

Expression of Interest

Engineering Services for Boiler Plant
Upgrades in Buildings #5 & #6 and Evaluate
Building #36

West Virginia Division of General
Services

#GSD136412



October 15, 2012



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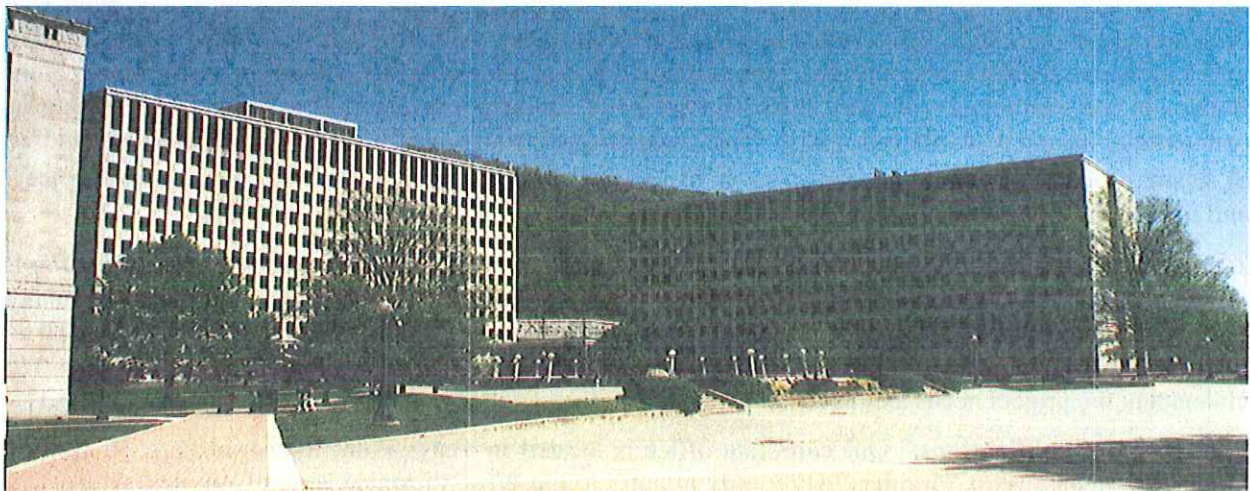
WV PURCHASING
DIVISION



Design/Consulting Services

ZDS Design/Consulting Services is pleased and proud to submit our statement of qualifications for your consideration. We have been involved with many central boiler plants using both steam and heating hot water for both campus settings and larger buildings.

CONCEPT: We designed the existing State Capitol complex central boiler heating system under Johnson Controls program and understand all the background and reasons the central plant was built the way it was ultimately constructed. We provided the engineering design for the Campus Central Heating Plant and distribution system including Buildings #3, #4, #5, #6, #7, #8, #9 and #10. We have experience with the steam distribution system and loads on campus as originally conceived. There will be a dynamic effect on the overall system as heating loads and operating pressures change. All the original CAD drawings from designing the central heating plant, distribution system and documentation of the decisions made due to financial restraints imposed on the program are available. Changes likely occurred since completing the central plant construction. We have extensive knowledge of Building's #5, #6, #7, and #36, which we believe will aid in the proposed modification outlined in GSD136412 Design Services to *Upgrade the Boiler Plant B5 & 6 including evaluation of Building #36*. **ZDS** assisted in the original comprehensive study of the campus heating distribution system that provides us with the unique understanding of how the plant was intended to operate which can be compared with how the State would like to operate the heating plant now. Our understanding of some of the challenges for renovating the existing heating plant includes the following:



1. Asbestos will still likely be encountered with both demolition of obsolete equipment and routing new piping and systems to serve Building #6 to replace the existing 10 modular boilers. Our understanding is the State has abated most areas but some asbestos likely remains.
2. Phasing of the work while using the facilities adds to the challenges, especially if asbestos is encountered in Buildings #5, #6 and #7. Building #7 may be impacted in order to extend the central plant capacity from the existing mains in Building #5 to get to Building #6.
3. The original steam plant was designed to operate at 100 psi. If the pressure is lowered, it will lead to unintended consequences. The valves identified in the RFQ that are presenting an issue may be a result of changing the plant operating steam pressure or changes in expected loads. We understand how those operational changes interact and affect the system to help with proper direction on changes that need to occur.
4. The central steam plant was designed to operate all year. When the system is shut down every summer, it can lead to unintended consequences that we understand and can assist the State by providing direction to address those challenges.
5. The original central boiler plant was sized for new future large building(s) when the State

- expected the Lottery facility and others to be built on campus. If these future loads and other loads including Building #3 being vacant are not added to the central plant, operating practices should be revisited and changes made to fit with the States current heating plant needs.
6. Building PRV stations were designed based on 100-psi steam entering them. Lowering the heating plant steam pressure can have a negative impact on their capacity and operation. We have the knowledge of how the system was originally intended to operate and know how to make changes to fit current desired operating practices.
 7. We understand the need for the proposed replacement of the heat exchangers in Building #5 from our previous work in the facility. The State along with JCI elected during the central heating plant to defer work to fit within the financial parameters of the overall project at the time.
 8. Adding Building #6 to the Central Plant load is an excellent viable approach to improve overall plant efficiency.
 9. Building #36 Mechanical and Electrical evaluation were added as part of Addenda #1. This is what **ZDS** specialize in and have provided comparable service for all WVDHHR hospitals in the last few years.

We believe our successful experience in previous work on the Central Plant makes us the best qualified to address the proposed *Upgrade the Boiler Plant B5 & 6 including evaluation of Building #36*. We understand the Capitol Complex central boiler plant and campus distribution system since we designed it. We know how each change in the operating practices impact the plant. The original boiler plant was designed based on running all year and operating at 100-psi steam pressure. Lowering the steam pressure will lead to unintended consequences. Frequent shutting down of the boiler plant may result in premature failures in the manholes, especially if the startup is not handled very carefully so to not have a slug of condensate “hammer” a fitting or valve. The design firm selected must have an excellent understanding of steam, especially in operating pressures up to 120 psi. **ZDS** has been involved in many steam projects and renovations for both large facilities and campus setting with great success.

ZDS will provide comprehensive MEP engineering support for the proposed *Upgrade the Boiler Plant B5 & 6 including evaluation of Building #36*. We have provided these types of upgrades for many clients including, the Cultural Center, Raleigh County Schools, Elkins Middle School, WVDHHR Hospitals, WVU, Ohio University, Marshall University and at the West Virginia Capitol Complex. We understand the project needs and have the personnel and experience to meet the State’s needs.

Firm/Team Qualifications: Our corporate office is located in Teays Point Industrial Park, 91 Smiley Drive, St. Albans, West Virginia, 25177; only minutes to the West Virginia Capitol Complex, which will aid in the communications. We have many licensed Professional Engineers in West Virginia and **ZDS**'s personnel have worked from Hawaii to New York covering the USA. Refer to *Section II* for our team’s services.



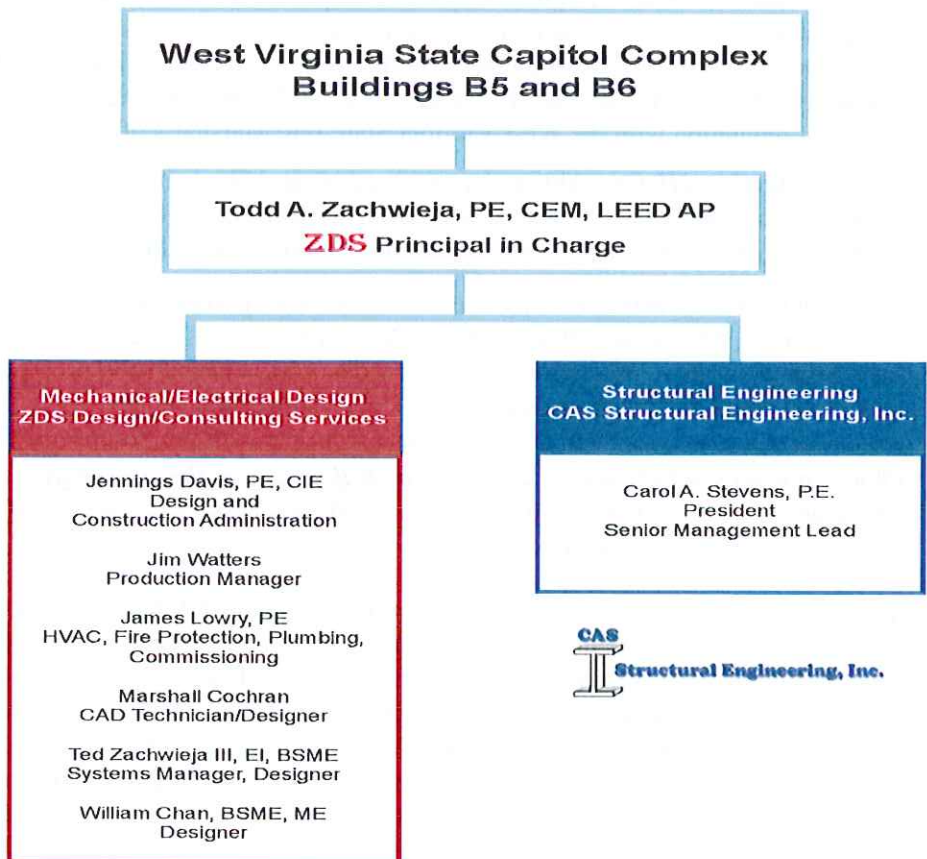
CAS Structural Engineering, Inc., a West Virginia Certified Disadvantaged Business Enterprise is located in the Charleston, West Virginia area. CAS will provide any structural design required for your project. Carol A. Stevens, PE, is the firm president and will be the structural engineer for this project. Ms. Stevens has over 25 years of experience with building structures in both West Virginia and Pennsylvania. Projects for CAS involving the West Virginia State Capitol Complex include: exploratory evaluation and design for corrections to the Capitol dome (during the gilding project), evaluation of existing conditions and structural design for renovations at the Governor’s Mansion, evaluation and recommendations for the renovations to the Main Capitol Building façade, Buildings #3/#5 central boiler plant structural design.

Personnel Having Authority – Direct answers to RFQ The project is assigned to **ZDS**'s principal in-charge of planning/design who will follow the project from inception through design. He has full authority to execute a binding contract on behalf of **ZDS**: **Todd A. Zachwieja, PE, CEM, LEED AP – Principal and CEO of ZDS Design/Consulting Services**, 91 Smiley Drive, Saint Albans, WV 25177 E-mail: Todd.Zachwieja@ZDSDesign.com, Phone 304-755-0075, Ext. 307, Mobile (304) 545-4550.

- ZDS Design/Consulting Services and its structural engineering consultant CAS Structural Engineering can handle this project in its entirety and has done many similar projects.
- ZDS Design/Consulting Services accepts and understands that all work produced as a result of the contract and payment for our work will become the property of the Agency with the following clarification. *All drawings, specifications and other documents, including those in electronic form (e.g. including but not limited to CADD files, etc.), are Instruments of Service and shall become, upon payment of all sums due Vendor under this Agreement, the property of the Client. Vendor shall be permitted to use standard details of such Instruments of Service for other work executed by Client's employees but shall not use any unique design elements. If Vendor for any reason does not complete all the services contemplated by this Agreement, Vendor cannot be responsible for the accuracy, completeness or workability of the Instruments of Service prepared by Vendor if used, changed or completed by Client or by another party. Additionally, Vendor cannot be responsible for the reuse of its Instruments of Service by the Client or others who may receive such Instruments by or through the Client for any other project.*
- ZDS Design/Consulting Services **does not** have any litigation or arbitration proceedings, nor any vendors complaints filed with the State of West Virginia or any other agencies that involve legal representation by either party relating to the firm's delivery of design services.

Project Organization:

We assign the production staff according to the nature of the project and the work force necessary to meet the schedule. Jennings Davis, PE is ZDS's Associate who would be in charge of overseeing the construction administration process and would attend the construction meetings while coordinating the design intent with Todd Zachwieja and other engineers. Jim Watters, ZDS's Associate will act as Production Manager due to his expertise in both construction and design. Resumes are included in *Section IV* of our submission.



A brief listing of key people includes:

Todd A. Zachwieja, P.E., CEM, LEED AP, CEO, **ZDS** Principal, BSME, MSEM with over 32 years of experience in M/E design, energy mgt., IAQ and commissioning. *Nationally recognized for expertise in Mechanical Design, Indoor Air Quality and Certified as an Energy Manager.*

Jim Watters, Associate **ZDS** Production Manager, over 35 years of HVAC/Electrical/Plumbing design & Construction experience.

James Lowry, P.E., BSME specialist in HVAC, Fire Protection, plumbing Engineering design for **ZDS**.

David Dial, P.E., **ZDS** Senior Engineer, BSME, MSEE, over 28 years of HVAC/Electrical/Plumbing & Structural design experience.

Jennings Davis, P.E., **ZDS** Associate, BSME, with over 22 years of design experience with extensive knowledge of the Main Capitol Complex.

Ted A. Zachwieja III, *El, BIM Mgr*, **ZDS** Systems Administrator, BSME from Rochester Institute of Technology with extensive experience in BIM, 3D modeling, information technology, renovations and energy efficient design. Awarded *2012 Legend-in-Energy* by the Association of Energy Engineers.

Carol Stevens, P.E., President of *CAS Structural Engineering*, BSCE, MEES, over 25 years of Structural design experience with extensive knowledge of the Main Capitol Complex including Building #5.

Demonstrated Experience: Our team has over five decades of experience in West Virginia giving us a great local understanding of the State community. The WVDHHR, Marshall University, West Virginia County Schools, Ohio University (Athens & Chillicothe campuses), Concord University, Raleigh County Schools and the West Virginia Capitol Complex all found **ZDS** to be successful in comparable infrastructure retrofits to their facilities. We have code specialists as part of our team to help ensure that the proposed renovations also incorporate the State of West Virginia Fire Marshal requirements, NFPA, ASHRAE, NEC, International Building Code and other pertinent requirements. We also have an excellent reputation with the West Virginia State Fire Marshal's office.

Refer to *Section III* for additional project examples which include the project name, project location, project description, type of service provided, project size with square footage, cost and other relevant information, name of project Owner with phone number and address, completion dates, etc.

ZDS provided engineering for upgrades to the West Virginia Capitol Complex including Buildings #1, #3, #4, #5, #6, #7, #8, #9 and #10 as part of a Performance Contracting team. We believe our knowledge and involvement in the Capitol Complex's facilities will help with the proposed renovations. Our work at Ohio University at both its Athens campus and Chillicothe campuses involved saving over \$2.5 million annually. Please review the enclosed article from the *College Planning & Management* on our work at Ohio University which states "**ZDS**, is worth the monies the university paid for their services." It was important to have somebody guide us through the process," says Sherwood Wilson, then Associate Vice President for Facilities and Auxiliaries.

We also provided comparable engineering renovations for HVAC/electrical renovations for Harris Hall at Marshall University. Many of our WV County Schools clients involved extensive MEP renovations totaling hundreds of millions in construction costs. These include Raleigh County School's Woodrow Wilson High School 4 pipe HVAC system, Park Middle School with renovated boiler plant, Shady Springs Middle School new 4 pipe HVAC system, Trap Hill Middle School 4 pipe HVAC system, Randolph County School's Elkins Middle School conversion of steam to heating hot water plus comprehensive MEP renovations, Webster County High School and many others. Ask the WV Department of Education and School Building Authority about our firm. Both have asked our participation in establishing design and construction guidelines for all schools in WV.

References: We pride ourselves on being viewed as an extension to our client's staff and successfully incorporating pertinent information about their facility into any proposed solution. We have extensive renovation experience including phasing construction. Please call our references and ask how well we worked with their staff, about our technical strengths and our ability to work with contractors to provide the Owner with a quality project. **ZDS** references that we would encourage you to call, and which relate to this type of Project include:

1. Mr. Greg Nicholson, Chief Operations Officer for WVDHHR (304) 558-1577 for Master planning and MEP Design/bidding/construction for all their hospitals, E-mail: greg.c.nicholson@wv.gov.
2. Mr. Ron Adkins, Construction Mgr. for WVDHHR (304) 957-0205, ron.adkins@wv.gov
3. Mr. Mike Pickens, Executive Director of Office of School Facilities, phone, (304) 558-2711 mepicken@access.k12.wv.us who has knowledge with ZDS's work for over ten years.
4. Mr. Racine Thompson, Retired Assistant Superintendent, Raleigh Co Schools (304) 222-3907 or home (304) 253-6890 who has worked with **ZDS** for over 15 years at Raleigh County Schools.
5. Mr. Mark Lynch, Dir. of Facility Operations, WV Div. of Culture & History (304) 558-0220, ext 160
6. Mr. Tony Crislip, Manager, Physical Plant, Marshall University (304) 696-6241
7. Dr. Mark Manchin, Executive Director School Building Authority, phone (304) 558-2541

We believe that our combined specialties and experience with your facility provide the State with the best expertise to provide economical solutions to your specific projects needs. Our proposed Team Members have knowledge of your existing facility, which will also aid in responding promptly to your needs.

We believe that our combined specialties provide *State of West Virginia's Upgrade the Boiler Plant B5 & 6 including evaluation of Building #36* with the best Engineering expertise to provide economical solutions for your specific projects needs. We look forward to meeting with you to discuss our team's qualifications and your needs further. If there are any questions, please do not hesitate to call.

Sincerely,



Todd A. Zachwieja, P.E., CEM, LEED AP
Principal, Chief Executive Officer

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CERTIFICATION AND SIGNATURE PAGE

By signing below, I certify that I have reviewed this Solicitation in its entirety; understand the requirements, terms and conditions, and other information contained herein; that I am submitting this bid or proposal for review and consideration; that I am authorized by the bidder to execute this bid or any documents related thereto on bidder's behalf; that I am authorized to bind the bidder in a contractual relationship; and that to the best of my knowledge, the bidder has properly registered with any State agency that may require registration.

ZDS DESIGN/CONSULTING SERVICES

(Company)

Todd A. Zachwieja

(Authorized Signature)

Todd A. Zachwieja
PRINCIPAL, CEO

(Representative Name, Title)

304-755-0075

(Phone Number)

304-755-0076

(Fax Number)

Oct. 15, 2012

(Date)

ADDENDUM ACKNOWLEDGEMENT FORM

SOLICITATION NO.: GSD136412

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)

- List of addendum numbers 1 through 10 with checkboxes. Addendum No. 1 is checked with an 'X'.

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.

Handwritten signature block including 'ZDS DESIGN/CONSULTING SERVICES Company', 'David Q. Joshwaga Authorized Signature', and 'October 15, 2012 Date'.

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

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

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

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

DEFINITIONS:

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

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

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

Authorized Signature: [Signature] Date: 10/15/2012

State of WV

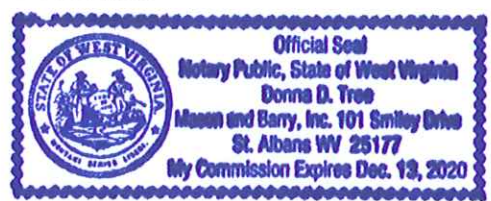
County of Putnam, to-wit:

Taken, subscribed, and sworn to before me this 15 day of October, 2012.

My Commission expires 12-13, 2020.

AFFIX SEAL HERE

NOTARY PUBLIC [Signature]





State of West Virginia
DRUG FREE WORKPLACE CONFORMANCE AFFIDAVIT
West Virginia Code §21-1D-5

STATE OF West Virginia

COUNTY OF Putnam, TO-WIT:

I, Todd A. Zachwieja, after being first duly sworn, depose and state as follows:

- 1. I am an employee of ZDS Design/Consulting Service; and,
2. I do hereby attest that ZDS Design/Consulting Services

maintains a valid written drug free workplace policy and that such policy is in compliance with West Virginia Code §21-1D-5.

The above statements are sworn to under the penalty of perjury.

