

History and Special Interests

The Importance of Construction Documents to Restoration Architects

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Abstract: The needs of preservation architects for archival architectural records are opposite the needs of historians. While the historian may be more interested in earlier drafts and design concepts for a building, most important to the preservationist is not what *might* have been, but what actually *is*. While it is usually not possible to retain all the architectural records for a building, it is possible to distinguish the types of records most useful to preservation architects. The various documents related to a building's construction are reviewed for their value to preservation architects.

About the author: Alice Carey is the owner and founder of San Francisco, California-based Carey & Co. Inc., a fourteen-member architectural firm specializing in the preservation, restoration, and rehabilitation of historic structures. Ms. Carey has over seventeen years experience in all aspects of design and construction, including many of the San Francisco Bay area's notable structures, such as the San Francisco City Hall, San Francisco War Memorial Opera House, Spreckels Temple of Music in Golden Gate Park, San Francisco's Shell Building, and Oakland City Hall, among others. She holds a Master of Architecture from the University of California, Berkeley, and a B.A. from the University of Colorado.

Introduction

REHABILITATING OR RESTORING an existing building years after its construction requires a thorough knowledge of the original structure, so historical research is an essential part of a restoration. A preservation architect's archival needs, however, are in some ways the opposite of a historian's. A historian, for example, is interested in the architect's original conceptual sketches. Preservation architects usually need very specific information about the final product, i.e., the existing building.

After the 1989 Loma Prieta earthquake, my firm was hired by the San Francisco Bureau of Architecture to carry out a seismic upgrade (strengthening for earthquake resistance) and restoration of the San Francisco Opera House, built in 1931. All of the original construction documentation for the building had been saved—every single piece of construction correspondence, every single drawing. The trouble was that no one had ever gone through it. We finally convinced the Bureau of Architecture to hire an archivist, who spent about six weeks cataloging. We compiled a database that listed what was in each box and identified each document, whether it was a letter regarding a change, a proposal, a shop drawing, a summary of bids, and so forth.

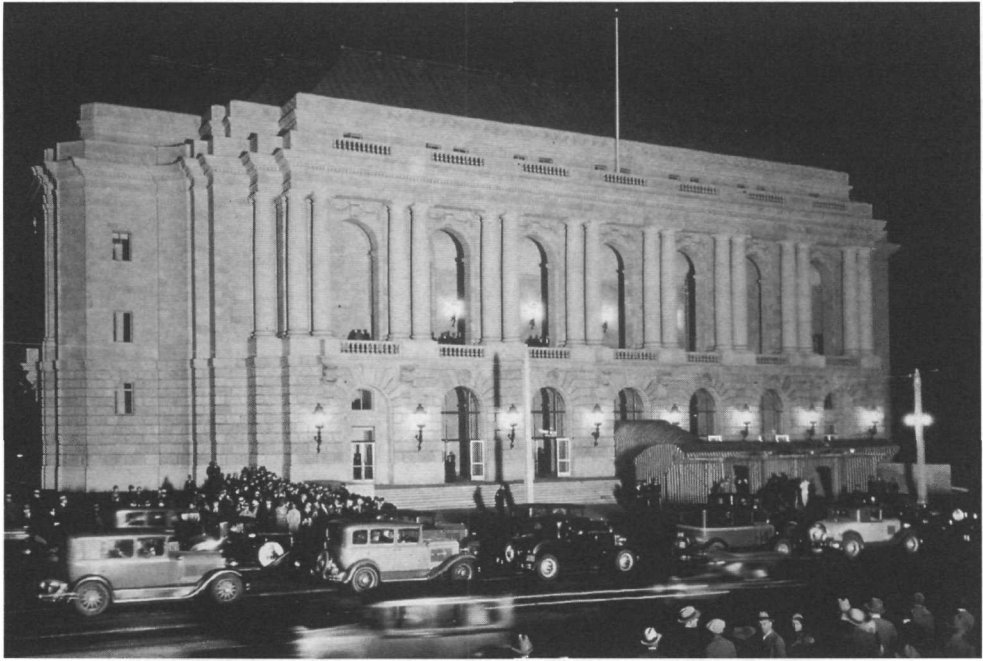
Among other things, we found the original certifications of the structural strength of the steel and concrete, making it unnecessary for the structural engineer to remove steel and concrete from the structure in order to test them. (This kind of procedure, known as destructive testing, is something preservationists try to avoid.) So we saved wear and tear on the building, as well as time and money.

