Expression of Interest
to Provide Engineering Services

Pipestem Resort State Park
McKeever Lodge

West Virginia Division of Natural Resources

DNR 213077
April 9, 2013

04/05/13 03:47:42 PM
'West Virginia Purchasing Division

ZDS
DESIGN/CONSULTING SERVICES

91 Smiley Drive, St. Albans, WV 25177 • (304) 755-0075 • www.zdsdesign.com

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ZDS
Design/Consulting Services MECHANICAL . ELECTRICAL . INDOOR AIR QUALITY . ENERGY . COMMISSIONING

91 Smiley Drive St. Albans, WV 25177 Phone: 304-755-0075 Fax: 304-755-0076 Email: todd.zachwieja@zdsdesign.com

April 6, 2013

Department of Administration
Purchasing Division
2019 Washington Street East
P.O. Box 50130
Charleston, WV 25305-0130

RE: **McKeever Lodge HVAC Piping, Pipestem Resort State Park**

ZDS has enjoyed working with many State Agencies and commercial facilities throughout West Virginia and the surrounding areas. We look forward to having the opportunity to provide professional engineering services for the design of replacement heating and cooling fluid piping and related mechanical and other improvements at ***McKeever Lodge*** located at Pipestem Resort State Park. We have provided professional mechanical and electrical engineering consulting/commissioning services for many facilities across the country and throughout the State of West Virginia.

We believe our company is the right size that gives the necessary depth to provide the level of service necessary but small enough to listen and care about your needs. Entering our **20th year**, our firm has a staff of 15 with corporate office located at 91 Smiley Drive, St. Albans, West Virginia, which is near the Agency and close to the project. We pride ourselves on being viewed as an extension of the client's staff and successfully incorporating pertinent information about their facility into any proposed solution. Our combined experience involves hundreds of projects including working with the State Fire Marshal and the State of West Virginia in establishing and enforcing their engineering design standards. We were also recently selected to teach the new Energy Codes required by the State of West Virginia for this project under the Green Buildings Minimum Energy Standards effective July 2012. This was presented to code officials, designers and building Owners all over West Virginia, including at the recent March 2013 EXPO event at the Charleston Civic Center sponsored by West Virginia University and the West Virginia Energy Office.

We have enclosed one original technical proposal plus three convenience copies outlining ZDS' Team qualifications to provide Professional Engineering Services and related work for ***McKeever Lodge***. Our professionals are dedicated to performing quality services taking into account our clients' needs, scheduling and budgets. Refer to ***Section II*** of this document for a brief description of ZDS' Organization and Services and our other team members, **CAS Structural Engineering** and **Chapman Technical Group** for Architecture and potential site involvement if a geothermal HVAC system is considered. This same team has been working on projects successfully together for many years. Our Team Organizational Chart is located immediately after this letter outlining our qualifications and project concept.

- **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 West Virginia and has worked on many projects for WVDNR.

- **Chapman Technical Group**, located in St. Albans, West Virginia, will provide the professional Architectural and Interior design supporting services required for your project. If a geothermal HVAC system is considered, CTG would also provide some site support related to restoration of the grounds for the installation of a geothermal well field. CTG's collective staff has hundreds of years of architectural and engineering experience that complement the overall Team.

Refer to ***Section III*** of this document for related project experience for our team. The ZDS Team has extensive experience leading HVAC renovation projects for hundreds of schools, commercial buildings, health care facilities and higher education facilities. We are currently leading the renovation of William R. Sharpe Hospital where hydronic piping and their central heating and cooling plant were experiencing significant problems. Total project cost is expected to be over $30 million which includes an addition.

Some previous HVAC renovation project experiences include schools in Raleigh County like Woodrow Wilson High School, Park Middle School, Shady Spring Middle, Trap Hill Middle and many more. We recently completed new central boiler plants for the entire West Virginia State Capitol Complex in Charleston and Jackie Withrow Hospital campus in Beckley. We know HVAC systems and all the codes and standards. Our HVAC renovations for Webster County Schools resulted in the County School system receiving the award as the 2012 most energy efficient schools system in West Virginia. We also have received three **2013 Energy Star Certified** facility for renovating three major facilities.

We are recognized for our specialties in mechanical design, electrical design, indoor air quality services, energy conservation/performance contracting and commissioning services for Commercial, Health Care and Educational facilities. ZDS principals Ted Zachwieja and Todd Zachwieja specialized in energy conservation design prior to establishing ZDS and were involved in hundreds of millions in renovations, new construction, and Performance Contracting heavily involving HVAC/Electrical systems. Some projects include Ohio University's Athens and Chillicothe campuses, Harvard University's new LEED Gold Arboretum, and the recently completed new $43 million West Virginia Air National Guard Fuel Cell/Maintenance Hangars at the Yeager Airport in Charleston. We do work in 24 states but our home is in West Virginia. We have worked with many State Agencies and hope to be able to work with you.

Refer to ***Section IV*** of this document for our Professional Qualifications with detailed resumes. ZDS Design/Consulting Services and its Team have registered professionals in all of the required disciplines to effectively execute all the requirements of the project. We believe that our specialties in commissioning/design of HVAC systems, Electrical systems, Energy Management, Planning and Codes compliance make us most qualified to work on these types of projects. We continue to have an excellent working relationship with the West Virginia State Fire Marshal, the West Virginia Department of Education and the State of West Virginia. Below is a partial listing of the Project Team.

Todd A. Zachwieja, ZDS ***Principal-in-charge of Design/Commissioning and Project Management*** BSME, MSEM, P.E., CEM, LEED AP with over 38 years of experience in M/E design, energy management, IAQ and commissioning. *Nationally recognized for expertise in IAQ, LEED and Certified Energy Manager. Received "Legend in Energy" by AEE in 2007/2008. Guest Speaker at National System Commissioning Conference. Selected to teach West Virginia's new Energy Code.*

Ted T. Zachwieja, ZDS ***Principal-in-charge of Construction Administration*** with over 55 years of experience in M/E design and Construction Administration. *Ted was one of three engineers selected by the Department of Energy to train those who manage buildings to conserve energy.*

Jennings L. Davis II, ZDS ***Associate,*** BSME, P.E., CIE specializing in operations/commissioning and HVAC design with over 22 years of experience.

Ted A. Zachwieja III, ZDS BSME, EI, 2012 Legend-in-Energy Award, specializing in 3D MEP design and responsible for all IT systems administration while working for ZDS nearly 10 years.

Jim Watters, ZDS ***Production Manager/Associate*** with over 35 years of experience in mechanical, electrical and plumbing design/commissioning and Construction Administration.

James Lowry*, ZDS *Senior Engineer, BSME, P.E. specializing in HVAC design and commissioning with over eight years of experience.

***Carol Stevens*, CAS Structural Engineering,** President, BSCE, MEES, P.E. specializing in structural design, forensic investigation and analysis with over 25 years of experience including previous DNR projects.

***Joe Bird*, Chapman Technical Group**, Senior Vice President and Project Coordinator, ASLA, BSLA with over 35 years of professional experience in Project Management/Architectural Planning.

***Tom Cloer*, Chapman Technical Group,** Project Architect, NCARB AIA, Architect-of-Record with over 12 years of experience in architecture design and construction administration.

ZDS personnel have worked on hundreds of schools including projects for the West Virginia counties of Clay, Calhoun, Jackson, Grant, Greenbrier, Hardy, Harrison, Kanawha, Lewis, Logan, Marion, McDowell, Mercer, Mingo, Monroe, Ohio, Pocahontas, Putnam, Raleigh, Randolph, Ritchie, Summers, Taylor, Tucker, Upshur, Webster, Wyoming, and others. Please contact Mike Pickens, Rudy Raynes (State Fire Marshal) or Dr. Manchin about ZDS' work as references. We encourage you to call and ask how well we worked with their staff, about our technical strengths and our ability to work with contractors to provide ***McKeever Lodge*** with a quality project. Please feel free to contact any of the following references about ZDS' work and more details:

1. Mr. Mike Pickens, Executive Director of the West Virginia Department of Education (304) 558-2711
2. Dr. Mark Manchin, Executive Director School Building Authority, previous superintendent of both McDowell County Schools and Webster County Schools (304) 558-2541
3. Mr. Greg Nicholson, CEO, WVDHHR, Charleston, WV (304) 558-3217
4. Mr. Tony Crislip, Manager, Marshall University (304) 696-6241
5. Mr. Ron Adkins, former Project Manager for West Virginia Air National Guard projects (304) 634-9379
6. Mr. Tony Crislip, Manager, Physical Plant, Marshall University (304) 696-6241
7. Mr. Mark Lynch, Director of Facility Operations, West Virginia Division of Culture & History (304) 558-0220, ext 160

The ZDS Team has over five decades of experience in West Virginia, giving us the local understanding of your needs. ZDS has offices in Saint Albans and Morgantown, West Virginia providing easy access to ***McKeever Lodge***. We have extensive renovation experience, including phasing construction, to minimize potential disruptions including health care where stringent requirements have been met.

Our approach is different than the traditional role; we have actual operational experience and design experience. We have designed the improvements and commissioned the Mechanical/Electrical systems. By commissioning the systems, we fine-tune them to actual conditions and assist the personnel after occupancy to improve comfort, provide training, and minimize operating costs.

CONCEPT

Goal/Objective #1: Review existing plans and conditions and evaluate to determine a priority for all necessary replacement of piping or equipment:

We believe the best engineers lead the industry in applying innovative ideas and concepts while adhering to proven approaches. ZDS was selected as the premier engineer in the region to establish a pilot 500-ton geothermal heat pump system for Webster County High School that saved them over 45% off their utilities' costs annually and serves as a pilot for all schools in the State of West Virginia, which was finished with zero change orders within budget and on time. Ask Dr. Mark Manchin about our work since he was Superintendent for Webster County when that project was completed. The County only had electric available so geothermal provided the best long-term solution for their HVAC system needs and may be an option to consider at ***McKeever Lodge*** since that facility is an all-electric facility. We have reviewed the original 1967 construction drawings to gain a better understanding of the existing HVAC systems. The hydronic system is a "two-pipe switchover" system with multiple chillers and electric boilers that tie into a dual temperature supply and return water piping system. Our understanding is the hydronic system is beyond repair and at one point leaks on the electric switchgear below caused major damage. NFPA/NEC does not permit water lines

to route over electric switchgear, panelboards nor transformers so piping needs rerouted to bring it into compliance with current codes. We have provided evaluation services for all of the DHHR State Hospital facilities to help them prioritize their needs for a long-term plan and have helped them implement some of our recommendations. Please contact Greg Nicholson, COO at (304) 558-3217 about the care we took in the evaluation and how it has helped them in their overall planning. HVAC was a driving force behind their initial evaluation and some of their priority construction projects.

Goal/Objectives #2 and #3: Provide all necessary services to design the approved solutions in accordance with DNR's needs, objectives, current code and budget and provide Construction Administration Services.

ZDS has an excellent track record of completing projects on time and in budget. The renovation projects at Marshall University were under budget and finished ahead of schedule. Ask Tony Crislip about the Harris Hall HVAC Renovations project where he said "*Harris Hall Renovations should serve as the pilot for how projects should be done and it's the most comfortable building on campus!*" Our recent renovation projects for the WVDHHR involving ARRA funding were finished within budget and on time while providing long-term value to DHHR through the energy saving the improvements produced. Our many projects involving the School Building Authority and the West Virginia Department of Education have proven we are the best at providing excellent evaluation of your existing facilities to help guide the process to the best end result even if that means a project needs to be phased due to funding limitations. Most of our work has been renovations so we understand what to look for in our evaluation of the existing facility.

We also have ***3D laser scanning technology*** to be able to verify existing building conditions in 3D within 2 mm accuracy which can also be uploaded to our Webshare for viewing existing conditions over the web while verifying measurement. This technology minimizes surprises during the construction process.

Ted Zachwieja, Principal-in-charge of Construction Administration, knows the history on the construction of this project when the original designers were fired and he, while employed at ZMM, was asked to assist in picking up the left-over pieces and help in the construction administration trying to make the best out of a very difficult situation with contractors from Baltimore who were trying to take advantage of the State. We expect his background knowledge of the original construction and our skills to assess the existing facility needs will prove invaluable to the success of the renovation process.

We can help prioritize improvements and provide advantages and disadvantages of performing the work to help DNR make the most informed decisions not just for today but for the life of the building. Our long-term focus has been praised by our clients as invaluable. We help them understand the benefits of incrementally spending more now have over the life of the systems and building instead of being first cost-oriented.

We have staff ready and willing to start on your project when you are ready. Please see our Team Organizational Chart following this page for information on how we are structured. **ZDS** has NEVER had an E&O claim and pride ourselves on meeting our clients' needs. We see our projects through and, if an issue arises, resolve it in the best way possible. We believe that our specialties provide DNR's proposed renovations to ***McKeever Lodge*** with the best expertise to provide economical solutions for your specific project's needs. We look forward to discussing our qualifications and your project. If there are any questions, please do not hesitate to call.

Sincerely,

Todd A. Zachwieja

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

Project Team

ZDS

DNR - Pipestem Resort State Park
McKeever Lodge HVAC

Todd Zachwieja, PE, CEM, LEED AP
ZDS Principal-in-charge, CEO
Design

Ted T. Zachwieja
ZDS Principal-in-charge
Construction Administration

Architecture/Interior Design
Chapman Technical Group

Joseph E. Bird, ASLA,
Project Officer – Senior VP

Tom Cloer, AIA, NCARB
Project Architect
Architecture

Roger J. Kennedy, ASLA
Landscape Architect/Project Mgr.

Steve Johnson, PE
Civil/Environmental Engineering

Structural Design
CAS Structural Engineering

Carol A. Stevens, PE
Structural Engineer

CAS Structural Engineering, Inc.

Mechanical/Electrical Design
ZDS Design/Consulting

Jennings Davis, PE
Associate MEP Engineering

James Lowry, PE
Mechanical Engineering

Jim Watters
Associate-Production Mgr.

Ted A Zachwieja III, EI
BIM Mgr./3D Digital Imaging

State of West Virginia
Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

Solicitation

NUMBER	PAGE
DNR213077	1

ADDRESS CORRESPONDENCE TO ATTENTION OF:
GUY NISBET
304-558-8802

VENDOR
RFQ COPY
TYPE NAME/ADDRESS HERE

SHIP TO
DIVISION OF NATURAL RESOURCES
PARKS & RECREATION SECTION

324 4TH AVENUE
SOUTH CHARLESTON, WV
25303-1228 304-558-3397

DATE PRINTED: 02/22/2013
BID OPENING DATE: 04/09/2013 BID OPENING TIME 1:30PM

LINE	QUANTITY	UOP	CAT. NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
0001	1	LS		906-29		

MCKEEVER LODGE HVAC PIPING

EXPRESSION OF INTEREST
(EOI)

THE WEST VIRGINIA PURCHASING DIVISION, FOR THE AGENCY, THE WEST VIRGINIA DIVISION OF NATURAL RESOURCES, PARKS AND RECREATION DIVISION, IS SOLICITING EXPRESSION OF INTEREST FOR THE PROFESSIONAL ENGINEERING AND INCIDENTAL ARCHITECTURAL SERVICES FOR THE DESIGN AND CONSTRUCTION OF REPLACEMENT HEATING AND COOLING FLUID PIPING AND RELATED MECHANICAL AND OTHER IMPROVEMENTS AT THE MC KEEVER LODGE LOCATED AT PIPESTEM RESORT STATE PARK, PER THE FOLLOWING BID REQUIREMENTS AND THE ATTACHED SPECIFICATIONS.

****** THIS IS THE END OF RFQ DNR213077 ****** TOTAL:

SIGNATURE	TELEPHONE	DATE
Jack R. Jackwise	(304) 755-0075	4-5-13
TITLE: Principal / CEO	FEIN: 55-0735995	ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO SOLICITATION, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

EXPRESSION OF INTEREST

Pipestem Resort State Park
McKeever Lodge Heating and Cooling Piping Replacement

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2. Section One: General Information
3. Section Two: Instructions to Vendors Submitting Bids
4. Section Three: Project Specifications
5. Section Four: Vendor Proposal, Evaluation, and Award
6. Section Five: Terms and Conditions
7. Certification and Signature Page

SECTION ONE: GENERAL INFORMATION

1. PURPOSE: The Acquisition and Contract Administration Section of the Purchasing Division ("Purchasing Division") is soliciting Expression(s) of Interest ("EOI" or "Bids") for West Virginia Division of Natural Resources, State Park Section ("Agency"), from qualified firms to provide architectural/engineering services ("Vendors") as defined herein.

2. PROJECT: The mission or purpose of the project for which bids are being solicited is to provide necessary Engineering and incidental Architectural Services for the Design and Construction of replacement heating and cooling fluid piping and related mechanical and other improvements at the McKeever Lodge located at Pipestem Resort State Park ("Project").

3. SCHEDULE OF EVENTS:

Release of the EOI.....	March 01, 2013
Firm's Written Questions Submission Deadline.	March 15, 2013 / 1:00PM. EST.
Addendum Issued	TBD
Expressions of Interest Opening Date.....	April 09, 2013
Estimated Date for Interviews (wk. of?).....	TBD

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)

(Authorized Signature)

PRINCIPAL, CEO
(Representative Name, Title)

304-755-0075 , 304-755-0076
(Phone Number) (Fax Number)

4/5/2013
(Date)

ADDENDUM ACKNOWLEDGEMENT FORM

SOLICITATION NO.: DNR213077

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

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

Addendum Numbers Received:
(Check the box next to each addendum received)

[X]	Addendum No. 1	[ ]	Addendum No. 6
[ ]	Addendum No. 2	[ ]	Addendum No. 7
[ ]	Addendum No. 3	[ ]	Addendum No. 8
[ ]	Addendum No. 4	[ ]	Addendum No. 9
[ ]	Addendum No. 5	[ ]	Addendum No. 10

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

ZDS DESIGN/CONSULTING SERVICES
Company

Todd R. Zahnow
Authorized Signature

4/5/2013
Date

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

RFQ No. DNR 213077

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: Jodal Q Johnson Date: 4/5/2013

State of West Virginia

County of Putnam, to-wit:

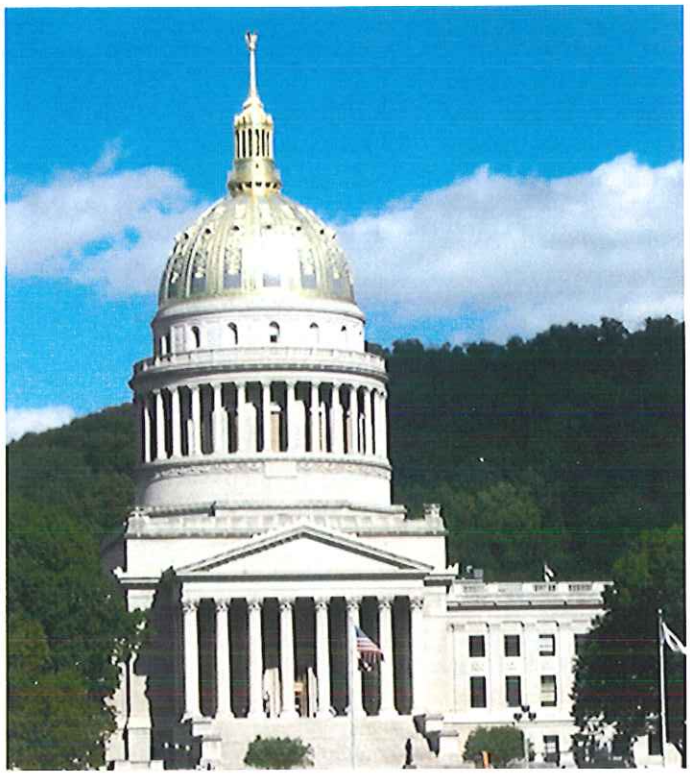
Taken, subscribed, and sworn to before me this 5 day of April, 2013.

My Commission expires Nov. 1, 2014.

AFFIX SEAL HERE

NOTARY PUBLIC Patricia Hart

OFFICIAL SEAL
Notary Public, State Of West Virginia
PATRICIA HART
105 Mesa Drive
St. Albans, WV 25177
My Commission Expires Nov. 1, 2014



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** has four principals with over 100 years of technical expertise:

Todd A. Zachwieja, PE, C.E.M., LEED AP, Chief Executive Officer, brings with him over 38 years in the design and consulting business.

Ted T. Zachwieja, Principal over Construction Administration services, has over 55 years experience in the design and consulting business. He was owner of Ted T. Zachwieja & Company from 1962 to 1982.

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, Chief Financial Officer, MFA, was cofounder of ZECO Consultants and brings over 30 years experience in operating a business.

