R3A

EXPRESSION OF INTEREST

MARSHALL UNIVERSITY
SCIENCE BUILDING FEASIBILITY STUDY

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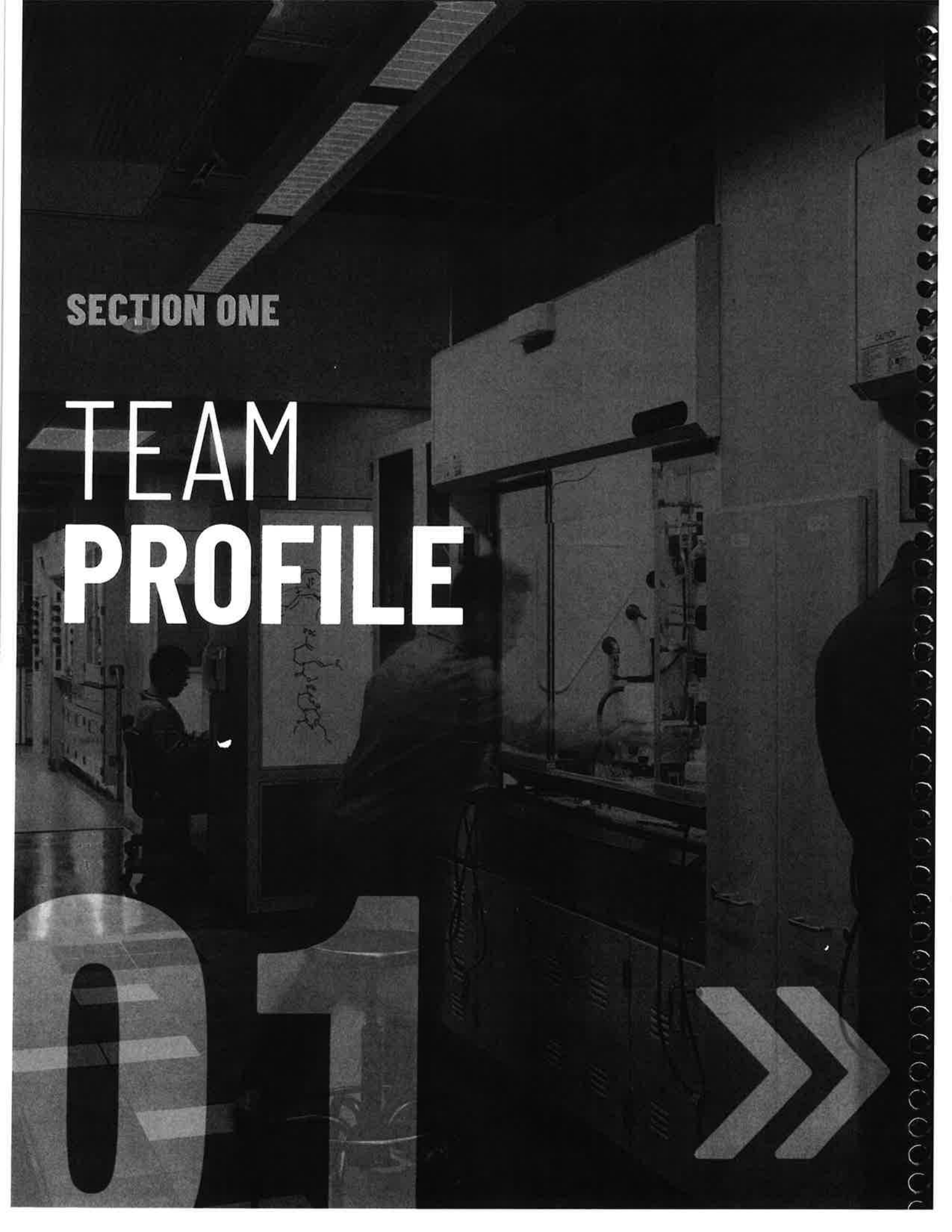


SECTION ONE

TEAM PROFILE

01

R3A

April 29, 2021

Marshall University
Office of Purchasing
Room 125,
Old Main Building
One John Marshall Dr.
Huntington, WV 25755-4100

RE: Marshall University Science Building Feasibility Study

We are appreciative of the opportunity to present the credentials and experience that our Feasibility Study Team brings to this assignment and we are confident that if selected to assist Marshall University with re-envisioning the future of the Science Building our methodical process will be both comprehensive and engaging for all the MU participants and all will recognize that their concerns were heard and understood and to a meaningful extent reflected in the recommendations and solutions our team presents for inclusion in the study.

Winning solutions will include the following components: A harmonious balance of building history, forward thinking on the procedural and physical opportunities for science education, enabling advanced research, and the provision for impromptu and accessible spaces for interaction between researchers, educators, and students so that learning opportunities for all occur everywhere.

Out team welcomes the challenges of learning / visioning and then adapting a historically significant 1950's Georgian Revival building that was expanded most recently in 1984 and that now needs to integrate new elements, systems infrastructure and procedural paradigms that will permit the building to successfully serve for the next 40 years.

We appreciate the University's interest in offering facilities that advance research from the lab bench to the marketplace and that these facilities need to cultivate a dynamic, engaging, and collaborative learning and research environment. As teaching pedagogies evolve to adapt to an ever changing technologically driven marketplace, the proposed renovation to the Marshall University Science Building must also adapt to accommodate activity based collaborative and flexible modes of teaching and research that not only functions efficiently but also offers opportunities for chance interactions between faculty, researchers, and students, that is where learning takes place.

Given our experience re-envisioning existing buildings, we understand the challenges that come with updating infrastructure, improving floor plate utilization, and improving the thermal performance of the envelope while maintaining the historic character of the building and permitting updates and changes to occur while the building remains in operation. Having completed numerous science and technology projects for varying disciplines, our knowledge equips us to understand the complexities associated with developing up-to-date flexible laboratory environments. Our client-centric project approach is motivated by working collaboratively and interactively with the MU team through all phases of the feasibility study, which we characterize as Methodology & Approach:

- **Areas of Investigation**
- **Approach**
- **Key Considerations**
- **Project Understanding**

We focus on thoroughly understanding key project visions and objectives and implementing strategies to effectively develop design solutions that embody them. We have learned that it is this synergistic relationship that is the key to a compelling and successful project.

James Sheehan, AIA, NCARB, LEED AP
Principal, R3A Architecture
(412) 431.2480 x 120 | JAS@r3a.com

Chris Gruendl AIA
Associate Principal, R3A Architecture
(412) 431.2480 x 143 | CTG@r3a.com

TEAM / PROJECT ORGANIZATION

OWNER | MARSHALL UNIVERSITY

R3A ARCHITECTURE
Science Facility Planning

WYK ASSOCIATES
Code, Constructibility, Local Market Knowledge

CJL ENGINEERS
Mechanical / Electrical / Plumbing / Fire Protection

ALLEGHENY DESIGN SERVICES
Structural Engineer

M3CM
Cost Estimator

INTERTEK PSI
Industrial Hygenist

TEAM / ABOUT R3A ARCHITECTURE

R3A Architecture was founded on the idea that thoughtful, contextual design can improve the way we live, work, & learn. We work closely with our clients, using design as a catalyst for envisioning futures that are more equitable, connected, and empowering for all.

Located in Pittsburgh's dynamic South Side neighborhood, our multi-generational team is led by principals James Sheehan and Deepak Wadhwani. While our portfolio is diverse, we have strong expertise in the design of science and technology, higher-education, and workplace facilities.

We believe that architecture has the power to transform people's daily lives, and we don't take that responsibility lightly. Our approach to designing human-centered spaces foregrounds the daily paths, interactions, and physical requirements that comprise daily life in a given environment. In service of facilitating, streamlining, and even spicing up the routine relationships between a space and its users, we create facilities that promote wellness, productivity, sustainability, and a sense of joy.

With personal attention paid to each project by our principals as well as our flexible and proactive approach, we have formed working relationships with clients that last years and even decades. R3A has earned 30+ awards, and while we are grateful for these honors, we measure our success by these lasting relationships and our clients' continued trust.

SERVICES WE OFFER

- Architecture
- Interior Design
- Furniture, Fixtures & Equipment
- Project Management
- Feasibility Studies
- Master Planning
- Lab Planning
- Infrastructure Upgrades
- Adaptive Reuse
- Sustainable Design
- Move Management
- Consulting Engineering

TEAM INFORMATION

R3A ARCHITECTURE

Science Facility Planning

Pittsburgh, Pennsylvania

R3A is deeply committed to the success of the region, because we are involved citizens of the communities our buildings serve. We have designed over 40 projects local public and civic projects with the City of Pittsburgh and surroudning counties. Our deep local expertise allows us to understand the context, history, local players, and regional design trends that impact our industry, and also, how to navigate jurisdictional reviews as well as respond to trends in the regional bidding market.

We understand that each project is driven by a number of critical forces that need to be reconciled through a faithful design campaign. Historic context, sustainability, functionality/durability, security and value each offer unique design considerations and challenges. Our team not only appreciates the need to carefully evaluate and address these considerations but we view these constraints as the framework that sparks our creativity.

At R3A, we see an intrinsic relationship between form and process, where your project's unique considerations and challenges have a profound role in guiding our design decision making. We understand form and interior atmosphere not as a preconceived notion, but instead as a critical response to a number of project forces each requiring study and analysis. To structure our design approach and to explore opportunities for innovative and cost-effective solutions we follow a methodology that consists of three major steps. We lead our clients through this process to help co-create resonant, thoughtful architecture that responds to each project's specific constraints

WYK ASSOCIATES

Code, Constructibility, Market Knowledge

Clarksburg, West Virginia

Established as a full service architecture firm in 1900, then named Edward J. Wood Architect, WYK Associates, Inc. has been located in Clarksburg for 120 years. Through innovative and thoughtful responses to the unique issues of each project, our goal is to create places that fi t the needs and desires of those who use them.

Our team approach integrates the collaborative strengths of each member to produce a solution of balance between design quality, schedule and budget. We have always considered sustainability, the built environment, and quality of life long before the public began to focus on its benefi ts. We take seriously the responsibility of designs and solutions to be cost effetive and operate efficiently throughout the building's lifecycle.

CJL ENGINEERING

Mechcanical, Electrical, Plumbing, Fire Protection

Morgantown, WV | Pittsburgh, Pennsylvania

Established in 1938, CJL Engineering is a full service, mechanical, electrical, plumbing, fire protection, and civil/structural consulting engineering firm known for mastering the most challenging projects in the region.

With offices in western Pennsylvania, eastern Ohio, northern West Virginia and Maryland, our super-regional focus has enabled us to become one of the preeminent MEP firms in the industry, proudly serving a wide range of specializations and clients. University Projects are a major focus of CJL Engineering's practice.

Our firm has been involved in designing MEP systems for universities for 83 years. University work accounts for 25% of our annual billing. Our experience over the past 5 years represents over $1.2 billion total construction cost and approximately 25 million square feet of university facilities design.

Our West Virginia office is located at 1097 Chaplin Road, Morgantown, WV, 26501. Matthew Corathers, a WVU Graduate and Mechanical Engineer is the Manager of the office.

CJL has 7 Licensed Professional Engineers in the State of West Virginia. CJL is currently the MEP/FP Design Professional for the new WVU Medicine Children's Hospital and the new West Virginia University Business and Economics Building.

ALLEGHENY DESIGN SERVICES

Structural Engineering

Morgantown, West Virginia

Allegheny Design Services is a consulting engineering firm specializing in Structural & MEP building design and analysis.

Dedicated to serving West Virginia and the surrounding region, ADS recognizes the need for reliable and full service engineering service for our clients. ADS provides all phases necessary to successfully complete a building project including: schematic design, design development, construction documents and specifications, and construction administration.

Our straightforward approach provides our clients with efficient and creative solutions to their project.

INTERTEK PSI

Industrial Hygenist

Pittsburgh, Pennsylvania

Intertek/Professional Service Industries, Inc. (Intertek-PSI) is a nationally recognized consulting engineering, and testing firm, providing integrated services in several disciplines, including environmental consulting, building envelope consulting and commissioning, geotechnical engineering, construction materials testing and engineering, asbestos management, and facilities engineering and consulting. We are a leader among the nation's independent testing organizations and rank among the country's largest consulting engineering firms.

Intertek-PSI has been providing businesses and industry with objective, accurate and useful information for more than 138 years. Today, our Building and Construction Group employs approximately 4,000 skilled personnel in 100 offices nationwide. The B&C Group also has offices in China, India, the United Arab Emirates and Great Britain.

M3CM CONSULTANTS, LLC

Cost Estimator

Pittsburgh, Pennsylvania

M3cm Consulting, llc offers a wide variety of services as an Owner's Representative for construction project delivery. We provide both project management and cost estimating services to owners and design teams and bring relevant construction management experience and knowledge to projects primarily related to athletic, lab and research, academic, and healthcare facilities.

Working together increases the team synergy and passion, which results in a high-energy collaborative team effort capable of making confident, informed decisions. In addition to project management and leadership, the services M3cm provides during estimating services include:

Cost Estimating - Accuracy in estimating at every phase of a project is critical to ensuring budget certainty throughout the design process for any construction project. M3cm's expertise in providing cost estimates at each phase of design includes initial Feasibility & Conceptual Phase, Schematic Design Phase, into Design Development and ultimately through the final Construction Documents phase.

Design Management - In conjunction with costing at each phase of design, engaging M3cm's services during design allows for 3rd party evaluations of many of the building systems and building materials to be analyzed to inform both schedule and budget.

