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

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

Proc Folder: 435826

Doc Description: EOI: Capitol Bldg Fire Protection and Sprinkler Design

Proc Type: Central Purchase Order

Date Issued	Solicitation Closes	Solicitation No	Version
2018-03-30	2018-04-26 13:30:00	CEOI 0211 GSD1800000003	1

BID RECEIVING LOCATION

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

VENDOR

Vendor Name, Address and Telephone Number:

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

04/26/18 12:20:49
WV Purchasing Division

FOR INFORMATION CONTACT THE BUYER

Linda B Harper
(304) 558-0468
linda.b.harper@wv.gov

Signature X ADRW **FEIN #** 55-0676608 **DATE** 4-25-2018

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

Purchasing Division
2019 Washington Street East
Post Office Box 50130
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Signature X [signature] **FEIN #** 55-0676608 **DATE** 4-25-2018

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.

AdRK, PRINCIPAL
(Name, Title)
Adam R. Krason, AIA, LEED AP, Principal
(Printed Name and Title)
222 Lee Street, W., 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contained herein; that this bid, offer or proposal constitutes an offer to the State that cannot be unilaterally withdrawn; that the product or service proposed meets the mandatory requirements contained in the Solicitation for that product or service, unless otherwise stated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., Architects and Engineers
(Company)
AdRK, PRINCIPAL
(Authorized Signature) (Representative Name, Title)
Adam R. Krason, AIA, LEED AP, Principal
(Printed Name and Title of Authorized Representative)
4-25-2018
(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)

[X]	Addendum No. 1	[ ]	Addendum No. 6
[ ]	Addendum No. 2	[ ]	Addendum No. 7
[ ]	Addendum No. 3	[ ]	Addendum No. 8
[ ]	Addendum No. 4	[ ]	Addendum No. 9
[ ]	Addendum No. 5	[ ]	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., Architects and Engineers
Company

Authorized Signature

April 25, 2018
Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.
Revised 6/8/2012

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 OTHER 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., Architects and Engineers

Authorized Signature: _____ Date: 4-25-2018

State of West Virginia

County of Kanawha, to-wit:

Taken, subscribed, and sworn to before me this 25th day of April, 2018.

My Commission expires 10-6, 2018.

AFFIX SEAL HERE

OFFICIAL SEAL
STATE OF WEST VIRGINIA
NOTARY PUBLIC
Lisa E. Bowles
ZMM, Inc.
222 Lee St., W.
Charleston, WV 25302
My Commission Expires October 6, 2018

NOTARY PUBLIC _____

West Virginia Ethics Commission

Disclosure of Interested Parties to Contracts

(Required by *W. Va. Code* § 6D-1-2)

Contracting Business Entity: ZMM, Inc. **Address:** 222 Lee Street, West Charleston, WV 25302

Authorized Agent: Adam R. Krason **Address:** Same as Above

Contract Number: GSD1800000003 **Contract Description:** Capitol Bldg. Fire Protection & Sprinkler Design

Governmental agency awarding contract: General Services Div.

☐ **Check here if this is a Supplemental Disclosure**

List the Names of Interested Parties to the contract which are known or reasonably anticipated by the contracting business entity for each category below *(attach additional pages if necessary)*:

1. **Subcontractors or other entities performing work or service under the Contract**
   ☒ Check here if none, otherwise list entity/individual names below.

2. **Any person or entity who owns 25% or more of contracting entity (not applicable to publicly traded entities)**
   ☐ Check here if none, otherwise list entity/individual names below.
   ZMM, Inc., Architects and Engineers:
   Robert Doeffinger Adam R. Krason
   David E. Ferguson

3. **Any person or entity that facilitated, or negotiated the terms of, the applicable contract (excluding legal services related to the negotiation or drafting of the applicable contract)**
   ☒ Check here if none, otherwise list entity/individual names below.

Signature: ADRK **Date Signed:** April 25, 2018

Notary Verification

State of West Virginia, County of Kanawha:

I, ADAM R. KRASON, the authorized agent of the contracting business entity listed above, being duly sworn, acknowledge that the Disclosure herein is being made under oath and under the penalty of perjury.

Taken, sworn to and subscribed before me this 25th day of April, 2018.

Lisa E. Bowles
Notary Public's Signature

OFFICIAL SEAL
STATE OF WEST VIRGINIA
NOTARY PUBLIC
Lisa E. Bowles
ZMM, Inc.
222 Lee St, W.
Charleston, WV 25302
My Commission Expires October 6, 2018

To be completed by State Agency:

Date Received by State Agency: _____

Date submitted to Ethics Commission: _____

Governmental agency submitting Disclosure: _____

ZMM
ARCHITECTS
ENGINEERS

April 26, 2018

Linda B. Harper, Buyer Supervisor
State of West Virginia – Purchasing Division
2019 Washington Street East
Charleston, WV 25305

Subject: Expression of Interest for West Virginia State Capitol Building Fire Protection & Sprinkler Design: CEOI – GSD1800000003

Dear Ms. Harper:

ZMM Architects and Engineers is pleased to submit the attached information to demonstrate our team's experience and our qualifications to provide professional architecture and engineering services to develop a phased approach for fire protection and sprinkler design throughout the West Virginia State Capitol Building. Established in 1959, ZMM is a Charleston based, multi-discipline A/E firm, and is noted for design excellence and client focus. Our integrated design approach makes ZMM unique among design firms of our size, and our ability to provide comprehensive design services has made us a trusted resource for complex renovation projects in West Virginia.

ZMM has renovated buildings throughout the region, and has a history of providing services on improvement projects to many landmark buildings, including previous experience at the West Virginia State Capitol. This experience included the recent roofing project, as well as engineering for the Capitol Food Court – a project that involved providing a fire service line to the building. Additional experience working on West Virginia's landmark buildings includes projects at the Culture Center, the Charleston Civic Center, State Office Buildings 5, 6, &7, the Greenbrier, and the Clay Center. Many of these projects included improvements to the fire protection and sprinkler systems.

It is our understanding that the West Virginia State Capitol Building Fire Protection & Sprinkler Design project will be undertaken in two phases. The first phase will include an assessment, recommendations, and an estimate, while the second phase will involve a phased implementation of the recommended solutions. This approach is very similar to the strategy that ZMM Architects and Engineers and the General Services Division (GSD) employed on the improvements to State Office Buildings 5, 6, & 7. The project commenced with a detailed assessment, which resulted in the installation of the infrastructure that is being used to provide fire protection throughout the office towers.

Our team for this project will include the specialized expertise of nationally recognized fire protection and life safety consultants Howe Engineers. Howe Engineers focuses their practice on large scale projects, and Howe is the only fire protection engineering firm in the United States that requires all Project Managers and Principals to obtain Master's of Engineering Degrees in the field of Fire Protection Engineering as well to require a Professional Engineering Licensure. ZMM and Howe Engineers recently collaborated on the Charleston Civic Center Renovation and Expansion.

As mentioned above, Howe Engineers specializes in providing fire protection solutions for complex large scale structures. Specifically, Howe is proficient with the design, construction, inspection and testing requirements for public buildings and historic preservation projects, and has served as an active fire protection engineer/code consultant on the following projects:

- Providence State House, Providence, RI
- Faneuil Hall Quincy Market, Boston, MA
- Deerfield Academy Main School Building, Deerfield, MA
- Deerfield Academy Kendall Building, Deerfield, MA
- Deerfield Academy Arms Building, Deerfield, MA

222 Lee Street, West ▪ Charleston, West Virginia 25302
304.342.0159 office ▪ 304.345.8144 fax
zmm.com

- Harvard Stadium, Boston, MA
- Fenway Park, Boston, MA
- Salem City Hall, Salem, MA
- Gloucester City Hall, Gloucester, MA
- Dudley Square School Building, Boston, MA
- Science Park Apartments, New Haven, CT
- Rose Bowl, Pasadena, CA

In addition to Howe Engineers, ZMM's team for this engagement will also include Mike Gioulis, Historic Preservation Consultant. Mr. Gioulis has been active in Historic Preservation in West Virginia since 1977. He previously served as Historical Architect for the West Virginia Department (now Division) of Culture and History and as Assistant Director of the Historic Preservation Unit. ZMM Architects and Engineers and Mike Gioulis have partnered on a variety of recent restoration and rehabilitation projects including the adaptive reuse of the old Dupont Hotel into the mixed use commercial and residential Charleston EDGE project (completed for the City of Charleston), the rehabilitation of the Houston Company Store for the McDowell County EDA, as well as the replacement of roofing and copper gutters on the State Capitol Building.Thank you for taking the time to review the attached qualification information and project approach that has been formatted as requested in the EOI.

The ZMM team understands the importance that the West Virginia State Capitol Building as both a critical governmental facility and as a source of civic pride. It is with this understanding that we commit to undertaking this process with the intent of delivering solutions that will enhance the facility, while improving the life safety of building occupants. We appreciate your consideration for this important assignment, and look forward to working closely with the General Services Division to ensure the successful completion of the West Virginia State Capitol Building Fire Protection & Sprinkler Design project.

Respectfully submitted,

ZMM, Inc.

Adam R. Krason, AIA, NCARB, LEED-AP
Principal

Table of Contents

ZMM ARCHITECTS ENGINEERS

Project Approach: West Virginia State Capitol Building
Fire Protection & Sprinkler Design

What differentiates ZMM and Howe Engineers, Inc. from our competition is a combination of local and national project experience and specialized knowledge in the field of Fire Protection Engineering. Our team also understands the importance that the West Virginia State Capitol Building as both a critical governmental facility and as a source of civic pride – and will make every effort to recommend improvements that minimize the impact on the historic structure. ZMM and Howe have also recently collaborated on another complex large scale local project at the Charleston Civic Center, where improvements were made to accommodate an expansion, but also required a detailed analysis to support the phased implementation of the renovations and new construction. Howe's specialized knowledge in the field of fire protection is further documented on our Recent Projects list as well as the personal resumes of our proposed Fire Protection Principal, Andrew Newman, P.E. and Fire Protection Project Manager, Ben Muscente, P.E.

Below, please find a detailed outline of our approach and proposed scope. Please note that the final approach and scope will be coordinated with General Services Division leadership and other key stakeholders including the State Fire Marshall and the State Historic Preservation Office.

Documentation

The existing building will be thoroughly evaluated to analyze existing systems, components and overall life safety elements. This will begin with a review of the existing drawings, historic photography and past studies, including the original design drawings, as well as previous reports from the State Fire Marshall and BRIM. Field visits will be conducted to document any gaps in the information and to record the condition of the structure, components and finishes that will be analyzed as part of the complete fire protection approach. We will identify fire protection and code compliance needs and their impact on the overall project; review building code issues and limitations on reuse strategies; and, if appropriate, we will initiate preliminary discussions with local life safety officials to identify their concerns on use of existing spaces, life safety and egress requirements. At the same time, base drawings will be set up as a foundation from which to design.

ZMM Architects and Engineers and Howe Engineers will meet with the General Services Division leadership and staff to review the findings of the site observations, identify existing space usage and functional issues and conflicts, and revise the fire protection and code compliance program based on evolving user needs and the constraints of the existing space. Mike Gioulis, our team's historic preservation consultant will be involved from the commencement of the project in an effort to ensure that all proposed solutions are developed in a manner that respects the character defining elements of our state's most important civic structure.

Design

Once base drawings have been developed and programming issues have been identified, options for fire protection strategies will be examined. If required, alternative approaches to solving life safety issues will be developed utilizing the International Building Code Chapter 34, NFPA 101 Chapter 5, and the West Virginia State Fire Code. The objectives are to maximize the functionality in the building and develop solutions for fire protection design, fire alarm design, general code compliance and egress that do not unnecessarily compromise functions or key historic features of the building. Relative costs of the most workable options will also be considered, and an advantage/disadvantage matrix will be developed for discussion and approval of all stakeholders.

Historic preservation issues will be studied as they relate to the overall fire protection upgrade, including identification of damaged, missing design features and historic finishes that may be affected. As alternatives are developed, they will be evaluated for preservation impacts of alternative approaches to fire protection, egress and code compliance provisions.

The preliminary design alternatives will be reviewed with the leadership and key stakeholders, and a preferred approach will be selected for further development. As the architectural plan is being developed, opportunities and issues for the installation of modern building fire protection, fire alarm, and special hazard systems will be identified and discussed to identify the best approach. A conceptual site design will also be developed to address fire department access, hydrant locations, entrances and access to the fire command, parking and preliminary grading for accessibility. The implications to any proposed modifications to the historic structure and historic site features will be considered throughout the process.

Once all proposed fire protection and sprinkler design improvements have been identified and documented, the design team will work with an independent estimator to establish the cost of the proposed improvements. This information will be used to help develop a plan for implementation of the improvements, which may include phasing.

Work Products

The Phase I Study report will include assessments and improvement recommendations for:

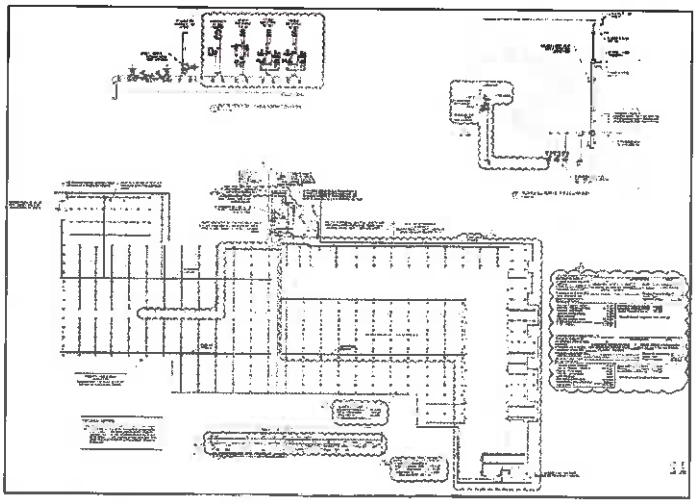
Site Requirements and Fire Department Access:

1. ZMM will lead design and implementation of the civil engineering design.
2. Howe Engineers to coordinate locations of hydrants, command center, control units, etc. as related to the overall fire protection approach.
3. Howe Engineers and ZMM to coordinate with local and state authorities regarding access and control points.