And we were able to do something else. Because there was money in the project budget for the steel and concrete tests and we didn't need them, we were able to test the hollow clay tile used for interior walls throughout the building instead. This very controversial material was used in many of San Francisco's older buildings. Preservationists try to save it, in order to save the beautiful limestone and marble that often covers it. Engineers want to rip it out because they think it is structurally unsound. When we tested the tile in the opera house, much to the surprise of the structural engineer, it met seismic standards. We didn't have to remove the tile, which would have required extensive demolition of historic finishes, so, in a way, we saved the building by having the right documents. It was an archival victory.

When asked what archivists should save, my first thought is that, of course, you should save everything. I realize that this is an impractical approach and therefore not a particularly helpful response. Instead, I will discuss the records associated with a construction project and then distinguish between those that can be discarded and those that should be retained.

Historic Structures Reports

In 1946, the National Park Service of the United States started producing historic structures reports. In the last ten years, this has become a common preliminary step for any historic project. A historic structures report compiles a wealth of material in one place: a chronology of construction, which establishes which permits were taken out and what was added or demolished over time. They also contain information about written sources on the building—newspaper articles, books, and so on. If a building has been restored or documented as a historic structure at an earlier date, a structures report may exist and should definitely be saved.



San Francisco Opera House, constructed in 1931. (Courtesy of Carey & Co. Inc.)

Contracts and Project Forms

The contract documents for a project explain who was supposed to provide what to whom, and in what time frame. As basic documentation for any research purpose, they are useful to a preservation architect partly because they indicate the scope of the original work and the fees that were paid for it. Most are standard American Institute of Architects (AIA) documents. Two important, but lengthy, contracts used for most projects are:

- The AIA Standard Form of Agreement Between Owner and Architect
- The AIA Standard Form of Agreement Between Contractor and Architect

These documents may run to hundreds of pages, consisting mostly of standard legal language. This boilerplate can always be obtained through the AIA, and the important information is contained on page one, so saving every page from every project is probably unnecessary. Other key information includes the time frame in which the design or construction was expected to take place and the financial compensation involved. If the few pages containing this information are saved, the remainder can be discarded.

The two documents that set forth the general aspects of the construction project are:

- The AIA General Conditions
- The AIA Supplementary Conditions

These also are lengthy contracts and are almost pure boilerplate. The valuable information is contained in the first page and in any amendments or additions.

Documents generated in the course of construction that are of some interest to historians and restoration architects are:

- Proposal requests
- Architect's supplemental instructions

These are essentially "talk papers," or written conversations, between the owner, architect, and contractor. A proposal request is made when one party suggests a change to the construction project. The architect's supplemental instructions are generated as a clarification if the contractor needs more information about, or an interpretation of, the drawings or specifications.

The restoration architect, however, needs to know what actually happened, not what may or may not have occurred as a result of these discussions. The directive to make a change will appear in one of the following:

- Construction change directive, also known as a field order
- Change order

These are critical to a preservation architect because they record an actual, and sometimes very major, change in construction. If an archives has the original drawings and specifications but not these documents, it does not have the materials that give a true picture of the final project.

Drawings

Obviously we should save drawings, but which drawings? Each project generates many sets of drawings during different phases of design and construction. Each set can run to hundreds of pages, and often a set is reproduced many times. They are large, heavy, and difficult to store. Generally speaking, drawings are issued at the end of key phases of design, including:

- Schematic design
- Design development
- Issue for permit
- Issue for construction
- Revisions to the set issued for construction (each revision numbered and dated)
- As-built (drawings generated after construction to reflect existing conditions)

While a historian may be interested in the early design drawings because they show how the architect thought through the design, the preservation architect needs just the opposite: the last set of drawings issued. This final set will reflect most accurately what was built and what is now physically present. As-built drawings, prepared after the project is complete, reflect all the changes made during construction. Unfortunately, these drawings are rarely prepared. If they are not available, the next best set is the final revision set. If you are faced with multiple sets of drawings, this is easy to identify by looking at the title block (on the far righthand side of each sheet), which shows the name of the project, the owner, the scale, and the date. The title block also includes a block labeled "revisions." This lists a series of revision numbers with the corresponding dates of issue. The last number is the final revision set. From the preservation architect's point of view the other sets can be discarded.

