E. Mitchell Swann, P.E., FCIBSE, LEED AP
Consulting Engineer

Education

- Drexel University, Bachelor of Science, Mechanical Engineering, 1981

Registrations

- Professional Engineer: CA (M33516), CO (41127), CT (0025378), DE (15526), GA (032063), IL (062-058947), KY (24969), MD (35668), MI (6201053882), NJ (24GE04603800), NY (83765), and PA (032902E)
- Leadership in Energy and Environmental Design Accredited Professional
- National Council of Examiners for Engineering and Surveying (27223)
- Chartered Institution of Building Services Engineers (UK) – Fellow (036626)

Professional Affiliations

- American Bar Association, Associate Member
- ABA Forum on the Construction Industry, Member
- American Society of Heating, Refrigeration, and Air Conditioning Engineers, Member
- American Society of Mechanical Engineers, Member
- Association for International Arbitrators (AIA) – Professional Member
- Chartered Institute of Building Services Engineers (UK), Member
- Drexel University Alumni – Board of Directors
- Engineers Club of Philadelphia – Vice President & Board of Directors
- Instrument Society of America – Member
- International Code Council – Member
- International Society of Pharmaceutical Engineering
- National Society of Black Engineers – (President - Philadelphia Chapter 2002), Member
- Pennsylvania Environmental Council – Board of Directors
- U.S. Green Building Council – Member

General Experience

Mr. Swann has over 25 years of experience on both domestic and international projects in the areas of consulting, design engineering, construction, project management, forensic engineering and claims analysis. His career includes the engineering and design of mechanical and control systems across a wide range of commercial, industrial and institutional projects and building types including central utility plants, laboratories and research facilities, microelectronic facilities, pharmaceutical facilities, broadcasting, computer centers, correctional facilities and shipboard systems. Mr. Swann has served as Chair on several ASHRAE Technical Committees and co-authored design guidelines for ASHRAE

and ISPE. He also served as Vice-Chair of the ABA's Committee on ADR in Construction and currently serves as Chair of the on the Board of Directors for The Enterprise Center Community Development Corporation. He is frequently a national and international speaker and lecturer for professional organizations and is a member of ASHRAE's Distinguished Lecturer roster since 2005.

Expert Witness Testimony

High Rise Condominiums, Philadelphia, PA: The case involved assisting a design professional in recovering unpaid fees from a major developer and in rebutting a counterclaim alleging deficient and/or defective design in the completed and occupied property. Mr. Swann led MDC's team in the evaluation of the project workflow, unit customization and design changes requested by the Owner, construction deviations by the contractor, changing code interpretations by the local official and cost analysis of MEP systems construction costs for the project. The case was settled in mediation to the satisfaction of our client. Mr. Swann presented MDC's report in mediation.

Energy Use - Class A Office Tower, New York, NY: The case involved a dispute between the property owner and a tenant regarding excess electrical energy use and utility costs associated with same over a 10 year period. Mr. Swann led MDC's team on behalf of the in the analysis of varying electrical 'plug' loads; leased space totals; varying operating schedules and alternate power purchase contract impacts of the shifting space use of the tenant over their 10 year periods of occupancy to ascertain the extent of and value of excess electricity use (beyond that allocated in the base lease). The analysis had to consider varying power providers, changing utility rates and varying lease terms over the period to properly assess the appropriate charges to be levied on the tenant.

EnergyStar® Residential Property Analysis, Denville, NJ: Mr. Swann led a team at MDC through the detailed site investigation, analysis and development of remedial solutions to inadequate heating and other comfort problems in a number of properties built by a major residential developer in northern New Jersey. The properties were designed to be in compliance with the US DOE's Energy Star program. Construction issues caused complaints in several properties in the development. MDC, on behalf of the developer investigated the performance issues (including the use of infrared thermography and computerized energy modeling) to assess the properties, identify any defects and develop an effective remediation plan which could be executed economically by the builder and allow the properties to maintain their Energy Star rating.

Food Processing Plant, Allentown, PA. The case involved a defense of a design professional for failing to meet the Standard of Care regarding the design and construction of a fresh produce processing and packaging plant. The Owner alleged that the HVAC system design was defective despite having engaged the contractor without benefit of design professional input when making significant modifications to the plant, authorizing and di-

recting deviations in the construction from the original design and having used the plant for over 5 years before filing a complaint. Mr. Swann led MDC's team in the analysis of the HVAC system's design, deviations in construction and performance under varying operating conditions in preparation of an expert report responsive to the claim. The case settled to the client's satisfaction.

