



Consulting Engineers & Scientists, Inc.

**THE EXPERT APPROACH
TO
FORENSIC ARCHITECTURE**

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FORENSIC ARCHITECTURE

INTRODUCTION

Forensic Architecture establishes the relationship between the application of architectural codes, practices, and standards and legal responsibilities. This may deal with a service, product, or property that was rendered or provided in connection with the built environment. When claims arise from the design, construction, alteration, or operation of buildings, the Forensic Architect can be asked to investigate and evaluate the matter. Any design professional, building owner or developer, construction contractor or manager, or construction products manufacturer or distributor may be involved in litigation related to their products or services if they were alleged to have caused property damage, bodily injury, or financial losses. An investigation and evaluation of those products, services, or constructs can determine who is responsible for or contributed to the damages, injury, or losses. A technically educated and experienced Forensic Architect who can explain the responsibilities of the parties involved and their relationship to applicable codes, practices, and standards should perform this evaluation. The Forensic Architect's investigation and evaluation is paramount in determining the outcome of a built environment liability issue.

THE BUILT ENVIRONMENT

The built environment is a highly sophisticated and complex construct that requires the concerted efforts of many individuals and entities. Construction is a complex and dynamic enterprise, and it often takes special knowledge and understanding to address the intricate technical issues that arise during the course of planning, design, and construction. If a problem arises, the legal system looks to the Forensic Architect to investigate the architectural facts of the matter regarding the project's development, design, construction, and maintenance. Certain investigative tasks such as inspecting building failures, researching codes and ordinances, interpreting contract requirements, evaluating project financial arrangements, analyzing construction logistics and schedules, and reporting on investigation findings are integral to the Forensic Architect's services.

BUILT ENVIRONMENT DESIGN PROFESSIONALS

Built environment design professionals are licensed individuals who are responsible for their professional acts, errors, and omissions. Built environment design professionals may include registered architects, professional engineers, landscape architects, professional planners, and professional surveyors. These professionals are licensed and registered to practice their profession in a particular state or states. In certain cases individuals may illegally practice a profession while not registered or qualified to do so. If a matter arises where the actions of a built environment design professional are at issue, the Forensic Architect has the education and experience to evaluate the incident circumstances and provide a professional opinion as to the obligations and performance of the built environment design professional.

PUBLIC SAFETY

A Forensic Architect relies on certain rules of professional conduct. These include safeguarding the public's life, health and property; promoting public welfare; and the performance of the built environment. Laws have been established to regulate the construction industry and promote Public Safety. Protecting the public from inadequate or unsafe buildings is established through law by the adoption of building codes. These codes establish the minimally safe protections required in a construction and as part of his investigation into a matter, the Forensic Architect

FORENSIC ARCHITECTURE

may review building codes. There may be certain circumstances or conditions that would warrant a higher standard to adequately protect the public. The Forensic Architect is able to evaluate the criteria used in a particular circumstance, and opine on whether that criteria could have, or should have been, enhanced.

THE INVESTIGATION

One of the Forensic Architect’s most valuable skills is the ability to intuitively understand the mechanics of the built environment. Thorough years of education and experience, the Forensic Architect has become intimately involved in the design, documentation, and construction of a multitude of building types. One of the key skills possessed by the Forensic Architect is the ability to “read” a building. During a site investigation, the Forensic Architect may perform certain tasks such as examining the building’s physical condition. He may look for telltale evidence that suggests what happened when a failure occurred, or he may look for what is there, or what should be there. As part of his investigation, the Forensic Architect may review the building’s maintenance and upkeep, or research the building codes that were in force at the time of the incident building’s construction, or study documents related to its design and construction. Based on this investigation and research, the Forensic Architect will be in a position to opine whether a building failure was due to improper design, construction, and/or maintenance.

STANDARDS

For certain investigations, the Forensic Architect may research standards to assist in forming a basis for his opinions. These standards fall into two broad categories – Consensus Standards and Reference Standards. Consensus Standards are documents that are developed by authoritative professional or governmental organizations. Through a structured consensus and peer review process, these organizations promulgate standards that, although not codified in a law, address a minimum level of performance or design that should be implemented for the safety of the public. Reference Standards are documents that are widely recognized industry resources for the design of the built environment. The Forensic Architect will have a library of such resources to assist in the fact-based review and analysis of a given situation. To assist in determining the basis of his opinion, the Expert Architect may refer to Consensus and Reference Standards in his reports and testimonies.

