



# MARK L. COULIS, LEED AP

Senior Design Consultant | Building Envelope Consulting Group

Mr. Coulis provides leadership to our Building Envelope Consulting Division, providing expertise in building sciences and over 35 years of industry experience. The WS Consulting Group supplies owners, architects, contractors manufacturers, and like clients with expert design, consultation, and required technical resources.

## PROFESSIONAL BACKGROUND

Senior Building Envelope Design Consultant

Mark Coulis is a senior level building envelope design consultant with distinguished experience in the discipline. He has worked on a vast number of buildings worldwide with various levels of scope and magnitude.

Mark has served in many capacities and in various aspects of the industry for over 35 years. He has contributed on envelope and curtain wall system designs, provided enclosure assessments, forensic investigations, envelope system failure analysis, thermal analysis services, expert witness testimony and many other related cladding consulting services.

## EXPERIENCE

2008 - Present	Wheaton Sprague Building Envelope
2005 - 2008	Curtain Wall Design & Consulting
2003 - 2005	MK Architectural Products
2000 - 2003	Wheaton Sprague Building Envelope
1992 - 2000	Associated Materials
1987 - 1991	R.A. Hubbard Associates
1984 - 1987	PPG Industries
1980 - 1984	AMPAT/ Midwest

## PROFESSIONAL AFFILIATIONS

BEC, Building Enclosure Council  
GANA, Glass Association of North America  
USGBC, U.S. Green Building Council

## RECOGNITION & AWARDS

Awarded 4 letters of patent during his tenure as Director of Engineering of Associated Materials:  
5,661,939 (9/27/97)      5,704,188 (1/6/98)  
5,759,660 (6/2/98)      5,899,237 (5/4/99)  
2009 GSA Design Award for U.S. Courthouse, Austin, TX

## EDUCATION

Bachelor of Science | Mechanical Engineering  
The Ohio State University

## PROJECT EXPERIENCE

### A.J. Celebrezze Federal Building Facade Renovation | Cleveland, OH

Comprehensive facade consulting services to the Construction Manager, for this 32-story, 1,462,628 s.f. office tower, built in 1966. The estimated \$270 million dollar renovation is a Recovery Act funded roof and facade replacement project for GSA. It is a national test case on balancing architectural preservation with the need to address climate change. It will be the first high-rise tower in the U.S. re-clad with a new double skin facade on all four sides, leaving the refurbished original facade intact and visible. The second skin will create an insulating cushion of air in the 2.5-foot gap between the old and new facade. It will remain fully occupied during construction. Achieved VPP (Voluntary Protection Programs) status, and OSHA merit program.

### Four Seasons Hotel & Tower | Miami, FL

Facade Assessment Services for this 68-story Luxury Hotel & Tower in Miami, FL. WS provided review, assessment, field observations and response for the exterior curtain wall system related to water intrusion problems, glass replacements, seals, document review, field revisions, with specific issues related to the shadow boxes in the unitized curtain wall. Initial document review of construction drawings, specifications, manufacturer's product data submittals, shop drawings, as-built drawings, modifications, etc. Site observations to visually assess problem areas related to the items specified in the client's scope.

### Functional Research Building | Corning, Inc. | Corning, NY

Contracted by Corning, Inc. to provide exterior facades consulting to assist with the 6-story Functional Research Building in Corning, NY. The scope of work included technical consultation services for cast in place concrete facades; glazed aluminum curtain wall facades; roof copings and adjacent flashing. WS investigated and identified deficiencies; provided design of repairs and contract documents; and provided construction support through final documentation.

### The East End - Redevelopment of the former Goodyear HQ Buildings | Akron, OH

Provided comprehensive technical consulting services to the architect of record for this 7-story building complex which included the following enclosure systems: Exterior brick masonry, Exterior metal building panels, Curtainwalls, Windows, Suspended Structural Glass Walls, Skylights, Entrances, doors & storefronts, Above-grade Waterproofing, Roofing and Flashings. Provided DD Assistance, CD Preparation, Assisted with bid reviews and assisted with CA Services.

### Cunz Hall College of Public Health | The Ohio State University | Columbus, OH

Sr. Design Consultant for concrete facade renovation designed to remedy the problem of air and water infiltration and update the appearance. WS provided comprehensive building envelope consulting services, as well as commissioning of the building envelope.



