSE GASES.

A sustainable building, also referred to as a green building, is a structure that is designed, built, renovated, operated, or reused in an ecological and resource-efficient manner. Green buildings are designed to meet certain objectives such as protecting occupant health and wellness; reducing energy consumption, improving employee productivity and reducing a building or project's impact on the environment.

As technologies and systems have improved dramatically over the past decade, the up-front costs to sustainable design have been reduced significantly. And, smart design saves through lower operating costs over the life of the building. The sustainable building approach applies a project life cycle cost analysis for determining the appropriate up-front expenditure. This method calculates costs over the useful life of the asset.

From a business perspective, the biggest cost silo is salary and benefits. By creating healthier work environments with the inclusion of low/no VOC paints, no carpet adhesives, better air circulation, natural light and indirect lighting, ergonomic furniture and visually engaging work and breakout areas, employees are more productive and stay. So, green is really GREEN.



AT TOWER ENGINEERING WE BELIEVE IT IS OUR RESPONSIBILITY TO OFFER ARCHITECTS AND OWNERS SUSTAINABLE DESIGN ALTERNATIVES IN ADDITION TO CONVENTIONAL CHOICES, AND TO HELP OUR CLIENTS MAKE THE MOST INFORMED DECISIONS.

ENGINEERING EXPERTISE

Our engineers carefully consider preservation of site features, indoor air quality, natural lighting, energy efficiency and strategies to provide the best quality systems for project requirements. Focusing on whole systems, not isolated components, our engineers work holistically to help determine whether system upgrades or system replacements would be the best solution. We have been involved with the design of numerous buildings which have implemented Green Building and Sustainable Design features..

Engineering Evaluation Services

- HVAC Systems Assessments & Audits
- Electrical Systems Assessments & Audits
- Mechanical and Electrical Systems Monitoring
- Building Commissioning
- Retro Commissioning
- Technology Systems Assessments

Equipment

- Direct-Fired Double-Effect Absorption Chiller/Heater
- Desiccant Dehumidification Units
- Heat Recovery Wheel
- Geothermal Heat Pumps
- Underfloor Air Distribution Systems
- Building Automation Systems

GREEN BUILDING DESIGN STRATEGIES - A FEW EXAMPLES

- Install high-efficiency heating and cooling equipment. sealed-combustion appliances, well-designed systems including high-efficiency furnaces, boilers, and air conditioners; variable speed pumping; and premium motors. These systems not only save the building owners money, but also produce less pollution during operation.
- Install high-efficiency lighting systems with advanced lighting controls. Include motion sensors tied to dimmable lighting controls.
- Install water-efficient equipment. Water conserving toilets, shower heads, site stormwater management, and faucet aerators not only reduce water use, but also reduce demand on septic systems or sewage treatment plants.
- Green roofs & solar panels
- Mechanical ventilation is usually required to ensure safe, healthy indoor air. Heat recovery ventilators should be considered for less expensive exhaust only systems are sometimes indicated.

COMMISSIONING EXPERIENCE

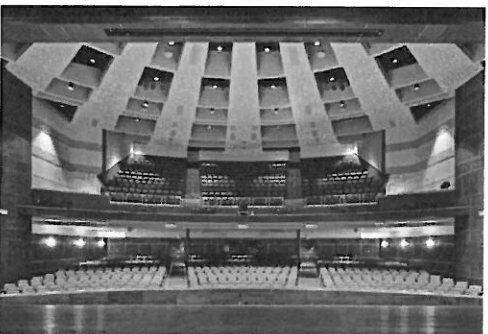
Tower Engineering has experience providing design and commissioning services on numerous projects. Our extensive design experience insures that we will be familiar with all aspects of each project's mechanical, electrical and plumbing design.

Our clients have relied on our expertise to evaluate multiple system types.