4. Mike Gioulis to review for any impact to historic site features.

Building Construction and Life Safety Drawing Requirements:

1. ZMM and Howe Engineers will complete a site observation to gather data on existing building code compliance and construction type.
    a. A complete summary report with findings will be produced and issued to leadership and key stakeholders for review.
2. If architectural plans do not exist, ZMM will model the West Virginia Capitol using building information modeling (BIM), specifically Revit.
3. Howe Engineers will develop a complete code compliance narrative addressing the following items:
    a. Applicable Codes and Standards
    b. Building Construction Type
    c. Occupancies
        i. Occupancy Classification
        ii. Occupancy Separations
        iii. Occupant Load
    d. Means of Egress Requirements
        i. Travel distances
        ii. Number of Exits
        iii. Occupant Load
        iv. Egress Capacity
        v. Egress Paths
        vi. Distribution of Exits
    e. Fire-Rated Construction Requirements
        i. Requirements for Fire Resistance Rated Elements
        ii. Opening Protection Requirements
    f. Interior Finishes
    g. Minimum Fire Protection Requirements, including:
        i. Required Fire Flow, Automatic Sprinkler and Standpipe Requirements
        ii. Required Fire Alarm, Detection and Notification Systems
        iii. MEP System Features Related to Fire Protection
        iv. Smoke Control Requirements
    h. This includes identification of concepts of where smoke control will be provided. If required, the design will be addressed using comprehensive 3D Computational Fluid Dynamics Modeling.
    i. Discussion/Identification of possible variances, equivalencies, or items of interpretation required.
    j. Conclusions and Recommendations
4. ZMM and Howe Engineers will prepare Comprehensive Life Safety/Egress Drawings. Drawings will be updated to include:
    a. Travel distances
    b. Occupancies
    c. Occupant Loads
    d. Exit Capacities
    e. Fire Resistance Ratings
    f. Occupant Distributions
    g. Exit Paths
    h. General Code Compliance Information, etc.



Fire Detection, Alarm and Fire Protection Systems:

1. ZMM and Howe Engineers will develop working drawing level Fire Protection, Fire Alarm and Smoke Control drawings and specifications. These will include Hydraulic Calculations for Fire Protection Design and fire pump analysis, if required.

Emergency Power, Lighting and Exit Signage:

1. ZMM will lead electrical design and power system design (as needed).
2. Howe Engineers will assist in locating exit signage if additional exit signage will be provided as part of the project.

Estimating:

1. ZMM and Howe will work with an independent estimator to establish the cost of the proposed fire protection and sprinkler improvements. The estimate will include options to implement the project utilizing a phased approach.

Historic Preservation

1. Throughout the assessment, planning, and design process our team's historic preservation consultant (Mike Gioulis) will coordinate with the State Historic Preservation Office and the Capitol Building Commission to ensure that the final recommendations do not negatively impact the historic fabric of the West Virginia State Capitol Building.

Special Requirements:

1. Howe Engineers will develop performance-based fire protection engineering analysis based on NFPA 101 Life Safety Code and the West Virginia State Fire Code to address building design concept. This analysis will be included in the Fire Protection and Life Safety Narrative.
2. This analysis will determine what protection measures will be required to meet owner/stakeholder goals.

3. If/when required, this will include a complete 3D virtual reality timed egress model based on the Architectural Revit model.

4. A complete 3D Fire Model using Computational Fluid Dynamics will be created and at least 10 different fire scenarios will be analyzed. Results of the fire modeling will be compared to egress times to confirm whether adequate protection is provided with and without special hazard systems (smoke control, etc.).

5. All critical facilities and equipment will be identified and appropriate protection systems will be designed and incorporated into the fire protection and fire alarm design drawings above.

Implementation

Once the assessment, report, and planning is complete, ZMM and Howe Engineers will assist the state implement the improvements in a phased manner. ZMM Architects and Engineers familiarity with the West Virginia State Capitol has been developed though our participation on a variety of design efforts including the recent roof replacement as well as the engineering services provided for the Capitol Food Court, as well as the proximity of our team to the Capitol Complex, will be a benefit as the project implemented. Additionally, ZMM has previous experience working with the General Services Division to implement projects in a phased manner (as demonstrated on State Office Buildings 5, 6, & 7). Our team's combination of trusted local experts combined with the nation's leading fire protection experts will help ensure the success of this project for the General Services Division, and will help improve the safety of all occupants of the West Virginia State Capitol.

Firm Profile

ZMM
ARCHITECTS
ENGINEERS

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
ARCHITECTS
ENGINEERS

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

Firm Profile

HOWE ENGINEERS

LOCATION:
101 Longwater Circle
Suite 203
Norwell, MA

CONTACT:
Phone 781.878.3500

At Howe Engineers, we provide comprehensive Fire Protection Engineering and Code Compliance Strategies that are expertly tailored for our clients New and Existing construction projects. As a full service firm, we are adept at providing specialized solutions to a wide variety of clients including architects, owners, developers, engineers, municipalities, and contractors. We have a combined 100+ years of project and industry experience, especially with the design of large scale assembly projects such as convention centers, stadiums, arenas, and performing arts centers. We have a thorough understanding of complex design processes and work to exceed client expectations.

For any large-scale construction project, a sound Fire Protection Engineering and Code Compliance plan is *not* optional. Howe Engineers specializes in providing solutions to both Code and Fire Protection related issues. It ensures the safety and preservation of human life and property, results in a thorough understanding of the architectural solutions available, and allows for sound cost estimating.

What makes us different?

We set the bar high. In fact, so high that we have implemented our own quality assurance program. Howe Engineers is the only fire protection engineering firm in the United States that requires all Project Managers and Principals to obtain Master's of Engineering Degrees in the field of Fire Protection Engineering as well to require a Professional Engineering Licensure.

This assures that our project managers and principals have been trained at the highest levels and maintain professional licensure which only approximately 2,000 individuals have obtained worldwide.

Services

Howe Engineers is a full service Fire Protection Engineering and Code Consulting firm located in Massachusetts. With over 100 years of combined experience in the industry, we offer expert consultation and design solutions to a wide range of clients including Architects, Owners, Engineers, and Contractors.

Although we practice all areas of fire protection engineering, our strengths are in the following fields:

Fire Protection Engineering & Design

- Complete Automatic Sprinkler Design
- Fire Pump Design
- Prescriptive Fire Alarm Design

- Performance Based Fire Alarm Design
- Engineered Smoke Control System Design
- Structural Fire Resistance Rating Analysis
- Performance Based Design
- Special Hazards Review and Design

Analysis and Consultation

- Building and Fire Code Analysis
- Preparation and Presentation of Code Variances and Equivalencies
- Accessibility (ADA/Disability) Compliance Consultation
- Existing Building Review and Analysis
- Life Safety Evaluations
- Crowd Manager Training
- Peer Review
- Third Party Plan Review
- Expert Witness
- Special Hazards System Analysis

Cutting Edge Computer Modeling

- Comprehensive Computer Fire Modeling for Smoke Control
- Comprehensive Computer Heat Transfer Modeling for Fire Resistance Rating Designs
- Comprehensive Computer Timed Egress Modeling
- Performance Based Design
- Peer Review

Construction Administration, Inspection & Review

- Complete Construction Administration Services
- Special Inspections for Smoke Control Systems
- Construction Project Management for Life Safety Systems
- Certificate of Occupancy Testing and Expediting
- Life Safety Systems Commissioning

Firm Profile

MICHAEL GIOULIS
HISTORIC PRESERVATION CONSULTANT, INC

LOCATION:
614 Main Street
Sutton, WV 26601

CONTACT:
Phone 304.765.5716
Fax 304.765.5464
michaelgioulis.com

The firm of Michael Gioulis specializes in the preservation of historic structures and the preservation and interpretation of historic sites. Mr. Gioulis has been a historic preservation professional since 1977. Since 1984, he has been practicing as a private Historic Preservation Consultant dedicated to enhancing awareness of historic preservation through historically accurate restorations and rehabilitations of many prominent buildings in West Virginia and surrounding areas.

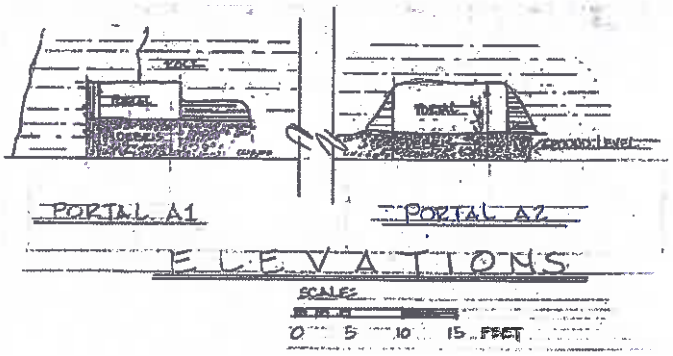
Since 1988, Mr. Gioulis has held a contract with the State of West Virginia as their Main Street West Virginia Design Contractor. Revitalization of commercial downtown buildings is the focus of the program emphasizing the preservation of historic integrity.

In conjunction with his work in historic preservation, Mr. Gioulis also offers services in the following areas: HABS/HAERS Reports, 106 Reviews, Feasibility Studies, Design Guidelines, Historic Preservation Certification Applications for tax credits, National Register Nominations, Historic Resource Surveys, and CAP Assessments.

Consulting with architects and property owners, Mr. Gioulis is also involved in several rehabilitation projects involving residential and commercial buildings. Preservation of historic fabric and character-defining elements of these extant buildings are the ingredients providing for their efficient, contemporary use within the community.

Services

- Preservation
- Planning
- Reports
- Rehabilitation



Charleston Civic Center Expansion and Renovation

ZMM ARCHITECTS ENGINEERS

HOWE ENGINEERS

LOCATION:
Charleston, WV

SIZE:
283,000 SF

COMPLETION:
Est. 2018

COST:
$75M

CONTACT:
Mr. David Molgaard
City Manager
City of Charleston
501 Virginia Street, E.
Room 101
Charleston, WV 25301
304.348.8014

The Charleston Civic Center Expansion and Renovation is a transformational project for both the city of Charleston and West Virginia. Our team is building on 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 Civic 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 Civic Center Expansion and Renovation

The renovated Civic Center is a building that emerges from this iconic landscape, with the architecture and topography working together. The Civic Center will also have 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 is to create separate entries and identities for the arena and convention center. This will allow 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 will be 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 will transform the southeast to the middle of the northern zone of the site, the existing building mass will still dominate 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 will be 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 will then transform the look and feel of the center into a fun and festive landmark.

Marriott Marquis Convention Hotel

HOWE ENGINEERS

LOCATION:
Washington, DC

SIZE:
1,200,000 SF

COST:
$500,000,000

COMPLETION:
2014

OWNER:
Quadrangle Development

General Scope of Project: The Washington Marriott Marquis Convention Hotel is located in the District of Columbia next to the Washington Convention Center and will be one of four Marquis properties in the world. The project consists of 1,170 guest rooms on fourteen floors above the lobby and more than 100,000 sf of meeting and assembly space.

The heart of the hotel will be the Grand Lobby which is designed to be a large, open, welcoming space activated with natural daylight from an interior atrium with a glass roof over 130' above the ground floor. Hotel registration occurs to the west side of the lobby and a cascading floor integrates the various lobby bar and food service areas associated with the space. Around the perimeter of the hotel, five publicly accessible retail and restaurant outlets will help activate the neighborhood.

The building is designed as Type IA Construction using the non-separated use provisions of the Building Code. In addition, the building utilizes advanced smoke control throughout the atrium and in the underground portions of the building. Howe Engineers, Inc. provided complete fire protection engineering and code consulting services for this new largest hotel within the District of Columbia. As part of the design team, Howe Engineers developed the code compliance approach for this unique multi-use building and developed several performance based designs to achieve the owner's goals while providing a cost effective life safety design. Some of the savings realized by Howe Engineers, Inc. analysis included over $1 Million of construction cost in the Fire Proofing of Large Atrium Columns and a 50% Reduction in the Smoke Exhaust Capacity Required.

Howe Engineers, Inc. completed their services on time and budget for this exciting new project.

State Office Buildings 5,6, & 7

ZMM
ARCHITECTS
ENGINEERS

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, antenas, 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.

WV State Capitol Roof Replacement

ZMM ARCHITECTS ENGINEERS

LOCATION:
Charleston, WV

COMPLETION:
TBA

The West Virginia State Capitol Building was constructed in 1924-1932 and is listed on the National Register. The scope of work includes replacement of the roof on connectors and roofs above as well as the base of the dome. This project started with an in-depth study of existing drawings and site conditions and a site visit to the Capitol to ascertain the actions necessary to provide the new roof system.

The investigation included:

- Review all Roofing Components for Integrity/Ability to Control Moisture Collection/Removal
- Conduct Destructive Testing (Multiple Roofing/Flashing Systems?)
- Hazardous Material Testing of Components (Paint, Mastic, Insulation, Caulking)
- Review all Points of Roof Access: Walkways, Walkway Pads, Stairs
- Work with GSD to Develop Recommendations for the Roofing System
- Consider Building Envelope Performance/Insulation Requirements

All the roof system components will need to be reviewed for their integrity and ability to control moisture collection and removal from the building's roof. The components that are to be reviewed will include parapet walls, railings, wall conditions, colonnades, roof penetrations, roof drains, roof equipment, and walking surfaces. Investigative holes will need to be cut into the existing membrane to identify conditions of insulation, roof deck and any remains of former roofing materials and flashing systems. Test of roofing materials will need to be made for any possible hazardous materials. Our ability to provide comprehensive design solutions will be advantageous as it relates to mechanical equipment curbs and structural supports.

A report will be prepared and presented showing findings and recommendations from the investigation of all the roof conditions. The report will include recommended option for the roof membrane material, discussion of repairs to roof components, as well as any required repairs to the roof deck. Also included in the report will be a preliminary cost estimate including cost differences for each proposed option. ZMM will provide construction observation services and will work with the owner's representative during the construction process. We will be responsible for reviewing all shop drawings and questions that occur during the project. ZMM will also participate in all progress meetings and make site visits on a regular basis. ZMM will remain available to assist the state throughout the warranty phase of the project.

State Office Building #5, 10th Floor

Office of Technology

ZMM ARCHITECTS ENGINEERS

LOCATION:
Charleston, WV

SIZE:
22,000SF

COST:
$3.7M

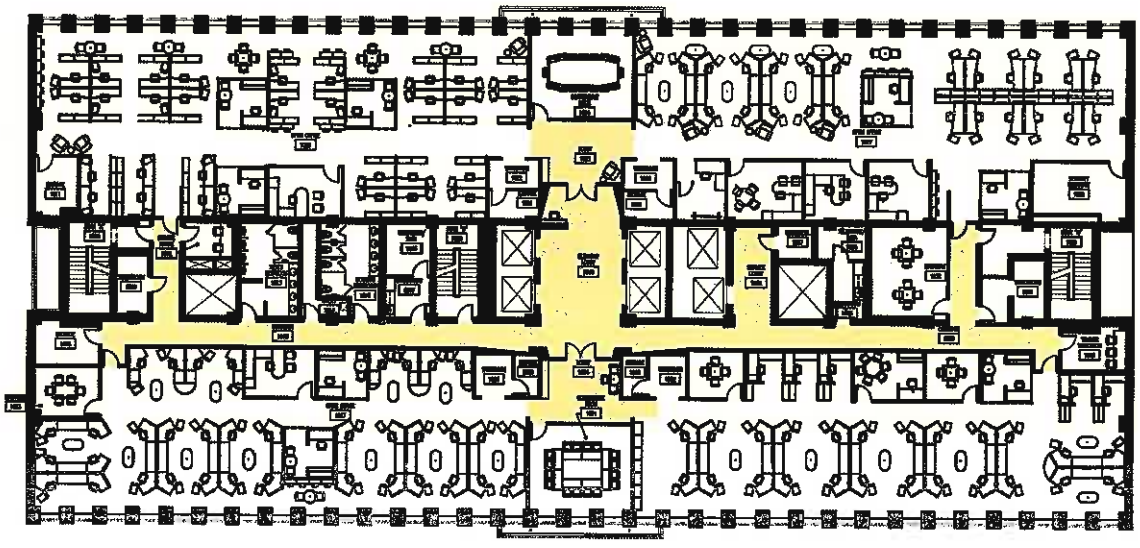
COMPLETION:
2010

CONTACT:
Ross Taylor
Cabinet Secretary
Department of Admin.
Building 1, Room E119
Charleston, WV 25305
304.558.4331

AWARD:
2011 AIA Merit Award
West Virginia Chapter
Achievement in Architecture Interiors

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. 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. The renovation was technically intensive, and included demolition of the existing construction back to the building structure, as well as significant hazardous material abatement.