SERVICES

MECHANICAL	ENERGY	INDOOR AIR QUALITY
ELECTRICAL	BIM	3D LASER SCANNING
PLUMBING	COMMISSIONING	EXPERT WITNESS

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
ASHRAE 90.1 Compliance
Commissioning
Master Planning

ELECTRICAL DESIGN

Power Distribution
Interior Lighting
Exterior Lighting
Emergency Power
Communications
Technology
Fire Alarm
Security
Life Safety
ASHRAE 90.1 Compliance
Commissioning
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, budget supervisor, 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 Limited Liability Company dba ZDS Design/Consulting Services

LOCATION OF INCORPORATION

West Virginia

PRINCIPAL OFFICERS

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

Ted T. Zachwieja, Principal

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:

- 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, released in January 1993.
- 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:

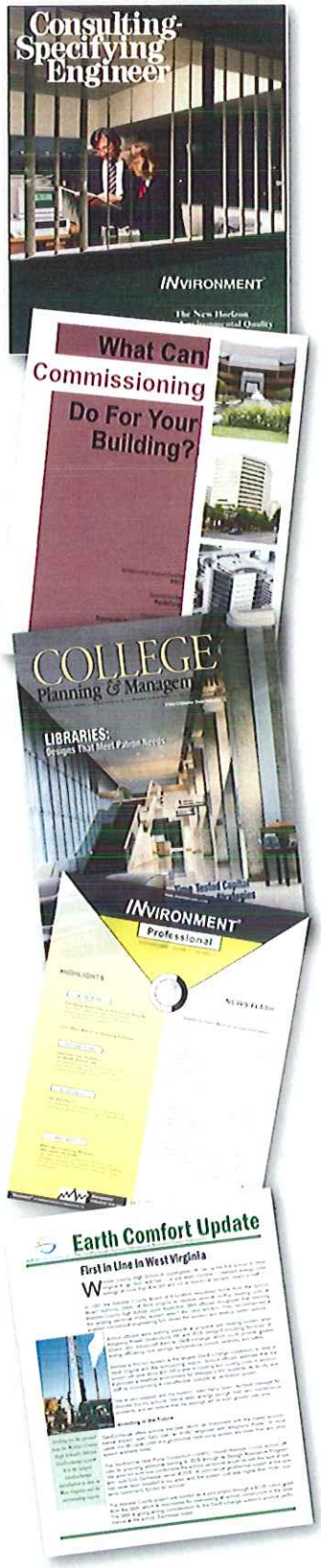
- Resolve the building's "sick building syndrome" complaints.
- Identify solutions to extensive biological contamination building-related illnesses in renovated office buildings.
- Develop solutions for HVAC systems, temperature controls, equipment, operating and maintenance practices causing IAQ problems 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** provides sophisticated technical expertise that enables our Client to be proactive in solving and preventing indoor environmental problems.


ASHRAE Insights

Three Generations of Service to ASHRAE

Ted T. Zachwieja, Principal-in-Charge Of Construction Administration



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, including upgrades to variable speed operation.
- Installing Direct Digital Control (DDC) Energy Management Systems.
- Replacing inefficient lighting equipment with energy efficient systems.
- 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.

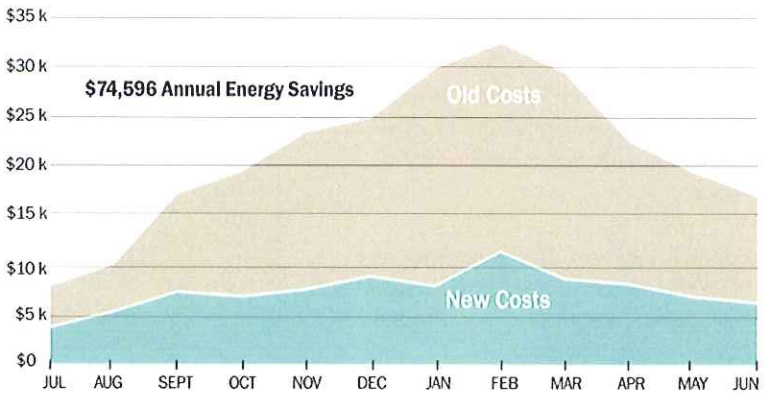
In addition to the energy management projects outlined above, the **ZDS** team members have extensive experience in identifying and implementing energy efficient operating and maintenance measures. These are typically low cost or no cost measures that include:

- 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.

ENERGY STAR 2013

Webster County Schools received Energy Star certification in 2013 as one of nation's top 25% of energy efficient schools.

Chart Below: ZDS designed and implemented the region's first and largest commercial geothermal system saving Webster County High School over $74,596 in energy savings.



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 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 Accredited Professional. Many utility companies and building owners now require commissioning for new or renovated facilities in order to maximize the use of their investments in their facilities and to obtain LEED 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 enhanced commissioning requirements. These services include strategic planning and 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, coordination of 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.

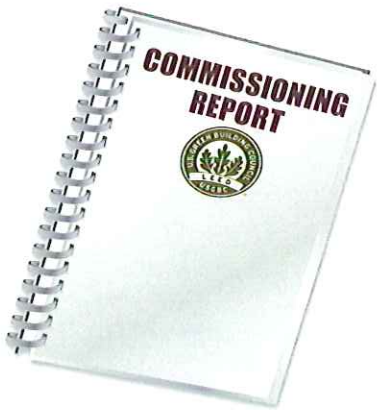
NATIONAL RECOGNITION

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.

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.

Through the efforts of our staff, working locations include:

West Virginia	Massachusetts
Arkansas	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

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, West Virginia Department of Education and the West Virginia School Building Authority.

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

Charleston National Bank

Culture & History Museum

District 2 Headquarters' Building HVAC Renovations, Huntington, WV

General Motors HVAC

Harvard University, Boston, MA

Kanawha County Commission Courthouse and Judicial Annex Renovations/Additions

Kanawha County Schools

Laidley Towers, Charleston, WV

Marshall University
Harris Hall HVAC Renovations
Smith Hall Renovations

Meadowbrook Rest Areas

Pocahontas Community Center

Putnam County Schools

Stonewall Jackson Marina

Veterans Administration

Webster County Development Authority

Webster County Schools

White Sulphur Springs Welcome Center

WV Air National Guard

WV Army National Guard

WV Dept. of Education

WV Division of Energy

WV Dept. of Transportation

WV Division of Health & Human Resources – State-Wide

WV Division of Culture and History HVAC, Lighting, Fire Alarm and Fire Protection Renovations

WV Division of Protective Services

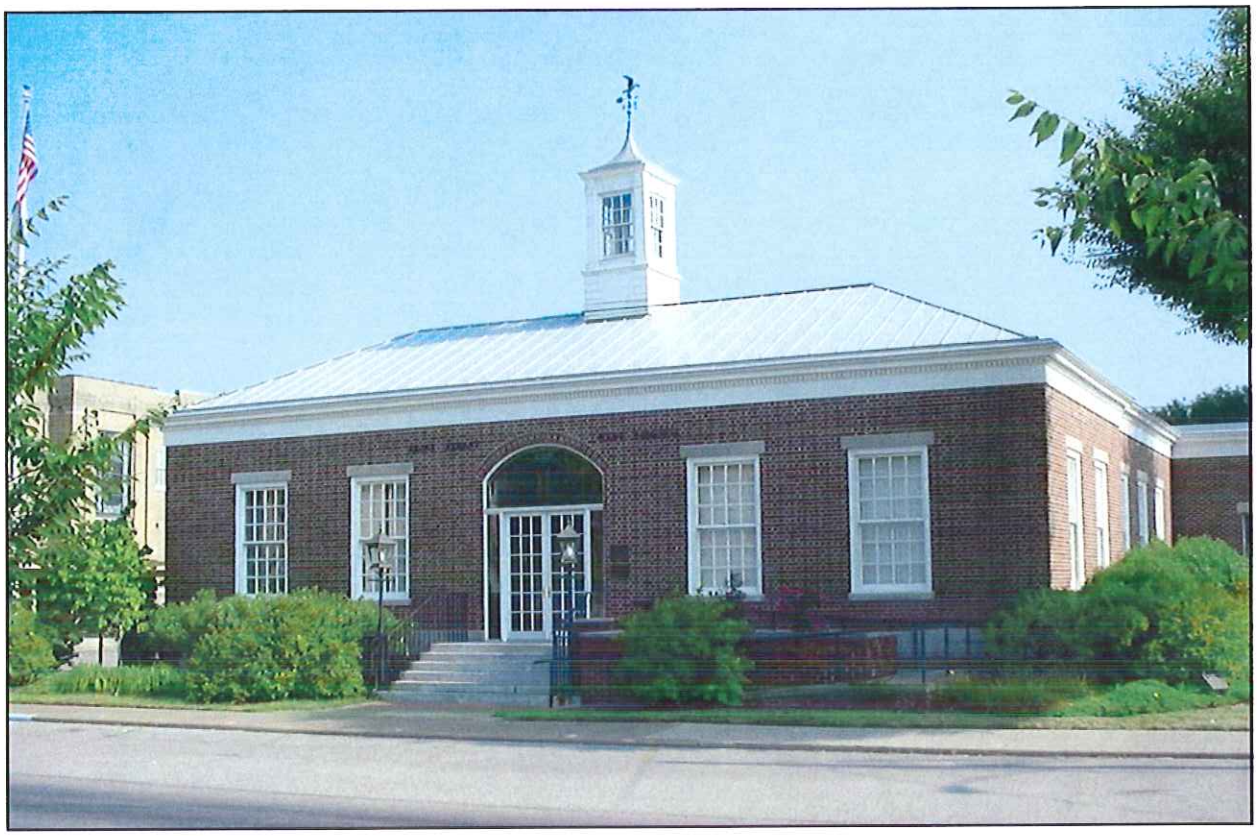
WV General Services Administration – Capitol Complex HVAC Renovations

WV Higher Education Policy Commission

WV Parkways Authority HVAC Renovations

West Virginia University

Company Overview



Chapman Technical Group's St. Albans Office

Chapman Technical Group is a full-service consulting firm with offices in St. Albans, Buckhannon, and Martinsburg, West Virginia offering an extensive range of professional architectural, engineering, interior design and landscape architectural services. Established in 1984, Chapman Technical Group has steadily grown to a diverse firm of professionals, many of whom were educated in West Virginia colleges and universities. We have achieved an outstanding reputation for providing high-quality design projects, while meeting client schedules and budgets and have received numerous awards for our work.

Our facilities are both state-of-the-art and architecturally significant. Our St. Albans office is a former post office and is now on the National Register of Historic Places.

Chapman Technical Group offers a broad range of professional services.

- Airport Design
- Architecture
- Civil Engineering
- Fire Pumping & Protection
- Interior Design
- Landscape Architecture
- Recreational Facilities
- Roads, Highways, & Bridges
- Site Development
- Space Planning
- Surveying
- Water & Wastewater Systems

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.

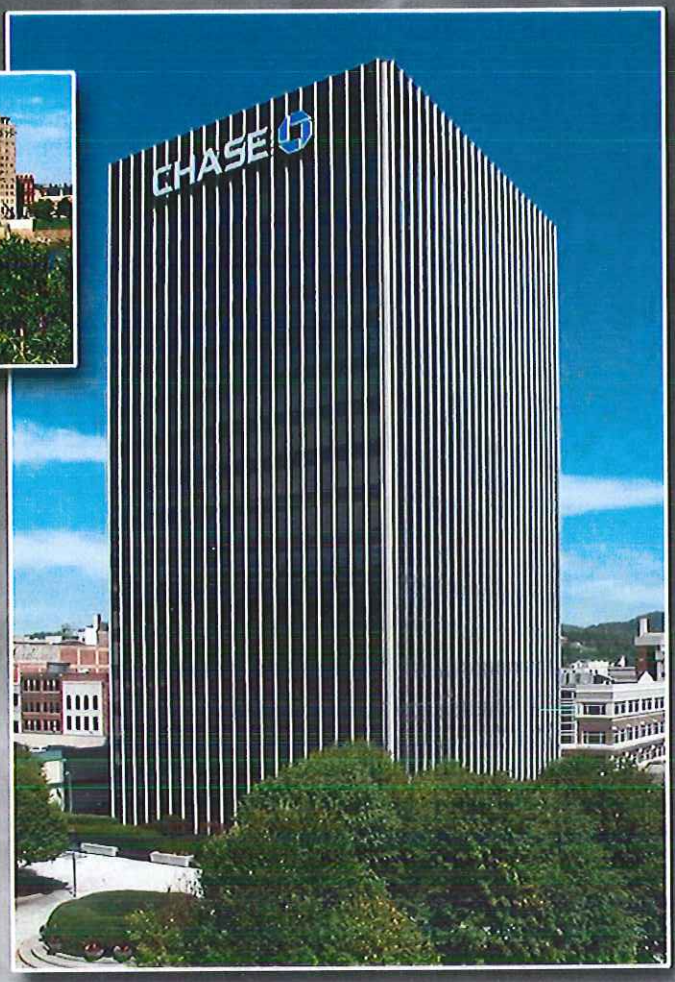
P.O. Box 469 Alum Creek, WV 25003-0469 (304) 756-2564 (voice) (304) 756-2565 (fax)
A West Virginia Certified DBE Consultant
Certified in the Practice of Structural Engineering

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.

ZDS

Design/Consulting Services

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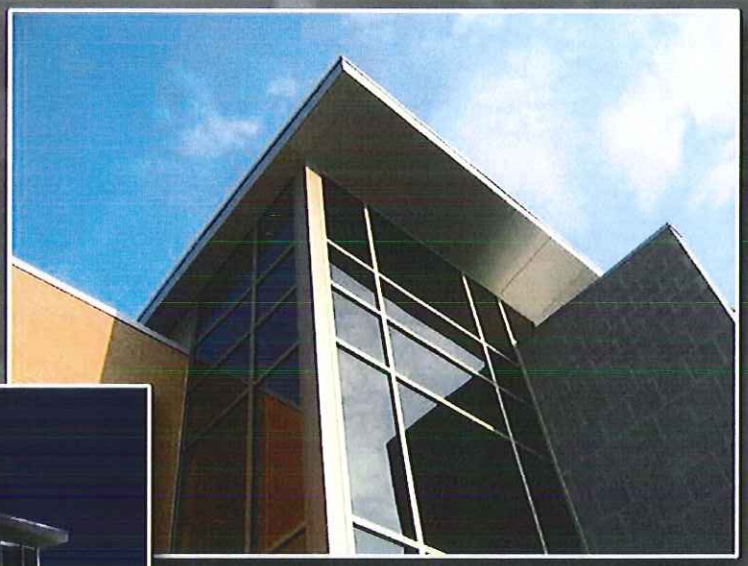
West Union Bank

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.

ZDS
Design/Consulting Services

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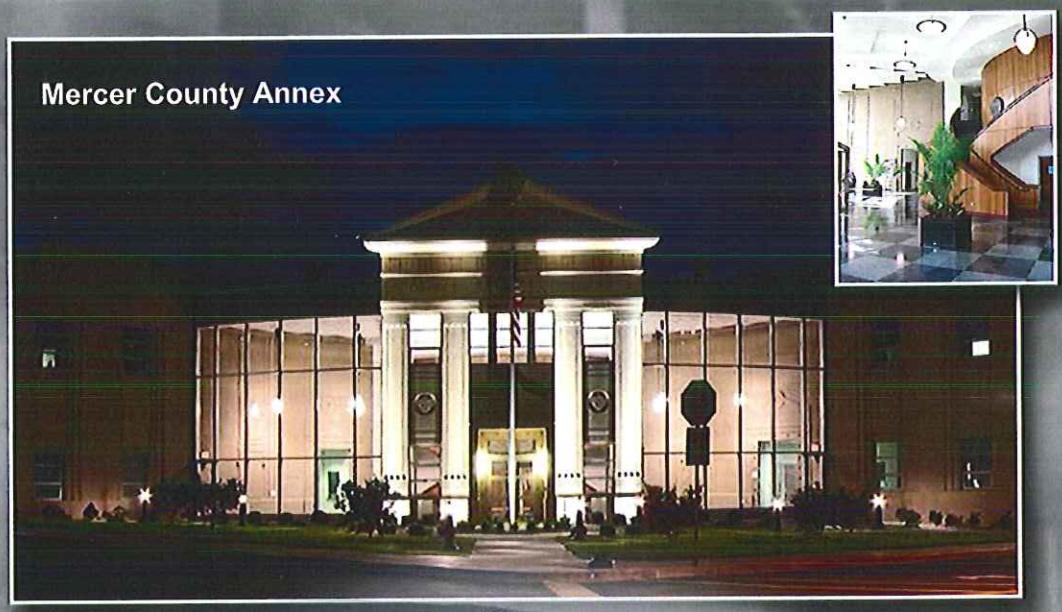
ZDS provided engineering planning, design, bidding and construction administration services for HVAC, Electrical, Plumbing and Fire Protection.

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



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.

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AWARD
AIA

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.

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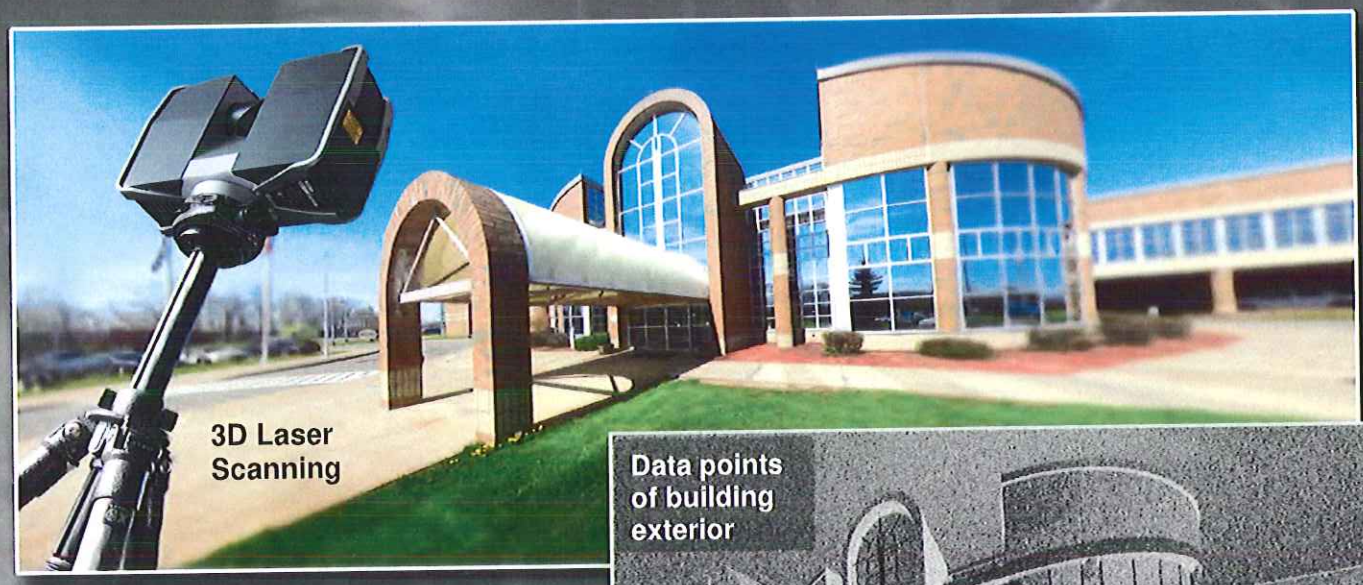
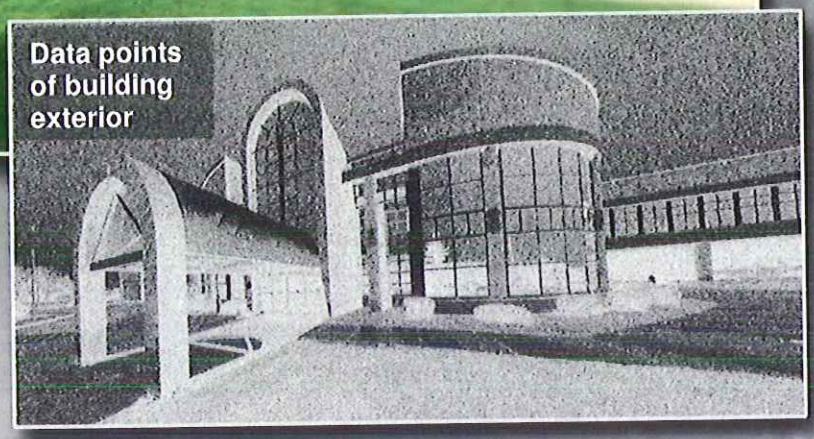
3D Digital Imaging for Facilities

Our 3D Laser Scanning Services helped William R. Sharpe, Jr. Hospital document existing conditions and integrate their 50-bed renovation.





