



Consulting Engineers & Scientists, Inc.

**THE EXPERT APPROACH
TO
CONSTRUCTION LIABILITY
(ACCIDENTS AND CLAIMS)**

Consulting Engineers & Scientists, Inc.
The Commons at Great Valley
41 General Warren Boulevard, Malvern, PA 19355
610-296-2250; info@ces-experts.com; www.ces-experts.com

CONSTRUCTION LIABILITY

INTRODUCTION

This document is intended to aid the attorney in assessing and preparing a construction liability investigation. Construction liability includes construction accidents and construction claims, such as defects or failures. Each construction liability case has unique considerations. The information contained herein is general in nature, and depending upon the circumstances of the case, certain items may or may not be applicable or justifiable. A timely technical assessment by the construction engineer can help the attorney plan the case more efficiently and can result in strengthening the case.

CONSTRUCTION ACCIDENTS

Certain construction accidents are caused by defects of the construction site. OSHA has stated that falls are leading causes of workplace injuries and fatalities. In addition to falls, other construction accidents include persons struck by objects, persons cut by sharp objects, electrocutions, trench cave-ins, equipment or rigging failures, and fires. These accidents may be related to design, construction, maintenance or use of items including scaffolds, ladders, guarding of openings and edges of roofs, and personal protective equipment. These accidents can often be avoided if OSHA regulations, relevant statutes, codes, standards and reasonable work site practices are adhered to.

Slip, trip, and fall accidents are often encountered at locations of construction activities. The temporary nature of certain walking surfaces that are subject to conditions such as debris or foreign materials that reduce the walking surface slip resistance pose hazards at construction sites. Slip, trip and fall are words often used interchangeably, however these events are quite different. A slip occurs when there is not sufficient slip resistance available between a foot or footwear bottom and the walking surface, often associated with a foreign material. A trip occurs when the toe or tip of the footwear fails to clear an at-ground object, generally during a walking swing phase. A fall can be associated with a slip or trip, but also can be associated with a misstep, or non-walking related factors including body impact or medical reasons. Consideration should also be given to the individual's footwear in conjunction with the work environment.

Lifting and rigging accidents occur at locations that are generally considered heavy construction work sites. In addition to swinging loads that can contact a person, the lifted load can drop due to instability/unbalance conditions or overload of the lifting mechanism. An engineering investigation can identify issues regarding improper rigging technique or structural overloading. Damaged or broken components should be secured for future examination. Often an engineering analysis and/or material evaluation is necessary to identify the weak component of a lifting mechanism.

Construction accidents can include certain road or utility construction activity at or on a roadway. This type of construction requires a work zone set-up to alert and direct traffic at the location of work activity and/or roadway disturbance. The proper work zone set-up provides protection for the construction workers as well as the public (vehicle or pedestrian traffic). Excavation around utilities also requires notification to the state's one-call (also known as Miss Utility) system.

Safety apparatus, safety training and protective gear may be factors in construction accidents. This includes items such as fall protection, trench shoring and monitoring of breathing air for

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confined spaces. Personnel working at hazardous locations should be reasonably trained in work procedures and procedures for emergency situations.

CONSTRUCTION CLAIMS

Construction claims can result from defects in design, construction workmanship or products used and include collapses, settlement, wet basements, work quality issues, structural degradation, and maintenance. A construction related defect can also create a hazard and subsequent personal injury, damage to a structure, or financial loss.

Construction defects can occur as a result of work performed by the design professional, contractor, subcontractor, construction inspector, or product manufacturer. Certain construction defects may be associated with the work product of multiple parties related to the construction project. Some hazards can be reasonably identified and eliminated by qualified personnel, such as many tripping hazards. Other hazards are not as visible, such as a covered (hidden) defect or a design or material or fatigue-related defect and may result in a future failure.

Questions regarding the acceptability of architecture, engineering, inspection, construction and owner roles are raised for certain projects. The complexity of construction claims or contract disputes intensifies as the project size increases and the number of parties expands. Claims and disputes may arise from contractor default, unforeseen conditions, project planning, ambiguity of documents, changes in scope, alterations in schedules, budgetary constraints, design errors and omissions, bankruptcies, and underbidding.

Certain construction defects may include failure to reasonably protect the public or workers at a construction work site. At the public interface of a construction site, federal laws, state laws, building codes or ordinances may require certain protections. These protections may include walkway/roadway protective coverings, guarding, warnings or direction such as a flag person. Other protections include the maintenance of reasonable walking/working surfaces, edge/opening guarding, and warnings and/or instruction necessary for safe access.

OSHA

The goal of the Occupational Safety and Health Administration (OSHA) is to ensure safe and healthful conditions for working men and women.

The OSHA Act covers employees throughout the United States and establishes standards requiring employers to provide their workers with workplaces free from recognized hazards that could cause serious injury or death. The OSHA Act also requires employees to comply with all safety and health standards that apply to their jobs.

