TOWER ENGINEERING

with Williamson Shriver Architects and
Taylor Structural Engineers

Engineering Services Qualifications:

West Virginia Schools for the Deaf and Blind

HVAC & Fire Protection

June 15, 2017

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June 15, 2017

BID Clerk

Department of Administration Purchasing Division

2019 Washington ST E

Charleston, WV 25305

Re: STATEMENT OF QUALIFICATIONS

West Virginia Schools for the Blind and Deaf HAVC and Fire Safety

Consulting Engineering Proposal

To whom it may concern,

This proposal is based upon the BID / Request for Proposal dated 05/23/2017, with sections as outlined in SECTION 3. Items outlined in SECTION 3 and 4 of the RFP are included and you can find references in the Appendix of this document.

Tower Engineering is a medium sized firm with many senior project managers that are LEED Accredited Professionals. We have been serving the region with mechanical, electrical, plumbing, fire protection and commissioning services for more than 85 years. Our office is located in Ross Township, and the firm specializes in K-12 facilities, healthcare and hospitality. We have served 108 k-12 schools, 43 healthcare facilities and 6 different hospitality facilities.

Over the past 20 years, we have provided Mechanical and Electrical engineering services on vast numbers of buildings (both renovation projects and new) throughout the state of West Virginia. By far, the majority of these projects have been K-12. We are very familiar with the code issues that apply to construction projects in West Virginia and have excellent working relationships with major mechanical and electrical contractors who routinely bid projects located in the state. We also maintain an excellent relationship with Fire Marshals (both state and county).

Tower Engineering is a firm that promotes principal involvement in all projects. For this project, our project team includes two principals and two associates. For this work we are recommending Taylor Structural Engineers and Williamson Shriver Architects. We frequently partner with them, and are confident that they will be able to assist in the development of a solution for your air conditioning system(s) design.

We welcome the opportunity to meet and discuss your project in more detail, and offer a path forward to improving your HVAC issues, fire protection and electrical design that will support these improvements.

Please contact me with any questions you may have.

Very truly yours,

TOWER ENGINEERING

James N. Kosinski, PE, LEED AP

Principal

TOWER ENGINEERING

Designated Contact Form

Company Name:	Tower Engineering, Inc.
Name/Title:	James N. Kosinski, PE, LEED AP – Vice President/Principal
Address:	115 Evergreen Heights Drive #400 Pittsburgh, PA 15229
Phone/Fax:	412-931-8888 X 135 412-939-2525 (fax)
Email:	jkosinski@estower.com

1. Qualifications & Experience

Description of past projects with location, project manager, name, contact information, type of project, project goals and objectives and how they were met.

Introduction:

HVAC System Assessments and Design

Tower Engineering has experience providing HVAC system assessment services for more than 50 clients in the healthcare, higher education, K-12, commercial and hospitality sectors for many older and historic buildings. The overall assessment of a building's mechanical systems is one of the most important aspects of any renovation or expansion project. These systems have a direct impact on how well the new space will fulfill the building's energy needs in the most efficient way - in terms of both cost and energy consumption.

Tower Engineering's evaluation approach 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. We also consider the life expectancy of major components and high-priority items, such as boilers and chillers, and look at costs and options for component improvements. All recommendations are prioritized to assist the client in interpreting the findings.

There was no pre-proposal site visit or drawings available, so we will first tour the building with the Owner and assess at that time.

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Felician Sisters Motherhouse

Location: Moon Township, PA

Project Manager: James N. Kosinski, PE, LEED AP

Contact Information: jkosinski@estower.com / 412-931-8888 X 135

Type of Project: Renovation of Historic building

Project Goals and Objectives/How Goals and Objectives were met:

This was a complete renovation of the 161,000 SF facility and required the examination of several HVAC options with analysis of equipment life-cycle issues. Using BIM, we compared multiple systems, including 4-pipe, water-source heat pumps, geothermal, and variable air volume systems with regard to initial costs, energy costs, energy usage, maintenance, longevity, aesthetics, acoustics, flexibility and reliability. Ultimately, the Sisters chose a geothermal system that has been working well for them since 2003.

In addition to a small commitment to preserving the 5-story house's historic character, the Owner and design team were committed to making the renovation environmentally responsible, which was achieved through this sustainable design features:

- Super high-efficiency modular boilers to maintain 60-degree flow-end and water temperature.
- Carefully-sized individual heat pumps to provide adequate compressor run-times 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 moni toring 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.
- Construction Cost: $15.9 million.

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Twin Falls Resort State Location

Location:	Mullens, WV
Project Manager:	T. Steffanie Bako, PE, LEED AP
Contact Information:	sbako@estower.com / 412-931-8888 X 111
Type of Project:	Renovation and Addition

Project Goals and Objectives/How Goals and Objectives were met:

Renovations were made to the existing 14,200 SF structure. An addition of 13,380 SF includes:

- An additional 27 lodge rooms, including several suites
- Conference space
- A new indoor pool, spa, and fitness center
- An elevator to resolve accessibility issues
- New lodge entrance and lobby and front desk transformation
- New electrical service and emergency generator

Waynesburg University, Paul R. Stewart Science Hall

Location:	Waynesburg, PA
Project Manager:	Thomas R. Valerio, PE, CEM, LEED AP
Contact Information:	tvalerio@estower.com / 412-931-8888 X 244
Type of Project:	Renovation and Addition

Project Goals and Objectives/How Goals and Objectives were met:

Tower Engineering provided HVAC, plumbing and fire protection engineering services for the restoration of Waynesburg University's Stewart Hall, a 60,000 SF health science building that provides classrooms, administrative offices, and laboratories for coursework in chemistry, physics, biology, anatomy, physiology, and nursing.

This project presented an extreme challenge for the design and construction teams, who were tasked to restore the building in its entirety, including all piping and ductwork serving HVAC, plumbing and fire protection systems, the entire electrical system, the exterior walls and glazing, and the roof - while keeping the building in service. And, the servers for the University's computer network are located in the building and couldn't be disturbed.

The team worked collaboratively to phase the project for continuous occupancy, while the University made materials and design decisions with the entire team.

A state of the art four-pipe fan coil system with demand controlled, dedicated outside air and VAV make-up for VAV laboratory exhaust was installed to maximize thermal comfort and minimize energy use. The $25M multi-phased construction project was accomplished the University's goals in four years.

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Park Ridge Buildings #1 and #2

Location:	Moon Township, PA
Project Manager:	James N. Kosinski, PE, LEED AP
Contact Information:	jkosinski@estower.com / 412-931-8888 X 135
Type of Project:	HVAC assessment and upgrades for 2 buildings

Project Goals and Objectives/How Goals and Objectives were met:

Tower's Mechanical Team reviewed the HVAC systems and recommended a course of action for an upgrade to the HVAC systems of two five-story, 100,000 SF office buildings originally built in the 1980's.

The owner wanted to increase cooling capacity and replace the original rooftop units, as well as replacing fan-powered boxes with larger capacity heating ability, while also increasing the electrical capacity of the building. The result of the project was a comprehensive report that included recommendations and estimates of construction costs.

Glenville State College Student Center

Location:	Glenville, WV
Project Manager:	T. Steffanie Bako, PE, LEED AP
Contact Information:	sbako@estower.com / 412-931-8888 X 111
Type of Project:	New building

Project Goals and Objectives/How Goals and Objectives were met:

Our design of the MEP systems for the new 60,000 SF $10.5 million Student Recreation Center at West Virginia University includes a 1,300 ton cooling system and a high-pressure steam system.

The building included the design of a fitness center, a bookstore, a new kitchen, a dining center and a multi-purpose gathering spaces. The Multi-Purpose room, Cyber Café and Auditorium were all designed with central dimming systems for different levels of lighting controls. These spaces were also designed with performance level sound systems.

This is an HVAC item,the building had a smoke-evacuation system for the Atrium space.