- Packaged or split HVAC
- Chiller System
- Boiler System
- Network/Technology

- Hydronic Systems
- Variable Air Volume Systems
- Energy Management System
- CCTV Access Control

- Variable Speed Pumping
- Variable Speed Fans
- Lighting Controls
- Electrical, Emergency Power



Our Commissioning Project Experience Includes:

Gateway School District - Gateway High School

This project involved commissioning services for approximately 200,000 SF of new and renovated space. As part of this project, Tower Engineering provided full commissioning services for all HVAC equipment including air handling units, variable volume boxes, chillers, boilers, pumps, unit ventilators, fan-coil units and DDC controls.

West Virginia University - Student Recreation Center Commissioning

Tower Engineering provided commissioning services for the 160,000 square foot Student Recreation Center. Systems commissioned included: chiller, cooling tower, glycol, heat exchanger, pumps, air handling units, pool water, witness start up and controls.

Moon Area School District - Bon Meade Elementary School

Tower Engineering provided retro-commissioning of rooftop units, air handling units, unit ventilators, chiller, and boiler, for renovation of 66,000 square feet.

Barbour County Board of Education - Philip Barbour High School Complex

Systems commissioned for this 180,000 square foot renovation/addition project included rooftop units, unit ventilators, heat recovery units, chiller, and boiler.

Pleasant County Board of Education - Middle School

Tower Engineering commissioned rooftop units and pool dehumidification units associated with this 60,000 square foot renovation project.

Upshur County Board of Education - Buckhannon High School

Tower Engineering is currently providing HVAC commissioning services associated with a full replacement of the original HVAC system in this 142,000 square foot renovation project.

Verizon Call Center

Commissioning of this 120,000 square foot new facility was completed in 2002. Systems commissioned included rooftop units, fan-powered boxes, computer room air conditioning units, exhaust systems and DDC controls.

Cranberry Woods III

Rooftop units, fan-powered boxes, exhaust fans and DDC controls were commissioned for this new 120,000 square foot office building.

Moon Area School District - High School

Commissioning of a new 200,000 square foot High school, with a WSHP HVAC system.

Moon Area School District - Middle School

Renovation and addition of the former high school. The HVAC system is a VAV system with multiple RTU's.

Cannan Valley Institute

This project is a Research and Education Center comprised of staff offices, laboratories, conference rooms, and a tiered classroom. LEED Silver Certification.

Kaufman Program Center

A four story 19,411 SF community center with a large multi-purpose space. Work began in November 2009, which included renovation of the existing 16,893 SF facility with the addition of 2,518 SF. Tower Engineering was chosen as both the MEP design firm and the Commissioning Agent.

RETROCOMMISSIONING

Retrocommissioning applies to buildings that have never been commissioned. In many cases, these buildings were never operating at optimum efficiency and over the years their performance has deteriorated further and is not meeting the functional needs of the occupants.

Retrocommissioning enables existing buildings to optimize the facility's energy consumption profile as much as possible, consistent with the energy codes that were in effect at the time the facility was designed and built.



The range of services offers support and evaluation on many levels.

- Bringing Building Systems back to original design
- Identification of possible retrofits
- Solve Operation and Comfort Problems
- Reduce Energy and Operation Costs
- Provide O&M training
- Provides Good Building Documentation
- Improves Operation Training
- Reduces Premature Equipment Failure
- Maintain or Increase Building Worth
- Fully exploit building management system (BMS)
- Provides Safe, Healthy Facility
- Improves Worker Productivity
- Ensure proper operation of equipment despite building alterations
- Improves Operating Strategies
- Aids in long term planning and major maintenance budgeting

HOW DOES RETROCOMMISSIONING WORK?

Ideally, a retrocommissioning process begins with interviews with building owners and users to determine their experience with system deficiencies. The process then continues by focusing on ideal design intent of the systems. Once we determine the ideal design intent, we can then review system documentation, perform testing and develop system modifications. Typically, retrocommissioning then concludes with O&M manual review and verification of operator training.