TEAM / ORGANIZATIONAL CHART & PERSONNEL

R3A ARCHITECTURE

JAMES SHEEHAN
Principal-in-Charge

CHRIS GRUENDL
Associate Principal, Project MANAGER

JON WILLIAMS
Project Architect

WYK ASSOCIATES

JAMES SWIGER
President & Principal

STEPHEN KELLEY
Sr. Project Manager

CANON FANCHER
Designer & BIM Coordinator

M3CM

PETER MASTRO

JACLYN A. KRAWCZYK

JAMES M. VIZZINI III

CJL ENGINEERING

JAMES M. VIZZINI

TIMOTHY C. BERTOLINO

ADAM B. HALE

MATTHEW C. CORATHERS

INTERTEK PSI

LARRY W. TROUTMAN

DOUGLAS FINKE

ERIC OLDROYD

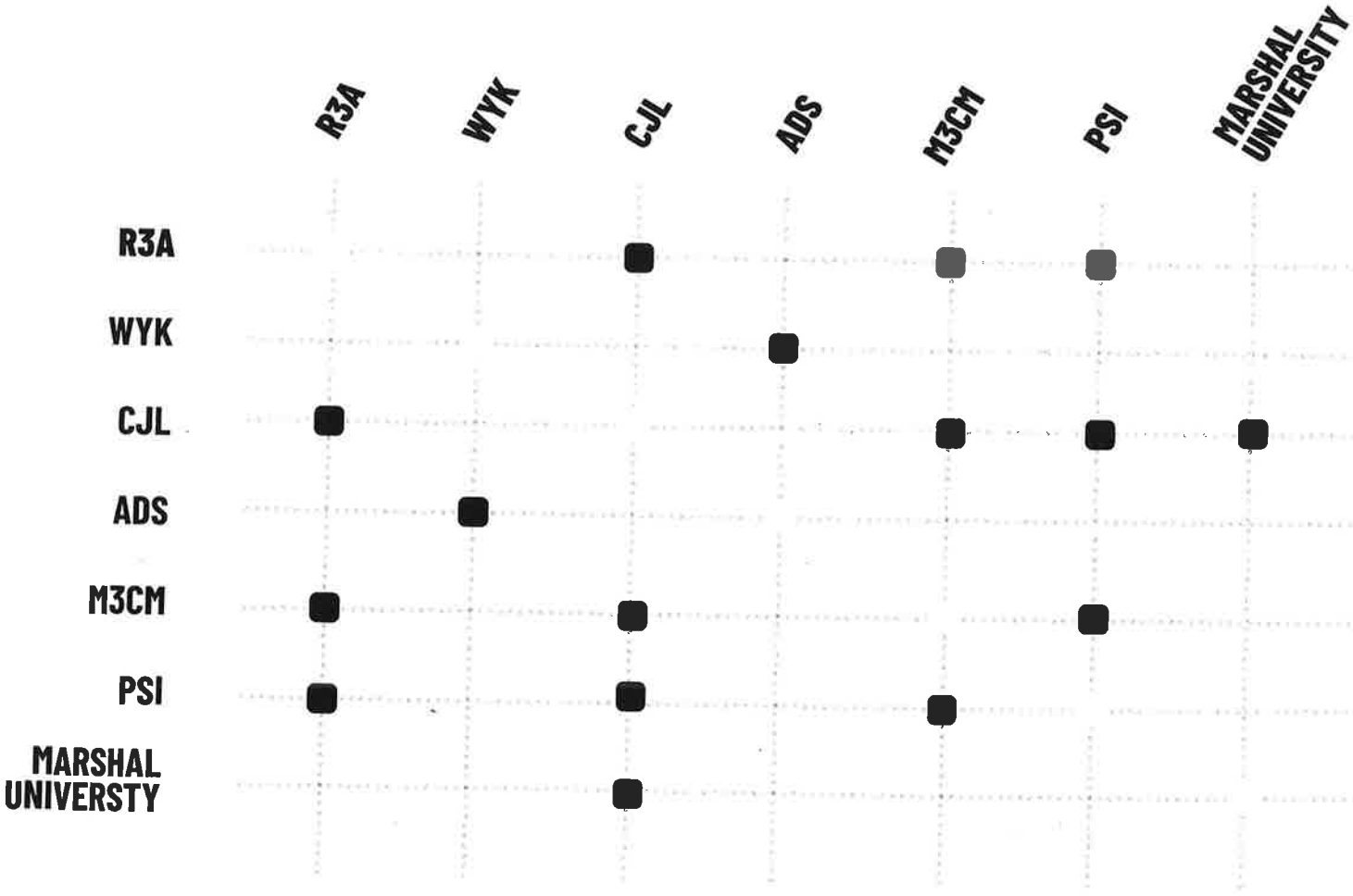
ALLEGHENY DESIGN SERVICES

DAVID SIMPSON

JASON ROBINSON

TEAM / COLLABORATION MATRIX

The matrix below demonstrates our team's rich collaborative inter-relationships. With offices and headquarters in West Virginia and Pennsylvania, many of our team members have had the opportunity to collaborate on previous projects. Every consultant on the roster has been vetted via their relationships to either other team members or on referral from another trusted partner. The strong history of professional relationships at work in this team's composition will lead to a smooth, efficient, and synergetic project timeline.



TEAM / DETAILED ROLE SUMMARIES

R3A ARCHITECTURE was introduced to WYK Architects through GAI Consultants, a planning, engineering & environmental consulting firm that both of our companies have worked with. R3A and WYK had strategized on making the opportunity for both of our firms to partner on a project in West Virginia. During our due diligence evaluation of each firms mission and team strengths we recognized a shared mission of empowering our clients by providing them with thorough and accurate project research information and that each of our firms had the experience of turning initial client engagements into ongoing and repetitive engagements for additional projects and assignments.

Since the regional market space, we each occupy, did not overlap we found that we were not competitors but great candidates for teaming on assignments where the individual strength of each of our organizations would support and amplify the skills of the other. This is the reason that our joint pursuit of the Marshall University science building feasibility study presents an opportunity to serve a new client with the unique skills, experience, and abilities that each of our firms can bring to this feasibility study . R3A Architecture and CJL Engineering have partnered on more than 40 projects over the last 15 years totaling over $50.5 million. The majority of our partnerships have been to serve our higher education clients including Carnegie Mellon University, The University of Pittsburgh(multiple campuses), Penn State University(multiple campuses) and Duquesne University to name a few. Given our extensive partnering on numerous projects, we have developed collaborative processes that enhance project delivery and document accuracy and efficiency. The overview of the combined services of each of the firms will be the following:

R3A ARCHITECTURE'S ROLE WILL INCLUDE:

1. EVALUATION of how to assess the best utilization of the facility to support the sciences being performed and the teaching being provided with the planning necessary to anticipate both the near term and long-term future facility flexibility requirements for the following:

a. program and pedagogy improvements

b. instrumentation and scientific equipment updates

c. ready access to the infrastructure systems so that future modifications are anticipated and planned for.

d. providing for impromptu learning zones along circulation routes for instructor / student or PI / lab team interactions with provided connectivity, white boards, casual seating

e. provide amenity / break zones where multiple disciplines can have chance encounters; that is where innovation happens.

2. IDENTIFICATION of applicable trends in lab space planning relating to both research and teaching environments. This could include moving individual PI "real estate domains" to open-planned "ball room" spaces that permit bench assignment modification, to ebb and flow with the success or failure of the PIs to win new grants. All enabled without any special reconfigurations.

3. EXPLORATION of space utilization and efficiency strategies to densify certain support functions which in turn re-assigns the freed-up floor area back into usable area for a net increase to program space.

4. EXPLORATION and Evaluation of potential current trends in strategies to implement robotics and automation for functions that are currently provided by human activity, this is a space and infrastructure realignment.

5. EVALUATION of types and quantities of chemicals, solvents and bio-agents used and the reevaluation of control and containment with the support of the MU EH&S department.

6. EVALUATION of current staffing by department to understand current program requirements and the identification of both anticipated department growth and its impact on various programs including the ebb and flow of senior staff and new hires as related to space allocation.

7. EXPLORATION of opportunities for shared central instrumentation facilities to increase space utilization.

TEAM / DETAILED ROLE SUMMARIES

WYK ASSOCIATES' ROLE WILL INCLUDE:

1. PROVIDE insight and understanding of West Virginia and local construction market

2. EVALUATION of current and future code and regulatory requirements that the State of WV, City of Huntington and all the associated AHJ's, authorities having jurisdiction, will impose on the facility when improvements and changes are performed on the building.

3. IDENTIFICATION of the procedures for coordination with all utility and infrastructure providers and determination of sources of impact on the local and regional environmental services providers.

4. INVESTIGATION of in-building modifications that will impact the life safety, energy utilization and constructability of the recommended physical changes to be identified in the feasibility study.

5. ON-SITE evaluation of all as-constructed conditions for cross referencing with the currently documented as-built conditions,

6. EVALUATION of current envelope conditions and recommended upgrades needed for enhanced energy performance.

7. IDENTIFICATION of the economics of the construction market in WV as a whole and in Huntington in particular so that our Cost Estimation consultant can have a source for verifying detailed market conditions for general and MEP local and regional construction cost variables.

8. PROVIDE commentary and insight on the major general and specialty contractors and identify their experience with these construction service providers.

CJL ENGINEERING'S ROLE WILL INCLUDE:

1. EVALUATION of operating and environmental requirements, specialized code requirements, ventilation and exhaust, air balance and pressure requirements, and industrial processes that are served by the MEP systems.

2. EVALUATION of operating hours, ie, 24/7/365 or M-F, etc. and the reliability requirements, ie, Mission Critical, tight tolerance or standard business. This give us the context for how the MEP systems need to operate and be controlled.

3. CONDUCT field survey and analysis of the existing systems. This will include on site visit by experienced mechanical, electrical and plumbing engineers to visually inspect and evaluate the age and operating condition of existing equipment.

4. EVALUATON of drawings and specifications and revisions to provide an overall understanding of the MEP systems. This will be then cross-checked against the survey information.

5. CONDUCT discussions with operations staff to determine how the systems are maintained and controlled, whether there are existing operating issues, and any insights they may have on potential improvements. Operating personnel are typically an invaluable resource on how the facility could best be served by MEP systems.

6. CONDUCT a review of utility bills to evaluate energy usage and peak demand characteristics for seasonal variations.

7. CONDUCT owner-required on-site testing if needed. This can include water flow, pressure tests; NETA electrical testing; thermal imaging for electrical

TEAM / ROLE SUMMARIES

systems evaluation or thermal losses; air flow and balancing; non-destructive testing (x-ray or ultrasound) or lab samples of piping systems to determine age and condition; ground penetrating radar; cameras run through underground piping and conduit.

8. PERFORM architectural and MEP systems code review and confirm upgrade requirements, in particular for life safety, ADA, energy, ventilation or exhaust. If major renovations are envisioned, meetings with local and state code officials are typically warranted and of benefit to anticipate requirements.

9. UPON request, CJL has the capability to develop computer-based energy models to evaluate upgrade cost/benefits for replacement MEP systems, such as Demand Controlled Ventilation, thermal energy recovery, Variable Frequency Drives, chiller or boiler plant options, thermal storage, Combined Heat & Power, lighting retrofits, etc. Additionally, CJL has the ability to apply Computational Fluid Dynamics (CFD) to help understand complex airflow, life safety or thermal performance issues. Life Cycle Analysis is often performed if there are various options recommended for system upgrades, in order to best understand overall cost and performance benefits. LED lighting retrofits, for example, result in both energy efficiency improvements, as well as significantly reduced maintenance costs.

ALLEGHENY DESIGN'S ROLE WILL INCLUDE:

1. PROVIDE structural assessment of the existing structure as related to potential improvements

2. EVALUATION of known building structural deficiencies; of repairs or deteriorated structural elements.

3. PROVIDE structural recommendations to accommodate building enhancements or additions.

4. IDENTIFICATION of structural concerns that will need to be addressed during the design phase.

INTERTEK PSI'S ROLE WILL INCLUDE:

1. SURVEYING structures designated for renovation or demolition for any Asbestos / Hazardous Materials in accordance with US EPA NESHAP regulations. These surveys would include a visual inspection of interior and exterior areas (including the roof if requested. Destructive inspections can also be performed, if requested); evaluation of material friability and condition; bulk sampling of suspect ACM and laboratory analysis of samples; identification and quantification of hazardous materials; preparation of a final report with findings.

2. SURVEYING structures for the presence of suspect lead-containing and lead-based paints (LBP); poly-chlorinated biphenyl (PCB)-containing equipment; mercury-containing fluorescent lamps (including fluorescent, metal halide, high-pressure halide, high-pressure sodium, and mercury-vapor) and equipment; chloro-fluorocarbon (CFC)-containing equipment, such as refrigerators and air conditioning units; batteries, such as NiCad and lead-acid, located in exit signs and emergency lighting units; and other hazardous materials that may be present at the time of the inspection. PSI will determine, as required, what needs to be removed and disposed or recycled and/or drained/purged by properly licensed personnel, prior to building demolition or renovation.

3. PREPARING a final report to be submitted to the client for review and approval. The final reports will detail the services provided and the results of the investigation. The inspection reports will include information obtained during the surveys regarding the findings at the subject sites, locations and quantities of each ACM and hazardous materials identified, and conclusions based upon this information. The final reports will be reviewed by a PSI Principal Consultant.

JAMES SHEEHAN | AIA, NCARB, LEED AP

PRINCIPAL-IN-CHARGE | R3A

Role: With over 39 years in practice, Jim is R3A's leader in science and technology design. He has developed a specialty in integrated project administration and has been responsible for the delivery of coordinated in-house and on-site management of complex S&T projects. Jim guides his clients through the design process by thoroughly understanding their program requirements, while supplementing this information with personal insight of current laboratory and classroom design.

Principal-in-Charge

Registered Architect:
PA, FL, MI, NJ, NY, OH, VA, WV
LEED Accredited Professional

Carnegie Mellon University,
Master of Architecture, 1982
Temple University,
Bachelors of Science in
Architecture, 1977

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Chevron Science Center
Master Plan & Comprehensive Renovations
Pittsburgh, PA | 160,000 sf.

Carnegie Mellon University
Additive Manufacturing / Workforce Training Center Tenant Fit-Out
Pittsburgh, PA | 60,000 sf.

Mansfield University
Grant Science Center
Mansfield, PA | 55,000 sf.

University of Pittsburgh
Graduate School of Public Health, Phase I & II
Pittsburgh, PA | 292,000 sf.| LEED Gold

Carnegie Mellon University
Civil & Environmental Engineering Lab Reno.
Pittsburgh, PA | ??? sf.

Carnegie Mellon University
Tata Consultancy Services Building
Pittsburgh, PA | 90,000 sf. | LEED Gold

CHRIS GRUENDL | AIA

ASSOCIATE PRINCIPAL, PROJECT MANAGER | R3A

Role: Chris is a Project Architect/Project Manager. His experience includes the design and management of higher education science facilities. Chris has a specific expertise in code analysis, conditions assessments, and presentation of variance requests for specialized code interpretation conditions. He also has vast experience with higher education clients.

Assc. Principal, Project Manager

Registered Architect, PA #407139
American Institute of Architects

Bachelors of Architecture,
Virginia Polytechnic Institute and
State University, 2001

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Carnegie Mellon University
Mill 19 Tenant Fit Out
Pittsburgh, PA | 75,000 sf. | LEEDv4 Gold

Carnegie Mellon University
Additive Manufacturing / Workforce Training Center Tenant Fit-Out
Pittsburgh, PA | 60,000 sf.

Carnegie Mellon University
Computer Cluster Study
Pittsburgh, PA | 89,530 sf.

University of Pittsburgh
Graduate School of Public Health, Phase I & II
Pittsburgh, PA | 292,000 sf.| LEED Gold

Carnegie Science Center
SportsWorks Museum
Pittsburgh, PA | 25,000 sf. | LEEDv4 Gold

Carnegie Mellon University
Tata Consultancy Services Building
Pittsburgh, PA | 90,000 sf. | LEED Gold

STEFANIE PLANT

ASSOCIATE INTERIOR DESIGNER, LAB PLANNER | R3A

Role: Stefanie is R3A's resident Lab Planner, and she will be an integral part of the design team. Stefanie's previous relevant project portfolio includes R&D laboratories, higher education, manufacturing, and corporate office environments. Over the past 13 years, Stefanie has developed a strong expertise in science and technology projects.

Asscociate Interior Designer / Lab Planner

Bachelor of Interior Design, The Art Institutes, 2008

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Penn State University, Main Campus
Research Building East Lab Renovations
State College, PA | ??? sf.

Carnegie Mellon University
Civil & Environmental Engineering Lab Reno.
Pittsburgh, PA | ??? sf.

University of Pittsburgh
Graduate School of Public Health Research Labs
Pittsburgh, PA | ??? sf.

Evoqua Water Technologies
Wet Labs & High Bay Pilot Testing Area
Pittsburgh, PA | ??? sf.

University of Pittsburgh
Chevron Science Center Organic Chemistry Lab & Classrooms
Pittsburgh, PA | ??? sf.

University of Pittsburgh
Chevron Science Center Synthetic Chemistry Lab & Classrooms
Pittsburgh, PA | ??? sf.

JON WILLIAMS

PROJECT ARCHITECT | R3A

Role: As the Project Architect for R3a, Jon brings a wealth of experience in the design of renovations and additions to facilities at numerous institutions of higher education. Jon understands the needs and expectations of the clients like Marshall University, and he will guide the R3a project team to maintain the study schedule while endeavoring to provide innovative design solutions which meet the client's needs and the established project budget.

Project Architect

Bachelor of Architecture, Temple University, 2009

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Carnegie Mellon University
Mill 19 Tenant Fit Out
Pittsburgh, PA | 75,000 sf. | LEEDv4 Gold

Penn State University, New Kensington
Engineering Lab
New Kensington, PA | 1,200 sf.

Nextovation
Digital Innovation Lab
New Kensington, PA | 15,000 sf.

PNC Bank
CLC Cafe & Common Area Renovation
Pittsburgh, PA | 8,668 sf.

Carnegie Mellon University
Doherty / Wean Renovations
New Kensington, PA | 13,526 sf.

CDR Maguire
Pittsburgh Office Renovation
Pittsburgh, PA | 17,600 sf.

JAMES SWIGER | AIA, NCARB, LEED AP BD+C

PRESIDENT & PRINCIPCAL | WYK ASSOCIATES

Role: James is a Harrison County native involved with several community and professional organizations. He has gained broad experience in both the private and public sectors of the construction / design industry. His completed work reflects a variety of projects with values ranging from thousands to tens of millions of dollars.