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HVAC Assessments were also completed for:

- Allegheny Center 4
- Allegheny General Hospital
- Ascension United Presbyterian Church
- Beaver County Courthouse Annex
- Dollar Bank Liberty Commons Computer Center
- Fairmont Sate College, Clarksburg Center
- Fairmont State University Feaster/Colebank/Hardway Halls
- First United Methodist Church
- Fiserv Data Center
- Fountain of Life Church
- Fox Chapel Episcopal Church
- Frick Building
- Glade Run Lutheran Services
- Hampton School District, Central Elementary School
- Hampton Township Municipal Buildings
- Holiday Valley Condominium
- Iceoplex at Southpointe
- Kennedy Medical Arts Building
- Mallinckrodt Specialty Chemicals Calsicat Lab
- Marian Hall Home
- Mercyhurst College Hammermill Library
- Millcreek School District, McDowell High School
- Mineral County Board of Education, Frankfort High School
- Mineral County Board of Education, Deyser High School
- Northland Public Library
- Orchard Hill Episcopal Church
- City of Pittsburgh Emergency Operations Center/911
- Nittany Lion Inn
- United Presbyterian Home for the Aged
- University of Pittsburgh, Allen Hall

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Fire Sprinkler Systems Design

The Request for Proposal includes an evaluation and upgrade of the building fire protection/sprinkler and fire alarm systems. Tower Engineering offers a complete range of fire protection, security system and code analysis services for both new construction and renovation of residential and commercial buildings. Typical projects involve the following services:

- Audits and Surveys: Including the evaluation of buildings and facilities to identify deficiencies and limit losses involving fire safety, property protection and accessibility for the disabled.
- Systems Design: Creative, cost-effective design of fire alarm systems, automatic sprinklers, specialty fire suppression systems and water supply systems for new or existing structures.
- Fire Protection Master Planning: Development and review of the fire safety program which addresses applicable codes, specific requirements of the project and alternative approaches to code compliance and design objectives.
- Code Analysis: Determine conformance with applicable codes and standards of the fire protection master plan.
- Negotiation: Communication with the authority having jurisdiction to explain, clarify and interpret how the project's fire safety program relates to code requirements.
- Inspection/Testing: Inspection, performance testing and evaluation of systems including fire alarms, fire detection, fire suppression, smoke control, emergency voice communication, access & emergency egress and water supply.
- Coordination: Overall Coordination of a facility's fire protection programs.

The firm's fire protection engineering solutions include:

- Fire sprinkler Systems
- Fire alarm systems
- Security systems
- Lightning Protection
- Halon Replacement
- CO2 monitoring
- Dry chemical fire suppression systems
- Water spray systems
- Fire pumps
- Standpipe systems

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Specific projects have included:

- Design of an analog/addressable intelligent fire alarm and life safety network for a 64-story office building.

- Design of a dry chemical fire suppression system in combination with modifications to the electrical and fuel oil systems associated with emergency generator systems.

- Design of a fire pump to fulfill water pressure requirements for sprinklers installed in a new 47,000 SF, 156-bed residential complex.

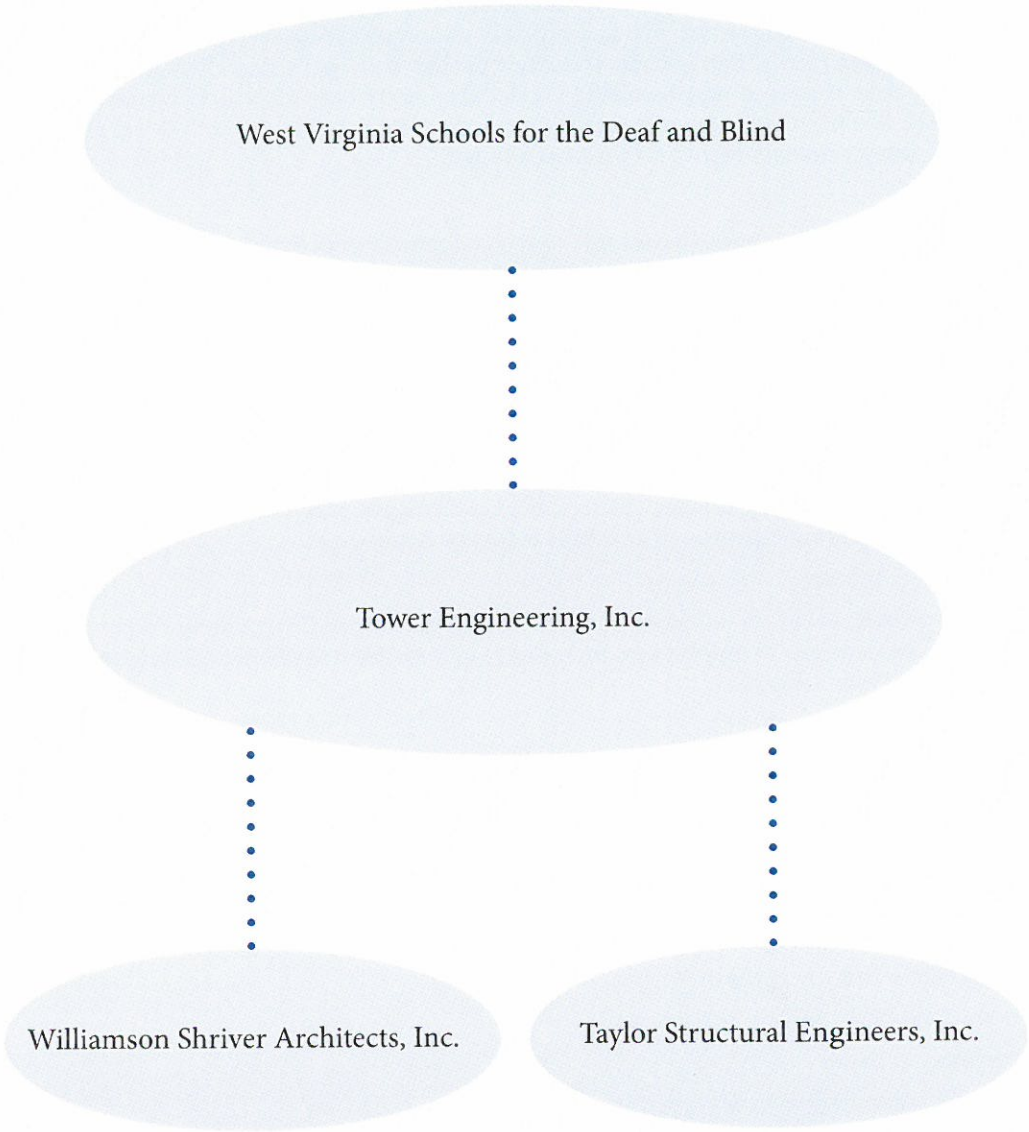
- Development of detailed sequences of controls to replace and automate a complete smoke control for a 565,247 SF office building.

- Installation of a fire alarm and security monitoring system for 35 existing laboratory, production and administration buildings. The selected system utilized a multiplex format with transponders in each of the buildings to allow for total coordination.

- Fire protection system for a 90,000 SF food services facility serving 40,000 students of a local school district. Design included dry pipe sprinkler systems for the freezer and cooler areas, a pre-action system for the computer room, and wet pipe sprinkler systems for the office, kitchen areas, and the high rack storage areas.

2. Team

2.1 Organization Chart



2.2 Firm Profiles

TOWER ENGINEERING

Tower Engineering, Inc. 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. The firm'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.

Tower's 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. Their 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. The firm has 26 employees, including 10 Registered Professional Engineers and nine (9) LEED Accredited Professionals.

SERVICES LIST:

HVAC

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

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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
- Security systems

TELECOMMUICATIONS

- 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

COMMISSIONING

- New Construction Commissioning
- Renovation Commissioning
- Retro-commissioning
- Recommissioning
- Value Recommissioning

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WILLIAMSON SHRIVER ARCHITECTS

Williamson Shriver Architects Inc. is an award-winning, multidisciplinary design firm with business roots back to 1967. While specializing in educational and commercial planning and design, we provide design services to a diverse client base throughout

West Virginia. With construction values exceeding one billion dollars over our history, the size and scale of our projects have ranged from detailed designs for small interior renovations to large multi-million dollar new facilities. Large or small, simple or complex, every project has our commitment to diligent, thoughtful design. Our functional and distinctive buildings reflect the vision of our clients and the spirit of our communities.

Experienced, capable, and responsive, we have a long tradition of excellence and client commitment. Simply put ... we listen ... and combine what we learn from listening with a clear understanding of technology, sustainability, and a wealth of experience. Every Williamson Shriver Architects design is a collaboration with the end user. Our finished projects work for people because they start with people. Through focus groups, individual interviews, and public meetings, we ask our clients to stretch their imagination and anticipate how they will use each space. The result of this process ... flexible design solutions that respond to people and make the most of budgets. Commitment to quality, dedication to project and client, and a nearly fifty year tradition of innovation and architectural excellence... that's Williamson Shriver Architects. No matter what the program, site, or budget, we've been there and we have the experience and vision to shape your project into a success. At Williamson Shriver Architects, we're listening.

Legal Organization

Williamson Shriver Architects is a type S corporation licensed as a business by the WV Secretary of State and headquartered in Charleston, WV. Corporate stockholders are Gregory A. Williamson and Ted A. Shriver. All of our professionals are duly licensed by relevant State of WV professional licensing boards.

TOWER ENGINEERING

In House Services

- Pre-Design & Planning
- Architecture
- Structural Engineering
- Interior Design
- Construction Procurement /Administration
- Cost Estimating
- Sustainable Design

Services through Partners

- Site and Civil Engineering
- Landscape Design
- Historic Review and Preservation
- Mechanical Engineering
- Electrical Engineering
- Lighting Design
- Technology and Security Design
- Audio / Visual Design
- Acoustical Design

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TSE

Taylor Structural Engineers, Inc. was established in February 1996 to provide the highest quality structural engineering services to architects, contractors, and owners working in the commercial, institutional, and light industrial building sectors. To date, TSE has provided services on more than 4,000 projects including new building construction, major building renovations, and comprehensive restoration of existing deteriorated buildings. Most of our work involves schools, hospitals, athletic complexes, commercial retail and office buildings, college and university facilities, multi-unit housing facilities, churches, parking garages, and light manufacturing facilities.