Why 3D Laser Scanning is better:

3D laser scans reveal significant differences between existing conditions and the original drawings.

3D laser scans also provide superior details by capturing data that is more comprehensive and precise than conventional methods.

"With the 3D laser scanning service, ZDS saved us countless hours communicating to all project team members, even to those who work or live far away.

Also, we now have an accurate record of the existing conditions that DHHR can easily access now and into the future."

Greg Nicholson, DHHR Chief Operations Officer

Web Share:

3D laser Scanning allows facility owners to view and measure areas with others on their planning and construction team.

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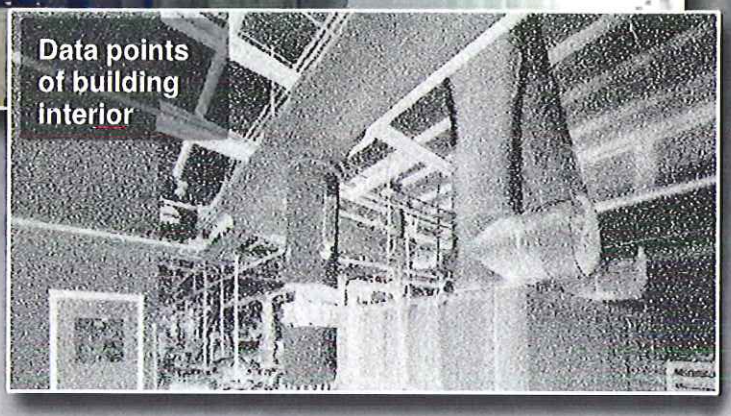
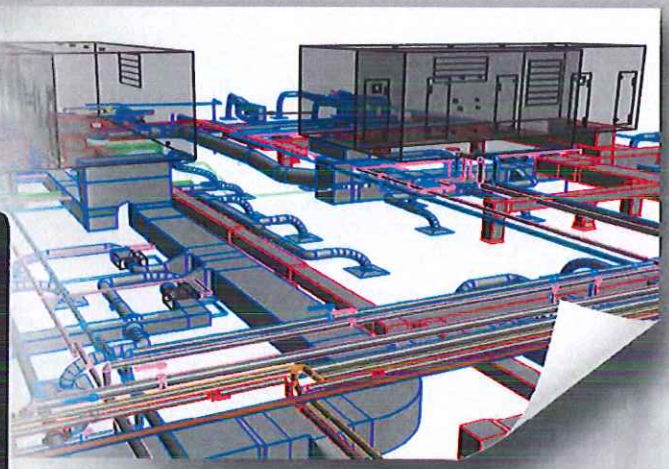
"The 3D laser imaging improves quality, saves time and money while providing a valuable resource now and into the future."
DHHR



"The 3D laser scans safely document hard-to-reach interior areas — this greatly reduces our risk for liability.

Also, the excellent details of the laser scans convert to accurate construction drawings, both architectural and engineering."

Ron Adkins, DHHR Director of Construction & Project Management



3D Engineering Drawing: Sample of 3D mechanical drawing converted from 3D laser scan data points.

Web Share: Helps construction team members integrate existing conditions into BIM models.

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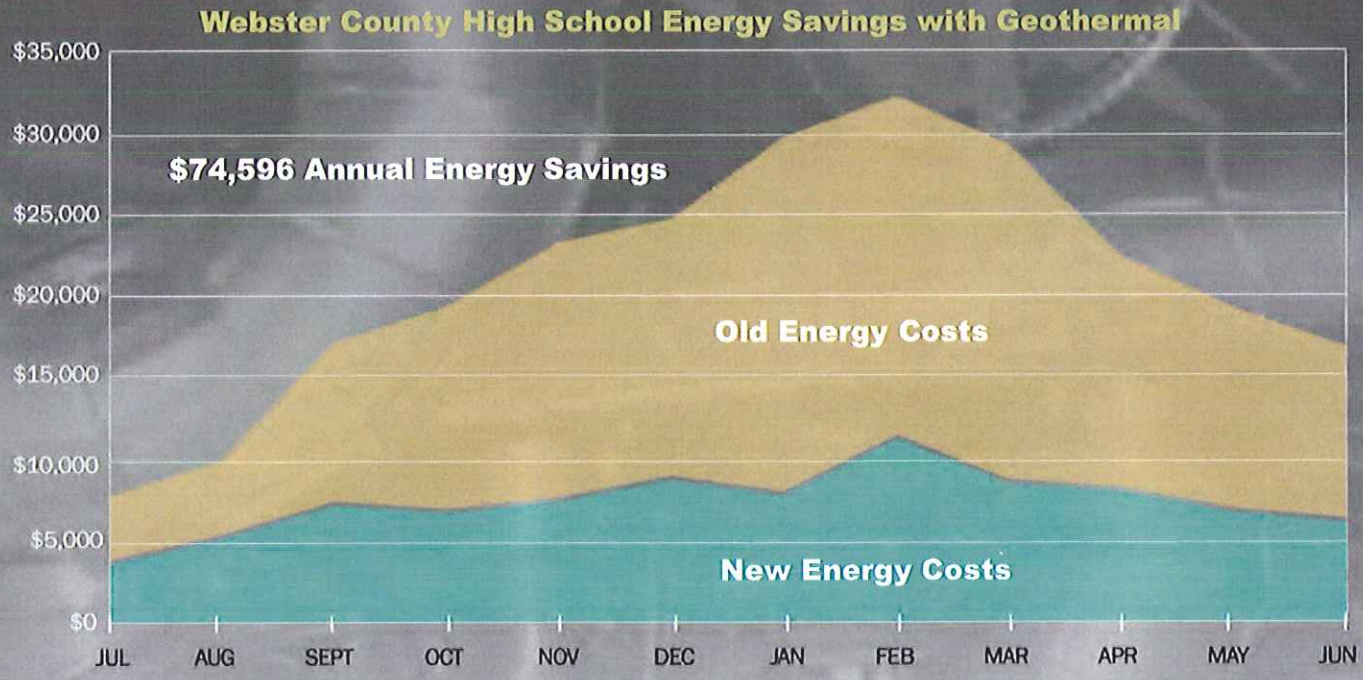
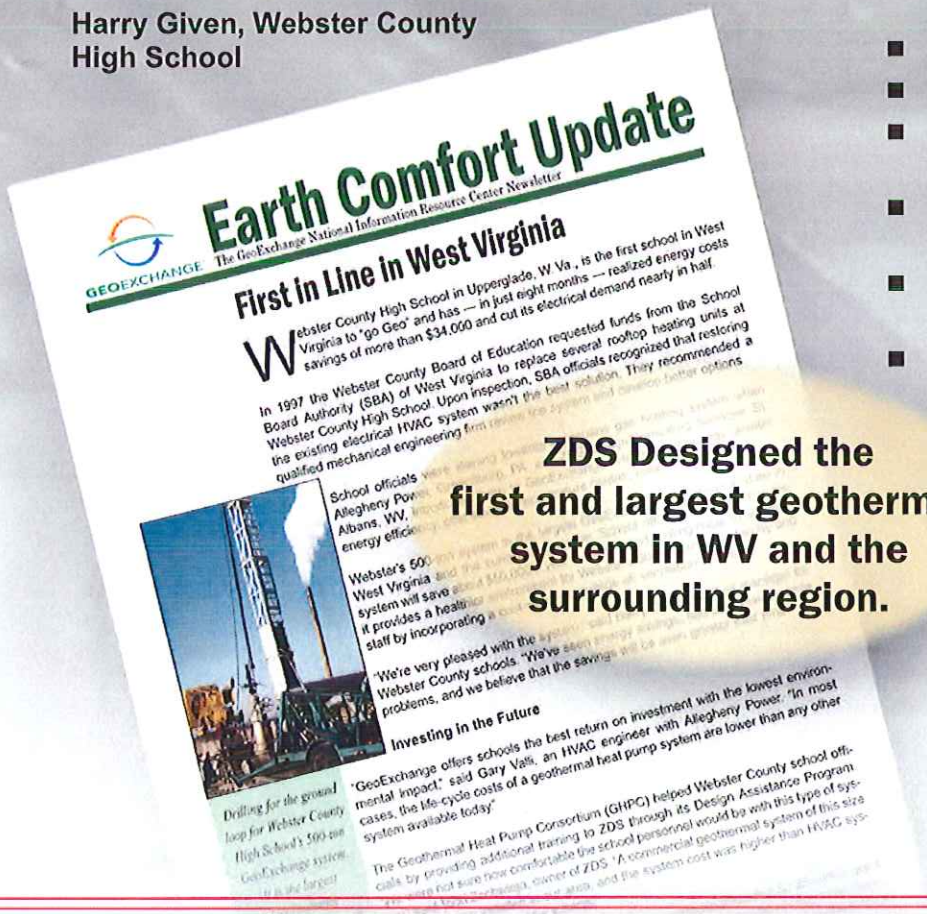
Geothermal Energy Engineering



"We're very pleased with the system. We've seen energy savings and had zero maintenance problems."

Harry Given, Webster County High School



GEOEXCHANGE The GeoExchange National Information Resource Center Newsletter

Earth Comfort Update

First in Line in West Virginia

Webster County High School in Upperglade, W Va., is the first school in West Virginia to "go Geo" and has — in just eight months — realized energy costs savings of more than $34,000 and cut its electrical demand nearly in half.

In 1997 the Webster County Board of Education requested funds from the School Board Authority (SBA) of West Virginia to replace several rooftop heating units at Webster County High School. Upon inspection, SBA officials recognized that restoring the existing electrical HVAC system wasn't the best solution. They recommended a qualified mechanical engineering firm

School officials
Allegheny Pow
Albans, WV,
energy effici

Webster's 50
West Virginia
system will save
it provides a healt
staff by incorporating

"We're very pleased with the
Webster County schools. "We've
problems, and we believe that the saving

Investing in the Future

"GeoExchange offers schools the best return on investment with the lowest environmental impact," said Gary Valls, an HVAC engineer with Allegheny Power. "In most cases, the life-cycle costs of a geothermal heat pump system are lower than any other system available today."

The Geothermal Heat Pump Consortium (GHPC) helped Webster County school officials by providing additional training to ZDS through its Design Assistance Program. "I was not sure how comfortable the school personnel would be with this type of system," said Gary Hollandsworth, owner of ZDS. "A commercial geothermal system of this size

Drilling for the ground loop for Webster County High School's 500-ton GeoExchange system is the largest

ZDS Designed the first and largest geothermal system in WV and the surrounding region.

Why Choose Geothermal?

- Save 30-70% on heating and cooling costs compared to conventional HVAC
- Excellent return on investment
- Pays for itself in less than 10 years
- Superior temperature and humidity control
- Quiet operation - No exposed, noisy outdoor equipment
- Adaptable to various building types for more efficient heating and cooling
- "Green" method may qualify for grants and energy tax credits

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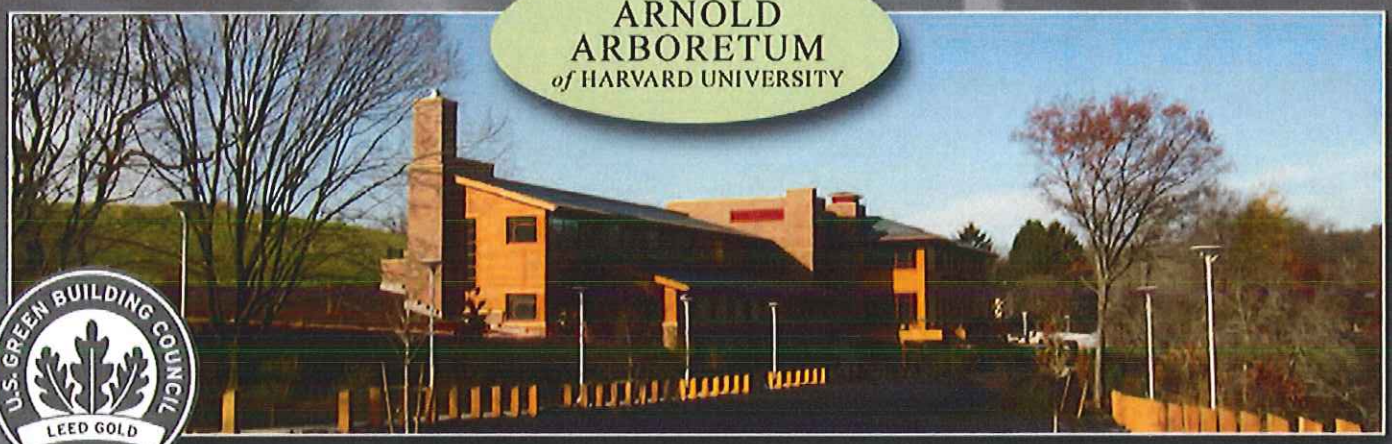
The ARNOLD ARBORETUM of HARVARD UNIVERSITY



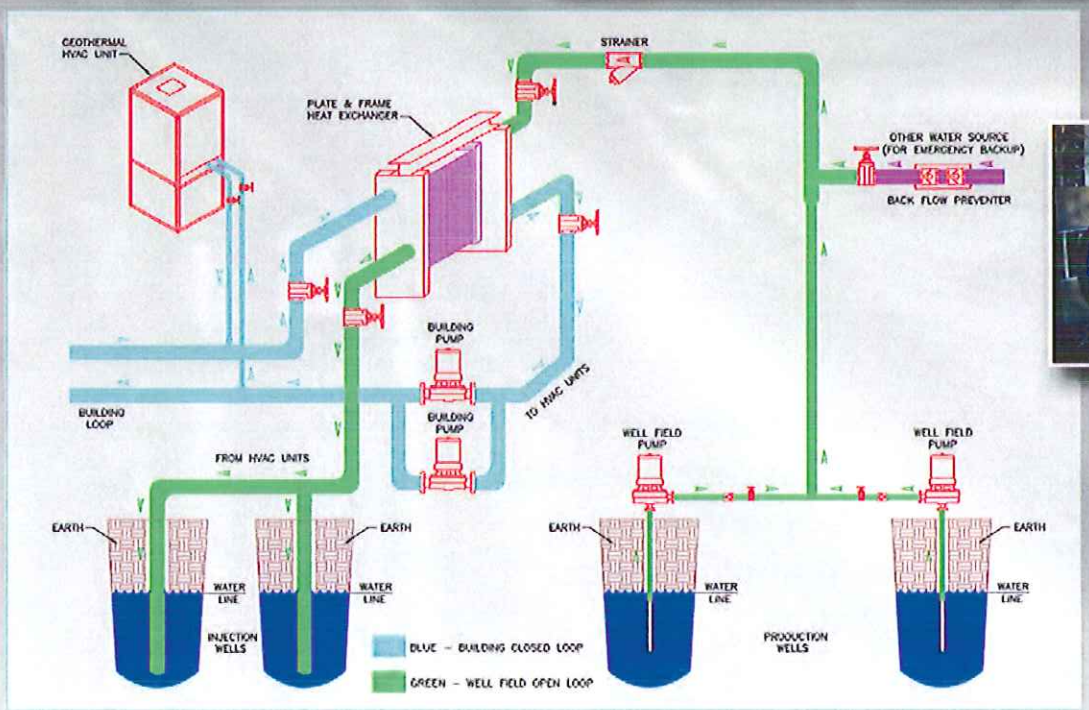
U.S. GREEN BUILDING COUNCIL LEED GOLD USGBC

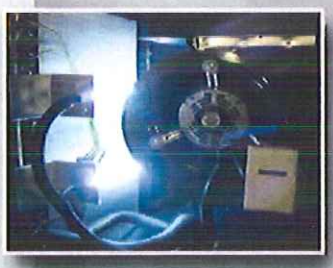
Harvard University Arnold Arboretum Weld Hill Research Facility
LEED Gold Certified

Pocahontas County High and Vocational Technical Center Geothermal HVAC Systems

IMC Operations Data Center

An AIA Award Winning Facility with Sustainable Features





Innovative use of ultraviolet light to purify air before venting it into the building rooms

Geothermal Open Loop System designed and implemented by ZDS for Webster Springs Elementary School.

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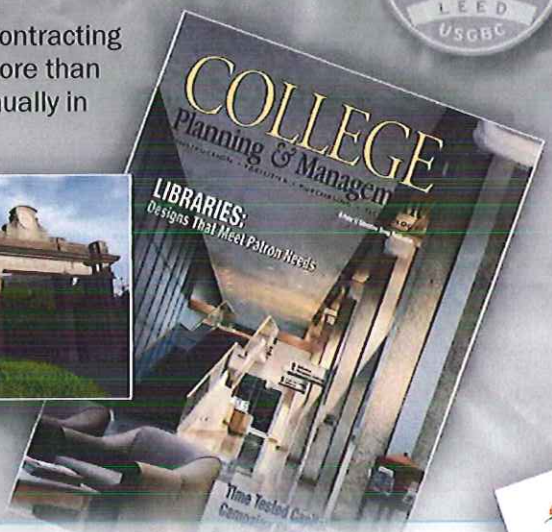
Nationally Recognized for Engineering Excellence

Energy Management Engineering

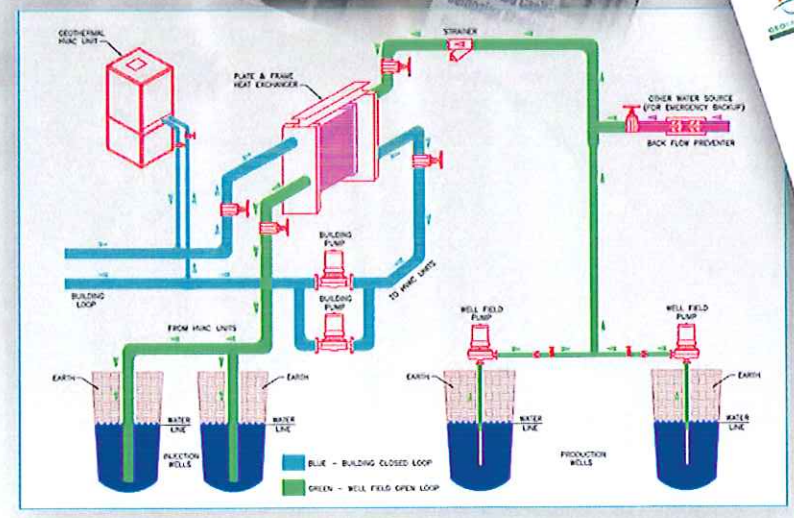
Ohio University—Athens

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



Webster Springs Geothermal System Designed by ZDS

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

ENERGY STAR 2013

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Below: East Wing

West Wing

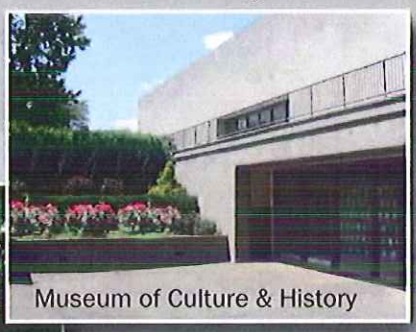
West Virginia Capitol Complex

LEED Certified Candidate

An integration of nine buildings involving over 1.9 million square feet of building space.

The initial year savings of $1,079,296 paid for the $10,108,102 investment cost over time.

Project savings include a new central heating plant serving nine buildings while eliminating old inefficient boilers and heating sytems.