President & Principal

Registered Architect: WV, VA, PA, OH, MD, KY

Bachelor of Architecture, University of Tennessee, 1996

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Davis Memorial Hospital Addition
Elkins, WV

UHC Cardio Rehab
Bridgeport, WV

UHC Family Medical Center
Bridgeport, WV

Louis A. Johnson VA Medical Center
Clarksburg, WV

SIU Nursing Lab
Carbondale, WV

Total Dental
Bridgeport, WV

Robinson Grand Performing Arts Center
Clarksburg, PA

Steptoe & Johnson
Morgantown, WV

STEPHEN KELLEY | AIA

SR. PROJECT MANAGER | WYK ASSOCIATES

Role: Stephen began his employment at WYK in 2008, after working at a previous firm and serving our country in active duty. He served as Senior Project Manager for the award winning Robinson Grand Performing Arts Center and numerous healthcare projects for United Hospital Center (UHC) and WVU Medicine. Stephen's 20 plus years of experience has ranged from small building additions to multi-million dollar, complex

Sr. Project Manager

Associate Member, AIA US
Associate Member, AIA WV

Bachelor of Architecture, Philadelphia University, 2000

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Davis Memorial Hospital Addition
Elkins, WV

UHC Cardio Rehab
Bridgeport, WV

UHC Family Medical Center
Bridgeport, WV

Louis A. Johnson VA Medical Center
Clarksburg, WV

SIU Nursing Lab
Carbondale, WV

Total Dental
Bridgeport, WV

Robinson Grand Performing Arts Center
Clarksburg, PA

Steptoe & Johnson
Morgantown, WV

CANON FANCHER | AIA, LEED GREEN ASSOCIATE

DESIGNER & BIM COORDINATOR | WYK ASSOCIATES

Role: Canon is equipped to aid in all areas of a project, from design through completion, including client relations, schematic design, project visualization, design development, construction documents and specifications, bidding phases and construction administration Canon also heads up the firm's residental design department, where he has worked on small additions to homes exceeding $1.5 million in construction.

Designer & BIM Coordinator

Associate Member, AIA US
Associate Member, AIA WV

Bachelor of Science in Architecture, Fairmont State University, 2016
Masters of Architecture, Fairmont State University, 2020

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Tyler Co 911 Center
Middlebourne, WV

UHC – Weston
Pittsburgh, PA

Louis A. Johnson VA Medical Center
Clarksburg, WV

Robinson Grand Performing Arts Center
Clarksburg, PA

JAMES M. VIZZINI | LEED AP, PE

PARTNER, MECHANICAL ENGINEER | CJL ENGINEERING

Role: Jim Vizzini is a Partner of CJL Engineering. He has over 29 years of experience. He is responsible for management decisions, overseeing current projects, and maintaining relationships with architect and clients. While at the Partner level, Jim maintains a close connection to all facets of his projects. Jim has been responsible for over $2.5 billion of mechanical and electrical construction projects.

Partner, Electrical Engineer

Registered Professional Engineer: WV, PA, AL, DE, MD, DC, MA, VA, NE, NJ, NC

Bachelor of Science in Mechanical Engineering Technology, University of Pittsburgh at Johnstown, 1987

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West Virginia University
Oglebay Hall | LEED Certified,
New Business / Economics Building Phase 1
Morgantown, WV

St. Francis University
New Science Center | LEED Certified,
DiSepio Rural Health & Wellness Center,
Sullivan Hall Health Sciences Renovation,
Loretto, PA

West Virginia Capitol Complex
Office Building #3 | LEED Certified,
Charleston, WV

Penn State University
Amsby Hall, Dedicated Outside Air System,
South Campus, Chiller Plant,
Pollock Dining Hall, HVAC Renovations,
Pattee-Paterno Library, HVAC Upgrades,
Greater Allegheny / McKeesport, PA

TIMOTHY C. BERTOLINO | PE

PARTNER, ELECTRICAL ENGINEER | CJL ENGINEERING

Role: Tim Bertolino is a Partner and Electrical Engineer of CJL Engineering. He started with the firm in 2006 and has more than 22 years of electrical design experience. Tim is the manager of the Electrical Department for CJL's Johnstown, Pennsylvania office. He has been involved in the electrical system design and commissioning of projects for college/university, schools K-12, health care, industrial, corporate, and government projects.

Partner, Electrical Engineer

Registered Professional Engineer: PA, AK, AZ, CO, CT, DC, FL, MA, MO, NY, TX, NM, NB, OK, VA
Illuminating Engineering Society of North America (IESNA)

Bachelor of Architectural Engineering, Penn State University, 1997

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West Virginia University
Puskar Center Performance Dining Facility,
New Business / Economics Building Phase 1
Morgantown, WV

Bucknell University
Carnegie Building Historic Renovation,
Hildreth-Mirza Humanities Center | LEED Silver,
Christy Mathewson Memorial Stadium Reno.
Lewisburg, PA

WVU School of Medicine
Children's Hospital New Construction
Morgantown, WV

Penn State University
Ostermayer Lab Building Renovations,
Wunderly Building Classroom Renovations,
Fitness & Cultural Center Renovation,
Pollock Dining Hall HVAC Renovation,
Greater Allegheny / McKeesport, PA

ADAM B. HALE | PE

ASSOCIATE PRINCIPAL, MECHANICAL ENGINEER | CJL ENGINEERING

Role: Adam Hale is an Associate Principal and Mechanical Engineer at CJL Engineering. He joined the firm in 2008 as an intern and became a full-time employee in 2010. Adam is responsible for the design and specification of HVAC and other mechanical systems for educational, healthcare, commercial, and corporate clients. e is also responsible for communicating project needs and requirements between owner, architect, engineer and client.

Assc. Principal, Mech. Engineer

Registered Professional Engineer: WV, PA
ASHRAE
ASHRAE HFDP
ASHE

Bachelor of Science in Mechanical Engineering Technology, University of Pittsburgh at Johnstown, 2010

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WVU School of Medicine
Children's Hospital New Construction
Morgantown, WV

Penn State University
Knowledge Park, Adv. Manufacturing Cntr.
Erie, PA

University of Pittsburgh
Salk Hall Renovation
Pittsburgh, PA

West Virginia University
Puskar Center Performance Dining Facility,
New Business / Economics Building Phase 1
Morgantown, WV

St. Francis University
New Science Center & Vivarium,
Degol Field House Renovation,
Sullivan Hall Renovation,
Loretto, PA

JACLYN A. KRAWCZYK | LEED AP, EIT

SENIOR ASSOCIATE, FIRE PROTECTION DESIGN | CJL ENGINEERING

Role: Jackie Krawczyk is a Senior Associate and Fire Protection Designer of CJL Engineering. She started with the firm in 2018 and has over 14 years of experience in the industry. Jackie is responsible for surveying and evaluating the condition of existing facilities, designing new fire protection and fire alarm systems, International Building Code and NFPA code consultations, evaluating shop drawing submissions, and performing life safety analysis on new and existing building projects.

Sr. Associate, Fire Protec. Design

Society of Fire Protection Engineers
National Fire Protection Association

Bachelor of Science in Mechanical Engineering, Penn State University, 2004

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West Virginia University
Oglebay Hall | LEED Certified,
New Business / Economics Building Phase 1
Morgantown, WV

Bucknell University
Hildreth-Mirza Humanities Cent. | LEED Silver,
Carnegie Building Historic Renovation
Lewisburg, PA

St. Francis University
New Science Center | LEED Certified,
Loretto, PA

University of Pittsburgh
Cathedral of Learning Multiple Renovations,
Posvar Hall Renovations,
Victoria Hall Sprinkler System Upgrade,
Alumni Hall, Student Computing Lab,
Barco Law Building, 5th Floor Upgrades
Pittsburgh, PA

MATTHEW C. CORATHERS | PE

SENIOR MECHANICAL ENGINEER | CJL ENGINEERING

Role: Matthew is a Senior Mechanical Engineer of CJL Engineering. He started with the firm in 2021 and has over 15 years of progressive experience. Matthew has been involved with the different stages of building design for Medical, Education, and Food Service Facilities. His responsibilities span from existing conditions surveys to 100% submittals, as well as Construction Administration during project construction phases.

Senior Engineer, Mech. Engineer

Registered Professional Engineer: WV

Bachelor of Science in Mechanical Engineering, West Virginia University, 2005

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West Virginia University
New Business / Economics Building Phase 1,
Evansville Traffic Gate Utility,
Morgantown, WV

Bridgewater College
Forrer Learning Commons Reno. & Addit.
Bridgewater, VA

Ariake Food Processing Plant
Harrisonburg, VA

Wheeling Air National Guard Hangar
Forrer Learning Commons Reno. & Addit.
Wheeling, WV

Ariake Food Processing Plant
Plant Expansion
Harrisonburg, VA

Mon General Hospital
Pharmacy Chemo Hood Replacement
Morgantown, VA

JAMES M. VIZZINI III | PE

ASSOCIATE, PLUMBING ENGINEER | CJL ENGINEERING

Role: James is an Associate and Plumbing Engineer at CJL Engineering. He has been involved in the plumbing system design and commissioning of projects for college/university, health care, schools K-12, industrial, corporate, and government projects. Jim specializes in the design and specification of domestic water distribution systems, sanitary drainage and vent systems, storm drainage systems, natural gas distribution, welding gas distribution systems, and site utilities.

Associate, Plumbing Engineer

Registered Professional Engineer: PA ASPE

Bachelor of Science in Mechanical Engineering Technology, University of Pittsburgh at Johnstown, 2013

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West Virginia University
New Business / Economics Building Phase 1
Morgantown, WV

University of Pittsburgh
SRCC Building Multiple Lab Renovations,
Community Engagement Center,
Katz School of Business,
Gardner Steel Building, Systems Evaluation
Pittsburgh, PA

West Virginia Capitol Complex
Office Building #3 | LEED Certified,
Charleston, WV

St. Francis University
New Science Building,
Sullivan Hall Renovations, Phase I,
DeGol Stadium Restroom Building,
Loretto, PA

DAVID R. SIMPSON | PE, SECB, MBA

PRESIDENT, PRINCIPAL ENGINEER | ALLEGHENY DESIGN SERVICES

Role: David is responsible for strategic management, marketing, quality control, personnel development, business development, project management and design at Allegheny Design Services. Experience includes over 40 years in structural design and project management for industrial, commercial, institutional, and nuclear/chemical facilities utilizing steel, concrete, masonry, and wood.

President, Principal Engineer

Registered Professional Engineer: WV, PA, MD, VA, FL, DC, NY, NJ, NC, SC, GA, OH

Bachelor of Science in Civil Engineering, West Virginia Institute of Technology, 1980
Master of Business Administration, West Virginia University, 1994

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WV School of Osteopathic Medicine
Lewishburg, WV

WVU Puskar Stadium Assess.
Morgantown, WV

University Park Mixed Use Building
Morgantown, WV

Marion County Health Department
Fairmont, WV

FSU Parking Garage Structural Eval.
Fairmont, WV

FSU McAteer Building Structural Eval.
Fairmont, WV

Woodburn School Structural Assess.
Morgantown, WV

Philippi Public Library Assessment
Philippi, WV

JASON D. ROBINSON | PE

PRINCIPAL, STRUCTURAL PROJECT MANAGER | ALLEGHENY DESIGN SERVICES

Role: Jason's responsibilities include structural engineering design, construction documents, quality control and field engineering.

Principal, Structural Proj. Manager

Registered Professional Engineer: WV, PA, MD, KY, NE, MI, AL

Bachelor of Science in Civil Engineering, West Virginia University, 2007

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University Place Parking Garage
Morgantown, WV

Bridgeport Public Safety Substation
Bridgeport, WV

University Park Mixed Use Building
Morgantown, WV

Charles Pointe BFS
Morgantown, WV

Canaan Valley Institute
Davis, WV

Gabriel Brothers Renovation
Clarksburg, WV

Pikewood Creative Addition & Reno.
Morgantown, WV

BFS Suncrest
Morgantown, WV

LARRY W. TROUTMAN

DIRECTOR OF OPERATIONS & PRINCIPAL CONSULTANT | INTERTEK PSI

Role: Larry has worked over 20 years in the environmental consulting industry. His experience is primarily in asbestos, lead, microbial, arsenic and Phase I environmental site assessments. He is known for his "hands on" approach and is extremely well respected throughout the Pittsburgh, West Virginia and Ohio regions.

Director of Operations & Principal Consultant

EPA Asbestos Project Designer
EPA Asbestos Building Inspector
EPA Asbestos Management Planner
EPA Lead-Based Paint Inspector
EPA Lead-Based Paint Risk Asses.
NIOSH 582E, Sampling and Evaluating Airborne Particulate Matter
West Virginia Building Inspector and Project Designer

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Weirton Steel Corporation
Weirton, WV

Former St. Francis Medical Center
Pittsburgh, PA

K&L Gates Building
Pittsburgh, PA

Penn State University
State College, PA

Carnegie Mellon University
Pittsburgh, PA

Duquesne Light
PA, OH, WV

PNC Bank
PA, DE, IN, KY, NJ, OH

Former Mellon Arena
Pittsburgh, PA

ERIC G. OLDROYD

PROJECT MANAGER | INTERTEK PSI

Role: Eric is a Project Manager for PSI's Pittsburgh Environmental Department. Mr. Oldroyd has over twelve (12) years of experience in the environmental field with concerns including asbestos, refractory ceramic fibers (RCF), lead-based paint (LBP), polychlorinated biphenyls (PCB), groundwater, waste water as well as performing other industrial hygiene services. Mr. Oldroyd also has experience with conducting AHERA Three-Year Re-inspections and Six-Month Surveillances.

Project Manager

WV Asbestos Inspector
WV Lead Inspector
WV Lead Risk Assessor
Aerial Lift Training
Healthy Homes Training
NIOSH 582E, Sampling and Evaluating Airborne Particulate Matter
OSHA 40 Hour Hazardous Waste Operations & Emergency Response Training

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Cleveland Clinic
Cleveland, OH

Cleveland Metropolitan School District
Cleveland, OH

Pittsburgh School District
Pittsburgh, PA

DaVita Dialysis Centers
Pittsburgh, PA

Seiberling Federal Building
Akron, OH

Ross Incineration Services
Grafton, OH

Cuyahoga County Courthouse
Cuyahoga. OH

City of Lakewood
Lakewood, OH

DOUGLAS E. FINKE

PROJECT MANAGER | INTERTEK PSI

Role: Doug has over 14 years of professional environmental experience, he started as a Scientist for an Ohio firm, where he conducted groundwater and soil sampling and became familiar with the various testing procedures. He is proficient in the use of lead-based paint surveys using XRF, performing indoor air quality studies, conducting environmental site assessments, developing remediation plans, as well as preparing technical reports, specifications and interpretations.

Project Manager

PA Asbestos Building Inspector/ Management Planner
PA Asbestos Project Designer
WV Asbestos Inspector
WV Asbestos Management Planner
WV Asbestos Project Designer
OH Asbestos Hazard Evaluation Specialist
NIOSH 582E, Sampling & Evaluating Airborne Particulate Matter

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West Virginia University
Morgantown, WV

Allegheny General Hospital
Pittsburgh, PA

City of Pittsburgh
Pittsburgh, PA

Pittsburgh Zoo & PPG Aquarium
Pittsburgh, PA

West Liberty University
West Liberty, WV

Carnegie Mellon University
Pittsburgh, PA

Point Park University
Pittsburgh, PA

NOVA Chemical
Monaca, PA

PETE MASTRO | DBIA, LEED AP, BD+C

COST ESTIMATOR | M3CE CONSULTING, LLC

Role: Pete's experience includes all aspects of construction including design management, project management, and cost estimating on projects up to $500M. Pete has held various positions with both large and mid-size construction management and general contracting firms. Pete has over 25 years of experience in the industry and has managed numerous projects from the initial feasibility through design development, and construction completion.

Cost Estimator

DBIA Designated Design-Build Professional
LEED-Accredited Professional BD+C

Bachelor of Architectural Engineering, Pennsylvania State University

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Universal Electric Corporation
Expansion Project
Pittsburgh, PA | 8,200 sf.

UPMC Mercy
Vision & Rehabilitation Center
Pittsburgh, PA

Lee Manufacturing Facility
Pre-Engineered Structure & Renovation
Wallingford, CT

Harrisburg International Airport
Multi-Modal Transportation Facility
Harrisburg, PA

University of Pittsburgh
Schenley Plaza Upgrade
Pittsburgh, PA

University of Pittsburgh
Bigelow Blvd. Pedestrian & Road Improvements Project
Pittsburgh, PA | 3,200 sf.