TSE maintains a professional staff with expertise in virtually all types of building construction including steel (conventional, composite, and light-gage), concrete (cast-in-place, precast, and post-tension), reinforced masonry, wood (dimensional lumber, heavy timber, and engineered wood products), deep foundations (drilled piers, auger-cast piles, driven piles, and pin piles), and the restoration of deteriorated and historic structures. That experience allows us to offer creative solutions to most complex structural challenges.

At TSE we take great pride in the fact that our business is built mostly on client referrals and repeat business. We feel that our strong client loyalty is a direct result of the consistent service that we provide on every project, and overall construction cost savings that we have been told time and again that our structural designs produce. Our goal of delivering the highest level of service to our clients has been recognized and rewarded with respect and loyalty throughout the region.

Taylor Structural Engineers has Professional Engineers currently licensed to practice structural engineering in thirteen states, including Pennsylvania, Ohio, West Virginia, Maryland, New York, New Jersey, Michigan, Connecticut, Tennessee, Virginia, Indiana, Vermont, and North Carolina. While most of our projects are located within 300 miles of Pittsburgh, we continue to maintain the flexibility to serve our clients throughout a much larger region of the country.

2.3 Staffing Plan

James N. Kosinski, PE, LEED AP will be the Principal in Charge and your main point of contact. In his 30 years at Tower Engineering, he has developed design solutions for dozens of similar projects. 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.

Thomas J. Gorski, PE, LEED AP will be the lead mechanical engineer. Mr. Gorski's primary responsibilities are the design of HVAC systems and their components for Tower Engineering projects in all sectors. 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.

T. Steffanie Bako, PE, LEED AP will be the lead electrical systems designer. Mrs. Bako has provided engineering services for the design of office buildings, educational facilities, municipal buildings, community/recreational buildings and commercial facilities. Her 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.

Steffanie'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, audio-visual, security and closed circuit television systems. Additional responsibilities include client contact, field observation, and project management.

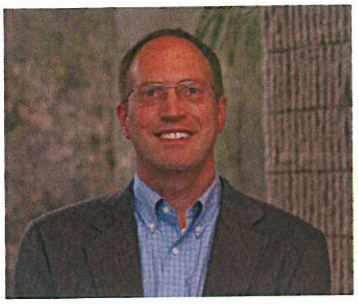
Michael S. Plummer, PE, CIPE, LEED AP will be the lead plumbing and fire protection system designer. Mr. Plummer is primarily responsible for the design of plumbing and fire protection systems and their components for educational, governmental, and commercial buildings. His plumbing duties include the design and layout of all domestic hot and cold water, sanitary drainage and storm water management systems. He is also responsible for the natural gas piping systems along with specialty systems involving laboratory or hospital gases.

Mike's fire protection responsibilities include the design of water supply and pumping systems involving fire mains and sizing of fire pumps, the layout of standpipe and sprinkler zone locations, sprinkler head placements and reviewing hydraulic calculations for contractor designed sprinkler systems. He is a LEED Accredited Professional and designs all of his projects with sustainability in mind. Mike's 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.

Ted Shriver, President, Architect LEED AP REFP, AIA will be the lead architectural partner. Ted Shriver is a registered architect and President of Williamson Shriver Architects. In addition to his role as firm partner, he is additionally responsible for the office-wide coordination and production of contract documents. He brings to the firm 30 plus years of architectural experience, and his primary responsibilities include assurance that appropriate production and support resources are applied to each project.

Ted also oversees the firm's computer system, including evaluation and installation of new technology. He has extended this computer expertise to an understanding of the utilization an implementation of technology in school facilities and attends the Council of Educational Facility Planners' Technology Conferences. Since 2005, Mr. Shriver has focused on establishing guidelines for our designs on implementing safe schools and monitoring systems.

Dirk Taylor, PE will be the structural engineering consultant as needed to help assess HVAC system site requirements, roof loads. He is the President / Principal at Taylor Structural Engineers, Inc.



EDUCATION
Bachelor Architectural Engineering
The Pennsylvania State
University, 1989

REGISTRATION
PE, Pennsylvania
[redacted]

PE, West Virginia 016993
[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, PE, LEED AP

Principal, Vice President
Senior Project manager, Mechanical Engineering

Mr. Kosinski's primarily responsible for the design of HVAC systems and their components for all of Tower Engineering's projects. 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.

West Virginia University
Current Term Contract
WVU Tech Interior and Exterior Renovations
Recreation Center
Brooks Hall - Lab Renovation
Honors Hall Dormitories
Law Building Phase I, II and III
Parkersburg Applied Technology Center (Parkersburg, WV Campus)

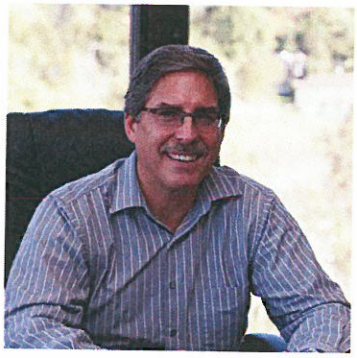
Fairmont State University - Fairmont, West Virginia
Engineering Technology
Multiple HVAC Systems Studies in Multiple Buildings
Electro-Optics Center Addition
Musik Library Renovation

Fairmont, West Virginia
Public Safety Building Renovations

Allegheny Energy - Fairmont, West Virginia
New Operations Center (LEED)

Department of Energy - Morgantown, West Virginia
New Record Storage Facility (LEED)

Morgan County Board of Education - Bath, West Virginia
Berkeley Springs High School Renovation/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,PE, 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

BridgeValley Community and Technical College
Restoration/Renovation

West Virginia University - Morgantown, West Virginia
Current Term Contract
WVU Tech - Interior and Exterior Renovations
New Intermodal Transportation Center
New Student Recreation Center
Student Recreation Center Building Commissioning
Caperton Center for Applied Technology
Parkersburg Applied Technology Center (Parkersburg, WV Campus)

Fairmont, West Virginia
Allegheny Energy New Operations Center

Fairmont State University - Fairmont, West Virginia
Engineering Technology Building

Berkeley County Board of Education - Inwood, West Virginia
Musselman High School (new)
Musselman Middle School Renovation/Addition
Potomack Intermediate School (new)

Clay County Board of Education - Clay, West Virginia
High School Auditorium/Classroom Addition

EDUCATION
BS Electrical Engineering
Case Western Reserve University
1997

REGISTRATION
Professional Engineer, PA
[redacted]

AFFILIATION
Illuminating Engineering Society of North America (IES): Treasurer Pittsburgh Section

AWARD
IES Design Award of Merit 2003, Ross Twp. Municipal Complex Pittsburgh, Pennsylvania

T. Steffanie Bako, PE, LEED AP

Principal, Senior Project Manager
Electrical Engineering Department Head

Mrs. Bako provides engineering services for the design of office buildings, educational facilities, municipal buildings, community/recreational buildings and commercial facilities. Her 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.

Steffanie'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, audio-visual, security and closed circuit television systems. Additional responsibilities include client contact, field observation, and project management.

REPRESENTATIVE EXPERIENCE

Army National Guard - Fairmont and Buckhannon, West Virginia
New Readiness Centers

Canaan Valley Institute - Davis, West Virginia
New Office Building (LEED Silver)

West Virginia High Tech Consortium Office Building - Fairmont, West Virginia
Tenant Fit-ups

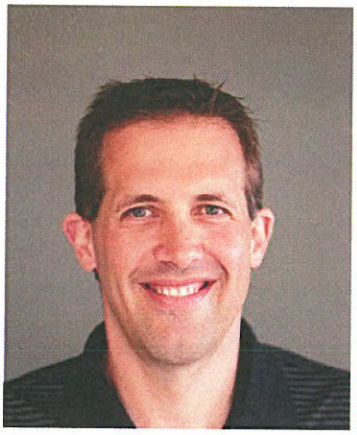
City of Fairmont - Fairmont, West Virginia
New Parking Garage
Municipal Building Renovations

Fairmont State University - Fairmont, West Virginia
Engineering Technology Building
Musick Library Addition and Renovations

Glenville State College - Glenville, West Virginia
Student Center Renovations

Harrison County School District - Clarskburg, West Virginia
New Lumberport Elementary School

Marion County School District - Fairmont, West Virginia
New Middle School



EDUCATION
BS, Mechanical Engineering
Penn State University 1997

REGISTRATION
Professional Engineer, PA
[redacted] 2003

Certified in Plumbing Engineering (CIPE), 1998

LEED Accredited Professional 2009

Michael S. Plummer, PE, CIPE, LEED AP

Principal, 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 duties include the design and layout of all domestic hot and cold water, sanitary drainage and storm water management systems. He is also responsible for the natural gas piping systems along with specialty systems involving laboratory or hospital gases. Mike's fire protection responsibilities include the design of water supply and pumping systems involving fire mains and sizing of fire pumps, the layout of standpipe and sprinkler zone locations, sprinkler head placements and reviewing hydraulic calculations for contractor designed sprinkler systems. He is a LEED Accredited Professional and designs all his projects with sustainability in mind.