ZMM, working with the State of West Virginia General Services Division, the Real Estate Division, and the Office of Technology developed a strategy to renovate 22,000 SF of space to accommodate 137 employees. The design includes a mix of private and open office space, and responds to current workplace trends. The renovations include a low profile cable management system which maximizes the flexibility of the space. ZMM also developed the interior, furniture, fixture, and equipment design with significant coordination with the Office of Technology.



State Office Building #5, 10th Floor

To improve the opportunity for daylighting, office spaces have been "pulled-in" to the core of the building. This decision will allow for daylight to be introduced deep into the interior work areas, and will allow access to the daylight and views for all employees. The perimeter structural bays of the open office areas have a "coffered" ceiling. Ductwork for mechanical distribution is terminated at a bulkhead at the interior edge of the perimeter structural bay, allowing for more open volume and a more contemporary aesthetic.

The design of the 10th floor renovation also provided the opportunity to introduce a standard "transverse" core will be developed throughout State Office Buildings 5 & 6. The transverse core includes all of the major entry, meeting, and workroom functions. In addition to the office areas, the elevator lobby has been updated to create a consistent look and level of finish at the entry point to the Office of Technology.

TCF Bank Stadium - University of Minnesota

HOWE ENGINEERS

LOCATION:
Minneapolis, MN

SIZE:
50,805 Seat Stadium was expanded to 80,000

COST:
$300,000,000

COMPLETION:
2009

OWNER:
University of Minnesota

General Scope of Project: The TCF Bank Stadium is an outdoor football stadium located at 2009 University Avenue in Minneapolis, Minnesota. The 50,805 Seat Stadium is horseshoe-style design and is a mixed-use facility to be used for sporting and other entertainment type events. Additional space is provided within the building for retail, private suites and clubs, locker rooms and training areas, maintenance and other support type facilities (i.e., electrical, mechanical and storage rooms).

The building is designed as Type IA Construction using the non-separated use provisions of the Building Code. In addition, the building utilizes the smoke protected assembly seating provisions, includes multiple mechanical smoke control systems, and is considered fully sprinklered in accordance with NFPA 13. Howe Engineers, Inc. provided complete fire protection engineering and code consulting services, and special inspections for this new 50,000 seat Stadium in Minneapolis, MN.

As part of the design team, Howe Engineers scope of services included development of the code compliance approach for this unique multi-use building (including field seating for concert type events), means of egress design, smoke control design, and developed several performance based designs (including exposed steel, computer fire modeling, value engineered smoke control system) to achieve the owner's goals while providing a cost effective life safety design.. Some of the savings realized by Howe Engineers, Inc. analysis included over $1 Million of construction cost in the Fire Proofing of Large Columns and a 30% Reduction in the Smoke Exhaust Capacity Required. In addition, Howe Engineers performed the special inspections for the smoke control systems and the commissioning of the fire alarm and fire protection systems for the project.

Cultural Center - Great Hall Lighting Wiring System

ZMM
ARCHITECTS
ENGINEERS

LOCATION:
Charleston, WV

COMPLETION:
2011

CONTACT:
Randal Reid Smith
Cultural Center Director
1900 Kanawha Blvd., E.
Capitol Complex, Building 9
Charleston, WV 25305
304.558.0220

ZMM completed the Great Hall Wiring System located at the Cultural Center on WV State Capitol Complex. The existing wiring and conduit system was approximately thirty-five years old and in need of drastic improvements. The existing conditions that were observed included the conduit and outlet boxes were mounted on the underside of the existing grating above the ceiling, the dimming circuits shared a common neutral, bad fixture connections and cables.

ZMM performed a complete survey and drawings of the existing conduit, wiring, and dimming systems. The circuiting requirements were confirmed and ZMM proposed new correction methods with a dimming equipment manufacturer.

The bidding documentation included the following:

- Drawings to indicate 141 dimmer circuits, conduit, and wiring to be removed back to the existing dimmer cabinet.
- Drawings to indicate new conduit and wiring requirements run above the existing grating with new twist-lock recap tacles for the lighting conditions.
- Drawings and details to indicate rewiring and cleaning methods to be used for 192 light fixtures.
- Specifications for all electrical work to be performed in accordance with National Electrical Code and all applicable codes.

Goodwill Prosperity Center

Historic Renovation

ZMM ARCHITECTS ENGINEERS

LOCATION:
Charleston, WV

SIZE:
10,200 SF

COMPLETION:
2015

COST:
$960,000

CONTACT:
Cheri Bever, President
Goodwill Industries
215 Virginia Street, W.
Charleston, WV 25302
304.346.0811

Goodwill's newly renovated Prosperity Center is located on Virginia Street (West) in Charleston. This facility will help prepare members of the community for the workforce, and will expand Goodwill's outreach opportunities. Inside the facility is several classrooms, a computer room, and a Career Center that is equipped with all the tools needed to prepare and apply for a job. A spacious and colorful lobby provides a relaxed atmosphere for visitors. Inside the center is a "Suited for Success" room where work-appropriate clothing will be available to those who need it.

The building, which was once the Charleston Transit Authority's bus garage, underwent a major exterior transformation. Layers of stucco were removed to open up the old garage bays, and glass was infilled into these openings to give the center a tremendous amount of natural light. The original brick was exposed, repointed, and painted. The improvements made to the exterior showcase the historic nature of the building while upholding the modern amenities needed for today.

Salem State University - Library and Learning Commons

HOWE ENGINEERS

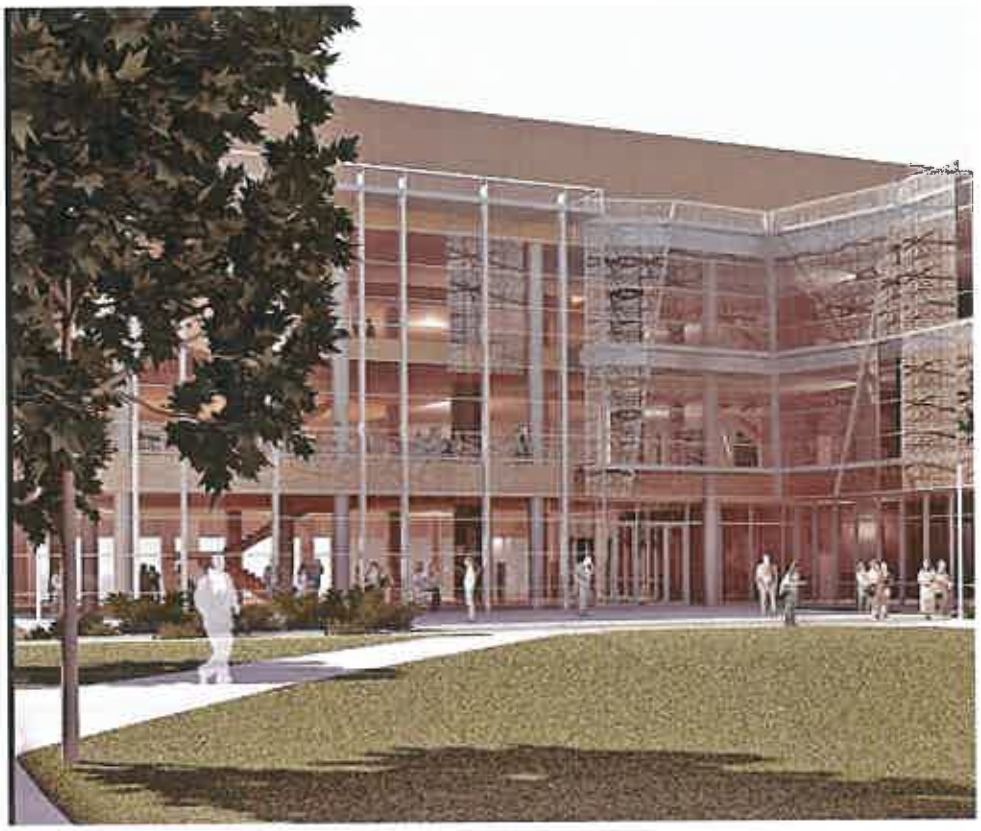
LOCATION:
Salem, MA

SIZE:
120,000 SF

COST:
$74,000,000 Approx.

COMPLETION:
2013

ARCHITECT:
Shepley Bulfinch



General Scope of Project: The Library defines a new academic quad for Salem State's North Campus and meets an urgent need for a replacement library to serve the University's five campuses.

A vibrant and welcoming academic crossroads, the Library has clear wayfinding and spaces for scholarship and collaboration, and is designed to accommodate changes in technology and pedagogy. The learning commons, rich with academic resources, is integrated with library services to provide a comprehensive and supportive learning environment. The library is sited to define the new quad, strengthening the identity of the North Campus as the University's academic heart, establishing a sense of place, and strengthening institutional identity. While the first level of the four-story Library offers an entrance facing College Drive, the second-floor main entrance faces the quad.Howe Engineers, Inc. provided complete fire protection engineering, code consulting, and special inspection services for this project.

As part of the design team, Howe Engineers scope of services included development of the code compliance approach for this unique multi-use building, means of egress design, and interface of the new addition with the existing stadium to achieve the owner's goals while providing a cost effective life safety design. In addition, Howe Engineers assisted in preparation of the facilities Life Safety Evaluation & Management Plan.

St. Margaret's Judicial Complex - 3rd Floor Renovation

ZMM ARCHITECTS ENGINEERS

LOCATION:
Charles Town, WV

SIZE:
7,000 SF

COMPLETION:
2017

CONTACT:
Bill Polk
Director of Maintenance
Jefferson County Commission
128 Industrial Blvd.
Kearneysville, WV 25430
304-728-3355

St. Margaret's Judicial Building is a three-story judicial building located in downtown Charles Town, West Virginia. The brick building was constructed in 1909 and has been updated throughout the years. The magistrate courts are located in this building. ZMM Architects and Engineers renovated the 7,000 square foot third floor to accommodate a bigger courtroom, more efficient office and meeting space, and increased security.

The main courtroom received security upgrades, an expanded jury area, and an enlarged visitor seating area. The office space was renovated to allow the judge easy access to the courtroom, while maintaining a secure path. The elevator was reconfigured to allow the judge direct, secured access to his office. An expanded waiting area and two attorney/client rooms were provided to meet the needs of the new court. An upgraded jury room was added with direct access from the courtroom. The existing restrooms were renovated for ADA accessibility.

The low-budget renovation was possible by working closely with the owner, using existing stair and elevator circulation patterns, and utilizing the existing structure.

Orlando City Stadium

HOWE ENGINEERS

LOCATION:
Orlando, FL

SIZE:
25,000 Seat Stadium

COST:
$155,000,000

COMPLETION:
2017

OWNER:
Orlando City Soccer Club

General Scope of Project: The Orlando City Stadium is an under-construction outdoor soccer stadium located at Church Street and Parramore Avenue in Orlando, Florida. The 25,000 seat stadium is a bowl style design which will be used primarily for professional soccer and other entertainment type events. Additional space is provided within the building for retail, clubs, restaurants, locker rooms and training areas, maintenance and other support type facilities (i.e., electrical, mechanical and storage rooms).

The building is designed as Type IIB Construction using the separated use provisions of the Building Code. In addition, the building utilizes the smoke protected assembly seating provisions, includes multiple passive smoke control systems, and is considered fully sprinklered in accordance with NFPA 13.

Howe Engineers, Inc. is providing complete fire protection engineering and code consulting services for this new 25,000 seat stadium in Orlando, FL.

As part of the design team, Howe Engineers scope of services included development of the code compliance approach for this unique multi-use building (including field seating for concert type events), means of egress design, smoke control design, and developed several alternative designs (including exposed steel, computer fire modeling, value engineered smoke control system) to achieve the owner's goals while providing a cost effective life safety design. Some of the savings realized by Howe Engineers, Inc. analysis included over $500,000 of construction cost in the Fire Proofing and reduction of smoke exhaust required.

Howe Engineers, Inc. completed their services on time and under budget for this exciting new project.

Kanawha Valley Bank

Elevator and Fire Alarm Upgrades

ZMM ARCHITECTS ENGINEERS

LOCATION:
Charleston, WV

COMPLETION:
2014

COST:
$750,000

Pat McGivern
Real Estate Resources
500 Virginia Street, East
Suite #950
Charleston, WV 25301
304-345-9348

The client had obtained bids from four elevator companies for upgrading the elevators for the high-rise building and requested ZMM evaluate the bids and prepare construction documents for the project. ZMM preformed a building electrical, mechanical and fire alarm survey to determine the feasibility of the proposed elevator upgrade. ZMM then prepared a detailed tabulation of the bids highlighting the pros and cons of each proposal and aided the client in determining which company to use for their upgrade.

ZMM met with the local building code officials and the fire department to determine the extent of the electrical, mechanical and fire alarm renovation necessary to support the elevator renovations. It was determined that the modifications to the electrical feeds to the elevators, new penthouse heating and air conditioning, elevator shaft smoke evacuation and replacement of the existing high-rise fire alarm system were necessary. ZMM prepared bidding and construction documents for the electrical upgrades, new elevator penthouse heating and air conditioning systems, an elevator shaft smoke evacuation system and a new addressable high-rise fire alarm system for the building.

The JW Marriott Marco Island Beach Resort

HOWE ENGINEERS

LOCATION:
Marco Island, FL

SIZE:
366,000 SF

COST:
$320M

COMPLETION:
2017

OWNER:
JW Marriott, Marco Island, FL

General Scope of Project: The JW Marriott Marco Island Beach Resort is a 726 -room Balinese style beachfront resort on the Gulf of Mexico, in Marco Island, Florida. This resort offers its guests nine indoor and outdoor dining venues, four pools, two golf courses, a fitness center and the luxurious JW Spa.

The new hotel, Lanai Tower, is approximately 366,000 square feet in gross area and contains one subterranean level with 10 levels above grade. This hotel is adjacent to the existing JW Marriott Marco Island Beach Resort and includes 94 Hotel Guest Rooms, Ballrooms, Meeting Rooms, Restaurants, Offices, BOH Kitchen and Support Areas and Parking.

The building contains a number of different occupancies and is classifies as a Mixed Occupancy building with a principal occupancy of Group R-1 Residential and is Type IB Construction.