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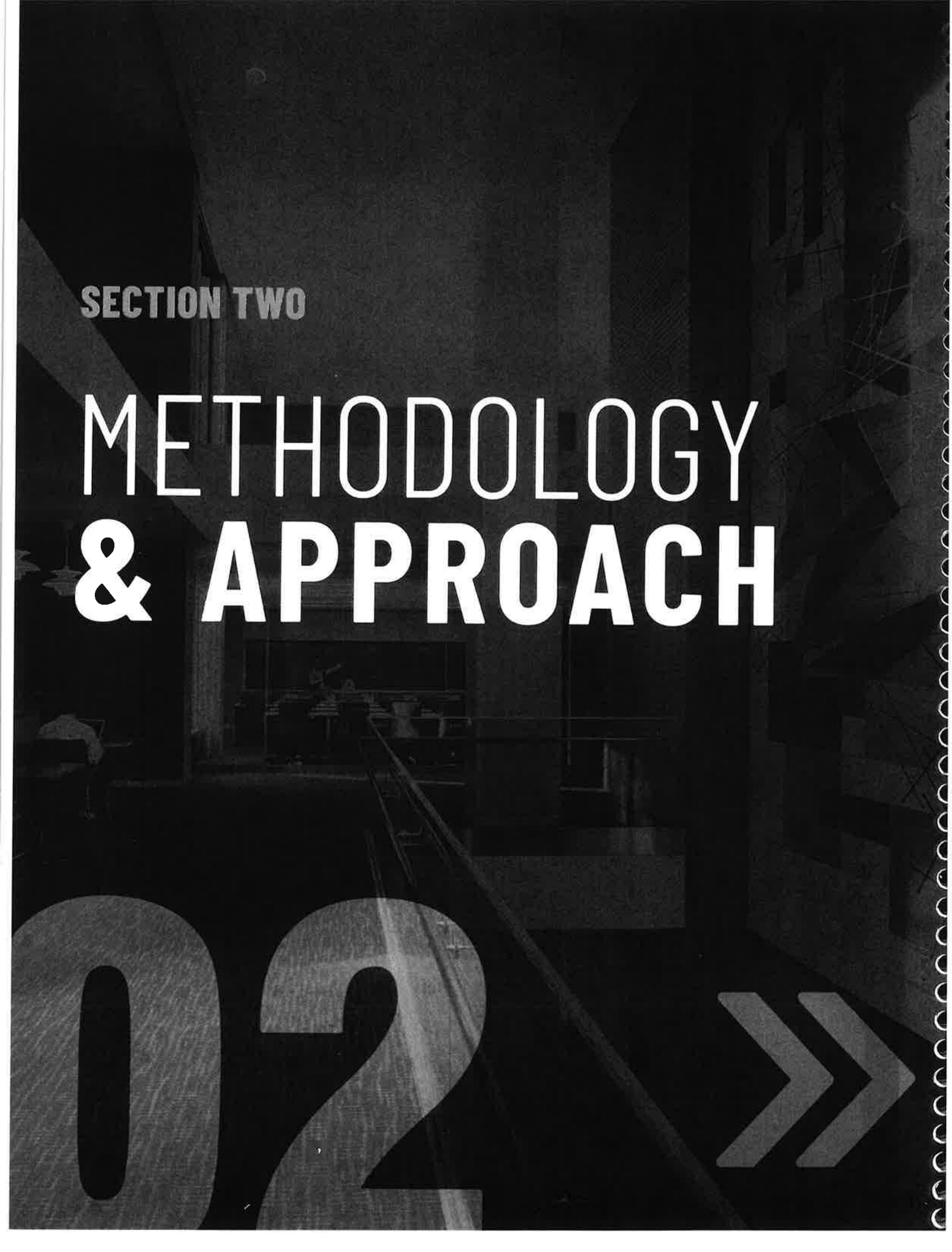


SECTION TWO

METHODOLOGY & APPROACH

02

METHODOLOGY / AREAS OF INVESTIGATION

R3A's design team appreciates the significance of engaging in a Feasibility Study as a critical part in an institution's design and major maintenance campaign. We understand that the Feasibility Study document must exist as Marshall University's road map for future building development with the goal to improve building utilization, increase building efficiency, upgrade systems / spaces and most importantly enhance the University Experience for current and prospective students and faculty.

To this end R3A, WYK and CJL are committed to ensuring that our Feasibility Study will exist as a comprehensive working document that serves as a resource for Marshall University. Functioning as a tool to evaluate practicality, outline challenges / opportunities, identify guidelines and illuminate expectations, we will approach this effort faithfully and collaboratively with the Marshall University team. To guide this effort, our approach to the Feasibility Study will focus on the following six interrelated areas of evaluation:

1. **University Vision**
2. **Disciplinary Requirements**
3. **Existing Conditions Evaluations**
4. **Pedagogical Drivers**
5. **Infrastructure Evaluation**
6. **Logistics Assessment**

METHODOLOGY / AREAS OF INVESTIGATION

1. UNIVERSITY VISION

We understand that the primary purpose for any Feasibility Study is outlined by the University's Vision for the project. We believe that your Vision is critical for identifying design strategies meant to maximize building efficiency, improve utilization, accommodate student, faculty, and staff needs, and enhance the student/faculty university experience. To this end, our approach to your project's Feasibility Study will include outlining the critical components that define the vision for the future of the Marshal University Science Building. Some essential considerations for understanding your Vision will include identification of the following:

- **Primary objectives for the Science Building**
- **Current and projected course offerings**
- **Desired student to professor ratio evaluation**
- **Current and differed major maintenance initiative**
- **Primary academic objectives of University's College of Science**
- **Current and projected FTE space utilization evaluation**
- **Enrollment targets**
- **Current and projected research objectives including Primary Investigator space allocation**

2. DISCIPLINARY REQUIREMENTS

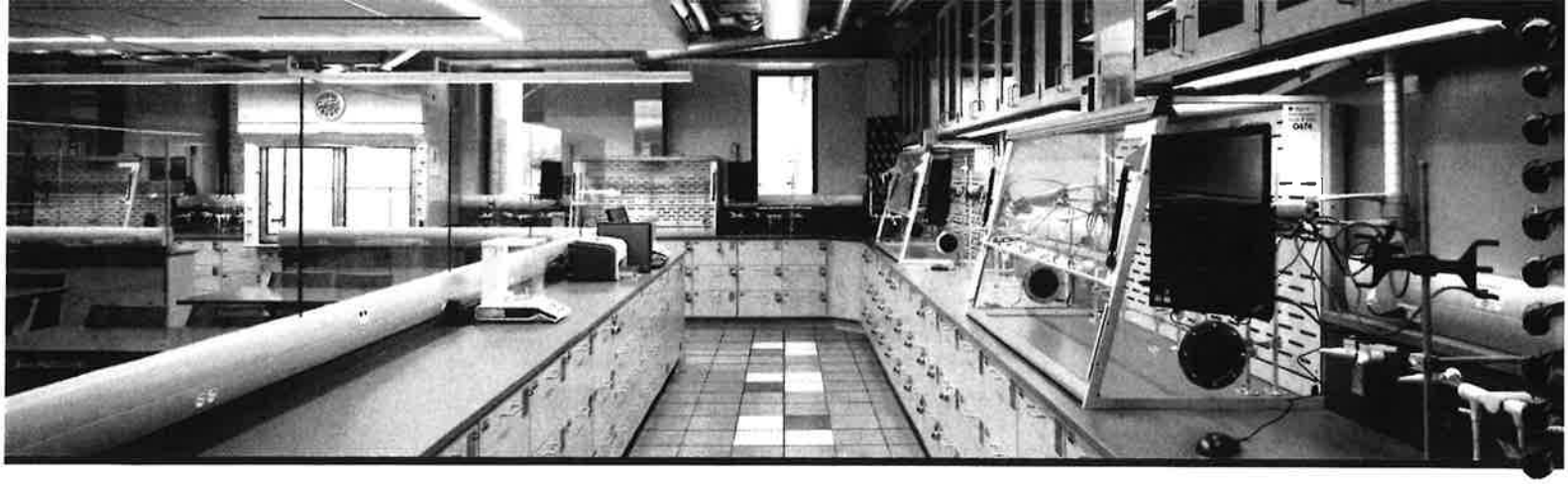
Marshall University's College of Sciences offers a diverse set of majors within the 10 departments that are part of the School of Biological Sciences, School of Forensics and Criminal Justice Sciences, School of Mathematics and Applied Informatics and School of Physics. Given our extensive experience in the evaluation and design of higher education and science facilities, we understand that each of these disciplines will have a distinct and sometimes unique set of requirements for optimal performance. Part of our approach to your Feasibility Study will be to faithfully understand and document needs of your Primary Investigators (PI), professors and tudents for each discipline. Some considerations for this area of evaluation include:

- **Evaluation of PI and End User profiles**
- **Application of NFPA 45 requirements**
- **Campus safety protocol evaluation**
- **Equipment and materials movement/delivery requirements**
- **Furniture and Equipment needs**
- **Support space/storage needs**
- **Evaluation of research & teaching objectives**
- **Chemical quantity evaluation**
- **Requisite equipment components per discipline**
- **Hazardous/Chemical storage and transport**
- **Permanence vs Impermanence of equipment & furniture**
- **Infrastructure needs**

3. EXISTING-CONDITIONS EVALUATIONS

Working within the limits of an existing 1950s Georgian Revival building offers both challenges and opportunities. Based on our experience with re-envisioning existing buildings, we understand and appreciate the challenges that can come with upgrading spatial configurations, infrastructure and thermal performance in buildings of this vintage. We are also excited by the opportunities that come with the prospect of housing state of the art teaching and lab facilities within a 1950's (and 1980's/1990's) building. To illuminate these challenges and opportunities, evaluation of the existing conditions of the building as related to space utilization, infrastructure integration and thermal performance will be paramount. As part of our Feasibility Study Approach some topics of investigation relating to existing building conditions would include:

- **Building program compilation**
- **Existing Structure Evaluation**
  - Floor-to-Floor heights / integration of infrastructure
  - Utility chase capacity and expansion
  - Column spacing relative to typical lab modules
- **Services needs evaluation**
- **Evaluation of existing structure**
- **Support space requirements by discipline**
- **Evaluating opportunities for research & instructional lab modules**
- **Evaluate opportunities for science-on-display**
- **Evaluation of lab adaptability needs**
- **In-room requirements**
  - Preparation rooms
  - Storage spaces
  - Bench requirements
  - Perimeter storage requirements
- **Building envelope evaluations**
- **Centralized shared equipment zones to serve multiple PI's / classes**
- **Critical adjacency evaluation**
- **Code evaluation and implications**
  - Building Construction Type
  - Occupancy evaluation
  - Egress Requirements
- **Centralized shared storage requirements**
  - High-density storage
  - Chemical storage
  - Vivarium
  - Greenhouse
  - Freezer farms
  - Equipment zones / corridors
  - Gas farms
  - **Window condition / performance**
  - **Masonry condition**
  - **Roof condition**
- **Historic envelope maintenance goals**
- **Activating circulation for impromptu meeting spaces**



4. PEDAGOGICAL DRIVERS

The modern University classroom must synthesize aspects of Pedagogy, Space and Technology, where technology and physical spaces are integrated to support the pedagogy. Understanding that today's Professors employ various modes of teaching that are not only diverse but evolving, the classroom must perform to allow Professors to provide appropriate assessment, direction and support to their students. From lectures to group setups to individual work, classrooms must be designed to be compatible with both the approach to teaching as well as the needs of the science/discipline being taught. Knowing that classroom design and capabilities significantly influence the educational experience and play a role in attracting today's top student and faculty talent, this would be a critical component of your Feasibility Study. A sample of areas of study relating to Pedagogical Drivers would include:

- **Integrated technology needs**
- **Active Shooter evaluations**
- **Classroom Lines of sight evaluations**
- **Class size evaluations: Student to Professor ratios**
- **Square foot per student evaluation**
- **Universal accessibility**
- **Social spaces: Need for impromptu collaboration areas**
- **Acoustic evaluations and metric requirements**
- **Relationship of lecture space vs. recitation space vs. lab space**
- **Teaching methodologies utilized by Professors (i.e. active learning, etc.)**

5. INFRASTRUCTURE EVALUATION

A robust infrastructure system is at the core of any science driven facility. Current generation research and science teaching environments require flexible plug and play energy efficient systems in order to optimize performance and minimize maintenance. Working closely with our engineering partners at CJL Engineering, we will identify potential strategies for integrating updated Mechanical, Electrical, Plumbing, IT/AV systems will only modernize but also maximize system efficiencies. To achieve this, our approach to your Feasibility Study will include:

- **Evaluation of existing system conditions**
- **Evaluation of water conservation objectives**
- **Optimal service pathways relative to distribution & maintenance**
- **Department DI water needs**
- **Evaluation of as-built drawings and modifications / upgrades / revisions made to the systems**
- **Evaluation of energy performance objectives**
- **Overall University sustainability objectives**
- **Department emergency power needs**
- **Fumehood and bio safety cabinet needs**
- **Optimizing supply & exhaust air shaft locations to maximize floor area**

6. LOGISTICS ASSESSMENT

Whether driven by capital funding schedules, inability for "downtime" in research efforts, or by operational requirements, we understand that projects of this magnitude are sometimes delivered in multiple phases. Working together with the Marshall University team, we will assist in develop phasing and move management strategies that will strive to maintain critical building operations, minimize downtime, and minimize the number of times specific individuals or departments have to move. To achieve this, our approach to your Feasibility Study will include:

- **Understand critical move management constraints**
- **Evaluate potential implacts to M.E.P. systems**
- **Evaluate pros and cons of various approaches to phasing, offerings and research efforts**
- **Establish project priority schedule**
- **Discuss possible swing spaces to maintain course offerings, including floor-by-floor quadrants, lateral or vertical phasing, etc.**

METHODOLGY / PROJECT UNDERSTANDING

THE R3A/WYK TEAM understands that the purpose of a comprehensive Feasibility Study is provide a strategic vision for both the short-term improvements and long-range enhancements to existing spaces and building infrastructure systems within the Science Building at Marshall University.

We also appreciate that the development of renovation objectives will rely on the design team developing a strong understanding the pertinent background information for the whole building including evaluation and enhancement of the building envelope, objectives for laboratory improvements, improving safety, connectivity, support space requirements, education space requirements, optimizing the opportunities for collaboration and putting 'science on display'; and understanding the quantitative requirements in terms of space, funding, and time.

As part of a comprehensive Feasibility Study for a Science Based Facility, development of the Laboratory Planning Document is critical. This portion of the Feasibility Study sets forth the planning recommendations for the renovations in terms of Laboratory Layouts, Code Issues, MEP infrastructure system upgrades. Conceptual estimates of construction costs and schedule identifying the appropriate phases of implementation.

In addition to discussion and evaluation of future projects and renovation plans, we understand that existing conditions evaluation and due diligence is paramount. To this end, our design team will analyze existing documentation as well as previous studies and improvements made to the building. Laboratory spaces will be inventoried and photographed to provide a data base from which to understand the context for renovations. Questionnaires will be distributed to members of the Faculty to collect preliminary information on their individual areas of responsibility and their related facilities. We will conduct interviews with the chemistry, biology, physics and geology faculty, and the MU Facilities Staff, which will provide guidance for the improvements and updates.

The outcome of the of the Feasibility Study effort will be the development of a document to be presented to Key Stakeholders at Marshall University. The Feasibility Study document will serve as a guide to outline future planning phases and inform strategic and conceptual ideas for future improvements and developments in the building.

Based on our experience in the production of Feasibility Studies, there is typically a set of goals that our clients identify that are critical to a comprehensive Feasibility Study. Our approach to your study will be specifically catered to your overall vision however below is a list of common Feasibility Study goals that we have seen in working with previous Higher Education clients:

1. To define a "statement of objectives", by which Marshall University intends to fulfill the long range and short-term requirements of the renovation of the Science building

2. Outline building, classroom, department and course aspirations identified by Facilities Management and from conversations held with the Departments of Chemistry, Biology and Geology.