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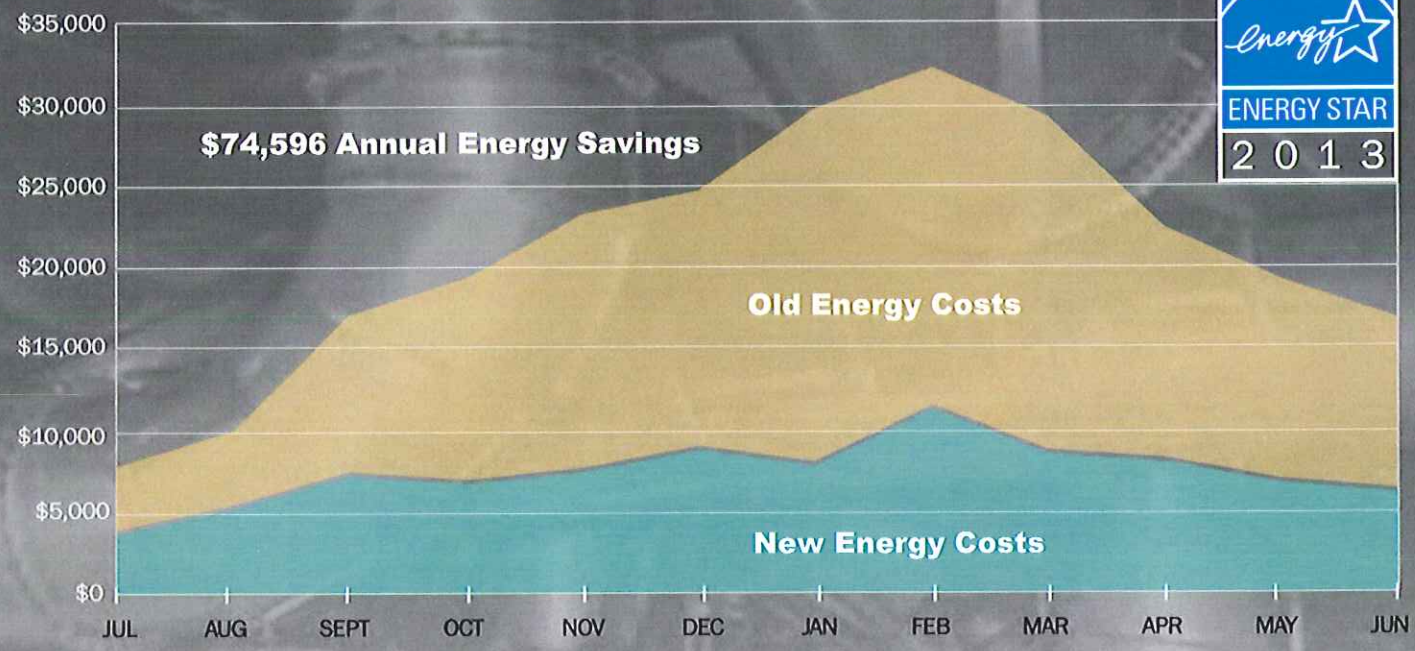
ZDS Geothermal Energy Engineering Savings



ENERGY STAR 2013

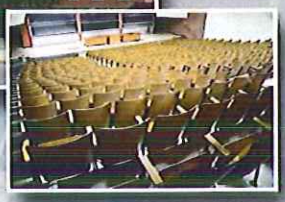
"We're very pleased with the system.
We've seen energy savings and have had zero maintenance problems."
Webster County Schools

OHIO UNIVERSITY 1804

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

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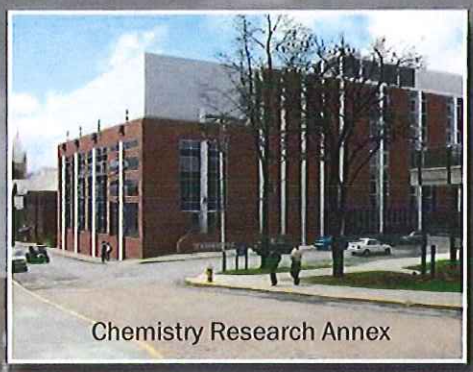
West Virginia University

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

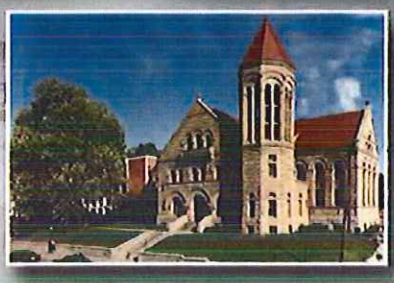
Renovations result in a $300,000 to $400,000 in annual savings in energy and related costs.

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

ZDS

Design/Consulting Services

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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 renovation work including Engineering Master Planning, energy analysis, Mechanical, Electrical, and Fire Protection design, bidding and construction administration services for retrofitting the 212,000 ft^2 Hospital. Consultant for all MEP engineering for the 32,000 ft^2 addition.

Project Description

William R. Sharpe Hospital, 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 MEP 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 the hospital. Provisions were also made for a temporary boiler and extension of piping for future renovations to the building including planning for a 32,000 ft^2 addition. This allowed for chilled water to continue to be served from the central plant while other renovations could be planned.

ZDS 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.

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 includes 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 are being replaced. All lighting will be upgraded to today's energy efficient technology including extensive use of LED lighting and lighting controls.

ZDS is a consultant for the 32,000 ft^2 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 comprehensive renovations work that is currently on-going. The renovation work will be effectively phased with the building remaining occupied throughout the renovations.

"ZDS are great planners and designers! They help us make the best decisions for the long term. We would recommend them to anyone!"

Greg Nicholson, Chief Operations Officer – DHHR.

Phase I HVAC Project Cost:	**$1,403,000**	**Completed in 2012**
ARRA Funded Lighting Upgrade Costs	**$618,700**	**Completed in 2011**
Original Hospital Size:	**212,000 FT^2**	
Comprehensive Renovation Project Cost:	**$19,000,000**	**Projected complete in 2015**
Addition to the Hospital Size:	**32,000 FT^2**	
Addition Project Cost:	**$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

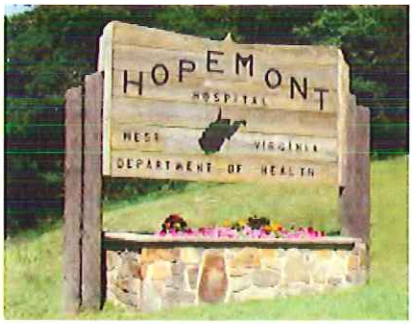
Services: Prime for all renovation work including Engineering Master Planning, energy analysis, Mechanical/Electrical design, bidding and construction administration services for retrofitting both hospitals heating systems using ARRA funds. New gas service and new central high pressure steam plant for 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 ft^2 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

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.

Jackie Withrow Heating Project Cost:	**$1,907,000**	**Completed in 2011**
Jackie Withrow Hospital Size:	**408,820 FT^2**	
Hopemont ARRA Renovation Project Cost:	**$760,000**	**Completed in 2011**
Hopemont Fire Alarm Project Cost:	**$175,000**	**Completed in 2003**
Hopemont Hospital Size:	**124,800 FT^2**	

ZDS Design/Consulting Services

Project Name: ***New Fuel Cell & Maintenance Hangars Commissioning***
Client: ***West Virginia Air National Guard***

Contact: Captain Harry Netzer, Project Mgr.
WV Air National Guard
130th Civil Engineering Squadron
Charleston, WV 26311
Harry.Netzer@ang.af.mil
(304) 341-6649

Services: HVAC/Lighting Controls/DWH commissioning services involving direct digital controls (DDC); operating and maintenance; energy recovery; VFD's; variable water volume pumping; boiler optimization; and chiller optimization.

Project Description

ZDS Design/Consulting Services worked with the West Virginia Air National Guard on the Commissioning for their new Replacement Aircraft Maintenance Hangar and Shops plus a new Fuel Cell Hangar. The first phase of the program initiated in early 2008 and continued until 2011. This facility included a larger maintenance hangar, miscellaneous maintenance shops, central boiler plant and chiller plant. The goal of the project was to achieve LEED and Air Force Silver Certification with commissioning being an integral part of that certification.

> ***"ZDS's commissioning services were invaluable in helping us understand our facility and ensure the systems were installed as intended and optimized for long-term operating benefits. We would recommend them again!"***
>
> *Captain Harry Netzer, WVANG Project Manager*

The commissioning scope met the LEED Energy and Atmosphere requirements for obtaining LEED certification. The HVAC system was comprised of a mixture of ten constant air volume and variable air volume (VAV) HVAC air handling systems plus four make-up air handling units with comprehensive DDC controls. The VAV units served about 77 VAV terminal boxes with a mixture of both heating hot water and electric reheat coils. The complex has 38 exhaust fans and 11 ceiling fans to serve the variety of spaces. Some of the specialty areas included the fuel cell hangar with a corrosion control room, welding shop, computer center, and telecom room. The commissioning process refined the proper control strategies to meet actual conditions.

The chilled water system consists of three variable speed pumps and two air-cooled chillers piped in parallel. The central heating hot water system consisted of five variable speed pumps and six condensing boilers. Commissioning of the HVAC equipment documented actual operating conditions, which allowed for the system to be fine-tuned to operate effectively and efficiently for the long term. The domestic hot water system and lighting controls were also commissioned.

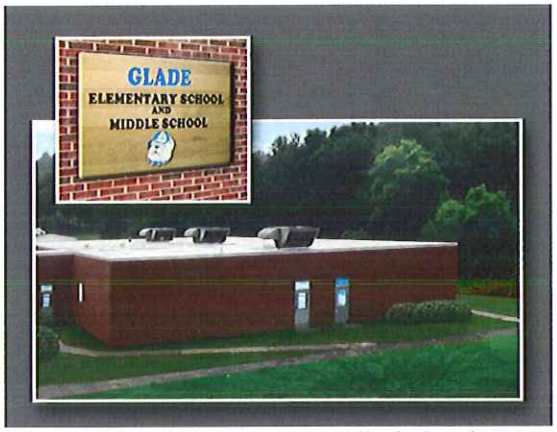
"ZDS performed a stellar job, going above and beyond what was expected. We would recommend them again!" says Mr. Tom Warner, RA, LEED AP who was the LEED Coordinator for SAIC for both phases of the project. Mr. Warner adds with reassurance, "Please ask anyone to give me a call at (651) 209-2802."

The projects involved working cooperatively with the Owner, Contractors and the Design Professional (SAIC) personnel and meeting difficult construction phasing requirements. The commissioning program's work expanded for Phase II as WVANG continued to realize the value from the commissioning program that helps them ensure the facilities operate more efficiently and effectively.

Commissioning allowed for construction issues to be identified early in the process while the contractors were still heavily involved with the project saving both the contractor and Owner from future issues. Commissioning also allowed for the Owner to gain a better understanding of how the systems are operated through extensive review of the DDC controls and communication between the contractor, Owner and design professional in a way that all could understand the issues and focus on resolving any challenges in an effective manner.

Project size	**128,715 ft^2**
Project Costs for both Phase I & II	**$43,000,000**
General Contractor	**BBL Carlton, Charleston, WV**
Design Professional	**SAIC, with LEED Coordinator from St. Paul MN**

ZDS Schools Project Experience



Glade Elementary/Middle School
Webster County, WV

Webster Springs Elementary School
Webster County, WV

Elkins Middle School
Randolph County, WV

ENERGY STAR
2013

Three ZDS projects (Glade Elementary/Middle School and Webster Springs Elementary School - Webster County, WV, and Elkins Middle School - Randolph County, WV) received Energy Star Certification in 2013, which means they rank in the nation's top 25% of energy efficiency for facilities.

ZDS

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Project Name: ***Greenbrier West High School – Renovations and Additions***

Location: ***Greenbrier County, West Virginia***

Description: Prime Consultant: Engineering Master Planning, Phasing development to match funding, energy analysis, Mechanical/Electrical design, bidding and construction administration services for retrofitting the school. School retrofitted over five phases due to funding. Project included comprehensive HVAC, electrical, lighting, fire alarm, and supporting work.

Construction Costs: $20,200,000; SBA Funds $10,600,000 for a $37.7 million bond for 5 schools

School Size: 152,000 square feet

Contact: Mr. Tim Holbrook, Clerk-of-Works (304) 546-1893

Project Name: ***New "War" Southside K-8 School***

Location: ***McDowell County, West Virginia***

Description: ZDS provided the HVAC, plumbing, fire protection and electrical engineering design for the new Southside K-8 School that was completed in 2008. The school was funded from a combination of grants from the Corp of Engineers and School Building Authority as part of an overall program to replace repeatedly flooded antiquated schools. The new school was designed to meet the requirements of both an elementary school and middle school. Superintendent Suzette Cook, Governor Joe Manchin and Dr. Mark Manchin, SBA Executive Director, previous McDowell County Schools superintendent, attended the ribbon cutting dedication ceremony celebrating the grand opening of the school which symbolized a new era for McDowell County Schools. This was the first new school built in the county in decades.

Construction Costs: $9,306,443 of which $3,750,000 were MEP costs
SBA and Corp of Engineering Funding $9,306,443

School Size: 73,050 square feet

Contact: Dr. Mark Manchin, Former Superintendent (304) 558-2541

Project Name: ***Shady Spring Junior High School***

Location: ***Raleigh County, WV***

Description: ZDS provided the HVAC, plumbing and electrical engineering design for the new Shady Spring Junior High School that was completed in 2002. The energy efficient design included Direct Digital Controls for remote monitoring and control of the facility's HVAC systems. Energy efficient lighting, motors and equipment were also incorporated into the facility's systems. Raleigh County Schools elected to be proactive in addressing Indoor Air Quality (IAQ) by incorporating many of the recommended practices even before they are required by codes. Improved filtration, ducted return air system, special consideration into the condensate removal system and providing adequate outside air were included in the HVAC systems.

Construction Costs: $9,116,384; SBA Funds $1,833,800

School Size: 77,543 square feet

Contact: Mr. Racine Thompson, Former Asst. Supt. (304) 222-3907 (c) (304) 253-6890 (h)

Project Name: ***Trap Hill Middle School***

Location: ***Raleigh County, WV***

Description: ZDS provided the HVAC, plumbing, fire protection and electrical engineering design for the new Trap Hill Middle School that was completed in 2002. The school was funded from a bond levy that passed in 1999. Raleigh County voters have been very supportive of the county school system which showed when they passed another bond levy in 2004. The energy efficient design included Direct Digital Controls for remote monitoring and control of the facility's HVAC systems. Energy efficient lighting, motors and equipment were also incorporated into the facility's systems. Raleigh County Schools elected to be proactive in addressing Indoor Air Quality (IAQ) by incorporating many of the recommended practices even before they are required by codes. Improving filtration, fully ducting the return air systems, considering the condensate removal system and providing adequate outside ventilation air were included in the HVAC systems.

Construction Costs: $9,251,899; SBA Funds $1,363,900

School Size: 60,950 square feet

Contact: Mr. Racine Thompson, Former Asst. Supt. (304) 222-3907 (c) (304) 253-6890 (h)

Project Name: ***Woodrow Wilson High School***

Location: ***Raleigh County, Beckley, WV***

Description: Prime Consultant: Engineering Master Planning, Phasing development to match funding, energy analysis, Mechanical/Electrical design, bidding and construction administration services for retrofitting the school. School retrofitted over five phases due to funding. Project included comprehensive HVAC, electrical, lighting, fire alarm, and supporting work.

Construction Costs: $12,050,000; SBA Funds $900,000

School Size: 240,000 square feet two-story campus-style high school

Contact: Mr. Racine Thompson, Former Asst. Supt. (304) 222-3907 (c) (304) 253-6890 (h)

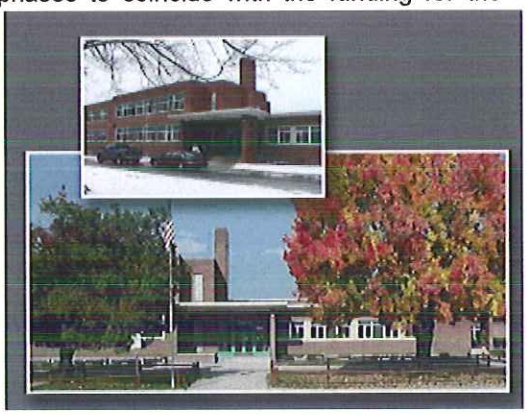
Project Name: ***Elkins Middle School – HVAC, Electrical and Plumbing Retrofits***

Location: ***Randolph County, Elkins, WV***

Description:

The engineering design and construction administration proved so successful that the Environmental Protection Agency (EPA) awarded Elkins Middle School with an Energy Star® certification in 2013, making the school one of the most energy efficient in the nation.

Prime consultant: Developed the initial plan and phasing strategy while providing HVAC, plumbing, electrical, and fire protection engineering services and related work. The project was developed into three phases to coincide with the funding for the project. The 74,500 ft^2 three-story school was originally built in 1952 with additions in the 70's, 80's and 90's. ZDS also assisted in securing the funding for the project through the School Building Authority. The project design addressed Indoor Air Quality issues and energy efficiency issues including providing comprehensive DDC controls over all the HVAC equipment and lighting controls. The plumbing systems were modernized to address current ADA issues and replace the 45 year old plumbing systems.



Construction Costs: $8,686,000

School Size: 74,500 square feet for a three-story school

Contact: Mr. Brad Smith, Dir. Finance (304) 636-9150, ext. 155 brrsmith@access.k12.wv.us

Project Name: ***Ritchie County High School/Middle School – MEP Design***

Location: ***Ritchie County, WV***

Description: ZDS was contacted to help define the issues and solutions required to eliminate sewer gas that was coming into the school from a corroded and cracked plumbing vent pipe. The extent of damaged piping was defined, renovations to the HVAC system determined and renovations work was designed, bid and constructed **without losing any school days**. Comfort was improved by replacing aging energy recovery rooftop units with energy efficient units. The HVAC system controls were upgraded to a fully automated central Direct Digital Control (DDC) system which aided in monitoring the building ventilation systems and for energy efficiency. The project was expedited with construction starting within a month of receiving funding.

Construction Costs: $1,848,353; SBA Funds $1,648,353

School Size: 180,480 square feet

Contact: Mr. David Weekly, Dir. Student Support Services (304) 643-2991, ext. 223

Project Name: ***Davis Thomas Elementary/Middle School***

Location: ***Tucker County, WV***

Description: ZDS converted the existing all electric heating system to natural gas heating hot water system. Two new boilers were designed and installed in a new mechanical equipment room. The existing unit ventilators were replaced with ceiling suspended blower coil air handling units with new wall mounted outside air intakes. Later, a new air cooled chiller and full building DDC controls were designed and installed. Filtration was upgraded to meet current standards for schools in HVAC equipment and improve Indoor Air Quality. The kitchen hoods and HVAC were upgraded to the new energy efficient hoods while providing HVAC to keep the kitchen comfortable. Converting from all electric to natural gas heat provided for a lower operating, longer-lasting heating system.

Construction Costs: $2,600,000; SBA Funds $2,540,000

School Size:

Contact: Dr. Edward Campbell, Jr., Superintendent (304) 478-2771

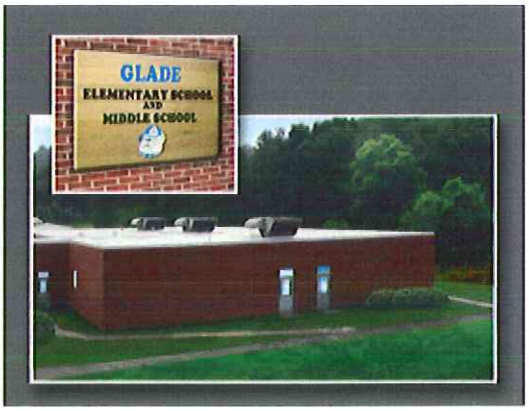
ENERGY STAR 2013

Project Name: ***Glade Elementary/Middle School - HVAC and Electrical Retrofits***

Location: ***Webster County, Glade, WV***

Description:

The engineering design and construction administration proved so successful that the Environmental Protection Agency (EPA) awarded Glade Elementary/Middle School with an Energy Star® certification in 2013, making the school one of the most energy efficient in the nation.



ZDS designed the new HVAC system for the school to meet current ASHRAE 62 and West Virginia Department of Education, Policy 6200 requirements. The HVAC system was through packaged roof mounted VAV air handling units. ZDS designed comprehensive DDC controls with remote monitoring, humidity and CO_2 controls including DDC centralized monitoring. With the aid of ZDS' planning, Webster County Schools was able to phase the project allowing the major construction efforts to continue **without** loss of any school days.

Construction Costs: $3,667,620

School Size: 68,000 square feet

Contact: Arthur J. (A.J.) Rogers, Jr., Former Superintendent; Current RESA 4 Executive Director, Summersville, WV (800) 251-7372, ext. 34 arogers@access.k12.wv.us

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Project Name: ***Webster County High School - Renovations***

Location: ***Webster County, WV***

Description: Webster County High School used a 500 ton geothermal heat pump loop consisting of 240 wells; 307 foot deep, with over 28 miles of underground piping spread in an adjacent practice football field. The HVAC system is fully automated through a central Direct Digital Control (DDC) system. Indoor air Quality (IAQ) issues are addressed through increased ventilation, improved filtration, customizing the design of the AHU's to address current IAQ practices, and cleaning/coating existing ductwork. **It is the largest GeoExchange installation to date in West Virginia and the surrounding region.**

Construction Costs: $5,083,000; SBA Funds $5,083,000; 50% reduction in HVAC and lighting operating costs

School Size:

Contact: Arthur J. (A.J.) Rogers, Jr., Former Superintendent; Current RESA 4 Executive Director, Summersville, WV (800) 251-7372, ext. 34 arogers@access.k12.wv.us

Harry Given, Retired Dir. of Maintenance, Webster County Schools (304) 226-5288

Project Name: *Webster Springs Elementary School – HVAC Renovations*

Location: *Webster County, WV*

ENERGY STAR 2013

Description:

The engineering design and construction administration proved so successful that the Environmental Protection Agency (EPA) awarded Webster Springs Elementary School with an Energy Star® certification in 2013, making the school one of the most energy efficient in the nation.