High School Construction Defect Analysis and Energy Conservation Program, Upstate Pennsylvania: Mr. Swann led a MDC team in the long term analysis of energy consumption at a newly constructed 'green' high school in upstate Pennsylvania. The issues driving the school's unexpected and excessive energy use involved three primary elements: defective construction which effectively negated several energy conserving aspects of the design; incorrect or inappropriate HVAC system control strategies which reduced the effectiveness of energy conserving design measures and insufficient training on system operation, monitoring and optimization for the schools personnel. MDC monitored, analyzed and modified system operational profiles, setpoints and strategies to reduce energy consumption by over 20% annually.

Apartment Complex, New Castle, DE. The subject of this matter involved the execution of a due diligence evaluation by an engineering/property assessment consulting firm, of an apartment complex purchase; the interpretation of conditions relative to building codes and the impact of those interpretations on the need for upgrades to meet code to satisfy local authorities. This assignment entailed the evaluation of the properties; evaluation of the applicable codes; assessment of code interpretations by local authorities and the evaluation of the design responses to mandated code upgrades precipitated by a catastrophic failure. Prepared a detailed expert report as well as provided deposition testimony in defense of the engineering firm. The case settled in a satisfactory manner for our client.

Termination of Prime Contractor, Rancocas Valley, NJ Mr. Swann provided expert analyses and a written report in support of an electrical contractor who was part of a school renovation and expansion project wherein the School District terminated the general contractor which impacted the efficiency and sequencing of the electrical work. The electrical contractor sought additional compensation for disruption, delay and inefficiencies caused by the owner's termination of the general contractor and failure to properly coordinated the work in the multi-prime arrangement on the project. MDC's report was instrumental in securing a satisfactory settlement forour client, the electrical contractor.

Exterior Insulation Finishing System, Princeton, NJ. The subject of this matter involved the analysis of water migration across an exterior synthetic stucco cladding system, EIFS and subsequent damage to the building components within. The "synthetic stucco" system was installed on numerous houses at a large scale residential development in New Jersey. This assignment entailed the analysis of the design, manufacturing, mar-

keting, and distribution of barrier EIFS synthetic stucco finish systems, as well as the installation and project management and oversight of the project development. The investigation also analyzed the design professional's responsibility for the EIFS systems, the adequacy of design details and manufacturer's specifications and the general applicability of EIFS systems for cladding wood frame construction. Prepared an expert report and deposition testimony on behalf of the client. The case was settled to the satisfaction of our client.

Senior Residential Living Complex, New Wilmington, PA. Provided professional analysis, expert report and testimony in defense of an architectural firm, against a claim made by the Owner. The assignment involved the evaluation and assessment of architectural firm's performance on this project relative to the Standard of Care with specific focus on the following areas of practice; the preparation of the drawings and specifications, supervision and coordination of engineering consultants and the performance of Construction Administration services. The case was a 3 member Arbitration panel.

HVAC Condenser Water System Failure and Flood, New York, NY. Provided professional analysis and an expert report. The assignment involved the evaluation and assessment of collective defendants regarding their execution of project responsibilities relative to a flooding incident which occurred during construction in the building. The flood resulted in significant damage to spaces occupied by tenants in the building whose firms were not involved, in the construction project.

Pharmaceutical API Plant, La Porte, TX. Deposition Testimony. Case involved the defense and counterclaim of the pharmaceutical chemicals division of PPG Industries against a GC/CM and electrical subcontractor for claims of incomplete and inaccurate and late design documentation and owner interference. Prepared an expert report defending the owner against said claim. The case settled to client's satisfaction. (Defendant)

Pharmaceutical Plant, Singapore. Arbitration Testimony, Singapore Arbitration Center. Technical review and evaluation of A/E design services involving piling, structural steel and computer 3D modeling (CADD) of piping for a bulk and intermediate manufacturing plant for Schering Plough. Presented findings, analysis and opinions to an international arbitration panel. (Plaintiff)

Industrial Dust Collection System, Perth Amboy, NJ. The subject of the matter revolved around the design-build execution of a project which provided an industrial dust collection system for use in the steel processing operations. During the course of operations, a worker at the plant came in contact with the collection system ductwork whereupon the worker received an electrical shock and was injured. The worker alleged that the design of the dust collection system was deficient and created the hazard and that the designers of the system were responsible. Mr. Swann provided technical analysis, expert

opinion and conclusions on several issues relative to the delivery of engineering services including the engineering and design of industrial process dust collection systems in general and the designer's performance of their duties with respect to the standard of care. Mr. Swann prepared a detailed expert report and shortly after submission of the report, the dispute reached a very favorable settlement for our client.

