



Purchasing Division
2019 Washington Street East
Post Office Box 80130
Charleston, WV 25305-0130

State of West Virginia
Centralized Expression of Interest
34 - Service - Prof

Proc Folder: 569921

Doc Description: EO: Central Chiller Plant Ice Farm and Upgrades

Proc Type: Central Contract - Fixed Amt

| Date Issued | Solicitation Closes | Solicitation No | Version |
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BID RECEIVING LOCATION

BID CLERK
DEPARTMENT OF ADMINISTRATION
PURCHASING DIVISION
2019 WASHINGTON ST E
CHARLESTON WV 25305
US

VENDOR

Vendor Name, Address and Telephone Number:

ZMM, Inc. (dba ZMM Architects and Engineers)
222 Lee Street, West
Charleston, WV 25302
304-342-0159

RECEIVED

2019 MAY 15 PM 1:04

WV PURCHASING
DIVISION

FOR INFORMATION CONTACT THE BUYER

Melissa Pettrey
(304) 558-0094
melissa.k.pettrey@wv.gov

Signature X

FEIN# 55-0676608

DATE 5-14-2019

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

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

ARK PRINCIPAL

(Name, Title)
Adam R. Krason, AIA, LEED AP, Principal

(Printed Name and Title)
222 Lee Street, West, Charleston, WV 25302

(Address)
304-342-0159 304-345-8144

(Phone Number) / (Fax Number)
ark@zmm.com

(email address)

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contained herein; that this bid, offer or proposal constitutes an offer to the State that cannot be unilaterally withdrawn; that the product or service proposed meets the mandatory requirements contained in the Solicitation for that product or service, unless otherwise stated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

ZMM, Inc. (dba ZMM Architects and Engineers)

(Company)

ARK ADAM R. KRASON, PRINCIPAL

(Authorized Signature) (Representative Name, Title)

Adam R. Krason, AIA, LEED AP, Principal

(Printed Name and Title of Authorized Representative)

5-14-2019

(Date)

304-342-0159 304-345-8144

(Phone Number) (Fax Number)

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.:

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

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

Addendum Numbers Received:

(Check the box next to each addendum received)

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

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

ZMM, Inc. (dba ZMM Architects and Engineers)
Company


Authorized Signature

5-14-2019
Date

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

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

CONSTRUCTION CONTRACTS: Under W. Va. Code § 5-22-1(i), the contracting public entity shall not award a construction contract to any bidder that is known to be in default on any monetary obligation owed to the state or a political subdivision of the state, including, but not limited to, obligations related to payroll taxes, property taxes, sales and use taxes, fire service fees, or other fines or fees.

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

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

DEFINITIONS:

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

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

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

AFFIRMATION: By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (W. Va. Code §61-5-3) that: (1) for construction contracts, the vendor is not in default on any monetary obligation owed to the state or a political subdivision of the state, and (2) for all other contracts, that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

WITNESS THE FOLLOWING SIGNATURE:

Vendor's Name: ZMM, Inc. (dba ZMM Architects and Engineers)

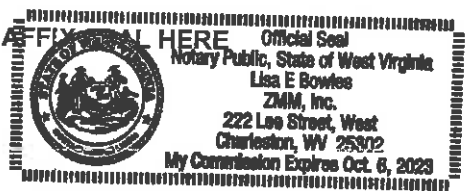
Authorized Signature: [Signature] Date: 5-14-2019

State of West Virginia

County of Kanawha, to-wit:

Taken, subscribed, and sworn to before me this 14th day of May, 2019

My Commission expires 10-6, 2023



NOTARY PUBLIC [Signature]

May 15, 2019

Ms. Melissa Pettrey, Senior Buyer
WV State Purchasing Division
2019 Washington Street, East
Charleston, West Virginia 25305-0130



Subject: Expression of Interest – Central Chiller Plant Ice Farm and Upgrades - GSD190000008

Dear Ms. Pettrey:

ZMM Architects and Engineers is pleased to submit the attached information to demonstrate our experience and our qualifications to provide professional architectural and engineering services for the technical analysis and review of energy and cost saving approaches for the Campus Central Chiller Plant. Ice generation and storage is one specific approach to offset peak load demand and requires a strong technical analysis to confirm the project is a responsible investment to achieve the energy and cost savings expected. ZMM intends to be the Owner's advocate in the approach of providing a detailed analysis and review of multiple project options and solutions to achieve the primary goal of increased Chiller Plant efficiency and a reduction in operational and utility costs. Our complete architectural and engineering services can then translate forward into consensually approved project development, construction documentation and construction administration services.

- **Experience.** ZMM was founded sixty years ago as a full service A/E design firm. One of the specialties that the firm provides is the design of new and renovated large Chilled Water systems. ZMM Principal Bob Doeffinger is a mechanical engineer with 40+ years of experience analyzing and working on some of the most challenging Chilled Water Central Plant projects across West Virginia and surrounding states. ZMM has the right combination of technical expertise, computer energy modelling, and proven positive fiscal payback to help successfully analyze the best approach to improve and upgrade the WV State Capital Campus Central Chiller Plant. ZMM's most recent Central Chilled Water Plant experience includes the renovation and expansion of the Charleston Coliseum and Convention Center. This project required multiple phases of construction to achieve project completion. One very important aspect of the design-build teams winning approach was their unique, insightful capability to design the new Heating and Chilled Water Central Plant, which was constructed adjacent to an existing, operational central plant, achieving continuous systems operation with minimal down time down required to connect the new to existing.
- **Quality.** ZMM has a proven history of providing high quality analysis, design, and construction services for Chilled Water systems, Central Chilled Water Plants and Emergency Power Generator systems. ZMM's consistent capability to provide quality analysis and design services has resulted in repeat business from clients that include the largest retail mall, critical data centers, and life-saving hospitals.
- **Talent.** With over thirty-five local employees ZMM employs an integrated design approach by providing all building-related design services including architecture, engineering (structural, mechanical, and electrical), interior design, and construction administration in-house. ZMM's team includes seven registered architects, eight professional engineers (civil, structural, mechanical, and electrical), interior and lighting designers, and construction administrators. Our architects and engineers are highly qualified, and have delivered on previous projects at the WV State Capital Campus.

- **Teamwork.** Teamwork is the key to a successful project and ZMM is committed to the success of the Campus Central Chiller Plant energy efficiency and cost savings upgrades project. We look forward to the opportunity to build upon the relationship we have established by working together on the Capitol Roof and improvements to State Office Buildings 5, 6, & 7. Our goal is to become an extension of your team as we assist in providing analysis, and implementing the improvements to the Campus Central Chiller Plant.

Thank you for taking the time to review the attached expression of interest that has been formatted to address the needs of your project. Additionally, please visit our website at www.zmm.com to see the full range of projects that we have designed, and to learn about working with ZMM from a client's perspective. We appreciate your consideration for this important assignment.

Respectfully submitted,

ZMM, Inc.



Samuel Butzer, PE, LEED AP BD+C
Senior Mechanical Engineer



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Project Understanding and Approach

PROJECT BACKGROUND

The Central Plant, WV State Building #11, is located at 114 California Ave., Charleston, WV 25301. The building was commissioned as a chiller plant in 1999 and serves approximately 2.1 million square feet of campus office space within six (6) buildings. The scope of this project is to provide a thorough analysis of the existing facility for improvements, upgrades and modifications of the plant to improve energy efficiencies. Subsequent design, construction documents, and construction administration services may be undertaken to implement the results of the design and subsequent renovation/improvement recommendations.



PROJECT GOALS

ZMM confirms the top priority or goal of this project is to provide a thorough analysis of strategies to reduce the electrical load of the central plant through increased plant efficiencies and the installation of supplemental cooling and heating systems to achieve energy, and cost savings. It is our understanding the State of West Virginia would like to pursue the installation of an ice generation and storage system to offset the daily peak load demand based on indicated load in real time. It is our belief that ZMM should be provided with the opportunity to thoroughly analyze the cost impacts of an ice storage system as to inform the State of West Virginia if that is the best use of funds. ZMM will ask and answer the important

questions as an impartial advocate of the owner. "What is the initial capital investment, what is the expected reduction in energy consumption and utility demand charges, what is the estimated pay-back period, how much energy should be saved, what is the life expectancy and is the system maintainable?"

One of the proposed first steps taken would be to request utility bills and utility billing information in writing from the major electrical, natural gas and water utilities. Information provided from the utilities shall include 5-10 years of actual utility bills, current billing rates, rate structures, demand charges, consumption charges, etc. and this information should then be used by the State of West Virginia to negotiate proposed cost savings directly with the appropriate utility.

Our initial energy analysis would focus on cost-effectively improving the efficiency of the existing central plant. Variable speed pumping, variable speed chiller operation, variable speed tower fans, water-side economizer with a plate and frame heat exchanger, increased chiller efficiencies, and increased ΔT to name a few.

Computer-aided energy modelling using Trane Trace 3D Plus and Trane Trace 700 would be used to perform the analysis of the proposed energy efficiency resolutions. The entire load of the existing campus buildings can be modeled effectively to determine what impacts each solution would have on system efficiency, utility demand and costs.

ZMM's analysis of supplemental cooling and heating systems wouldn't focus solely on ice storage. A narrow project scope is not beneficial for the Owner, especially when considering the larger project goals. In addition to ice storage, ZMM would analyze options for geothermal heat pump chillers, heat recovery chillers, and because the project scope includes the design and installation of generators, it is our recommendation to investigate a Combined Heat and Power (CHP) system where waste-heat from power production can be utilized to offset heating and cooling demands.

LARGE CHILLER COOLING PLANT TYPE SYSTEM EVALUATIONS/DESIGN EXPERIENCE



- Charleston Coliseum and Convention Center - Charleston, WV
- Pavilion – Philadelphia, PA
- ALPHA Technologies Data Center – Charleston, WV
- The Court at King of Prussia – King of Prussia, PA
- King of Prussia Mall – King of Prussia, PA

- Hamilton Mall – Mays Landing, NJ
- United Bank Building – Charleston, WV
- NGK Spark Plugs – Sissonville, WV
- Tug Valley Appalachian Regional Hospital – South Williamson, KY
- K-12 Schools – WV

GENERATOR SYSTEM EVALUATIONS/DESIGN EXPERIENCE INCLUDES:

- Charleston Coliseum and Convention Center - Charleston, WV
- NGK Spark Plugs – Sissonville, WV
- I.R.S. Data Center – Martinsburg, WV
- WV Army National Guard – WV
- WV Regional Jails and Juvenile Detention Centers – WV

CONSTRUCTION DOCUMENTS AND CONSTRUCTION PHASE SERVICES

ZMM understands the challenges that can arise during the construction phase of the project, and provides a robust team to ensure an efficient delivery of every project. The ZMM mechanical engineering project manager will serve as the primary representative of ZMM, and will attend all construction progress meetings. ZMM also employs an in-house construction administrator (who will assist the project manager) and an administrative assistant who tracks all information (incoming and outgoing) during the construction phase to ensure ZMM is being responsive to project needs.