## Aronoff Center for Design & Art | University of Cincinnati | Cincinnati, OH

Sr. Design Consultant for exterior cladding renovation, which included exterior insulation and finish system (EIFS), window assemblies, and a single-ply membrane roof with associated flashings consisting of a floor plate of approximately 130,000 gsf total area. The wall system was comprised of an opaque panelized fascia with various fenestration elements, and the overall wall assembly included rain screen design features. Renovation included complete restoration of the existing envelope and exterior wall systems and interior finishes/assemblies damaged as a result of moisture and water damage. Fast track project. All goals met.

## ODAS Tower Team | Various Location, OH

Senior Building Envelope Consultant and leader of the high-rise team for building envelope assessments from elevated platforms for several buildings for the department of state related to the building envelope: water infiltration; glazing systems; cladding systems; roof systems. These included the James A. Rhodes State Office Tower in Columbus, The Oliver R. Ocasek Building in Akron, The Michael v. DiSalle Government Center in Toledo, The Frank J. Lausche State Office Building in Cleveland, and the Vern Riffe Center for Government and the Arts in Columbus. WS provided a comprehensive report of findings to the owner.

## Willis Tower (formerly Sears Tower) | Chicago, IL

Senior Design Consultant for this 110 story, 4,560,000 s.f. building in Chicago which had experienced the loss of curtain wall segments from the building resulting from a wind event occurring June of 2010. Provided a forensic exploration and observations to determine the causations for catastrophic detachment. Using building science tools and methods, discovered the fatal flaw mechanisms that led to the catastrophic failure, and determined that the flaw was not introduced at the time of construction but was developed over an extended in-situ time period due to the corrosion stress cracking of weld affected aluminum materials. Planned and provided a forensic engineering analysis to determine if the flaws were spread throughout the 110 stories of exterior curtain walls, and confirmed the flaws to be systemic. Worked with Alcoa Corporation to assess the existing aluminum mullion extrusion alloys which were classed as experimental at the time of building construction. WS prepared technical reports with findings, and repair recommendations with probable costs.

## Kent State University | Kent, OH

Provided technical consultation services for the preparation of a feasibility study for adding screen walls and roofing elements for protection of the existing roof mounted air handlers and ducting for the Fine Arts building. This study provided our professional opinion as to the viability of the existing structure to support the added screen walls and roofs, and considered wind, snow, and other design events as per current governing codes and standards. WS included in our study, the following:

1. Preliminary dead loads and reactions;
2. Preliminary live loads and reactions;
3. Protection of rooftop mechanical units/ducting;
4. Access to rooftop mechanical units/ducting;
5. Penetrations through existing roofs and building envelope;
6. Anchorages and attachments;
7. Constructability and construction tolerances;
8. Accumulation & shedding of ice and snow;
9. Selection of systems types, materials and finishes;
10. Building code requirements;
11. Wind and snow load requirements;
12. Effects on the envelope systems for building frame movements resulting from wind and/or seismic forces;
13. Service life;
14. Probable costs.

## Various BECx Projects | Locations throughout Ohio

Contracted by various authorized commissioning agents in the state of Ohio to provide a systematic quality assurance process that is intended to identify and avoid issues that could lead to defective or deficient building envelope or roof assemblies in new construction projects. BECx provides documented confirmation that exterior building systems function according to criteria set forth in the project documents to satisfy the owner's operational needs. WS has provided professional services through Pre-Design, Design, Construction, and Occupancy/Operations phases to address any performance objectives required by an owner for the exterior enclosure, curtain wall or roofing systems, including the control of: fire, acoustics, value, aesthetics, day lighting, heat flow (Infrared, Ultraviolet), air flow (infiltration, exfiltration), rain penetration, moisture control, vapor control, constructability, maintainability, and sustainability, structural performance, durability, security, & reliability.

## Metro Hospital Replacement Project | Wyoming, MI

Provided causation studies relative to condensation formation deficiencies, reviewed construction documents, specifications and other relevant printed materials provided. On-site visit to observe built conditions, record measurements (temperature, pressure and thermography images), and will place data loggers for the purpose of collecting temperature and humidity readings taken at periodic intervals during an approximate thirty (30) day period. Provided thermal finite element analysis with an "as currently built" and repair alteration scenario. Provided a written report with captioned photographs with a recommended repair method and an estimate of probable repair costs.