ZDS Design/Consulting Service
(Company Name)

By: Todd A. Zachwieja
Title: Principal, CEO

Date: Oct. 15, 2012

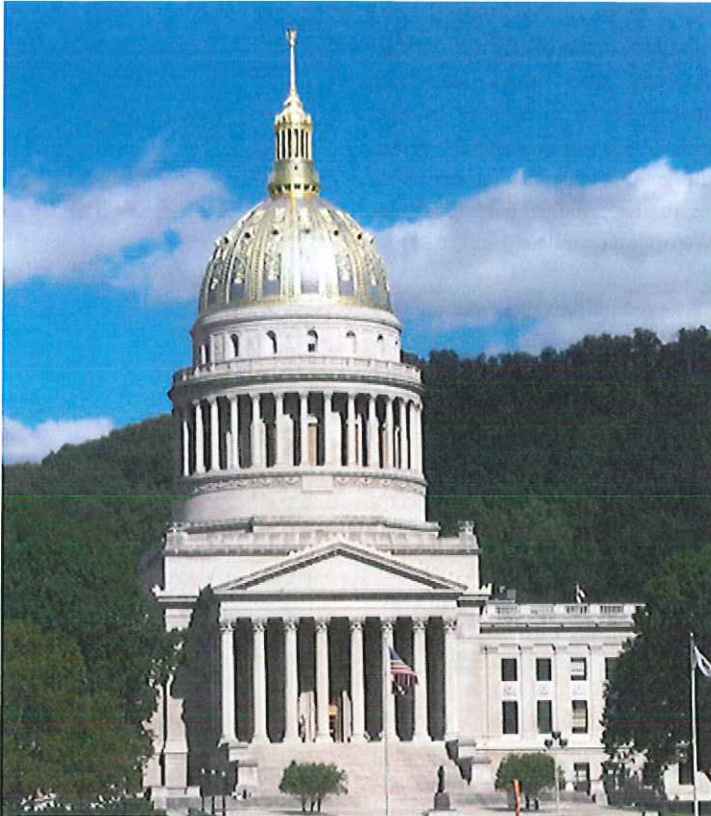
Taken, subscribed and sworn to before me this 15 day of October.



Donna D. Tree
(Notary Public)

THIS AFFIDAVIT MUST BE SUBMITTED WITH THE BID IN ORDER TO COMPLY WITH WV CODE PROVISIONS. FAILURE TO INCLUDE THE AFFIDAVIT WITH THE BID SHALL RESULT IN DISQUALIFICATION OF THE BID.

Section II
Organization & Services



ZDS OFFERS AN EFFECTIVE ORGANIZATIONAL STRUCTURE; ONE THAT TAKES EACH PROJECT FROM INCEPTION THROUGH COMPLETION, WORKING AS AN EXTENSION OF THE CLIENT EVERY STEP OF THE WAY.

EXCELLENT MECHANICAL AND ELECTRICAL DESIGN RESULTS FROM AN EXPERIENCED TEAM, AS WELL AS LISTENING TO THE NEEDS OF THE CLIENT. ABOUT ZDS DESIGN/CONSULTING SERVICES.

ORGANIZATION

In 1983, Todd A. Zachwieja founded ZECO Consultants. In 1994 **ZDS** Limited Liability Company was incorporated in West Virginia using dba **ZDS** Design/Consulting Services, and was founded to provide design and consulting services. Today **ZDS'** principals have over 100 combined years of technical expertise:

Todd A. Zachwieja, PE, C.E.M., LEED AP, Chief Executive Officer, brings with him over 30 years in the design and consulting business.

Daniel H. Kim, Ph.D., Manager of Strategic Planning brings with him over 25 years in the design and consulting business and is one of the nation's leading experts in organizational management. He is also owner/founder of Pegasus Communications, Inc. from 1991 to present.

Lori Zachwieja, CPA, MFA Chief Financial Officer, was cofounder of ZECO Consultants.

SERVICES

MECHANICAL
INDOOR AIR QUALITY
ENERGY

ELECTRICAL
COMMISSIONING

Each new project is assigned to a principal in-charge who will follow the project from inception through commissioning.

ZDS assigns the production staff according to the nature of the project and the work force necessary to meet the schedule. The Principal in charge of that project determines if consultants are needed and coordinates all areas. After bidding, a Principal of **ZDS** coordinates visits to the job site regularly, all the way through the post-warranty inspection.

ZDS believes in the team approach when providing engineering design and consulting services. We start with our client as the number one member on our team. We listen to the needs and concerns of our client and that becomes the basis for our design. Our design expertise includes:

MECHANICAL DESIGN

- Heating & Ventilation
- Air Conditioning
- Piping
- Environmental Controls
- Process Controls
- Refrigeration
- Plumbing
- Medical Gases
- Sprinkler-Fire Protection
- Master Planning

ELECTRICAL DESIGN

- Power Distribution
- Interior Lighting
- Exterior Lighting
- Emergency Power
- Communications
- Technology
- Fire Alarm
- Security
- Life Safety
- Master Planning

ZDS provides comprehensive design services. We have experience and specialties in indoor air quality, energy management and commissioning, along with traditional mechanical and electrical design experience dating back as far as 1958. We offer a complete package.

ZDS works with all levels of the client's staff: the building owner, the budget supervisor, the operating and maintenance staff and others impacted by the project. We recognize that the maintenance and operating staff live with the design long after the project's completion. We listen to and work with those who will continue to operate and maintain the equipment. We find that proper communication benefits the client throughout the design process and beyond.

The **ZDS** design team provides a total system evaluation for cost-effective selection, installation, and ease of maintenance for both new systems and retrofit of in-place systems.

Design begins with our client. Our staff meets with our client to review their concerns, budgets and schedules. The **ZDS** design team reviews the entire picture, and ends with "A Total Design."

COMPANY LEGAL NAME

ZDS Design/Consulting Services

LOCATION OF INCORPORATION

West Virginia

PRINCIPAL OFFICERS

Todd A. Zachwieja, PE, C.E.O.

Daniel H. Kim, PhD

Lori Zachwieja, CPA

OFFICES

St. Albans, WV

Morgantown, WV

NUMBER OF EMPLOYEES

ZDS currently employs 15 design professionals.

INDOOR AIR QUALITY SERVICES

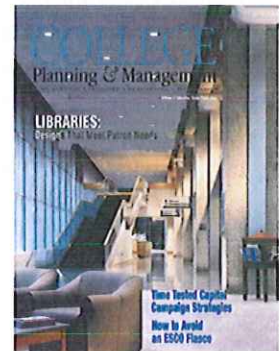
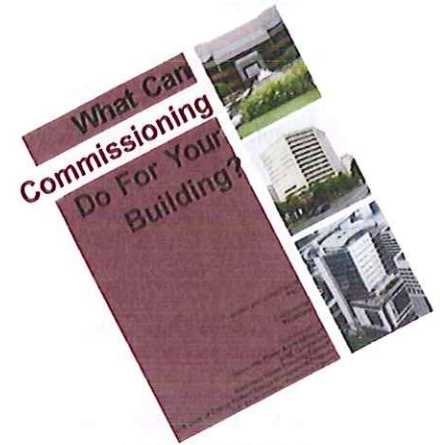
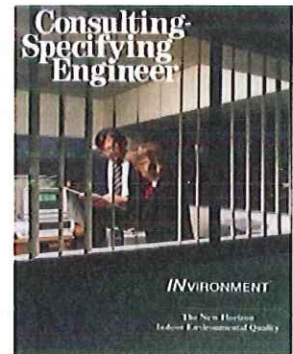
ZDS provides consulting engineering services for the indoor air quality (IAQ) environment. These services include: strategic planning for renovation and new construction projects; technical research and writing; specialized applications software development; corporate and professional training programs; publications support and fulfillment; and site-specific engineering and scientific consultation.

Todd Zachwieja, **ZDS** principal, is contributing editor for the following IAQ publications:

- Contributing Editor and Technical Review Panel for the publication of the INvironment™ Handbook of Building Management and Indoor Air Quality, by Chelsea Group and published for Powers Educational Services.
- Technical Review Panel for the Quarterly publication of the INvironment™ Newsletter, by Chelsea Group for Powers Educational Services.
- Ventilation for a Quality Dining Experience: a Technical Bulletin for Restaurant Owners and Managers.
- The New Horizon: Indoor Environmental Quality, published as a supplement to the June 1993 issue of Consulting-Specifying Engineer magazine, a trade magazine distributed to roughly 50,000 engineers.
- Editorial Advisory Board member reviewing the articles of the monthly publication INvironment™ Professional.
- Editorial Advisory Board member of POWER PRESCRIPTIONS™ Indoor Air Quality Publication by Electric Power Research Institute.

- **ZDS** provides IAQ services for major corporations, government organizations and property owners to resolve their specific facility problems:
- Resolve the building's "sick building syndrome" complaints.
- Identify solutions to extensive biological contamination building related illnesses in renovated office buildings.
- Develop solutions for HVAC systems, temperature controls, equipment, operating and maintenance practices causing IAQ problems in schools and commercial buildings.
- Commission new and renovated facilities to minimize or eliminate IAQ issues before they become problems.
- Develop and establish master plans as well as conduct training seminars for IAQ of schools and commercial buildings.

As one of the nation's leaders in Indoor Air Quality, **ZDS** produces sophisticated technical expertise that enables our Client to be proactive in solving and preventing indoor environmental problems.



SUMMARY

At **ZDS**, our engineering staff integrates energy efficiency into each project design to provide you, our client, with the added value that you expect and deserve. The **ZDS** team approach represents a tremendous amount of experience in designing energy efficient facilities. **ZDS** offers a comprehensive range of energy management services that includes:

- Providing detailed analysis of facilities.
- Recommending sound and proven energy saving solutions.
- Implementing energy management improvements.
- Determining, quantifying and assisting in securing available Utility and Government grants.
- Evaluating and documenting utility savings.

Todd Zachwieja received AEE's LEGENDS IN ENERGY AWARD in 2007 and 2008 for lifetime achievements in energy. The **ZDS** team



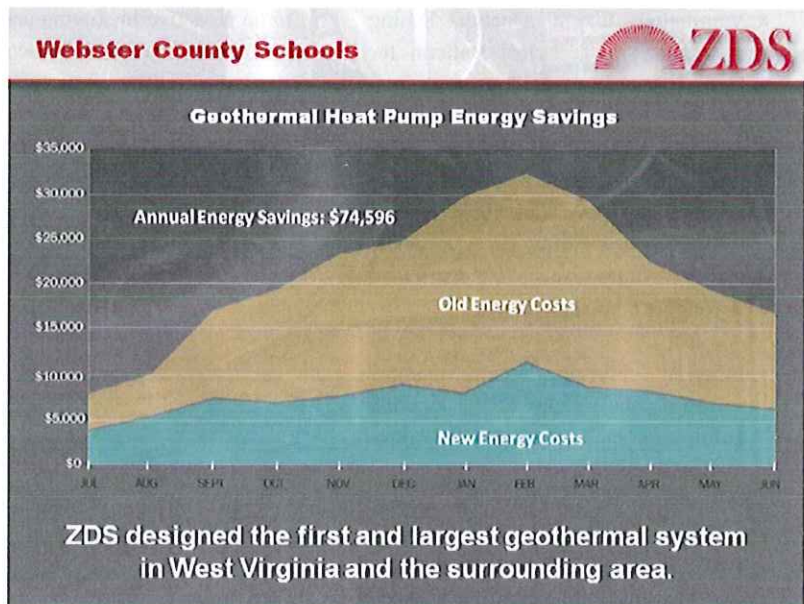
members take pride in the quality of their projects and have been responsible for designing and implementing numerous energy management programs. These programs are providing significant energy improvements and include optimizing, central utility plant equipment, control systems, air handling systems, lighting systems, and other energy consuming equipment.

Recent projects include:

- Interconnecting boilers and chiller plant systems.
- Designing Geothermal HVAC systems.
- Optimizing HVAC equipment and operating sequences.
- Installing Direct Digital Control (DDC) Energy Management Systems.
- Replacing inefficient lighting equipment with energy efficient systems to variable speed operation.
- Modifying air handling equipment from 100% outside air to return air operation.
- Implementing heat recovery units into HVAC equipment.
- Improving laundry, kitchen and other process application efficiencies.

In addition to the energy management projects outlined above, the **ZDS** team members have extensive experience in identifying and implementing energy efficient operating and maintenance measures. These are typically low cost or no cost measures that include:

- Inspecting, calibrating temperature controls and adjusting outdoor air dampers.
- Commissioning economizer cycle operation.
- Testing steam traps and pressure relief equipment operation.
- Enabling heating and cooling equipment only when required.



The **ZDS** team is trained and experienced in advising you of program options to incorporate energy efficiency and operational savings features into the design of your new construction and renovation projects. At **ZDS**, we view our role as helping you to define your own energy efficiency needs and goals through identifying energy savings options and providing supporting financial information. We then help you fit your energy efficiency needs and goals into a workable budget and schedule, and then design a program to fill those needs.

Sustainable “Green Building” design, including LEED’s certification, recognizes the importance of commissioning. The design and construction industry have had start-up problems when a facility is occupied and construction deficiencies were not discovered until the contractor’s traditional one-year warranty period expired. The mechanical and electrical systems have continued to become more complex with sophisticated control systems and equipment, and a mountainous amount of changing technology. If not properly addressed, building owners could face numerous operational problems from “Sick Building Syndrome,” excessive energy costs, and uncomfortable indoor environments. Commissioning is the missing link between design and implementation.

Subsequent to joining **ZDS**, Todd Zachwieja established commissioning services for one of the nation’s largest energy service companies. He is also a LEED’s Accredited Professional. Many utility companies and building owners now require commissioning for the new or renovated facilities in order to maximize the use of their investments in their facilities and to obtain LEED’s certification. The

commissioning process offers the following benefits:

- Improved comfort, serviceability and Owner understanding of systems and design intent.
- Added technical support for the Owner and being proactive in preventing new problems.
- Reduced maintenance and decreased expenses related to operating deficiencies.
- Early identification and resolution of system discrepancies while designers and contractors are still under contract and on the job.
- Verification of system performance while meeting financial restraints.
- Commission new and renovated facilities to minimize or eliminate IAQ issues before they become problems.

ZDS and its consultants offer commissioning services for their commercial and institutional clients; including meeting LEED’s enhanced commissioning requirements. These services include strategic planning operations assistance for renovation and new construction projects. Commissioning services consist of construction document review, equipment performance testing, documentation of design criteria, value engineering, operational fine tuning, professional operations training programs and site-specific engineering consultation. Our project team has the unique experience of in-depth design knowledge and hands-on operations knowledge that fills in the gap between traditional design services and the building Owner’s operational needs.

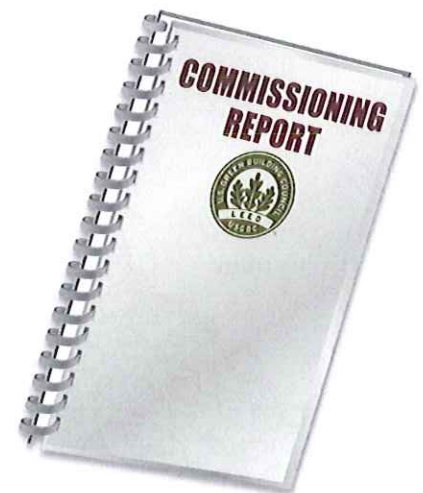
NATIONAL RECOGNITION

The National Conference on Building Commissioning invited Todd Zachwieja, **ZDS**’ owner, to speak. He jointly presented a paper with the Director of Maintenance of Charleston Area Medical Center’s Memorial Division. The Tampa, Florida Conference involved experts nationwide.

The principal owners of **ZDS** and their consultants have extensive experience in building commissioning and have saved their customers hundreds of thousands of dollars in construction costs and operating costs through their efforts.

The design team at **ZDS** is the best to provide engineering services for your project. Satisfying our client’s individual needs and distinct requirements is the foremost concern of **ZDS**.

The most important member of the design team is the client. We make every effort to involve our clients throughout the entire process, from the planning through the construction and beyond.



The **ZDS** design staff continuously provides engineering design services value well into the millions of dollars on a variety of project types. Designing expertise goes as far back as 1958.

Through the efforts of our staff, project locations include:

- | | |
|---------------|----------------|
| West Virginia | Michigan |
| California | New York |
| Colorado | North Carolina |
| Connecticut | Ohio |
| Florida | Pennsylvania |
| Georgia | South Carolina |
| Hawaii | Tennessee |
| Illinois | Texas |
| Indiana | Virginia |
| Kentucky | Washington, DC |
| Maryland | Wisconsin |
| Massachusetts | |

ZDS clients can rest assured that the design team will be available, not just for the year or two that we are involved in the initial design and construction, but also for years that follow as questions arise about your facility. A good engineered system and its equipment should last 15 to 40 years. Why not select a design firm with experienced staff committed to their projects with a comparable track record.

The **ZDS** design team will provide comprehensive services utilizing experienced staff through planning; cost estimating, engineering, coordination of bidding, regular site visitation during construction and specifications for equipment. You, our client, will greatly benefit from a single point of responsibility for every need your project may have.

The **ZDS** staff has the expertise with codes and standards. We have extensive experience in conducting engineering code surveys of existing facilities. Our staff has excellent working relationships with the West Virginia Fire Marshal's Office and the West Virginia Department of Health and Human Resources.

In addition to comprehensive Engineering services from an experienced design team, another major consideration in the selection of your engineer and design staff should be their track record. **ZDS'** organization has an unbeatable, long running, and well-known track record for meeting our clients' needs, on time and within budget, with outstanding quality.

ZDS views these characteristics as the foundation of Quality. We look forward to the opportunity to discuss our ideas with you and assist you by providing solutions for your needs with a full range of services from Planning to Commissioning.



CLIENTS

- Bank One
- Charleston National Bank
- Culture & History Museum
- District 2 Headquarters' Building Renovations, Huntington, WV
- General Motors
- Harvard University, Boston, MA
- Kanawha County Commission
- Kanawha County Schools
- Laidley Towers, Charleston, WV
- Marshall University
- Meadowbrook Rest Area
- Raleigh County Schools
- Pocahontas Community Center
- Putnam County Schools
- Stonewall Jackson Marina
- Veterans Administration
- Webster County Development Authority
- White Sulphur Springs Welcome Center
- WV Air National Guard
- WV Army National Guard
- WV Dept. of Education
- WV Dept. of Transportation
- WV Division of Health & Human Resources
- WV Division of Culture and History
- WV Division of Protective Services
- WV General Services Administration – Capitol Complex Renovations
- WV Higher Education Policy Commission
- WV Parkways Authority

CAS **Structural Engineering, Inc.**

Firm Profile

CAS Structural Engineering, Inc. – CAS Structural Engineering, Inc. is a West Virginia Certified Disadvantaged Business Enterprise structural engineering firm located in the Charleston, West Virginia area.

Providing structural engineering design and/or analysis on a variety of projects throughout the state of West Virginia, CAS Structural Engineering has experience in excess of 20 years on the following types of building and parking structures:

- Governmental Facilities (including Institutional and Educational Facilities)
- Industrial Facilities
- Commercial Facilities

Projects range from new design and construction, additions, renovation, adaptive reuse and historic preservation (including use of The Secretary of the Interior's Standards for Rehabilitation) to evaluation studies/reports and analysis.

CAS Structural Engineering utilizes AutoCAD for drawing production and Enercalc and RISA 2D and 3D engineering software programs for design and analysis. Structural systems designed and analyzed have included reinforced concrete, masonry, precast concrete, structural steel, light gauge steel and timber.

Carol A. Stevens, PE is the firm President and will be the individual responsible for, as well as reviewing, the structural engineering design work on this project. While CAS Structural Engineering, Inc. has only been in business for nine years, Carol has over 20 years of experience in the building structures field, working both here in West Virginia and in the York, Pennsylvania vicinity. Carol is also certified by the Structural Engineering Certification Board for experience in the field of structural engineering.

CAS Structural Engineering, Inc. is covered by a \$1 million errors and omissions liability policy.