3. Full time equivalent student evaluation. Of particular importance is the current number of students enrolled in each program as well as student/professor ratios in classrooms and instructional laboratories. Identification of the number of current staff working in the research laboratories number of fume hoods; and the amount of floor space allotted to each person. Programmatic analysis will

METHODOLGY / PROJECT UNDERSTANDING

demonstrate how the existing facilities compare to current academic standards

4. Identify project timeline. Some initiatives may not be fully attained as part of the initial phase of planning and construction. Outlining when long-range objectives will be attained during later phases as defined by the Strategic Vision for the Science building is a critical part of defining project timelines.

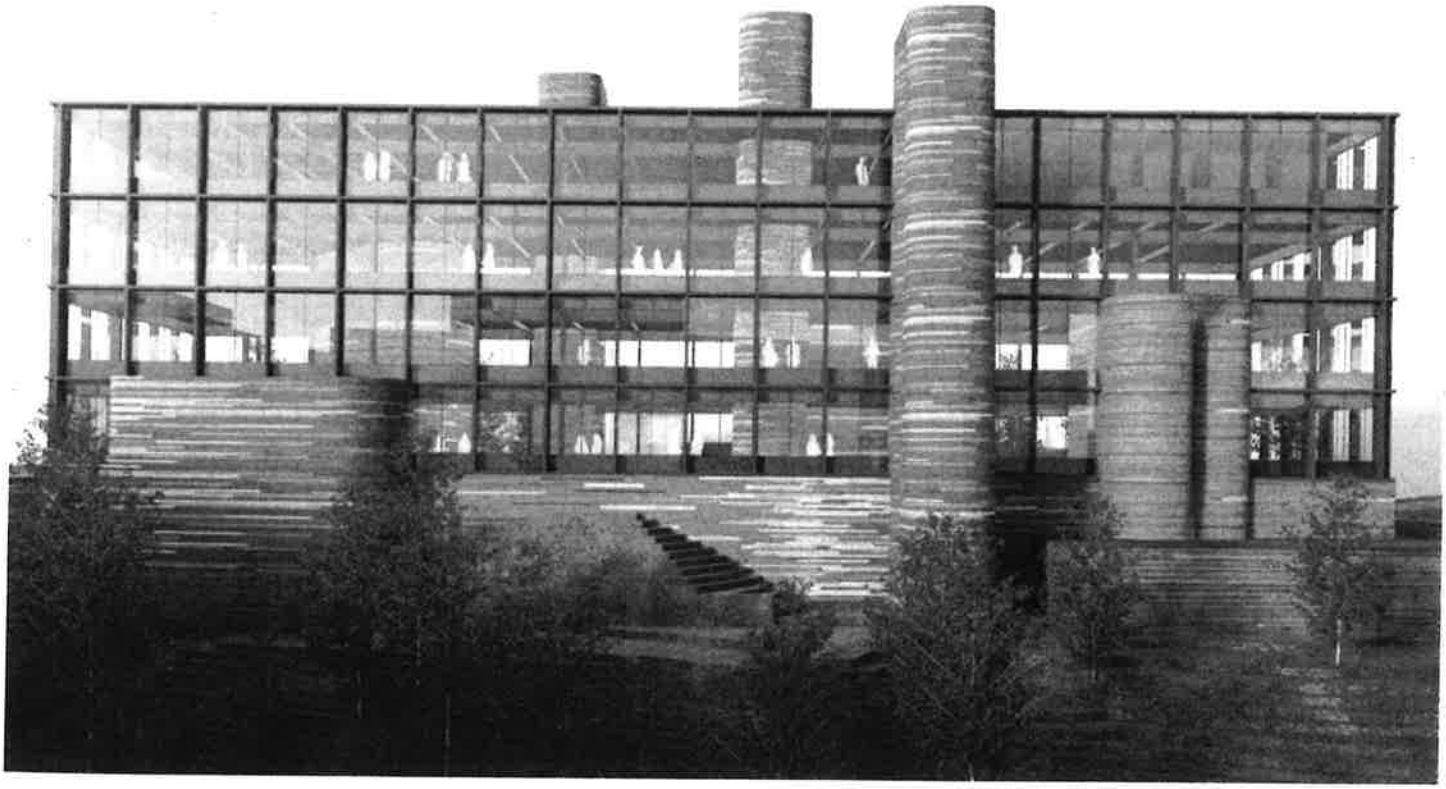
5. Achieving Consensus. Utilizing the Feasibility Study process as a means to establish goal statements that gains buy in by the entire Marshal University team. This goal statement will work toward establishing concensous between all team participating team members including faculty and staff of the School of Biological and Environmental Sciences, School of Forensic and Criminal Justice Sciences, School of Mathematics and Applied Informatics, and School of Physical Sciences.

6. Functional Goals. Objectives concerning activities, relationships, and people.

7. Form Goals. Objectives dealing with the physical considerations of special perception, physical. content and the supporting facility systems.

8. Economy Goals are aspects of controlling project costs, specifically construction costs, life-cycle costs, and the cost of energy.

9. Scheduling Goals. Evaluation of targets and milestone dates, phasing scenarios, project scheduling and forecasting, future growth, and changes.



METHODOLOGY / FEASIBILITY STUDY APPROACH

We understand that this study will be being driven by a number of critical forces that will need to be reconciled through a faithful investigation and analysis effort. Our approach will focus on maintaining a co-creative process between key stakeholders at Marshall University and our design team. Working collaboratively with your team to develop a robust and comprehensive understanding of the project objectives is a vital component of our design process. Our inclusive process will allow us to faithfully understand and interpret your key project visions and objectives and implement strategies to effectively develop solutions that embody them. Our approach to your Feasibility Study can be illustrated through 4 interrelated actions:

1. DATA COLLECTION - The backbone to our approach will center on data collection. It is the information we gather that will guide both the evaluation process as well as potential solutions. Our information gathering effort will be conducted through a number of methods including:

a. Interactive workshops with key stakeholders

b. Student engagement workshops

c. End user interviews

d. Site visit documentation

e. Existing drawing and document review

f. Best practice research

2. ITERATION - Information gathered during the Data Collection effort will begin to illuminate the project vision, which will include aspirations, objectives and challenges - each of which will need to be carefully considered. Armed with this information, we will begin outlining possible solutions and establishing guiding principles that meet the project vision and facility objectives. Generally, this will come in the form of multiple potential solutions that will each come with pros and cons that will then be evaluated between the Marshall University Team and the our Design Team. Potential solutions will be illustrated through the use of diagrams, drawings, modeling and narratives.

3. CONFIRMATION - The iteration step will offer various solutions and options that will be reviewed and discussed that will ultimately be synthesized into a comprehensive solution/approach. This solution will have considered all key considerations and be informed by user behavior patterns, value/space driven efficiencies, space requirements, organizational flows etc. The confirmation step will focus on gaining consensus between all Key Stakeholders and offer an opportunity to incorporate any final adjustments, concepts or refinements to the Study.

4. DOCUMENTATION - With validation and consensus gained, finalization and compilation of the Feasibility Study will be completed. The compilation process will ensure that the Feasibility Study is compiled to not only document the Feasibility Study effort, but also serve as a functional tool for the University in future capital campaign, project planning and project construction deployment efforts.

METHODOLOGY / MEP & HVAC APPROACH

Our Mechanical, Electrical and HVAC engineering partner, CJL Engineering, will concurrently implement their assessment/evaluation process, which will be conducted to align with our process and approach. Their process will be hyper-focused on compiling a strong understanding of the existing systems and future system goals and will ensure proper integration with spatial and programmatic objectives of the University. Their integrated assessment/evaluation process will include:

1. DATA COLLECTION

a. history of the buildings (age, condition, etc.)
b. review existing maps, drawings, specifications
c. discussion & questioning of the facility operator
d. take pictures of key areas requiring attention

2. BUILDING INVENTORY

a. evaluate mechanical, electrical & plumbing
b. understand current systems & functionality
c. note any deficiencies or problem area's
d. document findings in the matrix provided

3. EVALUATION & RECOMMENDATION

f. document findings per building
g. include pictures and operator comments
h. develop recommendations for each building
i. evaluate potential Sustainable Design strategies

4. DOCUMENTATION

a. when making recommendations for MEP system upgrades, consider energy usage and sustainability issues, such as emissions, water conservation, and thermal energy recovery. Energy costs are likely to increase, so consider the future impact of utility charges.

b. study how scheduling, constructability, phasing and/or potential disruptions to operations fit into the recommendations for how systems are to be reconfigured.

c. make sure that any cost estimating information is as accurate as possible given the phase of study and/or design. Incorporate appropriate contingencies to account for unforeseen circumstances and unknown conditions. Having inaccurate pricing is a detriment to an Owner's long-term planning process.

CJL Engineering Methods for Evaluating MEP/FP SYSTEMS

The methods used to evaluate MEP/FP systems vary depending on the project. Some of the methods listed below are utilized on every project, while others are specific to a particular location or the type of application. Depending on age and condition, existing MEP systems in industrial facilities may not be suitable for re-use, in which case extensive surveys of these systems are not required. The following are evaluation methods used by CJL:

a. our first task is to understand the nature of the business, operating and environmental requirements, specialized code requirements, ventilation and exhaust, air balance and pressure requirements, and industrial processes that are served by the MEP systems. We also evaluate the operating hours, ie, 24/7/365 or M-F, etc. and the reliability requirements, ie, Mission Critical, tight tolerance or standard business. This give us the context for how the MEP systems need to operate and be controlled.

b. a field survey of the existing systems is the most important tool in analyzing existing systems. Teams of experienced mechanical, electrical and plumbing engineers go to the building site to visually inspect and evaluate the age and operating condition of existing equipment. Google maps are often used to help CJL understand the building(s) in relation to a campus or neighbors.

METHODOLOGY / MEP & HVAC APPROACH

c. existing drawings and specifications are studied, if available, to give us an overall understanding of the MEP systems. Often, there are a variety of different vintages of drawings, which we use to the extent possible to cross-check against the survey information.

d. CJL engineers meet with operations staff to determine how the systems are maintained and controlled, whether there are existing operating issues, and any insights they may have on potential improvements. Operating personnel are typically an invaluable resource on how the facility could best be served by MEP systems.

e. CJL conducts a review of utility bills to evaluate energy usage and peak demand characteristics for seasonal variations.

f. An architectural and MEP systems code review and report may be appropriate to confirm upgrade requirements, in particular for life safety, ADA, energy, ventilation or exhaust. If major renovations are envisioned, meetings with local and state code officials are typically warranted and of benefit to anticipate requirements.

g. CJL has the capability to develop computer-based energy models to evaluate upgrade cost/benefits for replacement MEP systems, such as Demand Controlled Ventilation, thermal energy recovery, Variable Frequency Drives, chiller or boiler plant options, thermal storage, Combined Heat & Power, lighting retrofits, etc. Additionally, CJL has the ability to apply Computational Fluid Dynamics (CFD) to help understand complex airflow, life safety or thermal performance issues. Life Cycle Analysis is often performed if there are various options recommended for system upgrades, in order to best understand overall cost and performance benefits.

CJL has extensive experience in evaluation of many large-scale institutional, industrial, and commercial buildings. Some lessons learned include the following:

a. do not depend solely on existing drawings for verification of the systems. Time spent on site in the survey process is the single most critical factor in evaluation of the existing conditions, especially for any equipment that may be re-used.

b. It is important for our engineers to understand the actual processes in operation in the facility and how they can be supported by the MEP systems. CJL always tries to incorporate planning for ease of maintainability (or concurrent maintainability), reliability, and future flexibility.

c. Communicate with team members on a regular basis to ensure that everyone is aware of goals and expectations. Coordinate with the Architect and Structural Engineer to make sure any potential upgrades work together for the best facility for the Owner.

d. to the extent possible, early in the design process, try to anticipate issues that will impact business operations, schedule, security, safety, or costs and discuss with the team so that they can be appropriately considered in planning.

e. if significant upgrades are envisioned, meetings with the utility companies and code officials are critical to make sure there are no surprises or misunderstandings further down the line.

f. study how scheduling, constructability, phasing and/or potential disruptions to operations fit into the recommendations for how systems are to be reconfigured.

g. ensure that any cost estimating information is as accurate as possible given the phase of study and/or design. Incorporate appropriate contingencies to account for unforeseen circumstances.

METHODOLOGY / MARKET UNDERSTANDING & MANAGEMENT

Our team member, WYK Associates, is a Clarksburg, WV based practice and has provided design and project construction administration phase services for clients throughout West Virginia. WYK is experienced with the West Virginia State Fire Marshal process, having worked with many of the Deputy Fire Marshals throughout the state. They have facilitated the zoning and building department permitting process for numerous projects in multiple West Virginia municipalities. With over a hundred years of operation, WYK has developed relationships with most of the major building material suppliers, general contractors and Specialty contractors in West Virginia.

Because of their close proximity to Marshall University, our Partners at WYK will have the ability to quickly visit the campus for any reconnaissance or necessary on-site service or meetings required by the campus.

The R3A/WYK team has extensive experience in all construction delivery methods including Design/ Build, CM at Risk, Multi-prime contracts and Design/ Bid/Build. We understand that most State institutions have favored the Design / Bid / Build format for project delivery with the GC contractual relationship being the preferred contracting method and are experienced in this approach. Given our experience in various construction delivery methods, we have established the following approach to project management:

Our approach to Project Management is based on 1. open and effective collaboration with the Marshall University Team guided by our experienced team of Project Leaders and 2. a shared passion for a successful project that meets and exceeds our client's expectations. Our project managers are the "composers" who direct our process from initial inception through occupancy and are focused on faithfully tracking all aspects of the design and construction process to ensure that the vision, schedule and budget is respected and maintained. With a sincere appreciation for a smooth and seamless process, we have developed an approach to project management and construction administration that is comprised of 7 integral components centered on communication:

1. COMMUNICATION

The key to successful communication is carefully managing the flow of information. Understanding who the key project participants are and establishing an information delivery mechanism that support a PROactive and not Reactive approach to communication. By working closely with the Owner, Consultant Team, and Contractors we can more easily identify potential issues and areas of concern ahead of time, thereby reducing the impact to schedule and budget.

Key stakeholders at Marshall University will all play significant roles in the design process and managing communication between all parties will be critical to creating a design solution that synthesizes the needs of each of the user groups.

Our proactive approach to communication allows us to better maintain the design intent and vision, which the Marshall University Team worked so diligently to craft during the design phases.

METHODOLOGY / PROJECT MANAGEMENT APPROACH

2. SCHEDULE MANAGEMENT

Proper schedule management begins with establishing critical project milestones and understanding the necessary tasks needed to hit these targets. Progress on the project must be continually evaluated against these established critical milestones and reacted to accordingly. Doing this on a frequent basis will allow identification of trends and provides an opportunity to correct any deviations earlier rather than later in the process. This constant evaluation and feedback also allow for adaptation to the inevitable changes that occur over the course of the project design. Our management of your schedule will carefully consider critical schedule goals, local authority having Jurisdiction required reviews and submissions, move management objectives and ideal construction milestones defined by the Construction Manager/ Contractor. We will leverage our communication strategies and our technology to define, implement and monitor effective and efficient delivery of the project that will maintain the established schedule.

3. TECHNOLOGY

Our approach to Project Management will be assisted by our implementation of various software packages as a means to effectively deliver quality projects that maintain the Owner's budget, schedule and design vision. We have experience with many Construction Management software platforms, including Constructware, eBuilder, Newforma Cloud, ProCore, BlueBeam, etc. We can use these tools to track critical design and construction issues as well as to document the design and construction process. Document/ Design production for your project will be developed using the latest Building Information Modeling software that allows us to three dimensionally explore and solve potential constructability and coordination issues to avoid construction delays and potential change orders. Developing our design through the use of BIM software also allows seamless utilization of our Virtual Reality and Augmented Reality software that provides for a fully immersive exploration of the design prior to construction. This software allows our clients to verify and validate design decisions that have been implemented throughout the design process in a 3D environment.