Howe Engineers, Inc. provided complete fire protection engineering and code consulting services from Schematic Design through the Construction Administration Phase for this new 10 story hotel.

As part of the design team, Howe Engineers scope of services included development of the code compliance approach for the hotel, means of egress design, smoke control analysis and special inspection.

Southside Elementary & Huntington Middle School

Historic Preservation

ZMM ARCHITECTS ENGINEERS

LOCATION:
Huntington, WV

SIZE:
158,194 SF

COMPLETION:
2010

COST:
$27M

CONTACT:
Ryan Saxe
Superintendent
2850 5th Avenue
Huntington, WV 25702
304.824.3033

AWARDS:
2011 AIA Honor Award
West Virginia Chapter
Excellence in Architecture Preservation

The two schools that previously occupied the site of the New Southside Elementary School and Huntington Middle School were known as Cammack Elementary School and Cammack Middle School. The new facility houses a combined 1,014 Elementary and Middle School students. When the Cabell County Board of Education proposed a $61M bond issue in 2006, the Huntington community expressed the importance of saving this neighborhood landmark.

The new facilities were designed to blend with the architectural character of the existing facility. More than 70% of the existing building was demolished and the portion remaining was completely renovated. Two new stair towers provide a vertical architectural element that separates the existing structure from the new construction. The result is a cohesive design that blends the unique elements of the former Cammack School into a modern educational complex that exceeds the requirements of 21st century learning.

Southside Elementary & Huntington Middle School

Although the expanded facility houses both an elementary and a middle school, each have their own distinct entrance and administrative complex and the students remain physically separated on opposite sides of the facility. The new schools only share a kitchen, which has been located to serve separate dining facilities.

With the community's support of the bond, ZMM has designed a facility that maintains the historic character of the façade and auditorium, while replacing the remainder of the facility. The community has maintained a landmark, while developing new state of the art elementary and middle schools.

Similar Project Experience

Historic Preservation Work

HOWE ENGINEERS

Howe Engineers, Inc. specializes in Large Scale Complicated Structures. Specifically, Howe Engineers is especially proficient with the design, construction, inspection and testing requirements for Public Buildings and Historic Preservation. Howe Engineers, Inc. has served as an active fire protection engineer/code consultant on the following projects:

HISTORIC PRESERVATION WORK

- Providence State House, Providence, RI
- Fanueil Hall Quincy Market, Boston, MA
- Deerfield Academy Main School Building, Deerfield, MA
- Deerfield Academy Kendall Building, Deerfield, MA
- Deerfield Academy Arms Building, Deerfield, MA
- Harvard Stadium, Boston, MA
- Fenway Park, Boston, MA
- Salem City Hall, Salem, MA
- Gloucester City Hall, Gloucester, MA
- Dudley Square School Building, Boston, MA
- Science Park Apartments, New Haven, CT
- Rose Bowl, Pasadena, CA

Boston College - St. Ignatius of Loyola Church

HOWE ENGINEERS

LOCATION:
Chestnut Hill, MA

SIZE:
60,000 SF

OWNER:
Archdiocese of Boston

Name and location of Project:
St. Ignatius Loyola is located at 28 Commonwealth Avenue, Chestnut Hill, MA.

Description of project and type of work performed:
Analysis of the existing Church for future renovations.

The potential project scope includes window replacement, exterior façade work, interior updates, installation of fire protection system and accessibility upgrades. In addition, improved HVAC systems will better distribute air, a new fire alarm system is planned, and plumbing upgrades needed to support new bathroom spaces.

As part of the design team, Howe Engineers scope of services was to complete an existing building assessment based on the Massachusetts State Building Code (MSBC), Chapter 34 *International Existing Building Code* (IEBC). The report outlined the application of the major building code fire protection, life safety, and accessibility (including ADAAG) requirements as referenced by the MSBC for historic building.

Nature of time and schedule constraints:
Several time constraints during the construction phase were achieved to keep the project on time and negotiations needed with AHJs based on field conditions.

Management of relationships with owners, users, and contractors:
Working closely with the design team and Boston College, Howe Engineers provided code consulting services relative to implications for proposed renovations as part of an assessment of the building.

The Houston Coal Company Store

Historic Renovation

ZMM ARCHITECTS ENGINEERS

MICHAEL GIOULIS
HISTORIC PRESERVATION CONSULTANT, INC

LOCATION:
Kimball, WV

SIZE:
7,100 SF

COMPLETION:
Fall 2015

COST:
$1.8M

ZMM Architects and Engineers, in association with Mike Gioulis, Historic Preservation Specialist, have been assisting the McDowell County Economic Development Authority with the restoration of the Houston Coal Company Store. The Company Store, located in Kimball, WV, is at the intersection of Route 52 and Carswell Hollow Road. It was constructed in 1923 and served as a coal company store until the 1940's. The building has since served as a dairy company, office and storage facility for a construction company, and currently sits vacant.

The 7,100 square foot facility includes a full basement, storage sheds, and a loading dock. The main portion of the building is 5,750 square feet, excluding the storage sheds and loading dock. The project team began by investigating all available historical documentation for the original facility. ZMM and Mr. Gioulis also visited the building site several times to assess the conditions of the architecture, structure, building systems, and surrounding cultural landscape.

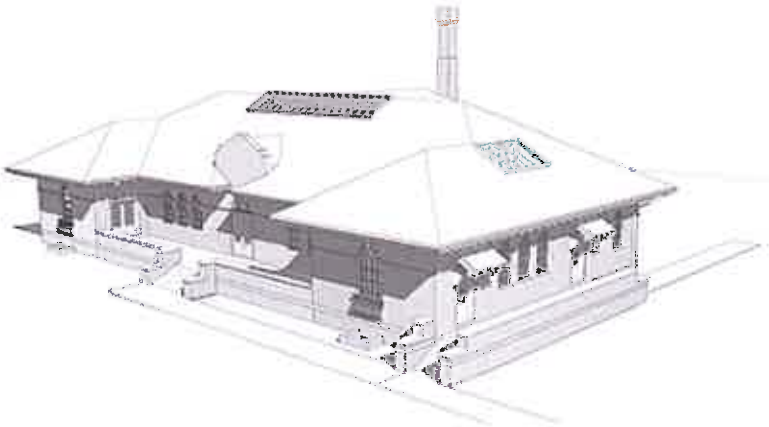
To ensure the accuracy of the proposed improvements, a building information model (BIM) was created for analysis and documentation. The model was created based upon measurements and documentation performed on-site by the project team. Once the documentation was complete, a proposed floor plan was developed that included office space for the McDowell County Economic Development Authority staff, display areas for coal heritage artifacts, public restrooms, a gift shop, and a coffee shop. There are also plans to convert the outdoor storage sheds into an artisan's row.
Based upon the investigative results of the facility's existing conditions and its proposed use, recommendations and a proposed cost estimate were created. All proposed improvements were developed based upon the Secretary of the Interior's Standards for Rehabilitation (Department of Interior regulations, 36 CFR 67), and were reviewed with the State Historic Preservation Office.

A final draft of the report was issued that prioritized the recommendations:

- Phase I – Building Shell Restoration (stabilize and restore)
- Phase II – Building Systems Integration (mechanical, plumbing, and electrical systems)
- Phase III – Interior Restoration and Reuse (Including the removal of construction not original and not historically significant to the building)

The Houston Coal Company Store

Based upon the availability of the initial funding, ZMM prepared bidding documents for Phase I. Once this documentation was complete, funding became available for the remaining phases of the work. The improvement package was bid in the summer of 2014, and all work was completed in the fall of 2015.



MICHAEL GIOULIS
HISTORIC PRESERVATION CONSULTANT, INC

Office Building #3

LOCATION:
Charleston, WV

COMPLETION:
2008-2016

CONTACT:
Robert Krause
General Services Division
Capitol Complex
Charleston, WV 25305
304.558.9018

Research was conducted on the significant extant fabric and character defining elements of the building, designed by Cass Gilbert Jr. A plan was devised to preserve the lobby, first floor public DMV space and other significant spaces. Included in that plan was research on the conservation of painted surfaces. Samples were used to reveal accumulated paint layers, as well as the original paint used in these areas.

During construction we provided advice on restoration of the bas relief ornamentation over the entrance bays. We then provided on site supervision during the restoration process.

Building #1 - Main Capitol Building

We consulted on the roof replacement, which included historic lead coated copper gutters in the entablature and balustrade, lead coated copper flashing at the flat roofs, flat roof replacement, hyphen walkway connectors with appropriate handrails and walking surfaces, skylight restoration above the Legislative Chambers and Supreme Courtroom and other sheet metal work.

Dickinson Furniture Building

Rehabilitation Tax Credit

MICHAEL GIOULIS
HISTORIC PRESERVATION CONSULTANT, INC

LOCATION:
Huntington, WV

COMPLETION:
2010-2015

CONTACT:
James Weiler
PO Box 841
Barboursville, WV 25504
304.525.2300

The Dickinson Furniture Building, located across from the Cabell County Courthouse, occupies a prominent location in downtown Huntington. It became vacant when the furniture business closed. The upper floors had been vacant for a number of years before the project started.

It includes two smaller commercial buildings along 8th Street that were connected to the building as the furniture business expanded. The rehabilitation converted the building to office space for a legal firm; offices for a personal wealth management firm; and retail storefronts on the first floor.

MICHAEL GIOULIS
HISTORIC PRESERVATION CONSULTANT, INC

CM Love Building

Rehabilitation Tax Credit

LOCATION:
Huntington, WV

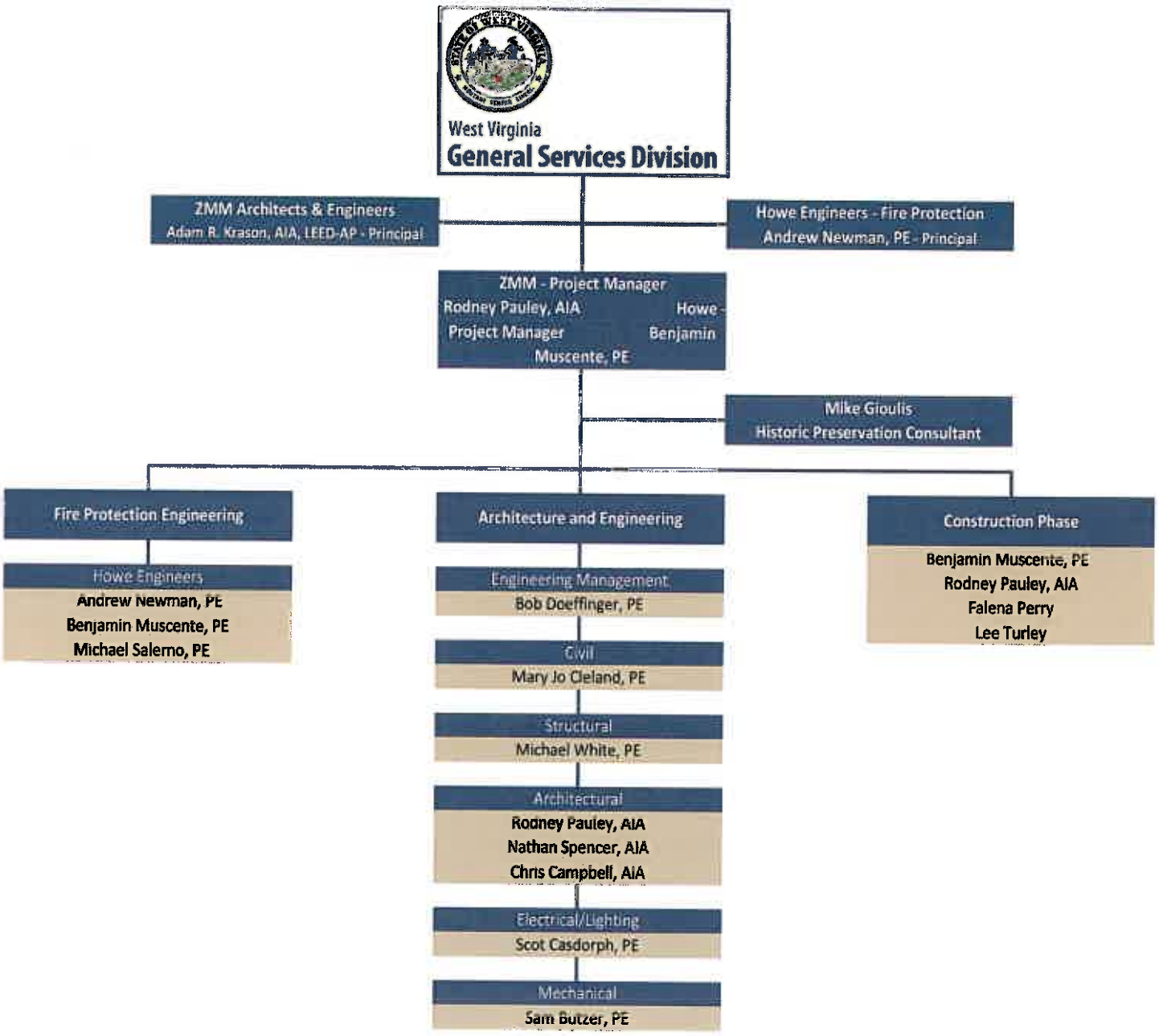
COMPLETION:
2012

CONTACT:
James Weiler
PB Box 841
Barboursville, WV
304.525.2300

The Love Hardware building became vacant when the long running hardware business closed. The upper floors had been vacant for a number of years before the project started. The rehabilitation converted the building to office space for a tri state legal firm.

The building is located across from a major hotel in the downtown and adjacent to the Pullman Square lifestyle center.

Organizational Chart



Adam R. Krason, AIA, LEED AP, ALEP

ZMM ARCHITECTS ENGINEERS

Role
Principal

Professional Registrations
Registered Architect (WV, OH, KY, VA)
LEED Accredited Professional
Accredited Learning Environment Professional
NCARB (55,984)
Construction Specifications Institute (CSI)
Construction Documents Technician (CDT)

Mr. Krason has served in the capacity of Architect and Project Manager for a variety of projects at ZMM. This experience includes Military, Educational (K-12 and Higher Education), Office, Justice (Courthouses, Correctional, Justice Centers), and Multi-Unit Residential projects. Mr. Krason's responsibilities include programming, design, documentation, coordination of the architectural and engineering team, as well as construction administration. Mr. Krason began his career in 1998, working on a variety of educational, commercial office, and correctional projects throughout Ohio, West Virginia, and North Carolina.

Mr. Krason has been an advocate of sustainable design in West Virginia, participating in a variety of sustainable design seminars throughout the State, and serving on the West Virginia School Building Authority Green Schools Sub-Committee. Recently, Mr. Krason helped coordinate the "Making the Business Case for Sustainability" conference at the University of Charleston that included speakers from Armstrong Industries, American Electric Power, CB Richard Ellis, and Interface Raise. Mr. Krason also assisted Habitat for Humanity Kanawha and Putnam County develop a commercial recycling program to fill a void in the sustainable design infrastructure in West Virginia. Mr. Krason has noted that, "I became a LEED Accredited Professional because I believe that good design has value, and the ability to impact our daily lives. Sustainable design showcases the value of design through demonstrated improvements in the performance of the students and employees who occupy our buildings." In addition to his design and project management responsibilities, Mr. Krason serves on the Board of Directors and is responsible for business development at ZMM.