Given a choice between originals (usually in ink or pencil on linen, vellum, Mylar, or a sepia reproducible) and prints (blueprints, blue lines, black lines, brown lines, etc.), always save the original. First, it is reproducible, so many prints can be generated from it



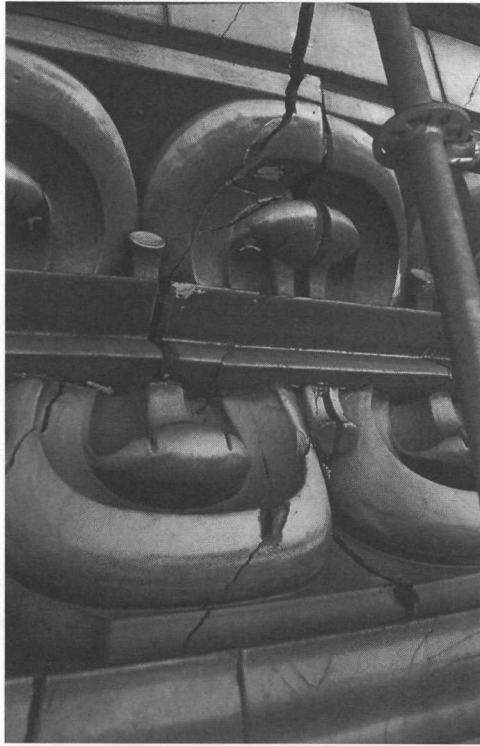
Oakland City Hall, 1914. (Courtesy of Carey & Co. Inc.)

at a later time. Second, it is more stable, so it will last much longer. Third, the information is most legible on the original.

Specifications and Materials Tests

While most of us know we must save drawings, few understand the importance of the other half of the documents—the specifications. Drawings are pretty and interesting, even to a lay person who does not understand the content. The specifications, usually an 8 1/2-by-11-inch book, 1 to 5 inches thick, with no drawings, look dull by contrast. While I can often find drawings in some form, I can count on one hand the number of times I have found the original specifications for a building. The drawings show locations and dimensions. The specifications say *what* things are; the kind of hardware used, the type of plumbing fixtures, the strength of the concrete, the size of the reinforcing bar (the steel buried inside the concrete), and so forth. Together, the drawings and specifications give the complete picture of what was intended to be built. The information they contain can be confirmed by results of materials tests like those that proved so useful in the opera house project.

In a building restoration, the original specifications and test results are of great assistance to the entire project team, particularly the structural, mechanical, and electrical engineers, who grapple with analyzing things buried within the walls. Again, as in the case of the opera house, original specifications can eliminate the need for destructive testing.



Terra cotta ornament detail, Oakland City Hall, 1992. (Courtesy of Carey & Co. Inc.)

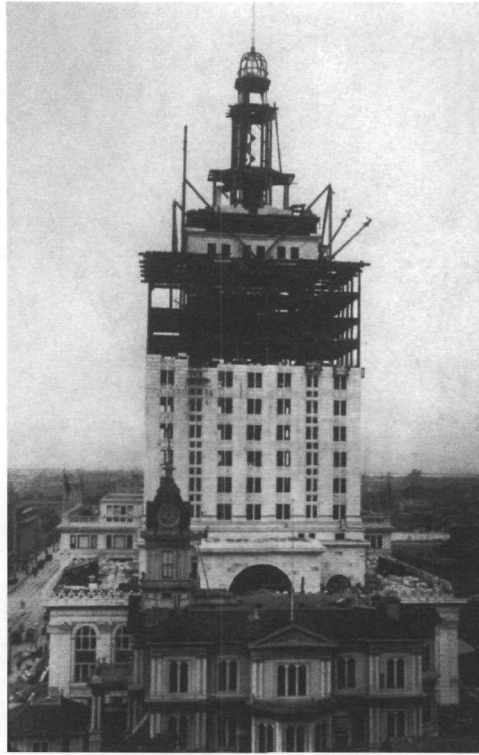
Shop Drawings

In the specifications, the contractor is often asked to submit shop drawings for the architect's review. Shop drawings are highly detailed drawings which show exactly how a subcontractor proposes to construct various assemblies (for example, a sheet metal cornice). The drawings show the size and location of every bolt, nut, and screw; they indicate where each joint will be, and, for example, whether it will be soldered or welded.

Shop drawings not only aid in avoiding destructive testing; they are extremely helpful in reconstructing missing components. In 1989, the Loma Prieta earthquake in California destroyed much of the molded terra cotta decoration of Oakland City Hall, built in 1914. The original shop drawings produced by Gladding McBean (the terra cotta manufacturer), which had been preserved at the company's archives in Lincoln, California, indicated which units were identical, literally taken from the same mold. The surviving pieces, which had initially been numbered in the same way as the missing or destroyed pieces, could be used to identify and reconstruct the damaged areas. Although shop drawings cannot be saved for every building, they should be saved for major projects.