Typical construction phase services include the following:

1. Attendance at Pre-Construction Meeting
2. Observation of Construction Progress
3. Serve as the Liaison Between the Owner and Contractor

4. Attend Bi-weekly Site Visits/Construction Progress Meetings
5. Responsible for Attending Pre-Installation Meetings
6. Attends Progress Meetings
7. Certify Applications for Payment by the Contractor
8. Process RFI's, Submittals and Change Orders

PROJECT MANAGEMENT/STAFFING PLAN

With over thirty-five local (WV) employees ZMM provides an integrated design approach by delivering all building-related design services including architecture, engineering (structural, mechanical, and electrical), interior design, and construction administration in-house. ZMM's team includes seven registered architects, eight professional engineers (structural, mechanical, and electrical), interior and lighting designers, and construction administrators. Our architects and engineers are industry leaders, and have worked together to deliver projects with similar scope and complexity. In fact, ZMM has provided design services to replace rooftop equipment on Regional Jail facilities throughout West Virginia. If ZMM is selected to provide design services for this project, key team members will include:

| <u>ZMM Team Member</u> | <u>Role</u> |
|------------------------|----------------------------|
| Bob Doeffinger, PE | Project Principal |
| Samuel Butzer, PE | Mechanical Engineering PM |
| Rodney Pauley, AIA | Project Architect |
| Mike White, PE | Structural Engineer |
| Scot Casdorff, PE | Electrical Engineer |
| FaLena Perry, EIT | Construction Administrator |



Our team has successfully collaborated on multiple jail and correctional HVAC equipment replacement projects throughout West Virginia, and each team member is familiar with the standards, requirements, and processes that will be required to successfully deliver your project.

Firm Profile



LOCATION:
222 Lee Street, West
Charleston, WV

CONTACT:
Phone 304.342.0159
Fax 304.345.8144
www.zmm.com



ZMM was founded in 1959 in Charleston, West Virginia by Ray Zando, Ken Martin, and Monty Milstead. Since the inception of the firm, ZMM has been dedicated to providing an integrated approach to building design for our clients. ZMM delivers this integrated approach by providing all building related design services, including architecture, engineering (civil, structural, mechanical, and electrical), interior design, and construction administration from our office in Charleston. Our integrated design approach makes ZMM unique among architectural firms in West Virginia, and helps to ensure the quality of our design solutions by providing more thoroughly coordinated construction documents.

Over the last decade, ZMM has become a leader in sustainable or 'green' design in West Virginia. In addition to participating in sustainable design and construction seminars throughout the State (Beckley, Fayette County, Morgantown, Charleston, and Parkersburg), ZMM designed one of the first sustainable educational facilities in West Virginia (Lincoln County High School). ZMM's unique design approach has proven invaluable on projects that employ sustainable design principles, which often require a more integrated approach to building design.

As ZMM enters our second half-century providing professional design services in West Virginia, we remain committed to the ideal of providing high quality, client focused, design solutions that meet budget and schedule requirements. This commitment to quality has been recognized through both State and National design awards, as well as through the long-term client relationships that we have developed.



ZMM has been dedicated to the integrated approach to building design which is unique to architectural firms of our size. Our past successful experience demonstrates that providing multi-disciplined services within one organization results in a fully coordinated project. ZMM has the qualified professionals available to provide services throughout the duration of a project from the initial planning phases through post-occupancy evaluations and beyond.

Advantages of an integrated Design Approach:

- The Owner has a Single Point of Design Responsibility
- Improved Design Schedule
- Improved Coordination of Documents
- Improved Construction Phase Services
- Well Coordinated Documents Lead to Better Bids for the Owner

Additionally, ZMM is constantly working to improve the services we offer by addressing emerging and evolving trends that impact the design and construction market. ZMM has seven LEED accredited Professionals on staff to address the needs of our clients who are interested in designing buildings that meet the US Green Building Council's standards. This continues ZMM's active implementation of sustainable design principles on our projects.

Services

Pre-Design

- Educational Facility Planning
- Programming
- Space Planning
- Feasibility Studies
- Existing Building Evaluation
- Site Evaluation and Analysis
- Master Planning
- Construction Cost Estimating

Design

- Architectural Design
- Sustainable Design
- Interior Design
- Landscape Architecture
- Civil Engineering
- Structural Engineering
- Engineering (MEP)
- Energy Consumption Analysis
- Net Zero Design

Post Design

- Construction Administration
- Value Engineering
- Life Cycle Cost Analysis
- Post-Occupancy Evaluation



Award Winning Design



2019

AIA West Virginia Chapter: Honor Award
AIA West Virginia Chapter: Citation Award
AIA West Virginia Chapter: People's Choice Award
Charleston Coliseum & Convention Center
Charleston, West Virginia



2018

AIA West Virginia Chapter: Citation Award
Unbuilt Project
Charleston EDGE
Charleston, West Virginia



2017

AIA West Virginia Chapter: Merit Award
Achievement in Architecture
Explorer Academy
Huntington, West Virginia



AIA West Virginia Chapter: Merit Award
Achievement in Sustainability
Logan - Mingo Readiness Center
Holden, West Virginia



2016

AIA West Virginia Chapter: Merit Award
Achievement in Architecture in Interior Design
Christ Church United Methodist
Charleston, West Virginia

AIA West Virginia Chapter: Merit Award
Achievement in Architecture
Gauley River Elementary School
Craigsville, West Virginia



2015

AIA West Virginia Chapter: Honor Award
Achievement in Architecture in Sustainable Design
Edgewood Elementary School
Charleston, West Virginia

Award Winning Design



AIA West Virginia Chapter: Merit Award
Achievement in Architecture
Kenna Pk-5 School
Kenna, West Virginia

2014

AIA West Virginia Chapter: Merit Award
Achievement in Architecture in Sustainable Design
Huntington East Middle School
Huntington, West Virginia

AIA West Virginia Chapter: Merit Award
Achievement in Architecture
Southern West Virginia Community & Technical College
Williamson, West Virginia

AIA West Virginia Chapter: Merit Award
Achievement in Architecture in Interiors/Graphics
Girl Scouts of Black Diamond Council
Charleston, West Virginia

2012

AIA West Virginia Chapter: Honor Award
Excellence in Architecture
West Virginia Housing Development Fund Building
Charleston, West Virginia

2011

AIA West Virginia Chapter: Honor Award
Excellence in Architecture in Historical Preservation
Southside Elementary/Huntington Middle School
Huntington, West Virginia

AIA West Virginia Chapter: Honor Award
Excellence in Architecture
Joint Interagency Training & Education Center
Kingwood, West Virginia

AIA West Virginia Chapter: Merit Award
Excellence in Architecture in Interiors
WV State Office Building #5, 10th Floor Renovation
Charleston, West Virginia



CERTIFICATE OF *Authorization*

STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS

*The West Virginia State Board of Registration for Professional Engineers
having verified the person in responsible charge is registered in
West Virginia as a professional engineer for the noted firm, hereby certifies*

**ZMM, INC.
C00689-00**

Engineer in Responsible Charge: ROBERT C. DOEFFINGER, JR - WV PE 009847

*has complied with section §30-13-17 of the West Virginia Code governing
the issuance of a Certificate of Authorization. The Board hereby notifies you of its
certification with issuance of this Certification of Authorization for the period of:*

January 1, 2018 - December 31, 2019

providing for the practice of engineering services in the State of West Virginia.

IF YOU ARE REQUIRED TO REGISTER WITH THE SECRETARY OF STATE'S OFFICE,
PLEASE SUBMIT THIS CERTIFICATE WITH YOUR APPLICATION.



IN TESTIMONY WHEREOF, THE WEST VIRGINIA STATE BOARD OF
REGISTRATION FOR PROFESSIONAL ENGINEERS HAS ISSUED THIS COA
UNDER ITS SEAL, AND SIGNED BY THE PRESIDENT OF SAID BOARD.

BOARD PRESIDENT

Professional Registrations



Bob Doeffinger, PE
WV 009847



Samuel Butzer, PE
WV 20417



Rodney Pauley, AIA
WV 4302



Mike White, PE
WV 19204



Scot Casdorff, PE
WV 017269

Robert Doeffinger, PE



Role
Engineering Principal

Professional Registrations

Professional Engineer (WV, VA, PA, OH, TN, KY, NY, NH, ME, NC, SC, FL, NJ, GA)

As ZMM's Principal Engineer, Mr. Doeffinger is in charge of the engineering disciplines, it is his responsibility to ensure that the mechanical and electrical engineering components of ZMM's design are coordinated and integrated into the final product.

After graduate school in Architectural Engineering, Mr. Doeffinger joined ZMM. He has over 35 years design experience in mechanical and electrical systems for buildings. He has a broad range of engineering experience in education, industrial and manufacturing facilities, large retail, correctional and jails, office buildings, and military facilities.

Mr. Doeffinger is responsible for new design and retrofit of chilled water systems for all building types including large regional shopping malls. He is involved daily with the firm's selection of appropriate systems for all building types and performs life-cycle cost analysis and energy studies.

Mr. Doeffinger is a member of the American Society of Heating, Ventilation and Air-Conditioning Engineers. He is the current national Chairman of the Technical Committee on Heating and Air-Conditioning Load Calculation. He is involved in writing the National Standard on the Method of Calculation, which will shape the nature of the future building energy use for the nation.

Project Experience

Charleston Civic Center, Charleston, WV

Mr. Doeffinger was the mechanical project engineer on the expansion and renovation to the Charleston Civic Center project. The \$75M, 283,000 SF design-build project was a collaboration with tvsdesign and BBL Carlton. The design commenced in the spring of 2015, and construction was completed in October 2018. The mechanical design is expected to reduce the energy requirements defined by ASHRAE 90.1-2013 by an estimated 25% and extensive water savings will be shown. The project includes a new chilled and hot water central plant with extensive replacement and upgrades to the facilities existing mechanical systems. Multiple phases of construction will allow the Civic Center to remain operational throughout the construction progress.

Education

Master of Science Architectural Engineering, Pennsylvania State University, 1976

Bachelor of Science Mechanical Engineering, West Virginia University, 1973

Employment History

2005 - Present, President, ZMM
1976 - 2005, Vice President and Engineering Principal, ZMM

Civic Affiliations

- ASHRAE – Member of the Technical Committee Load Calculations Data and Procedures for 15 years, serving as chairman. Presently Chairman of the Research Subcommittee
- Advisory Board for the Department of Electrical Engineering Technology, Bridgmont Community and Technical College
- City of Pt. Pleasant, WV – 2nd Ward Councilman for 20 years

State Office Buildings #5, 10th Floor Charleston, WV Mr. Doeffinger was the Project Engineer for this renovation project. The renovation of the tenth floor of State Office Building #5 on the State of West Virginia Capitol Campus was recently completed for the Office of Technology. The renovation was designed to meet the United States Green Building Council's LEED for Commercial Interiors standard. The renovations also include a low profile cable management system which maximizes the flexibility of the space. To commence the project, ZMM conducted a detailed investigation of State Office Buildings 5, 6, & 7, which included recommendations for improvement of the facilities. The renovation of the 10th floor of Building #5 was the first major interior renovation project that responded to the recommendations.