Mike's 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

West Virginia University - Morgantown, West Virginia
Current Term Contract
WVU Tech – Interior and Exterior Renovations
New Intermodal Transportation Center
New Student Recreation Center
Parkersburg Applied Technology Center (Parkersburg, WV Campus)

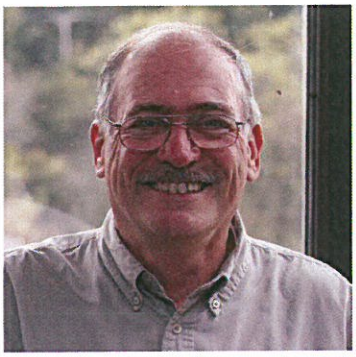
Fairmont, West Virginia
Allegheny Energy New Operations Center

Fairmont State University - Fairmont, West Virginia
Engineering Technology Building

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

Cacapon Resort - Berkeley Springs, West Virginia
Lodge Renovation and Expansion

City of Fairmont - Fairmont, West Virginia
Public Safety Building



EDUCATION

Steamfitters Local Union # 449
Apprentice Program 1970-1975

Point Park College 1967-1970
Mechanical Engineering Technology

PROFESSIONAL

Ross Township Planning Commission

CFC Recovery Certificate
Universal Rating

Circon DDC School - 1999

Combustion Efficiency Monitoring
Seminar - 1994

Boiler Safety Seminar: Flameguard
Co. - 1986

Honeywell Energy Management
Training Delta 21 - 1986

Liebert Service Training School 1987

John R. Sample

Commissioning Technician
Mechanical Engineering Department

Mr. Sample has been involved in all phases of the HVAC industry, with experience in commercial and industrial applications. This includes installation, startup, retrofit, estimating, ordering, engineering, load calculations, and sales. The emphasis being on energy management and retrofit of existing buildings. He has been directly involved in building preventive maintenance and control design for building HVAC systems, estimating contracts, and scheduling work. John has also been directly responsible for project management, which includes scheduling, engineering, ordering material, programming, and commissioning projects.

Corry Memorial Hospital - Corry, PA
Forensic Investigation

Seneca Valley School District - Jackson and Cranberry Township, PA
2014 and 2015 HVAC Upgrades - multiple buildings

North Hills Middle School - Pittsburgh, PA
HVAC Upgrades

Marshall University - Huntington, WV
Commissioning

Bethel Park School District - Bethel Park, PA
Neil Armstrong Middle School survey

Blackhawk School District - Beaver Falls, PA
Highland Middle School Renovations

Gateway School District - Monroeville, PA
High School Commissioning

Harbor Creek School District - Erie, PA
Klein Elementary School Renovation

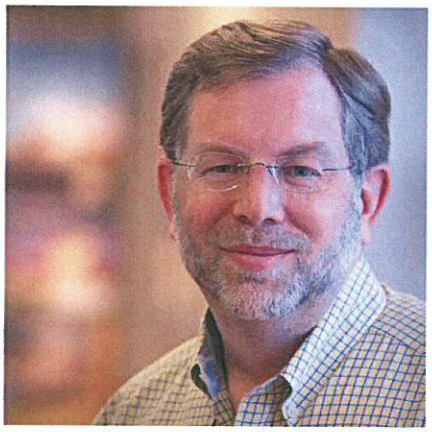
Moon Area School District - Coraopolis, PA
New High School and DAO, Middle School Renovation

Penn Hills School District - Pittsburgh, PA
New Elementary School and New High School

Pine Richland School District - Gibsonia, PA
High School Renovations and Additions

Ted A. Shriver

AIA / LEED AP BD+C / CEFP
Architect / Partner



Ted Shriver is a registered architect and President of Williamson Shriver Architects. In addition to his role as firm partner, he is additionally responsible for the office-wide coordination and production of contract documents. He brings to the firm 30 plus years of architectural experience, and his primary responsibilities include assurance that appropriate production and support resources are applied to each project.

Mr. Shriver's career began in 1979 with other local firms, but he has been with the firm since 1984 with partner Greg Williamson.

Office management, marketing and construction administration on smaller scope projects add to his daily responsibilities. He also oversees the firm's computer system, including evaluation and installation of new technology. He has extended this computer expertise to an understanding of the utilization and implementation of technology in school facilities and attends the Council of Educational Facility Planners' Technology Conferences. Since 2005, Mr. Shriver has focused on establishing guidelines for our designs on implementing safe schools and monitoring systems.

Mr. Shriver is active in the Association for Learning Environments (A4LE) especially in the Southeast Region. In 2003, he was one of the founding members of the West Virginia Chapter and served as their President from 2004-2007. He has also served as the Southeast Director since 2002.

Education:
Fairmont State College, 1979
A.S. Architectural Technology
South Charleston High School 1977

Registration:
Architect, WV [redacted]
Architect OH [redacted]
Architect MD [redacted]
Green Building Certification Institute
LEED Accredited Professional
(AP BD+C)

Affiliations:
West Virginia State Fire Commission
2009-Present
Code / Regulatory Committee, Chair
2009-Present
American Institute of Architects
WV Chapter
Executive Committee 2008-2013
Treasurer 2008-2013
Association for Learning Environments
Southeast Region
Alternate Director 2002-2003
Region Director 2003-Present
Recognized Educational Facility
Professional Certification (REFP)
Contractors Association of WV
Kanawha Valley Builders Association
International Code Council
National Fire Protection Association
South Charleston Board of Health
United States Green Building Council
Building Codes Plan Examiner
2015 - Present

The West Virginia Board of Architects

certifies that

TED A SHRIVER

is registered and authorized to practice Architecture in the State of West Virginia

In testimony whereof this certificate has been issued by the authority of this board.

Certificate Number [redacted]

The registration is in good standing until June 30, 2016

LEED AP BD+C

Ted Shriver

LEED ACCREDITED PROFESSIONAL

[redacted]

cefpi

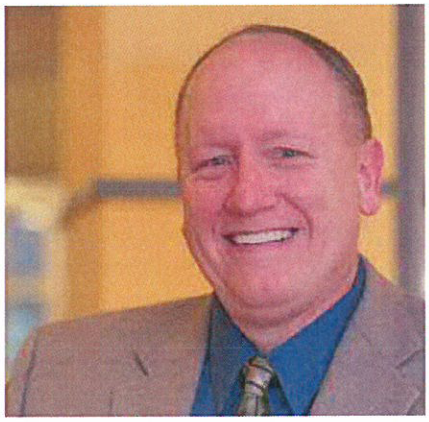
Recognized Educational Facility Planner

Ted A. Shriver, REFP

2015

Gregory A. Williamson

AIA / LEED AP / CEFP
Architect / Partner

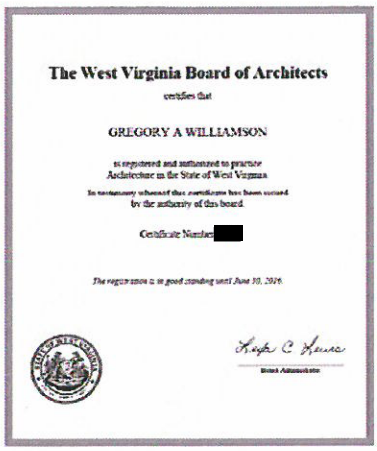


Greg Williamson attended the University of Tennessee, where he received his bachelor of architecture degree in 1981. His professional career began at Sverdrup and Parcel and later with Donald L. Moses Associates, both in Charleston. In 1983 he joined Gandee Thomas and Sprouse as an architect and project designer and obtained his West Virginia registration as an architect in 1985.

In 1994, along with Ted Shriver, Mr. Williamson acquired the firm from founder Kent Gandee. As design partner, Mr. Williamson has designed such prominent and well-received projects as the LEED Gold Spring Mills Primary School, Caperton Center for Applied Technology at WVU-Parkersburg, and the Lodge and Conference Center at Chief Logan State Park. Additionally, he represented Williamson Shriver Architects in their role as associated architect on two prominent commissions in Charleston, the United States Federal Courthouse with architect SOM of New York City, and the Clay Center for the Arts and Sciences with KSK Architects of Philadelphia.

Mr. Williamson is a former member of the WV Board of Architects, appointed by Governor Underwood in 1999. He has active registrations in five states and is a holder of an NCARB certificate. Mr. Williamson is active in the WV Chapter of the American Institute of Architects and serves on several standing committees including the Scholarship Committee, the Architect/Contractors Task Force, and the WV Foundation for Architecture.

In his spare time, Mr. Williamson is a musician and songwriter and enjoys recording original music in his home studio.