Engineering for Commercial Facilities

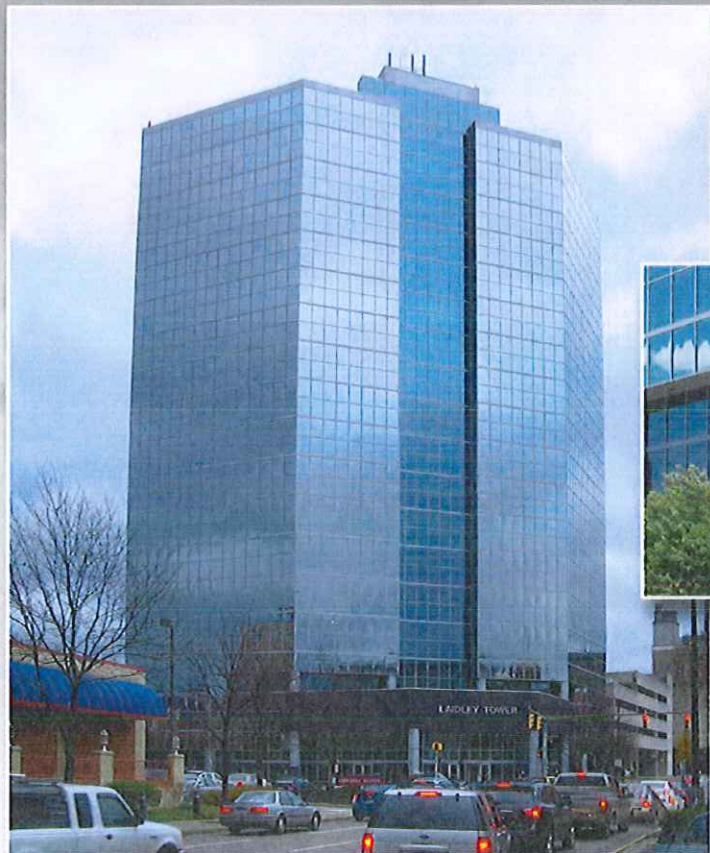
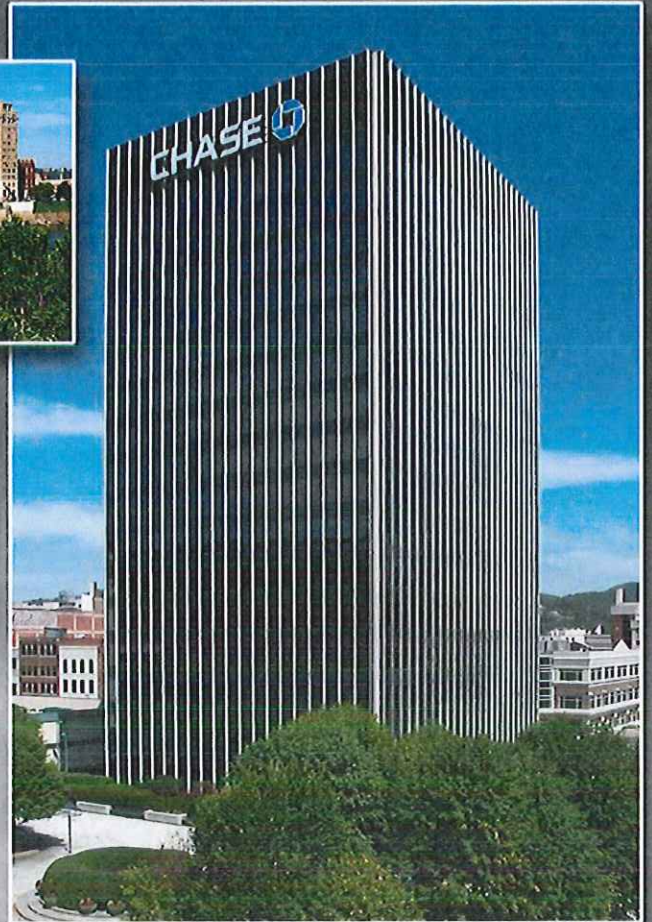
ZDS project experience includes a wide variety of commercial buildings — office, retail, judicial, banking, dining, technical and other facility types.

Bank One/Chase

A Charleston skyline focal point, the Chase Tower (formerly Bank One) contains 271,000 feet of professional office space.



ZDS replaced the core central HVAC system for the entire building.



Laidley Tower

One of the State's tallest buildings rising 18 stories high.

ZDS provided the Master Engineering Planning for the whole structure.

ZDS upgraded the core Mechanical/Electrical and Plumbing systems as well as customized tenant build-out renovations.



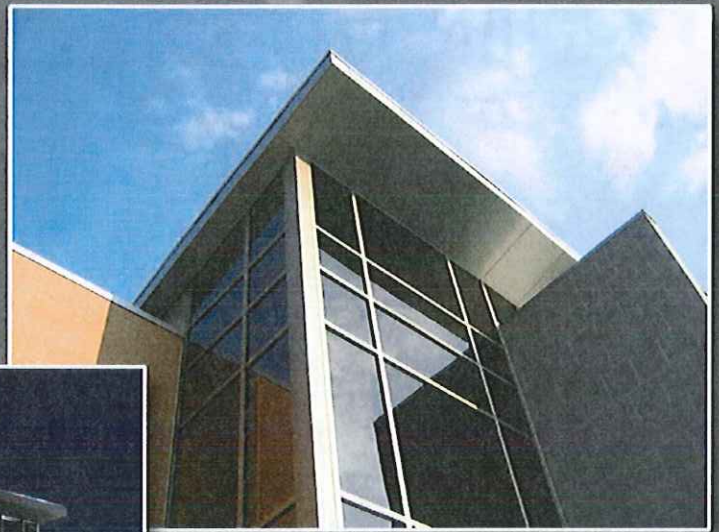
Design/Consulting Services

West Union Bank

An AIA Awarded project, ZDS provided HVAC, Plumbing and Electrical engineering, which included rigorous bank security standards and systems.



AWARD
AIA



Clear Mountain Bank (formerly called Sabraton)



ZDS provided comprehensive HVAC, Plumbing and Electrical engineering, which included stringent bank security systems.

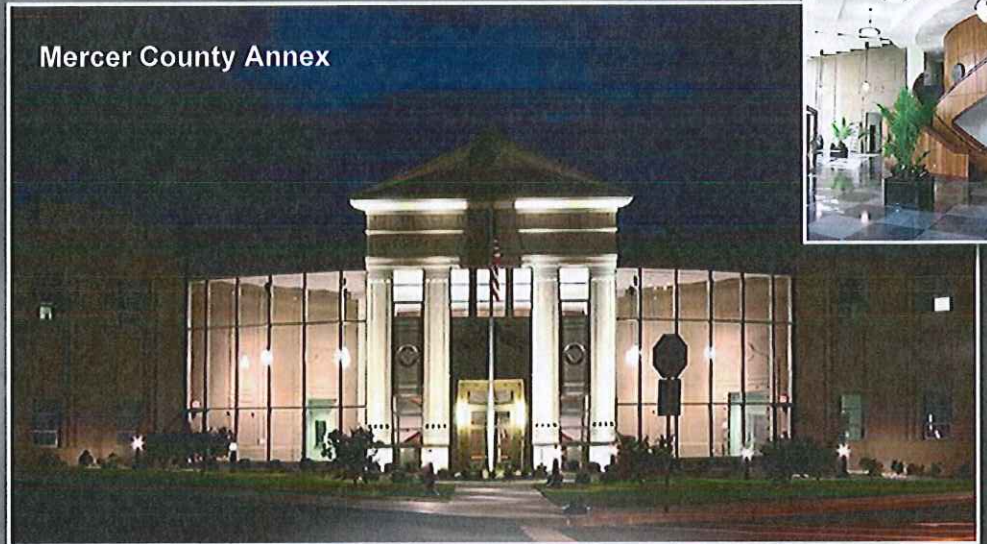


Design/Consulting Services

ZDS provided engineering planning, design, bidding and construction administration services for HVAC, Electrical, Plumbing and Fire Protection.

ZDS evaluated the existing courthouse's potential power needs and incorporated those in the new Judicial Annex's electrical systems while providing emergency power.

Mercer County Annex

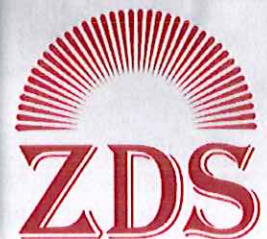


West Virginia Museum of Culture and History

Renovations save the Museum nearly \$153,000 in annual energy costs while preserving the State's priceless collection with proper HVAC, humidification, lighting, electrical and power generator systems.

ZDS engineered the prototype for all of the Welcome Centers and Rest Areas throughout West Virginia.

AIA recognized the Burnsville Rest Area with a Merit Award.

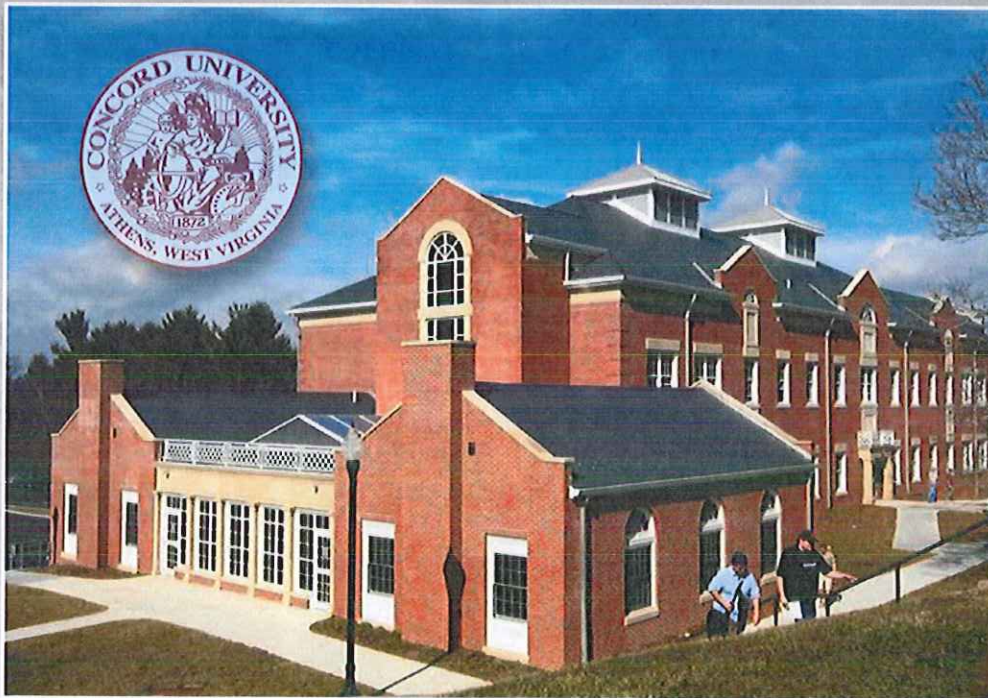


Design/Consulting Services



IMC Data Operations Center

An AIA Awarded facility with sustainable features including geothermal energy.



An intensive evaluation showed the benefits of constructing a new 50,000 sf facility attached to an existing structure.

Concord University Nick J. Rahall Technology Center

The \$375,000 electrical upgrades included a Campus Medium Voltage Loop, which also provided an uninterruptible power supply needed for the new technology center where all of the University's internet and intranet systems resided.



Design/Consulting Services

NATIONALLY RECOGNIZED FOR ENGINEERING EXCELLENCE

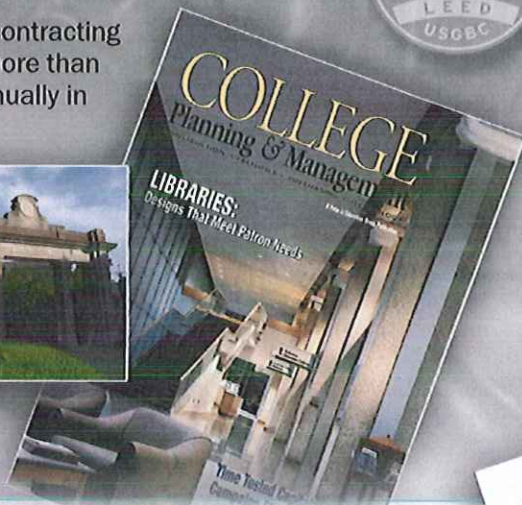


Energy Management Engineering



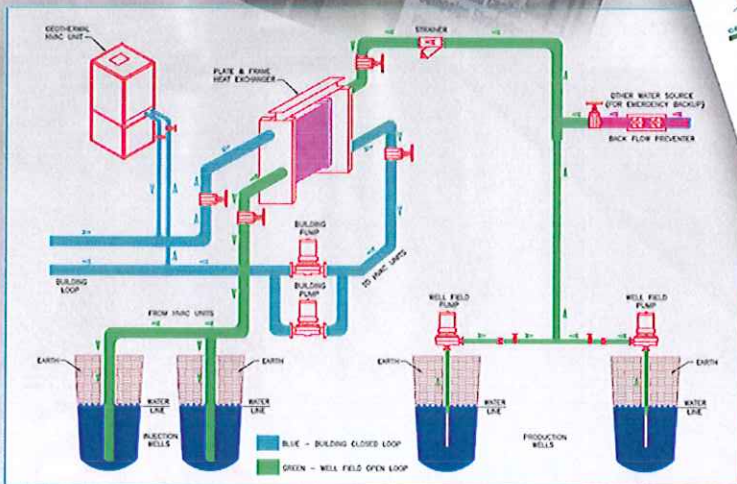
Ohio University—Athens

A performance contracting project saving more than \$2,500,000 annually in energy costs.

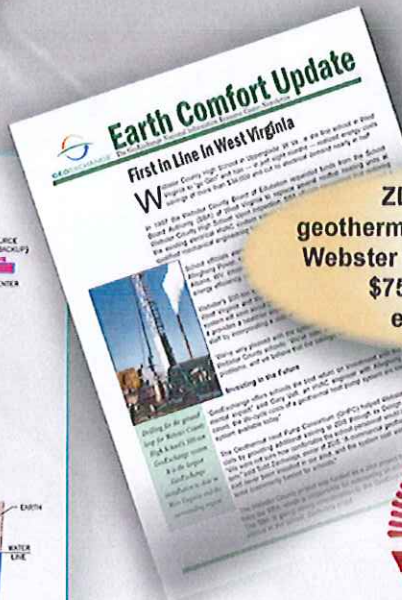


ZDS offers these and other energy management services:

- Compliance with LEED
- Utility Monitoring & Forecasting
- Energy Audits
- Performance Contracting Management
- Utility Savings Verification
- Utility & Government Funding
- Staff Training



Geothermal Open Loop System Designed by ZDS

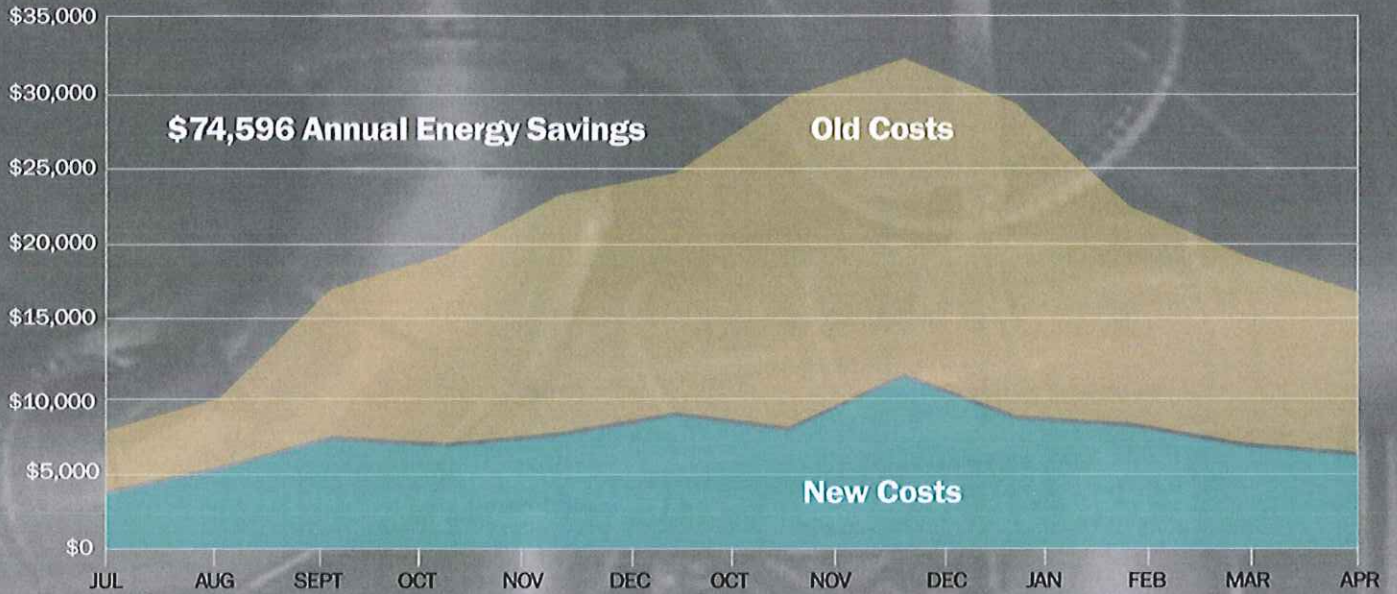


ZDS designed a geothermal system that saves Webster County High School \$75,000 in annual energy costs.



Design/Consulting Services

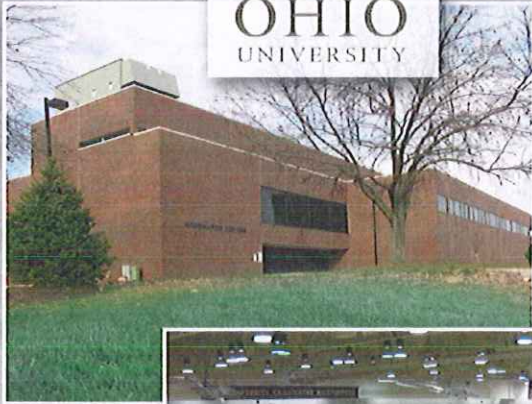
ZDS Geothermal Energy Engineering Savings



"We're very pleased with the system.
We've seen energy savings and have had zero maintenance problems."
Webster County High School



Ohio University Chillicothe Campus realizes an annual energy savings from \$200,000 to \$300,000 through ZDS master planning, HVAC/Electrical/Plumbing design, and the established comprehensive Performance Contracting program.



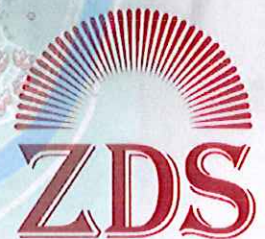
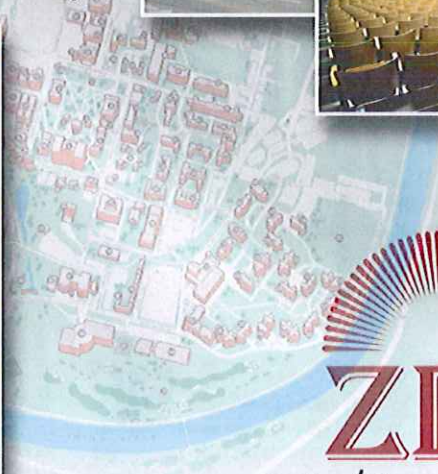
Stevenson Center Library



Bennett Hall



Shoemaker Center and Gymnasium



Design/Consulting Services



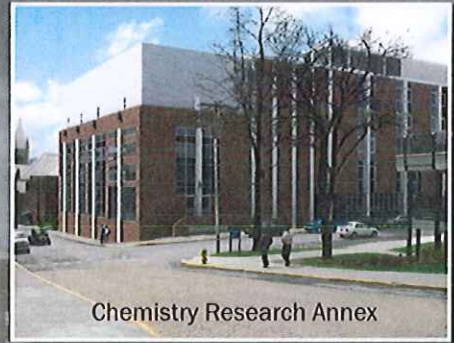
West Virginia University

ZDS established the central plan and renovations for the downtown campus chilled water loop system.