West Virginia Capitol Complex - Buildings #5, 6, & 7, Charleston, WV Mr. Doeffinger was the Project Engineer for the in-depth analysis of Buildings #5, 6, & 7 at the State Capitol Campus. The study included the preparation of as-built plans, as well as an analysis of all building systems, including: Life Safety; Vertical Transportation; Mechanical; Electrical; Data; Façade; Structure; and Roofing. The analysis also included a study related to potential hazardous materials in the facility.

West Virginia Regional Jails, Mr. Doeffinger was the Project Engineer on ten West Virginia Regional Jails. In 2009 he was responsible for the HVAC renovation on four regional jails, including the replacement of rooftop HVAC units and Building Automation Systems.

West Virginia Army National Guard, Joint Interagency Training & Education Center, Camp Dawson, WV Mr. Doeffinger was responsible for the mechanical engineering design of the 600 room billeting expansion to the Regional Training Institute at Camp Dawson. The project is served by a 4 - pipe hot and chilled water system with an energy recovery ventilation system. This project received LEED Gold Certification.

West Virginia Research, Education, and Technology – Building 704, South Charleston WV Mr. Doeffinger is the engineering principal-in-charge of preparing a life safety analysis of the building as well as design services to improve the exterior façade of Building 704 at the WV Research, Education, and Technology Park. Building 704 had previously been utilized as a campus maintenance facility by Union Carbide and DOW Chemical. Bridgemont began utilizing the facilities for instruction in the Spring of 2011.

West Virginia Regional Technology Park (WVRTP) - Building 740, South Charleston WV Mr. Doeffinger is the engineering principal-in-charge of the new Steam Plant for Building 740. This project involves designing and constructing the Interim Steam Heating System throughout Building 740.

Bridgemont (BridgeValley) Community and Technical College Davis Hall Renovation, Montgomery, WV Mr. Doeffinger led an architectural and engineering investigation into the condition of Davis Hall to help Bridgemont Community and Technical College to develop a scope for the current renovation project, as well as a plan to undertake deferred maintenance at the facility. The project scope included remedying several life safety deficiencies, as well as improvements to the building envelope.

NGK Oxygen Sensor and Spark Plug Plant, Sissonville, WV Mr. Doeffinger was in charge of engineering design of the 250,000 SF NGK facility. The most recent 130,000 SF expansion moved NGK's spark plug production for the west coast to West Virginia. For both the oxygen sensor plant and spark plug plant Mr. Doeffinger designed a cycle water system for the manufacturing equipment.

The Plaza at King of Prussia, Pittsburgh, PA One of the largest retail centers in the east. Mr. Doeffinger has performed engineering services for the past 20 years. The project consists of a 5,000 -ton chilled water plant and 1,500,000 cfm variable volume system for tenants and constant volume air system for common areas and an engineered smoke control system. The most recent project is a 2011, 100,000 square foot expansion of tenant spaces, a renovation of the food court, and a 1,250-ton chiller addition to the central chilled water plant.

Samuel Butzer, PE, LEED AP BD+C



Role

Mechanical Project Engineer

Professional Registrations

Professional Engineer (WV, WI, IL)
LEED Accredited Professional

Mr. Butzer is a registered Professional Engineer with design experience in HVAC, Piping (Mechanical, Industrial, Laboratory, Medical Gas), Fire Protection and Plumbing systems. He has been responsible for an extensive range of projects that include Hospitals, Civic Complexes, Laboratories, Medical and Dental Office Buildings, Retail, Military Installations, Churches, Restaurants, K-12 Schools, Higher Education Facilities, Pharmaceutical Manufacturing, Natatoriums and Historical Renovations.

Mr. Butzer began his career in engineering with a mechanical contractor located in Wisconsin. His collective engineering experience includes projects that were design-build, design-assist and plan & spec. His background in engineering and 3D BIM design and coordination has provided him with extensive experience in the "real world" of HVAC and piping constructability. That experience has forged him into a leader at the integration of all construction disciplines into a multitude of building types and space constraints.

Mr. Butzer's dedication to the community and his civic affiliations demonstrates a strong connection to the engineering principles of energy efficiency, sustainability, occupant comfort and health.

Project Experience

Charleston Civic Center, Charleston, WV

Mr. Butzer was the Mechanical Project Engineer on the expansion and renovation to the Charleston Civic Center project. The \$75M, 283,000 SF design-build project was completed as a collaboration with tvsdesign and BBL Carlton. The design commenced in the spring of 2015, and construction is complete in October 2018. The mechanical design is expected to reduce the energy requirements defined by ASHRAE 90.1-2013 by an estimated 25% and extensive water savings will be shown. The project included a new chilled and hot water central plant with extensive replacement and upgrades to the facilities existing mechanical systems. Multiple phases of construction allowed the Civic Center to remain operational throughout the construction progress.

Education

Bachelor of Science, Mechanical Engineering, University of Wisconsin at Madison, 2007

Associate of Science, Madison Area Technical College, Madison, WI, 2004

Employment History

2018 - Present, Board of Directors, ZMM
2013 - Present, Project Engineer, ZMM
2007 - 2013, Mechanical Engineer, WI
2005 - 2007, Mechanical Engineer Intern, UW-Madison FP&M

Civic Affiliations

- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), President of West Virginia State Chapter
- United States Green Building Council (USGBC), Board Member of West Virginia State Chapter
- Marshall University Engineering Advisory Board Member
- Kanawha City Community Association Board Member

Harrisville Elementary School, Harrisville, WV

Mr. Butzer was responsible for designing the HVAC systems for the renovation and additions to the elementary school. Initial design development consisted of variable refrigerant flow (VRF) systems coupled with dedicated outdoor air (DOAS) systems for the Classrooms and Administration areas. Roof mounted air conditioning and exhaust equipment were provided for the new Cafeteria, Kitchen and existing Gymnasium. Budget and space constraints forced the design to evolve into individual, self-contained, interior air handling units for each Classroom. The units were able to meet ASHRAE 62.1 requirements for ventilation, the Acoustical Society of America's (ASA) requirement for sound, and every other standard such as individual classroom temperature and dehumidification control as set forth by the School Building Authority (SBA).

Appalachian Regional Hospital, Beckley, WV

Mr. Butzer is the Mechanical Project Engineer currently working with the hospital on multiple renovations. The ICU and OR departments will undergo Mechanical and Architectural upgrades in a multiphase project while the hospital remains operational. The existing kitchen will receive a new make-up air unit, and fan coil units to improve pressure and air balance relationships within the hospital. A dedicated HVAC unit was provided for the endoscopy suite to improve thermal comfort and provide code-required ventilation, air-changes and humidity.

Glenwood Elementary School, Princeton, WV

Mr. Butzer was the Mechanical Project Engineer for this successful project that came in under budget, on-time and with zero change orders. The first phase was duct cleaning and sealing that improved indoor air quality and reduced system demand by 8 tons. The second phase was the HVAC improvements which replaced all existing constant volume, single compressor, multizone, air handling units (AHUs) with new variable speed, multi-compressor AHUs. VAV terminal units were installed to create separate zones for each classroom. A new building automation system was provided for system controls and to incorporate the facility into the existing county-wide controls network. All electric heating was abandoned to maximize use of the hot water heating system. Mechanical upgrades saved the school an estimated 18.5% in the electric usage and provided them with over \$13,000 in rebates from the electric utility.

Nicholas County Courthouse, Summersville, WV

The Nicholas County Courthouse is a Historic building constructed in 1898 with an addition executed by the Works Progress Administration in 1940. The courthouse was added to the U.S. National Register of Historic Places in 1991. Mr. Butzer led a project team responsible for upgrading an existing 2-pipe fan coil system into a 4-pipe system to provide simultaneous heating and cooling and meet the climate and comfort needs of specific occupants. A new 4-pipe system, variable speed pumps and 3-way valves were provided in the basement to achieve integration of the new system into the existing. Construction had to be phased to allow installation of the new heating loop while the existing system remained in cooling operation; the new cooling loop would be installed once the building switched over to the new heating loop. Welding and soldering were not allowed so materials such as PEX, pressure-seal copper and mechanical joint steel piping were specified. A new Building Automation System with most of the communication occurring wirelessly was chosen to minimize disturbances to the historical architecture of the building.

Gestamp West Virginia, South Charleston, WV

Mr. Butzer led a design team that was tasked to provide a mechanical system to separate out, or divert hydraulic fluid collected along with chilled water released from immense, automobile component stamping machines. The design included an aboveground oil-water separator, density meters, 3-way valves, storage tanks and a controls system to monitor fluid flow and guarantee separation or storage of non-compliant sanitary discharges.

Rodney Pauley, AIA



Role

Project Architect

Professional Registrations

Registered Architect (WV)

Mr. Pauley is responsible for overseeing the daily design and production of the building, working in conjunction with in-house architectural, interiors and engineering staff to ensure the building not only meets the program requirements and budget, but meet the long-term needs of the owner. He also works directly with project principals to manage contracts, staffing and project deliverables. Mr. Pauley has a broad knowledge of building materials and services, building codes, and construction techniques, along with extensive experience in architectural detailing.

Mr. Pauley began his career in 1992 with an architectural firm in Atlanta, Georgia, and for the next 12 years rose to the Associate level by designing and managing a wide variety of project types including educational, retail, historic renovation, medical, and entertainment, specializing in office and speculative office design.

From 2005 through 2010, he worked at a number of Atlanta firms designing and managing office, high-rise condominium, and hotel projects. In 2010, Mr. Pauley moved back to Charleston, WV, to take a project management position with ZMM where he supervises the design and production of military, correctional and higher education projects.

Project Experience

Charleston Civic Center, Charleston, WV

Mr. Pauley served as project manager on the expansion and renovation to the Charleston Civic Center. The \$75M, 283,000 SF design-build project was completed as a collaboration with tvsdesign and BBL Carlton. The design commenced in the spring of 2015, and construction is scheduled and completed in the fall 2018.

Bridgemont Community and Technical College (Davis Hall, Building 704), Montgomery, WV Mr. Pauley is the project manager for a design team that is currently preparing construction documents for the renovation to an existing 7-story, 77,000 SF educational building. The project scope includes remediating several engineering and life safety deficiencies, as well as architectural improvements to the building envelope.

Education

Bachelor of Architecture, University of Tennessee, 1992

Associate of Science, West Virginia Institute of Technology, 1986

Employment History

2010 - Present, Project Manager, ZMM

2008 - 2010, Project Manager, GA Firm

2006 - 2008, Project Manager, GA Firm

2005 - 2006, Sr. Project Architect, GA Firm

Jan 2005 - Aug. 2005, Project Architect, VA Firm

VA Firm

Civic Affiliations

- American Institute of Architects, Member

Bridgemont Community and Technical College - Master Plan, Montgomery, WV

As part of an effort to provide overall Master Plan services to Bridgemont CTC, ZMM worked with various stakeholders to develop a Master Plan for Bridgemont's current and future facilities at the Tech Park. The Master Plan incorporated the need to develop a consistency between Bridgemont's Montgomery and South Charleston campuses, while also integrating the Bridgemont brand into the Park. The final design included planning for a new classroom and laboratory building adjacent to Building 704, across from the Advanced Technology Center. Signage, site circulation, parking, and campus amenities were also included in this planning process.