The West Virginia Board of Architects

certifies that

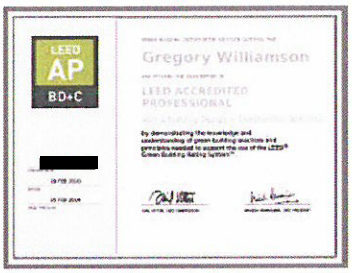
GREGORY A WILLIAMSON

is registered and authorized to practice Architecture in the State of West Virginia

In testimony whereof this certificate has been issued by the authority of this board.

Certificate Number [redacted]

The registration is in good standing until June 30, 2016

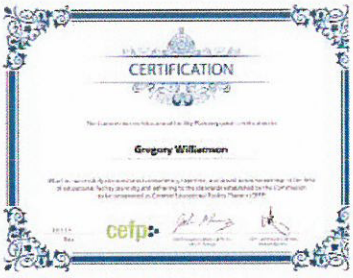


LEED AP BD+C

Gregory Williamson

LEED ACCREDITED PROFESSIONAL

[redacted]



CERTIFICATION

Gregory Williamson

cefp:

Education:
University of Tennessee, 1981
B. Architecture
West Virginia State College, 1978
Winfield (WV) High School 1976

Registration:
Architect, WV [redacted]
Architect, KY [redacted]
Architect, MD [redacted]
Architect, VA [redacted]
Architect, OH [redacted]
NCARB Certified [redacted]
Green Building Certification Institute
LEED Accredited Professional (AP)

Affiliations:
West Virginia Board of Architects 1999-2015
American Institute of Architects
AIA - WV Chapter
President 1994 & 1995
WV Foundation for Architecture
Trustee / Secretary 2007-present
Contractors Association of WV
Architects/Contractors Task Force
Association for Learning Environments
Member
Certified Educational Facility Professional (CEFP)
Putnam Co. Planning Commission
Member - 2016 to present
Putnam Co. Bd. of Zoning Appeals
Member - 1997 to 2001
US Green Building Council
Member

Taylor Structural Engineers, Inc.
2275 Swallow Hill Road, Bldg. 100, Pittsburgh, PA 15220
Phone: 412.722.0880 | Fax: 412.722.0887
TSEpgh.com

Dirk A. Taylor, P.E.

President / Principal

EDUCATION:

Bachelor of Science, Civil Engineering, West Virginia University
Department of Architecture, Carnegie-Mellon University

PROFESSIONAL REGISTRATIONS:

Pennsylvania [redacted], Ohio, West Virginia, Maryland, New York, New Jersey, Michigan, North Carolina, Virginia

AFFILIATIONS:

American Society of Civil Engineers
American Institute of Steel Construction
Structural Engineers Association of Pennsylvania

EXPERIENCE:

President/Owner, Taylor Structural Engineers, Inc., Pittsburgh, Pennsylvania (Established February 1, 1996)

Structural Department Manager, Peter F. Loftus Division of Eichleay Engineers, Inc., Pittsburgh, Pennsylvania (1991 to 1996)

Senior Project Engineer, Structural Engineering Corporation, Pittsburgh, Pennsylvania (1989 to 1991)

Senior Design Engineer, CECO Buildings Division, Rocky Mount, North Carolina (1984 to 1989)

Design Engineer, American Bridge Division of USSteel, Pittsburgh, Pennsylvania (1981 to 1984)

3. Approach and Methodology

3.1 *Clear procedure for communication with the owner during all phases of the project.*

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, our approach would be to move forward with the replacement of existing HVAC systems, which you state must be done. This approach would meet the project requirements stated in the RFP and would minimize the design requirements. Our approach to the planning phase is to step back and consider all applicable options, as outlined in Section 1, while also considering upgrades to the sprinkler system and overall building systems' health.

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, expectations of comfort levels, awareness of environmental concerns, and 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, understanding that the HVAC system will be replaced, 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 (Revit). 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.

We recognize that the selection of an MEP system has a long lasting impact on a building's initial construction cost, energy costs, architectural layout and future flexibility. We also recognize that there is no cookie-cutter approach that can be taken because all buildings and owners are unique. Important decisions with respect to MEP system selections need to be made as early as possible in a project's design phase and must include detailed discussions between the Owner and design professional so that the project can proceed through design and construction with a consistent set of goals.

Unfortunately, all too often this process is bypassed as design professionals proceed with minimal MEP discussions with their clients. The end result can be budget problems, unnecessary value engineering, high utility costs and future inflexibility.

Every Building Owner is unique, and we will work with you to carry out a process that is systematic, accountable and has clear communication.

Communication is vital . . .

During the process, 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.

Tower Engineering recognizes the importance of maintaining a high level of client satisfaction to insure that long-term relationships will be maintained. Our clients require that projects have minimal change orders, meet programmatic requirements, and are designed/constructed within the allotted schedule.

At the commencement of all projects, it is important to have meetings during which the project scope is discussed in detail. In most cases, there are multiple system alternatives that need to be evaluated. It is crucial that the design professional makes the owner aware of the advantages/disadvantages of each alternative and that a consensus is reached regarding the design concept.

During the design/construction phase of each project, we are continuously in contact with our client to insure that the project is proceeding smoothly and that all expectations are being met.

At the completion of our projects, we arrange for a debriefing meeting with our client (architect and/or owner) during which the project is reviewed in detail. During this meeting, we discuss actual construction costs versus budgeted costs, change orders and the overall performance of Tower Engineering.

By discussing issues related to the design and construction of our projects in an open and frank manner, we aim to insure that our client's expectations are being met so that existing and/or new relationships are maintained. Please contact our references for a better overview of our successful projects.

3.2 Demonstrate history of projects that met the owner's budget and a clear plan to ensure that project can be constructed within the project budget. Describe in detail. – can report per your instructions

For all buildings, the design of effective, efficient mechanical and electrical systems has become increasingly complex and demanding. With so many systems from which to choose, all with distinct advantages and disadvantages, selecting the best possible system can be quite daunting. The design team must carefully consider which system alternatives best meet the immediate and long-term needs of the Owner and building occupants, as well as regulatory agencies. Outdated, or misapplied systems can result in comfort complaints, indoor air quality issues, control problems, and exorbitant utility costs.

We recognize that the selection of an MEP system has a long lasting impact on a building's initial construction cost, energy costs, architectural layout and future flexibility. We also recognize that there is no cookie-cutter approach that can be taken because all buildings and owners are unique. We are very serious with all of the phases of design for each project. It is important to us that we work with your needs in every way, especially budget. We can even reconcile budget vs scope by building alternates into our bid packages so it becomes more affordable. These important decisions, with respect to MEP system selections, need to be made as early as possible in a project's design phase and must include detailed discussions between the Owner and design professional so that the project can proceed through design and construction with a consistent set of goals. With these goals, we can stay on track and on budget.

3.3 Demonstrate a history of projects constructed on schedule per the contract documents and a clear plan to ensure this project will be constructed within the agreed-upon period. Describe in detail. - can report per your instructions

To keep projects on schedule, we keep them in three phases, each phase having specific duties that must be completed. These phases are as follows:

- Schematic Design Phase

  - Attend kick-off meeting (1 engineer)
  - Attend one meeting with owner (3 engineers)
  - Review of existing MEP/FP drawings
  - Visit the site to confirm existing conditions
  - Develop a conceptual energy model of the building that compares energy and life cycle costs of potential HVAC systems that could be installed in the building. The model will compare up to a maximum of 3 HVAC systems.
  - Attend meeting with owner to review project's MEP/FP system requirements and alternatives
  - Provide and coordinate MEPFP space type, size and location requirements.
  - Author MEP/FP Scope of Work document
  - Review the MEP/FP cost estimates (estimates prepared and provided by others)
  - Preparation of square-foot based Estimate of Probable MEP/FP construction costs

- Design Development Phase

• Attend one meeting (3 engineers)

• Perform preliminary (square-foot based) heat gain/loss, sanitary, gas and electric load calculations based upon the approved Schematic Design submission.

• Prepare HVAC drawings showing the following:

• Preliminary HVAC equipment sizes and capacities

• Single-line duct layout (mains only, approximate sizing)

• HVAC pipe routing (mains only, no sizing)

• HVAC equipment locations (major equipment only, chiller, boiler, air handler, rooftop unit, etc.), noting approximate sizes and clearance requirements

• Prepare electrical drawings showing the following:

• Typical interior lighting (no circuiting)

oIdentification of proposed light fixtures

• Electrical panel locations

• Coordinating with the Owner's security, AV, data/networking, and phone consultant(s)/vendor(s) to determine wireway infrastructure requirements.

