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Inside

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Construction and Conservator Safety

By Constance Lai

HEALTH & SAFETY COMMITTEE COLUMN

Have you worked on a building design project or construction site and needed to understand the safety requirements for the job? The general principles of how the design and construction process dovetail with construction safety throughout all stages of a project, including conception, codification, and implementation, are an important consideration for any project. Conservators can play many different roles during the design and construction process: as a member of the building owner's staff, the design team, and later, as a contractor hired by the construction firm. During every phase, conservators have an opportunity to contribute to construction safety. The article is organized to provide an overview of the stages of a construction project and will hopefully serve as a catalyst for dialogue that will continue through future *AIC News* and wiki articles, blog posts, and conference presentations.

Design Process

Before any construction begins, the design process should engage all parties to assure that work will be carried out as planned, and in a safe and systematic manner. The design process usually begins with the Owner (whether a museum, library, government entity, or private client) deciding that a new building or renovation is required. Typically an architect or engineering firm will be hired to complete the design and write the construction specifications (the "project manual"). The Design team consists of the architectural and engineering disciplines, while the Owner team consists of all the client-side stakeholders, including their conservators and collection care staff, and any fire and safety professionals on staff. Conservators within institutions (on the Owner side) who are consulted at this early stage will start to create protocols regarding the protection of sensitive objects that must remain in place during construction or other collections concerns that may be impacted by this project. Also, when there is testing for the presence of hazardous materials such as lead and asbestos, conservators on the Owner's side should ask to be part of the process; they should offer to walk through the building with the testing agency in order to choose testing locations. Not only is this important to ensure museum collections are minimally impacted by the testing process, but also so that critical *in-situ* pieces such as murals can be specifically flagged for the testing agency. If there are conservators on the Design team, they should begin to identify particular procedures and chemicals—like paint strippers, consolidants, and clear-coat protective barriers—that will be specified for the construction phase, and may require additional safety precautions and specialized containment areas. In addition, if hazardous chemicals or water are to be used in close proximity to sensitive *in-situ* items during demolition, conservators on both Owner and Design teams should begin to discuss preparations and protocols—even if the contractor has not yet been chosen.

The design process is also the time for all conservators, both on the Owner side and the Design team, to ask the architect to include specific requirements in the contract

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documents regarding temperature, relative humidity, dust and vibration control, and other safety or security protection measures for *in-situ* collections and historic architectural features that will remain. Also, if the work is being done by a sub-contractor that does not specialize in conservation or historic preservation, special attention and guidance for conservation concerns will be required. As the design process moves forward, it will become more and more difficult to make changes. It is important to include as much information as possible in these documents right from the start.

Review of Contract Specification Documents

During the contract review process, stakeholders will communicate with each other to improve the design of the building or renovation project. If something is missing from the specification documents or is not appropriately addressed, this is the appropriate time to comment and make changes. Not only is it important to review the drawings, it is critical to review the specifications (aka "the project manual"), which describe the expected quality and sometimes quantity of materials and systems. In particular, one should review the specification sections that address safety issues, such as "Section 015476 Safety and Health" or "Section 01 57 20, Environmental Protection." (All project manuals are different, so the specification number or the title might be slightly different, but the topics are the same.) These specifications might conflict with other specifications, so it's important that these conflicts are addressed early in a project. For example, the Safety and Health specification might state that methylene chloride cannot be used on the project, but the decorative paint restoration specification lists it as an acceptable paint stripper. During the iterations of the review process, stakeholders will suggest different ways to execute the project, causing potential conflict between the conservator on the Owner side and the conservator on the Design side. Communication among all parties is important in order to come to agreement about a single solution or approach. Finally, specifications detailing work activities that impact lead-containing or asbestos-containing materials must require all contractors to comply with the most current edition of all federal, state, county, and city codes and ordinances as they apply to the project locations. If these requirements will cause irreversible damage to an historic element in the building, this is the time to troubleshoot the issue and request a variance from the jurisdiction prior to construction.

Request for Information (RFI) and Submittal Process

After the project documents are complete, the Owner will request contractors to bid on the project. During the bidding process, all of the construction companies will have a chance to send in Requests for Information (RFI). If there are conservators on the construction team, they will probably submit an RFI to clarify their scope of work, including such details as what type of gold leaf is required or whether a final conservation report is to be submitted at the end of a job.

After the project is awarded to one contractor, RFIs can also be sent out during the construction phase. In addition to RFIs, the contractor is required to submit information to the Owner and/or architect for review in order to ensure conformance with the specifications. The submittal process can be critical, especially from a safety standpoint. This is the point in the construction process when the contractor and all of the sub-contractors start to describe and codify their safety plans, protection measures, products, and means and methods. These submittals are forwarded to all relevant stakeholders, who are required to review and approve what is going to be executed and used on the construction site. The submittal process is similar to the design review process in that there is a limited time frame to review the submittals in order to keep the project moving forward. If there is no response from the Design team or Owner within the designated timeframe, the contractor is allowed to assume that the submittal was approved. Note that any changes requested by the Owner or Design teams during the submittal process may result in expensive "Change Orders," which is why design decisions should be made during the Design Process, and not during the Construction Process.