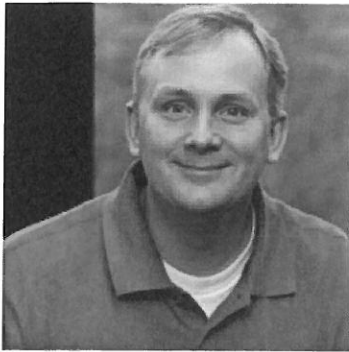
WHAT BUILDINGS SHOULD BE RETROCOMMISSIONED?

- Building that were not commissioned when built
- Buildings where health and safety are of primary concern
- Facilities where improper operation would pose risks
- Facilities where building operators require more concentrated training
- Buildings in which monthly energy optimization is a chief goal.
- Any building with complex control systems

OUR APPROACH TO RETROCOMMISSIONING

- Access the scope of the project and develop an optimum plan and order-of-magnitude cost estimate.
- Determine if a phased schedule will need to be implemented to ensure minimal disruption to daily building activities.
- Conduct Individual Component Testing
- Prepare a Component Verification Report and recommendations
- Conduct System Testing
- Prepare a Retrocommissioning Report
- Corrections and Modifications, Retesting
- Transition to Operations

Tower coordinates and directs the commissioning activities in a logical, sequential and efficient manner using consistent protocols and forms, centralized documentation, clear and regular communications and consultation with all parties, frequently updated time lines, schedules and technical expertise.



EDUCATION

BS, Architectural Engineering
Penn State University 1994

REGISTRATION

PE, Pennsylvania
[REDACTED]

AFFILIATION

Illuminating Engineering Society
of North America (IES): Past
President

AWARD

IES Design Award of Merit 2003,
Ross Township Municipal
Complex; Pittsburgh, PA

JOHN C. WEST JR., P.E.

ASSOCIATE, SENIOR PROJECT MANAGER ELECTRICAL ENGINEERING DEPARTMENT HEAD

Mr. West has provided engineering services for the design of office buildings, educational facilities, municipal buildings, community/recreational buildings, health care, and commercial facilities. His primary responsibility is for the preparation of electrical opinions of cost, technical specifications, engineering drawings, field observation, and coordination with architectural and other engineering disciplines.

John's design responsibilities include lighting layout and fixture selection, including calculations and system coordination studies and calculations; computer rooms and associated support facilities; fire alarm and detection systems; emergency power, public address, nurse call, audio-visual, security and closed circuit television systems. Additional responsibilities include client contact, field observation, and project management.

REPRESENTATIVE EXPERIENCE

Blackhawk School District - Beaver Falls, Pennsylvania

Highland Middle School Renovation

Corry School District - Corry, Pennsylvania

New Corry Elementary School; Columbus Elementary Renovation and Addition

Freedom Area School District - Freedom, Pennsylvania

Elementary School Addition; Middle School Alterations

Girard School District - Girard, Pennsylvania

Rice Avenue Middle School Renovation

Harbor Creek School District - Erie, Pennsylvania

Clark Elementary School Renovation; Klein Elementary School Renovation

Millcreek School District - Erie, Pennsylvania

J.S. Wilson Middle School Renovation and Addition; New McDowell High School

Montour School District - McKees Rocks, Pennsylvania

New Elementary School

North Allegheny School District - Pittsburgh, Pennsylvania

Marshall Elementary Data Wiring; Marshall Middle School Data Wiring Upgrade; Carson Middle School Addition/Renovation (lighting design only); Carson Middle School Closed Circuit Television System; Marshall Middle School Closed Circuit Television System; Franklin Elementary School Fire Alarm Replacement

North Hills School District - Pittsburgh, Pennsylvania

McIntyre Elementary Addition and Renovation

Penn Hills School District - Pittsburgh, Pennsylvania

New Elementary School; New High School; Shenandoah Elementary Renovations

Pine Richland School District - Gibsonia, Pennsylvania

New Upper Elementary School

Putnam County Board of Education - West Virginia

Poca Middle School; Poca Elementary School (Poca)

Quaker Valley School District - Sewickley, Pennsylvania

Middle School Renovation

Seneca Valley School District - Harmony, Pennsylvania

High School Renovation and Addition

Warren County School District - Warren, Pennsylvania

Eisenhower Middle School and High School Addition; Sheffield Elementary School Addition