Renovations result in a \$300,000 to \$400,000 in annual savings in energy and related costs.



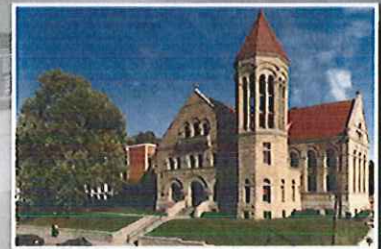
WVU Mountainlair



Chemistry Research Annex



White Hall



Stewart Hall



West Virginia Center for Culture and History

ZDS initiated the HVAC renovations and reduced HVAC operating costs up to 50%.



HVAC Boiler System



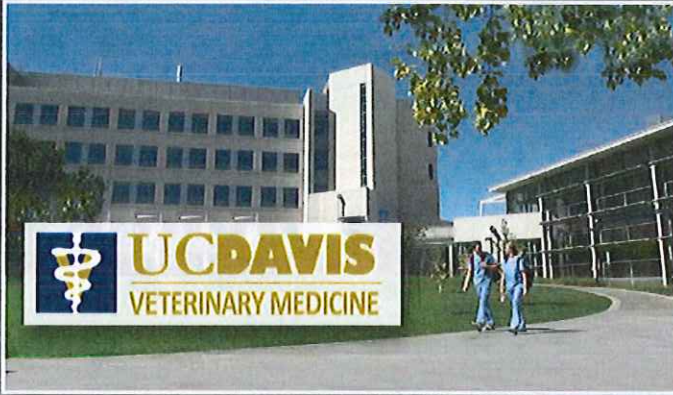
Emergency Generator



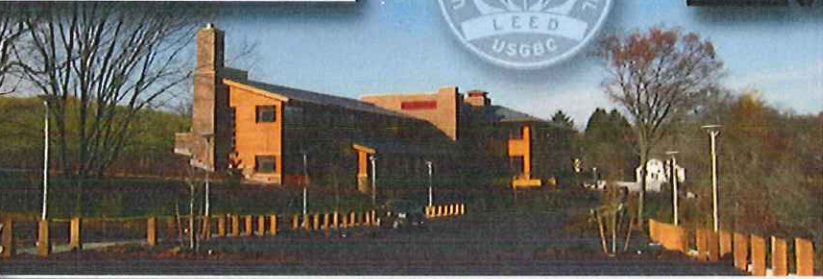
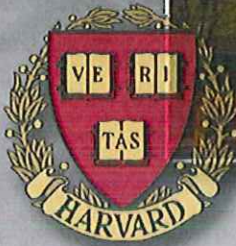
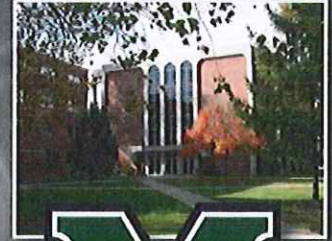
Design/Consulting Services

Engineering for Universities

ZDS project experience includes over 100 University and College Facilities.

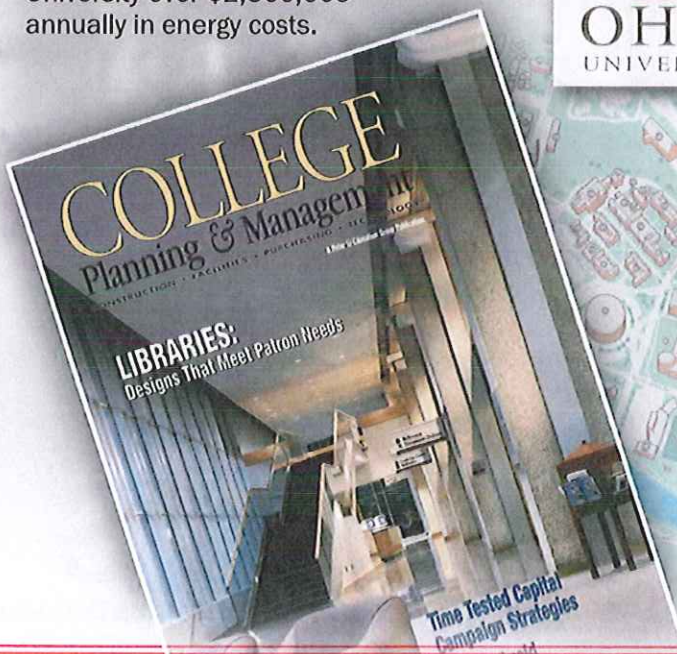
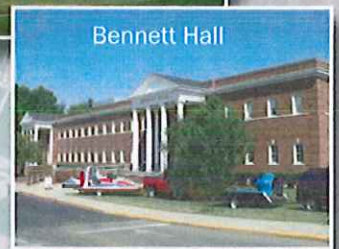


ZDS employed LEED principles in projects for the University of California Davis and Marshall University.

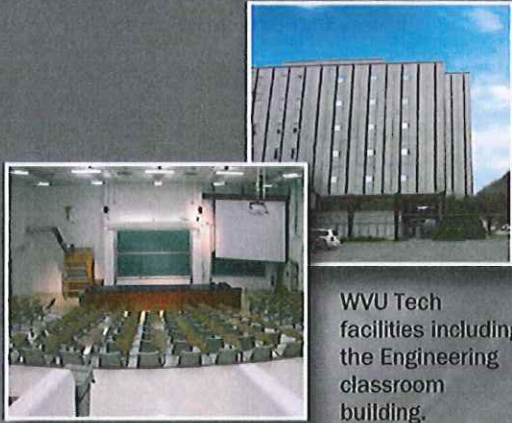
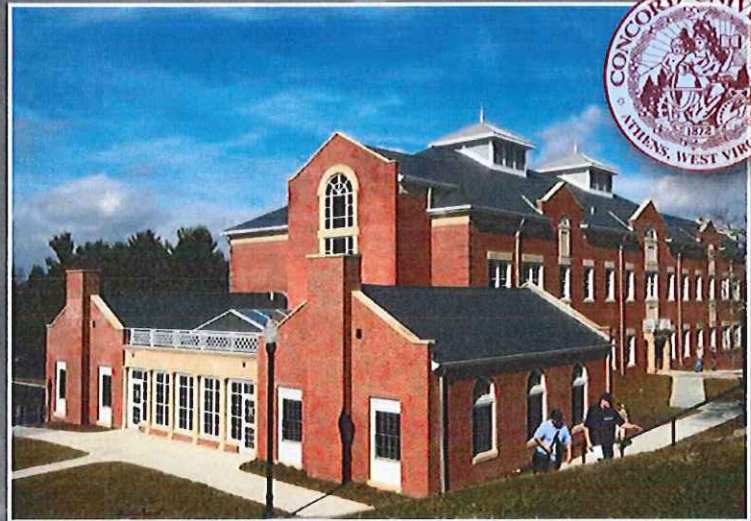


Harvard University, Arnold Arboretum, Weld Hill Research and Administration Building, a LEED Gold Candidate

ZDS initiated a performance contracting project saving Ohio University over \$2,500,000 annually in energy costs.



Design/Consulting Services



WVU Tech facilities including the Engineering classroom building.



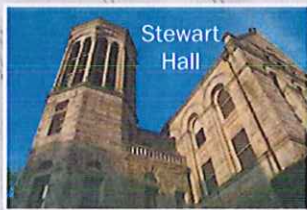
Concord University Technology Center HVAC/Electrical and Campus Medium Voltage Loop involving every building on campus — completed under budget and ahead of schedule.



ZDS designed a system allowing West Virginia University to optimize their operation of the campus chilled water system.



WVU Mountainlair Center



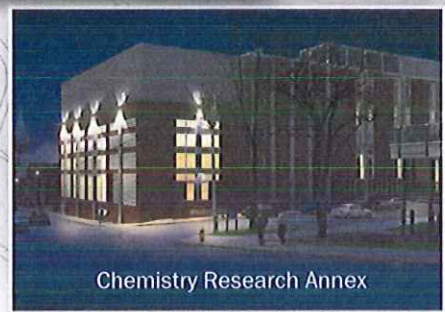
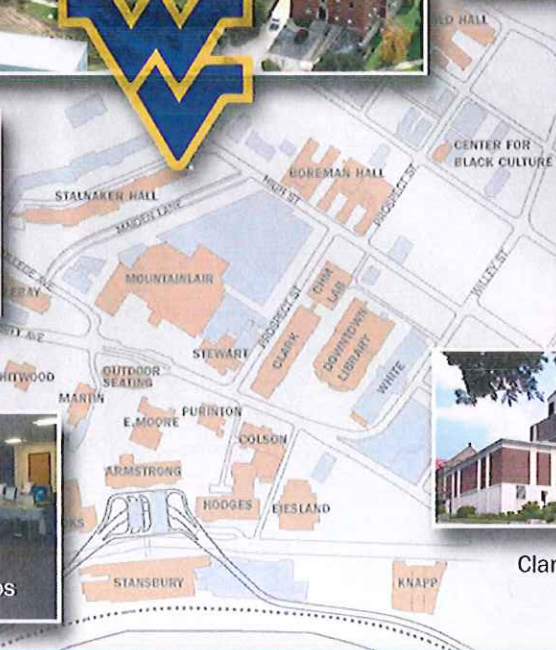
Stewart Hall



White Hall



Computer Labs



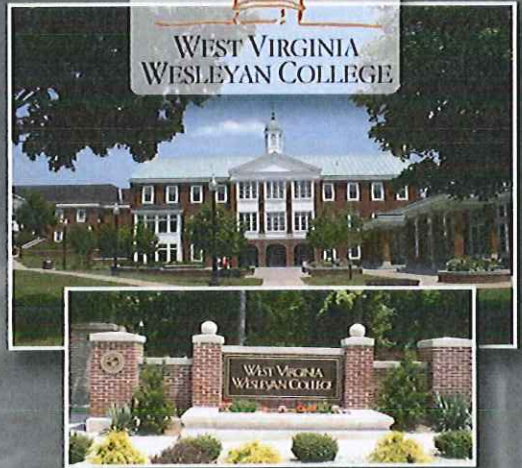
Chemistry Research Annex



Clark Hall



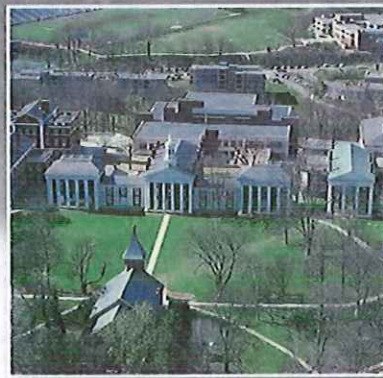
Design/Consulting Services



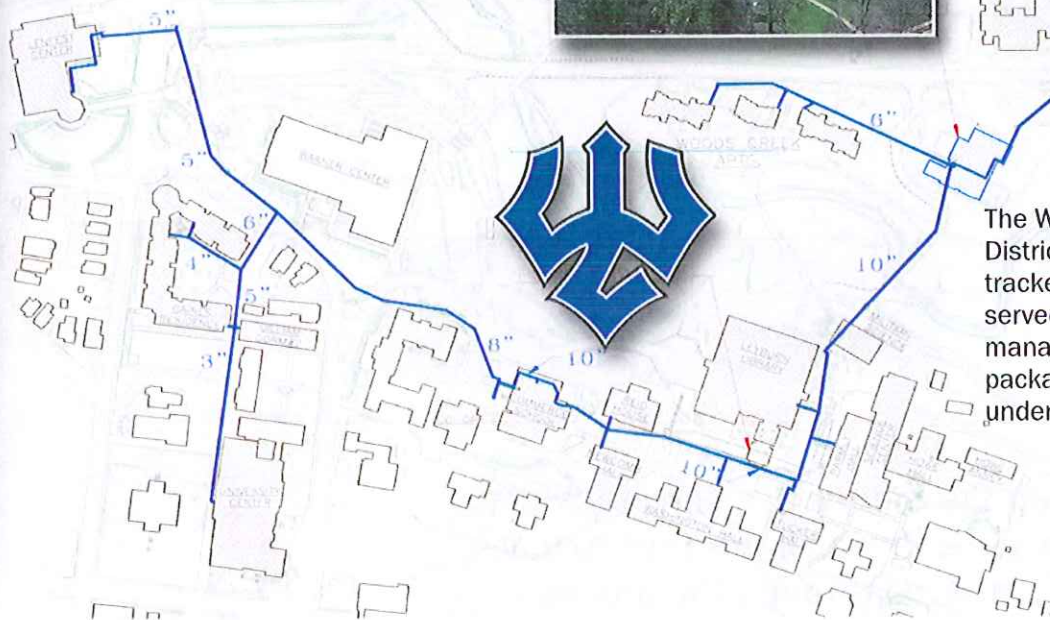
Southern
West Virginia
Community and
Technical College



UNIVERSITY OF
CHARLESTON



Washington & Lee
UNIVERSITY



The Washington & Lee University District Cooling project was fast tracked. ZDS designed and served as the construction manager for over 14 separate bid packages to complete the project under budget and on time.

WASHINGTON & LEE UNIVERSITY
CAMPUS CHILLER WATER LOOP PLAN



Design/Consulting Services

Engineering for Universities

ZDS project experience includes
over 100 University and College Facilities.



OHIO
UNIVERSITY



Southern
West Virginia
Community and
Technical College



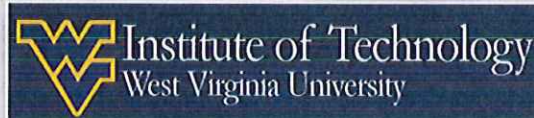
UNIVERSITY OF
CHARLESTON



WASHINGTON
& LEE
UNIVERSITY



West Virginia
University



**"ZDS is worth the money the University paid
for their services. It was important to have
somebody guide us through the process."**

Sherwood Wilson, Associate VP for Facilities and Auxiliaries

Ohio University



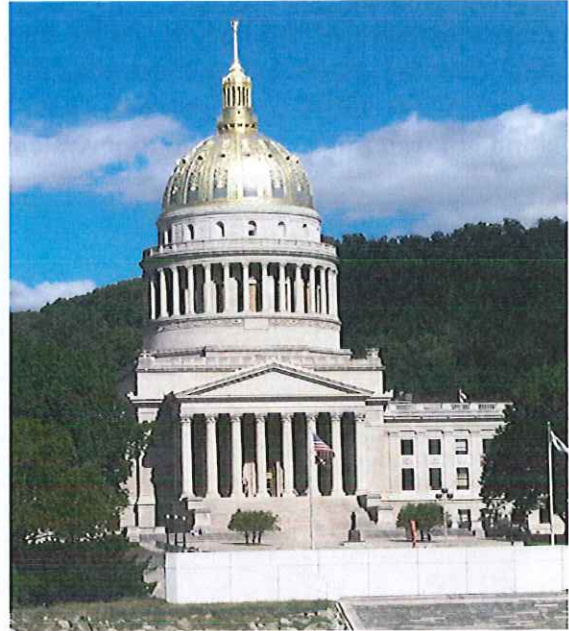
Design/Consulting Services

Section III
Project Experience

ZDS Design/Consulting Services

Project Name: *State of WV Capitol Complex Performance Contracting
Located in Charleston, WV*

Client Contact: *Mr. Russ Labarbra*
Johnson Controls, Inc.
4132 First Avenue
Nitro, WV 25143
(304) 759-2709
(304) 389-1254



Services: Engineering planning & design for central heating plant, DDC controls, Air Handling Unit replacements and retrofits, operating and maintenance, training, heat recovery, fuel conversion, VFD's, variable water volume pumping, steam/heating hot water and chiller optimization. **ZDS** was a consultant, working under the direction of Johnson Controls, Inc.

Project Description**ZDS** Design/Consulting Services and Johnson Controls, Inc.

The State of West Virginia was aware that their facilities at the Capitol Complex were aging and in need of significant infrastructure upgrades, but were having difficulty appropriating the necessary funding to make such improvements. Many of the existing boilers and other primary heating equipment were past their expected service life and in disrepair. The State of West Virginia passed a new bill in 2003 that permits Performance Contracting to be used as an avenue for implementing infrastructure upgrades in State facilities provided the upgrades self-fund within a 15 year time period. The State elected to solicit proposals from various ESCO's with the intention of crafting a major improvement project that would reduce operating costs to the State as well as pay for itself over the 15 year period. After an extensive review and selection process, the Team of Johnson Controls, Inc. and **ZDS** Design/Consulting Services was selected. The scope of the project included various energy conservation measures to the Capitol Building as well as Buildings #3, 4, 5, 6, 7, 8, 9, 11, 13, 15, 16 and 17. The center piece of the program involved engineering the central heating plant and distribution system for the Capitol Building, as well as Buildings #3, 4, 5, 6, 7, 8 (Governor's Mansion) and provisions for #10 (Holly Grove) plus additional future capacity.

A central heating plant anchored the Facility Improvement Measures. It yielded the elimination of 14 failing boilers with provisions for future expansion of up to 600,000 square-feet of office

PROJECT EXPERIENCE

space. A centralized heating plant offers greater efficiency in overall system operation, centralized control and maintenance of primary heating equipment, with the added benefit of supplemental capacity in the event of a boiler failure. The first phase of the program began in May, 2005 with the evaluation of the existing heating plants, HVAC equipment, and their sub-systems to quantify deficiencies and identify potential opportunities to improve comfort, IAQ, extension of equipment life and an overall reduction in operating costs. Preliminary engineering studies reflected that millions of dollars could be saved in energy, operating costs and deferred capital costs by implementing this multi-million dollar program. The new central plant consisted of four 25,000 MBH high pressure steam boilers and retrofitting two 5,500 MBH boilers to heating hot water plus the distribution system to serve nine (9) buildings on campus.



Some typical improvements included either the replacement or retrofit of major air handling units, re-establishing proper control strategies, reducing outdoor air intake quantities when allowable, installing new building automation equipment, general HVAC equipment repairs and replacement, documentation of existing and post-construction conditions, and establishing a consistent overall operating strategy. Individual HVAC systems were enhanced to meet applicable codes and standards. Exhaustive hours were spent with the State in assisting them with the identification and prioritization of facility improvement measures. The time spent also identified potential construction issues with an emphasis on critical phasing requirements.

ZDS has been involved in evaluation and/or design, including construction activities, for 2,137,400 square-feet involving fifteen (15) buildings at the State Capitol campus over the years.

<i>Contracting Costs:</i>	\$10,108,802
<i>Initial Year Savings:</i>	\$1,079,296
<i>Size:</i>	1,929,155 FT²
<i>Completion:</i>	2008 for Construction

ZDS Design/Consulting Services

Project Name: *William R. Sharpe, Jr. Hospital – Renovations & Additions Weston, WV*
Client: *WV Department of Health and Human Resources (WVDHHR),
Charleston, WV*

Client Contact: Mr. Greg Nicholson
Chief Operations Officer
Phone (304) 558-1577
WVDHHR
One Davis Square, Room 116
Charleston, WV 25301
Greg.C.Nicholson@wv.gov

Services: Prime for all renovation work including Engineering Master Planning, energy analysis, Mechanical, Electrical, and Fire Protection design, bidding and construction administration services for retrofitting the 212,000 ft² Hospital. Consultant for all MEP engineering for the 32,000 ft² addition.



Project Description

William R. Sharpe Hospital Renovations, originally constructed in 1995, had many HVAC, electrical and plumbing issues even though the facility wasn't that old. The two-story hospital houses 150 patients but is overcrowded. The HVAC and electrical systems experienced frequent equipment failures, power outages and many complaints on comfort. **ZDS** identified and designed the solutions. **ZDS** was the Prime who evaluated existing mechanical, electrical, and plumbing systems and prepared an extensive report and plan for renovating the facility while keeping the facility occupied. The initial phase involved replacing underground piping between the central plant and hospital which was completed in 2011. Provisions were also made for a temporary boiler and extension of piping for future renovations to the building including planning for a 32,000 ft² addition. This allowed for chilled water to continue to be served from the central plant while other renovations could be planned.