Key Construction Site Personnel & Safety Orientation

Construction sites can be very daunting places, especially when there are large scale, noisy activities such as jackhammering, concrete placement, and welding occurring simultaneously. The first task is to figure out the onsite hierarchy. The Superintendent is ultimately in charge of job site safety and is responsible for the day-to-day operations of the construction project. If the project is large enough, there might be a full-time Safety Coordinator, Quality Control Manager (QCM), and/or Historic Preservation Specialist on the construction team as well. These team members are also there to address any safety questions that arise.

For many construction sites, the first order of business for new persons entering the site is to go through a safety orientation, which can be as simple as watching a video or reading a list of protocols. Conservators, on either side, can help to ensure that the orientation includes a discussion about important elements that need to be protected or areas where workers need to be especially careful. Conservators, who are contracted with the General Contractor or a Sub-contractor to evaluate and/or treat specific elements during construction, can request that their means and methods be discussed so that other workers understand how and why construction protocols need to be modified accordingly. For example, a key safety procedure on many construction sites is the installation of negative-pressure air machines, which help to evacuate dusty, contaminated air, but this creates air flow problems that impact treatments such as gilding of plaster decorative elements. In this situation, it is crucial for the conservator (and/or decorative painter) to coordinate his/her schedule with the rest of the construction activities to ensure that the project is completed properly without compromising safety.

There is also a tendency for the safety orientation process to be "waived" for subcontractors, like conservators or construction site visitors, who are only on the project site for a limited time. Accidents and misunderstandings often occur when assumptions about safety protocols are made, making this practice dangerous and unsafe. In addition, visitors – whether they are from the

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Sample Construction Site Safety Orientation

Each construction site will have different rules pertaining to safety management and enforcement. Since it is not a requirement for everyone – from the client to the construction worker – to read the project manual in its entirety, below are typical items that are meant for review during the orientation process before anyone is allowed on the construction site.
Note: A downloadble copy of this guide is available at www.conservation-us.org/docs/default-source/periodicals/2014_05_sept_samplesitesafetyorientation.pdf.

GENERAL

- PPE appropriate for the construction site hazards is required to be worn 100% of the time onsite, even for visiting or walking an active site during consultations. (e.g.: Hardhats, safety eyewear, leather work boots, shirts with a minimum of 4" sleeves, long pants, and non-tattered clothes).
- No emailing or texting while walking the job.
- Radios, iPods, and/or headphones are not allowed onsite.
- Smoking and/or tobacco of any kind is not allowed in the building or on site and is only allowed in designated areas outside the building. Cigarette butts must be disposed of properly.
- Eating is allowed in predetermined and designated break areas only as dictated by the Superintendent.
- Safety protection systems – like plywood barriers and protection board – are not to be removed without coordinating with the Superintendent first. This protocol exists so safety provisions can be determined and plans developed before the protective systems are removed.
- Dust and Air Quality: Barriers and work practice controls that minimize dust, vapor, or gas generation and prevent accumulation of toxic air contaminants should be reviewed with the Superintendent prior to execution.
- Emergency Action Plan: In an emergency, exit the building and assemble at a pre-determined location for a head count.
- Daily Hot Work Permits are required to be completed by the sub-contractor supervisor and Superintendent on a DAILY basis for any and all flame and/or spark producing work.

EQUIPMENT

- Scaffolding must be installed in accordance with manufacturer's recommendations and OSHA standards, using stamped shop drawings that are prepared and certified by a Professional Engineer. All scaffolding must be inspected by Safety personnel prior to use.
- Each sub-contractor shall provide their own trained and recognized Scaffold Competent Person [OSHA-defined] for the daily inspection of scaffold systems. Documented inspections must take place.
- Forklift Operator Training Documentation is required for any and all personnel that will be operating forklifts onsite. Training cards must be kept on each operator's person.
- Personnel working at heights 6′ or greater without fall protection will be immediately and permanently removed from the project.
- Any person on, traveling on, or operating a scissor lift must use a fall protection system as inspected by the contractor's Competent Person [e.g., full body harness ("safety harness") and retractable lifeline or shock absorbing lanyard].
- Scissor lifts shall not travel long distances across the work areas while the work platform is elevated.

HAZARDOUS MATERIALS

- Lead Awareness training must be provided by the contractor for their personnel if they will be involved with contact or impact of lead painted surfaces.
- Contractors performing work that will impact, heat, burn, or disturb lead paint shall provide a complete Lead Exposure Assessment plan and assistance from an industrial hygienist throughout the process.
- Asbestos Awareness training must be provided by each sub-contractor at their expense if their personnel will be working near or in close proximity or contact with known or presumed asbestos containing materials. Documentation of this training must be given to the Superintendent.
- Non-Environmental Contractors are not to impact, disturb, aggravate, or remove asbestos materials.
- Notify the Superintendent immediately if any unlabeled, untagged, unmarked, or untested suspect asbestos material is observed. If loose or impacted asbestos or presumed asbestos containing materials are encountered, all workers should leave the immediate vicinity, and notify their supervisors and the Superintendent until the area is deemed safe to resume work by the Safety personnel and/or the independent Industrial Hygienist.