EDUCATION

BS Mechanical Engineering
Penn State University 1982

REGISTRATION

PE, Pennsylvania
[REDACTED]

PE, West Virginia
[REDACTED]

PE, New York

NCEES Registration

LEED Accredited Professional
2009

AFFILIATION

American Society of Heating,
Refrigeration & Air Conditioning
Engineers (ASHRAE)
Pittsburgh Chapter: Past President



THOMAS J. GORSKI, P.E., LEED AP

PRINCIPAL, PRESIDENT MECHANICAL ENGINEERING DEPARTMENT HEAD

Mr. Gorski's primary responsibilities are the design of HVAC systems and their components for schools, universities, commercial and light industrial office buildings, laboratory buildings, health care facilities, and military facilities. He has designed HVAC systems including constant and variable air volume, air handling and exhaust systems; chilled water and hot water systems and steam distribution systems; electric/electronic control, pneumatic control and DDC systems.

Tom's design responsibilities include load calculations, equipment selection and system layout, project specifications, cost estimates, direction of the project drafting effort, coordination with architectural and other engineering disciplines, and construction administration. He also performs system analysis and energy studies, maintains client contact, and supervises the engineering effort of the Mechanical Engineering groups.

REPRESENTATIVE EXPERIENCE

Berkeley County Board of Education - Inwood, West Virginia

Musselman High School (New); Musselman Middle School Renovation and Addition; Potomack Intermediate School (New)

Bethel Park School District - Bethel Park, Pennsylvania

New High School

Calhoun County Board of Education - Mount Zion, West Virginia

New Calhoun Middle/High School

Chartiers Valley School District - Bridgeville, Pennsylvania

Chartiers Valley Intermediate Addition and Alterations

Freedom Area School District - Freedom, Pennsylvania

Elementary School Addition; Middle School Alterations

Girard School District - Girard, Pennsylvania

Rice Avenue Middle School Renovation

Harrison County Board of Education - Lumberport, West Virginia

Lumberport Elementary School

Mercer County Board of Education - Princeton, West Virginia

Princeton High School Addition

Mineral County Board of Education - Keyser, West Virginia

New Keyser High School

Monongalia County Board of Education - Morgantown, West Virginia

Eastwood Elementary School

Montour School District - McKees Rocks, Pennsylvania

New Elementary School

Penn Hills School District - Pittsburgh, Pennsylvania

New High School; New Elementary School

Putnam County Board of Education - Winfield, West Virginia

Winfield Middle School

South Fayette School District - McDonald, Pennsylvania

New Elementary School



EDUCATION

Bachelor Architectural Engineering
Penn State University 1989

REGISTRATION

PE, Pennsylvania
[REDACTED]

PE, West Virginia
[REDACTED]

PE, New York

PE, Maryland

NCEES Registered

LEED Accredited Professional
2009

AFFILIATION

American Society of Heating,
Refrigeration & Air Conditioning
Engineers (ASHRAE)



JAMES N. KOSINSKI, P.E., LEED AP

PRINCIPAL, VICE PRESIDENT

SENIOR PROJECT MANAGER, MECHANICAL ENGINEERING

Mr. Kosinski is primarily responsible for the design of HVAC systems and their components for hospitals, schools, universities, laboratories, office buildings, and commercial and light industrial facilities. He has experience with the design of numerous types of HVAC systems, including constant and variable air volume air handling, geothermal heat pump and exhaust systems; chilled water and hot water; electric/electronic, pneumatic and DDC control systems.

Jim's design responsibilities include load calculations, equipment selection, system layout, project specifications, cost estimates, direction of project drafting efforts, coordination with other engineering disciplines, and construction administration. Additional responsibilities include system analysis and energy studies, client contact, and project management and scheduling. He has performed energy conservation analyses, evaluated HVAC system performance, and justified the installation of DDC control systems and other energy saving measures. As a Mechanical Engineering Group Leader, Mr. Kosinski coordinates the efforts of a team of staff engineers, designers and CAD operators.