ZDS then was selected to implement ARRA funded energy efficiency upgrades for all seven major WVDHHR hospitals including William R. Sharpe Hospital. Energy efficient lighting was implemented using the ARRA funds and was completed on schedule in 2011 resulting in energy savings of up to 50% of the original lighting electric usage.

PROJECT EXPERIENCE

All three original boilers were in such poor condition that a temporary boiler had to be installed and the original boilers permanently shut down. Many of the heating coils were blocked including control valves failing making comfort a major issue. The boilers were blocked with dirt and debris assumed to come from leaks in the underground piping where the maintenance staff was adding up to 10,000 gallons of makeup water per day to the cooling system to keep it functional.

The design included central plant replacement with three 10,500 MBH dual fuel heating hot water boilers with variable water volume pumping, three (3) 600 KW Bi-Fuel emergency generators, 15,000 gallon fuel oil storage tank, three (3) chillers – two centrifugal chillers with cooling towers and one air cooled chiller with variable water volume pumping, and a new central domestic water heating system. The design and construction make provisions to allow the hospital to retain emergency services and HVAC while the central plant is being retrofitted.

The HVAC renovation includes comprehensive DDC controls for central monitoring and control, replacing all AHU's and provides new VAV terminal units with hot water reheat coils. The hospital's HVAC system is also an integral part of the smoke control system. The hospital will remain in operation while the renovations take place. Careful phasing and the need to disrupt only small portions of the hospital at a time will result in an extended construction period currently projected to be in 2015. All original heating hot water piping and chilled water piping is being replaced. All lighting will be upgraded to today's energy efficient technology including extensive use of LED lighting and lighting controls. The electrical system is being upgraded to meet current code required three branches of emergency power including provisions for the Addition.

ZDS is a consultant for the 32,000 ft² addition and is providing all the MEP engineering services for design, bidding and construction administration services related to the addition. The single story addition consists of rooms to house fifty (50) forensic patients and supporting administration services, a Sally Port, enclosed courtyards and connection to the existing facility. An engineered smoke control system is integrated into the HVAC system. The four pipe VAV HVAC system is served from the central plant which is being upgraded as part of the existing building renovations. The project was designed so the construction could be completed in combination with the renovations work occurring under a separate contract.

ZDS Design/Consulting Services was the Prime for Phase I, ARRA Funded work and for the Phase II renovations work that is currently on-going. The renovation work will be effectively phased with the building remaining occupied throughout the renovations.

<i>Phase I HVAC Project Cost:</i>	\$1,403,000	Completed in 2012
<i>ARRA Funded Lighting Upgrade Costs</i>	\$618,700	Completed in 2011
<i>Original Hospital Size:</i>	212,000 FT ²	
<i>Phase II Renovation Project Cost:</i>	\$19,000,000	Projected complete in 2015
<i>Addition to the Hospital Size:</i>	32,000 FT ²	
<i>Addition Project Cost:</i>	\$11,800,000	Projected complete in 2014

ZDS Design/Consulting Services

Project Name: Jackie Withrow Hospital, Beckley WV & Hopemont Hospital, Terra Alta, WV – Heating Plant Renovations

Client: WV Department of Health and Human Resources (WVDHHR), Charleston, WV

Client Contact: Mr. Greg Nicholson
Chief Operations Officer
Phone (304) 558-1577
WVDHHR
One Davis Square, Room 116
Charleston, WV 25301
Greg.C.Nicholson@wv.gov

Services: Prime for all renovation work including Engineering Master Planning, energy analysis, Mechanical/Electrical design, bidding and construction administration services for retrofitting both hospitals heating systems using ARRA funds. New gas service and new central high pressure steam plant for Jackie Withrow. Optimize heating system at both Jackie Withrow & Hopemont Hospital



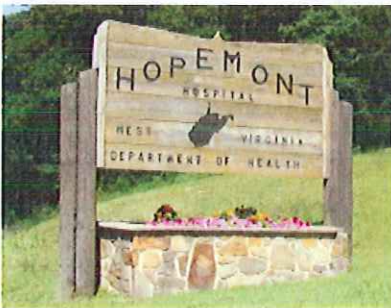
Project Description

Jackie Withrow Hospital's Unit "A" was constructed in the early 1930's with the addition of Unit "B" built in 1937 and with the Kitchen, Cafeteria and Auditorium added in 1940; Unit "C" in 1938; and Unit "D" in 1941. The 408,802 ft² facility has been renovated numerous times and most recently includes the alteration of the 4th floor of unit "B" for an isolation area, and the alteration of the entire 4th floor of unit "D" for use by the West Virginia Division of Corrections.

Jackie Withrow's heating systems were distributed over multiple buildings. **ZDS** was the Prime who evaluated existing mechanical and electrical systems and prepared an extensive report and plan for renovating the facility while keeping the facility occupied. Many of the existing boilers were beyond their useful life or in poor condition and in need of replacement. Steam traps were not functioning correctly with very little of the condensate being returned back to the boilers. The renovations included creating a central plant at one end of the large facility which included three 3,000 MBH, 125 psi steam boilers with upgrades to the condensate return system and comprehensive steam trap upgrades. The renovations included providing a new gas service to the new boiler plant. The existing boiler plant in the opposite end of the large facility was upgraded

PROJECT EXPERIENCE

to lengthen the life of it including a 2,500 MBH steam boiler. Several old or poor condition boilers were either removed or isolated from providing heat to the system. The natural gas service upgrades were coordinated through the State Fire Marshal for approval to meet emergency backup fuel needs required by current code for both heating and emergency power.



ZDS's initial work for Hopemont Hospital addressed their fire alarm needs in 2003. The original building was constructed in the early 1900's with multiple additions. The center "Gore" addition was built in 1941 as a fallout shelter during the "cold war" and had 18" to 24" thick reinforced concrete walls. We were contracted again in 2010 for providing master planning; heating system upgrades and ARRA funded lighting upgrades which were completed in 2011. Hopemont Hospital's heating plant optimization initial phase completed in 2011 involved

replacing underground piping between the central plant and hospital along with comprehensive steam trap upgrades. These projects required the engineering planning, design, supervision, preparation of construction documents, specifications, and construction administration of the heating systems. The ARRA funded work also including lighting upgrades that with included the replacement of T-12 lighting fixtures and incandescent lights with energy efficient T-8/T-5 and LED lighting reducing lighting energy usage by over 30%.

ZDS Design/Consulting Services was the Prime for both of the hospitals for the heating renovations project and the Fire Alarm Protection renovations. The renovations projects were completed with the building occupied through effectively phased planning of the renovations.

<i>Jackie Withrow Heating Project Cost:</i>	\$1,907,000	Completed in 2011
<i>Jackie Withrow Hospital Size:</i>	408,820 FT²	
<i>Hopemont ARRA Renovation Project Cost:</i>	\$760,000	Completed in 2011
<i>Hopemont Fire Alarm Project Cost:</i>	\$175,000	Completed in 2003
<i>Hopemont Hospital Size:</i>	124,800 FT²	

ZDS Design/Consulting Services

Client: Raleigh County Schools, West Virginia
Projects: Woodrow Wilson High School & Academy of Career & Technologies Renovations

Client Contact: Mr. Racine Thompson,
Retired Assistant Supt.
Phone (304) 222-3907
Raleigh County Schools
Beckley, WV 25801-3791

Services: Engineering Master Planning, Phasing development to match funding, energy analysis, Mechanical/Electrical design, bidding and construction administration services for retrofitting the school.

Woodrow Wilson High School



Project Description

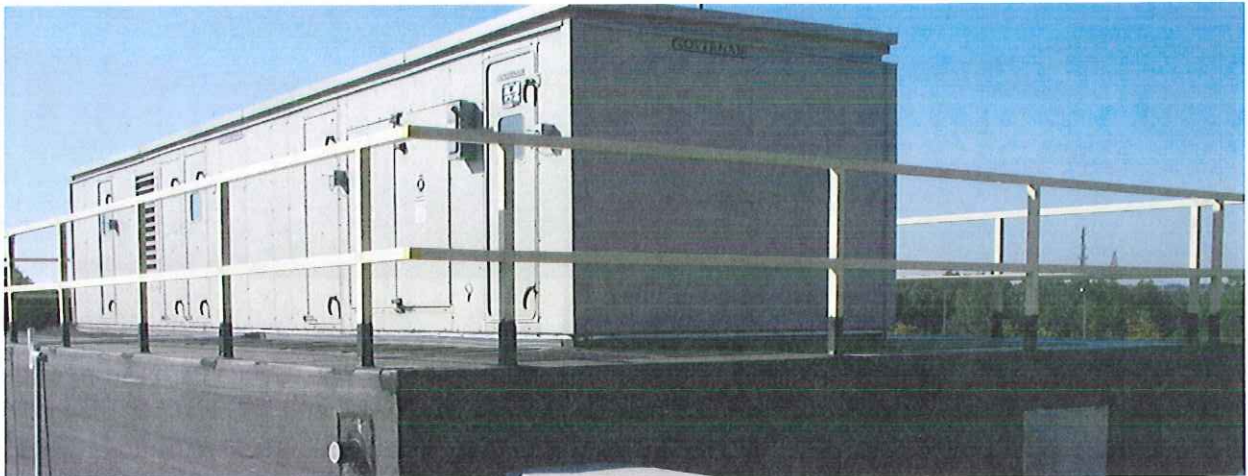
Woodrow Wilson High is rich in tradition with over 240,000 sq-ft. involving seven buildings and space for over 1500 students. The facility was constructed in 1965 and the HVAC/Electrical systems were well past their expected life. When it was time to renovate these facilities Raleigh county Schools hired **ZDS** to evaluate the HVAC and electrical needs for Woodrow Wilson High School to bring the school up to current codes and standards. The renovation work needed implemented in phases. The first phase involved HVAC upgrades for the Administrative wing of WWHS which was completed in 2001.

The next phase involved lighting upgrades, ceiling plenum cleaning and tile replacement which was completed in 2003 and followed by a \$10 million project to complete the HVAC/Electrical and related upgrades for the remainder of Woodrow Wilson High School which was completed in 2011. **ZDS** evaluated the facility and developed the preliminary opinion of construction costs used for the Bond Levy that was overwhelmingly passed in January, 2004 that provided the bulk of the funds for the renovations. **ZDS** also assisted the County in obtaining SBA funding.

PROJECT EXPERIENCE

The energy efficient design was over 40% more efficient than the State code required standards. Some of the design elements included:

1. Three (3) 10,500 MBH and one (1) 2,500 MBH high efficiency natural gas heating hot water boilers which use variable water volume pumping to serve all the heating needs.
2. A 500 Ton chiller and a 140 ton chiller which use variable water volume pumping to provide cooling to fully air condition the school that was only partially air conditioned.
3. Custom designed VAV rooftop units with special elevated platforms to permit an all air system in a facility that wasn't meant for an all air HVAC system. The air handling units are equipped with high efficient filters and UV lights for improved indoor air quality.
4. Each classroom has individual control and uses demand control ventilation monitoring and controls to minimize unnecessary outside air while still meeting current code required ventilation rates. Humidity monitoring and control reduce the risk of a high moisture event in the school which minimizes the potential for mold growth.
5. Comprehensive DDC controls tied back to the central maintenance headquarters.
6. Electric service upgrades, new grounding system, energy efficient lighting.
7. Kitchen upgrades including new kitchen hoods, makeup air system and HVAC to maintain comfort in the kitchen while maintaining proper pressure relationships between the kitchen and adjacent spaces.
8. New central domestic water heating system.



Space comfort and indoor air quality in Woodrow Wilson High School were brought up to levels; the students and staff are now saying

***“We have never been comfortable until now!
We can now focus our attention on teaching and learning.”***

<i>Total Project Cost:</i>	\$12,050,000	Final Phase Completed 2011
<i>School Building Authority Funds</i>	\$900,000	
<i>Facility Size</i>	240,000 ft²	

PROJECT EXPERIENCE

ZDS Design/Consulting Services



Project Name: *Harris Hall - HVAC and Electrical Retrofits*

Client/Location: *Marshall University, Huntington, WV*

Client Contact: Mr. Tony Crislip,
Project Manager,
Mechanical/ Electrical Trades
One John Marshall Drive
Huntington, WV 25755-2450
Phone (304)-696-6241

Services: Engineering planning, design, bidding and construction administration services HVAC, Plumbing & Electrical retrofits, DDC Controls, AHU's replacement, chiller replacement, VAV pumping, new electrical service, switchgear and fire alarm systems.



Project Description

Harris Hall, on Third Avenue, was originally constructed in 1976. The four-story building houses the departments of classical studies, geography, history, religious studies, philosophy, psychology, counseling and rehabilitation, adult and technical education, and administrative education. Marshall University recognized that the HVAC and electrical systems were at the end of their expected service life and were experiencing frequent equipment failures, power outages and numerous complaints on comfort and “stuffy air”. The plumbing was also wasteful with an opportunity to incorporate water saving features into the existing plumbing systems.

PROJECT EXPERIENCE

Marshall University initially contracted **ZDS** to evaluate Harris Hall's existing mechanical/electrical/plumbing systems and prepare an extensive report. **ZDS**'s cost estimates showed it would take \$3 million to meet their needs. The planning document covered multiple HVAC approaches with advantages and disadvantages for each to provide a comfortable environment while addressing Indoor Air Quality, energy efficiency, operating costs and meeting the Owner's goals. The report also covered related work including roof replacement, lighting upgrades, and energy/operating conservation measures.

We worked with the University on different approaches to fit the project within available funding while defining alternates that would permit the Owner to complete the HVAC/Electrical/Plumbing retrofits if more funding could be found or to phase the work as funding was found. With the aid of **ZDS**'s planning, Marshall University was able to phase the project. The facility was vacated for less than 60 days in the summer of 2006 to allow the contractor to perform the major construction efforts without working around the occupants. The project was successful through careful planning and coordinating construction efforts between the University, the design and the installation.

The HVAC system had a direct impact on the health and safety of the college students and staff. Previously, occupant comfort was not being maintained and recommended levels of outside ventilation air were not being introduced to the classrooms. **ZDS** designed a VAV air handling system with reheat HVAC system to address health, safety, and IAQ issues by increasing outdoor ventilation air rates, higher filtration, strict humidity control, DDC monitoring/control, carbon monoxide demand control ventilation, outside air measuring/monitoring and other design strategies. Multiple HVAC options with their associated opinion of costs for modifying, updating and replacing the existing equipment were reviewed with the Owner for their preferences to find the best fit with the existing maintenance staff. A ground mounted air cooled chiller with antifreeze and variable water volume pumping was also designed. All HVAC equipment was designed for full DDC controls for remote monitoring, trouble shooting and energy efficiency. Plumbing fixtures were upgraded with water conserving low flow auto flushing devices to reduce water/sewer costs.

A new addressable fire alarm system, electrical service, electrical switchgear and additional panelboards were also included in the design. A section of the original aluminum bussed switchgear had previously "melted" which caused an extensive outage while a custom replacement part could be manufactured. The electrical retrofits addressed this & energy efficient lighting with motion detectors were also incorporated into the building.

Tony Crislip, Manager, Marshall University stated "*This building serves as a pilot for how all our buildings should be constructed. This building is the most comfortable one on campus!*"

MEP Project Cost:	\$2,856,000
Project Size:	56,680 square-feet
Completion Date:	Completion fall 2006

ZDS Design/Consulting Services

Project Name: *The Museum of Culture & History - HVAC Renovations*

Client: *State of West Virginia, Charleston, WV*

Client Contact: Mr. Mark Lynch, Director of
Facility Operations
Phone (304) 558-0220
The Culture Center - Bldg 9
WV Capitol Complex
Charleston, WV 25305

Services: Engineering Master Planning, Indoor Air Quality evaluation, energy analysis, Mechanical/Electrical/Fire Protection design, bidding and construction administration services for retrofitting the 228,500 ft² museum and protecting the artifacts.



Museum of Culture & History

Project Description

ZDS principals and personnel have been involved in numerous design and recommissioning projects for the WV State Capitol Complex while at **ZDS** and through other employment over their careers. These projects required the engineering planning, design, supervision, preparation of construction documents, specifications, construction administration, and commissioning of HVAC systems, sprinkler systems, plumbing systems, electrical power, lighting, fire alarm, security, technology and communications. **ZDS** completed the design for the WV Division of Culture and History, correcting their long-term HVAC and Indoor Air Quality problems in 2001, and were contracted again in 2008 for providing fire alarm and fire protection upgrades which were completed in 2010.

Lack of humidity control damaged many of the State's priceless artifacts. Books and other State collections were deteriorating rapidly due to lack of proper control of temperature, humidity, and

PROJECT EXPERIENCE

filtration. The occupants had also experienced allergic reactions and discomfort from the long-term high humidity conditions. **ZDS** identified and designed the solutions. Conserving energy without sacrificing comfort or indoor air quality was a major consideration. The design included converting an all electric resistance heating system to natural gas, comprehensive DDC controls for central monitoring and control, converting AHUs from constant air volume to variable air volume while meeting stringent ASHRAE Indoor Air Quality requirements, providing variable water volume pumping and interfacing with the facility into the new District campus chilled water system to reduce long-term operating costs. The design also included providing a new boiler plant with redundant heating and piping distribution system and an emergency generator to help protect the State's priceless collections.



New Boiler Plant



New Emergency Generator

The mechanical and electrical renovations for the State of West Virginia Library Commission stacks and office spaces were also part of a \$4.5 million dollar HVAC and Electrical Renovations project for the Division of Culture and History. The retrofits saved energy and improved indoor air quality and comfort within the building. *The Culture Center renovations are estimated to save nearly \$153,000 annually over the costs of operating the old system.*

ZDS Design/Consulting Services was the Prime for both the HVAC/Electrical Renovations project and the Fire Alarm/Fire Protection renovations. The Fire Alarm/Fire Protection renovations project was completed well **under budget** while the work was effectively phased with the building remaining occupied throughout the renovations.

<i>Total Culture Center Project Cost:</i>	\$6,000,000
<i>Size:</i>	228,500 FT²
<i>Completion:</i>	2001 for HVAC, 2010 for FA/Sprinklers
<i>Estimated Energy Savings:</i>	Reduced HVAC Operating Costs up to 50%

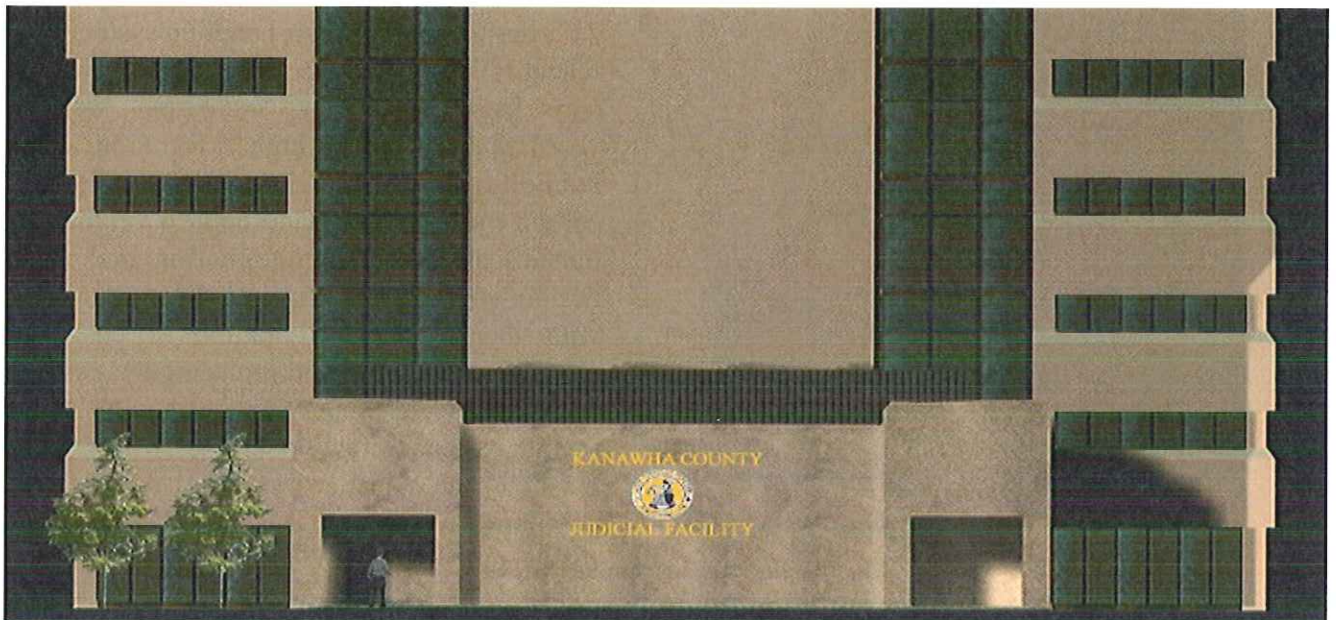
ZDS Design/Consulting Services

Project Name: *Kanawha County Judicial Annex - HVAC Retrofits*

Client/Location: *Kanawha County Commission, Charleston, WV*

Client Contact: Ms. Jerie Whitehead, Director,
PO Box 3627
Charleston, WV 25336
Phone (304)-357-0115

Services: Engineering planning, design, bidding and construction administration services comprehensive HVAC retrofits, DDC Controls, smoke control system, sprinklers and plumbing retrofits.