ACTIVITY HAZARD ANALYSIS (AHA's)

- An Activity Hazard Analysis (AHA) shall be developed for each definable feature of work as shown on the schedule of activities by each contractor and reviewed by safety personnel for completeness prior to the start of work.
- Each contractor will provide training on each AHA to the personnel involved with this activity and a documented sign-in sheet (with printed name, signature, date, and contractor) will be provided to the Superintendent before any work takes place.
- Each new person to the site must be also be trained on the AHA by the sub-contractor supervisor, with the same documentation provided to the Superintendent.
- Report any unsafe conditions to your supervisor or a Superintendent immediately.

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Owner/client side or from the main office of a historic preservation trade subcontractor – are usually the most unfamiliar with the construction site, and should also go through the safety orientation. One way to ensure that safety orientations are provided to ALL construction site workers and visitors is to include this in the project manual requirements. The few minutes spent will have a positive impact on the safety of the job site as a whole and lessen the chances for an incident to occur. [See fact sheet on Page 4.]

Construction Meetings

Both the Superintendent and Quality Control Manager (QCM) conduct meetings that can be very helpful to conservators. Quality Control meetings, usually conducted by the QCM or Superintendent, are held to discuss one "definable feature of work," which usually correlates to one specification section in the contract documents. During these meetings, safety measures and potential impacts to other trades are discussed. Conservators on the Owner's side who are responsible for following the construction process should request an invitation from the General Contractor's QCM to attend all of these meetings. Conservators on the design and construction sides should only attend the ones that are relevant to specific conservation work. In addition, conservators on the construction team should attend the foreman's meetings that are run by the Superintendent, where the detailed sequence of work in a space is discussed. These meetings, which are sometimes held daily but at a minimum of once per week, are critical to ensure that the tasks are safely performed in the correct order.

Communicate

From the very early stages of the design process in reviewing the safety specifications, right until the end when detail work such as applying gold leaf or treating a wall mural, conservators are asked to participate and be key members of the design and construction teams. On any design or construction project, the term "conservator" often designates individuals who serve a variety of roles such as collections-care specialists, architectural conservator, or construction-site worker. For the people who interact with these conservators on a building project, from the architect to the contractor, this range of specialties in one profession can be very confusing. They will probably assume that all "conservators" will have the same level of knowledge in terms of safety. So, if you encounter a blank stare or a befuddled expression, take the time to explain your safety concerns. They will appreciate what you bring to the design and construction process once they realize how you fit into the puzzle!

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Have a question about health and safety in your conservation work? Send it to us at HealthandSafety [at] conservation-us.org

AIC News

Bylaws Discussion

Proposed updates to the AIC Bylaws have now been posted on the members-only forum in the AIC Social Community. Please take time to review the proposed changes to the Bylaws, which will bring AIC in concordance with current laws. The forum can be found at www.conservation-us.org/bylawsdiscussion. You should receive an email about the proposed changes to the Bylaws in early September. Please contact Ryan Winfield at rwinfield [at] conservation-us.org, if you have difficulty gaining access to this page.

Become a Professional Associate or Fellow in 2015 and Strengthen the Profession

If you have been considering applying for recognition as a Professional Associate, make it a reality in 2015. The process is easier than you may realize. Check out these new, improved facets of creating a Professional Associate application:

- We now accept electronic applications, so there's no longer a need to assemble large paper files. You can email pdfs of the application directly to applications [at] conservation-us.org, or via a designated Dropbox folder (for large files).
- Your sponsors can now email their sponsor letters directly to Ruth Seyler at AIC via the email address applications [at] conservation-us.org.
- Unsure if you know three Professional Associates to sponsor you? Use the members-only directory on the AIC website. You can search for Professional Associates by both specialties and state. You probably know more PAs than you realize.
- Remember that you can also approach Professional Associates that you don't know and introduce yourself! It is both possible and encouraged to ask if they would get to know you and your work, so that they may sponsor you. The online member directory tool can help you connect to AIC PAs and Fellows.

If you already are a Professional Associate, consider applying for Fellow! Electronic applications are now also accepted for Fellow, and at our recent business meeting, most Fellows present indicated they are willing to help sponsor PAs they were not already familiar with.

Applications for PA and Fellow are accepted at each of these deadlines: January 1, May 1, July 10, and October 1. For more information, visit www.conservation-us.org/peerreview. Please feel free to contact Ruth Seyler with any questions about the application process!

—Ruth Seyler, Membership and Meetings Director, rseyler [at] conservation-us.org

New AIC and FAIC Publications Online and in the AIC Store

AIC's many postprint series will be added as electronic books in pdf format to the AIC store (available on the AIC website at www.conservation-us.org/shop) over the next year. Many issues are available only in print—and many are out of print—and these are being professionally scanned for this purpose. AIC is