OSHA regulations are Federal Law and apply to all contractors regardless of number of employees, dollar volume of business or type and location of customer base. Further, in the Field Inspection Reference Manual, OSHA stated its Multi-Employer Worksite Policy, which addresses the overall jobsite responsibilities of the several contractors typically present on a construction project.

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THE INVESTIGATION

A construction liability investigation may include a site examination, securing evidence, witness statements, production of documents, additional discovery, and case analysis.

The conditions of the construction incident environment may be factors in an accident. However, a construction site is a rapidly changing environment. Changes can also occur at the location of a failure (claim site). The timely documentation of accident conditions is important. Evidence should be secured before it can be altered or destroyed.

In addition to the site examination, accident related documents such as accident reports and witness statements can provide valuable information. It is often the situation that limited knowledge of the incident circumstances exists, and witnesses are sometimes confused and provide incomplete, conflicting or erroneous information. The timely documentation of accident circumstances and accident site data can reduce or eliminate future assumptions or speculation.

Pertinent information must be carefully gathered and preserved for subsequent study and evaluation. When additional testing and analysis are warranted, the extent of an evaluation can be dependent upon securing evidence, before the evidence is altered, lost or destroyed.

Factors that may be considered during a construction accident evaluation include site conditions, inspections, safety precautions, relationships of parties, OSHA, means and methods, scheduling, environmental factors, and industry practices.

Some construction accidents are more complex due to number of parties involved, certain contract conditions, subcontracts, indemnities, owner involvement and other similar issues. The review of the design, bid and construction documents can help identify areas of responsibility.

EXAMINATION OF THE CONSTRUCTION ACCIDENT/CLAIM SITE

Conditions of the site should be observed and documented as soon as possible. Performing a site investigation as close to the incident date as possible is useful in determining the nature and cause of an accident. A site is subject to change due to environmental/natural conditions, authorized construction or unauthorized alteration. Evidence should be secured before it is altered or destroyed. A prompt, thorough site investigation that defines the accident site conditions can reduce assumptions and minimize speculation. The accident site conditions should be documented with close-up and wide-area photographs and photos that include measuring devices. Broken or damaged elements related to the construction accident should be secured and preserved for future examination and when necessary testing. Findings should be preserved for future evaluation.

When it is determined that a case warrants an expert, the expert can work with the legal team to identify reasonable theories that relate to the cause of the accident. Even after an accident/claim site has been changed the expert may be able to make useful observations. Incident date conditions can be compared to examined conditions. The expert can also assist in identifying technically related discovery material to effectively aide in formulating the case theories into fact and supportable expert opinions.

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The site examination may include the following:

Site Characteristics

- Barriers & obstructions
- Broken components
- Clothing
- Concrete forms
- Confined spaces
- Contaminants
- Contradictory conditions
- Curb & curb ramps
- Debris
- Deterioration
- Distractions
- Doors, hardware & glass
- Driveways
- Equipment guarding
- Equipment malfunctions
- Excavation
- Explosions
- Fall protection equipment
- Fasteners, nails & screws
- Fatigue
- Fences & gates
- Floors
- Footwear
- Guardrail & handrail
- Guards
- Hazardous materials
- Holes or openings
- Housekeeping
- Ice & snow
- Ladders
- Landings
- Leakage & spillage
- Lighting conditions
- Loading docks
- Locations
- Lockouts
- Material types
- Means of egress
- Measurements
- Name plates
- Pads
- Pavement, surfaces & joints
- Personal protection equipment
- Photographs
- Platforms
- Protective apparatus
- Protective or safety gear
- Protrusions
- Railings
- Ramps
- Rigging
- Roadway work zone
- Roof areas
- Sanitary sewers
- Scaffolds
- Security
- Shoe marks on surfaces
- Sidewalks
- Sight distance
- Signs
- Slopes & grades
- Soil conditions
- Stairs: risers & treads
- Stones & pebbles
- Storage & stacking
- Stormwater & drainage
- Subsidence
- Surface conditions
- Temporary roads
- Temporary traffic patterns
- Tools, hand & power
- Trees
- Trenches & shoring
- Utilities
- Walkways
- Walls
- Warnings, signs & devices
- Wind
- Windows, glass & screens
- Witness statements
- Work elevation

Environmental Conditions

- Day lighting
- Night lighting
- Incident conditions
- Weather records

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Measurements & Locations

- Change in elevations
- Curb heights
- Debris location
- Deteriorated areas
- Dips
- Drainage locations
- Fixed object locations
- Guard height
- Handrail anchorage
- Handrail diameter
- Handrail heights
- Layout of area
- Markings
- Overhead clearances
- Ramp slopes
- Riser heights
- Sight distance
- Signage
- Slopes & grades
- Surface texture
- Surface unevenness
- Tread depths

Testing and Analysis

- Air quality
- Chemical analysis
- Concrete testing
- Electric grounding
- Electrical systems
- Failure analysis of materials
- Hydraulics
- Metal detection
- Slip resistance
- Soils testing
- Stability
- Steel strength
- Structural analysis
- Timber evaluation
- X-Ray

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DISCOVERY REQUESTS

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. A history of the component(s), believed to be a factor related to an accident, may be relevant to developing certain cases. Construction project parties, including architects, engineers, contractors, owners, and building code enforcement officers, may have information relevant to the matter. Information available through building code enforcement officers and OSHA may be obtained directly by the attorney or consultant. Dates of design, construction and alteration should be determined to evaluate issues of building code and/or OSHA compliance. Based upon the case requirements the following information may be requested as it is determined to be necessary for the development and support of the case.