• Preliminary single-line power riser diagram

• Preliminary power and voice/data outlet locations (typical rooms only)

• Prepare plumbing and fire protection drawings showing the following:

• Plumbing equipment location

• Plumbing pipe routing (mains only, no sizing)

• Fire Protection zones

• Provide and coordinate updated MEPFP and tech space size and location requirements

• Prepare MEP/FP outline specifications

• Provide preliminary plumbing and lighting fixture cut sheets

• Review MEP/FP cost estimates (estimates prepared and provided by others)

• Preparation of square-foot and systems based Estimate of Probable MEP/FP construction costs

•Construction Document Phase

- Attend one meeting (3 engineers)
- Perform detailed heat gain/loss, sanitary, gas and electric load calculations based upon the approved Design Development submission.
- Building HVAC systems engineering design and preparation of bid drawings and specifications.
- Building electrical systems engineering design and preparation of bid drawings and specifications.
- Building electrical and technology systems engineering design and preparation of bid drawings and specifications.
- Building plumbing systems engineering design and preparation of bid drawings and specifications.
- Building plumbing and fire protection systems engineering design and preparation of bid drawings and specifications.
- Participated in value engineering activities. Note that redesign may necessitate fee adjustments.
- Participate in the development of bid alternates and unit pricing.
- Participate in the preparation and coordination of front-end documents
- Coordination with other team members: architect, structural, civil, etc.
- Preparation of MEP/FP Bid Drawings.
- ComCheck preparation (MEP portions only).
- Review MEP/FP cost estimates (estimates prepared and provided by others)
- Preparation of square-foot and systems based Estimate of Probable MEP/FP construction costs

3.4 Demonstrate competent and acceptable experience in all expected professional disciplines necessary for the design and completion of this project.

Our proposal includes all professional design services normally required to manage a construction project. This includes preparation technical construction drawings and specifications, managing the bid process, assisting with contractor selection, reviewing submittal drawings, attending and managing regular construction meetings, responding to questions raised during bidding and construction, reviewing payment requests, and processing project closeout materials.

3.5 *Special Considerations for Special Needs Adaptations/ADA*

Tower Engineering's work has focused on K-12 and higher education facilities, all with ADA requirements. In addition, we have worked on specialty schools and medical facilities that specialize in the education and care of disabled children and adults, such as the Children's Home, Pressley Ridge and Watson Institute. We coordinate closely with design team so that the building infrastructure, such as plumbing, electrical, building automation systems are all functional at sizes and heights to serve the building's users.

In our everyday work, as our design team renovates client buildings, ADA upgrades are typically done to all restrooms and building common areas. In 2014 and 2015, we have designed ADA upgrades for:

- Steel Valley School District, Park Elementary School restroom upgrades
- Seneca Valley School District, all building upgrades summer 2014 and summer 2015
- Chartiers Valley Middle School and High School renovations
- University of Pittsburgh, Fitzgerald Fieldhouse Restroom renovations
- Carlow University, ADA Ramp Renovations
- Allegheny Intermediate Unit 1 – ADA Toilet Renovation
- Corry Memorial Hospital, OR
- Lifecare, Transitional Care Center
- University Park Apartments in Morgantown, WV

4. Meeting Your Goals and Objectives

- *Objective 1*

Review Existing Plans & Conditions

Evaluate Condition

Determine a Plan that will minimize disruption of building activities

Tower Engineering, as the lead designer would begin the process by meeting with you, conducting a physical inspection of the building(s), review existing drawings and preparing a report outlining the existing conditions with a plan forward.

Tower Engineering regularly schedules construction activities around buildings in operation. One recent example is Stewart Hall on the Waynesburg University campus. Tower Engineering provided HVAC, plumbing and fire protection engineering services for the restoration of Waynesburg University's Stewart Hall, a 60,000 SF health science building that provides classrooms, administrative offices, and laboratories for coursework in chemistry, physics, biology, anatomy, physiology, and nursing.

This project presented an extreme challenge for the design and construction teams, who were tasked to restore the building in its entirety, including all piping and ductwork serving HVAC, plumbing and fire protection systems, the entire electrical system, the exterior walls and glazing, and the roof - while keeping the building in service. And, the servers for the University's computer network are located in the building and couldn't be disturbed.

The $25M multi-phased construction project accomplished the University's goals in four years.

•*Objective 2*

Design in a manner consistent with WV Schools for Deaf and the Blind's needs and objectives, current laws/codes, following the plan and within the budget

Tower Engineering recognizes that today's buildings require the full attention of the design team to conceive and create mechanical, electrical, plumbing and fire protection systems which provide the best environmental climate, economy of operation and leading edge system solutions that will extend the life and utility of a structure for years to come. We meet this challenge with fundamentally sound engineering techniques applied to the latest proven concepts, and to furnish outstanding results for our clients. With experience nurtured by the successful completion of many projects, both small and large, in the educational, governmental, commercial and institutional markets, our staff has gained a reputation for producing innovative yet practical designs. We have done a lot of work in West Virginia so we are up to date on all of the current laws and codes.

Our project teams work closely with each client to define the scope of services required and to maximize the quality, efficiency, and control of each project; this ensures project quality and cost control. We conduct weekly project management meetings to monitor our workload. As a result of these meetings, a firm-wide project schedule is developed and distributed. This schedule helps us to track the various phases of a project – from conception to completion, as well as highlight current or future milestones. When necessary, additional staff is assigned to accelerate our progress.

We are committed to continue developing and maintaining our long-term relationships with our clients. To accomplish this, we provide the results our client's value most: design of effective, cost-effective mechanical and electrical systems; a team that listens; quality, professionalism and attention to detail – from the first sketch to the completed project. These qualities are what draw our clients back.

• *Objective 3*

Provide Construction Administration Services

Tower Engineering is accustomed to being the prime consulting professional during the process. We will be fully responsible with the construction administration services. We have staff that is ideally trained for this. Our team would consist of the specific design team of engineers and consultants, plus John Sample, our dedicated construction administration technician. For John Samples resume, please refer to Section 2.

Our best recommendation is that you contact our clients in the APPENDIX of this document. We have performed multiple studies and larger building projects for all of them, and they can speak to Tower's leadership, reliability, communication and the successful conclusion of their projects.

5. Relationship with State of West Virginia

Tower Engineering has "deep roots" working in West Virginia. The firm has completed projects on the West Virginia University campuses continuously since 1994, and is currently working on the 150,000 SF renovation and addition to the WVU Law Building, and recently was the MEP consultant for a 247,821 SF WVU Mountainlair Feasibility Study.

The firm has worked throughout the State of West Virginia with 33 County Boards of Education, completing renovations, studies and new construction.

Specific Renovation projects in West Virginia include:

Grant County Board of Education - Petersburg, WV
Petersburg Elementary RTU Replacement

Mercer County Board of Education - Princeton, WV
High School Addition

Monongalia Health System - Morgantown, WV
Renovations for ICU Suite

Berkeley County Board of Education - Inwood, WV
Musselman Middle School Renovation/Addition

Clay County Board of Education - Clay, WV
High School Auditorium/Classroom Addition

BridgeValley Community and Technical College, South Charleston, WV
Restoration/Renovation

West Virginia University, Morgantown, WV
WVU Tech Interior and Exterior Renovations
Brooks Hall - Lab Renovation
Honors Hall

Law Building Phases I, II and III
Parkersburg Applied Technology Center (Parkersburg, WV Campus)

Brooke County Board of Education - Follansbee, WV
Hooverson Heights Primary School
Bethany Primary School

Cacapon Resort - Berkeley Springs, WV
Lodge Renovation and Expansion

Fairmont State University - Fairmont, WV
Engineering Technology Building
Conference Center Computer Lab
MATEC Hangar Fire Protection Systems Evaluation

West Liberty University - West Liberty, WV
Shaw Hall Renovations

TOWER ENGINEERING

APPENDIX

Copies of staff certifications

Insurance Statement (or Terms & conditions)

References

Relevant Project Sheets

Licensure Verification

Search: Details

Name:	JAMES N KOSINSKI
WV Professional Engineer:	**PE License Number:** [redacted]
	PE License Status: Active
	PE Issue Date: 10/25/2006
	PE Expiration Date: 12/31/2016
WV Engineer Intern:	**EI Certification Number:**
	EI Issue Date:
Primary Address of Record:	[redacted]
Primary Employer of Record:	TOWER ENGINEERING 115 EVERGREEN HEIGHTS DRIVE PITTSBURGH, PA 15229

DISPLAY THIS CERTIFICATE PROMINENTLY • NOTIFY AGENCY WITHIN 10 DAYS OF ANY CHANGE

15 0172990

Commonwealth of Pennsylvania
Department of State
Bureau of Professional and Occupational Affairs
PO Box 2649 Harrisburg PA 17105-2649

License Type

Professional Engineer

License Status

Active

Initial License Date

08/01/1994

JAMES N KOSINSKI

[redacted]

License Number

[redacted]

Expiration Date

09/30/2017

Commissioner of Professional and Occupational Affairs

Signature

ALTERATION OF THIS DOCUMENT IS A CRIMINAL OFFENSE UNDER 18 PA.C.S.S. 4911

Licensure Verification

Search: Details

Name:	THOMAS J GORSKI
WV Professional Engineer:	**PE License Number:** [redacted]
	PE License Status: Active
	PE Issue Date: 07/09/1993
	PE Expiration Date: 12/31/2018
WV Engineer Intern:	**EI Certification Number:**
	EI Issue Date:
Primary Address of Record:	[redacted]
Primary Employer of Record:	TOWER ENGINEERING, INC. 115 EVERGREEN HEIGHTS DRIVE SUITE 400 PITTSBURGH, PA 15229