WVU Institute of Technology, Montgomery, WV

Mr. Pauley was the project manager responsible for owner coordination and construction document production for renovations to the Engineering Classroom Building at the WVU Institute of Technology campus in Montgomery, WV. The main project scope included various minor interior renovations to the existing 44,000 SF building in support of the Owner's replacement of the building's two elevators. Coordination was critical between ZMM, WVU, the owner's elevator supplier & installer and the WV Division of Labor.

WV Lottery Headquarters, Charleston, WV

Mr. Pauley is the project manager for a design team that is currently preparing construction documents for renovations to the existing WV Lottery Headquarters complex in Charleston, WV. Renovations to the existing 12-story office building include the demolition and reconstruction of three floors of tenant space and demolition and replacement of the existing roof along with various minor renovations throughout the office tower. The existing 5-story parking deck will undergo an extensive structural renovation, includes: replacing bearing pads, patch & repair of concrete members and the addition of waterproofing protection. The existing warehouse under the parking deck is being enlarged to provide additional storage space.

Sherman Junior High and High School, Seth, WV Mr. Pauley was the project manager responsible for owner coordination, design and construction document production for major renovations to the Sherman Junior High and High School in Seth, WV. The entire front of the building was renovated to improve both vehicular and pedestrian circulation while enhancing the entrances to both schools. Of the main road, a new, two lane bus loop was constructed along with a large parking area for 120 cars, separated from each other by a retaining wall with cable guardrail. Steps from the upper parking lot lead to two, new curved steel and brick canopies constructed to highlight the entrances to each school. On the interior of each school a new safe-school entrance was created along with renovations to each school's administrative area. At the rear of the building adjacent to the river, a new sanitary sewage treatment plant was installed replacing the larger existing unit.

Morgantown Readiness Center, Morgantown, WV Mr. Pauley was the project manager for the 58,000 square foot multi-use facility which includes assembly rooms, kitchen and dining facilities, military supply storage as well as locker rooms. The building is also designed to house the 249th Army Band and their associated practice and support spaces. This area is highlighted by a 150-seat auditorium and state-of-the-art main rehearsal stage. This project is aiming for LEED Silver Certification.

Edgewood Elementary School, Charleston, WV Mr. Pauley is the project manager for the design team that is currently developing a new 60,000 SF elementary school on Charleston's West Side. The school is being designed as a 21st Century Learning Environment, with a focus on integrating technology into the delivery of the curriculum. Instructional areas will be located off of an open 'exploratorium' that is being designed to function like a children's museum, providing a variety of learning opportunities, and flexible educational spaces. The school will also visibly integrate sustainable design principles to serve as a teaching tool for the students.

Beech Fork State Park, Lavalette, WV

Mr. Pauley was the project manager for new lodge and conference center at Beech Fork State Park. The facility will include guestrooms and other guest-only facilities in one area and public functions such as the restaurant, lounge, gift shop, and conference rooms in another area. All guestrooms offer a lake view, a 2-story atrium opens up each end of the lobby with curtain-wall glazing, and an indoor pool provides a

Michael J. White, PE



Role

Structural Engineer

Professional Registrations

Professional Engineer (WV, KY, IN, TN, OH, SC)

Mr. White has more than 10 years of Civil/Structural design and engineering experience. Project experience includes new construction and renovation work involving the design and analysis of reinforced concrete, wood, structural steel, masonry and cold formed steel.

Project Experience

WVDNR Forks of Coal
Milton PK School
Midland Trail High School
Valley Park Community Center
Marshall County Readiness Center

Other Jobs from Past Employers:

Monongalia County Justice Center - Morgantown, WV
Lewis Co. Judicial Annex - Weston, WV
Charleston Correctional Work Release Center - Charleston, WV
Stevens Correctional Facility - Welch, WV
Marsh Fork Elementary School - Naoma, WV
WVANG Camp Dawson, Multi-Purpose Building - Kingwood, WV
BridgeValley Advanced Technology Center - South Charleston, WV
New River Community and Technical College Headquarters Building - Beaver, WV
Lewisburg Elementary School - Lewisburg, WV
Rainelle Elementary School - Rainelle, WV
Boone County Honors Academy Addition - Madison, WV
WVU Parkersburg Center for Early Learning - Parkersburg, WV
WVU Parkersburg Applied Technologies Center - Parkersburg, WV

Education

B S , Civil Engineering, West Virginia University Institute of Technology, Montgomery, WV, 2006

Employment History

2016 - Present, Structural Engineer, ZMM
2016, Civil/Structural Lead, Jacobs Engineering Group
2013 - 2016, Structural Engineer, Chapman Technical Group
2010 - 2013, Structural Engineer/Project Manager, Moment Engineers
2007 - 2010, Structural Engineer/Project Manager, Advantage Group Engineers, Inc. (Cincinnati, OH)

Scot Casdorff, PE



Role

Electrical Engineer

Professional Registrations

Professional Engineer (WV)

Mr. Casdorff serves as an Electrical Engineer with ZMM providing electrical design services for a vast number of projects consisting of commercial, educational, correctional, institutional, and military facilities.

Mr. Casdorff is responsible for many facets of the project pertaining to electrical design such as interior and exterior lighting, power distribution, data system design, security, fire alarm, low voltage control systems, equipment specifications and performs electrical assessments during construction prior to the project's substantial completion date. Mr. Casdorff has participated on several LEED registered projects using energy conserving methods and utilizing lighting control systems and other means to meet or exceed ASHRAE 90.1, LEED, and energy code requirements.

Project Experience

Charleston Civic Center, Charleston, WV

Mr. Casdorff was the electrical engineer on the expansion and renovation to the Charleston Civic Center project. The \$75M, 283,000 SF design-build project is being completed as a collaboration with tvsdesign and BBL Carlton. The design commenced in the spring of 2015, and construction was complete in October 2018.

Joint Interagency Education and Training Center

(WVARNG), Kingwood, WV Mr. Casdorff was responsible for the electrical design of the 180,000 SF 3-story billeting/hotel expansion for the Army National Guard campus style facility for training and operational mission support. The expansion more than triples the facility size and increases the total capacity from 189 guest rooms to 600 guest rooms and suites. This project reached LEED Gold Certification.

Jackson County Armed Forces Reserve Center,

(WVARNG), Millwood, WV Mr. Casdorff was responsible for the electrical design of the 76,000 SF single story military reserve center which serves both the West Virginia Army National Guard and the United States Army Reserves (USAR) units. The multi-use facility provides educational spaces for classrooms, distance learning, physical training and a weapons

Education

Bachelor of Science, West Virginia
Institute of Technology, 1995

Employment History

2000 - Present, Electrical Engineer, ZMM
1995 - 2000 Electrical Controls Systems
Manager, WV Engineering Firm

simulation center. The project is targeted for LEED Silver Certification.

Glen Jean Armed Forces Reserve Center, (WVARNG), Glen Jean, WV Mr. Casdorff was responsible for the electrical design of the 102,000 SF military training facility which houses the Armed Forces Reserve Center (AFRC), Military Entrance Processing Station (MEPS), and an Organizational Maintenance Shop (OMS). The AFRC contains the administrative and training space for the 77th Brigade Troop Command, the 1863rd Transportation Company, and the 150th Armored Regiment Company. The MEPS houses their administrative, medical, headquarters, testing and storage functions at the facility. A comprehensive 8,500 SF OMS vehicle maintenance shop provides space for six large service workbays for maintaining the military fleet.

Southside Elementary and Huntington Middle School, Huntington, WV Mr. Casdorff was the electrical engineer on this 156,000 SF facility. This project encompasses all phases of construction; demolition, major renovation and new construction. The original historic 26,000 SF three story school building was preserved and the remaining less than adequate facility was strategically removed to accommodate the new addition. The existing facility was completely renovated and brought up to new construction standards to blend with the new addition. The project consisted of two distinct school facilities existing on the same piece of property. The new construction blends seamlessly with the older historic structure.

Gauley River Elementary School, Craigsville, WV

Mr. Casdorff was responsible for the electrical design of the new elementary school. The project is consolidating Beaver Elementary School and Craigsville Elementary School into a new 375-student school. The school houses 3 Pre-Kindergartens, 3 Kindergartens, 2 first grade, 12 1st-5th grade classrooms, activity room, cafeteria, kitchen, media center, and administration spaces.

Lincoln County High School, Hamlin, WV Mr. Casdorff was responsible for the electrical power distribution throughout the 216,000 SF facility containing high school classes, vocational education, technical community college classes and a community health clinic. The project was a 2007 AIA Honor Award Winner.

Milton Middle School, Milton, WV Mr. Casdorff was responsible for the electrical design of the new 96,000 SF facility housing 700 middle school students grades 6 through 8.

Fort Gay PK-8 School, Fort Gay, WV

Mr. Casdorff was the electrical engineer and was responsible for the electrical power distribution and design. The New Fort Gay PK-8 School replaces the existing facility that has been in disrepair and lacking the spaces and technology delivery system required for 21st century learning skills. The total enrollment for the school is 603 Students. The new grade configuration separates the Elementary students from the Middle School students, but still allows use of the common spaces within the building. They share the Dining Room, Gymnasium, Media Center and a Stage.

Southern WV Community & Technical College, Williamson WV Mr. Casdorff was responsible for the electrical power and lighting distribution design of this 22,000 SF higher education facility. This project is being designed to meet the USGBC LEED Silver.

West Virginia Research, Education, and Technology – Building 704, South Charleston, WV

Mr. Casdorff is the electrical engineer for building 704 and responsible for electrical power and lighting distribution. Building 704 had previously been utilized as a campus maintenance facility by Union Carbide and DOW Chemical. Bridgemont began utilizing the facilities for instruction in the Spring of 2011.

West Virginia Housing Development Fund Office, Charleston, WV Mr. Casdorff was responsible for the electrical design of the 37,000 SF office building which provides natural daylighting into its interior spaces coupled with an automatic dimming system and motorized shade controls. This 2-story administrative facility houses approximately 95 to 100 employees with a flexible open office floor plan utilizing modular under-floor wiring to accommodate any future modifications of the workspace with minimal disruption to the employees. The project is targeted for LEED Silver Certification.

FaLena Perry, CDT



Role

Construction Administrator

Professional Registrations

EIT

Mrs. Perry describes her role with ZMM as Construction Administrator as an exciting and invigorating opportunity with new experiences every day. From varying jobsite conditions to the differing professionals she encounters on a daily basis, Mrs. Perry approaches construction administration with a fresh set of eyes and desire to help provide the best outcomes possible for each project.

Mrs. Perry has nearly six years experience working as a Structural Engineer with two of those being a Project Manager. Structural engineering experience includes projects ranging from everything including \$135M university buildings down to residential homes and even historic restoration projects. Project variety includes Educational (K-12 and university), Commercial, Military, Office, Justice (Courthouses, Justice Centers, Police Department and Correctional), Multi-Use Residential, Civic (WWTP), Healthcare (Health Departments), Fitness (Gyms), Religious, Historic Restoration and an Arena. These projects are spread over Kentucky, West Virginia and Ohio.