Project Description

The Judicial Annex, located across the street from the Kanawha County Courthouse in Charleston, WV, was originally constructed in 1982. The original eight-story building is attached to a multilevel parking garage.

The Kanawha County Commission initially contracted **ZDS** in 1998 to evaluate the Judicial Annex's existing mechanical and electrical systems. **ZDS** prepared an extensive report which showed opinion of costs for many options. The report covered multiple HVAC approaches with advantages and disadvantages for each. Some of the HVAC equipment was in poor condition and while the Owner was deciding on when to proceed with the recommended work, the primary chiller failed. The weather was hot so **ZDS** was commissioned under emergency conditions to

PROJECT EXPERIENCE

find a solution as soon as possible to avoid closure of the facility. **ZDS** designed/project managed a replacement chiller within **days** of the equipment failure which prevented extended closure of the building.

The Kanawha County Commission then hired **ZDS** to provide engineering design/construction administration services for renovations for the facility and significant additions. The renovations included seven Circuit Court courtrooms; jury deliberation rooms; attorney conference rooms; witness rooms; Court Clerks offices, public research area; adult probation offices; Maintenance Shops, Prosecutors offices, Voter's Registration, Court Administration offices; and all public areas. The engineering for the additions included a new entrance, security checkpoint, and lobby to alleviate a very overcrowded situation and a building expansion for Juvenile Probation and a newly established Family Court.



ZDS designed a VAV air handling system with reheat HVAC system to address health, safety, and IAQ issues by increasing outdoor ventilation air rates, higher filtration, strict humidity control, DDC monitoring/control, carbon monoxide demand control ventilation, outside air measuring/monitoring and other design strategies. Multiple HVAC options with their associated opinion of costs for modifying, updating and replacing the existing equipment were reviewed with the Owner for their preferences to find the best fit with the existing maintenance staff. All HVAC equipment was designed for full DDC controls for remote monitoring, and energy efficiency.

Other support services and building infrastructures improvements installed concurrently include complete voice and data wiring systems, including wiring for LAN; new power distribution for clean and normal power; and new lighting systems that complement the computer environment. Building security improvements included a central security control room, staffed twenty-four hours a day; security vestibule with screening stations; closed circuit monitoring and card access admission systems; secured private judges suites connected to a private elevator; secured prisoner transfer from sally port to courtrooms; emergency call system from courtrooms, chambers and other public-interface points.

Total Project Costs	\$10,270,000
Mechanical Project Cost:	\$3,200,000
Project Size:	Renovations 93,000 ft² plus 23,000 ft² addition
Completion Date:	Completion 2008

PROJECT EXPERIENCE

ZDS Design/Consulting Services

Project Names: *Stevenson Library and Bennett Hall ME Renovations*
Client: *Ohio University, Chillicothe Campus, Chillicothe, Ohio*

Client Contact: **Mr. David Scott**
Director of Physical Plant
571 West Fifth Street
Chillicothe, Ohio 45601
Phone: (740)-774-7243
E-mail: scottd1@ohio.edu

Services: Engineering planning, mechanical and electrical design, consulting for establishing comprehensive Performance Contracting program coordinated with HVAC and electrical renovations to Stevenson Library, Bennett Hall and proposed renovations to Shoemaker gym.

Project Description

ZDS Design/Consulting Services was originally hired to provide master planning for all HVAC, lighting, power and utilities on campus and provide a comprehensive audit of available remaining life of mechanical and electrical equipment and expected savings for implementing capital upgrades while reducing operating costs. A hybrid comprehensive performance contracting program and capital upgrades projects for OU's Chillicothe Campus evolved from that process. The planned upgrades were phased to allow for funding to be in place as the upgrades needed to occur over the 5 to 10 year plan.



Stevenson Library – Renovations

PROJECT EXPERIENCE

The initial phase addressed indoor air quality concerns in the Stevenson Library. Mold and lack of humidity control caused concern by the faculty and students. The HVAC and electrical renovations addressed the Indoor Air Quality concerns, reduced operating costs while improving comfort. HVAC equipment was retrofitted or replaced to extend the life of the equipment for at least another 20 years.

The next phase involved upgrading the chiller plant and cooling tower that served most of the campus and the installation of variable water volume pumping and DDC controls. The chiller plant upgrades were in Bennett Hall.



Bennett Hall
100,000 square-foot classroom
facility with science labs

The Bennett Hall renovations included comprehensive HVAC renovations which include a new boiler plant to serve both Bennett Hall and Stevenson Library and incorporating the chilled water plant upgrades. The capital upgrades for this phase came in under budget and were completed in 2003. Asbestos abatement was also part of the needs for this project. The building also had to remain in use during construction.



Shoemaker Gym is the final phase of the program and is expected to be addressed in the near future. Comprehensive DDC controls and lighting upgrades along with the HVAC upgrades produced significant operating savings and addressed many of the Universities IAQ concerns.

<i>Project Size:</i>	Approximately 127,000 FT² thru 2004
<i>Total Capital Project Cost thru 2004:</i>	\$4,400,000
<i>Estimated Annual Savings:</i>	Between \$200,000 and \$300,000
<i>Project Completion:</i>	2004

PROJECT EXPERIENCE

ZDS Design/Consulting Services

Project Name: *Nick J. Rahall II Technology Center*
Client/Location: *Concord University, located in Athens, WV*



Client Contact: Mr. Chris Canterbury
Project Manager
Phone: (304) 920-6780

Services: Engineering planning & design for HVAC, Electrical, Plumbing, compliance with ADA, Fire Protection, Technology, DDC Controls, VAV AHU's, variable water volume pumping, UPS, Emergency Power, energy efficient lighting, & information technology.



Project Description

Concord University had an existing building, White Hall, that they wanted converted to a new state-of-the-art technology center. Working through E. T. Boggess Architects, ZDS evaluated the potential mechanical, electrical, plumbing, fire protection and technology needs for significant infrastructure upgrades for an existing building that was not ideally suited for a technology center. After careful analysis, the design team and Owner decided it was best to demolish most of White Hall and construct a 50,000 ft² three-story building attached to the existing remaining structure. Congressman Nick J. Rahall II helped in obtaining the necessary funding to make the project possible and Concord University named the building after him in appreciation.

The quality of HVAC system was crucial to Concord University since they had just spent over \$1,000,000 correcting Indoor Air Quality (IAQ) problems in an existing relatively new building in which they believed the existing HVAC system contributed to the problem. ZDS designed around a centralized heating/cooling plant for greater efficiency in overall system operation and provided centralized control and maintenance of primary heating/cooling equipment, with the added benefit of supplemental capacity in the event of a boiler failure. The planning and design

PROJECT EXPERIENCE

services included providing a quality HVAC system and electrical equipment, and their sub-systems to provide a comfortable environment while addressing Indoor Air Quality, energy efficiency, operating costs and meeting the Owner's needs.

HVAC systems were enhanced to meet applicable codes and standards and improved indoor air quality through higher filtration, strict humidity control, ultraviolet light purification, air flow measuring/monitoring and other design strategies. The business incubator area was equipped with flexible HVAC zoning and additional power to meet potential varying uses for the space.

The electrical systems included providing uninterruptible power supply, redundant HVAC and emergency power to the central computer center where all of the University's internet/intranet systems resided. Classrooms were equipped with the latest in technology including provisions for some of the future 3-D imaging instruction tools being developed.



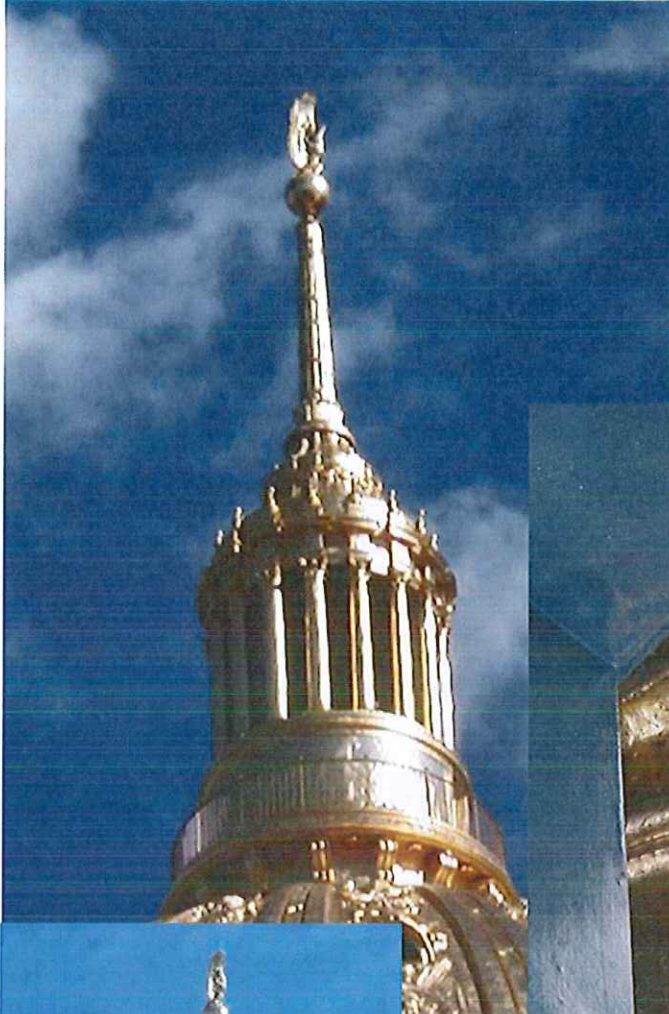
The MEP design aids Concord University to operate their facilities efficiently and effectively and the state-of-the-art technology will greatly benefit the faculty and students for many years to come.

ZDS also designed, bid and provided construction administration services for completing the Campus Medium Voltage Loop involving every building on the campus which was completed in 2005 under budget and ahead of schedule. The \$375,000 electrical upgrades also provided the electrical service capability for the new technology center.

MEP Construction Cost: \$3,675,000 out of a \$10,300,000 total costs
Size: Approximately 50,000 square-feet
Completion Date: Completed in 2008

STRUCTURAL INVESTIGATION MAIN CAPITOL BUILDING DOME

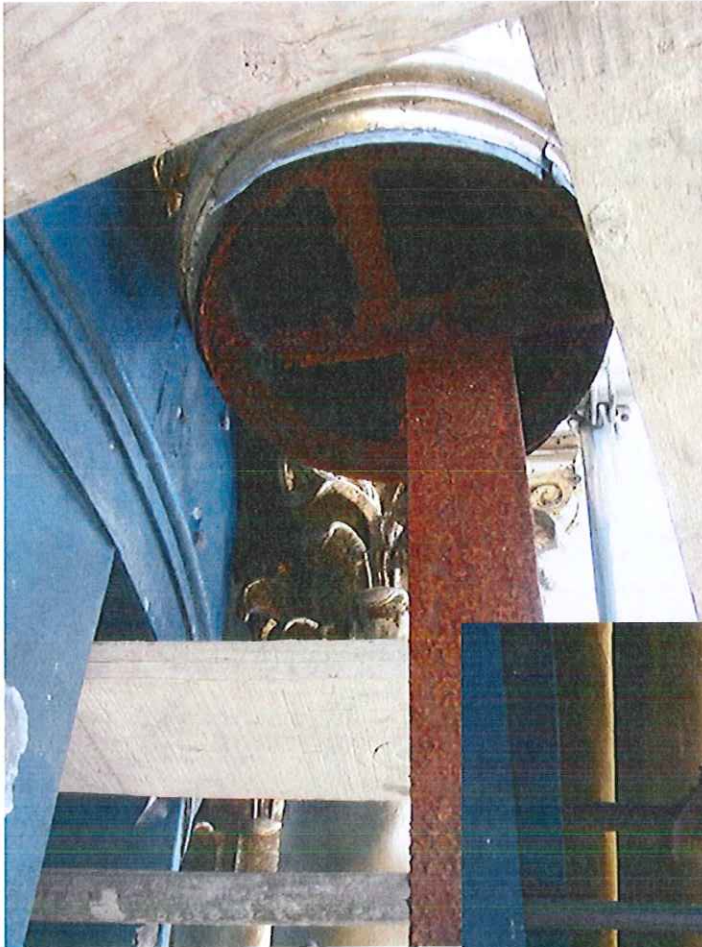
Charleston, West Virginia



The structural steel in the lantern level shows evidence of deterioration. Project included probing to determine extent of deterioration and preparation of plans and specifications for repairs.



The structural steel after being repaired and the regilding complete.



Removal of decorative column wrap indicated that back-up structure was severely deteriorated.





Deterioration of steel supporting sheet metal exhibited such deterioration that portions of the steel have disintegrated. Main wind bracing in Lantern Level (not shown here) also severely deteriorated.



DIVISION OF MOTOR VEHICLES—BUILDING 3
CAPITOL COMPLEX
Charleston, West Virginia



The limestone at the canopy was deteriorated to the point that pieces were loose and ready to fall. The project included an investigation to determine the support conditions for the stone.

During the investigation, it was determined that the support structure was not as shown on the original construction documents.

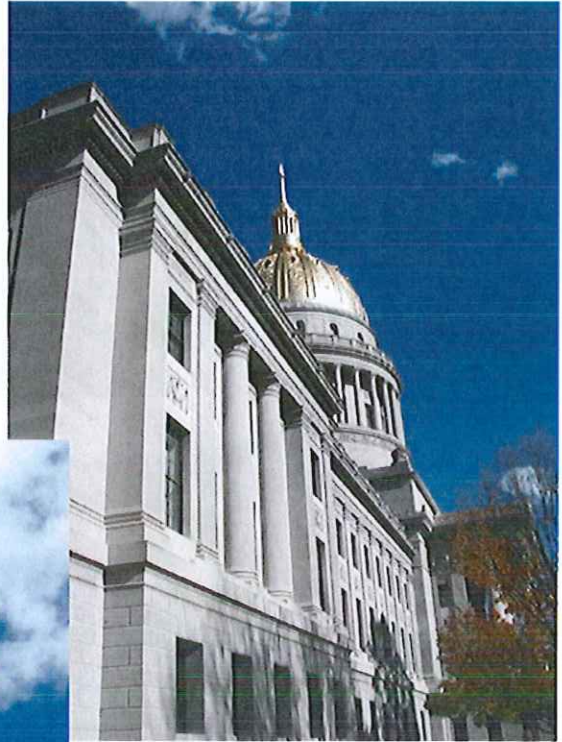


The repair of this element was completed in 2002.

PARAPET/BALUSTRADE INVESTIGATION MAIN CAPITOL BUILDING

Charleston, West Virginia

This project was recently completed and involved an exploratory investigation of the Main Capitol Building parapet and balustrade in an effort to determine the source of movement in the limestone panels. In addition, the leaking that is currently occurring in the upper floor ceilings was addressed.



There are a number of locations around the parapet where limestone panels or joints exhibit cracks and significant movement.

There is evidence of minor efflorescence within the ceiling space as well.





The exploratory investigation involved removing limestone and brick at several locations, documenting the findings, and developing a budget estimate for repairs to the parapet.



Ted (Todd) A. Zachwieja
PE, C.E.M., LEED AP**Chief Executive Officer**
Principal-in-Charge M/E/P Design

Todd has more than 32 years of experience in the design, construction management, and specifications for mechanical engineering, heating, ventilating, air conditioning, plumbing, electrical, and lighting, as well as indoor air quality analysis and building system commissioning for educational, commercial, industrial and health care facilities. His specialties include mechanical engineering, HVAC systems master planning, conceptual design, energy conservation program development, commissioning and IAQ analysis relating to HVAC systems. He has extensive experience in industrial, commercial, hospitals and educational design.

Prior to joining **ZDS**, Todd Zachwieja coordinated millions in comprehensive energy conservation programs resulting in annual energy savings of millions per year and managed a profitable regional office for one of the country's largest energy service companies covering southeastern United States. He also developed computer programs for building energy analysis and monitoring and presented technical papers at regional and national conferences. Some of Todd's project experience includes:

GOVERNMENT AND COMMERCIAL

- Bank One – WV
- Bayer Material Science
- Calvert County Aquatic Center, MD
- Culture Center HVAC renovations
- General Motors Corporation of North America Re-commissioning Program
- Kanawha County Commission – 120,000 sf additions/renovations for the Judicial Annex/Kanawha County Courthouse – Charleston
- Kohl's
- Laidley Towers – Charleston
- Mercer County Courthouse Annex – Princeton
- Olin Corporation
- Phillip Morris USA
- Rhone-Poulenc
- Santa Anna Federal Building, CA
- State of WV Capitol Complex Central Heating Plant and Renovations
- Sears
- Toyota Motor Manufacturer, WV Inc.
- Union Carbide/DOW
- United Center – Charleston
- Walker Machinery
- West Virginia Air National Guard including Cx recent \$45M Fuel Cell/Maintenance Hangers at Yeager Airport for LEED Silver
- West Virginia Army National Guard
- West Virginia Department of Transportation/DOH
- West Virginia Division of Protective Services
- West Virginia Higher Education Authority
- West Virginia General Services Division
- West Virginia Parkways Authority
- West Virginia Public Service Commission Headquarters
- West Virginia State Capitol Complex renovations
- Yeager Airport

Todd also designed one of the largest geothermal heat pump applications in the mid-Atlantic region, and retro-commissioned HVAC systems and mechanical engineering at many General Motors' facilities in North America.

**EDUCATION**

Bachelor of Science in Mechanical Engineering from West Virginia Institute of Technology in 1982

Masters of Science in Engineering Management from the University of West Virginia College of Graduate Studies in 1989

REGISTRATIONS

Professional Engineer West Virginia
No. 10127

Professional Engineer Ohio
No. E-53587

Professional Engineer Georgia
No. 18253

Professional Engineer Kentucky
No. PE-17961

Professional Engineer North Carolina
No. PE-017445

Professional Engineer Pennsylvania
No. PE-040929-R

Professional Engineer South Carolina
No. 25985

Professional Engineer Virginia
No. 0402 025427

Certified Energy Manager (C.E.M.),
National Certification, No. 2205

CEM[®]

LEED® Accredited
Professional, National
Certification through
USGBC No.