DISPLAY THIS CERTIFICATE PROMINENTLY • NOTIFY AGENCY WITHIN 10 DAYS OF ANY CHANGE

15 0158944

Commonwealth of Pennsylvania
Department of State
Bureau of Professional and Occupational Affairs
PO Box 2649 Harrisburg PA 17105-2649

License Type

Professional Engineer

License Status

Active

Initial License Date

08/01/1990

THOMAS J GORSKI
[redacted]

License Number

[redacted]

Expiration Date

09/30/2017

Commissioner of Professional and Occupational Affairs

Signature

ALTERATION OF THIS DOCUMENT IS A CRIMINAL OFFENSE UNDER 18 PA.C.S.S. 4911

DISPLAY THIS CERTIFICATE PROMINENTLY • NOTIFY AGENCY WITHIN 10 DAYS OF ANY CHANGE

15 0108016

Commonwealth of Pennsylvania
Department of State
Bureau of Professional and Occupational Affairs
PO Box 2649 Harrisburg PA 17105-2649

License Type

Professional Engineer

License Status

Active

Initial License Date

06/05/2003

T STEFFANIE BAKO
[redacted]

License Number

[redacted]

Expiration Date

09/30/2017

Commissioner of Professional and Occupational Affairs

Signature

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DISPLAY THIS CERTIFICATE PROMINENTLY • NOTIFY AGENCY WITHIN 10 DAYS OF ANY CHANGE

15 0127684

Commonwealth of Pennsylvania
Department of State
Bureau of Professional and Occupational Affairs
PO Box 2649 Harrisburg PA 17105-2649

License Type

Professional Engineer

License Status

Active

Initial License Date

06/05/2003

MICHAEL SCOTT PLUMMER
[redacted]

License Number

[redacted]

Expiration Date

09/30/2017

Commissioner of Professional and Occupational Affairs

Signature

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Search: Details

Name:	DIRK A TAYLOR
WV Professional Engineer:	**PE License Number:** [redacted]
	PE License Status: Active
	PE Issue Date: 02/23/1988
	PE Expiration Date: 12/31/2018
WV Engineer Intern:	**EI Certification Number:** 4355
	EI Issue Date: 04/17/1982
Primary Address of Record:	[redacted]
Primary Employer of Record:	TAYLOR STRUCTURAL ENGINEERS, INC. 2275 SWALLOW HILL ROAD BUILDING 100 PITTSBURGH, PA 15220

This data was retrieved on 6/13/2017.

Insurance Statement (or Terms & conditions)

Insurance

Professional Liability Insurance: Tower Engineering carries the following insurance coverage:

- Professional Liability Per Claim: $2,000,000
- Professional Liability Aggregate: $2,000,000
- Automobile Liability: $1,000,000
- General Liability Per Claim: $1,000,000
- General Liability Aggregate: $2,000,000
- Workers Compensation: $100,000 each accident, $500,000 policy limit
- Umbrella Liability Each Occurrence: $4,000,000
- Umbrella Liability Aggregate: $4,000,000

A certificate of insurance can be provided upon request.

STANDARD TERMS AND CONDITIONS

Tower Engineering
Consulting Engineers
January 1, 2017 – December 31, 2017

All services, actions, and communications relative to the Project by Tower Engineering, hereinafter referred to as Tower, is subject to the terms and conditions set forth herein and in the letter of agreement to which these standard terms and conditions are attached.

1. **SCOPE OF WORK/TERMS OF AGREEMENT:** Unless the letter of agreement specifically provides to the contrary, the scope of work undertaken by Tower, the "Basic Services," shall be as stated in the letter of agreement. In the event of a conflict between these standard terms and conditions and the express provisions of the letter of agreement, the letter of agreement shall override the conflicting provision of these standard terms and conditions, but only for that provision. Tower shall have no other duties or responsibilities, except as expressly provided in writing.

2. **CHANGES/MODIFICATIONS:** Changes to the Basic or Additional Services shall be effective if the client or its authorized representative directs Tower to change the work and Tower confirms the change in writing, mailed or delivered to the client or its authorized representative. Unless the confirmation so states, all changes to Basic or Additional Services are "Additional Services." Revisions in drawings, specifications or other documents when such revisions are inconsistent with client approvals or instructions previously given, or required by changes in applicable law or other cause not within the control of Tower, are also Additional Services. Other than changes to the Basic and Additional Services as provided above, no modification to the letter of agreement or these standard terms and conditions shall be effective unless in writing and signed by the client and an authorized representative of Tower.

3. **STANDARD PAYMENT TERMS:** Unless the letter of agreement specifically provides to the contrary, the client shall pay for Basic and/or Additional Services based on charges, as determined by Tower for three components: (A) Services provided directly by Tower; (B) Consultants retained by Tower with respect to the Basic or Additional Services; and, (C) Expenses of providing the Basic and Additional Services. Charges for each of these components shall be on the basis stated below:

   A. **CHARGES FOR ADDITIONAL SERVICES:** Additional services provided shall be charged on the basis of the number of hours expended by each professional, technical or administrative employee involved in providing the Basic or Additional Services, multiplied by the then current hourly rate for each such professional, technical, or administrative employee. Current rates for each classification of professional or technical employee are set forth below.

   Standard rates given below are effective through December 31, 2017, after which Tower reserves the right to adjust them.

Classification	Hourly Rate
Power Sys. Engineer	$200.00 per hour
Forensic Engineer	$200.00 per hour
Principal	$161.00 per hour
Technology Specialist	$145.00 per hour
Associate	$131.00 per hour
Project Manager	$117.00 per hour
Commissioning Technician	$117.00 per hour
Senior Designer	$ 95.00 per hour
Designer	$ 84.00 per hour
Administrative	$ 60.00 per hour

   B. **OTHER EXPENSE CHARGES:** Tower charges for certain expenses incurred in providing Basic or Additional Services, based on its then current expense charge policy. Typical expenses for which charges are made include, without limitation, printing/reproduction, postage or shipping and delivery of drawings/specifications, travel and travel related expenses beyond the metropolitan area of Pittsburgh, approval fees, toll telephone charges and facsimiles, and express delivery charges.

4. **INVOICING:** Invoices shall be rendered monthly. Payments are due within 45 days of invoice date.

5. **INSURANCE:** Tower carries Workers' Compensation, Professional Liability Insurance, Comprehensive General Liability Insurance, and Automobile Liability Insurance. Certificates of Insurance will be furnished on request.

6. **GENERAL LIMITATION ON LIABILITY: SPECIAL LIMITATION FOR ASBESTOS, HAZARDOUS MATERIALS OR OTHER LATENT DEFECTS:** (A) Tower shall not be liable for any special, incidental, or consequential damages whatsoever, which may include, but are not limited to lost profit, lost income, lost rent, temporary facilities, lost productivity, interest, or insurance. (B) Tower shall not be liable for any damages whatsoever, whether as a result of professional liability or otherwise, arising from or related to radon, asbestos or Hazardous Materials or other latent defects in the land or improvements in connection with which the Basic or Additional Services are performed. Unless the letter of agreement specifically so states, Tower undertakes no duty (and the Basic Services do not include such services) to detect or find radon, asbestos, Hazardous Materials or other latent defects, and has understood that they were not involved when it agreed to perform the Basic Services.

Hazardous Materials are any materials subject to regulation as hazardous substances under applicable federal, state or local environmental regulations.

7. **UNFORESEEN CIRCUMSTANCE:** Tower shall not be in default of its obligations to the extent that its performance is delayed or prevented by causes beyond its reasonable control, including but not limited to acts of God, delays in delivery by vendors, and strikes or other labor disturbances, and unforeseen or concealed conditions.

8. **TERMINATION:** Either party may terminate any obligation to provide or pay for post-termination services under any agreement as to which these standard terms and conditions are a part. Termination shall be effective seven (7) days after written notice has been mailed, certified mail, return receipt requested, to the last known business address of the Other, or delivered to the Other by hand, facsimile or overnight express if a copy of thereof is so mailed promptly thereafter. In the event of such termination, Tower shall be paid in accordance with this Agreement for services rendered and expenses incurred or committed to, before and including the date of termination.

9. **GOVERNING LAW:** Interpretation, construction, and enforcement of this Agreement shall be pursuant to the laws, statutes, and regulations of the Commonwealth of Pennsylvania.

10. **OWNERSHIP AND USE OF DOCUMENTS:**
Drawings and specifications provided to the client as part of the performance of the Basic or Additional Services are instruments of service only and all rights to own, possess, copy, publish, revise or use such drawings or specifications are and shall remain the property of Tower whether the specific project contemplated by them is ever built or completed. The client shall not itself and shall not permit others to transfer any original or copy of all or any part of the drawings or specifications to any other person or entity. Notwithstanding the foregoing, if the client is not in default of any of its obligations to Tower, the client may hold and use originals or copies of the drawings and specifications prepared by Tower, including reproducible copies, but the client shall not use, or permit others to use them except as reasonably necessary or customary in the construction, architectural or engineering industries, for information and reference in connection with the construction, and the client's use and occupancy of the original project at the location the drawings and specifications contemplate.