Project Experience

Valley Park Community Center, Hurricane, WV

Mrs. Perry served as Construction Administrator on the new Community Center building and renovation at Valley Park. The \$15M construction project included a new community building, ball fields and a playground. Mrs. Perry was responsible for the administrative duties, performing on-site observations and tracking construction progress. Mrs. Perry collaborated with the client, design team and contractors to confirm that project guidelines are satisfactorily met. The facility reached completion in May 2018.

Ravenswood Middle School, Ravenswood, WV

Mrs. Perry is serving as Construction Administrator of the high school addition that will house the two-story Ravenswood Middle School making this the 20th facility in WV that will combine both high school and middle school students. This project is limited with available space as it is to fit into the existing high school footprint.

Midland Trail High School, Fayetteville, WV Mrs. Perry is serving as Construction Administrator of the six room high school addition that will include a STEM lab as well as other

Education

Bachelor of Science, Civil Engineering,
University of Kentucky, 2003

Masters of Science, Civil Engineering,
University of Kentucky, 2005

Employment History

2017 - Present, Construction
Administrator, ZMM

2009 - 2010, Design Engineer, Moment
Engineers, Charleston, WV

2004 - 2008, Engineer, Project Manager,
BFMJ Inc., Lexington, KY

2003 - 2004, Graduate Assistant,
University of Kentucky College of
Engineering

Civic Affiliations

- Project Coordinator, Forrest Burdette UMC, Family Life Center
- Sunday School Teacher for Young Professionals
- Cub Scout Den Leader Pack 236

classrooms. The large space planned for the STEM lab will encourage hands-on exploration, learning, and technology integration. This addition will address the under utilization of Midland Trail as well as Anstead Middle.

Project Experience Other Firms

University of Kentucky Biopharmacy Building, Lexington, KY

Mrs. Perry worked as team member in the design the new \$134M College of Pharmacy Biopharmacy research building. The research facility builds on the state's initiative to address health challenges and disparities in KY. The building featured expansive auditorium style classrooms and a self-supporting stair, of which Mrs. Perry modeled and designed.

Kentucky Transportation Cabinet, DOH, District Five Office Building, Louisville, KY

Mrs. Perry acted as the Project Manager for this new office space for the Department of Highways. This project consisted of concrete and steel structural members. Mrs. Perry coordinated design efforts with a team of engineers, architects and the owner.

Moses Residence, Huntington, WV

Mrs. Perry was responsible for the structural design of the Moses Residence which includes ICF walls, timber, steel and concrete. This home is a zero net energy home and has platinum LEED certification.



Large Chiller Cooling Plant Type System Evaluations/Design Experience

Charleston Coliseum and Convention Center - Charleston, WV

Design included (3) 1000 ton (N+1) centrifugal chillers, (2) induced draft, counterflow cooling towers, 150 ton dedicated heat recovery chiller, variable primary pumping, variable speed condenser water and cooling tower fans, 16°F Δ -T, 2-way "energy valve" control valves. Multiple systems were evaluated and energy modelling was performed to verify compliance with meeting the project energy saving requirements and to achieve the LEED credits from energy savings for LEED Certification.

Pavilion – Philadelphia, PA

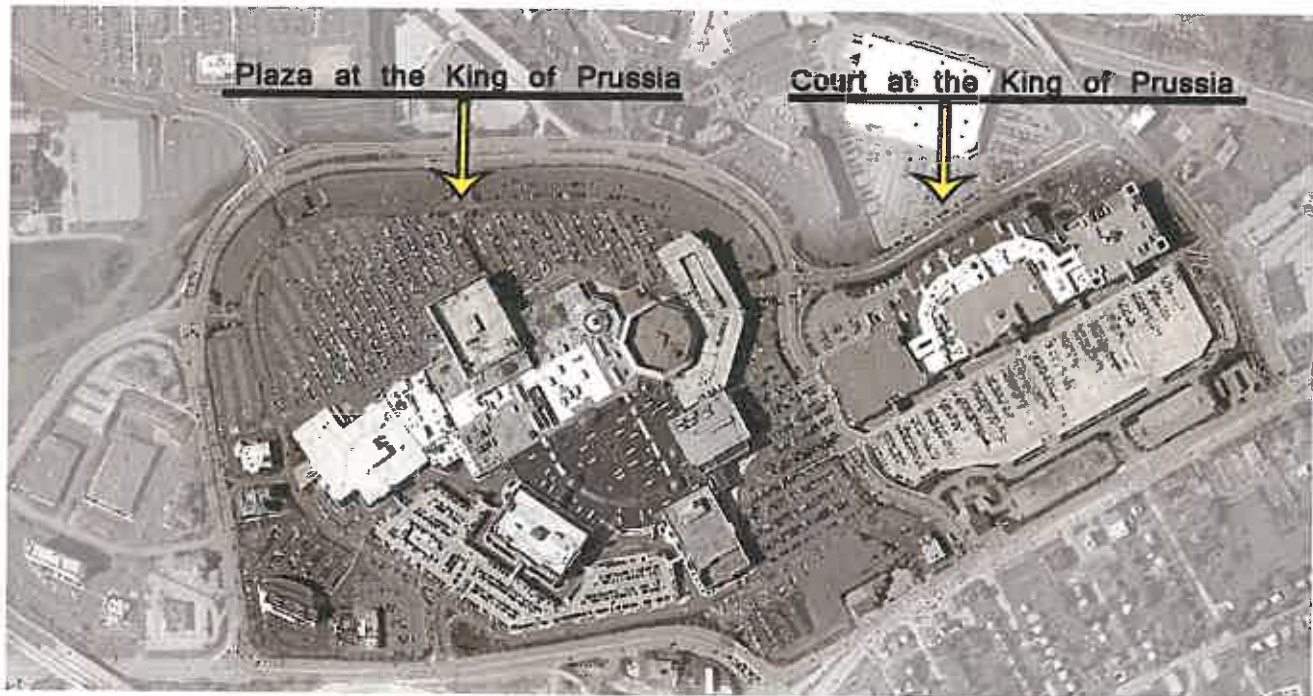
Analysis performed to investigate cost savings associated with changing from a purchased chilled water system to providing chilled water via owner controlled air-cooled chillers. Design included installation of (2) air-cooled chillers and a variable primary piping system. Owner realized cost savings immediately upon start-up.

ALPHA Technologies Data Center – Charleston, WV

This data center is located in the former Union Carbide world-wide data center in the WV Regional Technology Park. The design replaced the existing chillers with higher-efficiency chillers, provided a plate and frame heat exchanger for water side economizer, and provided a heat recovery chiller. Analysis of utility costs and energy savings calculated project payback from energy savings which was approximately 2 years.

The Court at King of Prussia – King of Prussia, PA

Analysis performed to investigate cost savings associated with changing from packaged DX to a chilled water system. Design removed 3000 tons of packaged DX rooftop equipment. Installed (3) 1000 ton chillers, variable primary piping, and chilled water air handling units.



King of Prussia Mall – King of Prussia, PA

Design included (3) 1250 ton centrifugal chillers and cooling towers. Primary/secondary chilled water pumping. An additional 1250 ton chiller was added after 10 years for mall expansion.

Hamilton Mall – Mays Landing, NJ

Design replaced the entire central plant. Started with a constant volume pumping system with 3-way control valves. Provided 2-way control valves and converted to a variable primary chiller, cooling tower and pumping arrangement.

United Bank Building – Charleston, WV

Started by designing the replacement an undersized cooling tower (78°F WB vs. 76°F WB design) which

Large Chiller Cooling Plant Type System Evaluations/Design Experience

Hamilton Mall – Mays Landing, NJ

Design replaced the entire central plant. Started with a constant volume pumping system with 3-way control valves. Provided 2-way control valves and converted to a variable primary chiller, cooling tower and pumping arrangement.



United Bank Building – Charleston, WV

Started by designing the replacement an undersized cooling tower (78°F WB vs. 76°F WB design) which allowed the existing chillers to operate for an additional 5-7 years. Additional design replaced the chillers with higher-efficiency chillers, and provided a plate and frame heat exchanger for water side economizer.

NGK Spark Plugs – Sissonville, WV

Design for a process cooling water system for critical manufacturing equipment. An open-air, underground concrete tank with variable speed vertical turbine pumps cycles the process water through a shell and tube heat exchanger and the process water system. The HEX is used to cool the process water using a closed loop, forced draft fluid cooler or an air-cooled chiller (OA temperature dependent).

Tug Valley Appalachian Regional Hospital – South Williamson, KY

Involved in the analysis of a proposed ice generation and storage system, reviewed utility rates and proposed energy savings.

K-12 Schools – WV

ZMM has designed the installation of multiple K-12 school projects across West Virginia with chilled water systems that include air-cooled chillers, water-cooled chillers, cooling towers and fluid coolers. ZMM has designed the installation of multiple Regional Jail and Juvenile Detention Center projects which have included diesel-fueled emergency power generators.



Generator System Evaluations/Design Experience

Charleston Coliseum and Convention Center - Charleston, WV

500 KW natural gas fired generator sizing included emergency power demands associated with Department of Homeland Security, Shelter-in-Place requirements for Federal Emergency Management. Analyzed generators as part of a CHP system as Owner was interested in providing on-site natural gas well production.

NGK Spark Plugs – Sissonville, WV

Designed systems to facilitate Owner installation of a 2000 KW natural-gas fired generator. Design also included analysis of combustion products and EPA/WVDEP regulations and permits. Generator is used as a test cell for natural gas spark plugs, all power produced is sold back to the utility. Investigated multiple options to recover waste heat (CHP) for use in plant heating and cooling.

I.R.S. Data Center – Martinsburg, WV

Design for emergency back-up power included generators, uninterruptible power supplies and battery back-up.

WV Army National Guard – WV

ZMM has designed the installation of multiple WVARNG projects which have included diesel fuel, emergency power generators. Readiness Center locations include Logan Readiness Center, Morgantown Readiness Center, Jackson County AFRC and Glen Jean AFRC.



WV Regional Jails and Juvenile Detention Centers – WV

ZMM has designed the installation of multiple Regional Jail and Juvenile Detention Center projects which have included diesel-fueled emergency power generators.



Charleston Coliseum & Convention Center (2015) – Replace entire MEP infrastructure three 1,000 ton chillers and cooling towers, three 8,000 mbh gas condensing boilers, approximately ten VAV AHU's, approximately 10 large single zone VAV AHU's.

Charleston Kanawha Health Department (2015) – Replace entire mechanical system to include air cooled chiller, gas fired make-up unit and zone fan coils with electric reheat, approximately 45,000 SF new DDC controls.

United Bank Building – Cooling Tower Replacement (2010) – Two 400 ton centrifugal chillers, rebuild two large VAV AHU's, installed free cooling plate frame heat exchangers (2015).