Agreements, Contracts & Parties

- Agreements & contracts
- Approval agencies
- Approved drawings
- Architects
- Building Code Enforcement File
- Code enforcement officer
- Construction applications
- Construction manager
- Construction permits
- Contractors
- Developers
- Engineers
- General contractor
- Inspection forms
- Inspectors
- Joint ventures
- Landlord
- Notes
- Notices
- Occupancy permits
- Official file
- Owners
- Project manager
- Property manager
- Realtor
- Safety engineer
- Sealed contract documents
- Subcontractors
- Tenant
- Variances
- Violations

Contractors

- Accident investigations
- Accident prevention programs
- Accident records
- Approved shop drawings
- As-built drawings
- Bid packages
- Change orders
- Codes, constructed under
- Construction meeting minutes
- Construction packages
- Gate logs
- Inspection records
- Instruction manuals
- Instructions
- Job meeting notes
- Job notes & records
- Job schedules
- Monthly reports
- Orientation of workers
- Person approving construction
- Safety manuals
- Safety meeting minutes
- Safety meetings
- Safety records
- Safety training
- Scheduling, project
- Scheduling, acceleration
- Shop steward(s)
- Special reports, correspondence
- Specifications

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- Construction photographs
- Daily reports
- Diaries
- Drawings
- Final construction drawings
- Foreman
- Person responsible for safety
- Photographs
- Policy manuals
- Safety directives
- Safety file
- Safety gear
- Superintendent
- Test reports
- Tool box meeting records
- Videos
- Work orders
- Workplace safety

Engineers & Architects

- As-built drawings
- Change orders
- Codes, designed under
- Construction packages
- Final construction drawings
- Preliminary drawings & sketches
- Project engineer
- Project manager
- References, relied on
- Revised drawings
- Shop drawings
- Specifications
- Who sealed drawings

Maintenance Records

- Agreements
- Alterations after construction
- Cleaning procedures
- Floor maintenance records
- Maintenance contractor
- Maintenance records
- Manuals
- Meeting notes
- Methods & techniques
- Personnel names
- Policies
- Procedures
- Purchase orders, equipment
- Purchase orders, products
- Records of repair
- Schedules
- Seasonal maintenance
- Warnings, signs & devices

Ordinances: Design & Construction

- Building code
- Existing structures code
- Fire code
- Ordinances: incident date
- Property maintenance code
- Rental properties code
- Roadway requirements
- Sidewalk requirements
- Site development requirements
- Usage of sidewalks
- Zoning requirements

Plaintiff

- Accident history
- Age
- Alcohol/drug abuse
- Attentiveness
- Climbing ability
- Clothing
- Experience
- Health
- Medical history
- Prior physical conditions
- Running ability
- Statements
- Training
- Vision
- Walking ability

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OSHA

- Accident history
- Citations
- Complete file
- Fines
- Hearings
- Inspections
- Investigations
- Letters
- Meeting notes
- Names of inspectors
- Notes
- Photographs
- Resolutions
- Statements
- Violations

Other Items

- Depositions
- EMT Reports
- Police Accident Report
- Newspaper photographs & reports
- Television reports

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THE ROLE OF THE ENGINEER IN A CONSTRUCTION ACCIDENT / CLAIM INVESTIGATION

The complexity of a case can affect the involvement of an engineer in the case. An attorney often encounters technical documents or engineering reports that provide information that is difficult to interpret. The engineer can assist the attorney by interpreting technical information and by providing technical direction. The expert engineer can assist in the development of a case by performing tasks including the following:

- Arrange or conduct testing
- Assist the attorney on technical issues
- Code enforcement or OSHA file review
- Code requirements, code changes & standards
- Complaint review
- Deposition notes
- Engineering & construction general practice criteria
- Evidence storage
- Examination of accident scene
- Exhibit preparation
- Governmental department file review
- Identify useful information
- Instruct attorney on technical issues
- Interface & coordinate obtaining available information
- Interface with other consultants
- Interview witnesses
- Local & state requirements
- Photograph evidence
- Predict opposing liability arguments
- Prepare a report, if warranted
- Questions & wording for discovery requests
- Research publications
- Review technical documents
- Reviewing & obtaining records
- Reviewing drawings, contracts & design documents
- Testify, if warranted
- Testing of accident conditions & evidence
- Translate engineering 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.