ZDS designed and installed a system that integrated both a closed-loop and open-loop geothermal system. This was the first system of its type installed, according to the State Department. ZDS helped establish a procedure to minimize the risk of cross contamination with the aquifers as part of this project and also improved the Indoor Air Quality through increased ventilation, improved filtration and the use of ultraviolet lights that reduce the risk of mold growth and airborne germs. ZDS also helped Webster County Schools to obtain funding for the project from the State's School Building Authority (SBA).

Construction Costs: $1,430,000; SBA Funds $1,300,000; 40% reduction in HVAC energy usage

School Size:

Contact: Arthur J. (A.J.) Rogers, Jr., Former Superintendent; Current RESA 4 Executive Director, Summersville, WV (800) 251-7372, ext. 34 arogers@access.k12.wv.us

ZDS Universities Project Experience

Marshall University
Huntington, WV

Ohio University - Bennett Hall
Chillicothe, OH

West Virginia University
Morgantown, WV

ZDS

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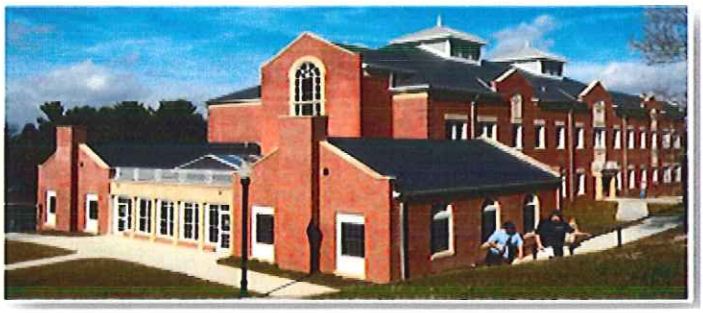
Project Name: ***Nick J. Rahall II Technology Center***

Location: ***Concord University, Athens, WV***

Description: Converted old White Hall into a new technology center involving 50,000 ft^2. 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, and information technology. Extended the campus medium voltage service to complete the campus loop.



Construction Costs: $3,675,000 out of a $10,300,000 total cost for approximately 50,000 ft^2 completed in 2008

Prime Contractor(s): Swope Construction Company, Mr. Joel Young, Project Mgr., 304-325-8146

Contact: Mr. Chris Canterbury, Project Administrator 304-920-6780

Project Name: ***Marshall University, Harris Hall & Smith Hall Renovations***

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

Description: Prime consultant for Harris Hall renovations included engineering planning, design, bidding and construction administration services HVAC, Plumbing & Electrical retrofits, DDC Controls, AHU's replacement, chiller replacement, VWV pumping, new electrical service, switchgear and addressable fire alarm systems for the 56,680 square-foot facility. Consultant for Smith Hall Renovations involved HVAC and Plumbing for design, bidding and construction administration services. The eight story facility consisted of complete window replacement/upgrade, exit stair smoke control system and plumbing sanitary stack renovation to the largest classroom building on campus. The project was designed so the construction could be completed during a single summer session when it was originally planned for a two year period. ***Smith Hall project was complete a year ahead of schedule and under budget.***

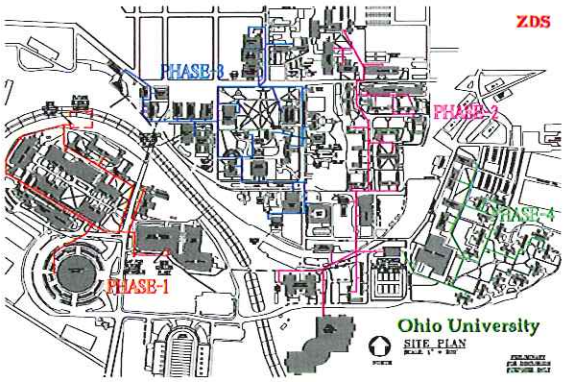
Construction Costs: $2,856,000 for Harris Hall Renovations, $2,800,000 for Smith Hall Renovations

Completed: 2006 for Harris Hall, 2011 for Smith Hall

Contact: Mr. Tony Crislip, PM for Harris Hall at 304-696-6241 Crislip@Marshall.edu
Mr. Ron May, Facilities Planning & Management for Smith Hall at 304-696-6415

Project Name: ***General & Auxiliary Services Performance Contracting and Campus District Cooling***

Location: ***Ohio University, Athens, Ohio***



Description: Engineering planning, mechanical and electrical design, consulting for establishing comprehensive Performance Contracting program & Master Planning for District Cooling System covering entire campus from 1998 to 2000 then again a 2nd Performance Contracting program from 2010 until 2025.

Construction Costs: $25,000,000; Savings over $2,500,000 annually

Completed: 2001, 2010 – on-going

Contact: Mike Gebeke, Executive Director Facility Management for Ohio University (740-593-2928) for work from 2010 to current. Dr. Sherwood Wilson, V.P. for Administrative Services for Virginia Polytechnic Institute of Blacksburg, VA. Former Associate V.P. for Administration, Ohio University, Athens, Ohio. (540-231-4416) for 2001 and earlier.

Project Name: ***Stevenson Library and Bennett Hall ME Renovations***

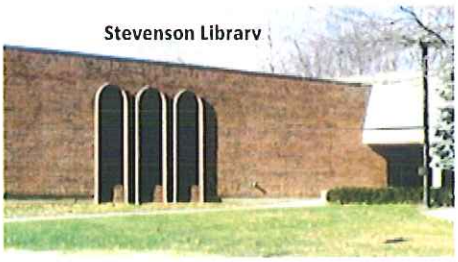
Location: ***Ohio University, Chillicothe Campus, Chillicothe, Ohio***

Description: ***Prime*** to Address IAQ issues within Stevenson Library by providing the 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 renovations to Shoemaker gym.

Construction Costs: $4,400,000; Estimated annual savings between $200,000 and $300,000

Completed: 2004

Contact: David Scott, Director of Physical Plant, 571 West Fifth Street, Chillicothe, OH 45601. (740) 774-7423 scottd1@ohio.edu



Project Name: ***Chiller Loop, White Hall Additions & Renovations and others***

Location: ***West Virginia University, Downtown Campus, Morgantown, WV***

Description: Engineering planning, mechanical and electrical design, bidding and construction administration services for multiple projects involving 12 separate buildings at the Morgantown Campus and one at WV Tech Campus.

The downtown campus chilled water loop including White Hall involved interconnecting multiple chilled water plants and installation of new 750-ton electric drive centrifugal chiller with provisions for a future 1000-ton electric centrifugal chiller.

Construction Costs: $4,410,000 Total MEP Project Cost; Estimated Annual Savings between $200,000 and $300,000.

Completed: 2002 Downtown Campus, 2010 for WVU-Tech

Contact: Bradley Field, Capital Projects Inspector (304) 826-0179
brad.field@mail.wvu.edu

Project Name: ***Williamson Campus***

Location: ***Southern WV Community & Technical College, Williamson, WV***

Description: ZDS's planning and design services included providing HVAC system and associated electrical retrofits and their sub-systems to provide a comfortable environment while **addressing Indoor Air Quality**, energy efficiency, operating costs and meeting the Owner's needs while the building remained in use. HVAC systems were enhanced to meet applicable codes and standards and improved indoor air quality by increasing outdoor ventilation air rates, higher filtration, strict humidity control, DDC monitoring/control and other design strategies.

Construction Costs: $1,040,000

Completed: Substantially Complete 2005

Contact: Ms. Rita Roberson, Campus Manager, 1601 Armory Drive, Williamson, WV 25661 – (304) 236-7648

Project Name: ***District Cooling Chiller Plant Renovations***

Location: ***Washington & Lee University, Lexington, VA***

Description:

Project involved master planning for the Campus Chilled Water Systems and the design, supervision, preparation of construction documents, specifications, construction administration, and commissioning of a 3,100 ton chiller plant and distribution system with variable water volume (VWV) pumping for energy and operation systems. The chiller project has received national recognition for pioneering series VWV pumping and for using a combination mixer-air separator in the main chiller plant piping system. ***Other projects include Commerce School mechanical system analysis for Indoor Air Quality and the Natatorium mechanical system analysis for Indoor Air Quality.***

Construction Costs: $2,100,000; Estimated Annual Energy Savings of $283,000.

Completed: 2001

Contact: Scott Beebe, Director of Energy Initiative, Washington & Lee University, Lexington, VA 24450 - (540) 458-8491

Architecture

Beech Fork State Park

97049

West Virginia Division of Natural Resources
State Capitol , Building 3, Room 669
1900 Kanawha Boulevard, East
Charleston, West Virginia 25305

Chapman Technical Group designed $4.5 million worth of improvements at the state park near Barboursville including a 50-meter swimming pool, bathhouse, six modern cabins, and campground upgrades. With its distinctive high sloped roof, the bathhouse was designed as the architectural centerpiece of the Bowan Day Use area while complementing the architecture of the existing park structures. The cabins provide the warmth of natural materials such as wood and stone, yet are fully equipped with modern conveniences such as air conditioning and microwaves.

Landscape Architecture

Blackwater Falls Cabins 07069

Blackwater Falls Cabins
WV DNR Parks and Recreation
Davis, West Virginia

Chapman Technical Group was selected to provide the architectural, civil engineering, and landscape architectural design to construct 13 new cabins in the environmentally-sensitive Blackwater Falls State Park. The project also included site development and utility system upgrades.

One of the goals in developing the project was to have as little environmental site impact as possible. A plan to cluster the cabins was developed that would minimize the footprint of the cabin development. As much as possible, the existing grade remained unchanged to preserve the natural vegetation. A natural planting plan was developed using indigenous or naturalized plant species, with a special effort made to provide habitat vegetation for endangered animal species in the area.

As part of the project, a low-impact wastewater treatment plant was designed and will result in water clean enough to discharge into the natural waterways of the park. More than a mile of potable water line was also upgraded, which will benefit other areas of the park as well.

Landscape Architecture

Blennerhassett Island Landing

Blennerhassett Island Landing
WV DNR Parks and Recreation
Parkersburg, West Virginia

Chapman Technical Group, with consultant TRC, was selected to provide planning and design services for a new landing and docking facility at historic Blennerhasset Island in Parkersburg, West Virginia. The new facility will serve vessels of varying types and sizes, ranging from small pleasure craft to sternwheelers.

Chapman Technical Group will be responsible for the preparation of all documntation for agency reviews including the West Virginia Division of Culture and History, the Land and Water Conservation Fund, the West Virginia Division of Health and the U.S. Army Corps of Engineers.

Architecture
Landscape Architecture

Canaan Valley Resort State Park Ski Area Improvements 11022

Canaan Valley Resort State Park
WV DNR Parks and Recreation
Canaan Valley, West Virginia

Chapman Technical Group is leading a team of specialists in developing a wide range of improvements at the ski area of Canaan Valley Resort State Park.

The upgrades include new facilities that will have a major impact on the resort's operations; others will be little-noticed but important improvements to the resort's infrastructure.

A new tubing park will be developed and will feature a 12-lane tube run in excess of 800 feet long with a vertical drop of 90 feet. A new boardwalk conveyor will carry tubers back up the hill. A tubing lodge will feature a wood-burning fireplace, restrooms, and a concession stand for hot drinks, and an outdoor patio will include a wood-burning fire pit. A storage building will house tubes and snow grooming equipment. In the same area, a wobble clay shooting range will be developed as a seasonal activity.

Another major improvement will be a new beginners slope and ski school area. This new slope will be easily accessible by beginning skiers and will include new snow guns and lighting for night skiing. A boardwalk conveyor will carry skiers back to the head of the slope, enabling them to ski at their skill level as long as they want.

The main ski lodge, the Bear Paw Lodge, is relatively new, but the older buildings at the base of the ski slopes will get a much-needed face lift. New wall and floor finishes, new furnishings, new lighting and upgrades to the heating and ventilation systems, will make the lodge buildings much more comfortable. The pub will likewise be upgraded with an expanded bar area. Outside, a new plaza with a fire pit will provide more options for outdoor seating.

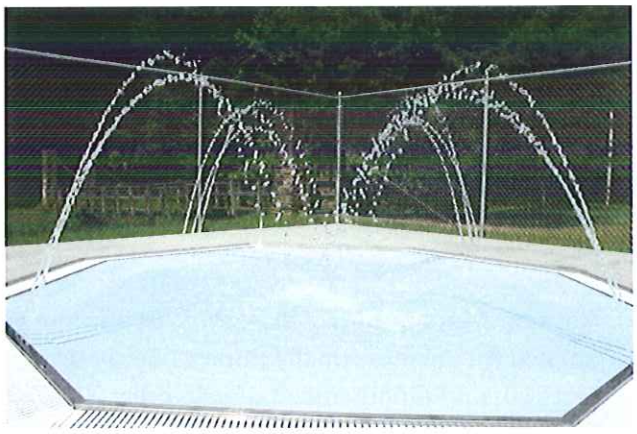
Important infrastructure improvements will include upgrades and major maintenance to the existing ski lifts; snow-making waterline repairs and upgrades; new snow guns; and major storm drainage improvements. A new waterline from the Canaan Valley golf course ponds will provide expanded snow-making capabilities.

Landscape Architecture

Laurel Lake WMA Swimming Pool 08080

Laurel Lake WMA Swimming Pool
Mingo County, West Virginia

The West Virginia Division of Natural Resources swimming pool at the Laurel Lake Wildlife Management Area near Lenore, West Virginia had fallen into serious disrepair and had actually closed down. Chapman Technical Group designed a rehabilitation of the pool that included a new stainless steel gutter recirculation system, a membrane liner, a new interactive wading pool, and new concrete decks. After the demolition of the old bathhouse, a new bathhouse was built which also houses the filtration equipment for the wading pool. The project was completed in 2010 at a cost of $714,000.



The swimming pool renovations included a new interactive wading pool.

Landscape Architecture

Moncove Lake State Park Swimming Pool 97051

West Virginia Division of Natural Resources
State Capitol, Building 3, Room 669
1900 Kanawha Boulevard,
Charleston, West Virginia 25305

The new Moncove Lake State Park swimming pool opened for business on the Fourth of July weekend of 1999, one month ahead of schedule. Designed by Chapman Technical Group for the West Virginia Division of Natural Resources, the pool features a stainless steel gutter recirculation system and a wading pool surrounded by spraying jets of water. The 25 meter pool is a long-needed addition to the state park located south of Lewisburg.

In order to provide adequate water for the pool, not only was the construction of a pool filter room required, but the entire water system for the park had to be renovated. The water system design included a larger well pump, a larger green sand filter to remove iron, and upgraded water storage and filter backwash capabilities.

Landscape Architecture

Nitro Boat Ramp

05016

Nitro Boat Ramp
Nitro, West Virginia

Construction Cost: $100,000
Services: Civil Engineering, Landscape Architecture
Project Size: 4 Acres
Owner: WV Division of Natural Resources
Dennis Kincer, PE
(304)558-2771

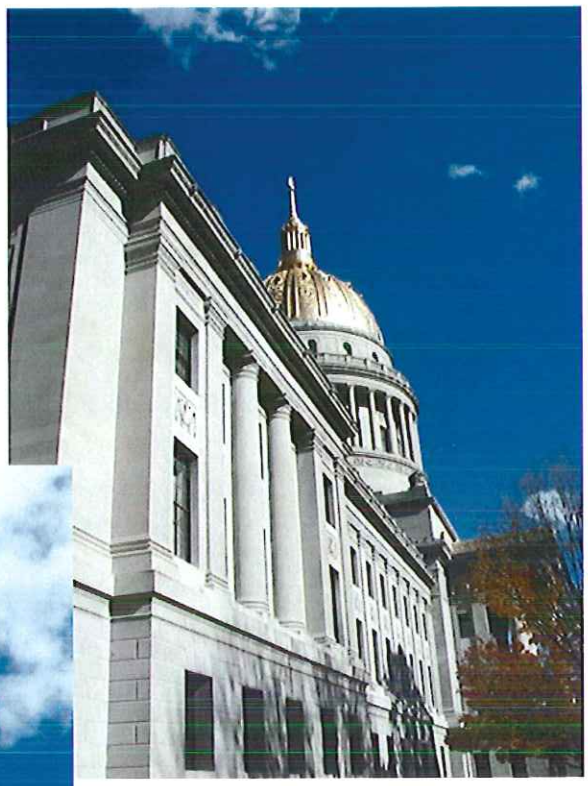
Completion Date: August 2011.

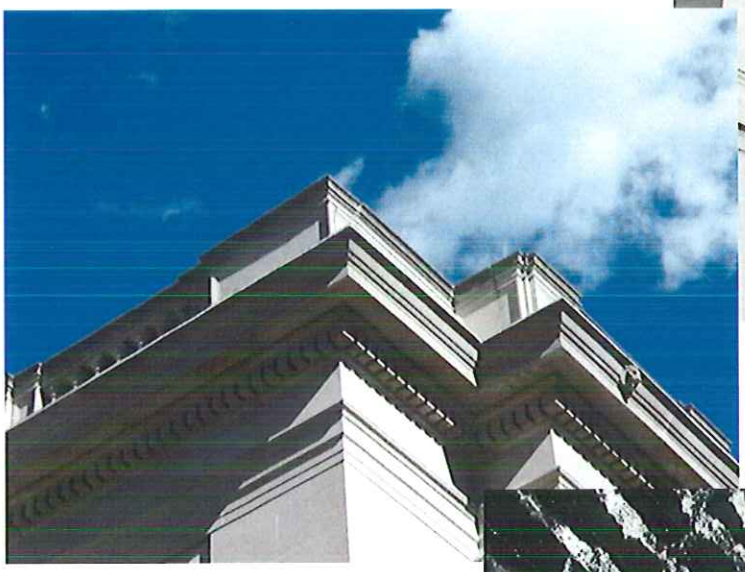
This project is located along the banks of the Kanawha River in the City of Nitro. The project consists of a 30' wide boat launch, an ADA accessible boarding ramp & dock and a 60 space vehicle parking lot.

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.

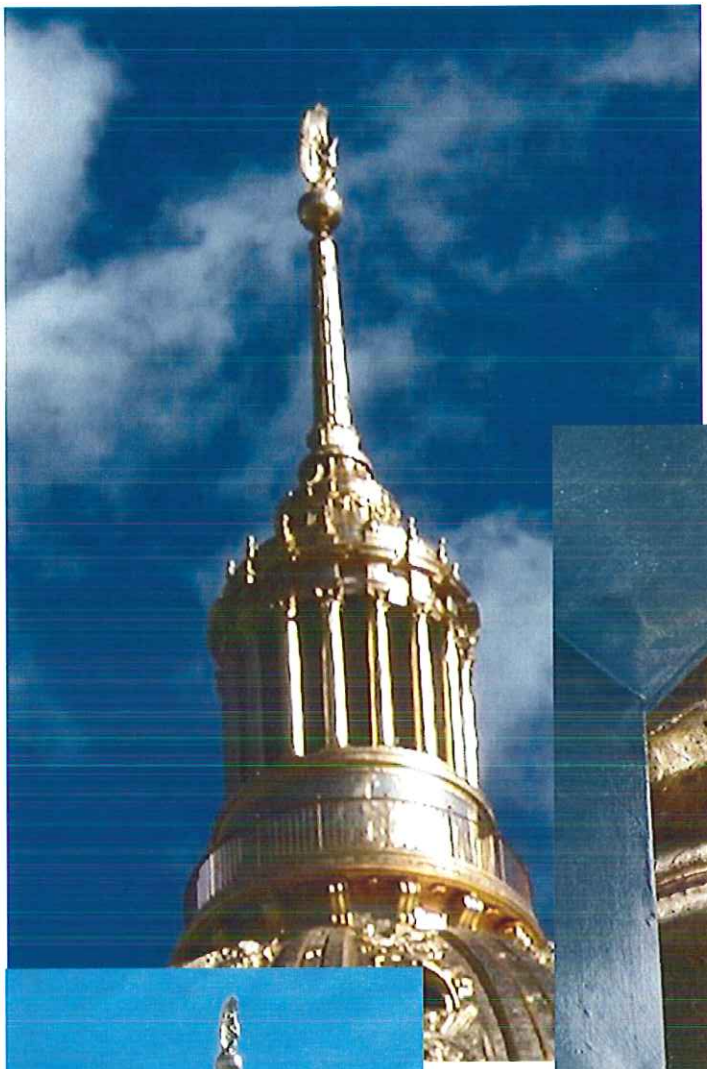
CAS
Structural Engineering, Inc.