Photographs

From the important pages of the contracts and agreements, the last revised set of drawings, the specifications, and the shop drawings, it is possible to reconstruct the proposed or intended building and some concealed details. Buildings, however, are not always built to specifications, and changes often are not properly documented. In such cases, the



Construction photograph of the Oakland City Hall, 1913. (*Courtesy of Carey & Co. Inc.*)

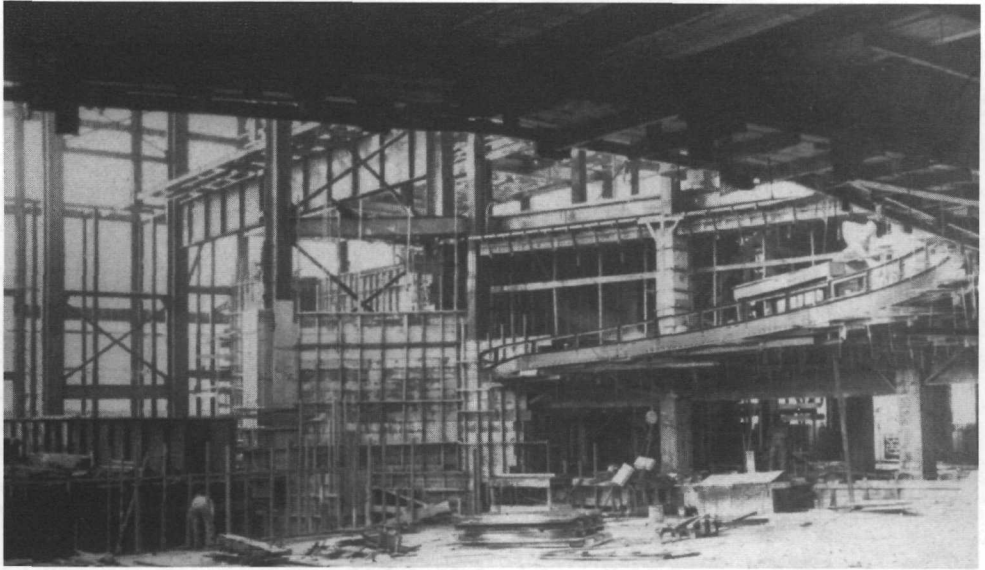
real evidence of the final execution is in historic photographs. Also, in many instances, the agreements, plans, and specifications no longer exist. Thus, the surviving photographs become the only record of the project.

Often, the progress of a construction project is photographed at various stages, and these pictures are essential to documenting what really was built. Construction photographs, like specifications, are of particular concern to those on the project team who wish to know what mysteries are hiding within the walls or beneath the basement. Again like specifications, construction photographs can help eliminate destructive testing.

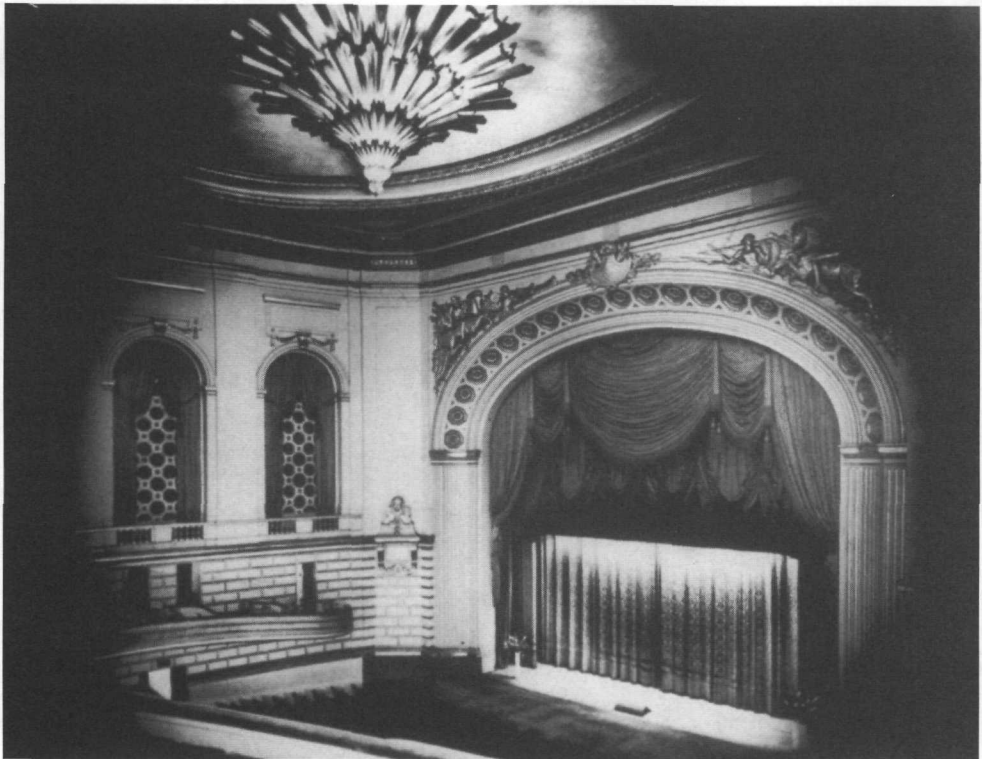
Photographs taken after completion are equally important. For a significant historic building, one can usually find many photographs of the exterior front. But the side or rear elevations are rarely photographed, so documentation of these is all the more precious. The same is true for interiors, particularly the nonceremonial spaces. With an early interior photograph in hand, one can easily distinguish original features from additions and reconstruct entire missing elements, such as light fixtures.