Project Experience

Charleston Civic Center, Charleston, WV
Mr. Krason is serving as principal-in-charge of the expansion and renovation to the Charleston Civic Center. The $75M, 283,000 SF design-build project is being completed as a

Education
Bachelor of Architecture, The Catholic University of America, 1998

Bachelor of Civil Engineering, The Catholic University of America, 1997

Employment History
2007 - Present, Principal, ZMM
2007 - Present, Board of Directors, ZMM
2003 - Present, Architect, Project Manager, ZMM
1998 - 2003, Architect, Project Manager, Charleston Area Architectural Firm

Civic Affiliations
- WV American Institute of Architects, President
- Habitat for Humanity Kanawha & Putnam County, Board of Directors 2011 - 2014
- WV Qualification Based Selections Council, President, 2012/2013
- Leadership WV 2010 - 2012
- Charleston Rotary
- West Side Main Street, Board of Directors 2008 - 2014
- City of Charleston Land Trust 2008 - 2014

collaboration with tvsdesign and BBL Carlton. Mr. Krason is responsible for the overall management of the design team, coordination with the client, and also has input critical project management decisions. The design commenced in the spring of 2015, and construction is scheduled for completion in 2018.

State Office Building #5, 10th Floor Renovation (Office of Technology), Charleston, WV
Mr. Krason led an architectural and engineering team that completed a detailed assessment of State Office Buildings 5, 6, & 7. Once the assessment was complete, ZMM had the opportunity to implement the proposed improvements on the 10th Floor of State Office Building #5 for the Office of Technology. The renovations, aiming for LEED-CI Certification, re-oriented the layout by drawing all private offices into the building core, providing access to daylight and views for all employees. The design also utilized acoustical ceiling clouds and bulkheads to maximize the acoustical performance, while also increasing the volume of the space.

Joint Interagency Training & Education Center (WVARNG), Kingwood, WV Mr. Krason was responsible for the preliminary programming, and participated in the schematic design of the 180,000 SF addition to the Regional Training Institute at Camp Dawson. Mr. Krason was also responsible for managing the production effort for the billeting (hotel) expansion, which increased the total billeting capacity at the JITEC to 600 rooms. This project received LEED Gold Certification.

Morgantown Readiness Center (WVARNG), Morgantown, WV
Mr. Krason was the project architect on the new Morgantown Readiness Center. This facility is a 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. This center supports traditional military functions including the 1-201st Field Artillery. A significant portion of the Morgantown Readiness Center supports the 249th Army Band. The Readiness Center contains a performance hall, pre-function spaces, as well as a variety of training and rehearsal areas.

Construction and Facilities Management Office Expansion (WVARNG), Charleston, WV
Mr. Krason was responsible for the programming, architectural design, and project management of the office expansion. The project included the renovation and addition to an existing pre-engineered metal building. The design, which was honored with a 2009 AIA Merit Award, focused the client's resources on a new entry and corridor that separated the existing office space from the addition.

Bridgemont Community and Technical College - Davis Hall Renovation and Master Plan, Montgomery, WV Mr. Krason 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.

Edgewood Elementary School, Charleston, WV
Mr. Krason was the project manager on the new Kanawha County 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. Mr. Krason worked with students from Watts and Robbins Elementary Schools in Kanawha County, assisting them in an effort to actively participate in the design process

Participated on the team that won the following awards and acknowledgements:
2017 WV AIA Merit Award Logan-Mingo Readiness Center, Holden, WV
2016 WV AIA Merit Award Christ Church United Methodist, Charleston, WV
2015 WV AIA Merit Award Edgewood Elementary School, Charleston, WV
2014 WV AIA Merit Award Girl Scouts of Black Diamond Council, Charleston, WV
2011 WV AIA Honor Award Joint Interagency Training and Education Center (JITEC), Kingwood, WV
2011 AIA Honor Award State Office Building #5, 10th Floor Renovation, Charleston, WV
2009 AIA Merit Award WVARNG Construction and Facilities Management Office, Charleston, WV

Andrew Newman, PE

Role
Fire Protection/Safety Consultant

Professional Registrations
Professional Engineer (TN, FL, GA, MA, OK, CT, FL, LA, KY, NY, MD, AZ, IL, MI, VA, NM, Washington D.C., SC, NC, CO)

With over 100 years of combined experience in the industry, Howe Engineers offers expert fire protection and life safety consultation and design solutions to a wide range of clients including Architects, Owners and Engineers. Howe Engineers is a full service fire protection engineering firm that specializes in innovative code consulting solutions. All services will be performed by highly educated and experienced engineers who are familiar with large scale multi-use construction

Mr. Newman has played a vital role in the development of state of the art design and engineering solutions to complicated building design issues. Andrew has successfully completed fire protection design and life safety code consulting services for many projects including historic, public buildings and large mixed use building designs throughout the United States. Andrew has extensive knowledge in computational fluid dynamics modeling, timed egress analysis, fire protection design, smoke control design, and code consultation analysis.

Andrew will serve as the fire protection and life safety consultant for this project and will work closely with the team to develop the code compliance approach for the project design.

Project Experience
Providence State House, Providence, RI
Fenway Park, Boston, MA
Faneuil Hall Quincy Market, Quincy, MA
Harvard Stadium, Boston, MA
Rose Bowl, Pasadena, CA
Churchhill Down, Louisville, KY
The Phoenix Project (Pentagon Reconstruction), Arlington, VA

Education
Bachelor's Degree, Mechanical Engineering

Master's Degree, Fire Protection Engineering

Employment History
2008 - Present, Senior Engineer, Howe Engineers

Civic Affiliations
2001–Present National Fire Protection Association (NFPA)
2001–Present Society of Fire Protection Engineers (SFPE)
2002–Present Fire Protection Honor Society (Salamander)

Experience with BIM
50+ Projects Over 5 Years

Experience with LEED
25+ Projects Over 5 Years

Rodney Pauley, AIA

ZMM ARCHITECTS ENGINEERS

Role
Project Manager

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 is serving as project manager on the expansion and renovation to the Charleston Civic Center. 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 is scheduled for completion in 2018.

WV Lottery Headquarters, Charleston, WV
Mr. Pauley was 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

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

Civic Affiliations
- American Institute of Architects, Member

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.

WV Division of Juvenile Service – Davis Hall (unbuilt) Mr. Pauley was the project manager on the design team that prepared construction documents for the renovation to an existing juvenile corrections campus for women. The project scope included the demolition of two buildings, the interior renovation of the 6,800 SF education building, and a major reconstruction to the 10,000 SF gymnasium which includes two major additions for dining and living facilities. An entrance and parking area will be reconfigured to provide additional spaces, a sally port and perimeter security fencing.

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.

Valley Health Systems, Wayne, WV
Mr. Pauley was the project manager on the new health clinic in Wayne, WV. ZMM prepared construction documents for a new, one-story medical building operated by Valley Health Systems of Huntington, WV. The building is 15,580SF on a 2-acre site including approximately 100 parking spaces. Valley Health Systems provides primary and preventative care to the medically underserved population of southern West Virginia. The new building will replace an existing undersized facility.

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.

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 transparent connection to the outdoors. A high-performance envelope was designed to eliminate thermal bridging and the potential for condensation.

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 remedying several engineering and life safety deficiencies, as well as architectural improvements to the building envelope.

Michael Gioulis

MICHAEL GIOULIS
HISTORIC PRESERVATION CONSULTANT, INC

Role
Historic Preservation Consultant

Professional Registrations
Certified Architectural Historian

Mike started his own consulting practice in 1984 and works on a wide range of historic preservation projects for many types of clients. He is fully versant in interpreting standards for the rehabilitation of existing and historic buildings, and meets the Secretary of the Interior's professional qualifications for Architectural Historian as outlined in 36 CRF 61 through the West Virginia Division of Culture and History, State Historic Preservation Office. This certification assures that the Gioulis firm is qualified and has a background in the performance of historic preservation in accordance with specified standards. Mike's expertise includes rehabilitation projects, master plans, building analyses, design guidelines, tax credit applications, Section 106 proceedings, National Register nominations, historic surveys, and grant applications and management.

He has been the Design Consultant to the Main Street West Virginia Program since 1988. His Main Street services relating to design assistance programs for downtown structures have resulted in over 1,000 individual design projects, as well as numerous workshops, committee trainings, resource team visits and technical assistance responses. Multiple entities and individuals consult with Mike for his professional expertise in all phases of historic rehabilitation.

Project Experience
FEDERAL PROJECTS
Consulting and recommendations for Sidney Christie Federal Bldg., Wheeling Federal Bldg., Mt. Hope Federal Bldg., Huntington Federal Bldg., and Abingdon Federal Bldg. (VA) for increased energy and operational efficiency through window replacement and other upgrades; selection of color, manufacturer and glass for doors and windows; rest room rehabilitations for ADA compliance; interior and exterior repair and finish recommendations; façade maintenance and restoration processes; courtroom renovations

WV MAIN STREET/ON TRAC PROGRAM
Design assistance for 20+ communities
Rehabilitation recommendations
Consulting
Conceptual design drawings
Workshops

Education
B Arch., City University of New York, City College, 1977

B.S., City University of New York, City College, 1975

Continuing Education
Des Moines, IA, 2011

Online Mapping System Training Workshop, Ohio Historic Preservation Office, Columbus, OH, July 2010

Section 106 References Workshop, Ohio Historic Preservation Office, Columbus, OH, August 2010

Preservation Trades Network, Preservation Alliance of West Virginia, Fairmont, WV, 2010

Employment History
1984 - Present, Self Employed. Historical Preservation Consultant; Design, Construction supervision and management. Design Consultant to Main Street West Virginia since 1988

1979 -1984, State of WV Department of Culture and History, Historical Preservation Unit. Coordinate State, Local, Federal Programs, review construction and other projects for compliance with standards; administer grant, survey, and tax incentive programs, public addresses

Committee training
Resource team visits
Technical assistance response
Annual contract since 1988

HISTORIC RESOURCE SURVEYS
Reconnaissance and intensive surveys to document existing resources in cities, towns, and counties; and the CCC resources in selected WV state parks and forests

SECTION 106 REPORTS
Review and documentation for projects including federal, state, and municipal buildings; housing projects; commercial buildings; flood mitigation areas; mine sites; schools; refuse piles; railroad depots; coal company stores; and individual properties

COURTHOUSE PROJECTS
Rehabilitation recommendations for exterior and interior work, master plans, facilities studies, ADA compliance, and renovation designs for courthouses and courtrooms

RAILROAD DEPOTS
Rehabilitation of depot buildings including site work, masonry, roofs, windows, doors and interior spaces to stabilize, preserve, and adapt for viable alternative community uses and ADA compliance

NATIONAL REGISTER NOMINATIONS
Research, document, prepare and submit nominations for downtown historic districts, residential historic districts and individual commercial and residential properties

CIVIL WAR CONNECTIONS
Master plans developed for Laurel Hill Battlefield, Camp Bartow, Rich Mountain Battlefield and Corrick's Ford

TAX CERTIFICATIONS
Advise, review and prepare tax credit applications for multiple property types including large commercial buildings, schools, private residences, apartment buildings, hotels and individual commercial buildings

GENERAL CONSULTING
Additional consulting on rehabilitation efforts, historic preservation, adaptive reuse plans, storefront restorations, sensible but sensitive additions and renovations, streetscapes, downtown building revitalizations, paint analyses, street and building signage, design guidelines, retrofitting for ADA compliance and grant applications and oversight

Accomplishments
Guest Lecturer, Faculty Training , Art Institute, Pittsburgh, PA, 2011.
Guest Lecturer, Faculty Training , Art Institute, Pittsburgh, PA, 2010.
Guest Lecturer, Environmental Biology Department, City University of New York, Hunter, 2010.
Speaker, National Main Street Conference, Chicago, IL, March 2009.
Speaker, Create WV Conference, Snowshoe, WV, 2008.
State Designers Representative on the National Executive Committee of Main Street Coordinators, 2008 to present.

Publications
ADA Information Website Q&A and Pamphlet, National Trust for Historic Preservation, 2010 to present.
Courthouses of West Virginia Documentary, 2010-2011.
Mt. Dechantal Video, 2010.
Articles on Architects and Materials, West Virginia Encyclopedia & E-Encyclopedia, 2008-2009.
Home Grown Video, 2005.
Tax Credits for Historic Properties, West Virginia Development Office, 1996.

Benjamin Muscente, PE

HOWE ENGINEERS

Role
Project Manager

Professional Registrations
Professional Engineer (NV, CA, MA, NJ, NC, TX, MS, IA, PA, AL, CO, AK)

With over 100 years of combined experience in the industry, Howe Engineers offers expert fire protection and life safety consultation and design solutions to a wide range of clients including Architects, Owners and Engineers. Howe Engineers is a full service fire protection engineering firm that specializes in large assembly mixed use building design, having working on more than 75 convention center, arena and stadium type projects throughout the United States. All services will be performed by highly educated and experienced engineers who are familiar with Stadium Design.

Ben is proficient in state of the art fire protection engineering technologies and methods needed to develop unique performance-based design solutions. These services are helpful in value engineering and developing solutions outside of the strict letter of the code.

In addition to performance based solutions, Ben is extremely knowledgeable in model building codes and standards used throughout the world. His code knowledge and experience helps to prevent lengthy permit review processes by identifying potential compliance issues during the early design stages of a project and recommending design solutions that best fit the client's needs and goals.

Ben will serve as a Co-Project Manager for this project and will work closely with the design team to execute the Code Consulting and Life Safety Plan in accordance with the project schedule and team requirements.

Project Experience
Fenway Park, Boston, MA
University of Kentucky Hospital, Lexington, KY
University of Kentucky Academic Science Building, Lexington, KY
Miami Marlins Stadium, Miami, FL
Keeneland Facility Assessment, Lexington, KY
LA Convention Center Expansion, San Jose, CA
Pennsylvania Convention Center Expansion, Philadelphia, PA
Music City Convention Center, Nashville, TN
Detroit Convention Center, Detroit, MI

Education
Bachelor's Degree, Structural Engineering

Master's Degree, Fire Protection Engineering

Employment History
2007 - Present, Senior Engineer, Howe Engineers

Civic Affiliations
2001–Present National Fire Protection Association (NFPA)
2001–Present Society of Fire Protection Engineers (SFPE)

Experience with BIM
50+ Projects Over 5 Years

Experience with LEED
25+ Projects Over 5 Years

Cleveland Convention Center and Medical mart, Cleveland, OH
New Orleans Convention Center, New Orleans, LA
Phoenix Convention Center Phase II, Phoenix, AZ
Orlando Event Center, Orlando, FL
The Ford Center, Evansville, IN

Chris A. Campbell, AIA, LEED AP BD+C

ZMM ARCHITECTS ENGINEERS

Role
Architect

Professional Registrations
Registered Architect (WV)
LEED Accredited Professional
NCARB (53,302)

Mr. Campbell joined ZMM in November of 2017. Prior employment experience includes serving in the capacity of Architect and Project Manager for a variety of projects. This experience includes Educational (K-12 and Higher Education), Commercial Offices, Automotive Dealerships, Justice (Homeland Security and Department of Justice Offices), and Religious spaces. Mr. Campbell's responsibilities include programming, design, documentation, coordination of the architectural and engineering team, and construction administration. Project responsibilities comprised all duties from project inception to completion. Mr. Campbell began his career in 1996 and until 2006 was primarily working on K-12 educational projects throughout West Virginia. From 2006 until present the majority of his projects were Higher Education.