Kanawha County Public Library (2015) – Replaced two gas-fired boilers with new gas condensing boilers .

Building 5 Capital Complex (2008) – Replaced 10th floor office space air condition, replaced perimeter induction units with new steam chilled water air handling units, distributed VAV terminal units with modification to architectural fit out approximately 22,000 Sf. Installed new sprinkler service entrance for Buildings 5, 6, and 7.

Capitol Complex Building 5, 7th, 8th, & 9th Floors – Rebuild perimeter induction system and interior multi-zone distribution in addition to total architectural fit up, approximately 70,000 SF.

Capitol Complex Building 6, 3rd, 4th, & 5th Floors - Rebuild perimeter induction system and interior multi-zone distribution in addition to total architectural fit up, approximately 70,000 SF.

WV Lottery Headquarters Building (2014 - 2015) – Installed 40,000 SF of new variable refrigerant system, new make-up air system, comprehensive architectural services.

WV State Capitol Cafeteria – Installation of large catering and service kitchen, included steam make-up air system, 3 Class 1 kitchen hoods, Class 2 kitchen hoods, all plumbing system, sprinkler system including sprinkler service entrance for entire Capitol Buildings, comprehensive architectural services.

Additional Relevant Experience



Old Kanawha Valley Bank Building (2003) - New cooling chiller.
(2015) - New cooling tower.

City Center East (2008) Chiller Replacement.

Tenant Fit-Up Numerous Office Buildings Charleston – BB&T Building, City Center East, United National Bank Building, Hunting National Bank Building to include VAV distribution, electrical and architectural services.

Additional HVAC Projects:

Huntington Herald Dispatch - HVAC Study
Walker Machinery Main Office Renovation - HVAC
Walker Diamond Office - HVAC
Walker Machinery - HVAC Renovations
State of WV – Governor’s Mansion Corrective HVAC Study
Camp Dawson Regional Training Institute - HVAC
Central Regional Jail – HVAC and Roof Replacement
King of Prussia, PA – HVAC Design (Multiple Projects)
Kanawha Valley Senior Services - HVAC
Tolsia High School - HVAC Renovations
Cabell County Schools – (Multiple HVAC Projects)
Cabell County Career & Technical Center - HVAC Replacement
Cabell County Incubator School - HVAC
Harrisville Elementary School - HVAC
Ritchie County HS/MS - Cooling Tower Replacement
Spring Hill Elementary School - HVAC
Roane-Jackson Career & Technical Center
Salt Rock Elementary School - HVAC Renovation
Wayne County Schools – New HVAC System Projects
Greenbrier County Schools – New HVAC System Projects
Huntington High School
Cabell-Midland High School





The Plaza at King of Prussia

Multiple HVAC Replacements

COST:
\$30M

COMPLETION:
2006

CONTACT:
Mr. Mickey McLaughlin
Director
Plaza Mall Management
160 North Gulph Road
King of Prussia, PA
19406
610.337.9272



The Plaza at King of Prussia - Philadelphia, Pennsylvania

MP Services – Design Build

- 2,500,000 SF, 4,000-Ton Chilled Water Plant, VAV and CV
- Air Handling System
- Existing and New Spaces

The Court at King of Prussia - Philadelphia, Pennsylvania

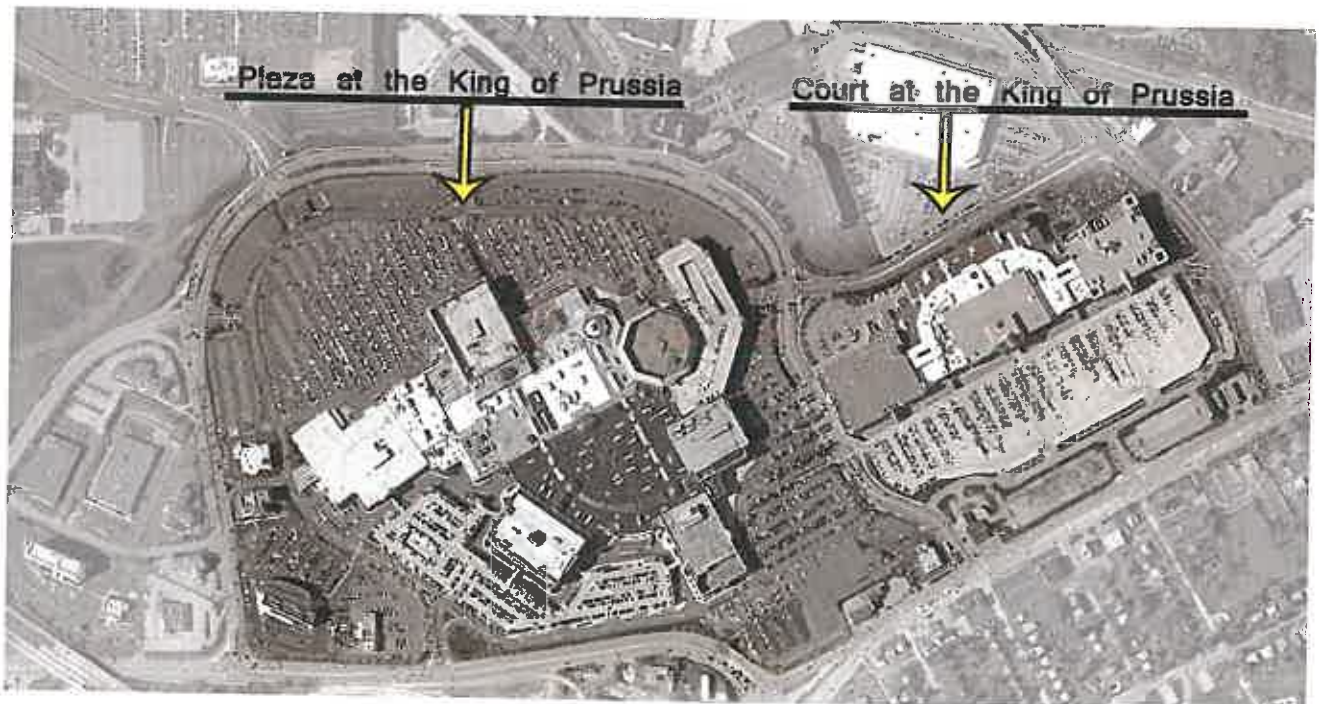
MEP Services

- Addition of a 3,000-Ton Chilled Water Plant Including
- New Structure and Replacement of All Air Handling Units
- Primary and Secondary Variable Chilled Water System

The Plaza at King of Prussia - Philadelphia, Pennsylvania

MEP Services

- Addition of 800-Tons of Chilled Water Air Handlers Units
- Addition - 150,000 SF and New VS 1,250 Ton Chiller
- 5,000 Ton CHW Plant Primary Secondary Pumping



Charleston Coliseum & Convention Center



LOCATION:
Charleston, WV

SIZE:
283,000 SF

COMPLETION:
Est. 2018

COST:
\$75M

CONTACT:
John Robertson, Director
200 Civic Center Drive
Charleston, WV 25301
304.345.1500



The Charleston Coliseum and Convention Center (formerly named Charleston Civic Center) Expansion and Renovation is a transformational project for both the city of Charleston and West Virginia. Our team was influenced by the strong authentic character of Charleston to remake the Charleston Civic Center into a more efficient, more sustainable, more dynamic and a more iconic best-in-class destination.

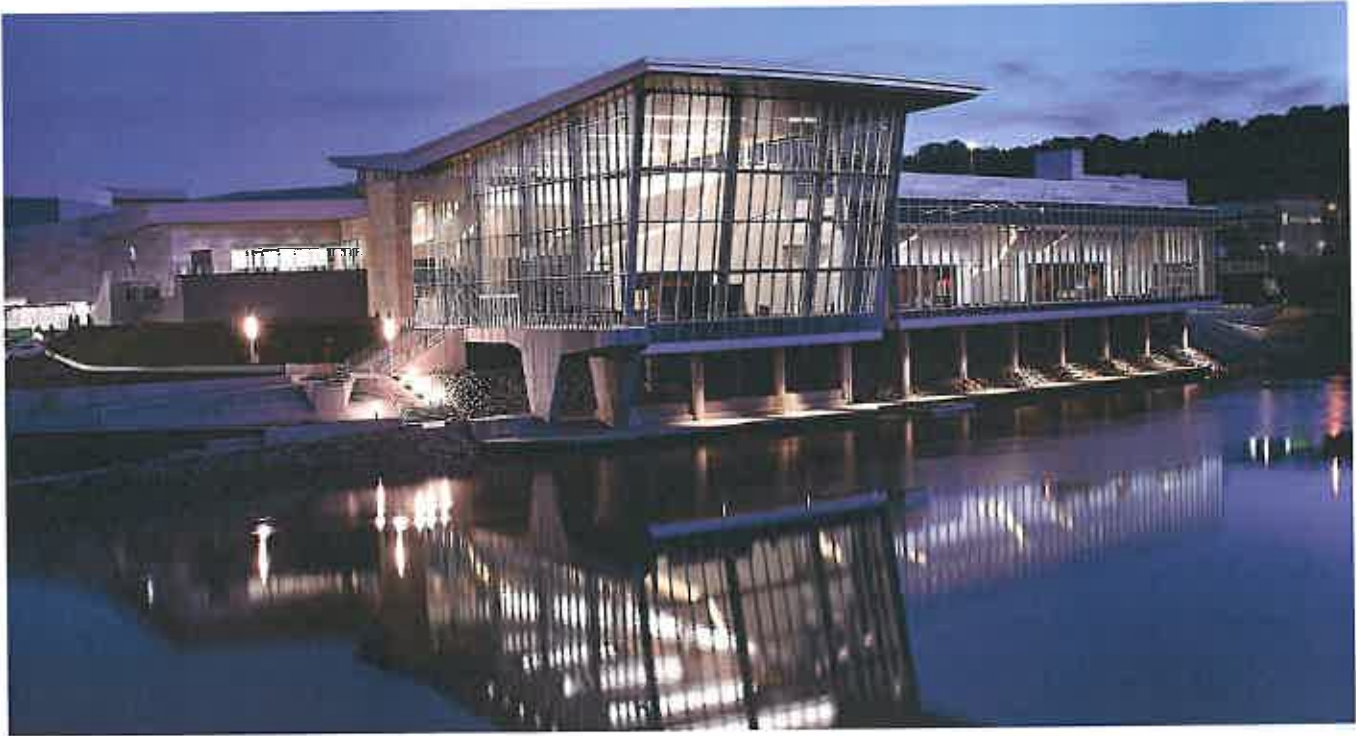


The design of the expansion and renovation of the Charleston Coliseum & Convention Center is inspired by the story of West Virginia. Defined by a rugged landscape, the early history of the state was dominated by extractive industries -- salt, coal, timber, trapping. This set the local character. With a foundation rich in resources, manufacturing added value to the raw materials with crafts like glass making and industries like chemicals and energy. This attracted a rich diversity of immigrants and a culture of craftsmanship that set the urban character. The economy is shifting from industry and service to information and technology. Again, the landscape and industry that shaped the region gives Charleston real advantages to exploit. The Creative Class, critical for the information and technology age, can live and work anywhere - what they want is access to the outdoors; real places with real character; and continuous education and entertainment.