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

CAS
Structural Engineering, Inc.

STRUCTURAL INVESTIGATION
MAIN CAPITOL BUILDING DOME

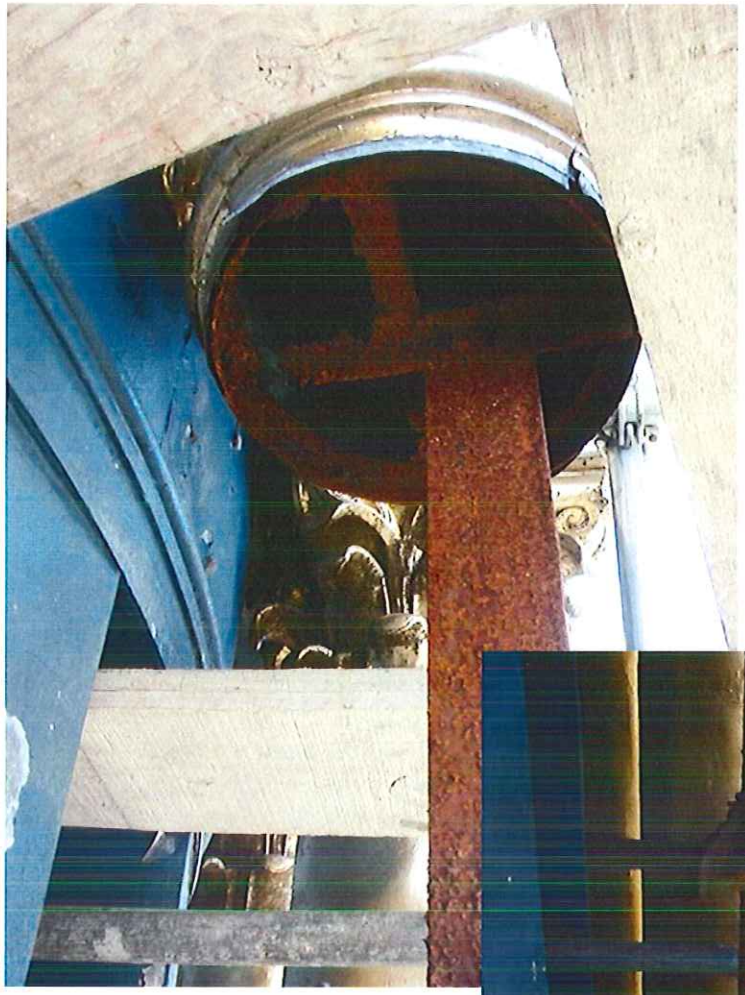
Charleston, West Virginia



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.

CAS Structural Engineering, Inc.



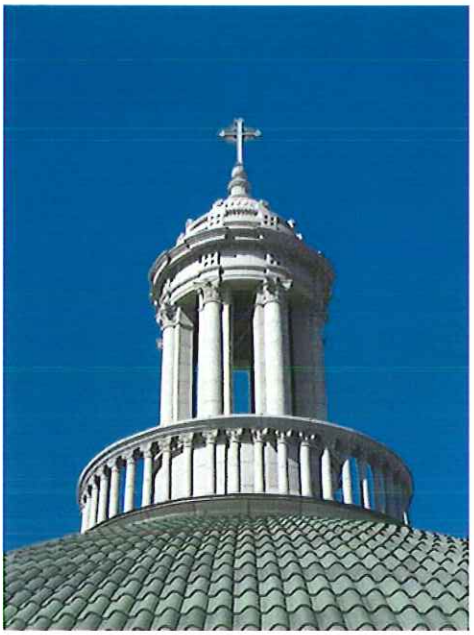
Removal of decorative column wrap indicated that back-up structure was severely deteriorated.

CAS
Structural Engineering, Inc.

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.

FIRST PRESBYTERIAN CHURCH
EXTERIOR FACADE RESTORATION

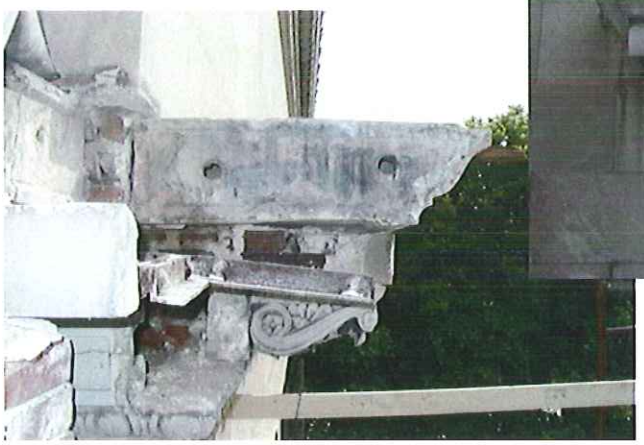
Charleston, West Virginia



The terra cotta and limestone exterior of this 1910's building was in need of being restored to prevent continued damage to the exterior and interior of the building. The structural steel in the lantern level was replaced with stainless steel members and wind bracing was added.

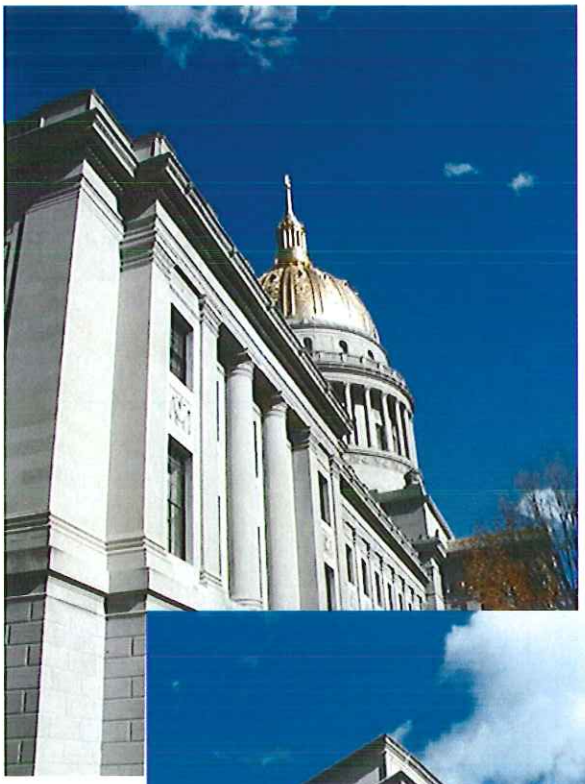
The terra cotta balustrade was re-built after the iron components were found to be deteriorated.

The corners of the terra cotta cornice exhibited significant deterioration of the mortar joints and rotation of the units. It was found that the supporting steel members were not adequate for the load that was being supported. They were also replaced with stainless steel components.



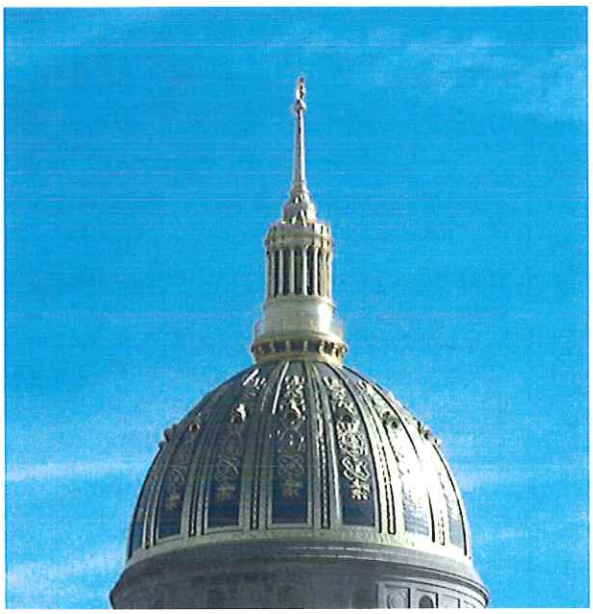
CAS Structural Engineering, Inc.

Project Experience



CAPITOL PARAPET WALL REPAIRS
Charleston, West Virginia

This project included an exploratory investigation and preparation of construction documents for repairs to the limestone and brick parapet wall and balustrade at the top of the Capitol Building.



CAPITOL DOME RESTORATION
Charleston, West Virginia

This project included an exploratory investigation and preparation of construction documents for repairs to the structural steel in Capitol Dome.

CAS Structural Engineering, Inc.

Project Experience

BUILDING 3 CANOPY REPAIRS
Charleston, West Virginia

Structural design of repairs to existing limestone canopy and supporting structural elements. Discovered that as-built conditions differed from original design documentation

GEORGE WASHINGTON HIGH SCHOOL
Charleston, West Virginia

Structural design of additions to include new 3-story classroom addition, new entrance/commons addition, and new gymnasium addition for Kanawha County Schools.

COVENANT HOUSE
Charleston, West Virginia

This 3-story structure utilized a structural steel frame and light-gauge steel roof trusses for the structural system. The 13,700 SF building was designed to appear as a residential structure, with vinyl siding, asphalt shingles, dormers and gingerbread accents.

CAS
Structural Engineering, Inc.

ZDS Design/Consulting Services

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

Todd has more than 38 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, South Charleston, WV
- Calvert County Aquatic Center, MD
- Culture Center HVAC, Fire Alarm, and Fire protection 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
- Ohio No. E-53587
- Georgia No. 18253
- Kentucky No. PE-17961
- North Carolina No. PE-017445
- Pennsylvania No. PE-040929-R
- South Carolina No. 25985
- Virginia No. 0402 025427

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

CEM®

LEED AP

LEED® Accredited Professional, National Certification through USGBC No. #10083891

OTHER RECOGNITIONS

Energy Star Certified for facilities in the nation's top 25% of energy efficiency

ENERGY STAR 2013

ZDS Design/Consulting Services

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

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 Regional Medical Center
- 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 – *LEED Gold Certified*
- 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 counties of Calhoun, Clay, Fayette, 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. ***In 2013 Elkins Middle School, Webster Springs Elementary and Glade Elementary/Middle School were given Energy Star Certification, placing them in the nation's top 25% of energy efficiency schools.***

Some of Todd's project experience includes 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.

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.

ZDS Design/Consulting Services

Ted T. Zachwieja
Principal-in-Charge
Construction Administration

Ted has over 52 years of experience in mechanical and electrical systems design and construction administration. His specialties include the design and development of mechanical and electrical systems, master planning and budgeting for mechanical and electrical systems, and management of complex design and construction projects. He is also a Codes and Standards Specialist. Ted has been involved in all aspects of mechanical and electrical design and construction since 1958, including machine design, structural design and design of heating, ventilating, air conditioning, plumbing, fire protection and electrical systems. Ted's experience includes work for the following as well as many additional clients in the private sector:

Bank One	U.S. Steel
Bluefield Regional Medical Center	Union Carbide
Charleston Area Medical Center	United Hospital Center
Kanawha County Schools	West Virginia Capitol Complex
Marshall University	West Virginia Institute of Technology
Rhone-Poulenc	West Virginia University

Ted's design regarding Chase Towers – Charleston included conducting a comprehensive energy audit, design of a Building Automation Energy Management System, HVAC renovations, design of flat plate heat exchanger system for the perimeter fan coil units and design of the boiler replacement.

Ted was involved with the mechanical and electrical renovations for the State of West Virginia Division of Culture and History as part of a total $4.5 million project. The indoor air quality, temperature and humidity each were not in accordance with good design practices for this type of structure. ZDS was commissioned to correct these deficiencies while conserving energy.

Ted was selected as one of three engineers to train and teach a course designed by the Department of Energy and American Society of Heating, Refrigeration and Air Conditioning Engineers for emergency building temperature restrictions.

Prior to forming ZDS, Ted was regional manager for a hospital design firm and responsible for designing, construction management and project management for over $200 million in hospital and health care facilities. The facilities were located over the eastern United States. Ted's most recent health care experience includes lighting projects and various studies for seven hospitals for the West Virginia Department of Health and Human Resources:

Hopemont State Hospital, Terra Alta
Jackie Withrow Hospital, Beckley
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

Bachelor of Science in Mechanical Engineering, West Virginia Institute of Technology, 1958

PROFESSIONAL AND COMMUNITY AFFILIATIONS

Construction Specifications Institute (Charter Member)

Life Time Member
American Society of Mechanical Engineers

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

West Virginia Mountaineer Chapter ASHRAE Past President and Charter Member

Association of Energy Engineers

Associate Member West Virginia Society for Healthcare Engineering

Professional Affiliate Member of AIA

WV Association of Physical Plant Administrators

Other health care experience includes millions in renovation and new construction design for the following:

Bluefield Regional Medical Center
Cabell Huntington Hospital
Charleston Area Medical Center's
(CAMC) Special Care Facility
Mercy Medical Center
Monongalia General Hospital
Montgomery General Hospital
St. Mary's Hospital
Summersville Memorial Hospital
Thomas Memorial Hospital
United Hospital Center
VA Hospital – Clarksburg
VA Hospital – Huntington
Webster Memorial Hospital
Welch Emergency Hospital Surgicare Center

Ted has been involved in the planning, design and construction administration of many facilities including the following:

Concord University
  Technology Center and Concord's campus medium voltage upgrades
Marshall University's Harris Hall renovations
Southern West Virginia Community & Technical College's renovations
West Virginia University (WVU)
  White Hall and Armstrong Hall
  Wise Library Sprinkler System
  Chilled Water Loop Interconnect – Morgantown
Charleston Area Medical Center (CAMC)
  Memorial Division Chiller Replacement
  General Division Chiller Replacement
Variable Pumping System and Chillers Interconnect – Charleston

Throughout the years, Ted has worked on new and renovation projects such as:

West Virginia University Stadium and Forestry Building – Morgantown
Addition and renovation of the air conditioning system for the West Virginia State Capitol Building – Charleston
Conley Hall and Science Building HVAC renovations and additions
West Virginia Institute of Technology – Montgomery
Indoor air quality (IAQ) and HVAC renovations of Andrew Jackson Junior High School for Kanawha County School Systems
Fume Hood Design and HVAC additions and renovations for Union Carbide - Charleston and Rhone Poulenc – Institute
HVAC renovations for the Benedum Student Center at West Virginia Wesleyan College – Buchannon
Greenbrier East and Greenbrier West Schools
Mingo County Schools
Raleigh County Schools including new Shady Springs Middle School
New Trap Hill Junior High School
Academy of Career and Technology Center HVAC renovations
Marsh Fork Elementary renovations
Park Middle School renovations
Woodrow Wilson High School renovations
Randolph County's Elkins Middle School renovations
Pocahontas County High School (Geothermal) renovations
Wyoming County Schools
Tucker County Schools
Webster County High School
Glade Elementary/Middle School and Webster Springs Elementary School HVAC renovations (Geothermal) and exterior renovations

ZDS Design/Consulting Services

Ted A. Zachwieja III, EI, BSME
Building Information Modeling (BIM) Manager
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 and Fuel Cell Hangar, Charleston, WV – *LEED Silver Candidate*
- Bayer Material Science
- Meadowbrook Rest Areas, WV
- I-70 Welcome Center, WV
- Morgantown Welcome Center, WV
- West Virginia State Capital Complex Central Heating Plant
- West Virginia I64 Turnpike Tollbooths Renovation Project
- White Sulfur Springs Rest Area

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, new 32,000 SF addition and renovations to the existing facility.

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 and Board Member of ASHRAE's Mountaineer Chapter

Lifetime Member of the Association of Energy Engineers (AEE)

Associate Member West Virginia Society for Healthcare Engineering

OTHER RECOGNITIONS

Energy Star Certified for facilities in the nation's top 25% of energy efficiency

2013

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 – *2013 Energy Star Certified*
- Elkins Middle School Renovations, WV
- Iaeger/Panther Elementary School, WV
- Spanishburg Elementary School, WV
- Lashmeet/Matoaka Elementary School, WV
- Montcalm High School, WV
- Mercer County Technical Education Center, WV
- Princeton High School renovations, WV
- 29 Schools in Raleigh County, WV

AWARDS AND RECOGNITIONS

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

- 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
Associate - 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 and Glade K-8 school which received 2013 Energy Star Certification; Marshall University Smith Hall Renovations; Marshall University Student Housing in Huntington; New Iaeger/Panther Elementary School; Paul Blazer High School in Ashland; Pleasant Hill Elementary School Renovations in Calhoun County; Ritchie County Middle/High School.

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 (*AIA Merit Award Recipient)* 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.

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)

Jennings L. Davis II, P.E.
Mechanical Engineer

Jennings has more than 23 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)

ASHRAE Mountaineer Section

Associate Member West Virginia Society for Healthcare Engineering

WEST VIRGINIA SOCIETY FOR HEALTHCARE ENGINEERING

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 (MNMC) 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 PRRTP) 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 eight 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 – *2013 Energy Star Certified*
- Greenbrier West High School additions/renovations
- Harvard University – *LEED Gold Certified*
- Iaeger/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, Montgomery, WV in 2004

REGISTRATIONS

Professional Engineer

- West Virginia No. 18948
- Ohio No. E-77003

PROFESSIONAL AFFILIATIONS

American Society of Mechanical Engineers

American Society of Heating, Refrigeration and Air Conditioning Engineers, Young Engineer's Association Chair for ASHRAE's Mountaineer Chapter

Association of Energy Engineers (AEE)

OTHER RECOGNITIONS

Energy Star Certified for facilities in the nation's top 25% of energy efficiency

ENERGY STAR 2013

COMMERCIAL

- Burnsville Rest Areas North and South Bound – *AIA Merit Award Recipient*
- 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 Areas North and South Bound
- 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 – *LEED Silver Candidate*
- West Virginia Capitol Complex Performance Contracting HVAC Retrofits and Master Planning for Security/Fire Alarm/Life Safety systems
- White Sulphur Springs Welcome Center

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

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

HEALTH CARE

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

EDUCATIONAL

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

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

David G. Dial, P.E.
Senior M/E/P Engineer

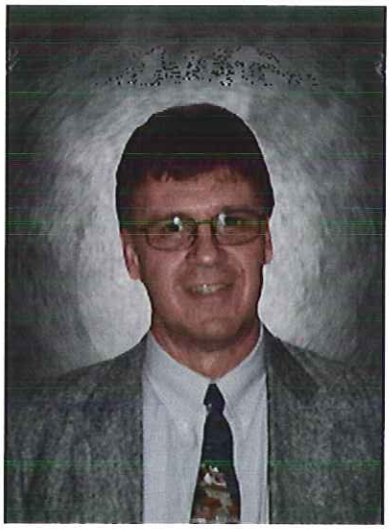
David has over twenty-eight years of experience in the design and commissioning of mechanical and electrical systems. He provides HVAC, electrical and plumbing design services for a variety of clients in West Virginia. His background includes managing operating and maintenance repair and construction 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 duel 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.

David is also is instrumental in construction administration and initial field investigation including working on projects with the West Virginia Division of Health and Human Resources. Some of his work included Hopemont Hospital Renovations, John Manchin Sr. Health Care Center, William R. Sharpe Hospital additions and renovations



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

ASHRAE Mountaineer Section

ZDS Design/Consulting Services

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

JOSEPH E. BIRD, ASLA
Senior Vice President
Project Manager

EDUCATION

West Virginia University, BSLA, 1978

REGISTRATION

Landscape Architect, West Virginia, 1981

PROFESSIONAL HISTORY

August 1985 to Present: Chapman Technical Group
Senior Vice President and Project Manager.

May 1978 to August 1985: Kelley, Gidley, Blair & Wolfe, Inc.
Landscape Architect and Project Manager.

Mr. Bird is a project manager and registered landscape architect. His experience ranges from large site development projects to the management of multi-discipline and architectural projects.

35 years professional experience.

PROJECT EXPERIENCE

Site Development: Site planning and project management for numerous projects throughout West Virginia ranging from small campus sites to large sites for commercial, government, industrial, and institutional development. Projects include military complexes, campuses, public housing developments and other public facilities.

Parks and Recreation: Projects include swimming pools, bathhouses, cabins and support facilities for the West Virginia Division of Natural Resources and similar facilities for county and municipal park systems. Also involved in the design of facilities such as softball fields, fishing access facilities, recreation facilities for prisons, as well as passive recreation areas for public and private clients.

Miscellaneous: Other project experience includes the urban planning and development, streetscape design, roadway and storm drainage projects, as well as the project management of numerous major architectural projects throughout West Virginia.

AFFILIATIONS

West Virginia Chapter of the American Society of Landscape Architects

AWARDS

Honor Award for Shrewsbury St. Redevelopment Plan
West Virginia Chapter of American Society of Landscape Architects

ROGER J. KENNEDY, ASLA
Landscape Architect
and Project Manager

EDUCATION

West Virginia University, BSLA, 1990
Natural Stream Training Courses I - III, West Virginia University, 2000-2002.