Project Experience
BridgeValley CTC, Montgomery, WV
– Staats Building Assessment
Williamstown Elementary School, Williamstown, WV

Project Experience – (With Another Firm)
Arthur Weisberg Applied Engineering Complex, Marshall University, Huntington, WV
Mr. Campbell was the project architect on the new Applied Engineering Complex. The $52M, 145,000 SF five-story facility houses six academic and research programs. The facility was designed to promote collaboration and communication between departments, programs, faculty and students. Mr. Campbell was responsible for the overall management of the design team, construction documentation and construction administration. This project was awarded LEED Gold certification which was the first LEED certified building on Marshall University's campus. The sustainable design features include stormwater management which is also utilized as an educational tool. A green roof was utilized over the advanced materials testing laboratory. Stormwater is collected from the green roof and

Education
Bachelor of Architecture, University of Tennessee, 1996

Employment History
2017 - Present, Architect, ZMM
2006 - 2017, Architect, Project Manager, Charleston Area Architectural Firm
1996 - 2006, Architect, Project Manager, Charleston Area Architectural Firm

Civic Affiliations
- WV American Institute of Architects, President, 2006-2007
- WV American Institute of Architects, Executive Committee, 2001-2009
- WV American Institute of Architects, Intern Development Coordinator, 2000-2005
- University of Charleston, Interior Design Advisory Board (2014 - 2016)

samples can be collected in a lower level laboratory allowing opportunities to study ecological effects of various plantings.

New Headquarters Building, Blue Ridge Community and Technical College, Martinsburg, WV
Mr. Campbell was the project architect for the new headquarters building for one of West Virginia's fastest growing Colleges. The $16M, 45,000 SF facility relocated several of the College's programs from an existing campus which could no longer support the growing student population. The three-story facility is comprised of classrooms, faculty offices, administration, science laboratories, allied health laboratories, and associated student support spaces. Mr. Campbell was responsible for the overall management of the design team, construction documentation and construction administration. In 2016, this project received a Merit Award from AIA West Virginia for the exterior massing of elements and the design intent to incorporate the historic buildings and factories/mills located in Martinsburg. A couple years after the completion of this project, Mr. Campbell presented the College's ten-year master plan to the State Council for the Community and Technical College System of West Virginia. Mr. Campbell was responsible for conducting on-site facility evaluations for all 3 campuses, conducted steering and vision meetings with the College's stakeholders, reported analysis, and prepared the final report.

Virginia Thomas Law Center for the Performing Arts, West Virginia Wesleyan College, Buckhannon, WV
Mr. Campbell was the project architect for the new $7M performing arts center. The design of the facility reflected the historic administration building while providing a vision for the future. The facility consists of a 374-seat performance hall, gathering spaces, dressing rooms, and building support spaces. The performing arts center was designed to be utilized by the and Theatre and Dance Department as well as offering a public facility for events and conferences. Mr. Campbell's project duties included facility programming, schematic design, overall management of the design team, construction documentation, and construction administration.

University High School, Monongalia County Schools, Morgantown, WV
Mr. Campbell was the project architect for the new 217,000 SF high school. The design of the $29M, 1,500 student facility was a throwback to the traditional school buildings with a large frontage presence consisting of classrooms. Mr. Campbell's project duties included facility programming, schematic design, overall management of the design team and construction documentation.

Ram Stadium, Shepherd University, Shepherdstown, WV
Mr. Campbell was the project manager for the new 2,100 seat home side bleachers and press box/ concessions building. The design of stadium and facility complimented the historic Shepherdstown and campus architecture. Mr. Campbell's project duties included, programming, overall management of the design team and construction documentation. In 2002, this project received a Merit Award from AIA West Virginia for the exterior massing of elements and the design intent to incorporate the historic buildings and factories/mills located in Martinsburg.

Erma Byrd Art Gallery, University of Charleston, WV
Mr. Campbell was the project architect for the Erma Byrd Art Gallery on the campus of University of Charleston. The existing library space in the main administration building had been vacant for several years and the University's goal was to transform the existing space into a multi-user, multi-function space that could be utilized for campus events as well as rented to the public. Mr. Campbell's project duties included facility programming, schematic design, overall management of the design team, construction documentation and construction administration.

Participated on the team that won the following awards and acknowledgements:
2016 WV AIA Merit Award Blue Ridge Community and Technical College Headquarters, Martinsburg, WV
2002 AIA Merit Award Ram Stadium, Shepherd University, Shepherdstown, WV

Michael Salerno, PE

HOWE ENGINEERS

Role
Senior Engineer

Professional Registrations
Professional Engineer (MA)

With over 100 years of combined experience in the industry, Howe Engineers offers expert fire protection and life safety consultation and design solutions to a wide range of clients including Architects, Owners and Engineers. Howe Engineers is a full service fire protection engineering firm that specializes in innovative code consulting solutions. All services will be performed by highly educated and experienced engineers who are familiar with complex construction projects.

Mr. Salerno has extensive experience in complex 3-dimensional fire modeling, timed egress analysis, smoke control design, fire protection and fire alarm design. He has successfully completed multiple value engineering services yielding the allowance of exposed, unprotected steel columns, beams and truss systems in arenas, stadiums, hotels, parking structures and convention centers throughout the United States.

Mike's cost-effective engineering solutions, fire protection and life safety design solutions, and knowledge of model building and fire codes has assisted design teams in achieving their project goals.

Project Experience
Fenway Park, Boston, MA
Boston College Conti Forum, Boston, MA
Copley Place, Boston, MA
Churchill Down, Louisville, KY
Orlando Magic Arena, Orlando, FL
Jackson Jaquars Amphitheatre & Training Facility
LA Stadium and Entertainment District at Hollwood Park, Inglewood, CA
Confidential Resort/Hotel/Condo, Orlando, FL
Coronado Springs Hotel, Lake Buena Vista, FL
Marriott Marco Island JW Resort Expansion, Marco Island, FL
W Nashville Hotel, Nashville, TN
Hollywood Park Performance Venue, Inglewood, CA
Dr. Phillips Center for the Performing Arts, Orlando, FL
Miami Marlins Stadium, Miami, Fl

Education
Bachelor's Degree, Mechanical Engineering

Employment History
2008 - Present, Senior Engineer, Howe Engineers

Civic Affiliations
2012 - Present National Fire Protection Association (NFPA)
2012 - Present Society of Fire Protection Engineers (SFPE)

Experience with BIM
50+ Projects Over 5 Years

Experience with LEED
25+ Projects Over 5 Years

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 is the mechanical project 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 is scheduled for completion in 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, Bridgemont 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.

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)

Ronnie L. Burdette, EIT

Role
Structural Engineer, EIT

Mr. Burdette serves as a Structural Engineer at ZMM. His experience he has gained while at ZMM includes Educational (Additions/Renovation to existing structures and Construction of new structures), Municipal (Community Centers), and Residential projects. Mr. Burdette's responsibilities include design and analysis of structural systems and documentation of design results.

Project Experience
Mr. Burdette has served as Structural Engineer on a variety of projects. His responsibilities included analysis and design of multiple building materials (Steel, Timber, & Concrete) and production of structural drawing sets.

Fayette County Schools, PK-2 & New Collins Middle Schools, Oak Hill, WV
This project included two separate projects located on the same site. Both buildings were designed to be ICF and steel construction.

The New Valley Park Community Center, Hurricane, WV
This new community center replaced an existing one at the Valley Park Wave Pool. It was designed to be constructed from masonry, steel, and timber. The exterior design concept plays off the existing Commons Building which incorporates stone accents, wood siding and multi-sloped roofing around a floor plan that emphasizes the internal components. The Community Center entrance is highlighted by a large, exposed wood truss bearing on tall, battered stone columns. These wood beams are featured at all entrances and carry into the meeting room prefunction to provide a fully-exposed, open wood structure.

Charleston Edge, Charleston, WV
The Charleston Edge renovation project included many different structural materials. The existing building is brick and masonry construction. Construction plans included the design of a new roof-top addition that was supported by structural steel.

Multiple Residential Renovations and Additions
The majority of residential work in the area consists of timber and masonry construction. Mr. Burdette has been involved in residential projects that range from analysis of a 3-story

Education
Bachelor of Science in Civil Engineering, West Virginia University, 2015

Master of Business Administration, University of Charleston (WV), 2016

Employment History
January 2017 – Present, Structural EIT, ZMM
May 2016 – Dec 2016, Civil/Structural EIT, Jacobs Engineering
May 2015 – Dec 2015, Civil/Structural EIT, CDI Corporation

wooden deck to the design of a new addition to an existing timber and masonry house.

Nathan Spencer, AIA

ZMM ARCHITECTS ENGINEERS

Role
Architect

Professional Registrations
Registered Architect (WV)

Mr. Spencer is responsible for coordinating the efforts of the design team in preparing thorough and clear design documents. He has experience in all phases of design working on a wide range of building types including; military, educational, office, justice, and residential.

He has worked on several projects that are currently pursuing LEED certification. In addition to production, Mr. Spencer, is also experienced in 3d modeling. He has worked on several preliminary concept study models as well as high quality renderings and 3d models later in the design process. Mr. Spencer is also experienced in high quality physical models.

Mr. Spencer began his career in architecture with ZMM in 2003, working as a summer intern. After graduating in 2003, he began working at ZMM full time.

Project Experience

Tucker County Courthouse Annex, Parsons, WV
Mr. Spencer was the project architect for the Courthouse Annex renovation project. The Annex is a 4-story 21,000 Square Foot building that is adjacent to the Tucker County Courthouse. The annex will house spaces for the Circuit Court, Circuit Clerk, Family Court, Magistrate Court, Prosecuting Attorney, County Commission, County Clerk, Community Corrections, and Probation Office.

Judge Black Courthouse Annex, Parkersburg, WV
Mr. Spencer assisted with the design and programming of the adaptive reuse of a former commercial space and movie theaters into a modern courthouse annex. The Judge Black Annex included two independent circulation paths – a secure entry and lobby for access to the Family Court and Prosecuting Attorney, and public access to the Assessor and Sheriff's Tax Department. The facility also houses several large public meeting rooms.

Logan-Mingo Readiness Center, Holden, WV
Mr. Spencer was the architect on the new Logan-Mingo Readiness Center. The exterior aesthetic of the facility was driven by the location within an industrial park on a reclaimed surface mined site. The building layout was developed by

Education
Bachelor of Architecture, University of Tennessee, 2007

Employment History
2009 - Present, Architect, ZMM
2007 - 2009, Intern Architect, ZMM
2003 - 2007, Summer Intern, ZMM

Civic Affiliations
- American Institute of Architects, Member

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.

Jackson County AFRC, Millwood, WV
Mr. Spencer participated in the schematic design of the 76,000 SF Reserve Center in Jackson County, West Virginia. Mr. Spencer was also responsible for coordinating the production effort for the project. Mr. Spencer also produced several 3D models throughout the design process. The project is aiming for LEED Silver Certification.

Joint Interagency Education and Training Center (WVARNG), Kingwood, WV Nate participated in the schematic design of the 180,000 SF addition to the Regional Training Institute at Camp Dawson. Mr. Spencer was also responsible for coordinating the production effort for the billeting (hotel) expansion, which increased the total billeting capacity at the JITEC to 600 rooms. This project received LEED Gold Certification.

Morgantown Readiness Center, Morgantown, WV
Mr. Spencer was a member of the production team for the 58,000 SF project, which housed the Army Band and associated performance spaces. Mr. Spencer also produced several 3d models throughout the design process. He also participated on all production work through all phases.

Edgewood Elementary School, Charleston, WV Mr. Spencer participated on the design team that developed the new Kanawha County Elementary School on Charleston's West Side. The school was 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 integrates sustainable design principles to serve as a teaching tool for the students. A dental and health clinic is also on site for all enrolled students in the Kanawha County School District.

Cabell County Bus Transportation Complex, Huntington, WV Mr. Spencer was the project Architect on the Cabell County Transportation Complex is located on the site of the old Cox Landing Junior High School. Challenges on the project involved retrofitting the old school and site to accommodate the new use. The rear portion of the school was demolished to make room for the new maintenance portion of the building. The remaining front section of the school was renovated to include office space, storage areas, and a new staff development room. The new maintenance area includes a high-bay metal building with 14 back to back workbays, three of which have hydraulic bus lifts. A hand wash bay and a state of the art automatic wash bay were also included in the project. Extensive sitework was also involved in the retrofit project including a fueling station, bus parking, a sediment pond, and an extensive rework of the existing site utilities.

Highland Hospital, Charleston, WV
Mr. Spencer was the project architect on Highland Psychiatric Hospital. Mr. Spencer was responsible for coordinating the production effort for the 60,000+ SF mental health facility. Mr. Spencer also produced several 3-D models throughout the design process. This project consisted of 87,300 SF, $26M addition to Highland Hospital in Charleston. The addition will include: administrative offices, training spaces, 165 patient beds, nurses stations, an out-patient treatment department, pharmacy, laundry, and building service spaces. A pedestrian bridge will connect the new facility to the existing hospital.

Additional Projects:
Charleston Civic Center, Charleston, WV
Wayne High School, Wayne, WV
Crum PK-8 School, Crum, WV
Goodwill Industries, Charleston, WV

Scot Casdorph, PE

Role
Electrical Engineer

Professional Registrations
Professional Engineer (WV)

Mr. Casdorph 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. Casdorph 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. Casdorph 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. Casdorph is 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 is scheduled for completion in 2018.

Southside Elementary and Huntington Middle School, Huntington, WV Mr. Casdorph 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. Casdorph was responsible for the electrical design of the new elementary school. The project is consolidating Beaver

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

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. Casdorph 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. Casdorph 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. Casdorph 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. Casdorph 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.

Joint Interagency Education and Training Center (WVARNG), Kingwood, WV Mr. Casdorph 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.

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

Jackson County Armed Forces Reserve Center, (WVARNG), Millwood, WV Mr. Casdorph 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 simulation center. The project is targeted for LEED Silver Certification.

Glen Jean Armed Forces Reserve Center, (WVARNG), Glen Jean, WV Mr. Casdorph 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.

Samuel Butzer, PE, LEED AP BD+C

ZMM ARCHITECTS ENGINEERS

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.

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

Project Experience

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.

Charleston Civic Center, Charleston, WV
Mr. Butzer is the Mechanical Project 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 is scheduled for completion in 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.