Our design starts with an organizational concept inspired by this history. The Kanawha River is the social organizing link throughout the region, with settlement zones developing on whatever flatland the river provided --creating nodes of activities among the hills and valleys.



Charleston Coliseum & Convention Center



The renovated facility is a building that emerges from this iconic landscape, with the architecture and topography working together. The Coliseum & Convention Center also has distinct active nodes to celebrate each activity; arena, convention, and banquet, and these nodes are connected like the hills and cut rock faces that are seen throughout the state as people work to connect to each other through the landscape.

The first critical design objective was to create separate entries and identities for the arena and convention center. This allows for simultaneous events and clarity of use. For the convention center to thrive, it needs a real ballroom assembly space. Located overlooking the Elk River, the new ballroom pre-function space is the most dramatic feature of the center. Together, the three glass enclosed nodes --arena lobby, convention lobby, ballroom --define a unique Charleston event campus. As described above, the spaces that connect these nodes are inspired by the hills and cut rock faces that connect the towns along the Kanawha River. With the building emerging from the landscape and expressed as cut rock walls, the connecting areas are designed to be expressive and economical backdrops to the glass boxed nodes.

While the expansion transforms the southeast to the middle of the northern zone of the site, the existing building mass still dominates a portion of the northern and eastern campus. The dominant expression along these existing facades is the landscaped berms. As we imagined the new building expression emerging from the landscape, a strategy developed to transform these berms to reflect, at the pedestrian level, the overall design theme. Above the level of the berms, the new concourse level windows will open up the facade and provide a much needed break in the massing. The upper part of the arena was painted in two tones to match the new building, playing off the different faces. The north, south, east and west faces painted a lighter shade; and the northeast, southeast, southwest and northwest faces a darker shade. Dramatic exterior color-changing lighting on the northeast, southeast, southwest and northwest faces transform the look and feel of the center into a fun and festive landmark.



Robert C. Byrd Regional Training Institute

WVARNG

LOCATION:
Kingwood, WV

SIZE:
148,066 SF

COST:
\$21M

COMPLETION:
2002

CONTACT:
MAJ Dan Clevenger
WVARNG
1707 Coonskin Drive
Charleston, WV 25311
304.561.6539



The Regional Training Institute at Camp Dawson is a new 148,066 square foot facility that will provide a setting for a variety of training classes, meetings, and conferences serving both military and civilian populations from the region and areas throughout the country. The facility includes classrooms, library, sleeping rooms, dining room, auditorium, swimming pool, Post Exchange and snack bar.

The Training Institute has a 400 Ton primary/secondary variable flow chiller water system, and an 8,800 MBH primary variable flow hot water system. The hot water system serves variable and constant value air handling units, fan coils, the swimming pool conditioner, and make up air units.



State Office Buildings 5,6, & 7



LOCATION:
Charleston, WV

COMPLETION:
On-Going

CONTACT:
Greg Melton
Director of General
Services
Capitol Complex Building
Building 1, Room MB-60
1900 Kanawha Blvd., E.
Charleston, WV 25305
304.558.2317



More than forty (40) years ago, ZMM (as Zando, Martin, and Milstead) designed the original State Office Buildings 5, 6, & 7. Over the last several years, ZMM has been assisting the State of West Virginia General Services with various improvements to the buildings. These improvements have ranged from substantial renovations to maintenance and repair type projects, and include:

Roof Replacement

ZMM assisted the General Services Division with a roof replacement for all three buildings. The roof replacement utilized a white EPDM roofing material, with consideration being given to sustainability. The existing ballast, roof membrane, and rigid insulation were also salvaged as part of the roof replacement project. Several unused mechanical penthouses, antennas, and other abandoned equipment was also removed.

Electrical Courtyard Improvements

ZMM assisted the General Services Division with a project to expand the electrical courtyard adjacent to Building 7, and simultaneously improve the electrical service entry to buildings 5, 6, & 7. This project required both historical (matching the existing granite panels), as well as very technical electrical engineering design considerations.

Door and Window Replacement

ZMM has assisted with two separate projects, one to replace the windows in Buildings 5 & 6, and the second the replace the doors at the entries to Buildings 5, 6, & 7. These projects included building envelope and security considerations. The projects were designed and staged to minimize disturbance to the buildings occupants.

State Office Buildings 5,6, & 7

Major Renovations

ZMM provided design services for the renovation of the 10th Floor of Building 5 for the Office of Technology - a project that was recognized with a design award from the West Virginia Chapter of the American Institute of Architects. The project focused on demonstrating the potential that exists in State Office Buildings 5 & 6 if the floors are renovated in a more contemporary manner that moves the open office spaces to the perimeter, and pulls the offices adjacent to the building core. The project also involved close coordination with the State Fire Marshal, the introduction of a new sprinkler service and fire pump into the building, demolition, construction management, and hazardous material abatement. The project was delivered considerably under the anticipated project budget. ZMM has also assisted on renovations to the 8th Floor of Building 6 for the Department of Education and the 2nd, 3rd & 4th Floors of Building 6 for the Department of Education and Division of Personnel. Work on the 8th Floor of Building 6 is the only additional renovation constructed to date. ZMM has recently been released to provide design services for Floor 7, 8 & 9 of Building 5 and the 7th Floor of Building 6.



Caulk Replacement

ZMM provided design services to remove and replace all of the caulk located between the limestone and precast panels on the exterior of Buildings 5, 6, & 7. The project also included cleaning of the building's exterior along with some repair work. The project was coordinated with the Capitol Building Commission, although to date, the construction for this improvement has not commenced.

Valve Replacement

ZMM assisted with a valve replacement project to isolate mechanical risers in Building 5 & 6. This technically intensive mechanical project will give the General Services Division greater control over the system, and will help isolate various risers in the event of significant system failures in the future.

NGK Spark Plugs (U.S.A) Production Facility



LOCATION:
Sissonville, WV

SIZE:
80,000 SF

OWNER:
Mr. Dilip Shah
One NGK Drive
Sissonville, WV 25320
304.988.0060



A manufacturing facility for automobile oxygen sensors, this plant contains 80,000 square feet of production/ assembly area. The building includes management and administration offices, conference rooms, computer room, employee cafeteria, testing / quality control area, and a shipping / receiving area. The site provides parking for 250, extensive landscaping, and ample space for future expansion.



The building consists of a steel frame (for quick erection) and masonry exterior walls, concrete floor slabs, and acoustical ceilings in most areas. ZMM's services included the integration of process piping into the buildings' HVAC systems for energy recovery and conservation, and provisions for process / assembly line utility services (power, process water, and ventilation).

Due to the success of the first phase of the project, ZMM is currently assisting NGK with additional growth at their campus in Sissonville.



Glen Jean Armed Forces Reserve Center WVARNG



LOCATION:
Glen Jean, WV

SIZE:
110,000 SF

COST:
\$17M

COMPLETION:
2004

CONTACT:
MAJ Dan Clevenger
WVARNG
1707 Coonskin Drive
Charleston, WV 25311
304.561.6446



The Glen Jean Armed Forces Center contains three distinct military functions: a facility for routine maintenance of over-the-road and tracked military vehicles, an armory housing four West Virginia National Guard units, and the Southern West Virginia Military Entrance Processing Station, where new recruits officially enter the military system.

The brick exterior walls are highlighted with limestone and metal trim accents. A large assembly hall, plus classroom and training space, enhance the ability of the armory building to provide training for military personnel to provide space for community functions.



Logan-Mingo Readiness Center

WVARNG



LOCATION:
Holden, WV

SIZE:
54,000 SF

COMPLETION:
2015

COST:
\$12M

CONTACT:
MAJ Dan Clevenger
WVARNG
1707 Coonskin Drive
Charleston, WV 25311
304.561.6446

AWARD:
2017 AIA Merit Award,
West Virginia Chapter,
Achievement in Architecture
in Sustainable Design



The design of the Logan-Mingo Readiness center was developed by examining both the program and building site, and developing strategies to design a facility that is functional, responds to site, security, and aesthetic parameters, while requiring minimal maintenance.

The building layout was developed by working closely with the end-users to determine the appropriate configuration of building spaces to maximize the efficiency of the operations, and to respond to the unique missions of the 150th Armored Reconnaissance Squadron and the 156th Military Police (LNO) Detachment. Clear separation of "public" and "private" areas within the facility, unique office configurations related to training requirements, and the addition of State Funded additional spaces.

The exterior (and in many cases the interior) aesthetic of the facility was driven by the location of the Readiness Center within an industrial park on a reclaimed surface mined site. The decision led to the use of reinforced cast-in-place retaining walls that became both a functional and visual focus. Similar pre-cast walls are used to anchor the facility at the Distance Learning Center, while a cast-in-place retaining wall serves as a part of the Anti-Terrorism/Force Protection design.



Morgantown Readiness Center

WVARNG



LOCATION:
Morgantown, WV

SIZE:
54,000 SF

COMPLETION:
2013

COST:
\$18.5M

CONTACT:
MAJ Dan Clevenger
WVARNG
1707 Coonskin Drive
Charleston, WV 25311
304.561.6446



The Morgantown Readiness Center is a unique military facility for several reasons. While the Readiness Center supports traditional military functions including the 1-201st Field Artillery, a significant portion of the Morgantown Readiness Center supports the 249th Army Band. To support the band, the Readiness Center contains a performance hall, pre-function spaces, as well as a variety of training and rehearsal areas.

To efficiently create the stage and performance area the design team utilized a variety of dual function spaces. The stage is actually a large rehearsal space with an adjacent elevated recording area. Two large operable partitions are used – one to separate the rehearsal area from the remainder of the stage and the auditorium – while the other separates the auditorium from the Drill Hall. This configuration allowed the design team to maximize the West Virginia Army National Guard's investment by utilizing federally authorized space to also function as a large performance area. Acoustically, this challenge was met by creating a Drill Hall with an irregular shape that was contained within a rectilinear sloped barrel arch form. The geometry was complimented by acoustically engineered interior surfaces and finishes to create a vibrant and rich auditorium.

The facility is also unique due to its location on an abandoned airport runway at the Morgantown Municipal Airport. The 54,000 SF Readiness Center occupies a 35 acre tract at the airport. Additionally, the Readiness Center is located approximately twenty (20) miles from Camp Dawson, a large State and Federal training campus. As troops will often be travelling to Camp Dawson through the Morgantown Readiness Center, the facility needed to function as a 'gateway.'