REGISTRATION

Landscape Architect, West Virginia, 1993

PROFESSIONAL HISTORY

June 1990 to Present: Chapman Technical Group
Landscape Architect, Project Manager and IT Manager.

May 1989 to May 1990: WVU and the National Park Service
Inventoried and analyzed abandoned mine sites along the New River Gorge National River utilizing PC ArcInfo.

24 years professional experience.

PROJECT EXPERIENCE

Site Development: Responsibilities include grading design, site planning and layout, analysis of existing features and services, storm water design and management, erosion control, as well as project management. Projects include prisons, landfills, military complexes, banks, airports, subdivisions, gas stations and other public facilities.

Bridge and Highway: Responsibilities include the design of horizontal and vertical road alignments, superelevation design, intersection layout, slope design and quality control review. Projects include several multi-lane highways and bridges throughout West Virginia.

Miscellaneous: Other experience includes the use of various civil design software packages for use in site development and road design, digital terrain modeling, hydraulic analysis and related computer aided design tools. Additional responibilities include the development and management of the computing resources of the company. This includes the management of software and hardware inventories, as well as the development and management of all local area networks in each office and the wide area network which links them.

AFFILIATIONS

Member, Sigma Lambda Alpha Honor Society of Landscape Architects
Member, St. Albans Rotary Club
President, St. Albans Riverfest, Inc.
Trustee, American Society of Landscape Architects, West Virginia Chapter

W. THOMAS CLOER, III, AIA, NCARB
Project Architect

EDUCATION

University of Tennessee, BArch, 2001

REGISTRATION

NCARB Registered Architect, 2009
IDP Program completed.

PROFESSIONAL HISTORY

October 2006 to Present: Chapman Technical Group
Project Architect and Architectural Designer

2001-2006: NVisions Architects
Architect Intern and Architectural Designer

12 years professional experience.

PROJECT EXPERIENCE

Experience ranges from drafting, detailing and design through project management and construction administration of building projects throughout West Virginia including the following project types:

- Public School Facilities
- Government Facilities
- Office Buildings
- Medical Office Facilities
- Single Family Housing
- Multi-family Housing
- Recreational Facilities
- ADA Assessments
- Site Planning

AFFILIATIONS

American Institute of Architects
City of St. Albans Property and Maintenance Board, Member
City of St. Albans Historic District Committee, Member
Boy Scouts of America Troop 250 Committee Member

STEPHEN M. JOHNSON, PE
Group Manager
Civil/Environmental Engineering

EDUCATION

West Virginia Institute of Technology, BSCE, 2004

REGISTRATION

Civil Engineering, West Virginia, 2009
Civil Engineering, North Carolina, 2008
Civil Engineering, Virginia, 2011

EXPERIENCE

January 2009 to Present: Chapman Technical Group
Civil Engineer

October 2006 to January 2009: McKim and Creed
Civil Engineer

May 2004 to October 2006: Chapman Technical Group
Civil Engineer

June 2001 to May 2004: Allegheny Power
Gas Support Technician/Intern

9 years professional experience.

PROJECT EXPERIENCE

Water Systems: Overall experience includes planning, design, bidding, and construction administration/management of various public and private water system projects throughout West Virginia, Virginia, and North Carolina. Specific project experience includes distribution systems, river crossings, horizontal directional drills, wells, raw water intakes, transmission lines, booster stations, treatment plants, ground and elevated water storage tank design, painting, and rehab, SCADA systems, computer modeling, treatment process evaluation, and problem troubleshooting in existing systems.

Wastewater Systems: Overall experience includes comprehensive system master plans, design, bidding, construction administration/management of various public and private wastewater system projects throughout West Virginia, Virginia, and North Carolina. Specific project expreiance includes gravity and low-pressure collection systems, pump stations and force main transmission systems, treatment plant process evaluation and design, trenchless pipeline rehabilitation, bypass pump system design, odor and corrosion control, effluent infiltration ponds, decentralized and alternative on-site disposal systems, and SCADA systems.

Stormwater Systems: Overall experience includes comprehensive system master plans, design, bidding, construction administration/management of various public and private stormwater system projects throughout West Virginia, Virginia, and North Carolina. Specific project experience includes drainage basin hydraulic analysis, stormwater collection, detention and BMP system design, construction stormwater management plan preparation, and MS4 permit guidance.

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

EXPERIENCE

West Virginia, Canaan Valley Resort State Park: Structural investigation and recommendations for repairs to the five (5) existing overnight sleeping facilities.

West Virginia, Twin Falls Resort State Park Lodge Addition: Structural design for new 28,000 SF addition to existing facility, including new entrance lobby, conference areas, sleeping rooms and indoor pool.

West Virginia, Hawks Nest State Park Lodge: Analysis of structural cracks in lodge building. Work included probes to determine condition of existing connections between structural elements.

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, 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 the 1830's.

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

West Virginia, Twin Falls Resort State Park: Structural evaluation of existing recreation building.

West Virginia, Pipestem Resort State Park: Structural evaluation of existing recreation building.

West Virginia, Cabwaylingo State Forest: Structural evaluation of existing dormitory buildings constructed in the 1950'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.

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

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.

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.

Ohio, Mahoning County Courthouse: Completed preliminary structural observation report of exterior façade conditions to recommended 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.

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

West Virginia, Shinnston Park: Structural design of new outdoor pool.

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, Beech Fork State Park Pool, Bathhouse and Cabins: Designed structure for new bathhouse, swimming pool and cabins.

West Virginia, Moncove Lake State Park Pool: Designed structure for new swimming pool.

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

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.

Pennsylvania, Hampton Inn: Structural design of new 5-story masonry and precast plank hotel building.

Pennsylvania, Comfort Inn: Structural design of new 5-story masonry and precast plank hotel building.

Pennsylvania, Misericordia University: Structural design of new 4-story masonry and precast plank dormitory building.

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

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: Structural design of new 10,000 SF masonry building.

ZDS believes the best designers lead the industry in applying innovative ideas and concepts while adhering to proven approaches. What follows are a few publications and recognition received by the members of ZDS. "***Paying for Performance***" was published in the Chronicle of Higher Education about our role in Ohio University for a $25 million performance contract program. ZDS was also highlighted in the College of Planning & Management magazine by Ohio University for the value we added as their consultant.

"Earth Comfort Update" highlights Geothermal Heat Pump systems in schools. ZDS receives recognition for design of Webster County High School's HVAC system, the first in West Virginia and one of the largest in the region where we pioneered specialty HVAC geothermal design in the region while saving over 45% in operating costs and is in the top percentile in energy efficiency for schools in the USA.

"*The New Horizon-Indoor Air Quality*" was published in Consulting-Specifying Engineer. Todd Zachwieja served as contributing editor for this article addressing office buildings. The article outlines innovative HVAC concepts as they relate to the office building's indoor air environment. This national publication provided quality technical information to over 100,000 building owners, managers, and designers.

Another article entitled "*Energy Savings to Bank On*," was written about Ted T. Zachwieja's innovative HVAC design approach on one of the largest buildings in the state of West Virginia. His approach improved comfort while saving the 17 story office building in Charleston significant energy costs.

Todd Zachwieja was the contributing editor and a member of the technical review pane for The Indoor Air Quality Reference Library. This library includes: Invironment®, The Handbook of Building Management and Indoor Air Quality and Building Air Quality, A Guide for Building Owners and Facility Managers. Todd Zachwieja was also the contributing editor of the "Ventilation for a Quality Dining Experience" technical bulletin on building management and indoor air quality.

ZDS principal Todd Zachwieja was invited to and spoke at the National Conference on Building Commissioning. He and the Director of Maintenance of Charleston Area Medical Center, Memorial Division jointly presented a paper at a Tampa, Florida Conference.

Todd Zachwieja is technical writer of articles for the "*Invironment® Professional*," a monthly publication that addresses current technology, codes, and design practices for building construction and operations. *"Power Prescriptions"*™ Indoor Air Quality is an additional monthly publication of which Todd Zachwieja is on the Editorial Advisory Board through the Electric Power Research Institute.

ZDS Design/Consulting Services also received recognition for its contribution in the PECI publication *"What Can Commissioning Do For Your Building?"*

GEOEXCHANGE

Earth Comfort Update

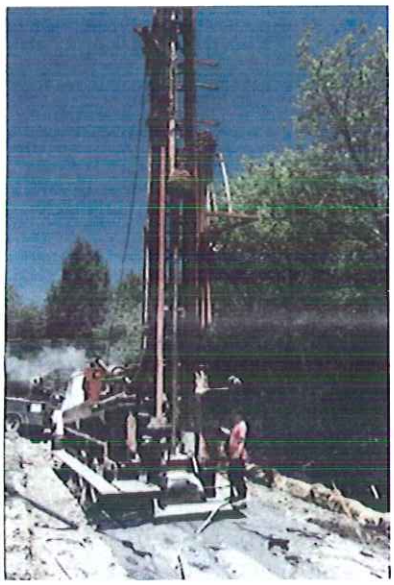
The GeoExchange National Information Resource Center Newsletter ■ Volume 6, Issue 4

July/August 1999

First in Line in West Virginia

Webster County High School in Upperglade, W. Va., is the first school in West Virginia to "go Geo" and has - in just eight months - realized energy costs savings of more than $34,000 and cut its electrical demand nearly in half. ***Update – 2000 annual energy savings exceed $74,500.***

In 1997 the Webster County Board of Education requested funds from the School Board Authority (SBA) of West Virginia to replace several rooftop heating units at Webster County High School. Upon inspection, SBA officials recognized that restoring the existing electrical HVAC system wasn't the best solution. They recommended a qualified mechanical engineering firm review the system and develop better options.



Drilling for the ground loop for Webster County High School's 500-ton GeoExchange system. It is the largest GeoExchange installation to date in West Virginia and the surrounding region.

School officials were leaning towards a propane gas heating system when Allegheny Power, Greensburg, PA, and ZDS Design/Consulting Services, St. Albans, WV, introduced them to GeoExchange, which could provide greater energy efficiency, cost savings, temperature control, reliability and safety.

Webster's 500-ton system is the largest GeoExchange installation to date in West Virginia and the surrounding region. School officials estimate that the system will save about $50,000 a year in heating and cooling costs. ***Update – Energy savings increasing every year and now exceed $74,500 annually.*** In addition, it provides a healthier environment for Webster's 600 students, its faculty and staff by incorporating a cost-effective, outside air ventilation system.

"***We're very pleased with the system***," said Harry Given, facilities manager for Webster County schools. "***We've seen energy savings, had zero maintenance problems, and we believe that the savings will be even greater over time.***"

Investing in the Future

"GeoExchange offers schools the best return on investment with the lowest environmental impact," said Gary Valli, an HVAC engineer with Allegheny Power. "In most cases, the life-cycle costs of a geothermal heat pump system are lower than any other system available today."

The Geothermal Heat Pump Consortium (GHPC) helped Webster County school officials by providing additional training to ZDS through its Design Assistance Program. "We were not sure how comfortable the school personnel would be with this type of system," said Todd Zachwieja, owner of ZDS. "A commercial geothermal system of this size had never been installed in our area, and the system cost was higher than HVAC systems customarily funded for schools."

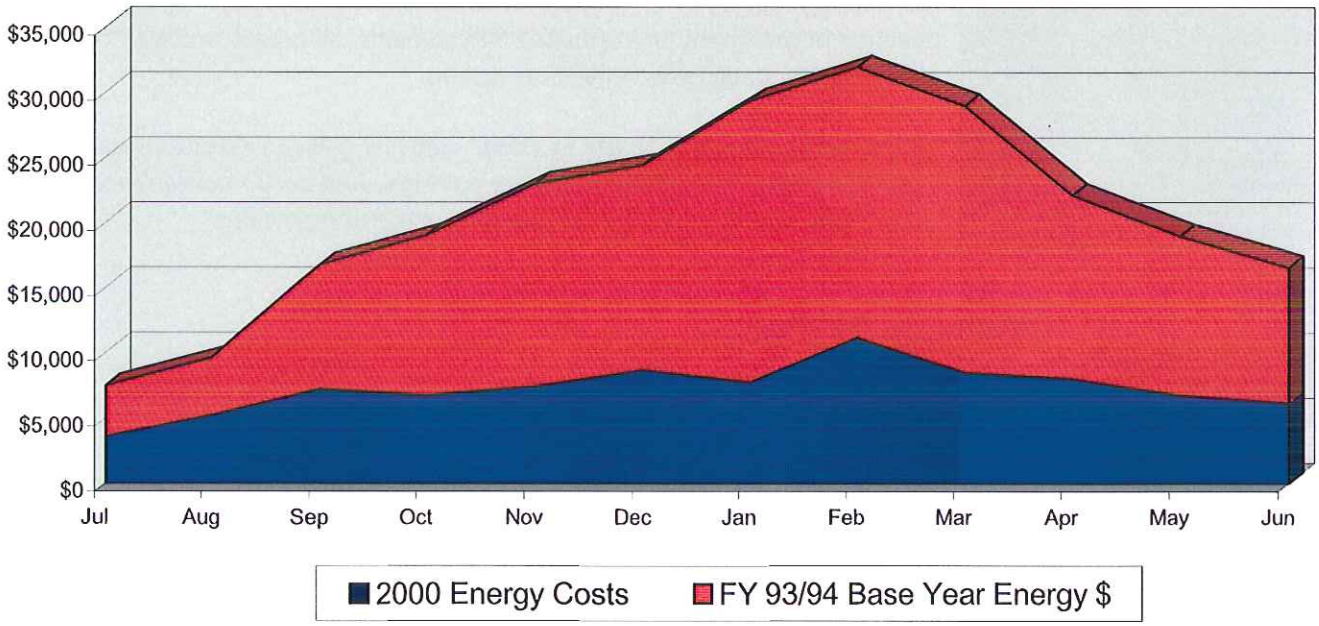
The Webster County project was funded as a pilot project through a $3.25 million grant from the SBA, which is responsible for overseeing all school construction in the state. The SBA is giving strong consideration to the GeoExchange system's positive performance at the school, Zachwieja noted. Significant lifecycle cost savings could allow more schools to benefit from funding for GeoExchange projects in the future.

Improved Comfort and Efficiency

The Webster County High School system includes 240 vertical loop heat exchangers inserted 304 feet into the ground. The new units that replaced the old multizone units incorporate exhaust air heat recovery for the incoming outdoor air. "That's another benefit of the system -bringing the outdoor air indoors," Given said. "***We've improved our indoor air quality; everyone appreciates that***."

"Schools are definitely realizing the benefits of GeoExchange for comfort and energy-efficiency," Valli said. To help, Allegheny Power is producing a technically detailed video on the step-by-step GeoExchange installation at the Webster County High School.
"Many schools have HVAC systems that are reaching the end of their useful life," Valli said. "These schools will look at a lot of options. Our job is to educate the decision-makers that GeoExchange is a viable and cost effective solution."

Webster County High School
Geothermal Heat Pump Energy Savings



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Paying for Performance

A growing number of colleges sign contracts with guarantees of savings of energy and money

BY MARTIN VAN DER WERF

TECHNICIANS are crawling over the campus of Ohio University, charting the use of electrical current in every office and dormitory room, measuring the brightness of lighting, the consumption of water, the air temperature in every room and alcove. They are trying to document every way that the university can cut its energy costs.

The answers are in little places. Ohio will replace 9,000 exit signs with exit lights that use 80 percent less energy and last 25 times longer. It will replace windows. It will put smaller, more efficient fluorescent tubes in the light fixtures. It will probably be watering its lawns and fields with well water rather than water from the tap. And, as a symbol of its turn away from a longtime reliance on coal, the university is considering buying its own natural-gas field, in the nearby hollows of the Appalachians.

It will be a 20-year project that will save millions of dollars per year in energy costs. Yet, to do it, the university won't have to come up with any new money up front.

In April, it signed a $25-million "performance contract" with Vestar, a subsidiary of Cinergy Corporation, a Cincinnati-based energy company.

HOW IT WORKS

Performance contracts are an innovative financing method that is increasing in popularity on campuses. The process works like this: A contractor or energy company explores a campus and recommends ways to save money on energy bills. Then the contractor makes the changes or hires others to make them, and guarantees, in writing, that the savings the college will realize will cover the costs of the changes, usually within 10 years. The company can also arrange financing, so the college does not have any upfront costs. The college pays the company for construction and equipment in installments that roughly equal the amounts by which the college is cutting its energy bills.

The companies benefit by selling more of their products. For many colleges, the greatest appeal of the contracts is that they can use the savings to help eliminate backlogs in deferred maintenance. Many of them use the savings to buy more-efficient chillers, ventilation systems, and other utility-related equipment.

"This is a way for many institutions to get capital quickly," says Mohammad H. Qayoumi, vice chancellor for administrative services at the University of Missouri at Rolla, who leads sessions on utilities policy at institutes sponsored by the Association of Higher Education Facilities Officers.

"Are we going to see more? Definitely. We are going to see things going in that direction, especially with the deregulation of energy companies. They are increasingly going to want to sell electricity not only as a commodity, but all kinds of services along with it," he says.

University officials who have entered into the contracts point out, however, that the deals are immensely complicated. Any institution that is considering such a contract should consult with outside

Todd A. Zachwieja, a Consultant with ZDS Design/Consulting Services: "Some schools have moved forward with contracts without fully understanding what they were doing."

Sherwood G. Wilson of Ohio U. says its new energy contract will help it cover the costs of deferred maintenance.

experts, says Joe Kelley, executive director of facilities at Louisiana State University at Baton Rouge, which signed one of the first performance contracts by any college, an $18.8-million deal in 1990.

"We sort of had to find a pathway through the jungle on this one," says Mr. Kelley. His advice: "Get every word of it in writing."

Todd A. Zachwieja, principal of ZDS Design/Consulting Services an Ohio and West Virginia-based consultant on performance contracting, says there are now more than 100 companies in the business. The traditional market leaders are Fortune 500 companies like Honeywell, Johnson Controls, and Sempra Energy. Many of the newest ones are utilities trying to broaden their services.

AN UNTAPPED MARKET

The size of the market is difficult to quantify. Johnson Controls alone has about $1.6-billion in contracts, about 100 million worth with colleges, says Tom Proffitt, marketing manager for performance contracting at the Milwaukee-based company.

The college market, however, remains relatively untapped. Mr. Proffitt estimates that fewer than 20 percent of institutions have signed such contracts. But higher education has been a steadily growing segment of his company's business, he says.

Performance contracts were born in the 1970's, during the Arab

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oil embargo, when energy savings were at a premium. But they were not widely used until the mid to late 1980's, when they became particularly popular at hospitals, which could get some Medicaid and Medicare reimbursement for facilities improvements, says Mr. Zachwieja, chief executive officer of ZDS Design/Consulting Services, in St. Albans, W.Va.

Slowly, as states have passed laws allowing multiyear financing, elementary and secondary schools and local governments are beginning to sign the contracts. About 35 states have now enacted the laws, says Mr. Proffitt.

In 1994, President Clinton signed an executive order allowing federal agencies to make the agreements, and the contracts have begun to proliferate, mostly at military bases and at office buildings owned by the General Services Administration.

STAYING ON THE SIDELINES

Other than pioneers like Louisiana State; however, most higher-education institutions have stood on the sidelines.

Many were scared away by earlier performance contracts, in which hospitals and some government agencies didn't save as much as they expected. In the 1980's and early 1990's, the contracts were usually structured to give the company a share of the savings. Those incentives encouraged companies to maximize profits by doing the least amount of work to save the amount of money specified in the contract. But the long-term benefits for the institution were dubious.

Mr. Zachwieja, the West Virginia consultant, says that if colleges are careful about what they specify in their contracts, the real savings will come after the contract expires, as newly installed equipment continues to cut energy costs for years.

"Some companies are structuring contracts that only give benefits during the life of the contract," he explains. "You really aren't saving any money unless you get benefits that are lasting."

Louisiana State, for example, decided that it wanted all of the energy savings rather than sharing them, and, in 1992, bought out its contract with CES/Way International, an energy-contracting company, which has since been acquired by Houston-based Sempra Energy.

"We didn't really need the savings guarantee, because the savings were there, the technology was proven, and it was, in our minds, a low-risk project, so we took it over ourselves," says Mr. Kelley, the facilities director.

Colleges also feared losing control of the operation of their buildings, something that indeed came about in early contracts.

"Some schools have moved forward with contracts without fully understanding what they were doing," says Mr. Zachwieja. "Let's say they agree to a shutdown schedule — the lights shut down at a certain time, as opposed to before, when a custodian just shut down the lights on a room-by-room basis. Then the college decides to go to a nighttime-use schedule. Then it won't be able to produce the savings that were projected in its contract. How do you deal with that? All those possibilities must be considered."