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.

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.

FaLena Perry

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 is serving as Construction Administrator of the new Community Center building and renovation at Valley Park. The $15M construction project includes a new community building, ball fields and a playground. Mrs. Perry is responsible for the administrative duties, performing on-site observations and tracking construction progress. Mrs. Perry collaborates with the client, design team and contractors to confirm that project guidelines are satisfactorily met. Substantial completion for the project is set for May of 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.

References

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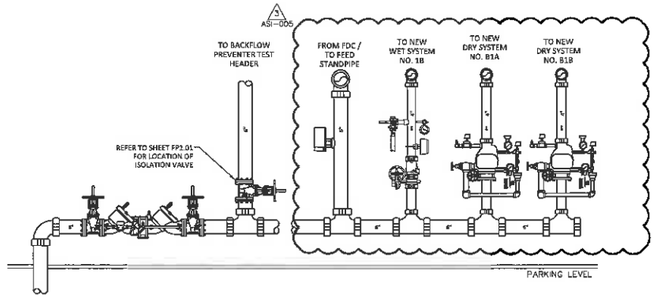
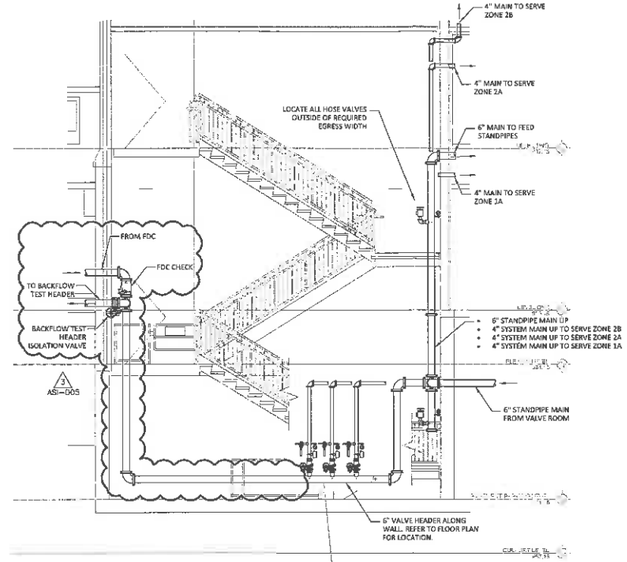
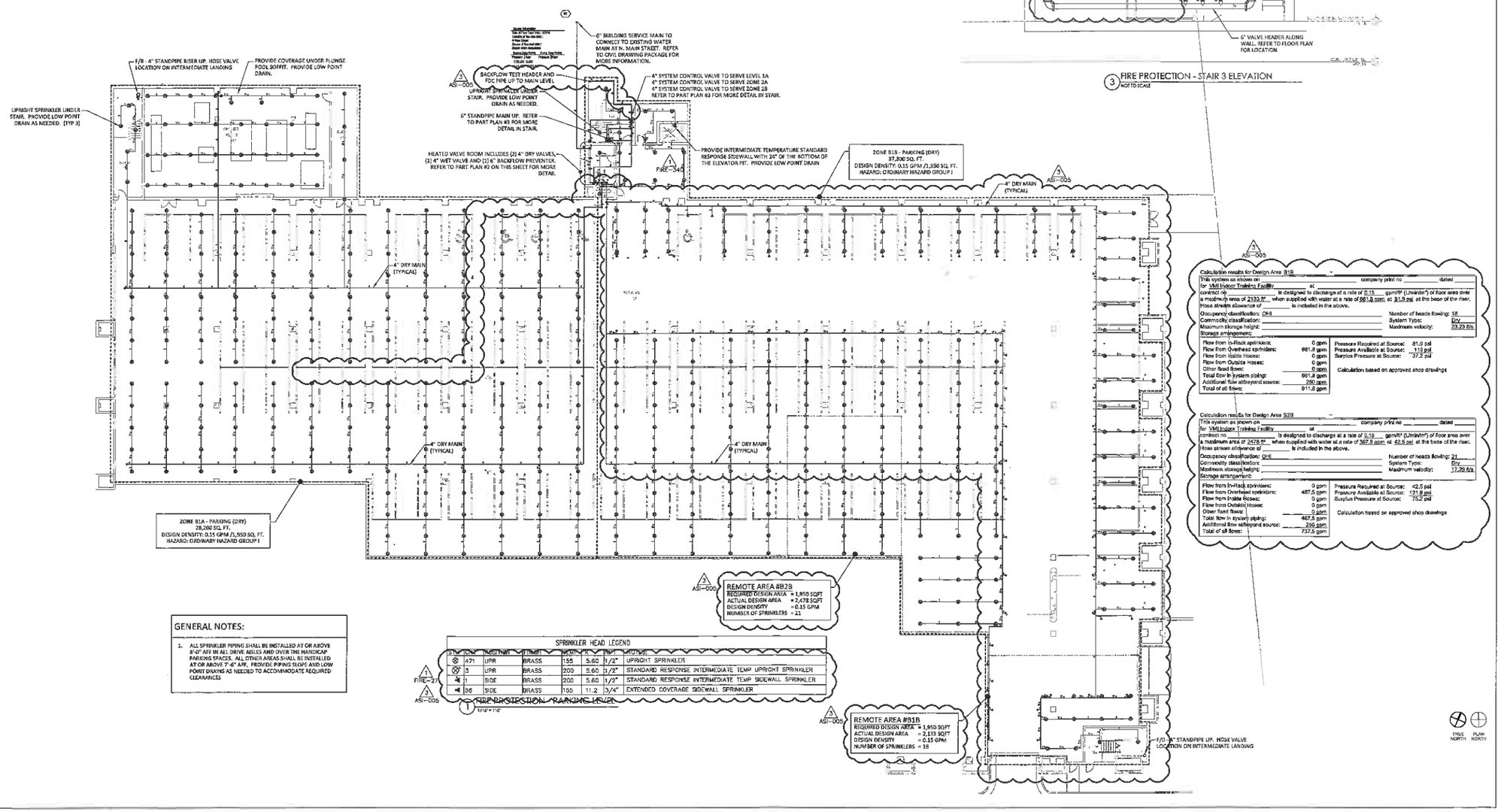
ZMM ARCHITECTS ENGINEERS



2 FIRE PROTECTION - VALVE ROOM ELEVATION
NOT TO SCALE



3 FIRE PROTECTION - STAIR 3 ELEVATION
NOT TO SCALE



3 ASI-005

Calculation results for Design Area B1B

This system as shown on _____ company print no _____ dated _____
for VMI Indoor Training Facility at _____
contract no _____ is designed to discharge at a rate of 0.15 gpm/ft² (L/min/m²) of floor area over a maximum area of 2133 ft² when supplied with water at a rate of 661.8 gpm at 81.9 psi at the base of the riser. Hose stream allowance of _____ is included in the above.

Occupancy classification: OHI
Commodity classification: _____
Maximum storage height: _____
Storage arrangement: _____
Number of heads flowing: 18
System Type: Dry
Maximum velocity: 23.23 f/s

Flow from In-Rack sprinklers:	0 gpm	Pressure Required at Source:	81.9 psi
Flow from Overhead sprinklers:	661.8 gpm	Pressure Available at Source:	119 psi
Flow from Hose Stations:	0 gpm	Surplus Pressure at Source:	37.2 psi
Flow from Outside Hoses:	0 gpm		
Other fixed flows:	0 gpm	Calculation based on approved shop drawings	
Total flow in system piping:	661.8 gpm		
Additional flow allowance source:	250 gpm		
Total of all flows:	911.8 gpm		

Calculation results for Design Area S2B

This system as shown on _____ company print no _____ dated _____
for VMI Indoor Training Facility at _____
contract no _____ is designed to discharge at a rate of 0.19 gpm/ft² (L/min/m²) of floor area over a maximum area of 2478 ft² when supplied with water at a rate of 367.8 gpm at 42.5 psi at the base of the riser. Hose stream allowance of _____ is included in the above.

Occupancy classification: OHI
Commodity classification: _____
Maximum storage height: _____
Storage arrangement: _____
Number of heads flowing: 21
System Type: Dry
Maximum velocity: 17.29 f/s

Flow from In-Rack sprinklers:	0 gpm	Pressure Required at Source:	42.5 psi
Flow from Overhead sprinklers:	467.5 gpm	Pressure Available at Source:	121.8 psi
Flow from Inside Hoses:	0 gpm	Surplus Pressure at Source:	79.2 psi
Flow from Outside Hoses:	0 gpm		
Other fixed flows:	0 gpm	Calculation based on approved shop drawings	
Total flow in system piping:	467.5 gpm		
Additional flow allowance source:	250 gpm		
Total of all flows:	737.5 gpm		

GENERAL NOTES:

1. ALL SPRINKLER PIPING SHALL BE INSTALLED AT OR ABOVE 8'-0" AFF IN ALL DRIVE AISLES AND OVER THE HANDICAP PARKING SPACES. ALL OTHER AREAS SHALL BE INSTALLED AT OR ABOVE 7'-6" AFF. PROVIDE PIPING SLOPE AND LOW POINT DRAINS AS NEEDED TO ACCOMMODATE REQUIRED CLEARANCES

SPRINKLER HEAD LEGEND

QTY	ONE	ASSEMBLY	FINISH	K-FACTOR	TEMP	ORIFICE	ACTIVITY
	471	UPR	BRASS	155	5.60	1/2"	UPRIGHT SPRINKLER
	3	UPR	BRASS	200	5.60	1/2"	STANDARD RESPONSE INTERMEDIATE TEMP UPRIGHT SPRINKLER
	1	SIDE	BRASS	200	5.60	1/2"	STANDARD RESPONSE INTERMEDIATE TEMP SIDEWALL SPRINKLER
	66	SIDE	BRASS	155	11.2	3/4"	EXTENDED COVERAGE SIDEWALL SPRINKLER

1 FIRE PROTECTION - PARKING LEVEL
1/16" = 1'-0"

A FIRE-27
A ASI-005

HKS

ARCHITECT
HKS, INC.
RICHMOND, VA 23233

ASSOCIATE ARCHITECT
COMMONWEALTH ARCHITECTS
RICHMOND, VA 23219

STRUCTURAL
THORNTON-TOMASETTI
WASHINGTON, DC 20005

LANDSCAPE ARCHITECT
OCULUS
WASHINGTON, DC 20019

CIVIL
DPAGRADATION ASSOCIATES
BLACKSBURG, VA 24060

MEP
WENFLACK & KUATZ
ARLINGTON, VA 22209

TRACK AND FIELD DESIGNER
OLYMPUS INTERNATIONAL
MIAMI, FL 33133

GEOTECHNICAL
FROEHLING & ROBERTSON, INC
ROANOKE, VA 24012

FIRE PROTECTION
HOWE ENGINEERS
NORWELL, MA 02061

AV, IT, SECURITY, AND ACOUSTICS
ANTHONY JAMES PARTNERS
RICHMOND, VA 23233

LIGHTING
COVENTRY LIGHTING
CHEVY CHASE, MD 20815

OBSTACLE COURSE DESIGNER
CHALLENGE DESIGN INNOVATIONS, INC.
PINSOLA, NC 28662

SIGNAGE AND EXHIBIT DESIGNER
THE 1977 DESIGN GROUP
RICHMOND, VA 23221

OWNER
VIRGINIA MILITARY INSTITUTE
LEXINGTON, VA 24450

VIRGINIA MILITARY INSTITUTE
LEXINGTON, VA 24450
CORPS PHYSICAL TRAINING FACILITY
PHASE 1

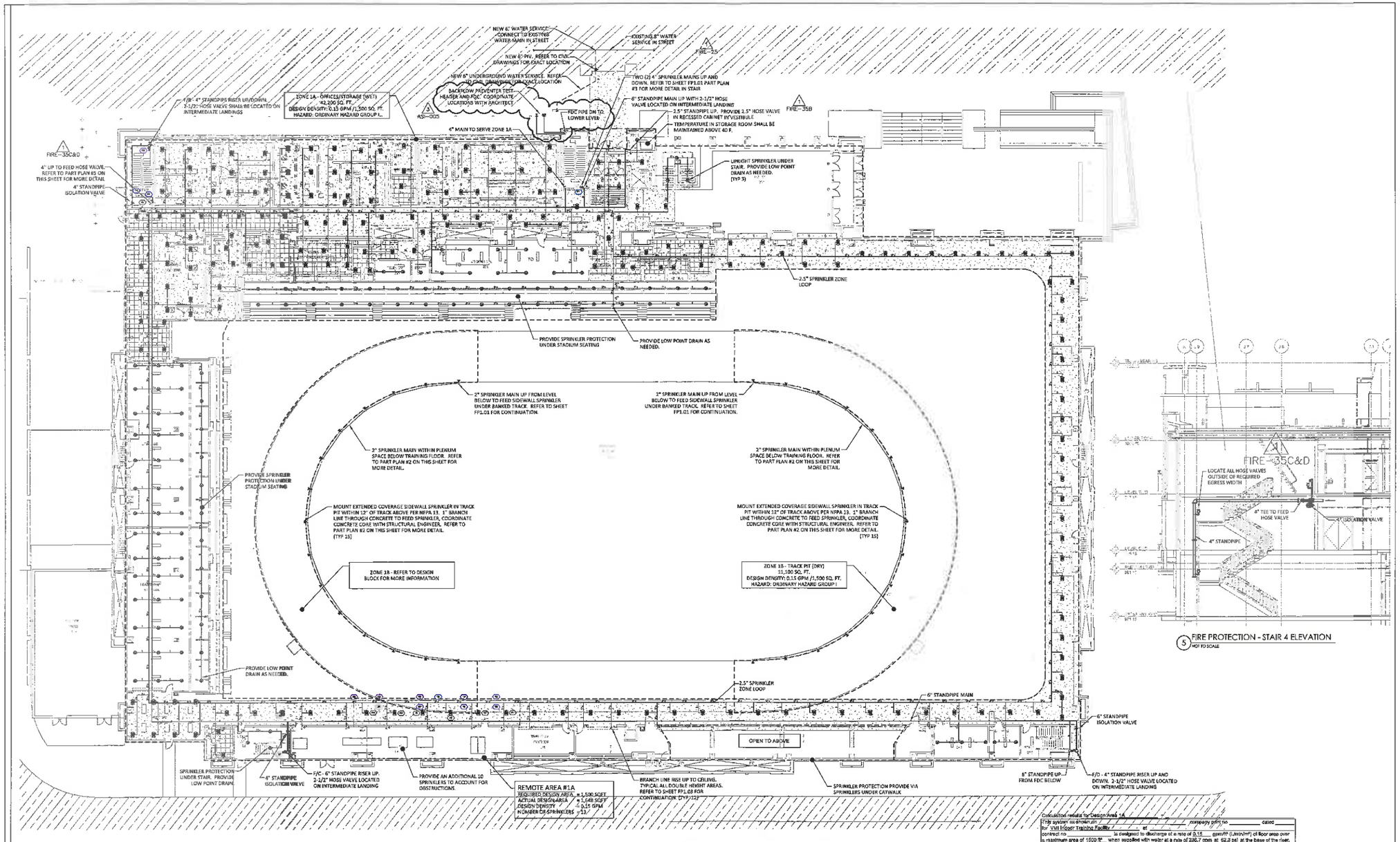
COMMONWEALTH OF VIRGINIA
ANDREW DAUGHMAN
Lic No 0402020800
June 26, 2014

