The Historic Construction Record (HCR) Project

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As an architectural photographer specializing in the documentation of historic properties using large format cameras, I have photographed many old buildings, bridges and factories following the guidelines of the Historic American Buildings Survey (HABS) and Historic American Engineering Record (HAER). Typically I am contracted to photograph these structures shortly before their demolition, while an architectural historian and/or architect researches the building's history and writes the HABS/HAER report.

Often these buildings are in pretty bad shape by the time the photography is contracted, and then it seems ironic that the photographs I'm taking will be archived forever at the U.S. Library of Congress, where the HABS/HAER libraries are kept.

In 1995 it occurred to me that a better use of such photography — from the perspective of future architectural historians — would be to photograph important new buildings while they are being constructed, instead of broken down old buildings shortly before demolition. Certain aspects of a building are uniquely visible during its construction, and they should be photographed well then.

Since HABS/HAER does not administer or accept contemporary construction photography, I started shooting for an imaginary companion archive called the Historic Construction Record (HCR) based on the HABS/HAER guidelines, but applied to buildings under construction. Table 1 lists the nine buildings I have photographed in this manner between 1995 and 2004.

In this paper I present some of what I've learned about photographing buildings under construction following the HABS/HAER guidelines and spirit. However, there are no written HCR reports on the individual buildings beyond the captions accompanying the photographs, which remain mostly in my private collection and are not on the public record.

One sample photograph from each of the nine projects is included in this paper in Figures 1-9 in the same order as listed in Table 1.

TABLE 1. Buildings under construction photographed for the proposed Historic Construction Record (HCR). Five are in the Seattle area; four are in the Midwest. Buildings are listed chronologically in order of completion dates.

Construction Dates	Building	Architect	Archive Views on 4x5"film
1995-1997	Henry Art Gallery	Charles Gwathmey	1450
1997-1998	Pacific Place (a vertical mall)	NBBJ/Elkus-Manfredi	999
1998-2000	Experience Music Project	Frank Gehry	1250
1999-2001	Bellevue Art Museum	Steven Holl	549
1997-2001*	Milwaukee Art Museum	Santiago Calatrava	593
2000-2003	IIT Campus Center (Chicago)	Rem Koolhaas	1259
2002-2003	IIT State Street Village	Helmut Jahn	260
1999-2003	Band Shell (Chicago)	Frank Gehry	301
2002-2004	Seattle Central Library	Rem Koolhaas	2692

* construction of MAM started in 1997 but my first photographs were in 1999.

HABS/HAER PHOTOGRAPHY

The principle requirement for HABS/HAER photography is for perspective controlled images on large-format black & film sized 4x5" or larger. Although some HABS/HAER photography is done on 5x7" film or larger, the smaller 4x5" size is more common. The film and contact prints must be processed for archival permanence for at least 100 years. Historically HABS/HAER has not accepted color photography because of questions over its long-term permanence.

Because large-format cameras must be mounted on tripods, the field work is a lot slower than when using smaller hand-held cameras. In my experience shooting both HABS/HAER and HCR projects, I can take three or four views per hour under good conditions, but often it's only two or less. The benefit of this constraint is that it forces the photographer to deeply study all the possibilities before deciding exactly which view to take and exactly where the tripod should be placed. A lot of visual editing happens before the picture is taken.

A typical directive for HABS photography of a building includes a context view, at least two corner views in normal perspective, all four sides in elevation and/or oblique, significant exterior details, and interior views showing both space and significant features. For a HAER documentation of a factory, additional photos would be required for showing the machinery and how the industrial process worked.

Although not stated in this way, the dominant credo of HABS/HAER photography is "explanation before art." Ideally the photographs should achieve both, but clear explanation of the built structure comes first. As much as possible, I try to shoot for "explanation and art," especially for the Historic Construction Record.

Generally overcast lighting conditions are best for exterior architectural documentation because of the lack of strong shadows. Ideally, according to the HABS/HAER photographic guidelines, the best lighting is weak, hazy sunlight with very soft shadows. But absent that condition, cloudy overcast light is better than strong direct sunlight, which can create deep shadows concealing important parts of the building.

A cabin-sized building may require only 10 photographs or less, but a large historic theater would require at least 40 or more. In my experience, most HABS/HAER projects on a single structure are in the range of 15-25 photographs. Multi-building sites require even more. The largest HABS project I've done was 170 photographs of Longacres Park horse racing track and attendant buildings in Renton, WA in 1993 (HABS No. WA-201).

HCR PHOTOGRAPHY

Archive Sizes

At the outset of this project in 1996 while photographing the construction of the new addition to the Henry Art Gallery in Seattle, WA, it seemed that an HCR project could be both a HABS project about the building itself and a HAER project about the industrial methods by which the building is constructed. Indeed, the first usage of any new building is a factory to build itself. But approaching building construction as both a HABS and a HAER project would require an enormous number of photographs, and especially to illustrate all the construction and industrial techniques involved.