University Campus Library, Glassboro, NJ. Mediation Testimony. The assignment included technical analysis and mediation session participation regarding an errors and omissions claim against a consulting engineering firm on behalf of the owner for a $20 million university library. Issues involved were based on the engineering design of the building chilled water plant and the system being improperly sized. The case settled in favor of the owner. (Plaintiff)

Pharmaceutical Packaging Facility, Bethlehem, PA. The case involved defense against a claim and counterclaim between the plant owner and the design-build contractor for the facility. Major issues included defective construction, and HVAC systems that failed to meet performance specifications and a late turnover of the facility to the owner. The case settled to the satisfaction of the owner.

Housing Authority of the City of Camden - Camden, NJ. The case involved a claim made by the Authority against the general contractor for defective workmanship and failure to comply with the project design documentation and local code requirements on over 30 different buildings. The case was resolved to the satisfaction of the Authority.

Project Consulting: Design & Construction

SSA MidAtlantic Operations Center, Philadelphia, PA. Acting as "the owner's engineer" as the SSA executes several renovation projects in the facility. The projects are being executed using a design-build strategy with multiple contractors in multiple locations within the facility. Coordinating with SSA and the contractors and providing "real time" direction on technical matters in order to maintain the project schedule and control costs.

Dining Center, Florham Park, NJ. Mr. Swann provided engineering consultation, peer review and value engineering services on a $20 million dining center for an international pharmaceutical company in Northern New Jersey. Mr. Swann advised on the incorporation and execution of significant owner requested modifications to the project while in construction so as to achieve economical and efficient execution while under construction saving the client considerable time and money compared to the base project team's recommended solutions. Mr. Swann also provided schematic design and execution advice and counsel on the addition of a radiant heating & cooling floor system as well as other system modifications which enhanced building comfort and flexibility.

Medical Center, Jersey City, NJ. Jersey City Medical Center completed the design and construction of a new hospital in May 2004. Shortly after taking use and operation of the chilled water plant, the piping systems developed major leaks or failures. These leaks required a shut-down of the system and immediate repairs and jeopardized JCMC's licensure as a properly operating facility. Investigated the piping, identified the most probable cause and provided recommendations for modifications of the system to mitigate the potential for such failures in the future. Mr. Swann spent time in the plant and developed a computerized dynamic model of the affected systems which has been used to predict stress conditions in the systems and determine corrective actions to alleviate those stresses. Also, assisted during construction to ensure that the work done in the field achieved the intended outcomes.

Parking Garage, Plainsboro, NJ. Conducted a forensic investigation into the premature and accelerated deterioration of a two story concrete garage on the Plainsboro, site. After completion of the forensic analysis, developed a remediation program including necessary construction/restoration work; developed bid packages and solicited contractors; selected contractors and monitored the construction portion of the work.

Philadelphia Park Casino, INTECH Construction, Bensalem, PA. Provided professional consulting and advisory assistance in the development, evaluation and execution of a start-up and testing program for mechanical, electrical and life safety systems essential to the proper operation and function of the Philadelphia Park Casino Renovation. Worked closely with Intech and both the mechanical and sheet metal subcontractors to inspect and qualify the system. Also reviewed and commissioned the control systems at the conclusion of construction.

INTECH Construction, The Bridge Cinema Complex, Philadelphia, PA.
The assignment involved the development of a mechanical and control systems commissioning program for a newly constructed, multi-screen theatre with state-of-the-art video and audio systems. Also provided a periodic inspection and review of the mechanical construction scope.

Pfizer Manufacturing Facility, Terre Haute, IN. Design of a 150,000 sq. ft. grassroots manufacturing facility utilizing new drug delivery technology (metered dose installation) requiring barrier/isolation processing technology. Project included multiple filling and packaging lines and accommodates two-stage expansion.

Vaccine Production Facility, Washington, D.C. Conceptual design development for a 250,000 sq. ft., multi-product vaccine production plant constructed by the Department of Defense in response to vaccine shortages experienced during Operation Desert Storm. The project included aseptic processing, cell culture and tissue culture processing.

Bayer Consumer Care, Morristown, NJ. Design, documentation and construction of a 150,000 sq. ft. facility housing product and administrative space for Bayer's Consumer Care Products. The project was designed on a 'fast track' with a project team including the owner, program manager and construction manager, developer and the design team.

Research Laboratory, Bristol-Myers Squibb, Lawrenceville, NJ. Upgrade of the central fumehood and laboratory exhaust system for an existing 100,000 sq. ft. research lab to reduce system noise, improve energy efficiency and maintain proper air balance and control.