KEY PLAN

REVISION NO.	DESCRIPTION	DATE
1	REVISED WORKING DRAWINGS	5/28/14
2	REVISED WORKING DRAWINGS	6/26/14
3	ASI-006	12/18/15

STATE PROJECT CODE #
211-17996-001
HKS PROJECT NUMBER
15811.000
DATE
26 JUNE, 2014
ISSUE
REVISED WORKING DRAWINGS
SHEET TITLE
FIRE PROTECTION PARKING LEVEL

SHEET NO.
FP1.01

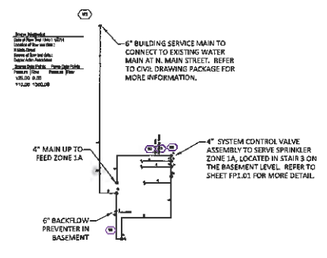


5 FIRE PROTECTION - STAIR 4 ELEVATION
NOT TO SCALE

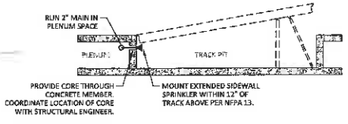
1 FIRE PROTECTION - LEVEL ONE
1/16" = 1'-0"

SPRINKLER HEAD LEGEND							
SYM	CNT	POSITION	FINISH	TEMP	K	NPT	NOTES:
⊗	113	UPR	BRASS	155	5.60	1/2"	UPRIGHT SPRINKLER SPRINKLER
●	216	PEND	WHITE	155	5.60	1/2"	CONCEALED PENDENT SPRINKLER
◁	2	SIDE	BRASS	155	5.60	1/2"	SIDEWALL
◀	31	SIDE	CHROME	155	5.60	3/4"	EXTENDED COVERAGE SIDEWALL

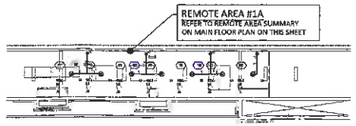
NOTES:
1. COVER PLATES SHALL BE CUSTOM PAINTED TO MATCH CEILING



2 FIRE PROTECTION - SYSTEM WATER SUPPLY SCHEMATIC
NOT TO SCALE



3 FIRE PROTECTION - TRACK PIT DETAIL
NOT TO SCALE



4 FIRE PROTECTION - LEVEL TWO PART PLAN
1/16" = 1'-0"

Calculation results for Design Area 1A
This system as shown on _____ company print no _____ dated _____
for VMI Indoor Training Facility at _____
contract no _____ is designed to discharge at a rate of 0.15 gpm/ft² (L/min/m²) of floor area over a maximum area of 1500 ft² when supplied with water at a rate of 236.7 gpm at 62.3 psi at the base of the riser.
Hose stream allowance of _____ is included in the above.

Occupancy classification:	OH1	Number of heads flowing:	13
Commodity classification:		System Type:	Wet
Maximum storage height:		Maximum velocity:	13.83 ft/s
Storage arrangement:			

Flow from In-Rack sprinklers:	0 gpm	Pressure Required at Source:	62.3 psi
Flow from Overhead sprinklers:	236.7 gpm	Pressure Available at Source:	120.1 psi
Flow from Inside Hoses:	0 gpm	Surplus Pressure at Source:	60.8 psi
Flow from Outside Hoses:	0 gpm		
Other fixed flows:	0 gpm		
Total flow in system piping:	236.7 gpm		
Additional flow at/beyond source:	250 gpm		
Total of all flows:	486.7 gpm		

Calculation results for Design Area 2 – Hose Valves
This system as shown on _____ company print no _____ dated _____
for VMI Indoor Training Facility at _____
contract no _____ is designed to discharge at a rate of 0.1 gpm/ft² (L/min/m²) of floor area over a maximum area of 0.5* when supplied with water at a rate of 1000 gpm at 133.5 psi at the base of the riser.
Hose stream allowance of _____ is included in the above.

Occupancy classification:		Number of heads flowing:	1
Commodity classification:		System Type:	Wet
Maximum storage height:		Maximum velocity:	16.75 ft/s
Storage arrangement:			

Flow from In-Rack sprinklers:	0 gpm	Pressure Required at Source:	133.5 psi
Flow from Overhead sprinklers:	0 gpm	Pressure Available at Source:	150 psi
Flow from Inside Hoses:	750 gpm	Surplus Pressure at Source:	16.5 psi
Flow from Outside Hoses:	0 gpm		
Other fixed flows:	0 gpm		
Total flow in system piping:	750 gpm		
Additional flow at/beyond source:	0 gpm		
Total of all flows:	750 gpm		

TRUE NORTH
PLAN NORTH

HKS
ARCHITECT
HKS, INC.
RICHMOND, VA 23293
ASSOCIATE ARCHITECT
COMMONWEALTH ARCHITECTS
RICHMOND, VA 23218
STRUCTURAL
THORNTON-TOMASETTI
WASHINGTON, DC 20036
LANDSCAPE ARCHITECT
OCULUS
WASHINGTON, DC 20009
CIVIL
DRAPER ADEN ASSOCIATES
BLACKSBURG, VA 24060
MEP
WSP FLACK & KURTZ
ARLINGTON, VA 22209
TRACK AND FIELD DESIGNER
OLYMPUS INTERNATIONAL
MIAMI, FL 33133
GEOTECHNICAL
FROEHLING & ROBERTSON, INC
ROANOKE, VA 24012
FIRE PROTECTION
HOWE ENGINEERS
HORWELL, MA 01061
AV, IT, SECURITY, AND ACOUSTICS
ANTHONY JAMES PARTNERS
RICHMOND, VA 23233
LIGHTING
COVENTRY LIGHTING
CHEVY CHASE, MD 20815
OBSTACLE COURSE DESIGNER
CHALLENGE DESIGN INNOVATIONS, INC.
PINCOLA, NC 28562
SIGNAGE AND EXHIBIT DESIGNER
THE 1717 DESIGN GROUP
RICHMOND, VA 23223
OWNER
VIRGINIA MILITARY INSTITUTE
LEXINGTON, VA 24450

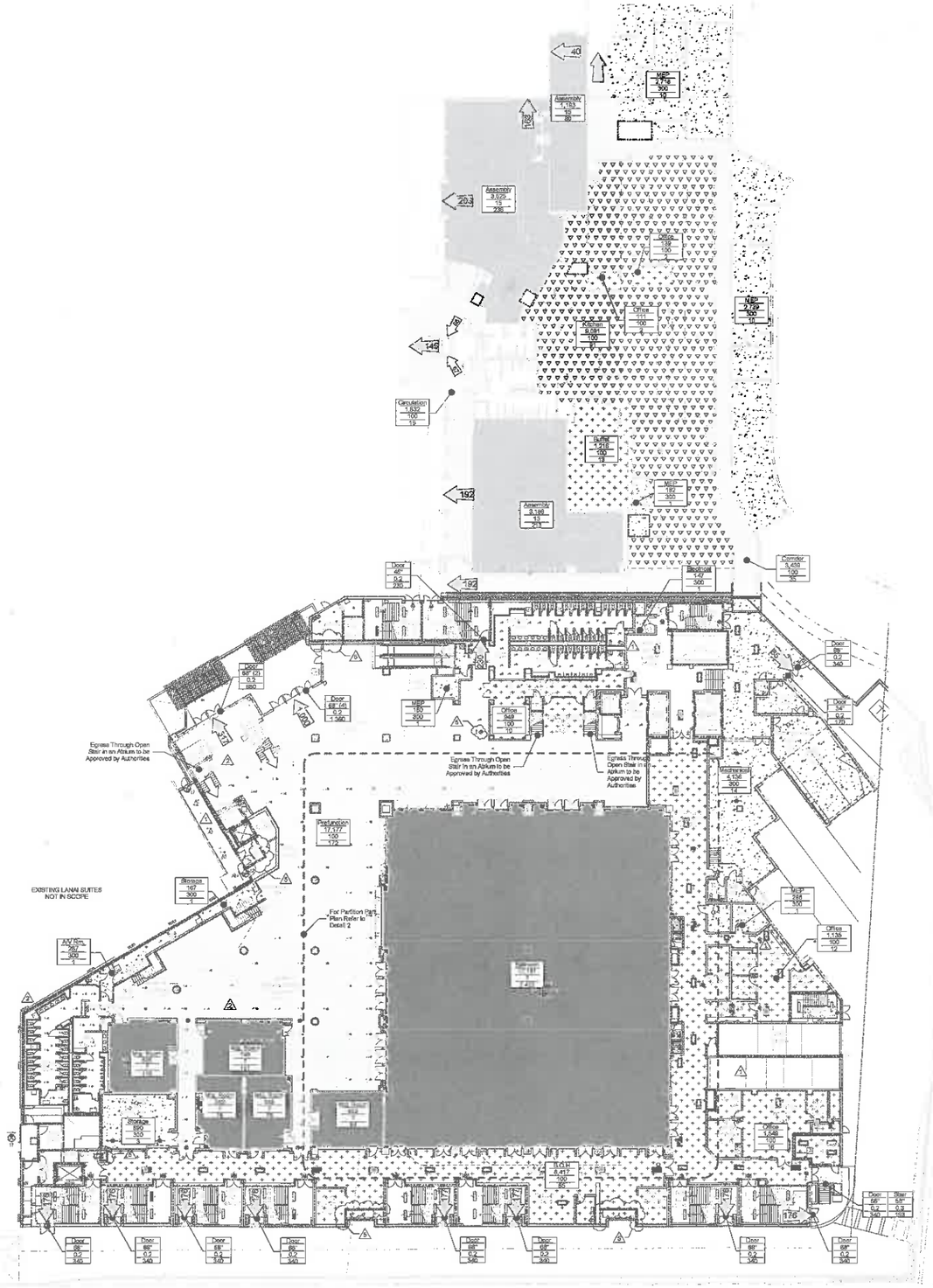
VIRGINIA MILITARY INSTITUTE
LEXINGTON, VA 24450
CORPS PHYSICAL TRAINING FACILITY
PHASE 1

COMMONWEALTH OF VIRGINIA
ANDREW DAVIDSON
Lic. No. 040020
June 26, 2014

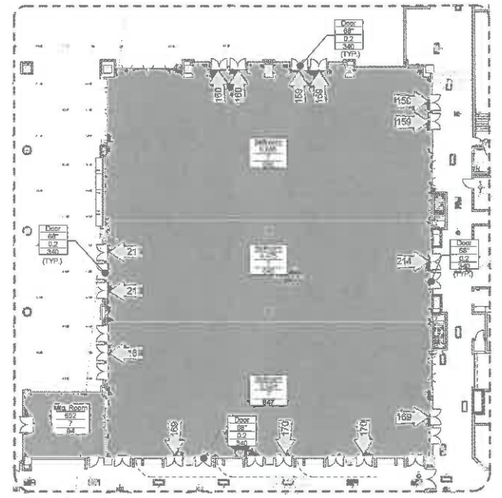
KEY PLAN

REVISION NO.	DESCRIPTION	DATE
1	REVISED WORKING DRAWINGS	6/26/14
2	REVISED WORKING DRAWINGS	6/22/14
3	AD-003	10/15/15

STATE PROJECT CODE #
211-17996-001
HKS PROJECT NUMBER
15811.000
DATE
26 JUNE, 2014
ISSUE
REVISED WORKING DRAWINGS
SHEET TITLE
FIRE PROTECTION LEVEL ONE
SHEET NO.
FP1.02



1 / ALS101 EXISTING - LEVEL 1 - 1" = 20'-0"



2 / ALS101 LEVEL 1_ Ballroom Partition Part Plan
1" = 20'-0"

DATE:
Professional of Record:
Andrew S. Renaldi, P.E.
License No. 68908
LIFE SAFETY ENGINEERS
191 Longwater Circle, Suite 203
Norwell, MA 02061
Ph:(781) 878-3606
Certificate of Authorization: 28369

Space Schedule Level 1 Existing			
Function of Space	Area (SF)	Occupancy Load Factor	Occupancy Load
Assembly Concentrated (7 sq.ft. per person)	20,458	7	2,925
Assembly Unconcentrated Decks (15 sq.ft. per person)	7,904	15	527
Business (100 sq.ft. per person)	13,518	100	140
Concourse/Circulation (100 sq.ft. per person)	22,447	100	225
Kitchen (200 sq.ft per person)	5,001	100	91
Storage/Mechanical/Misc (300 sq.ft per person)	11,544	300	43
	84,908		3,951

Graphic Legend

- Assembly Concentrated (7 sq. ft. per person)
- Assembly Unconcentrated (15 sq. ft. per person)
- Business/BOH (150 sq. ft. per person)
- Concourse/Circulation (100 sq. ft. per person)
- Exhibit/Museum Area (20 sq. ft. per person)
- Gaming Floor (11 sq. ft. per person)
- Locker Room/Gym (50 sq. ft. per person)
- Kitchen (100 sq. ft. per person)
- Pool (50 sq. ft. per person)
- Residential (200 sq. ft. per person)
- Storage/Mechanical (300 sq. ft. per person)
- Exit Signage (For reference only refer to electrical drawings)
- Egress Component Clear Width (in.)
- Egress Capacity Factor
- Egress Capacity
- Use
- Area (sq.ft.)
- Occupant Load Factor
- Occupant Load
- Occupant Load
- Occupant Flow floor exit
- Occupant Flow intermediate
- Occupant Flow stairs
- 1-hour Fire Partition
- 1-hour Fire Barrier
- 2-hour Fire Barrier
- 3-hour Fire Wall
- Other Rated Ceiling
- Emergency Lights (For reference only refer to electrical drawings)

Note: Fire alarm, fire protection, emergency lighting, egress signage and fire extinguishers are each shown in their respective trades within this drawing set. Please refer to specific trade drawings for additional information.

NORTH

CONTENT REMOVED DO TO CONFIDENTIALITY

CONTENT REMOVED DO TO CONFIDENTIALITY

LIFE SAFETY
HOME ENGINEERS
191 LONGWATER CIRCLE, SUITE 203
NORWELL MA 02061

MARCO ISLAND RESORT & SPA
Marriott.
MARCO ISLAND, FLORIDA

KEY PLAN

D A
C B

REVISION NO.	DESCRIPTION	DATE
1	ADDENDUM 03	03/06/2015
2	Permit Comments	03/06/2015
3	-	-
4	PERMIT SUBMISSION	09/05/2015
5	PERMIT REVISIONS	09/05/2015

DATE
02/20/2015
ISSUE
ISSUED

SHEET TITLE
Life Safety Drawing - Level 1

SHEET NO.
ALS101

PLOT DATE: 2/20/2015 2:53:57 PM TSCHLATT-WEBSOL