To show construction technique well, I would have to include workers and machinery in action. This would best be done with a small hand-held camera in 35mm or 6x7cm format. Since I am shooting more slowly in the 4x5" format, I decided to focus on the building itself as it changes, instead of the actual construction techniques and methods. However, construction technique is still evident in these photographs, even if the actual workers are not. And sometimes I am able to get good photographs of men working to illustrate construction technique. But generally, it's not easy to do when using a large format camera on an active construction site.

A building under construction is a building-in-motion. From one day to the next, it's a "new building" every day. Following that logic and applying 20 photographs per day (as in a typical HABS project), then an HCR project could reach 12,000 views over a 600-day construction schedule! That's almost three orders of magnitude greater than a HABS study of a single finished building. That did not seem financially or even practically possible when shooting in large format.

Nevertheless, the four largest HCR projects so far

have totaled 2792, 1450, and 1259 and 1250 views on 4x5" black and white film (Table 1), about two orders of magnitude greater than a typical HABS project. About 5 to 15 percent of these views were also taken in color.

Sample Rate

In my experience, the single most important parameter for good documentation of building construction is the "sample rate," or the number of site-visits per week. Since the building is constantly changing and certain construction conditions last for only a few days or less, it's important to return to the site frequently and on a regular basis. At sites close to home, I have maintained sample rates ranging from 1.9 days per week at the Bellevue Art Museum for 14 months to 3.4 days per week at the Seattle Central Library for 25 months. Each site-visit is typically between two and four hours in which I might take anywhere from 2 to 14 views.

At the sites in Milwaukee and Chicago (about 1700 miles from where I live in Seattle) I obviously could not maintain a high weekly sample rate. Instead, between August 2000 and November 2003 I made 27 one-week trips to the Midwest approximately six weeks apart. During each trip, I could photograph the sites intensively in-depth with more on-site hours per day than I would typically spend at a site near home. Luckily for me, most of the Midwest buildings in Table 1 were constructed slowly and far behind schedule, so even though I went there only every six weeks, I did not miss that much. An exception was Helmut Jahn's new dormitory at Illinois Institute of Technology which was built fast and on-schedule in 14 months. The photo archive of that building is smaller and weaker overall because the sample rate was too low for the speed of the building.

Sequences

A common approach in construction photography is take a sequence of photos over time from a fixed station point. When I started the HCR project, I was rather enamored with sequences, and at one point I had 26 fixed-point sequences going both inside and outside the new Henry Art Gallery addition. Looking at the results at the end of that project, I decided to limit the number of fixed-point sequences on future projects for the following reasons:

1. Fixed-point sequences are relatively labor-intensive. The resources spent on maintaining sequences can limit the time and film that might be better spent on more interesting parts of the building as it evolves. You can be lulled into thinking you are doing something important with the sequences, but in fact, you are ignoring significant changes happening elsewhere in the building. With only a limited number of views possible on each site visit, it's best not to spend too many just to maintain sequences.
2. You might pick the "wrong spot' for a fixed-point sequence. Although a particular fixed point might be anticipated to eventually yield a good view of the finished building or interior room — or a chosen fixed point view looks especially good at the beginning of the construction — a lot can happen during a two-year construction schedule. In my experience, many sequences have been cut short prematurely by unanticipated construction conditions, especially with building interiors.
3. For interior sequences especially, a "roving-point" sequence can yield practically the same information as a fixed-point sequence, and results in a much better photographic record. The idea of the roving-point sequence is to photograph the same interior space or building feature over time from *approximately* the same place and perspective. By freeing the sequence from a fixed station point, the composition of each photograph can be adjusted optimally for the conditions at the moment. Individual photographs are then more compelling in their own right. When viewed later chronologically, the slight changes in perspective from photo to photo creates a sense of three-dimensional depth to the scene.

THE BUILDING IN MOTION

As mentioned earlier, the logistics of working with a large-format camera on a construction site generally precludes the possibility of getting good pictures of men actively working. For that reason I generally do not try to record active construction techniques, except when it can be easily anticipated or it just happens by good luck. The easiest and most dramatic active-worker photographs to anticipate are the ironworker "connectors" setting high steel.

Even absent of worker activity, the photographs can still illustrate construction technique, especially when multiple layers become apparent at once. For instance, at the Henry site there was a period when four levels of the gallery walls were visible at once, which were, from oldest-to-newest: the

building's concrete wall, steel stud framing, plywood attached to the framing, and white gypsum board nailed to the plywood. In a glance a story can be told from building structure to finished room. The photograph is a still, but it shows the building "in motion."

Such multi-layer views happen throughout the construction process, but they tend to pass quickly (within 1-4 days) so a high site sample rate is needed to catch them at their best.

PHOTOGRAPHING BUILDING SYSTEMS

In assessing how well this photographic approach can explain the different building systems visible during construction, its seems that the HABS/HAER style of photography is especially well-suited for visually explaining the structural systems. Since the equations of structural engineering follow the same lines and masses of the structure, then perspective-controlled photographs can provide a direct visual link between the real structure and its theoretical basis. Often, some or all of a building's structure is covered up by the time the building is finished, so the only time to see it well is during construction. Photographs of structure have the potential for being the most interesting to future historians of the building.