Production Facility, Wyeth-Ayerst, Inc., Great Valley, PA. Renovation of 50,000 sq. ft. of solid dosage (tablet and suppository) production, filling and packaging space, including a QC Sampling and Testing lab addition. Mechanical system upgrades included bringing the existing HVAC systems up to current GMP levels, improving the packaging area filtration and the extension of breathing air and USP water systems into several new processing areas.

Pharmaceutical R&D Facility, West Point, PA. Master Plan, programming A/E design and construction supervision for a 220,000 sq. ft. product development and pilot facility. The facility included laboratories, cGMP processing areas, offices, warehousing and controlled environment production areas for preparing clinical samples.

Bio Medical Research Laboratory, Thomas Jefferson University, Philadelphia, PA. Design, documentation and construction supervision for a 289,000 sq. ft., 12-story medical laboratory building for the research and teaching of biochemistry and microbiology. A separate animal facility is on the top floor.

Pharmaceutical Warehouse, Glaxo, Inc., Zebulon, NC. Design of 80,000 sq. ft. of controlled environment, automated storage and retrieval warehouse used for storing finished pharmaceutical products. The facility is designed to maintain fixed cooling, heating and relative humidity conditions to prevent spoilage of the finished product.

Bristol-Myers Squibb, Lawrenceville, NJ. Renovated a 30,000 sq. ft. laboratory support services area including glass and tunnel wash areas, hazardous material storage area, media preparation, autoclaves, sterilizing ovens, radioactive materials handling and chemical storage.

Life Sciences Research Complex, Wilmington, DE. Design and construction of a 260,000 sq. ft. life sciences research complex that included plant and health science labs, a 65,000 sq. ft. animal holding area, and 35,000 sq. ft. pharmaceutical research and development facilities. Responsibilities included the engineering and design of various air handling and exhaust systems and the design of controlled environment growth chambers in the science wing and design of a narcotics vault in compliance with DEA regulations.

Fermentation Facility Upgrade, Genetics Institute, Cambridge, MA. Conceptual and schematic design of an upgrade and expansion of an existing GI biofermentation facility. Selected all mechanical equipment, schematic layouts and schematic design of instrumentation and controls systems to arrive at a construction cost estimate prior to funding approval.

Science and Technology Center, Syracuse University, Syracuse, NY. Supervised the design, construction and start-up of mechanical and control systems for a 230,000 sq. ft. research facility using a large scale variable air volume fumehood exhaust systems. The facility included over 60 chemistry, physics and specialty laboratories and 200 fumehoods.

24 x 7 Critical Computer Operations Center, DE. Supervised the design, construction and start-up of the mechanical, control and security systems for a 330,000 sq. ft. data center handling Morgan Stanley's primary transactions. Facility included a 2,200 ton chilled water plant, a heat-recovery chiller for heating and a diesel-powered, emergency power generation station.

Allenwood Correctional Complex, Allenwood, PA. Supervised the design of the mechanical control and security level facilities plus a Witness Protection Program facility. This Department of Justice project included a primary central utility plant with a radial distribution system supplying 7,000 tons of cooling throughout the entire complex.

Micro-Electronics Industry

- **Anadigics, Inc.** Wafer Fab Expansion, Warren, NJ.
- **IBM Labs**, Product Development Lab Renovations, Yorktown Heights, NY.
- **Southern California Edison**, Semiconductor Industry Futures 'Think Tank' Roundtable, San Francisco, CA.

Commercial Office Space & Data Operation Centers

- **Asia Pacific Coastal Insurance**, Taibao-Maolin Centre – Shanghai, China
- **Ciro Real Estate & Development Company,** Ciro's Plaza – Shanghai, China
- **Glaxo-France**, Headquarters, Marly-le-roi, France
- **IBM**, Regional Operations Center, Valley Forge, PA

Professional Activities

American Society of Heating, Refrigeration, and Air Conditioning Engineers

- TC 1.7 – Business, Management & General Legal Education, Voting Member
- TC 2.8 – Building Environmental Impacts and Sustainability, Member
- TC 7.1 – Integrated Project Design Processes, Member
- TC 9.10 – Laboratory Systems, Member
- TC 9.11 – Clean Spaces, Member, Former Chair (1995-2000)

International Society of Pharmaceutical Engineering

- ISPE/FDA Baseline Design Guideline, Bulk Pharmaceutical Chemical Facilities
- ISPE/FDA Baseline Design Guideline, Oral Solid Dosage Forum Facilities
- ISPE/FDA Baseline Design Guideline, Bio Pharm Manufacturing Facilities