Morgantown Readiness Center

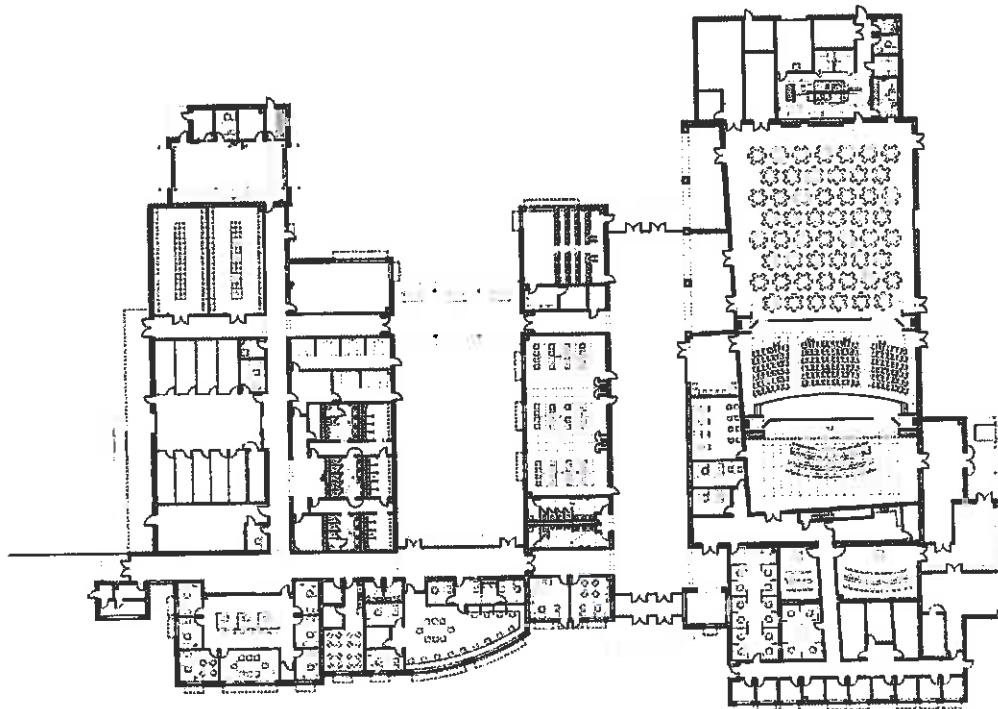
WVARNG



The creation of a 'gateway' facility was accomplished through exterior material choices (compatible with Camp Dawson), as well as the decision to utilize a tower-like feature to mark entry – a very prominent feature of the Regional Training Institute (RTI) at Camp Dawson. Where the RTI utilized a large cylindrical mass, the tower at the Morgantown Readiness Center respects the context of the former runway by reflecting the aesthetic of an airport control tower.

The Morgantown Readiness Center is also a sustainable building, and is in the process of pursuing LEED Certification from the USGBC. The 'U' shaped layout of the facility improves access to daylighting and views, while also limiting public access to the Guard's administrative and storage areas. Additional sustainable features include a reflective roof, the use of regional materials, and efficient lighting and HVAC systems.

While many features are addressed in the design of the Morgantown Readiness Center, the final result is a harmonious composition that reflects both its function and the environment, while deferring to its location on an abandoned runway.



Correctional Facilities

West Virginia Regional Jails



In 1990, the West Virginia Regional Jail and Correctional Facility Authority awarded the joint-venture team of ZMM/CRA a contract to design a prototype detention facility with the flexibility to meet the long range needs of 10 geographical regions in the State of West Virginia. The prototype building was designed as a 200 bed, 300 bed and 400 bed facility with the ability to add a 100 bed housing pod to each. All services required by the building were designed to accommodate the maximum population.

Unique to the design of the prototype jail is the ability of the staff to fully monitor all inmate movement within the corridor system of the building from a single central control location. The following systems were designed and installed: integrated security and PA system, closed circuit television, fire alarm system, door access control integrated with security system, cable television and perimeter security system.

ZMM Architects and Engineers also has significant experience renovating operational jails and correctional facilities, and has worked on previous successful renovation projects to the West Virginia Regional Jails. Below, please find a description of our experience providing design and construction phase services on operational West Virginia Regional Jail facilities:

Replacement of Existing Fire Alarm Systems – Central Regional Jail, Southern Regional Jail

The technology for Fire Alarm Systems changes rapidly and eventually spare parts for Fire Alarm Control Panels are no longer available. After the Central Regional Jail called a manufacturer for replacement parts and was told that their only option was to call E-Bay, ZMM was hired to prepare bid documents for replacement of the existing Fire Alarm System.

Correctional Facilities

West Virginia Regional Jails



We met with the West Virginia State Fire Marshal (WVSFMO) to develop an acceptable strategy: the operation of the Fire Alarm System was critical to the Life Safety of the facility so the Contractor was not to remove anything that could not be replaced and made operational by the end of the work day. If this was not possible, then the Contractor was required to notify the facility, which would then provide personnel to maintain a Fire Watch for any unprotected area. The cost of the Fire Watch was included in the Contractor's bid.

Addition of Auger Pit - Southern Regional Jail, Southwestern Regional Jail, and Northern Regional Jail and Correctional Facility (under construction)

Augers or Rotating Bar Screens were included in Regional Jail Projects when required by Sanitary Boards or Public Service Districts. They were omitted for budgetary reasons if not required. The purpose of the augers is to remove floating plastic debris such as candy wrappers, which can foul components in Sewage Treatment Plants, and deposit them in dumpsters. Eventually, augers were required by PSDs serving SRJ and SWRJ, so they were arranged as a single project to reduce costs. ZMM met with PSDs to obtain approval for the installation and also refuse haulers, public and private, so that the layout would accommodate front-loading trucks. The siting for the precast concrete Pits, roughly 20' x 8' x 10' deep, was complicated, because paved access, security, and intercepting the existing gravity sanitary sewer system were required.

Replacement of Roof and HVAC Systems – Central Regional Jail, Southern Regional Jail, Northern Regional Jail and Correctional Facility, Southwestern Regional Jail (under construction)

As the Jail Facilities aged, the RJA provided funding to replace roofs and rooftop HVAC systems.

Ballasted membrane roofing systems were replaced with the same type system in order to minimize disturbance of facility operation. Ballast was shifted and roofing replaced in sections, so that roofing integrity could be maintained.

HVAC systems for the facilities are gas-fired Rooftop Units with Direct Expansion (DX) cooling and heating only indoor Air handling Units for the cells. Adapter curbs were used on top of existing Rooftop Unit curbs, so that different brands of equipment could be bid and accommodated without modification of existing precast concrete construction. Contractors were required to have systems operational at the end of the workday. HVAC Replacement included upgrades not available when the facilities were built: Environmentally friendly 410A refrigerant for cooling; Hot Gas Reheat Dehumidification for better humidity control, and Carbon Monoxide Sensors for areas with gas-fired appliances.

Drinking Fountain Replacement – Central Regional Jail and South Central Regional Jail

Dayroom Drinking Fountains in the first four Jail Facilities built were commercial grade floor mounted type with electric water heaters. These units did not withstand inmate abuse and the water heater temperature was not adjustable down to a temperature that would not scald. ZMM worked with a security plumbing fixture manufacturer to put together a wall mounted stainless steel fixture with acceptable temperature controls. We surveyed each facility to ensure that existing utility rough-ins would serve or could be adapted to serve the new fixtures and be covered and secured when new fountains were installed.

Correctional Facilities

West Virginia Regional Jails

CCTV Camera and Security Audio Recording Systems – Tygart Valley Regional Jail (in Bid Phase)

These systems were required to document Correctional Officer/inmate interaction as evidence in potential legal actions. ZMM worked with Com-Tec, the Security and Detention Systems Contractor on all the Regional Jails, to develop a digital recording system for all Audio Security System Communications in Block, Medical, and Central Control Rooms. Approximately 150 closed circuit camera will be installed in the facility to record video digitally. The Audio and Video files will be archived regularly and available for legal disputes. The digital archive will also be downloadable to RJA Central Offices in Charleston.

New Vehicle Gate – South Central Regional Jail

The existing vehicle entrance gate was upgraded to more secure type entrance gate. The new gate has remove type call buttons that can be accessed from a vehicle window. A system of protective bollards was installed to provide more security at the gate.

Kitchen Flooring Replacement – Central Regional Jail, South Central Regional Jail, Southern Regional Jail

The existing kitchen floors were replaced with a seamless type resinous flooring system that provided a more slip and moisture resistant surface. The project was designed to minimize disturbance of the kitchens operation.

Gene Spadaro Juvenile Center

West Virginia Division of Juvenile Services



LOCATION:
Mount Hope, WV

COST:
\$4.8M

COMPLETION:
2004

CONTACT:
Denny Dodson
Deputy Director
WV - Division of Juvenile
Services
304.558.9800



The **Gene Spadaro Juvenile Center**, located in Mount Hope, Fayette County, proved that the prototype concept can be flexible enough to accommodate a dramatic variation in programming. The "softer" approach to this minimum-security facility anticipates program funding through federal IV-E regulations, and relies on staff involvement for security rather than bars and hardware. Innovative color schemes were used to simulating variety in the spaces.

Completed in 2004, the building is constructed of load-bearing masonry walls with brick and natural stone veneer. Lighting was carefully designed to supplement natural sunlight and ensure comfortable lighting levels. Staff-secured programming required even greater levels of observation, communication, and control. Sleeping quarters resemble a more institutional feel, educating the youth to look at their future and to stay away from delinquency and crime.

This juvenile facility won the 2005 Merit Award for *Achievement in Architecture* for American Institute of Architects, West Virginia Chapter.



Vicki V. Douglas Juvenile Center

West Virginia Division of Juvenile Services



LOCATION:
Martinsburg, WV

COST:
\$4.7M

COMPLETION:
July 2006

Contact:
Denny Dodson
Deputy Director
WV - Division of Juvenile
Services
304.558.9800



The Vicki V. Douglas Juvenile Center is a 23 bed co-ed, staff secure, juvenile detention center located in Martinsburg, West Virginia. The original Juvenile Center was enlarged and completely renovated by ZMM to provide a secure facility with additional capacity and services to meet the growing needs of the area. The original Juvenile Facility was quadrupled in size while leaving the original façade intact on two sides with the new addition wrapping around the remaining two sides.

ZMM provided multiple class rooms, recreation and common areas for educational, behavioral, training, counseling and life skills activities in the enlarged facility. These activities are able to be observed and monitored by staff from a central control area. The construction of the new addition and renovation of the existing was phased to provide minimal interruptions with operation of the original facility.





St. Albans High School

Renovation and Addition

LOCATION:
St. Albans, WV

SIZE:
172,596 SF

COMPLETION:
2003

COST:
\$24M

CONTACT:
Dr. Ron Duerring
Superintendent
200 Elizabeth Street
Charleston, WV 25523
304.348.7732

AWARDS:
Impact on Learning Award
Effective Transformation

Education Design Showcase
Outstanding Building Design

American School & University
Outstanding Building Design



The renovation and additions include the razing of about 40% of the existing structure and the construction of the 124,000 SF of new facility. The scope of this extensive renovation included the replacement of the existing HVAC system, to include a new heating plant, a 500 ton chilled water plant, rooftop units and installation of one retrofitted high speed elevator.

Provisions for new and emerging technologies were greatly enhanced throughout the building. The new media center is the central hub for technology and with the inclusion of an appropriate infrastructure, providing flexibility needed for the technology of the future.



References

Greg Melton, Director of General Services

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MAJ Dan Clevenger

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