REPRESENTATIVE EXPERIENCE

Allison Park, Pennsylvania

New Hampton Township Municipal Complex

Bethel Park, Pennsylvania

New Community Center

Fairmont, West Virginia

Public Safety Building Renovations

Morgantown, West Virginia

New West Virginia University Recreation Center

Pittsburgh, Pennsylvania

New Ross Township Municipal Complex

Wexford, Pennsylvania

New Marshall Township Municipal/Public Works Complex

New Pine Township Community Center



EDUCATION

BS, Mechanical Engineering
Penn State University 1997

REGISTRATION

Professional Engineer, PA

2003

Certified in Plumbing
Engineering (CIPE), 1998

LEED Accredited Professional
2009



MICHAEL S. PLUMMER, P.E., C.I.P.E., LEED AP

ASSOCIATE, SENIOR PROJECT MANAGER PLUMBING & FIRE PROTECTION ENGINEERING DEPARTMENT HEAD

Mr. Plummer is primarily responsible for the design of plumbing and fire protection systems and their components for educational, governmental, and commercial buildings. His plumbing and fire protection design responsibilities include performing calculations for hydraulically designed sprinkler systems; designing water supply and pumping systems including fire mains and sizing of fire pumps; design/testing of fire protection and alarm systems; and design of plumbing sewage, gas and water systems.

Mike is an experienced HVAC system designer, and performs load calculations, equipment selection and systems layout. His duties include preparation of project specifications, cost estimates, project management, and coordination with architectural and other engineering disciplines. He also performs construction administration duties including review of submittals, preparation of punch lists, and field problem solving, as well as supervising the engineering efforts of the Plumbing and Fire Protection Department.

REPRESENTATIVE EXPERIENCE

Beaver Area School District - Beaver, Pennsylvania
College Square Elementary Renovation

Bethel Park School District - Bethel Park, Pennsylvania
New High School

Brooke County Board of Education - Follansbee, West Virginia
Hooverson Heights Primary School; Bethany Primary School

Chartiers Valley School District - Bridgeville, Pennsylvania
Middle School Addition and Alterations; High School Addition and Alterations

Deer Lakes Area School District - Russellton, Pennsylvania
New Middle School

Girard School District - Girard, Pennsylvania
Rice Avenue Middle School Renovation

Harbor Creek School District - Erie, Pennsylvania
Clark Elementary School Renovation; Klein Elementary School Renovation

Hardy County Board of Education - West Virginia
East Hardy High School (Baker); Moorefield High School (Moorefield)

Lewis County Board of Education - West Virginia
Gilmer Inter-County Elementary School (Glennville)

Millcreek School District - Erie, Pennsylvania
New McDowell High School

Monongalia County Board of Education - West Virginia
Eastwood Elementary School (Morgantown)

Montour School District - McKees Rocks, Pennsylvania
New Elementary School

Penn Hills School District - Penn Hills, Pennsylvania
New High School; New Elementary School

Pine Richland School District - Gibsonia, Pennsylvania
New Upper Elementary School

Warren County School District - Warren, Pennsylvania
Sheffield Elementary School Addition; Eisenhower Elementary School Addition

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.

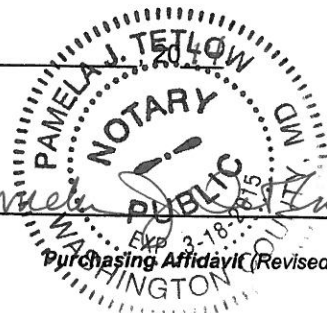
"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership 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: Bushy Freight Motion Architects IncAuthorized Signature: [Signature] Date: 12/15/14State of MarylandCounty of Washington, to-wit:Taken, subscribed, and sworn to before me this 15th day of DecemberMy Commission expires 3-1-, 2015.

AFFIX SEAL HERE

NOTARY PUBLIC



Purchasing Affidavit (Revised 07/01/2012)