Selected Presentations

- *Application of ASHRAE Standard 189.1in the Design of High-Performance Buildings,* Vietnam Green Building Council Conference, Ha Noi, Vietnam, 2010
- *Design Build for Green Buildings: Integrated Delivery of an Integrated Idea,* MEET Conference, Moncton, NB, Canada 2010
- *Setting the Horizon – Integrated Project Delivery in Theory and in Practice,* ASHRAE Annual Meeting, Albuquerque, NM 2010
- *Integrated Project Delivery Expectations of Performance & Promises to Deliver,* ASHRAE Annual Meeting, Salt Lake City, UT 2008
- *Managing Risk in Sustainable Buildings – Policy, Performance & Pitfalls,* DePaul University, Chicago, IL 2008
- *A Mock Arbitration – Gargantua Pharma v E. P. Hemeral Design & Rhube-Goldberg Construction, ASHRAE* Winter Meeting, New York NY 2008
- *Understanding the Legal Liabilities of Green Building Projects, Engineering* Vision 2030, Seattle, WA, 2008
- *Design Build for Green Buildings: Integrated Delivery of an Integrated Idea,* ASHRAE Sustainability Conference, Detroit, MI, 2008
- *Sustainability: Un-definable Success in a Defined World,* ASHRAE, NYC, 2008; Indiana Building Energy Symposium, Indianapolis, 2006; and ASHRAE, Kansas City, MO, and Chicago, 2006
- *AcreConf 2007 "Challenges to Sustainability" - Sustainability – Indefinable Success in a Defined World,* New Delhi, India 2007
- *Project Green Light: The Business Case for Green,* ASHRAE, Chicago, IL, 2006
- *Project Monitoring for Financial Institutions,* National Association of Real Estate Investment Managers – AE & Environmental Forum, Philadelphia, PA, 2005
- *Risk: The Real World of Project Management,* ISPE, Phoenix, AZ, 2005
- *Construction Management 2005: New Challenges and Opportunities with High Tech Projects,* International Superconference, London, UK, 2005
- *Professional Practice and Risk Management: Engineering as a Contact Sport,* Valley Forge, PA, 2005
- *Rule #1: Nothing Is as Simple as It Looks. The Use of Technical Experts as Neutrals in Complex Construction Cases,* American Bar Association Section of Dispute Resolution, Los Angeles, CA, 2005
- *The Standard of Care – Expectations of Performance & Promise to Deliver,* Construction Superconference, San Francisco, CA, 2004

- *Successful School Design & Construction: Mission Impossible or Impossible Mission?*, Duane Morris, Walter T. Wolf, Philadelphia, PA, 2004
- *"Can't We All Just Get Along?" Keeping Your Eye on the Prize Despite Getting Poked in It*, ISPE Annual Meeting, San Antonio, TX, 2004
- *HACCP – Design Responses to New Food Processing Regulations*, ASHRAE Annual Meeting, Nashville, TN, 2004
- *Project Management*, Pyramid Club's Innovation Forum, Philadelphia, PA, 2004
- *Construction Project ADR: Resolutions in Real Time*, presented to ABA with Pepper Hamilton LLP and Drinker Biddle, New York, NY, 2004
- *Legal Issues: Mold, Mildew and IAQ for Owners/Facility Managers/Engineers*, ASHRAE/BOMA meeting, Philadelphia, PA, 2004
- *Construction Management/Design-Build in Pennsylvania*, Presented with Pepper Hamilton LLP for Lorman Education Services, Wilkes-Barre, PA, 2004
- *Salvaging the Troubled Project*, Buchanan Ingersoll, New York, Pittsburgh, PA and Washington, D.C., 2003
- *Sustainability – Un-definable Success in a Defined World*, CIBSE/ASHRAE, Gathering of the Building Services Industry, Edinburgh, Scotland, 2003
- *Quality Through Project Management*, ISPE, Delaware Valley Spring Education Program, 2002
- *Current Practice and Future Trends in the Design of Oral Solid Dosage Facilities*, ISPE, Durham, NC, 2000
- *Fumehood Testing, Specifying and Executing*, ASHRAE, Dallas, 2000
- *ISPE/Interphex, Oral Solid Dosage Baseline Guidelines*, Sao Paolo, Brazil, 1999
- *Cleanroom Project Execution*, ASHRAE, 1998
- *ISPE/FDA Oral Solid Dosage Facilities Design Guidelines*, Tampa, FL, 1998