MAINTENANCE

The built environment is subject to the forces of weather and aging over time. Buildings and their associated site components do not last indefinitely and require adequate maintenance in order to function properly and safely. Certain incidents may be attributable to maintenance procedures. Once an incident occurs, the Forensic Architect can evaluate the maintenance procedures through the investigation of the existing conditions, maintenance records, past weather events, and the like. Additionally, the proper care and maintenance requirements of a building often come from the same codes that are used to design the facility. For instance, a high-rise tower’s exterior envelope will often have features to maintain the building’s skin built into the building. These features must be included as part of the building design process. The Forensic Architect may review the buildings design processes to determine if adequate maintenance features were properly provided.

FORENSIC ARCHITECTURE

INDUSTRY CONTRACTS

Oftentimes disputes arise over the performance of parties involved in a construction industry contract. These contracts may be agreements drawn between a property owner and a design professional, between a contractor and subcontractor or between an owner and a contractor. Or it may be a property lease or sale agreement. The contract may be an industry standard form of agreement as published by the American Institute of Architects (AIA), or it may be a less formal agreement to provide certain products and /or services, or it may be a derivation of other agreement types. Because of his education, experience and knowledge, the Forensic Architect is a qualified professional who can review construction industry contracts, and apply his insights to the resolution of contractual disputes. The Forensic Architect will research industry standards and opine upon the obligations of both parties as defined in the agreement.

DISCOVERY

The discovery of materials for expert technical evaluation should include documents and materials that offer historical insight leading to the incident events and are believed to be associated with the case development. When considering deponents, the owner, architect or engineer, contractors, construction managers, construction inspectors, maintenance supervisors and code enforcement officials may have relevant case information. Dates of design, construction and alteration should be determined to evaluate issues of code compliance.

BUILT ENVIRONMENT ISSUES

In the course of investigating a matter, the Forensic Architect may be asked to evaluate certain architectural characteristics of a building or site. Some of the areas of investigation may include the following:

Building Design

- Accessibility
- Bathrooms
- Building codes
- Building envelop failure
- Building material selection
- Building mold
- Building movement
- Chutes & Dumbwaiters
- Component failure
- Copywrite protections
- Door hardware
- Doors & egressways
- Elevators & Escalators
- Expansion joints
- Fire equipment
- Fire proofing
- Fire separation
- Fire stopping & draftstopping
- Floor heights
- Glass failure
- Glass protection
- Handrails
- Guards & guardrails
- Hazardous materials
- HVAC & thermal comfort
- Indoor air quality
- Insect control & damage
- Lighting design
- Local ordinances
- Maintenance requirements
- Means of ingress & egress
- Moisture control
- Noise & vibration
- Pedestrian safety
- Plumbing fixtures
- Radon control
- Restrooms
- Roof top access
- Safety standards
- Security planning & design
- Skylights
- Stairs & railings
- Stair Lifts
- Walking & working surfaces
- Water intrusion
- Wheelchair Lifts
- Windows
- Zoning & planning requirements

FORENSIC ARCHITECTURE
Building Systems

- Access control systems
- Alarm systems
- Ceiling systems
- Fenestration systems
- Fire protection systems
- Floor systems
- Foundation systems
- HVAC systems
- Lighting systems
- Monitoring systems
- Public address systems
- Roofing systems
- Security systems
- Structural systems
- Systems failures
- Systems maintenance
- Vertical transportation systems
- Wall systems

Construction Issues

- Bid solicitation
- Bidders list
- Building codes
- Change orders
- Construction contracts
- Construction delays
- Construction injuries
- Construction schedules & charts
- Contaminated waste
- Contract general conditions
- Contract scope of services
- Contract – cost plus
- Contract – fixed fee
- Contract – lump sum
- Contract – percentage
- Contractor performance
- Contractual obligations
- Correspondences
- Cost estimates
- Design-build issues
- Disposal
- Documents & records
- Field inspections
- General/subcontractors list
- General contracts
- General planning
- Hazardous materials
- Line manager responsibilities
- Liquidated damages
- Management control
- Notes & paperwork
- Payment notices & approval
- Personnel identification
- Production schedules
- Project manager responsibilities
- Project phase-out
- Project planning
- Project specifications
- Project stoppage
- Project transfer
- Shop drawings
- Statement of work
- Strategic project planning
- Work authorization
- Zoning regulations