#10083891

Ted (Todd) A. Zachwieja (Continued)

HEALTH CARE

- Bluefield Regional Medical Center
- Cabell Huntington Hospital
- Charleston Area Medical Center Memorial Division - millions in renovation and new construction design, including commissioning of Charleston Area Medical Center Surgery Replacement Center
- Charleston Area Medical Center General Division
- Charleston Area Medical Center Women & Children's Hospital
- Charleston Surgical Center
- Family Practice Center
- Jackie Withrow Hospital
- John Manchin Sr. Health Care
- Hometown Healthcare Center
- Hopemont Hospital
- Lakin Hospital
- Lewistown Outpatient Surgical Facility, PA
- Mercy Medical Center
- Mildred Mitchell-Bateman Hospital
- Monongalia General Hospital
- Montgomery General Hospital
- St. Joseph's Hospital
- St. Mary's Hospital
- Summersville Memorial Hospital
- Surgicare Center
- Thomas Memorial Hospital
- United Hospital Center
- VA Hospital - Clarksburg
- VA Hospital - Huntington
- Wayne Memorial Hospital
- Webster Memorial Hospital
- Welch Community Hospital
- William R. Sharpe, Jr. Hospital

EDUCATIONAL

Colleges and Universities

- Alderson Broadus College
- Bluefield State College
- Concord University
- Fairmont State College
- Harvard University
- Marshall University
- Ohio University's Athens Campus
- Ohio University's Chillicothe campuses
- Southern West Virginia Community & Technical College
- University of California-Davis
- University of Charleston
- Washington & Lee University
- WVU Institute of Technology
- West Virginia State University
- West Virginia University
- West Virginia Wesleyan College

Todd was recognized nationally for his work with Ohio University in development of multiple performance contracting programs that are anticipated to save \$2.5 million annually in energy and operating costs. He has been involved in 100's of higher education facilities.

Schools

M/E/P design for schools in West Virginia include the counties of Calhoun, Clay, Grant, Greenbrier, Hardy, Harrison, Jackson, Kanawha, Lewis, Logan, Marion, McDowell, Mercer, Mingo, Monroe, Ohio, Pocahontas, Putnam, Raleigh, Randolph, Ritchie, Summers, Taylor, Tucker, Upshur, Webster, and Wyoming.

Some of Todd's project experience includes the development and design of a pilot geothermal heat pump HVAC with variable speed pumping system at Webster County High School, which reduced electric bills by more than 40% while meeting IAQ requirements. He has been involved in 100's of school facilities.

PROFESSIONAL AND COMMUNITY AFFILIATIONS

Charter member Mountaineer Chapter of American Society of Heating, Refrigeration and Air Conditioning Engineers

Served as ASHRAE's Energy and Technical Affairs Chairman for six years, currently President-Elect



Recognized by the International Who's Who of Professionals

Recognized nationally as West Virginia's Business Man of the Year

Recognized nationally in 2007 as a "Legend in Energy"

Recognized nationally in 2008 as a "Charter Legend in Energy"

Charter Life Member of the Association of Energy Engineers



Professional Affiliate
Member of the American
Institute of Architecture

Associate Member West Virginia Society for Healthcare Engineering



Member of the National Society of Professional Engineers



Member of the National Society of Plumbing Engineers

Member of the International Code Council



Contributing editor and served on the Editorial Review Panel for "The Handbook of Building Management and Indoor Air Quality," "Ventilation for a Quality Dining Experience," INvironment Professional, Power Prescriptions and other publications and articles dealing with Indoor Air Quality (IAQ) and MEP engineering systems

Presented at regional and national conferences including the annual National System Commissioning Conference

Ted A. Zachwieja III, EI, BSME

BIM Manager and M/E/P Designer

Ted has over ten years of experience and has completed extensive Building Information Modeling studies through Autodesk. He also had special courses in Advanced Computational Techniques, Control Systems, Design Project Management, Design Optimization, Measurement Instruments and Controls, and Sound Attenuation, as well as extensive studies in several of the leading engineering programs: Autodesk Revit software, AutoCAD, Pro-Engineering software, ANSYS, Lab View, MATLAB, and complete training in Microsoft Office Software.

Ted develops and manages the IT systems at **ZDS**. The experience encompasses development and deployment of central server systems to networked client computer systems, strategic development for **ZDS**' Integrated Design Processes, and research and development into new technologies to continue staying on the cutting edge at **ZDS**.

Ted's project experience includes the commissioning and design for heating, ventilating, air conditioning, plumbing, electrical and lighting systems for educational, health care, industrial and commercial facilities. His experience encompasses working both on new construction as well as renovation projects. He also has experience as a Building Information Modeling (BIM) manager and excels at technical communications.

Ted maintains an active membership to the ASHRAE professional society and also has a lifetime membership to the Association of Energy Engineers. He maintains an active continuing education towards today's standards and codes.

Some of Ted's project experiences include the following:

COMMERCIAL AND INDUSTRIAL

- West Virginia Air National Guard Maintenance Hangar, Charleston, WV
- West Virginia Air National Guard Fuel Cell Hangar, Charleston, WV
- Bayer Material Science
- I-70 Welcome Center, WV
- West Virginia State Capital Complex Central Heating Plant

HEALTH CARE

- West Virginia Department of Health and Human Resources Hospitals:
 - Jackie Withrow Hospital, Beckley
 - Hopemont State Hospital, Terra Alta
 - John Manchin, Sr. Health Care Center, Fairmont
 - Lakin State Hospital, West Columbia
 - Mildred Mitchell-Bateman Hospital, Huntington
 - Welch Community Hospital, Welch
 - William R. Sharpe, Jr. Hospital, Weston



EDUCATION

Bachelors of Science in Mechanical Engineering from Rochester Institute of Technology, Rochester, NY

REGISTRATIONS

West Virginia State Board of Registration for Professional Engineers
West Virginia No. 9569

PROFESSIONAL AFFILIATIONS

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



Membership
Promotion Chair on Board of ASHRAE's Mountaineer Chapter



Lifetime Member of the Association of Energy Engineers (AEE)



Associate Member West Virginia Society for Healthcare Engineering

Ted A. Zachwieja III

(Continued)

EDUCATIONAL

Schools

M/E/P design for schools in the following West Virginia counties includes:

- Greenbrier West High School Additions/Renovations, WV
- Davis-Thomas Elementary/Middle School Renovations, WV
- South Charleston High School Renovations, WV
- Glade Elementary/Middle School Renovations, WV
- Elkins Middle School Renovations, WV
- Jaeger/Panther Elementary School, WV
- 29 Schools in Raleigh County, WV

AWARDS AND RECOGNITIONS

Special recognitions and awards indicating levels of achievement and leadership include:

- Recently awarded 2012 Legend in Energy by the Association of Energy Engineers
- Vice President and Social Chair for Phi Kappa Psi, a predominant scholastic fraternity celebrating over 20 years at Rochester Institute of Technology (RIT)
- Distinguished by the RIT Dean's List for outstanding scholastic achievement
- Numerous scholarships to Rochester Institute of Technology (RIT) including Recipient of RIT Presidential Scholarship

James E. Watters

**Project Manager
Production Manager**

Jim has over 37 years experience in design and implementation of HVAC, plumbing and electrical systems including nine years in the construction industry. He has a comprehensive knowledge of construction documents, contracts, and development of cost estimates, budgets and schedules.

Jim's strengths reside in his ability to manage projects and people in an organized and cost-effective manner. Jim has been involved with the design and production of mechanical and electrical drawings including HVAC, plumbing, fire protection, lighting, electrical power and specialized systems. He has worked with and managed engineers in projects for health care, educational and commercial buildings in the states of West Virginia, Ohio, Kentucky, Virginia, Georgia, New York, Arizona, Illinois and Massachusetts.

Jim has extensive experience in energy savings' programs for HVAC, plumbing and electrical systems in hospitals, state and government office buildings, school systems, and manufacturing facilities, as well as managing performance contracts for the state of Georgia totaling \$10,000,000 in construction costs on various projects, including the conception, design and construction administration for the installation of a 1.5 Megawatt emergency generator at the Central State Hospital facility in Milledgeville, Georgia. The propane-fired generator and associated switchgear in conjunction with 60,000 gallons of propane fuel storage served to provide peak shaving/load shedding to save on the facility utility costs as well as emergency power functions.

Through the years, Jim has researched and implemented into practice International Building Codes, NFPA Codes, National Electrical Codes, Life Safety Codes, IES standards, AIA Guidelines for Design and Construction, and the evolving ADA standards.

Some of Jim's HVAC, plumbing, fire protection and electrical project experience includes the following:

EDUCATIONAL

- Elkins Middle School HVAC and Electrical Renovations
- Marshall University Smith Hall Renovations
- Marshall University Student Housing in Huntington
- New Jaeger/Panther Elementary School
- Paul Blazer High School in Ashland
- Pleasant Hill Elementary School Renovations in Calhoun County
- Ritchie County Middle/High School



PROFESSIONAL AND COMMUNITY AFFILIATIONS

Member of the National
Fire Protection
Association (NFPA)



Member of the Health
Care Section of the NFPA

Member of
the
Illuminating
Engineering
Society (IES)



Past member of the
American Society of
Plumbing Engineers
(ASPE)

Past member of the Institute of
Electrical Engineers (IEE)

James E. Watters

(Continued)

GOVERNMENT AND COMMERCIAL

- Boyd County, Kentucky Judicial Center
- Fenway Park in Boston - Lightning Protection and Grounding Study
- Kanawha County Commission Judicial Annex Renovations
- Tucker County Board Office Boiler Retrofit
- West Virginia Department of Military Affairs and Public Safety Maintenance Facility in Eleanor
- West Virginia Department of Transportation Burnsville Rest Area and Domestic Water Pumping Station
- West Virginia Division of Culture and History Fire Alarm/Sprinkler upgrades

HEALTH CARE

- Charleston Area Medical Center Memorial Division in Charleston
- Charleston Area Medical Center General Division in Charleston
- Charleston Area Medical Center Women's and Children's Hospital in Charleston
- Kings Daughters Medical Center in Ashland
- St. Mary's Medical Center in Huntington
- VA Hospital, Huntington
- West Virginia Department of Health and Human Resources:
 - Jackie Withrow Hospital, Beckley
 - Hopemont State Hospital, Terra Alta
 - John Manchin, Sr. Health Care Center, Fairmont
 - Lakin State Hospital, West Columbia
 - Mildred Mitchell-Bateman Hospital, Huntington
 - Welch Community Hospital, Welch
 - William R. Sharpe, Jr. Hospital, Weston
- Central State Hospital, Milledgeville, Georgia

Jennings L. Davis II, P.E., CIE

Mechanical Engineer

Jennings has more than 22 years of experience in the design, project management and construction of heating, ventilating and air conditioning (HVAC), plumbing, electrical and specialized systems for healthcare, institutional and commercial facilities. His professional experience includes 11 years as an Owner's Representative at West Virginia University (WVU) in the positions of Staff Engineer and Construction Project Manager, 5 years as Mechanical Engineer for the West Virginia Department of Education (WVDE), and 6.5 years as a Project Engineer with a design and consulting engineering firm.

During his employment with WVU, Jennings was responsible for management of major repair and capital construction projects designed by outside Architectural and Engineering firms with budgets ranging from \$50,000 to \$37,000,000, as well as the design of smaller in-house projects ranging from \$10,000 to \$500,000. While working for the WVDE, he was responsible for quality control of design documents for various construction projects; troubleshooting maintenance for HVAC controls and for Indoor Air Quality (IAQ); recommissioning of HVAC systems to original design parameters; recommendations for HVAC operational and energy savings procedures; and training of maintenance personnel. He investigated facilities concentrating primarily on HVAC operation and occupant safety. Tasks included IAQ measurements such as temperature, humidity and carbon dioxide; HVAC equipment visual inspection; life safety assessment; and building component checks.

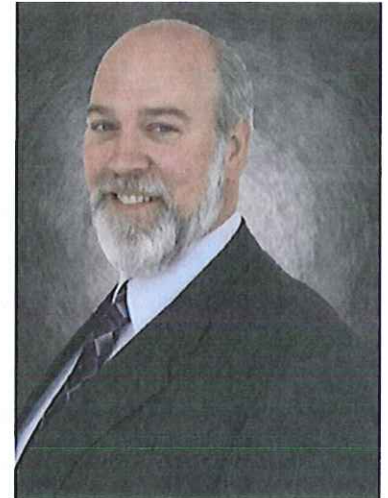
As a Project Engineer, Jennings specializes in developing scope, budget and design parameters; establishing program requirements through interaction with Owners and other Team members; design reviews; budget analysis and control; schedule control; complete design oversight and task assignment; and project closeout. Some of the projects he has been involved with include numerous renovation projects at several VA Medical Centers including multiple radiology room/suite installations and renovations, MRI's, X-ray and CT Scanners, Emergency Department renovations, numerous hospital out-patient treatment areas and specialty clinic renovations, a new \$4.4 million Hospice facility at the VA Medical Center in Coatesville, Pennsylvania, and a new \$5 million Medical Office Building for Somerset Hospital in Somerset, Pennsylvania.

Other projects include a \$37 million addition and renovation to WVU's Wise Library, a \$2.1 million chiller replacement for WVU's Engineering Sciences Building, a new primary 23kV power feed to the existing sub-station for the WVU Coliseum, engineering design for a hydrogenation reactor laboratory for WVU's Engineering Research Building, an \$8 million HVAC and sprinkler renovation for WVU's Armstrong Hall and HVAC design for transmitter station for the West Virginia Public Broadcasting Station.

A more complete list of Jennings' clients and projects includes the following:

SCHOOLS AND UNIVERSITIES

- West Virginia University (WVU)
 - Wise Library addition and renovation
 - Engineering Sciences Building chiller replacement
 - Coliseum's new primary 23kV power feed to existing sub-station
 - Engineering Research Building hydrogenation reactor laboratory
 - Armstrong Hall HVAC and sprinkler renovation
- Shepherd University Ikenberry Hall HVAC Renovation



EDUCATION

BS in Mechanical Engineering from West Virginia University

REGISTRATIONS

Professional Engineer West Virginia No. 15060

Professional Engineer Pennsylvania No. PE062186

Professional Engineer Virginia No. 040028

PROFESSIONAL AFFILIATIONS

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



Associate Member West Virginia Society for Healthcare Engineering



Jennings L. Davis, P.E., CIE**(Continued)****HEALTH CARE**

- Children's National Medical Center (CNMC) 7-story East Wing Addition and Fit Out, multiple office suite renovations, Pediatric Intensive Care Unit (PICU) renovations, Hearing & Speech Outpatient Suite renovations, Quarantine Infection Control System Modifications, Pulmonary Outpatient Renovations, and Pharmacy Renovations
- Friendship Ridge Bulk Oxygen System and Facility Distribution Upgrade
- Heritage Valley Health Systems (HVHS)/Sewickley Valley Hospital (SVH) Radiology Reading and Processing Suite Renovations, Outpatient Clinic and Emergency Department Renovations, 5th Floor Central/West Inpatient Wing Renovations
- HVHS/Moon Imaging X-Ray Relocation
- HVHS/The Medical Center of Beaver (TMC) Helipad Study, Bulk Oxygen Supply and Storage Replacement, Radiology Reading and Processing Suite Renovations, RIS-PACS Data Storage Facility
- Indiana (Pennsylvania) Regional Medical Center (IRMC) Blairsville Medical Office Building, IT Data Storage Room HVAC Upgrade, Dialysis Treatment Suite HVAC Upgrade
- Mount Nittany Medical Center (MNMCC) commissioning for East Wing addition, ED renovations, Central Utility Plant upgrades, Special Services/Computer Services Building
- Somerset Hospital ADL Suite Fit-out, Medical Office Building, Cath Lab Renovation, CT Replacement, X-Ray Replacement, Pharmacy Relocation/Renovations
- VAMC Clarksburg 4th Floor Renovations (Psychiatric Suite)
- VAMC Coatesville New Hospice Facility
- VAMC Huntington Mental Health-Psychiatric Residential Rehabilitation Treatment Program (MH PRRT) Addition and Renovations
- VAMC Philadelphia Canteen Renovations, Dental Lab Renovations, Emergency Department and Patient Processing Renovations, Home Health Renovations, Medical Records Renovations, MRI Renovations, CT Scan Renovations, Angio Suite Renovations, Specialty Clinic Renovations, OR Suite HVAC System Upgrades, Chiller and Cooling Tower Replacements, New Patient Transport Elevator, Clean Steam System for Facility Wide Humidification
- West Virginia Department of Health and Human Resources Hospitals:
 - Jackie Withrow Hospital, Beckley
 - Hopemont State Hospital, Terra Alta
 - John Manchin, Sr. Health Care Center, Fairmont
 - Lakin State Hospital, West Columbia
 - Mildred Mitchell-Bateman Hospital, Huntington
 - Welch Community Hospital, Welch
 - William R. Sharpe, Jr. Hospital, Weston

OTHER EXPERIENCE

- West Virginia Parkways Authority
- West Virginia Air National Guard (WVANG) New Hangar Commissioning
- West Virginia Public Broadcasting Station HVAC design for transmitter station
- Federal Government Facility Cafeteria and Food Court Renovations, Electrical Vault Renovations

James W. Lowry, P.E.**HVAC, Fire Protection, Plumbing
and Commissioning Engineer**

James has over seven years of experience and has completed extensive HVAC design training at Carrier Training Center, Syracuse, New York, and hydronic design/applications at the B&G Training Center, Chicago, Illinois. He also had special courses in Finite Element Analysis, Vibration Analysis, Fluid Power, Automatic Controls, Industrial Instrumentation, and Programmable Logic Controllers (PLCs).

James' experience includes the design for mechanical engineering, heating, ventilating, air conditioning, plumbing, electrical and lighting for educational, health care, industrial and commercial facilities. He specializes in HVAC, fire protection and plumbing design and commissioning. He researches and applies International Building Codes, NFPA, ASHRAE standards and the AIA Guidelines for Design and Construction of Health Care Facilities.

Some of James' project experience includes the following:

EDUCATIONAL

- Concord University Technology Center
- Davis Thomas Elementary/Middle School
- Eastern Greenbrier Middle School addition
- Elkins Middle School HVAC/electrical renovations
- Glade Elementary/Middle School renovations
- Greenbrier West High School additions/renovations
- Harvard University
- Jaeger/Panther Elementary School
- Independence Middle School
- James Monroe High School HVAC renovations
- Man/Central Elementary addition
- Marshall University
- New McDowell County Southside K-8 School
- Park Middle School HVAC renovations
- Pleasant Hill Elementary renovations
- Ritchie County Middle/High School HVAC/plumbing renovations
- Shady Spring Elementary School
- Smithville Elementary School additions/renovations
- South Charleston High School
- Tucker County High/Career Center HVAC renovations
- West Virginia University Institute of Technology – Engineering Building Evaluation
- Woodrow Wilson High School HVAC/electrical renovations

INDUSTRIAL

- Bayer Material Science
- West Virginia Higher Education Policy Commission (WVHEPC) South Charleston Tech Center – Campus Comprehensive Infrastructure Evaluation

**EDUCATION**

BS in Mechanical Engineering from
West Virginia University Institute of
Technology, Montgomerly, WV in 2004

REGISTRATIONS

Professional Engineer West Virginia
No. 18948

Professional Engineer Ohio
No. E-77003

PROFESSIONAL AFFILIATIONS

American Society of
Mechanical Engineers
(ASME)



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



Young
Engineer's Association Chair for
ASHRAE's Mountaineer Chapter



Association of Energy
Engineers (AEE)

James W. Lowry, P.E.
(Continued)**Project Experience (Continued)****COMMERCIAL**

- 4-H Camp Muffly Training/Dining facility
- Burnsville Rest Areas
- Cass Railroad Clubhouse renovations
- Department of Transportation Rest Area prototype
- Department of Transportation Welcome Center prototype
- Hardy County Daycare Center
- I-70 Welcome Center
- Jackson County Courthouse Annex
- Kanawha County Judicial Annex
- Mason County Courthouse
- Meadowbrook Rest Area
- Morgantown Welcome Center
- Multiple branch banking facilities
- Pendleton County Courthouse additions/renovations
- Pocahontas County Community Center
- Point Pleasant River Museum addition
- Tucker County Courthouse renovations
- Webster County Multi-tenant build-out
- West Union Bank Award Winning new facility
- West Virginia Air National Guard – Commissioning for \$43 million maintenance and fuel cell hangars
- West Virginia Capitol Complex Performance Contracting HVAC Retrofits and Master Planning for Security/Fire Alarm/Life Safety systems
- White Sulphur Springs Rest Area

HEALTH CARE

- Charleston Area Medical Center (Wound Center)
- Charleston Surgical Center
- VA Hospital, Huntington - steam replacement, water line replacement and CT Scan renovations
- West Virginia Department of Health and Human Resources:
 - Jackie Withrow Hospital, Beckley
 - Hopemont State Hospital, Terra Alta
 - John Manchin, Sr. Health Care Center, Fairmont
 - Lakin State Hospital, West Columbia
 - Mildred Mitchell-Bateman Hospital, Huntington
 - Welch Community Hospital, Welch
 - William R. Sharpe, Jr. Hospital, Weston

Marshall Cochran

**MEP CAD Designer
Technical Analyst**

Marshall has approximately 20 years experience specializing in Computer-Aided Drafting and design and is presently working with AutoCAD 2008 and Revit 2011. He has a comprehensive knowledge of AutoCAD and Integraph.