4. COST CONTROL

We understand that one of the primary project design drivers is the Owner's established budget. We appreciate the need to balance the integration of key components of the Marshal University Science Building within the defined cost parameters. Recent changes in our society brought on by the Covid-19 pandemic has created a very volatile bidding market for construction trades, which means that construction costs can vary considerably during the course of the design process. R3A will work closely with our estimating team at MC3M to approach these challenges pro-actively by continually comparing project design development against market trends to develop estimates that are relevant and accurate. This approach to managing costs and reduce budget uncertainty during the design process is driven by actively engaging all key participants in a systematic process of cost-benefit analysis relative to sustainability goals, the program, design and owner's priorities throughout the design phases. At the end of each phase of the design, the design team will review cost estimates to be sure that budget goals are being met. These interim cost estimates also allow the owner and design team to course correct if the design/program exceeds budget goals. This method ensures that when the project is issued for bid, the design intent and budget are in alignment. Our team is recognized for innovative cost saving ideas that

METHODOLOGY / PROJECT MANAGEMENT APPROACH

does not compromise quality, as well as our ability to meet client needs without exceeding established project budgets. Our understanding of best practice construction techniques will help us identify and work through design alternatives to ensure that we are able to reconcile budget variances to stay on target

5. CONSTRUCTIBILITY

Our in-house building performance science manager is involved in all projects to provide additional critical evaluation of the design as it relates to sustainability integration objectives(LEED, passive house, net zero, living building challenge)and constructability analysis and detailing. Their role will be to assist our Teams Project Manager, Chris Gruendl in providing another set of eyes to review and identify constructability issues and concerns. This review will occur at various stages of the design process to identify and evaluate critical construction details against issues of thermal performance, durability, constructability, functionality and aesthetic value. This evaluation allows our team to develop innovative construction assemblies that align the project vision with the assigned budget.

6. QUALITY CONTROL

Quality awareness for our team is an embedded attitude rather than a one-time checklist process. We are committed to integrating quality into our design efforts and ensuring that construction is performed in accordance with drawings and specifications that have been coordinated and checked for technical scope and constructible details. Our QA approach sets prescribed standards of performance for design and construction documents and deliverables through the following strategies:

- Internal independent peer review of design & construction documents
- Data validation and Due diligence of project information
- Documentation and deliverables control & review procedures
- Coordination with client's standards & protocols
- Staff training / continuing professional development
- Appropriate allocation of staff and resources
- Quality review oversight from firm's design and technical leaders

METHODOLOGY / KEY CONSIDERATIONS

Based on our past experience studying, designing, renovating scientific and educational facilities, we have assembled a list of key observations that will contribute to the success of this project:

SAFETY - Safety is the highest priority for any science facility project. First and foremost is the safety of the students, faculty, and employees. Because handling of hazardous chemicals and the avoidance of accidents are major safety concerns in an instructional and research environment, special emphasis is placed on concepts to mitigate safety risks.

CHARACTER - The character of the laboratories is one that makes the students and researchers feel comfortable and that helps them orientate within the building and in the individual labs. Emphasis will be placed upon the individuals being able to easily orient and to interact more effectively in the building.

FLEXIBILITY - Flexibility is the ability to respond to change. The desire for laboratories that can change as programs change may mean that the equipment and casework can accommodate different uses without modification. The idea of reloadability is more appropriate than the idea of movability. Flexibility is also applied to the individual floor- plates and the support systems.

AFFINITIES - Which functions should relate closely to other functions in order to promote both good flow and interaction between all users of the building.

OFFICES - Offices will require day lighting and easy access to the laboratories, important to keep office files in the office spaces and out of the laboratories, new conference spaces need to be considered in the initial programming.

LAB SUPPORT - This concern focuses on concepts for the equipment and chemicals supporting the primary laboratory spaces.

SERVICES - The need for specific laboratory utilities has most likely changed since the original building and additions were originally designed. The feasibility study will suggest those lab services that are most critical to current and future research and instructional lab requirements.

POWER - How primary and Epower electrical power is distributed to the spaces is a planning priority.

MECHANICAL - Exhausting of the fume hoods and the chemical storage cabinets are areas of concerns, both from a laboratory capacity perspective, life safety and energy utilization.

ACCESS - This will address best practices for increasing size of access ways and the number of access and egress points from lab and critical function areas. Additionally, movement of materials, equipment, chemicals and hazardous waste will need to be critically considered.

COMMUNICATION - Concepts that support personal interaction, meetings and conveying ideas. Exploring ways to facilitate impromptu interactions between students and faculty is of importance in educational facilities.

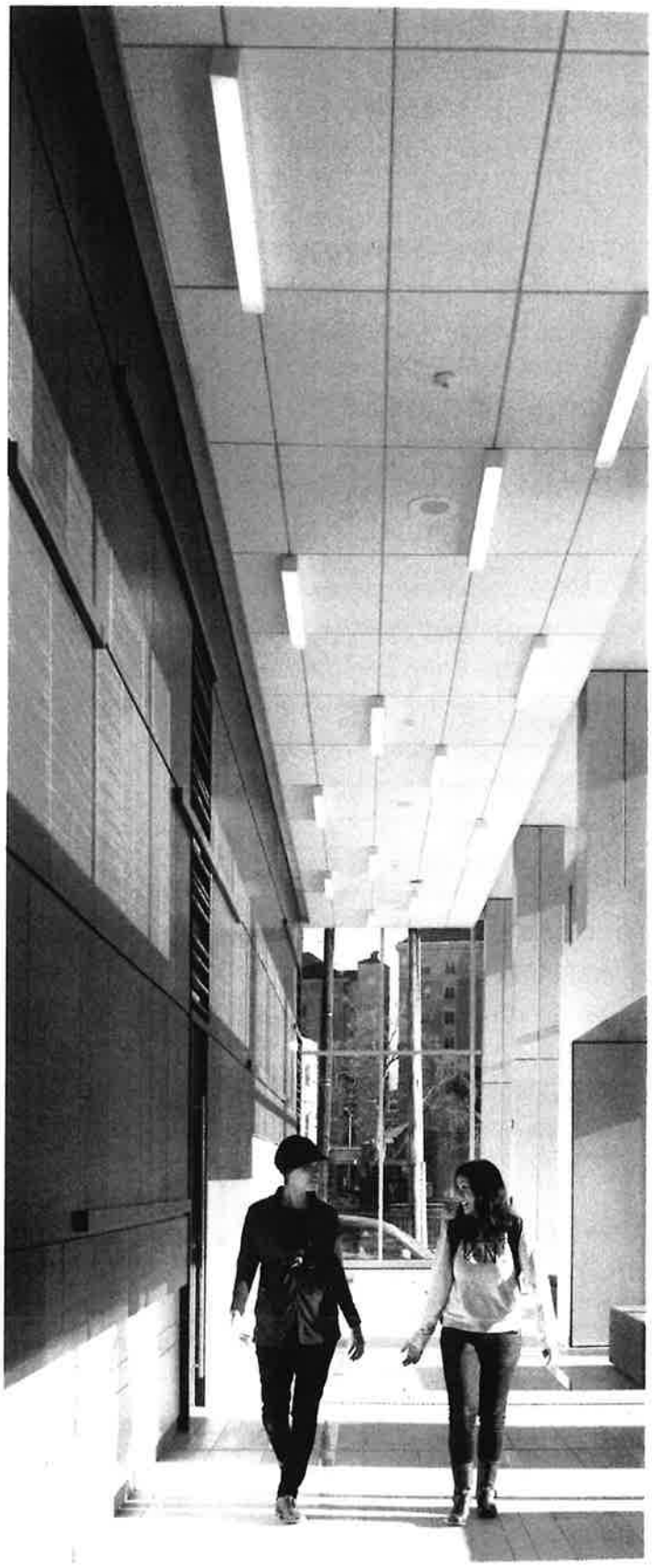
SECURITY - The idea of open laboratories will promote not only a safer environment but a more secure laboratory as well. Controlling access to the floors may be a departure from current operations.

METHODOLOGY / KEY CONSIDERATIONS

COLLABORATION - Out of classroom learning spaces have become a staple in today's higher education environments. Considering options for a network of collaborative areas, both formal and informal, supported by technology, can be an exciting design opportunity that has the potential to inspire students to learn, explore and innovate.

COST CONTROL - The Basis of design concepts presented in the feasibility report will serve to direct the core Team in making design decisions and in monitoring the project budget. Conceptual cost allocations will be part of the feasibility analysis and to be useful will need to be updated regularly to reflect both inflation and the realities of the construction market so that the conceptual cost data is kept current and reflects the market realities.

ENERGY - The major consumption of energy in the science building will be directly related to the flow of air into the labs and out through the fume hoods. This energy use is closely tied to the mechanical concepts and the systems and energy recovery recommendations.



METHODOLOGY / KEY CONSIDERATIONS

IMPROMPTU COLLABORATION

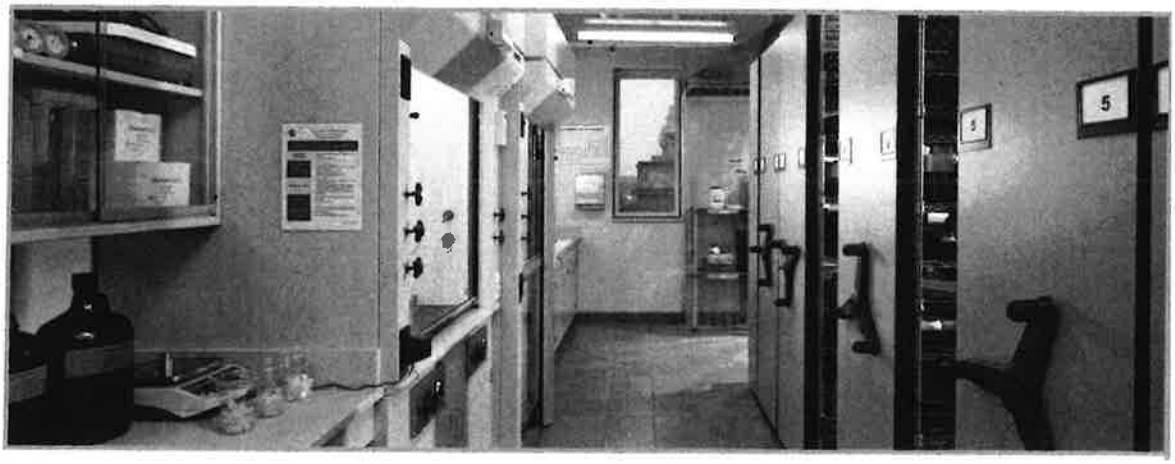
Today's learning can take place in unexpected places. A network of colla-borative areas, both formal and informal, supported by technology, can be an exciting design opportunity to inspire students to learn, explore and innovate collaboratively.

INTEGRATED TECHNOLOGY

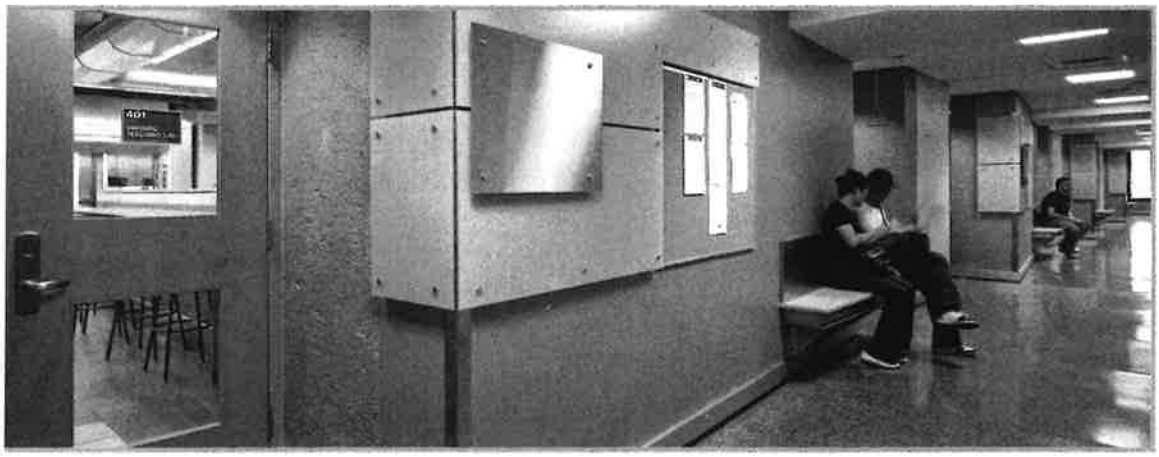
The Carnegie Mellon University Distance Learning Classroom integrated various technologies to allow professors to push the boundaries of technology driven pedagogy. The exposed infrastructure in this classroom provided a measure of future-proofing to allow ease of access to systems.

MAXIMIZING EFFICIENCY

The University of Pittsburgh Chevron Science Center 14th Floor incorporated high density storage shelves as an efficient way to store chemicals for multiple researchers. This coupled with centralized shared support spaces freed up floor area for additional lab spaces.



ACTIVATING CIRCULATION



At the **University of Pittsburgh Chevron Science Center 4th Floor,** R3A imple-mented strategies to make the corridors into active spaces. By providing places for students to sit betweenr class and message boards, the corridors became places to interact.

EDUCATION ON DISPLAY

The Carnegie Mellon University Multi-purpose Classroom implemented strategic placement of glass to celebrate learning and to create a level of interaction between departments.

ENHANCING STUDENT EXPERIENCE

At the Penn State University Williams Building, R3A imple-mented open adaptable spaces with flexible furniture which allows students the ability to create their own sense of place by cultivating a specific environment based on the tasks they are trying to complete.

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SECTION THREE

OUR EXPERIENCE

R3A EXPERIENCE / HIGHER EDUCATION

CARNEGIE MELLON UNIVERSITY
Tepper School of Business Quad
Tata Consultancy Building
Tepper SCS AI Makerspace
Mill 19 Tenant Build-Out
Psychology Department Renovations
Electrical & Computer Engineering Offices
Civil & Environmental Engineering Laboratory
Doherty Hall Classroom Renovations
Scaife Hall Office Renovations
Doherty Apartments Study
Porter Hall Classroom Renovations
IDeATe Center Feasibility Study
Children's Daycare

UNIVERSITY OF PITTSBURGH
Graduate School of Public Health
Chevron Science Center
Crawford Hall Science Lab Renovations
McGowan Institute Laboratory Building Upgrades
Immune Transplant and Therapy Center
MRI Suite
Atwood / Oakland Housing Survey
Community Engagement Center at HHA Blakey Center
Langley Hall 4-5th Floor Laboratories
Upper Campus Housing
Salk Hall 4-5th FLoors

INDIANA UNIVERSITY OF PENNSYLVANIA
Eberly College Classroom Renovations
Wilson Hall

SLIPPERY ROCK UNIVERSITY
President's House Renovation
Performing Arts Complex

UNIVERSITY OF PITTSBURGH, GREENSBURG
Campus Master Plan
Chambers Hall Renovation & Expansion
New Student Housing
Lyceum Expansion

OHIO STATE UNIVERSITY
Caldwell Lab Expansion

UNIVERSITY OF PITTSBURGH, JOHNSTOWN
New Student Housing

PENN STATE UNIVERSITY
Ruhl Student Success Center
Eberly Admissions Building Feasibility Study
Research Building East Lab Renovations

PENN STATE UNIVERSITY, FAYETTE
Biomedical Building Laboratory Study
University House Feasibility Study
Library Feasibility Study

PENN STATE UNIVERSITY, NEW KENSINGTON
D8 Laboratory Study

POINT PARK UNIVERSITY
WRL Pittsburgh Playhouse Theatre

MANSFIELD UNIVERSITY
Grant Science Center Teaching Labs

LINCOLN UNIVERSITY
Student Center

EDINBORO UNIVERSITY
Cooper Hall Laboratory Upgrades

R3A EXPERIENCE / LABORATORY

UNIVERSITY OF PITTSBURGH
Chevron Science Center Master Plan
Chevron Science Center D'Urso Research Lab
Eberly Hall, Various Research Laboratories
Chevron Annex Labs
Chevron Science Center, Various Organic Chemistry Labs
Graduate School of Public Health Research Labs & Offices
Langley Hall, Various Life Science Laboratories
Chevron Science Center, Various Synthetic Chemistry Labs
Bio Science Tower, Various Research Laboratories
Scaife Hall Research Lab Study
Energy Innovation Center Research Labs, Flex Space & Offices

