

Construction Defect Analysis

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To succeed in the construction defect analysis field, architects must have the expertise to diagnose building construction problems, accurately identify causes, thoroughly document their findings, and convincingly support them in arbitration, mediation, or litigation.

Construction defect analysts investigate building performance problems to determine their cause. Investigative findings are analyzed and documented. Analysts also may develop recommendations for conducting minimally intrusive investigations and for temporary repair methods as well as a budget for a definitive scope of work. The findings and recommendations may be used to assess blame for the problem (e.g., designer, contractor, materials supplier, manufacturer) in order to recover damages through mediation, arbitration, or litigation. The construction defect analyst is usually called upon to defend findings and recommendations in mediation, arbitration, or litigation proceedings.

The market for construction defect analysis services is somewhat cyclical, expanding dramatically during and following building booms, when the supply of qualified construction labor is tight and the capacity of code enforcement officials to regulate construction is especially challenged. In recent memory, the building boom in the 1970s and 1980s led to a rash of claims by owners of shoddily built condominiums and tract houses, particularly in areas experiencing rapid growth. A similar situation prevailed in the immediate post-World War II period, but the atmosphere then was not as litigiously charged as in recent years.

Claims and court actions related to building deficiencies have proliferated in recent decades. While suits by condominium and homeowners associations seem to be most prevalent, all types of buildings have been and continue to be subject to complaint, from medical facilities and schools to hotels and office buildings. The insurance industry, feeling the brunt of claims losses, is becoming more active in promoting construction quality control through improved, more uniform building code enforcement. In one initiative the cost of homeowners' insurance premiums soon will be linked to the rated competency of the building code department in the jurisdiction where the property is located.

Despite the growing strength of construction quality control initiatives, the market for construction defect analysis is likely to continue to expand. As long as mistakes are generated through greed, carelessness, lack of skill and knowledge, and inadequately administered fast-track projects, there will be construction defects.

CLIENT NEEDS

Anyone involved or potentially involved in a defect-related dispute is a potential client for a construction defect analyst. Building owners (including homeowners and condominium associations), usually working through their attorneys or manager representatives, need to determine the cause of building problems, devise a repair strategy, and assess the

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Summary

CONSTRUCTION DEFECT ANALYSIS SERVICES

Why a Client May Need These Services

- ▶ To determine the cause of building construction problems
- ▶ To identify measures to alleviate or correct problems
- ▶ To determine the cost and budget for corrective measures
- ▶ To obtain expert testimony during arbitration, mediation, or litigation

Knowledge and Skills Required

- ▶ Expertise in building materials, components, and systems
- ▶ Knowledge of construction methods and building codes
- ▶ Knowledge of product standards and standards of practice
- ▶ Familiarity with intrusive investigation techniques
- ▶ Knowledge of materials testing methods and protocols
- ▶ Skills in information analysis and report writing
- ▶ Ability to defend findings in testimony

Representative Process Tasks

- ▶ Determine teaming approach
- ▶ Collect data
- ▶ Analyze collected data
- ▶ Devise investigation strategy
- ▶ Conduct intrusive investigation and testing
- ▶ Analyze test data and results
- ▶ Evaluate scope of damages
- ▶ Develop recommended corrective measures
- ▶ Prepare and submit report
- ▶ Testify or conduct repairs as required

Insurance Industry Moving Toward Rating Local Building Code Departments

Poor enforcement of building codes is the cause of many construction defects. The insurance industry is moving toward rating local building code departments as a way to encourage better building code enforcement. The building code department rating would affect home insurance rates in the community. A similar system has long been in place for fire insurance rating based on a community's fire protection guide.

The initiative grows out of widespread concern about the poor quality of building code enforcement in many communities. As a result of these concerns, the Federal Emergency Management Agency (FEMA) and the insurance industry are working with building code organizations to develop training programs for officials, as well as a program for evaluating individual building code departments. The evaluation program is administered by the same insurance service bureaus that have long evaluated fire department operations. Plans call for evaluating building code departments around the country.

The building code evaluation system will affect insurance rates only on homes built during or after the year in which the community was graded, so preexisting homes will not fall under the system. The system will provide credits in the form of a reduction in insurance premiums, based on a ten-point grading system. The maximum credit will be for jurisdictions graded one; those graded ten will receive no credit.

possibility of recovering damages. Parties who must defend against damage claims also require analysis services. Defendants can include materials suppliers and manufacturers, contractors, and designers. Quite often it is the attorney representing the defendant's insurance company who solicits the services of a construction defect analyst.

Because so much depends on the accuracy of the analyst's findings, clients seek defect consultants who have solid records for accurately pinpointing the causes of construction problems. But correct diagnosis is only half the battle. Findings must hold up in arbitration, mediation, or litigation. Hence clients also look for analysts who produce clear, well-documented reports and who have a talent for giving convincing testimony.

Fees for construction defect analysis services can be double those for design services. Some consultants charge even higher rates for testimony (as much as three times their normal rate for design services).

The major providers of construction defect analysis services are architecture and engineering firms. Some firms specialize in analysis of certain building types with which they have had considerable experience. Others have a more general defect analysis practice. Some home inspection consultants also offer the service, but as unlicensed and unregulated businesses, they do not constitute serious competition to professional design firms.