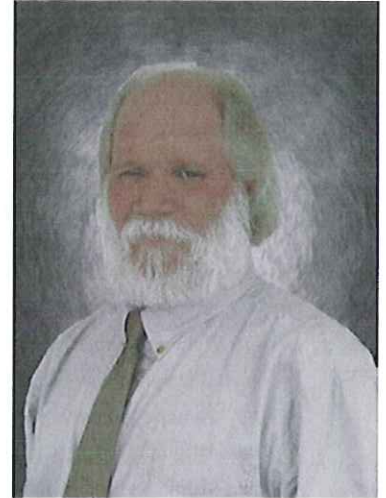
Marshall has been involved in the design and production of mechanical, electrical, fire protection, plumbing, process piping, structural and civil schematic design, design development and construction documents for colleges and universities, schools, health care, industrial and civil organizations in the states of Utah, Nevada, West Virginia, Virginia, Ohio and Pennsylvania. Marshall has developed site utility drawings, plan views, isometric views, elevation, flow diagrams, riser diagrams, details and schedules, for a complete set of working documents.

Some of Marshall's project experience includes the following:

EDUCATIONAL

- Bluefield College
- Bluefield State College
- Concord University
- Marshall University
- Ohio University
- Southern West Virginia Community and Technical College
- West Virginia Wesleyan College
- Washington and Lee University
- West Virginia University
- Mechanical, electrical and plumbing renovations for schools in the following counties in West Virginia:

- | | |
|------------|------------|
| Calhoun | Mingo |
| Clay | Monroe |
| Grant | Raleigh |
| Greenbrier | Randolph |
| Hardy | Ritchie |
| Harrison | Putnam |
| Jackson | Pocahontas |
| Kanawha | Summers |
| Lewis | Taylor |
| Logan | Tucker |
| Marion | Upshur |
| McDowell | Wayne |
| Mercer | Webster |
| | Wyoming |



EDUCATION

Associate Degree in Computer-Aided Drafting, ITT Technical Institute, Murray, Utah, 1990

Has completed various courses at Parkersburg Community College, Parkersburg, West Virginia and Arch Moore Vo-Tech, Frozen Camp, West Virginia

Marshall Cochran

(Continued)

GOVERNMENT AND COMMERCIAL

- Kanawha County Judicial Annex HVAC renovations
- Morgantown Welcome Center
- I-70 Welcome Center
- DOT Welcome/Rest Area Prototypes
- DOT Boiler and Chiller replacement
- West Virginia Culture Center HVAC renov.
- Cass Scenic Railroad Clubhouse renov.
- Bluefield Area Transit Authority Administration and Maintenance Facility
- Jackson County Libraries
- Point Pleasant River Museum
- Dudley Public Safety Center Fire Station
- Hardy County Daycare Center
- United States Department of Agriculture – Forest Products Marketing Laboratory
- Hart Field Maintenance Building
- Bank One of Charleston
- General Motors
- Toyota
- West Virginia Public Service Commission Headquarters Building
- West Virginia Capitol Complex Central Boiler Plant
- Kanawha County Circuit Court Room
- Fairmont Boys Home

HEALTH CARE

- Charleston Area Medical Center (CAMC)
- CAMC Wound Care Center
- Montgomery General Hospital
- Outpatient Surgery Facility of Pennsylvania
- St. Joseph's Hospital
- United Hospital Center
- VA Hospital, Huntington
- Webster Memorial Hospital
- West Virginia Department of Health and Human Resources:
 - Jackie Withrow Hospital, Beckley
 - Hopemont State Hospital, Terra Alta
 - John Manchin, Sr. Health Care Center, Fairmont
 - Lakin State Hospital, West Columbia
 - Mildred Mitchell-Bateman Hospital, Huntington
 - Welch Community Hospital, Welch
 - William R. Sharpe, Jr. Hospital, Weston

William W. Chan, BSME, ME**Senior Technical Analyst
M/E/P Designer**

Will is a graduate of Rochester Institute of Technology with highest honors. His past experiences include Impact Sensors in Henrietta, NY and NASA Glenn Research Center in Cleveland Ohio. At Impact Sensors, he worked extensively on creating a particle simulator (in MATLAB) for research and development of the company's debris and particle sensors, as well as developing a novel method on handling individual particles on the scale of tens of microns. In his second tenure at NASA GRC, he finalized the graphical user interface of the Commercial Modular Aero-Propulsion System Simulation version 2 (C-MAPSSv2), a simulation of a commercial turbofan engine which has subsequently been released for public use. In his first tenure at GRC, he used SolidWorks to redraw a future generation cargo transport plane for the purpose of computational fluid dynamics analysis.

Will has had extensive studies in Mechanical Engineering, with courses in Advanced Computational Techniques, Critical Thinking in Engineering Design, Wind Turbine Design, Design Project Management, Design of Machine Elements and Systems, Systems Modeling and Computer Implementation, as well as various business and communications courses.

Will is familiar with several leading engineering programs: Autodesk Revit software, AutoCAD, Pro-Engineering software, ANSYS, Lab View, MATLAB, and has had complete training in Microsoft Office software. He also has experience in IT systems and administration. The experience encompasses development and deployment of a central server to networked computer systems, strategic development for a truly mobile employee, and research and development of new project management tools.

Will's project experience includes the commissioning and design for heating, ventilating, air conditioning, plumbing, electrical and lighting systems for educational, health care, industrial and commercial facilities. He also maintains an active membership to the ASHRAE professional society. He maintains an active continuing education towards today's standards and codes.

**EDUCATION**

Bachelors of Science in Mechanical Engineering from Rochester Institute of Technology, Rochester, NY

Masters of Engineering in Mechanical Engineering from Rochester Institute of Technology, Rochester, NY

Concentrations in Business and Communication

RIT Merit Scholarship recipient

RIT Dean's List

PROFESSIONAL AFFILIATIONS

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



John T. Brigham, PE**Electrical Engineer**

John has more than 22 years of engineering experience, 5 of those years in the design, construction management, and specifications for electrical engineering experience for educational, commercial, industrial and health care facilities. His specialties include electrical engineering, systems master planning, conceptual design. He has experience in commercial, hospitals and educational design.

Prior to joining **ZDS**, John Brigham completed numerous residential electrical projects that included apartments, condos and multi-family housing. Other project experience included street lighting and interstate highway lighting design. Some of John's project experience includes:

GOVERNMENT AND COMMERCIAL

- Aldi Market, OH
- Alpha Investments, OH
- Avril and Bleh Market, OH
- Butler County Regional Airport, OH
- Central Parkway Car Wash, OH
- Colorado Metals, OH
- Evans Landscaping Facility, OH
- Fairfield Church, OH
- Fairfield Salon, OH
- Foundation Advisors, OH
- Gateway Distribution Center, OH
- Grant County Extension Office, KY
- Hamilton City Schools Modular Classroom, OH
- Heinz Offices, OH
- Kenwood Nails, OH
- Murphy Hair Salon
- Necco Offices, OH
- Ocean Spray Offices, OH
- Pure Concepts Salon, OH
- Senate Restaurant, OH
- Ted's Pawn Shop, OH
- Tot Dogs, OH
- Urban Active, OH
- Village of Glendale Fire Station, OH
- Wachovia, OH
- Wake Nation Water Skiing Facility, OH

EDUCATION

Associate of Applied Science in Electronics from Kentucky State University, Frankfort, KY in 1986

Bachelor of Science in Electrical Engineering Technology from Thomas Edison State College, Trenton, NJ in 1988

Masters of Business Administration from Brenau University, Gainesville, GA in 1994

REGISTRATIONS

Professional Engineer Ohio No. E-66883

Professional Engineer Oregon No. 67074 PE

Professional Engineer Pennsylvania No. PE-063137-R

PROFESSIONAL AND COMMUNITY AFFILIATIONS

Member of the Institute of Electrical and Electronic Engineers

Institute of Transportation Engineers

John T. Brigham
(Continued)

HEALTH CARE

- Arthritis Foundation, OH
- Gateway Chiropractic Center, OH
- Springfield Cardiac Care, OH

EDUCATIONAL

Colleges and Universities

- Great Oaks Institute of Technology, OH
- Hondros College, OH
- Mt. Vernon Nazarene University, OH
- Southwestern College, OH

SITE LIGHTING

- 1202 Main Street Parking Lot Lighting, OH
- 4411 Courtland Avenue Site Lighting, OH
- 5202 Delhi Avenue Site Lighting, OH
- Hughes Street Sit Lighting, OH

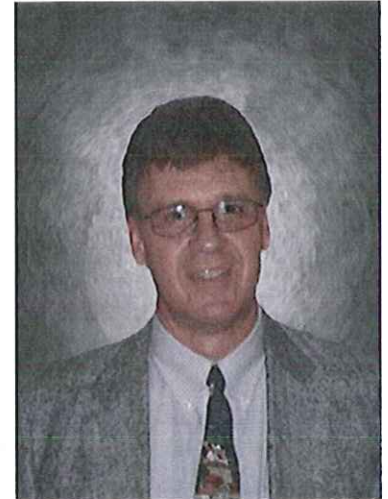
David G. Dial, P.E.**Senior MEP Engineer**

David has over twenty-eight years of experience in the design and commissioning of mechanical and electrical systems. He provides HVAC, electrical and plumbing design services for a variety of clients in West Virginia. His background includes managing operating and maintenance repair and construction services for HVAC, plumbing, electrical and maintenance. He has managed grounds maintenance, security staff, information technology, IT NASA network, video surveillance and telephone systems.

David has experience in Maintenance Engineering in plumbing, HVAC, clean room design, dust collector selections, steam and condensate flow measurement, transfer of steam production from in-house to private contractor, athletic field lighting design, and farm pump water design. He has even completed a successful energy grant application from the U.S. Department of Energy. His Environmental Design experience includes PCB remediation, Air Pollution Control Commission annual reporting, removal of underground fuel storage tanks/pumps, installation and testing for radioactive material, conversion of a fleet of vehicles to operated dual fuel (gasoline and natural gas) including training, designing a filling station, custom built compressor station, cylinder operations area, filling post and monitoring of natural gas usage.

David has been involved in the design, document development, contract administration and recommissioning of the structural, mechanical and electrical disciplines of several WVU projects including Downtown Steam Tunnel Assessment, Coliseum Tunnel Redesign, Towers Exercise Room, Brooks Clean Room, lighting retrofits at Brooks Hall, exterior lighting for Mountainlair Parking Garage, cooling towers replacement at the Chemistry Annex, replacement of electric hot water boilers with natural gas pulse steam boilers, HVAC controls for Allen Hall, measure flow for sub metering/billing for campus steam/condensate systems, PCB removal from electrical equipment on campus, and power/cooling for a data Center at the WVU/NASA facility.

Other project experience includes design for Trinity High School's HVAC, plumbing and electrical system, industrial dust collector system for the Percival Dust Collector and replacement of rigging of a 2500 seat auditorium. As a production engineer, David optimized design of medical quality cryogenic freezers, incubator and shaker including scheduling the freight trucks, quality assurance of sheet metal shipments, writing repair manuals and setting up insulation.

**EDUCATION**

Bachelor of Science Mechanical Engineering, West Virginia University, 1978

Masters of Science Environmental Engineering, West Virginia University, 1980

REGISTRATION

Professional Engineer, West Virginia, No. 11692

Lori L. Zachwieja, CPA

**Principal
Chief Financial Officer**

Lori has over 26 years experience in finance, business, and accounting including being a Partner in a consulting firm, a Senior Financial and Tax Analyst for the Corporate Financial Services and Small Systems Support Department at Blue Cross and Blue Shield of West Virginia, Inc. and Staff Accountant for Simpson and Osborne, a CPA firm located in Charleston, West Virginia. Lori also has worked with an architectural firm located in Charleston.



EDUCATION

Bachelor of Science in Accounting,
Bachelor of Science in Business
Management, and Bachelor of Science
in Computer Management; all three
degrees were with Honors, West
Virginia Institute of Technology in
1983

Master's Degree at Marshall University

REGISTRATIONS

Certified Public Accounting in 1988,
No. 2542

Member of West Virginia Society of
CPA's since 1985; Certificate Number
1949

CAS

Structural Engineering, Inc.

Carol A. Stevens, P.E.
Structural Engineer

EDUCATION

West Virginia University, BSCE, 1984
 Chi Epsilon National Civil Engineering Honorary
 The Pennsylvania State University, ME Eng Sci, 1989

PROFESSIONAL REGISTRATION

P.E.	1990	Pennsylvania
P.E.	1991	West Virginia
P.E.	1994	Maryland
P.E.	2008	Ohio
P.E.	2010	Kentucky

BACKGROUND SUMMARY

2001 – Present	President, Structural Engineer CAS Structural Engineering, Inc.
1999 – 2001	Structural Engineer Clingenpeel/McBrayer & Assoc, Inc.
1996 – 1999	Transportation Department Manager Structural Engineer Chapman Technical Group, Inc.
1995 – 1996	Structural Engineer Alpha Associates, Inc.
1988 – 1995	Structural Department Manager Structural Engineer NuTec Design Associates, Inc.
1982 – 1988	Engineer AAI Corporation, Inc.

PROFESSIONAL ASSOCIATIONS

American Society of Civil Engineers
 National Society of Professional Engineers
 American Concrete Institute
 American Institute of Steel Construction
 West Virginia University Department of Civil and
 Environmental Engineering Advisory Committee Chair
 West Virginia University Institute of Technology
 Department of Civil Engineering Advisory Committee

CIVIC INVOLVEMENT

ASCE Christmas in April Project
 Engineer's Week Speaker

P.O. Box 469

Alum Creek, WV 25003-0469

EXPERIENCE

West Virginia, Roane County Courthouse:
 Structural analysis of existing floor framing for addition of
 new high-density file storage system on upper floor level.

West Virginia, Lewis County Courthouse:
 Structural investigation for work required to update
 structure and apply for grant monies through WVCFIA.

West Virginia, Tucker County Courthouse: Structural
 investigation for work required to update structure and
 apply for grant monies through WVCFIA.

West Virginia, Gilmer County Courthouse: Structural
 analysis of existing floor framing for addition of high-
 density file storage system on upper floor level.

**West Virginia, State Capitol Complex, Main Capitol
 Building Exterior Façade Restoration:** Investigation and
 preparation of details for repairs to limestone and terra
 cotta exterior façade. Building is on State Historic Register
 and was constructed in the 1920's and 1930's.

West Virginia, First Presbyterian Church Restoration:
 Structural renovations of steel in lantern level and terra
 cotta cornice, overview of repairs to limestone and terra
 cotta façade of 1920's structure.

**West Virginia, State Capitol Complex, Governor's
 Mansion:** Structural analysis and design in addition to
 evaluation report for modifications and renovations to
 several areas of mansion. Building is on State Historic
 Register and was constructed in the 1920's.

West Virginia, Upshur County Courthouse: Developed
 construction documents for structural repairs to main
 entrance, dome and monumental sandstone columns of
 1899 structure. Work was recently completed and received
 a WVAIA Honor Award for Design Excellence.

**West Virginia, State Capitol Complex, Holly Grove
 Mansion:** Structural evaluation report for preliminary
 condition assessment of building structure. Building is on
 State Historic Register and was constructed in 1815.

**West Virginia, State Capitol Complex, Main Capitol
 Building Parapet:** Exploratory investigation of
 limestone/brick parapet/balustrade of Main Capitol
 Building to determine cause of movement/cracking/ leaks.
 Construction contract for repairs has been completed.

P.O. Box 469

Alum Creek, WV 25003-0469

(304) 756-2564 (voice)

(304) 756-2565 (fax)

A West Virginia Certified DBE Consultant
 Certified in the Practice of Structural Engineering

Building is on State Historic Register and was constructed in the 1920's and 1930's.

West Virginia, State Capitol Complex, Main Capitol Building Dome: Exploratory investigation of structural steel components of Lantern Level of dome and development of contract documents for repairs. Building is on State Historic Register and was constructed in the 1930's.

West Virginia, Hampshire County Courthouse: Structural design for new elevator for existing historic building.

West Virginia, Historic Putnam-Houser House (Parkersburg): Designed system for stabilization and upgrades to floor framing of building that was constructed in the 1700's.

Ohio, Mahoning County Courthouse: Completed preliminary structural observation report of exterior façade conditions to recommend phased repairs for terra cotta and granite façade. Building is on State Historic Register and was constructed in the early 1900's.

West Virginia, State Capitol Complex, Building 5: Structural design and analysis for support of new boilers and other mechanical equipment to be placed in mechanical penthouse.

West Virginia, State Capitol Complex, Building 7: Investigation and development of Construction Documents for new elevators.

West Virginia, State Capitol Complex, Building 3: Structural design and construction administration of repairs to limestone canopy. Building is eligible to be placed on State Historic Register and was constructed in the 1950's.

West Virginia, State of West Virginia Office Building #21, Fairmont, WV: Preliminary structural observation report for condition assessment of building structure.

PREVIOUS EXPERIENCE

West Virginia, State Capitol Building, North Portico Steps: Designed structural system to replace deteriorated reinforced concrete slab at landing on north side of Capitol steps. Building is on State Historic Register and was constructed in the 1930's.

West Virginia, Upshur County Courthouse Annex: Performed structural evaluation and design for repairs to existing multi-story Annex addition.

West Virginia, Farrell Law Building: Performed analysis of existing deteriorated structural sidewalk over parking area. Recommended repair solutions for reinforced concrete and aged terra cotta façade of 1920's building.

West Virginia, Canaan Valley Resort and Conference Center: Structural feasibility study to upgrade lodging units.
West Virginia, West Virginia University Masterplan: Investigated structural floor load capacity of several university buildings as a consultant to a large national architectural firm for masterplan.

West Virginia, Morgantown High School Additions: Designed steel framing and foundations for science classroom, cafeteria and gymnasium additions to existing education complex.

West Virginia, Grafton High School Addition: Designed steel framing and foundations for new science classroom addition to existing high school.

Pennsylvania, York County Government Center: Structural analysis and design of 1898 former department store converted to county government offices. Interior renovations included adding floor framing at mezzanine level, analyzing and redesigning deficient floor framing, and adding new elevators. Exterior renovations included complete façade rework to recreate original appearance.

Pennsylvania, Metropolitan Edison Company, Headquarters: Structural design for new 80,000 SF two-story office addition to existing complex.

Pennsylvania, Defense Distribution Region East: Structural engineering and design for a 33,000 SF Hazardous Materials Storage Warehouse.

Maryland, U.S. Army Corps of Engineers, Baltimore District, Administration Building: Seismic design of new 10,000 SF masonry building.

Pennsylvania, Carlisle Syntec: Design of foundation supports for 800,000 lb rubber vulcanizing machine; enlargement of foreman's office including new framing to support mechanical equipment on roof; new monorail installation; extension of existing gantry rail.

Pennsylvania, Engel Worldwide: Steel framing and foundations for new 12,000 SF two-story office building; design of crane beams and columns for adjacent 60,000 SF crane building.