Accessibility

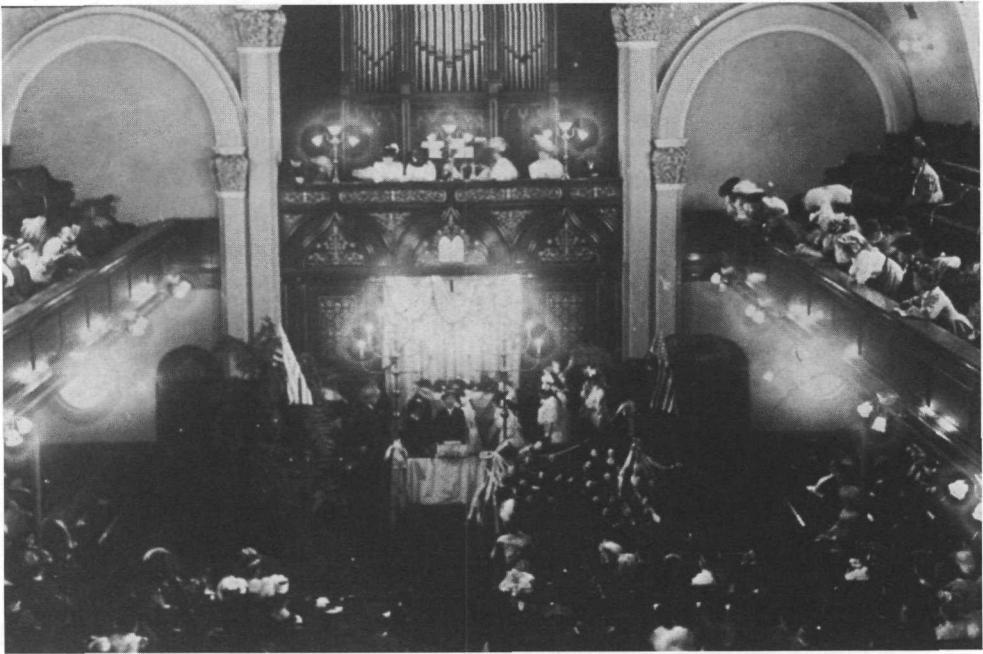
Saving the aforementioned documents is of great help to the team of design and preservation professionals who need them to rehabilitate and prolong the life of a historic structure. But they are of use only if we can obtain them and reproduce them. Sometimes these access problems arise because the institution holding the records is underfunded or understaffed, or it has yet to organize the archives. The archivist may know that the



Construction photograph of the San Francisco Opera House, 1931. (Courtesy of Carey & Co. Inc.)



Interior photograph of the San Francisco Opera House. (Courtesy of Carey & Co. Inc.)



Interior photograph of the Bush Street Synagogue. (Courtesy of Carey & Co. Inc.)

documents are in the collection, but cannot determine their exact location. Even more frustrating, the documents may be considered too valuable to be released for reproduction. What could be a more important use than to strengthen a building and preserve it for future generations? Archives are for people, all of us, in the same way that our architectural heritage is for the enjoyment and benefit of all. There is no point in carefully saving architectural documentation if there is no vehicle for future reuse.