Space defined by structure should also be photographed. It may not represent the finished space, but it will be the space that existed there briefly, and maybe the space will return if the walls, etc. are removed in a future building remodel.

Other systems that photograph especially well in progress are excavations, foundations, flooring, interior walls, secondary structures and sometimes HVAC.

CONCLUSION

With the exception of the two HCR projects at IIT in Chicago funded generously by the Richard H. Driehaus Foundation and IIT, this work has been carried out mostly at my own expense with some help from small art and academic grants. Although cooperative and personally cordial on site, the buildings' architects and contractors have generally shown little interest in the need for this work. Large format photographic documentation of building construction has not generally been a line item in anyone's budget. On the contemporary construction site where all the team members might be carrying their own digital cameras, the HCR project can be dismissed as "a solution in search of a problem." Outside the building industry I have found a much stronger audience for this work amongst architecture students and artists. Hopefully, the historians of the future will find value in it too when studying these buildings.

Figure 1. Henry Art Gallery, Seattle, WA. View looking SE into the main gallery. (1996-9.12-7a).

Figure 2. Pacific Place, Seattle, WA. The space-defined-by-structure in the cinema complex on the fifth floor above the retail floors. (1998-1.2-10b).

Figure 3. Experience Music Project, Seattle, WA. Structural ribs partially installed in Elements 1 and 2. (1999-5.15-5a).

Figure 4. Bellevue Art Museum, Bellevue, WA. View looking west in third-floor galleries. (2000-8.27-6b).

Figure 5. Milwaukee Art Museum, Milwaukee, WI. Construction of A-frame structure which will later support the building's signature wings. (2000-8.3-9a).

Figure 6. IIT McCormick-Tribune Campus Center, Chicago, IL. View looking north in main corridor before roof framing is installed. (2002-8.10-22a).

Figure 7. IIT State Street Village, Chicago, IL. Concrete structure of southern unit reaches its final height. emporary wooden posts, visible on all floors, support the concrete floors until they reach their final hardened strength. (2002-11.3-22a).

Figure 8. Band Shell at Millennium Park, Chicago, IL. View of steel within trellis column includes imbed at top supported by a temporary scaffolding structure. (2002-9.19-7a).

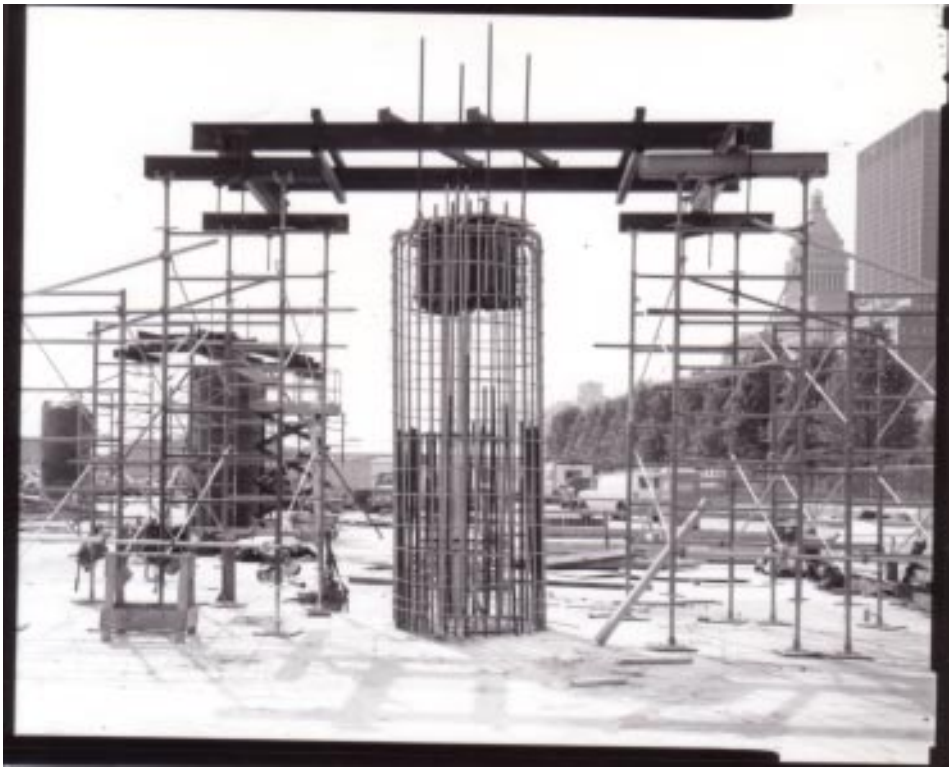

Figure 9. Seattle Central Library, Seattle, WA. East elevation with platform and scaffolding installed for installing glass at the upper levels. (2003-7.9-12a).