Some college officials say they think such kinks have been worked out.

Sherwood G. Wilson, associate vice president for facilities and auxiliaries at Ohio University, believes that more institutions will sign the contracts as an answer to deferred-maintenance problems.

"We are faced with a backlog of deferred maintenance," says Mr. Wilson, who estimates Ohio's total at $55-million. "We have resources that fall a long way short of covering all of our needs." The contract will allow Ohio to take care of more than $10-million of the backlog.

Nationally, deferred-maintenance costs for colleges reached an estimated $26-billion, according to a 1996 report by the facilities-officers association. Chipping away at that total will become a big selling point as more companies approach colleges about the contracts, says Mr. Proffitt, of Johnson Controls.

"Everyone has looked at the K-12 market, and this has worked at K-12," he says. "You look at universities. There are greater bureaucracies, they may have credit issues, they have more-complex systems. Quite frankly, you go where the low-hanging fruit is, and that has been the school systems. The more-complex clients usually come later."

At Ohio, it took three years to get the administration, the Board of Trustees, and the state Board of Regents to approve the contract, mostly because of bureaucratic problems, says Mr. Wilson. When key financial people left, he had to explain and justify the contract to their replacements. It is one of the largest performance contracts ever signed by a university.

Then there is the cultural shift for a region where the economy is centered on energy consumption.

Ohio University has always been run by burning the very ground beneath it. Like clearing a forest to build a log cabin, the university has counted on nearby coal mines to stoke the boilers in the bowels of its sprawling campus.

But then came the Clean Air Act, and black-lung disease, and acid rain, and unemployment for many of the miners who dug up the ore that, in this part of the world, is particularly high in pollution-causing sulfur.

"We have tried to support the local industry, but this is even better," says Gene Mapes, an associate professor of environmental and plant biology and director of environmental studies. "I think this is a real leadership role, because we are modeling behavior." The university is trying to get area residents to acknowledge that the local economy must shift its emphasis from coal to tourism and small industry.

CREATING A LONG-TERM RELATIONSHIP

Construction is set to begin in June on the first phase of the contract with Vestar, in which the company will make changes in nine of the 200 or so buildings on campus.

"Our math building is a huge building, with lots and lots of lights that are inefficient," says Mr. Wilson. "Our library is the same way." In addition, showerheads and perhaps toilets will be changed in two residence halls to models that use less water. The power plant will get new controls, which will more closely match energy production to demand.

This is the beginning of a relationship that is expected to last for 20 years, says Mr. Wilson. The project will comprise five phases, with one starting every two years. Each phase will have a guarantee that the costs will be repaid by energy savings over the ensuing 10 years. Ohio can terminate the contract after any of the phases.

SAVING $25-MILLION

If the university goes through with all of the phases, the contract guarantees that Ohio will save $25-million, although Mr. Wilson and Vestar officials have analyzed only about half of the seven million square feet of building space on the campus.

Construction costs in the first phase are estimated at $4.2-million. Ohio University is financing the project itself, probably with bond issues. Financing costs for the first phase are estimated at $23 1,000. If the changes in the first phase save $700,000 a year, as projected, the savings will have paid for the costs, including financing, in a little more than six years. Each succeeding phase will involve more-complex projects, with longer payback schedules. Plans are still being drawn up for those phases.

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Mr. Wilson says he has not calculated how much all of the work will eventually save the university. In the first phase alone, he says, the equipment being installed will continue to save Ohio $700,000 annually for 20 years. The total savings after subtracting the cost of the equipment and financing would exceed $9-million.

At Louisiana State, the annual energy bill before the performance contract was $12.5-million. Now it is about $8.5-million, even with 10 percent more students on the Baton Rouge campus, says Peter N. Davidson, director of energy services.

The contracts are structured to guarantee that the savings will cover not only the costs of construction, new equipment, and financing, but also, in some cases, a fee, generally ranging from 1 to 4 percent of the size of the contract, for a guarantee that the contractor will make up the difference if the college's projected savings fall short of expectations.

Usually, the savings guaranteed in the contract are about 80 percent of the company's estimated energy-cost reductions, says Michael Besspiata III, director of facilities management at Georgetown College, in Kentucky.

Johnson Controls last year paid out about 1 percent of the total savings it guaranteed but could not meet in its $1.6-billion worth of contracts, says Mr. Proffitt.

As performance contracts become more common, Mr. Besspiata says, any size institution can benefit. Georgetown College, for example, signed a $750,000 performance contract last year with Enertech, a subsidiary of LG&E Energy Corporation.

Mr. Besspiata moved to Georgetown in May 1998, from the Southern Baptist Theological Seminary. Both institutions have fewer than 2,000 students. And each one now has modern energy-management systems, which tightly control energy use across the campus, paid for by the savings produced in performance contracts.

"I think a lot of colleges think they are too small to really get much benefit," says Mr. Besspiata. He projects savings in the current fiscal year of $85,000 on a typical annual utility bill of $1-million. "That's real money," he says. ■

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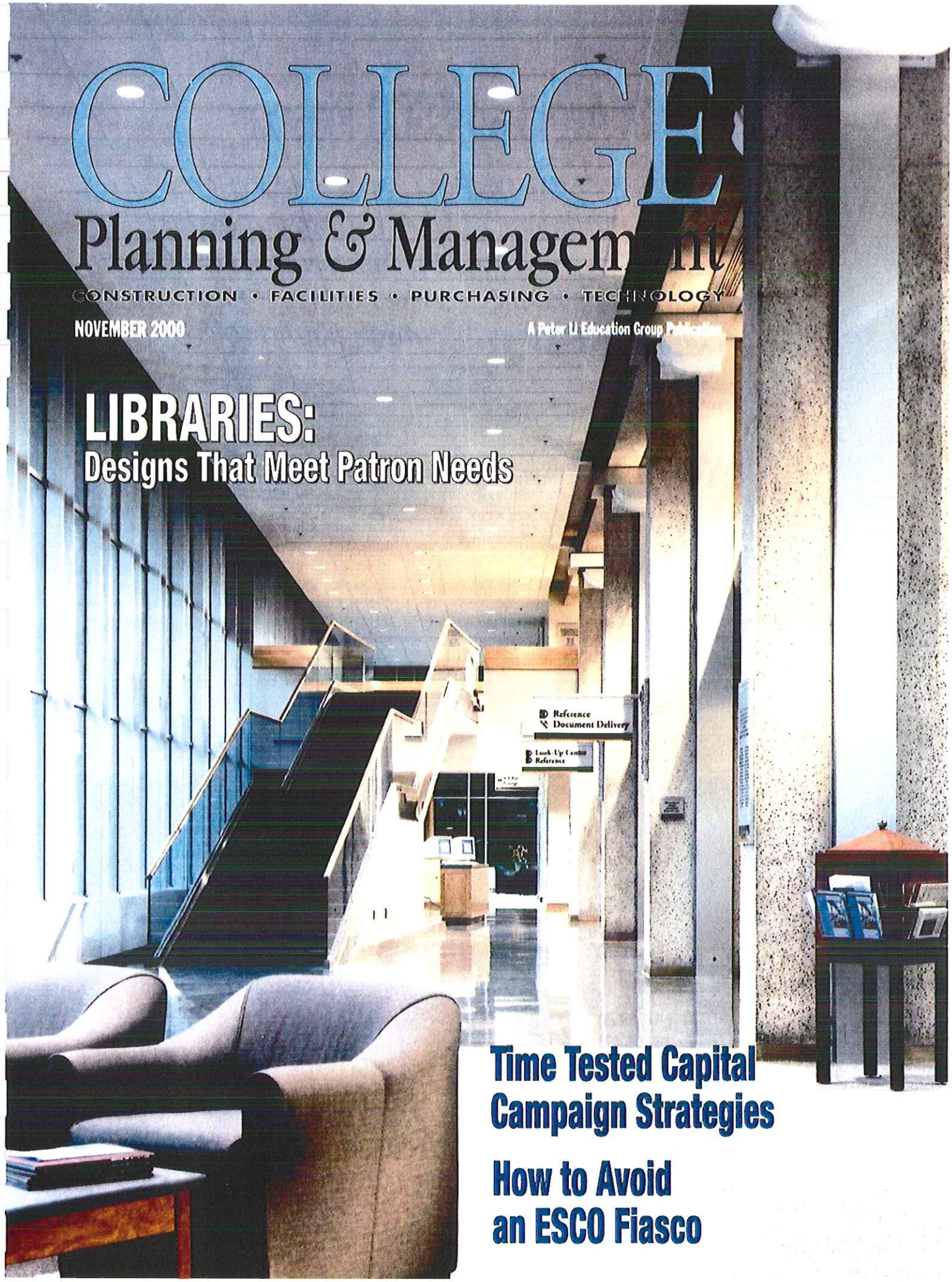

COLLEGE Planning & Management

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NOVEMBER 2000

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LIBRARIES:
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How to Avoid an ESCO Fiasco

How to Avoid an ESCO Fiasco

Facility managers at Ohio University used a performance contracting consultant to assist them in hiring an energy services company that could implement an energy conservation project.

by Dorothy Wright, staff writer

Performance contracting seems like a win-win proposition: Work with an energy services company (ESCO) to implement an energy conservation project that will improve facilities and lower energy and operating costs. Pay the ESCO using the energy savings — not capital funds. After the payback period, keep the savings. Yet many college and university facilities planners are reluctant to do so. Some lack experience with this approach to funding and implementing a facilities project. Others have heard of cases in which a project simply did not deliver results or, worse yet, an educational institution became embroiled in litigation with the ESCO.

Facility managers at Ohio University in Athens, Ohio, found an effective solution: They relied on an independent consultant experienced in performance contracting to guide them through the process of selecting an ESCO. Now the university and its ESCO are in the first phase of implementing an energy efficiency project comprising new and upgraded lighting, heating and ventilation systems; enhanced building controls; and water conservation measures, including low-flow plumbing fixtures. When the project is completed, the university will save $2 million to $2.5 million a year in energy and operating costs, which will pay for the project within 10 years. After the payback period, the

Photo courtesy Ohio University

Ohio University's independent consultant helped administrators select an ESCO to implement an energy efficiency project that will save $2 million to $2.5 million a year in energy and operating costs.

university will retain the annual savings.

Founded in 1804, today Ohio University is an educational community of 20,000 students and 3,500 faculty and staff. The 1,700-acre campus has some 190 buildings comprising a total 6.7 million square feet. In the 1970s the university created an energy management fund to carry out energy conservation projects, implementing a number of effective initiatives through the years. In the mid-1990s, with utility costs projected to rise to $19.1 million by 2020, the university knew it was time to make a major investment in upgrading its infrastructure and increasing energy efficiency.

The university's facility managers first identified performance contracting as a means to implement a new central chilled water plant. "Initially, the university saw no way to do this with existing resources, so we started looking for alternatives," says Terry Conry, director of Facilities Management. "While we have an outstanding staff, we didn't have anyone who personally had gone through a performance contract selection or implementation process. We were concerned about it, and we looked for help."

Selecting a Consultant

The consultant's key service would be to assist the university in selecting an ESCO. Through open advertisements and direct invitations, consultants were invited to submit their qualifications for consideration. After an evaluation of the RFQs, the university's facilities management team developed a short list of consultants, who were asked to provide the university with a proposal detailing their experience in the field of performance contracting. References were carefully checked, and interviews were conducted with finalists. All members of the consultant's staff who would be assigned to work with the university were required to be present for the interview.

The consultant's past experience with similar projects in colleges and universities was essential to Ohio University. "The consultants were asked to provide a list of at least five performance-based energy projects completed in the higher education environment," explains Ted Fares, director, Engineering and Technical Services, Ohio University.

Candidates were required to prove their expertise in design, planning, specifications, implementation and monitoring of energy conservation projects. "They had to be capable of analyzing energy use at our facilities and making recommendations for energy conservation projects which, if implemented, would provide guaranteed energy savings to Ohio University," Fares says.

Most important, they needed past experience in awarding similar contracts to ESCOs. "Knowledge of the legal and financial issues surrounding performance contracting was essential," Fares says.

In addition, the consultant needed to be able to train the university's staff in operation, final inspection and commissioning.

As a result, the university selected ZDS DESIGN/CONSULTING SERVICE. Based in St. Albans, W.Va., and Cincinnati, Ohio, ZDS is a consulting engineering firm specializing in mechanical and electrical engineering, indoor air quality, commissioning and energy conservation projects.

ZDS had previously worked with the university in a traditional design and mechanical/electrical engineering role. "Our role in this project was to assist the university in defining its needs, ensure that the structure of the program met these needs and guide the university in its selection of a performance contractor," says Todd Zachwieja, principal, ZDS.

Selecting the ESCO

The ESCO was selected through a two-step, RFQ/RFP process. The university advertised internationally, nationally and locally in trade magazines and newspapers. The advertisement required all candidates to attend a meeting at Ohio University to obtain the RFQ document, walk through the campus and participate in a question-and-answer session.

RFQ submittals from 14 ESCO candidates were evaluated and candidates short-listed by a committee of 12, comprising the university's architect, facility engineers, energy managers, administrators and service personnel, and ZDS. The two ESCOs who made it past the first cut were required to submit a detailed RFP.

The two-step process lengthened the selection process by about eight months, Conry says, while at the same time streamlining it. "ZDS provided a template that the companies had to respond to, to keep them from burying us in paper," he explains. "We asked everyone clear, concise questions, then limited the amount of additional information they could add. Nevertheless we got two- to three-inch-thick binders back from each firm. We took a lot of time going through those and checked references carefully."

Conry says one of the advantages of the two-step process is that it effectively narrows

the field for the RFP. "If we had had the complete RFP done by 14 companies we would have had a mountain of paper," he says. "This streamlined the process even though the initial step took extra time."

Conry says there were a lot of similarities among candidates, but some distinct differences revealed by the RFQ. "One is the level of experience in performance contracting in higher education," he says. "Second, some had more solid in-house engineering teams and wouldn't need to go to subcontractors as much — we liked that accountability. Third, they differed in their philosophies of project staging and customer service."

The RFP got to the nitty gritty. "We said, 'Here are sample buildings: We want you to bring in your engineering team and give us specific proposals for improvements, tell us what the cost savings are, and explicitly show us how you calculated these cost savings,'" Conry says. "That allowed us to see how creative their engineering teams were, how sensitive they are to occupants during the implementation/construction, and how conservative or liberal they were in calculating the energy savings on a given measure. It was good to have that type of in-depth analysis of fewer firms."

As a result, the university selected as its energy services partner Vestar, an energy efficiency design, engineering, construction and facility operation firm with headquarters in Cincinnati, Ohio, and Toronto, Ontario.

Ironically, design and construction of the chilled water plant, which initially drove the university to explore performance contracting, is not part of the performance contract with Vestar. Conry says it did not have a quick enough payback — 10 years, as required by Ohio state law. That project is proceeding in phases under a separate contract, funded with Ohio University operating money, revenues accrued in its energy management fund and bonds, he says, "but coordinated with the energy performance contract to make sure that the system we are building is efficient and that we have controls in place that allow it to be operated efficiently in the future."

Consultant Proves Beneficial

Considering that the energy efficiency program implemented under the performance contract will save the university more than $2 million a year, Ohio University's facility planners and managers are convinced that their consultant, **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, associate vice president for Facilities and Auxiliaries. "It is also important when you are doing something new to have an independent consultant to help convince trustees and administrators of the validity of the approach. Performance contracting was a new concept here."

Indeed, it's still a new concept. "Many universities really don't understand performance contracting, and they are scared to death of it," he says. "Performance contracting can be as little or as much as you want it to be — it is a concept, not a template. It can be styled and adjusted to meet the needs of your own campus."

But many administrators and planners shy away from hiring consultants. "They see consultants wanting to charge fees to guide them through a process they think they can already do themselves," Wilson says. "Our energy management program was very successful through the years, but it only picked the 'low fruit.' We still identified a need for a $25- to $30-million performance contract."

That's why hiring a consultant is smart business, Wilson says. "Having a professional to get you started is worth every penny."

Awards

AMERICAN INSTITUTE OF ARCHITECTS - HONOR AWARD FOR EXCELLENCE IN PLANNING & DESIGN PROJECTS , 2012 - Upper Big Branch Miners Memorial.

AMERICAN INSTITUTE OF ARCHITECTS - MERIT AWARD FOR EXCELLENCE IN PLANNING & DESIGN PROJECTS , 2012 - Nuttallburg Mine Complex.

AMERICAN COUNCIL OF ENGINEERING COMPANIES-WV - ENGINEERING EXCELLENCE AWARD, 2012, Gold Award - Water & Wastewater Category for the Corporation of Shepherdstown Wastewater Treatment Plant Project.

AMERICAN COUNCIL OF ENGINEERING COMPANIES-WV - ENGINEERING EXCELLENCE AWARD, 2012, Gold Award - Transportation Category for the Appalachian Regional Airport Project, Mingo County.

WINNER - "COMMISSIONER'S ENGINEERING ACHIEVEMENT AWARD", WVDOT - DIVISION OF HIGHWAYS - 2011: Large Roadway Category for WV10 North Davy Branch to Rum Creek; 2000: Large Bridge Category for WV10 Buffalo Creek Bridge, Logan County, West Virginia.

AMERICAN INSTITUTE OF ARCHITECTS - MERIT AWARD FOR EXCELLENCE IN ARCHITECTURE, 2009 - Interstate 79 Rest Areas.

AMERICAN COUNCIL OF ENGINEERING COMPANIES-WV - ENGINEERING EXCELLENCE AWARD, 2009, Gold Award - Special Projects Category for the Mercer County Airport Runway Safety Area Project.

AMERICAN SOCIETY OF CIVIL ENGINEERS, 2009, National Superior Employer in the Private Sector Award.

AMERICAN INSTITUTE OF ARCHITECTS - HONOR AWARD FOR EXCELLENCE IN ARCHITECTURE, 2008 - Upshur County Courthouse Restoration and Renovations.

AMERICAN COUNCIL OF ENGINEERING COMPANIES-WV - ENGINEERING EXCELLENCE AWARD, 2008, Bronze Award - Wastewater Category for the Spring Run State Fish Hatchery Improvements.

AMERICAN COUNCIL OF ENGINEERING COMPANIES-WV - ENGINEERING EXCELLENCE AWARD, 2007, Silver Award - Structures Category for the Mercer County Airport Runway Safety Area Project.

AMERICAN COUNCIL OF ENGINEERING COMPANIES -WV - ENGINEERING EXCELLENCE AWARD, 2003, Gold Award - Water Treatment Category for the City of Fairmont Water Treatment Plant Project.

FINALIST - "COMMISSIONER'S ENGINEERING ACHIEVEMENT AWARD", WVDOT - DIVISION OF HIGHWAYS - 1999: Large Roadway Category for WV10 Buffalo Creek - Taplin Project; 2000: WV10 Buffalo Creek - Huff Junction Project, both in Logan County, West Virginia.

AMERICAN COUNCIL OF ENGINEERING COMPANIES-WV - ENGINEERING EXCELLENCE AWARD, 1999, Silver Award - Water and Wastewater Category, for the City of Beckley Piney Creek Wastewater Treatment Plant Project.

ENTREPRENEUR OF THE YEAR AWARD - FINALIST, 1999 and 2000, Sharon L. Chapman, President, was named one of twenty finalists in the West Virginia Area Entrepreneur of the Year Award. Sharon was recognized for leading Chapman Technical Group to become one of the most highly regarded engineering firms in the state after the death of her husband and company founder, Harvey R. Chapman.

"EXPECT THE BEST FROM WEST VIRGINIA AWARD", 1998, Charleston Regional Chamber of Commerce.

HONOR AWARD, West Virginia Chapter of the American Society of Landscape Architects, 1994, Shrewsbury Street Area Redevelopment Plan, for excellence in planning and design projects. Joseph E. Bird, ASLA, Project Manager.

"GOVERNOR'S AWARD FOR ENGINEERING EXCELLENCE", 1990, The West Virginia Chapter of the American Public Works Association, in recognition of outstanding Public Works Engineering and Design of Projects within West Virginia.

DUNDEE CEMENT COMPANY ANNUAL DESIGN AWARD, 1988, Yeager Airport Taxiway Overlay Project. Harvey R. Chapman, P.E., Project Manager.

"GEORGE WARREN FULLER AWARD", Harvey R. Chapman, P.E., 1984, Robert G. Belcher, P.E., 2001, and Sharon L. Chapman, 2005, Jeffery D. Ekstrom, P.E., 2010, American Water Works Association, for distinguished service in the water supply field in the State of West Virginia.