Building and Property Maintenance

- Alterations after construction
- Building systems
- Cleaning procedures
- Code compliance
- Emergency maintenance
- Exterior maintenance
- Interior maintenance
- Maintenance agreements
- Maintenance records
- Maintenance contractors
- Maintenance procedures
- Maintenance programs
- Maintenance records
- Maintenance schedule
- Manuals
- Meeting notes
- Methods & techniques
- Personnel identification
- Policies and procedures
- Product purchase orders
- Repair records
- Seasonal maintenance
- Schedules
- Warning signs and devices

FORENSIC ARCHITECTURE

Lighting Issues

- Building illumination
- Cabling systems
- Display lighting
- Emergency lighting
- General lighting
- Lighting controls
- Lighting graphics
- Luminous ceilings
- Medical/surgical lighting
- Site lighting
- Stair lighting
- Studio lighting
- Theatrical lighting
- Underwater lighting
- Walkway illumination

Premises Liability

- Automated doors
- Elevators & escalators
- Fire & panic planning
- Furniture & accessories
- Guarding & protection
- Railings
- Ramps
- Safety programs
- Security failures
- Slip resistance
- Slip, trip & falls
- Stairways
- Walkway surfaces
- Wet floors & surfaces
- Window protections

Furniture & Equipment

- Accessories
- Aquariums
- Art glass
- Artworks & antiques
- Athletic flooring
- Bank fixtures & casework
- Benches
- Blinds, shades, shutters
- Booths & tables
- Carved & cast sculpture
- Ceiling systems
- Classroom & library furniture
- Communications failure
- Computer failure
- Computer/raised flooring
- Display casework
- Dormitory furniture
- Draperies & curtains
- Ecclesiastical furniture
- Fixed audience seating
- Floor & table lamps
- Floor mats
- Flooring
- Flooring transitions
- Folding wall furniture
- Healthcare furniture
- Hotel & motel furniture
- Interior plants & planters
- Laboratory casework
- Mailroom furniture
- Manufactured casework
- Metal casework
- Motorized blinds & shades
- Motorized draperies
- Multiple seating
- Office furniture
- Outdoor furniture
- Plastic laminate casework
- Portable audience seating
- Relief artwork
- Residential furniture
- Restaurant/bar furniture
- Room dividers & screens
- Rugs & carpeting
- Solar control film & devices
- Special purpose flooring
- Specialty casework
- Wall coverings
- Wall decorations
- Wood casework
- Wood flooring

Professional Liability

- Bidding
- Construction documentation
- Contract administration
- Contract disputes
- Contract negotiation
- Design errors
- Design omissions
- Design-build issues
- Drawings & specifications
- Historical review
- Programming
- Project close-out
- Project coordination
- Project initiation
- Schematic design

FORENSIC ARCHITECTURE

- Copywrite protection
- Cost & time claims
- Cost estimates
- Design development
- HUD review
- Material selections
- Performance Issues
- Planning & Zoning Hearings
- Shop drawing/submittal review
- Site inspections
- Systems selections

ARCHITECTURAL ASSISTANCE FOR INCIDENT INVESTIGATION

An attorney often encounters technical documents or reports that provide information that is difficult to interpret. Sometimes, an attorney needs assistance interpreting technical information. The Forensic Architect can provide technical assistance to an attorney in performing tasks including the following:

- Anticipate opposing arguments
- Architecture & construction general practice criteria
- Arrange or conduct testing
- Code enforcement law
- Code requirements, changes & standards
- Complaint review
- Deposition notes
- Evidence storage
- Examination of accident scene
- Exhibit preparation
- Governmental department file review
- Identify useful information
- Inform attorney about technical issues
- Interface & coordinate obtaining information
- Interface with other consultants
- Local & state requirements
- Photograph evidence
- Prepare a report, if warranted
- Questions & wording for discovery requests
- Research publications
- Review drawings, contract, & design documents
- Review records & correspondence
- Review technical documents
- Testify, if warranted
- Testing of incident conditions
- Translate architectural language into common terms
- Trial cross-examination questions
- Trial monitoring
- Trial preparation

The information presented in this booklet is intended only to be used as a guide in assisting clients concerned with or involved in the legal process where litigation or potential litigation is an issue. The information is further intended to inform clients that Consulting Engineers & Scientists, Inc. has both the expertise and the capability to provide direction and guidance in the specific disciplines and areas presented in this booklet. It is important to note that the information also is general and is not intended to completely cover the specific nuances of a particular matter. If there are any questions concerning this information, please feel free to contact us.