11. The client shall not permit others to, and shall not itself, copy, use or transfer the drawings and specifications except as provided in the previous sentence without the prior written consent of Tower. Tower may require additional compensation and/or restrictions as a condition of such consent. This limitation on copying, use or transfer includes, without limitation, with respect to other projects, for additions to the original project, or for completion of any drawings or specifications by others.

12. **MEDIATION:** In an effort to resolve any conflicts that arise during the design or construction of the project or following completion of the project, the client and Tower agree that all disputes between them arising out of or relating to this agreement shall be submitted to non-binding mediation unless the parties mutually agree otherwise.

13. **STANDARD OF CARE:** Services performed by Tower will be conducted in a manner consistent with and limited to that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions. No other representation, expressed or implied, and no warranty or guarantee is included or intended in this agreement, or intended in this agreement, or in any report, opinion, document, or otherwise.

14. **CERTIFICATIONS:** Subsequent to the signing of this agreement, Tower shall not be required to sign or execute any documents, no matter by whom requested, that would result in Tower having to certify, guarantee or warrant the existence of conditions whose existence Tower cannot ascertain, or that in any way increases Tower's risk or affects the availability or cost of Tower's professional liability insurance.

15. **ASSIGNMENT:** Neither party of this Agreement shall transfer, sublet or assign any rights under or interest in this Agreement (including, but not limited to monies that are due or monies that may be due) without the prior written consent of the other party.

16. **CONSTRUCTION PHASE SERVICES:** Tower shall not have control over or charge of and shall not be responsible for construction means, methods, techniques, sequences or procedures or for safety precautions and programs in connection with the work, since these are solely the contractor's responsibility.

17. **THIRD PARTY RIGHTS:** This Agreement and the Services provided pursuant to this Agreement are intended for the sole use and benefit of the parties and are not intended to create any third party rights or benefits.

END OF DOCUMENT

References

John Thompson, Associate Director
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cookrk@svsd.net

Stephen M. Lippiello, VP Administrative Services
Westmoreland Community College
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John Santucci - Director of Facilities (No longer at Penn Hills, with Rucon now)
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(jsantu@phsd.k12.pa.us)

Len Clark - Director of Facilities
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swindellk@nhsd.k12.pa.us

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Bethel Park School District
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Email: chatty@moonarea.net

K-12 School Experience

School design reflects ongoing changes in education delivery. 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. The telecommunications industry moves at the speed of light. Voice. Video. Interactive Multimedia. Data networks. 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.

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

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

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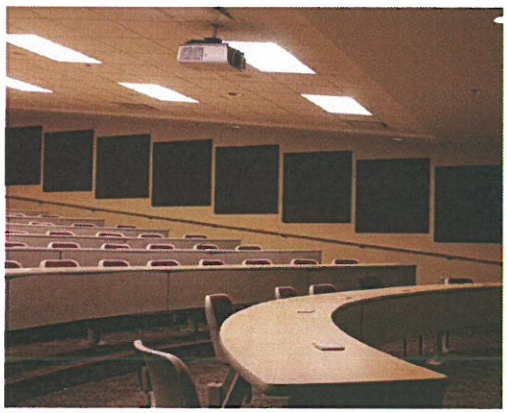
West Virginia Renovation Projects

BridgeValley Community and Technical College

Musselman Middle School



Fairmont State Universtiy, Engineering Tech

Grant County Board of Education - Petersburg, WV
Petersburg Elementary RTU Replacement

Mercer County Board of Education - Princeton, WV
High School Addition

Monongalia Health System - Morgantown, WV
Renovations for ICU Suite

Berkeley County Board of Education - Inwood, WV
Musselman Middle School Renovation/Addition

Clay County Board of Education - Clay, WV
High School Auditorium/Classroom Addition

BridgeValley Community and Technical College, South Charleston, WV
Restoration/Renovation

West Virginia University, Morgantown, WV
WVU Tech Interior and Exterior Renovations
Brooks Hall - Lab Renovation
Honors Hall
Law Building Phases I, II and III
Parkersburg Applied Technology Center (Parkersburg, WV Campus)

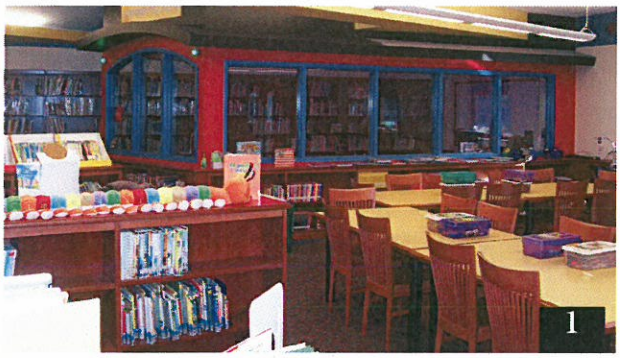
Brooke County Board of Education - Follansbee, WV
Hooverson Heights Primary School
Bethany Primary School

Cacapon Resort - Berkeley Springs, WV
Lodge Renovation and Expansion

Fairmont State University - Fairmont, WV
Engineering Technology Building
Conference Center Computer Lab
MATEC Hangar Fire Protection Systems Evaluation

West Liberty University - West Liberty, WV
Shaw Hall Renovations

Library Experience Continued



1. North Hills School District, McIntyre Elementary School, Pittsburgh, PA
2. Blackhawk School District, Highlands Middle School, Beaver Falls, PA
3. Regional Learning Center, Cranberry, PA

These are a few of the more than 50 school library spaces we have designed.

Other community libaries include:

- Citizen's Library - Study, Masterplan, HVAC Upgrade
- Connellsville Library - Basement Renovation
- Fort Pitt Museum
- Frick Carriage Museum & Art Museum
- Hamlin Library - MEP/FP Performance Specification
- Hamlin Library - Renovation/Design Build
- Hammermill Library (Mercyhurst College) - HVAC Study
- Hillman Library (University of Pittsburgh) - Motor Control Center Replacement
- Laughlin Memorial Library - HVAC Study
- Millstein Library Room 101 (University of Pittsburgh Greensburg Campus) - Feasibility Study
- Niagara Place Museum
- Northland Public Library - HVAC System Replacement
- PA Capital Building
- Pelletier Library (Allegheny College) - Study
- Sewickley Art Center
- Wise Library Stack (West Virginia University) - Electrical Upgrade

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 Renovation
- Martinsburg High School Gym Addition
- Hedgesville High School Addition/Renovation
- 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)

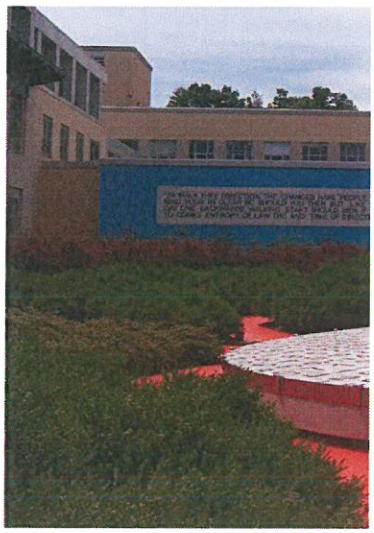
Elementary School Projects:

- 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

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 green-house gases.

A sustainable building is a structure that 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 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, we 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

- Director-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 ior less expensive exhaust only systems are sometimes indicated.

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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.

Sustainable Design features commonly include

- Conceptual Energy Model
- HVAC
- Geothermal
- Ice Storage
- Fan-Coil Units
- Rooftop Units
- Variable Refrigerant Flow
- Condensing Boilers
- Daylight Harvesting
- Insulated Concrete Forms
- Energy Recovery
- Carbon Dioxide Sensors
- DDC Controls
- LED Lighting
- High Efficiency Lighting
- Direct/Indirect Pendant Lighting
- Waterless Urinals
- Occupancy Sensors
- Rainwater Collection

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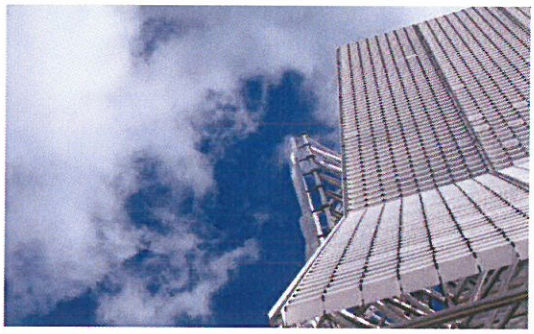
LEED Rated Design Continued



Pittsburgh Children's Museum (LEED Silver)

Tower Engineering recently provided mechanical and electrical engineering services for the 80,000 SF 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:

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

Projects Designed in Accordance with LEED Rating, but did not pursue LEED certification:

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