PENN STATE UNIVERSITY, BEAVER
Michael Baker Engineering Building Feasibility Study

PENN STATE UNIVERSITY, SHENANGO
Forker Lab Complex Feasibility Study

PENN STATE UNIVERSITY, MAIN CAMPUS
Nuclear Commons Instructional Lab

PENN STATE UNIVERSITY, FAYETTE
Biomedical Building Laboratory Study

EVOQUA WATER TECHNOLOGIES
Wet Labs & High Bay Pilot Testing / Water Treatment Facility

NOVEOME BIOTHERAPEUTICS
Life Sciences Feasibility Study

MANSFIELD UNIVERSITY
Grant Science Center Teaching Labs
Grant Science Center Vivarium & Fishery

PRECISION BIOTHERAPEUTICS
Clinical Life Science Labs

NEUBASE THERAPEUTICS
Bio Research and Clinical Lab Feasibility Study

DUQUESNE UNIVERSITY
Mellon Hall Central Autoclave Facility Upgrade
Mellon Hall, Biology Research Labs and Microscopy Suites

CARNEGIE MELLON UNIVERSITY
Tata Consultancy Services Building, Various Labs
Mill 19 Tech Flex / High Bay Labs, Conferencing, Office Spaces
Tata Consultancy Services, Tech Flex Spaces
Tata Consultancy Services, Light Industrial & Materials Labs
Civil & Environmental Engineering Laboratory Renovation

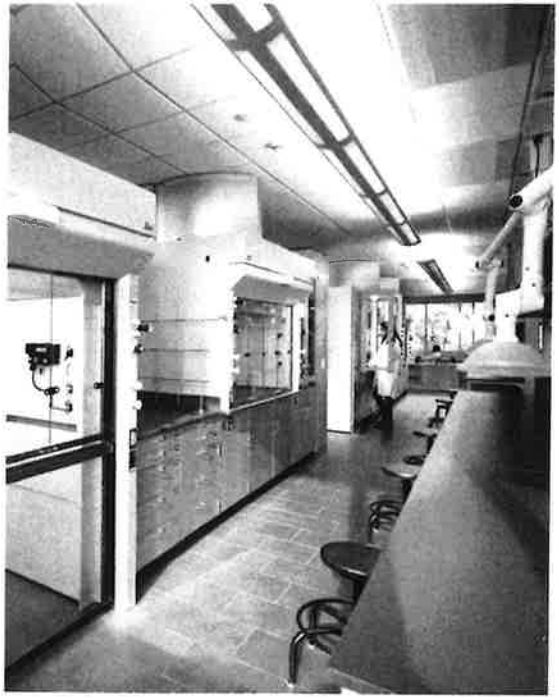
AQUION ENERGY
Energy Analytical Research Labs for Battery Technology

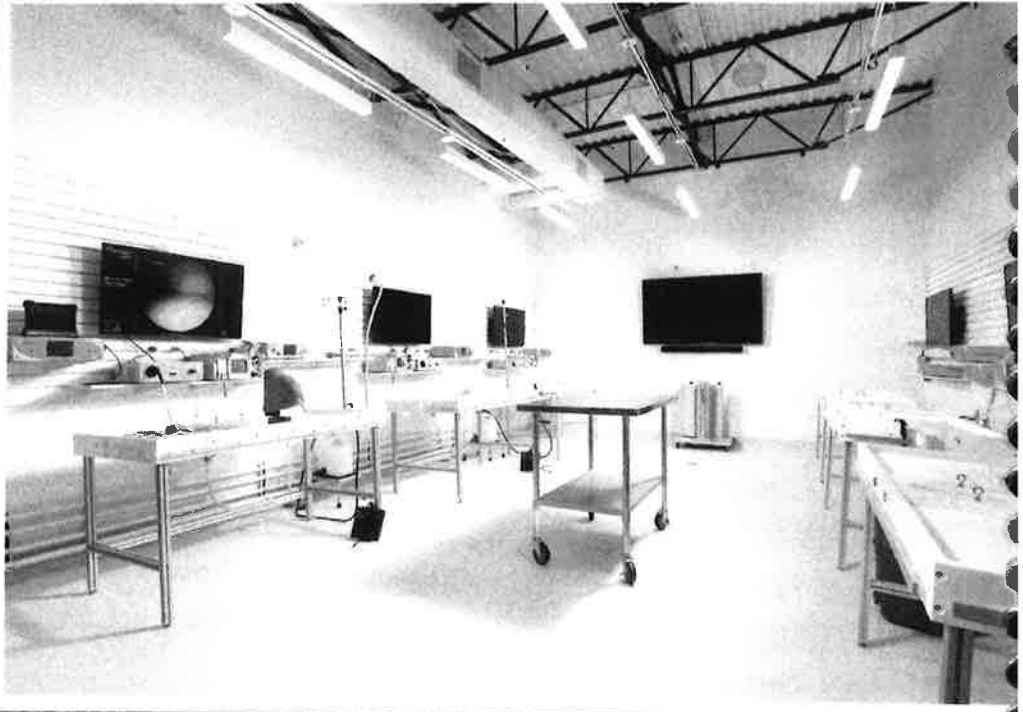
PENN STATE UNIVERSITY, NEW KENSINGTON
Anatomy & Biology Instructional Labs
Engineering Building Classroom Renovations

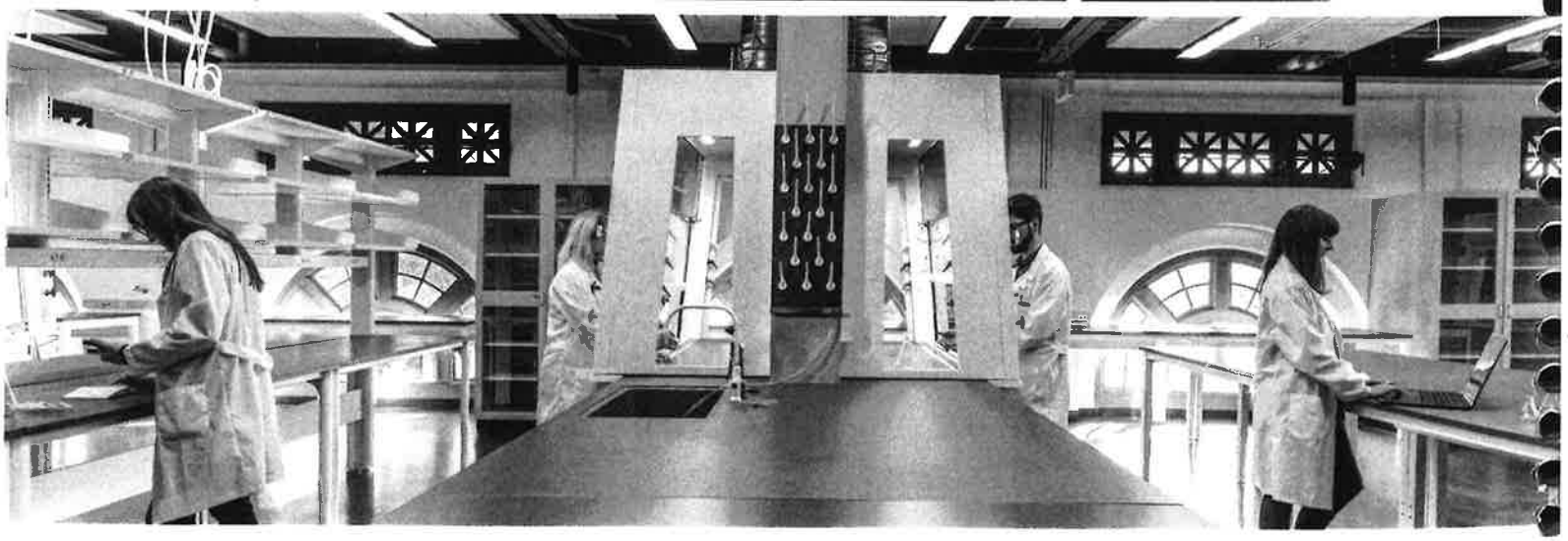
BLUESPHERE BIO
Bio Research Lab and Office Feasibility Study

Nextovation Digital Foundry
Digital Innovation Lab, Tech Flex, and Office Spaces

ICARNEGIE NAZARBAYEV UNIVERSITY
Comprehensive Facility Planning for Physics, Mechatronics, Chemistry, and Biology







R3A EXPERIENCE / SUSTAINABLE DESIGN

As architects, we are in the business of creating spaces that last. At its point of completion, a building is not a static entity, despite the steel and concrete involved in its construction. In a manner of speaking, it is living. Buildings take in air, water, electricity, among other resources, and expel waste and exhaust as a result of human intervention. In order to ensure that these living ecosystems are well-situated for success in the greater environment and across time, we implement LEED practices whenever possible. From the beginning of the research process through construction and daily operation, a sustainable approach to design sets each project on a trajectory for longterm success, lowered operating costs, and a greener footprint upon the landscape it lives on.

CARNEGIE MELLON UNIVERSITY

Tepper School of Business Quadrangle | LEED Platinum

Tata Consultancy Services Building | LEED Certified

SportsWorks Museum | LEED Certified

Mill 19 at Hazelwood Green | LEEDv4 Gold

Electrical & Computer Engineering Dept. Reno. | LEED Certified

UPMC

Wexford Spine Center | LEED Certified

BOB O'CONNELL GOLF COURSE

The Arnold Palmer Learning Center | LEED Silver

SLIPPERY ROCK UNIVERSITY

Performing Arts Complex | LEED Certified

UNIVERSITY OF PITTSBURGH

Energy Innovation Center | LEED Platinum

Graduate School of Public Health, Phase I & II | LEED Gold

Chevron Chemistry Annex | LEED Gold

SIEMENS WESTINGHOUSE

Fuel Cell Facility | LEED Certified

HILL HOUSE ASSOCIATION

Kaufman Program Center | LEED Silver

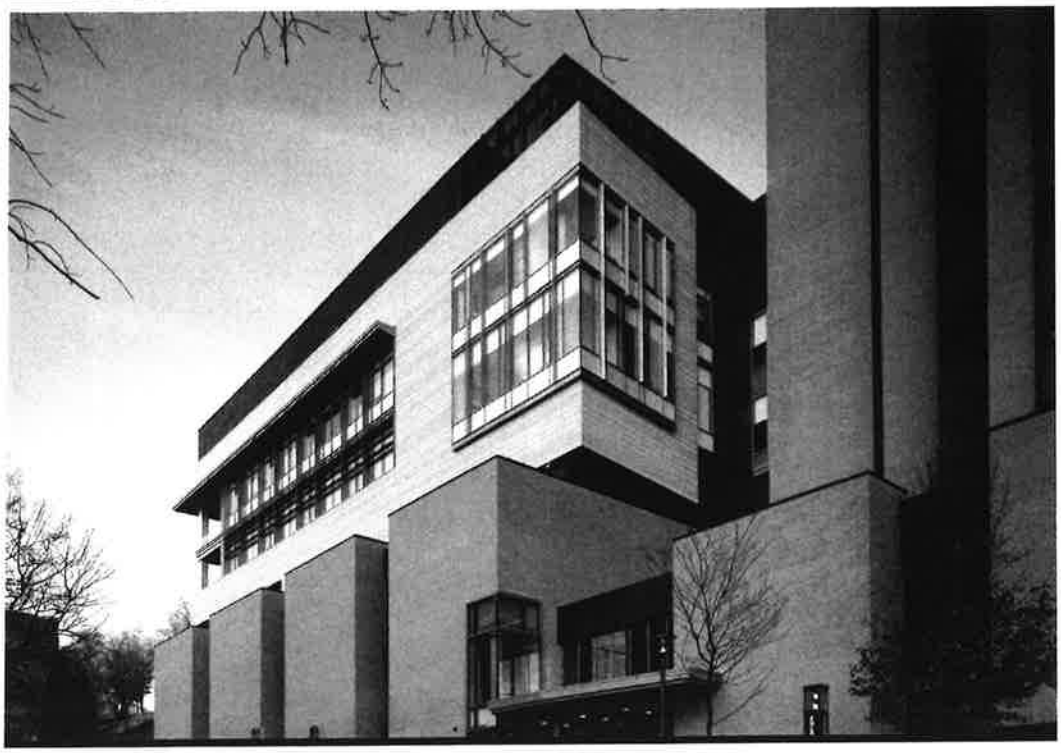
REGIONAL LEARNING ALLIANCE

Regional Learning Alliance Center | LEED Silver

CORO PITTSBURGH

Coro Center for Civic Leadership | LEED Gold

R3A EXPERIENCE / SELECTED FEASIBILITY STUDIES



UNIVERSITY OF PITTSBURGH
Scaife Hall Research Lab Feasibility Study
Chevron Science Center Feasibility Study

CARNEGIE MELLON UNIVERSITY
IDeATe Center Feasibility Study
Doherty Apartments Feasibility Study

PENN STATE UNIVERSITY, MAIN CAMPUS
Eberly Building Admissions Suite Feasibility Study

IRISH CENTER OF PITTSBURGH
Site Renovation Feasibility Study

NEUBASE THERAPEUTICS
Bio Research and Clinical Lab Feasibility Study

BLUESPHERE BIO
Bio Research Lab and Office Feasibility Study

NOVEOME BIOTHERAPEUTICS
Life Sciences Feasibility Study

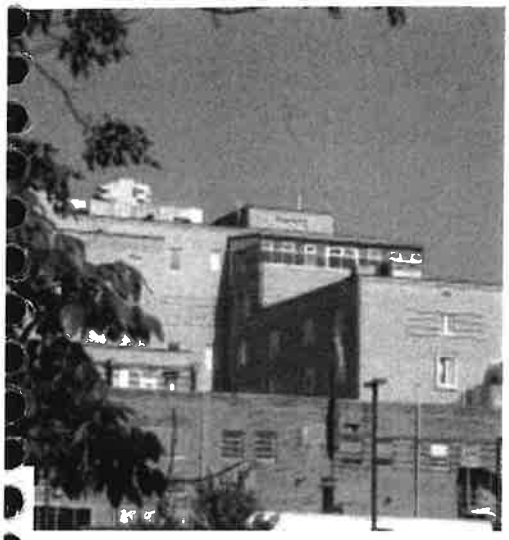
PENN STATE UNIVERSITY, FAYETTE
Biomedical Building Laboratory Study
University House Feasibility Study
Library Feasibility Study

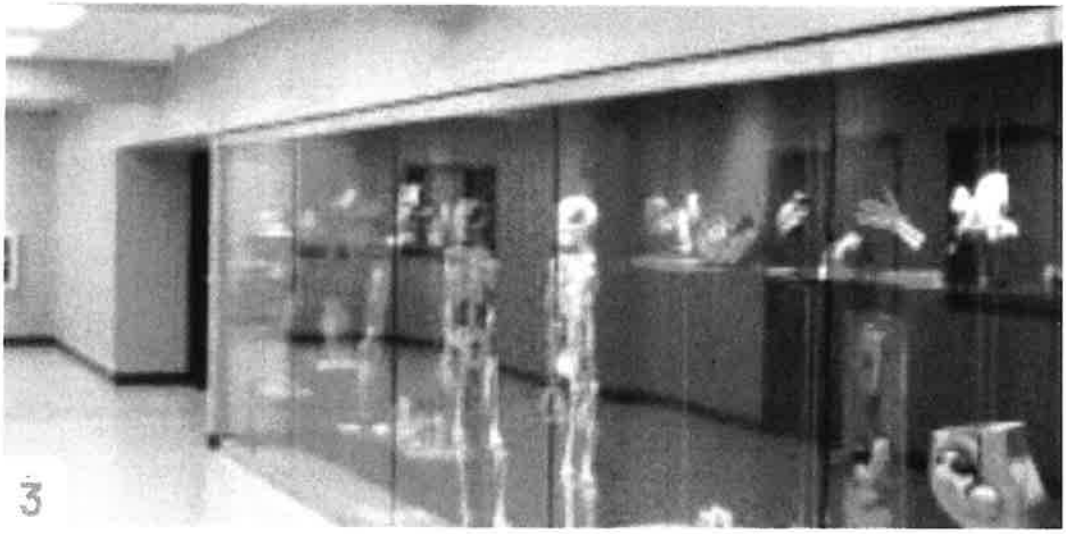
HOUSING AUTHORITY OF THE CITY OF PGH
Cove Place Feasibility Study
Addison Terrace Management Office Feasibility Study
Northview Heights Feasibility Study

PENN STATE UNIVERSITY, BEAVER
Michael Baker Engineering Building Feasibility Study

SIEMENS ENERGY
New Kensington Office Renovation Feasibility Study

TEAM EXPERIENCE / WYK ASSOCIATES





1 | TOTAL DENTAL

WYK Associates provided architectural services for Dr. Jeffrey Browning in designing this new 9,800 square foot facility. Designed primarily for Total Dental, this building provides additional build-out spaces for future clients. WYK designed the second floor of the building to the dental office with eight operatory rooms for dental services, a large waiting room, two doctor's offices, and a breakroom/ kitchen space with access to an outdoor balcony.