Clients often retain a construction defect analysis consultant to develop repair documents and oversee damage repair. Other closely related services include cost estimating, code compliance review, peer review, preparation of demolition documents, construction contract administration, development of construction repair documents, bidding and negotiation, commissioning, warranty reviews, preparation of maintenance manuals, and the making of record drawings.

SKILLS

The architect or architecture firm offering construction defect analysis services must have true expertise in building materials, components, and systems; thorough knowledge of general construction methods; and thorough knowledge of applicable building codes, product manufacturers' standards and limits, and standards of professional practice. Familiarity with intrusive investigation techniques and destructive and nondestructive testing methods and protocols also is required. The ability to analyze information and generate well-written and thoroughly documented reports is very important. As noted above, the principal investigator must have the poise and verbal skills to defend findings and recommendations in testimony if necessary.

While it would seem that retirees might find good opportunities for part-time consulting in this field, in fact most architects who offer construction defect analysis services also have an active building design practice. Knowledge of current standards of professional practice is essential, and it is very difficult to stay abreast of practice changes during retirement.

For many projects a senior architect will serve as principal investigator and supplement the investigation team with related disciplines as necessary. Related disciplines often include civil, structural, mechanical, and electrical engineering and can reach into other specialized disciplines such as environmental analysis, corrosive protection engineering, audio engineering, scheduling, cost estimating, and electronic engineering.

The intrusive investigations contractor is almost always a key member of the team. Under the direction of a construction defect analyst, these contractors specialize in probing the causes of construction problems while minimizing damage to the site, obtaining necessary samples and documentation without damaging evidence, and making temporary repairs. Often a professional photographer is hired to accompany the intrusive

investigations contractor and obtain top-quality photographic documentation of the investigative findings.

Firms that do a lot of construction defect analysis may assign a project architect to supervise investigative fieldwork. Tools of the trade include cameras, video cameras, tape recorders, lights, moisture recorders, levels, tapes, lamps, and tools for intrusive on-site probing.

If the problem is related to a particular building material (e.g., hardware, window, plaster, gypsum), consultants with expertise in that material or product may be added to the investigation team. The design members of the relevant committees in the model building code organizations, the National Institute of Building Sciences, and the AIA Building Performance Committee are good sources for referrals to these types of consultants. In selecting team members, consider not only expertise but also whether the consultant would be convincing if called upon to testify.

PROCESS

The scope of service for a construction defect analysis project ordinarily is defined after an initial review of the construction documents, a meeting with the client, and a walk-through of the site. A wise consultant will have a letter of agreement to ensure compensation for these initial activities.

Based on initial observations, the principal investigator can evaluate the need for additional consultants and determine the teaming approach. At this point an ongoing work plan (including scope and schedule) and consulting fee arrangement can be negotiated with the client. With the agreement in hand, subconsultants are engaged.

Investigation. The investigation begins by collecting additional data, including a more detailed review of construction documents, the client's project records, product literature, and relevant codes and regulations. Based on analysis of the available data and site observations, hypotheses are formed regarding the probable cause of the building performance problem. The team devises an investigation strategy for conclusively determining the cause. The strategy usually involves intrusive investigation, materials and system testing, or both.

Protocols are established for intrusive investigation, and the need for any accompanying materials and system testing and documentation is determined. When the actual investigations are conducted, care is taken to preserve material evidence and to obtain step-by-step photographic and written or graphic documentation of the conditions observed.

The data gathered from the investigations and testing are correlated and analyzed. Based on the investigative findings, the team evaluates the damages. In order to do this, the team must estimate the scope and cost of demolition required and the scope and cost of repair.

The report of investigative findings is the usual deliverable. These reports normally are quite detailed and in complex cases may comprise several volumes and thousands of pages. An investigative findings report often includes an executive summary that summarizes the overall conditions found and probable causes, all applicable construction documents, documentation of each condition found (including photographs), copies of laboratory test reports, recommendations for repair, and an estimate of the cost of repair. Appendixes may contain product samples, product literature, or any other information that may be helpful to the other professionals involved.

Postinvestigation. Several things can happen after the findings and recommendations are submitted. The building owner may elect to repair the damage without seeking damages from another party. The parties may enter into mediation, arbitration, or litigation, in which case the construction defect analysis team may be called upon to participate in depositions and testify in court.

Repair and restoration. Architecture firms that conduct defect analysis often are selected for the follow-on work to design and administer construction repairs, as they are the most knowledgeable and have already assembled the professional team of consultants needed for the project. This work often includes preparation of detailed construction documentation for the demolition and repair work, cost estimation, and construction administration. Upon completion of the repair work, the client customarily is provided with a maintenance manual for the components or systems that have been repaired, with references to the contracting team, the manufacturer's product literature, and the as-built details, as

applicable. Some construction defect analysis consultants back their repair and restoration services by providing, at no additional cost to the client, continuing consulting on issues related to the building component that suffered the defect.

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The AIA provides a contract document designed especially for alternative architectural services.

B102–2007, Standard Form of Agreement Between Owner and Architect without a Predefined Scope of Architect’s Services.

AIA Document B102–2007 is a standard form of agreement between owner and architect that contains terms and conditions and compensation details. B102–2007 does not include a scope of architect’s services, which must be inserted in Article 1 or attached as an exhibit. Special terms and conditions that modify the agreement may be included in Article 8.

The separation of the scope of services from the owner/architect agreement allows users the freedom to append alternative scopes of services.

AIA Document B102–2007 replaces and serves the same purpose as AIA Document B141–1997 Part 1.

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