2 | VA MEDICAL CENTER

WYK was selected to completely renovate various parts of the existing VA Medical Center in Clarksburg. A complete renovation and expansion of the main hospital laboratory, the addition of the Solarium, and a Chapel conversion. The Phlebotomy lab was temporarily relocated to an adjacent space during construction operations. The existing lab was in deplorable conditions. All new HVAC, ceilings, lighting, casework and equipment and finishes were included in this renovation.

3 | SALEM IU NURSING LAB

Salem International University is located in North Central West Virginia. Formerly Salem College, this institution brought back a very much missed RN nursing program to the area. This new state-of-the-art facility houses two mock-up hospital rooms, a nurses' station and SMART classroom technologies as well as the main corridor renovation and new ADA restrooms. This project was as design-build and the total design / construction period was only 8 weeks.

TEAM EXPERIENCE / ALLEGHENY DESIGN SERVICES

1 | GSA DEPARTMENT OF ENERGY

A new modern office and records storage building for the United States Department of Energy Office of Legacy Management. Awarded through a Design-Build Competition sponsored by the General Services Administration. This building includes 37,000 square feet of NARA Certified Records Storage space and additional spaces for administrative offices, etc. Awarded LEED Gold (Core & Shell); LEED Gold (Commercial Interiors); 2010 Excellence in Construction by the Associated Builders & Contractors, Inc.—WV Chapter.

2 | GSA SABRATON (USDA)

Awarded through a Design-Build Competition sponsored by the General Services Administration. This facility will house five agencies of the USDA including: the Credit Union, Rural Development, Farm Services Administration, Natural Resource Conservation services, and the USDA Information Technology Services. This project is registered as a LEED Certified Building.

3 | DOMINION TRANSMISSION HQ

This project consists of a new 106,000 Sq. Ft., 4-Story Office Building, located in White Oaks Office Park, Bridgeport, WV. High Efficiency Packaged DX rooftop equipment and VAV units with hot water heat from modular condensing boiler system. Precision cooling server room air conditioning system. Water conserving plumbing fixtures. This project is the Second LEED V3 BD+C: New Construction, certified level Gold project and the First Privately Owned LEED V3 BD+C: New Construction.

TEAM EXPERIENCE / CJL ENGINEERING

SELECTED HIGHER EDUCATION EXPERIENCE

- Allegheny College, Meadville, PA
- Bloomsburg University, Bloomsburg, PA
- Bucknell University, Lewisburg, PA
- Carlow University, Pittsburgh, PA
- Carnegie Mellon University, Pittsburgh, PA
- Clarion University of Pennsylvania, Clarion, PA
- Davidson College, Charlotte, NC
- Duquesne University, Pittsburgh, PA
- Fairmont State College, Fairmont, WV
- Grove City College, Grove City, PA
- Illinois Wesleyan University, Bloomington, IN
- Indiana University of Pennsylvania, Indiana, PA
- Lebanon Valley College, Lebanon, PA
- Lock Haven University, Lock Haven, PA
- Mercyhurst University, Erie, PA
- Point Park University, Pittsburgh, PA
- Robert Morris University, Pittsburgh, PA
- St. Francis University, Loretto, PA
- St. Vincent College, Latrobe, PA
- Shepherd University, Shepherdstown, WV
- Shippensburg University, Shippensburg, PA
- Slippery Rock University, Slippery Rock, PA
- The Pennsylvania State University, State College, Monaca, Erie, DuBois, Lemont Furnace, and White Oak, PA
- University of Akron, Akron, OH
- University of Pittsburgh, Pittsburgh, Bradford, Greensburg, Johnstown, Pymatuning, and Titusville PA
- West Liberty State College, West Liberty, WV
- West Virginia University, Morgantown, WV
- Westmoreland County Community College, Youngwood, PA
- Wittenberg University, Springfield, OH
- Wooster College, Wooster, OH

SELECTED LEED / HIGH-PERFORMANCE EXPERIENCE

- **NET ZERO**
  - Phipps Conservatory, Center for Sustainable Landscapes, Net Zero, LEED® Platinum, Pittsburgh, PA
  - Frick Environmental Center, Net Zero, LEED® Platinum, Pittsburgh, PA
  - PNC Branch, Net Zero, LEED® Platinum, Ft. Lauderdale, PA
- **LEED®**
  - A. W. Beattie Career Center, LEED® Gold, Pittsburgh, PA
  - Allegheny Sports Complex, LEED Silver®, Salamanca, NY
  - Art Works, LEED® Silver, Johnstown, PA
  - Bucknell University, Lewisburg, PA
  - Carnegie Building, LEED® Certified,
  - Hildreth-Mirza Hall, LEED® Silver
  - Butler VA Hospital, LEED® Silver, Butler, PA
  - CamTran Operations Facility, LEED® Compliant, Johnstown, PA
  - Carlow University Commons, LEED® Silver, Pittsburgh, PA
  - Carnegie Mellon University Scott Hall, LEED® Silver, Pittsburgh, PA
  - Chatham University Eden Hall, LEED® Certified Anticipated, Pittsburgh, PA
  - CJL Engineering Office Building, LEED® Silver, Johnstown, PA
  - DaVita Greenmount Central Dialysis, LEED® Gold, Baltimore, MD
  - eCenter@Lindenpointe, LEED® Silver, Hermitage, PA
  - Energy Innovation Center, LEED® Platinum, Pittsburgh, PA
  - Financial Institution, 175 LEED® Silver/ Gold Branch Bank Locations in 14 States
  - Hermitage Tech Center Incubator, LEED® Silver, Hermitage, PA
  - Kinzua Bridge State Park Visitors Center, LEED® Silver, Mt. Jewett, PA

SELECTED WEST VIRGINIA EXPERIENCE

- West Virginia University, Morgantown, WV New Business and Economics Building, Morgantown, WV (In-Design)
- NASA Independent Verification and Validation Center, Fairmont, WV
- Studio Theater Renovation, Morgantown, WV
- Oglebay Hall, Forensic Science Lab, LEED® Certified, Morgantown, WV
- Brooks Science Hall, Morgantown, WV
- Campus Master Plan, Morgantown, WV
- Puskar Center Performance Dining Facility, Morgantown, WV
- Shepherd University, Byrd Hall/Snyder Hall, Shepherdstown, WV
- Fairmont State College, Fairmont, WV
- Hunt Haught Hall
- Pritchard Hall
- West Liberty State College, Fire Alarm System, West Liberty, WV
- WVU Medicine, Ruby Memorial Hospital, Multiple Renovations, Morgantown, WV
- WVU Medicine, New Children's Hospital, Morgantown, WV
- Mon General Hospital, Morgantown, WV
- Operating Room, Air Handling Units
- Pharmacy USP Renovation
- Radiology Renovation, (In-Design)
- Weirton Medical Center, Weirton, WV
- Administration Suite, CT Scanner, Emergency Power
- Medical Records, MRI, Pharmacy, Sleep Lab
- Women's Center, Endoscopy, Fire Pump
- Medical Office Building, Business Office
- Chestnut Manor, Renovation Project, Weirton, WV

1 | OGLEBAY FORENSIC SCIENCE LAB

West Virginia University transformed its historic 54,000 SF Oglebay Hall into a state-of-the-art forensics laboratory and classroom building. Dating from 1916, the new 74,000 SF building includes DNA and molecular biology laboratories, electron microscopy, bone analysis, gas chromatograph, ballistics analysis, blood, fingerprint, and trace evidence analysis facilities, as well as classrooms, faculty and graduate student offices, and new auditoriums. The project achieved a LEED® certification.

2 | WVU MEDICINE

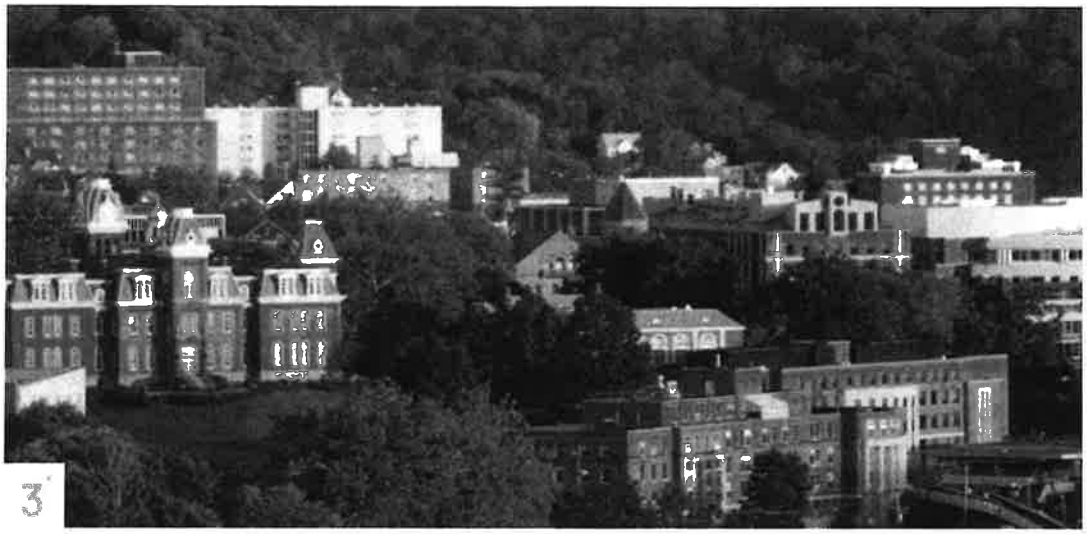
Our expertise in healthcare engineering including central plants and system planning for hospitals allowed CJL to skillfully design the mechanical and electrical systems for this new Children's Hospital owned by and located on the WVU Medicine Ruby Campus.

The $167 million project consists of a new 9-story building of 300,000 SF. This full-service hospital houses operating rooms, emergency department, cath lab, GI lab, PICU beds, private NICU rooms, acute care, postpartum, compounding pharmacy, full radiology suite, LDRP, clinics, oncology floors – infusion, epilepsy monitoring unit, central sterile processing, offices and building support, and a space for enhanced research. The 10th Floor will host the Family Resource Center, a unique space for family therapy and gathering.

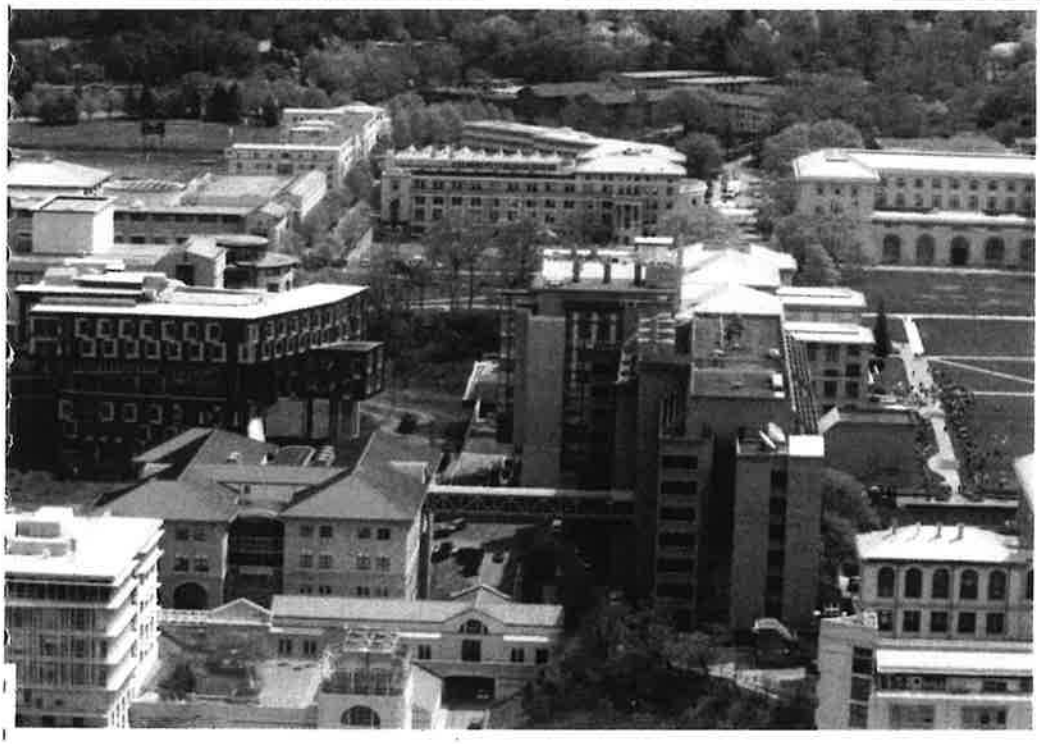
3 | PENN STATE FAYETTE

Penn State Fayette conducted a feasibility study to evaluate costs and options for renovating the biology lab in the Biomedical Building, which includes rooms 103, 104, 105, 106 and 107 for a total of 2,300 SF.

TEAM EXPERIENCE / INTERTEK PSI



3



1

1 | CARNEGIE MELLON UNIVERSITY

PSI has conducted asbestos, hazardous materials, and lead-based paint surveys throughout the Carnegie Mellon University Campus. The comprehensive surveys were conducted at a variety of campus settings for inspections, sampling, polarized light microscopy (PLM) asbestos analysis, lead-paint testing via x-ray fluorescence (XRF), and report preparation. PSI also performed labeling of identified asbestos-containing materials (ACM) at the facilities.

2 | POINT PARK UNIVERSITY

PSI has conducted asbestos, hazardous materials, and lead-based paint surveys throughout Point Park University's Downtown and Oakland Campuses. The comprehensive surveys were conducted at a variety of campus settings for inspections, sampling, PLM and Point Count asbestos analysis, lead-paint testing via x-ray fluorescence (XRF), and report preparation. PSI also performed labeling of identified asbestos-containing materials (ACM) at the facilities

3 | WEST VIRGINIA UNIVERSITY

PSI has conducted several asbestos surveys to identify suspect asbestos-containing materials (ACM) and hazardous materials of various buildings at West Virginia University Campuses. The purpose of the asbestos surveys was to provide information regarding the presence, condition, and estimated quantity of accessible ACM in the buildings prior to renovations. The surveys were also performed to confirm the presence or absence of asbestos in materials impacted by the renovations.

R3A EXPERIENCE / REFERENCES

01

Reference One

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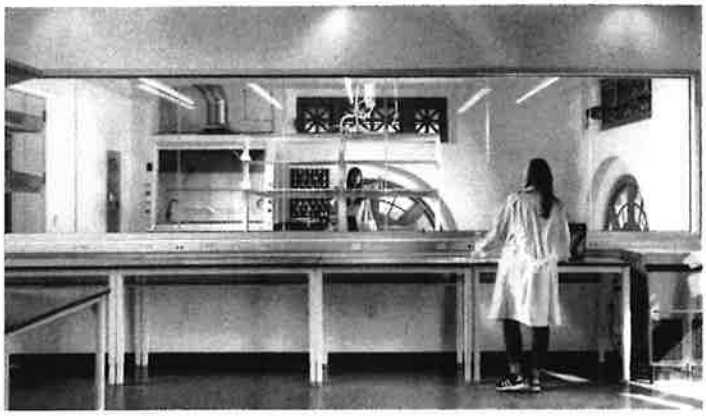

Civil & Environmental Engineering Lab Renovation

02

Reference One

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R3A

THANK **YOU**