

Case Study: Mitigating Schedule Impacts from OSHPD Regulations on Medical Equipment

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The vast majority of healthcare construction projects in the state of California work with OSHPD—Office of Statewide Health Planning and Development—to meet California’s Hospital Seismic Safety Law. While meeting the state’s Hospital Seismic Safety Law is important and even critical, working with OSHPD’s stringent regulations does imply additional concerns to be addressed by the project team. One concern regards the approval of bigger medical equipment and its impact on the overall construction schedule. This paper examines the factors that contribute to delays in the construction schedule, responsible parties for the delay, and responsibilities of each involved party. Based on an analysis of information provided by the Layton Construction project team at the Good Samaritan Hospital ED (Emergency Department) Renovation project and industry professionals, maintaining good relationships with the IOR (Inspector of Records), Architect of Record, and the client/owner is the key to success. In doing so, it creates a positive working environment to solve problems, communicate efficiently, and ultimately help facilitate the approval process for any equipment meeting the requirements. This paper provides recommendations for dealing with schedule impacts due to the medical equipment approval processes through OSHPD for future project teams involved on OSHPD healthcare construction projects.

Key Words: Healthcare Construction, OSHPD, Medical Equipment, Impacts

Introduction

Within the construction industry, healthcare construction usually does not differ much from commercial construction in terms of materials used, project team organization, contracts/subcontracts, etc. In California, however, due to the threat of earthquakes, all structural and fire life safety system requirements on OSHPD healthcare projects must receive OSHPD’s approval and inspection. Aside from Florida with AHCA—Agency for Health Care Administration—no other states in America require such entities to intervene with the construction process. Although it is critical to the construction of hospital buildings to ensure the safety of patients during emergencies, working with OSHPD often entails a wait period that may affect the overall construction schedule.

A particular aspect of healthcare construction in California commonly affected by OSHPD is the approval of plans for bigger medical equipment such as CT scanners and x-ray machines. This may not make sense to many, as medical equipment is usually owner furnished and installed and not part of the construction process. Bigger medical equipment require approval from OSHPD for structural reasons. Given that the equipment adds hazardous potential to tip during seismic events, even updates to equipment of the same brand and model must receive OSHPD approval prior to installation.

Even without entities such as OSHPD and AHCA, planning and coordinating the work up to and through the installation process for medical equipment should not be easily overlooked. With so many elements prone to change throughout the construction process, the planning and coordination of medical equipment is not truly complete until the project is complete. The management team needs to be flexible. Although anticipation is important, setting things in stone allows for a far more difficult task when changes arise.

This particular case study examines the impacts of medical equipment on the project schedule and the management team at the Good Samaritan Hospital in San Jose, California. The project is a renovation of the hospital's Emergency Department, taking place over three phases. As the project will be wrapping up its first phase at the time of publication, the paper will focus specifically on the first phase of the project. The contractor responsible for the project is the Layton Construction Company, based in Salt Lake City, Utah, working out of their San Jose office. The case study will be conducted through interviews with the Senior Project Manager, Project Manager, Superintendent, and the Project Engineer from the Layton Construction team responsible for the project, as well as an analysis of news articles written by industry professionals. The objective of this paper is to identify the factors that contribute to the schedule impacts caused by medical equipment approvals and offer a solution for project teams involved in OSHPD healthcare construction projects of the future.

Methodology

The information presented below come from interviews conducted with the Layton Construction team at the Good Samaritan Hospital ED Renovation project and news articles written by industry professionals. An analysis of the information presented may yield knowledge that may be helpful for project management teams involved in OSHPD healthcare construction projects of the future. Questions utilized to retrieve information from the Layton Construction team are as follows:

- Generally speaking, how does working with OSHPD alter the construction process?
- In general, how much of the clients' input alter the construction process working with OSHPD, if any?
- What kinds of medical equipment are subject to OSHPD approvals?
- How long does it take for drawings relating to bigger medical equipment to be approved and what factors influence that timeline?
- Do newer versions of medical equipment appear on the market prior to the approval of the current model in review? If so, what happens if the client wants the newer version? If so, how often does this happen?
- What do you believe are key and crucial steps for the project management team in order to most efficiently address the impacts and delays that result from OSHPD approval of drawings pertaining to bigger medical equipment?
- Are there processes that the project management team could take to help facilitate the approval process for these drawings pertaining to bigger medical equipment?
- What responsibilities does the contractor have regarding coordination of medical equipment delivery?
- As the Senior Project Manager/Project Manager/Project Engineer/Superintendent, what do you believe are your most crucial responsibilities in terms of dealing with OSHPD? What are your most crucial responsibilities in terms of dealing with the medical equipment schedule?

Research Objectives

There is no doubt that healthcare construction in general entails many obstacles to overcome during the construction process. Cooperating with OSHPD for healthcare projects in the state of California further complicates the obstacles to overcome. OSHPD even affects processes that do not seem to be directly related to the construction process, such as the installation of medical equipment. The objective of this paper is to provide project teams involved in future OSHPD healthcare construction projects with information and recommendations for working around the obstacles presented by the OSHPD approval process for medical equipment.

Planning for Medical Equipment

“Equipment planning is an integral part of the building design and construction process,” says Thomas MacVaugh, president of Healthcare Strategic Resource Solutions Inc. In any healthcare construction, medical equipment is a key component to the construction and installation process. Yet, equipment planning is a grossly underutilized. Medical equipment is also an aspect of healthcare construction that is subject to many changes and no healthcare construction is complete, despite equipment installation dates, until the project is complete (MacVaugh, 2003). Elements relating to medical equipment that affect the construction schedule and budget may include lack of project control, troubles with equipment vendors, design changes mid-construction, emergence of newer technology, and maneuvering for

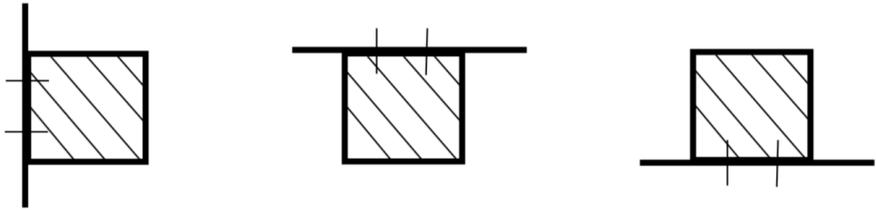
space (MacVaugh, 2003). An example of the emergence of newer medical equipment technology affecting the construction process is Skanska’s fifth hospital in the UNC Hospital system, the North Carolina Cancer Hospital. Parts of the foundation and slab work are on hold because the hospital had not yet purchased the equipment (Fisher, 2007). Ben Huffman from Skanska states that due to the ever-changing technology in the medical field, the hospital is holding off on purchasing equipment until the latest possible moment. Huffman states that this has become a challenge for the contractor because without the equipment details, the contractor cannot move forward and rough in the troughs, penetrations, and overhead supports required to accommodate the medical equipment yet to be purchased. Despite the difficult situation, Skanska has been able to come to a mutual decision with the client to pour some of the slabs later (Fisher, 2007). When accommodating medical equipment, situations may become tricky and even frustrating; despite the frustration, however, maintaining healthy relationships with all involved parties is the key to an overall successful project.

Layton Construction: Good Samaritan Hospital ED Renovation

Senior Project Manager: Kimberly Allen

Senior Project Manager Kimberly Allen believes that coordinating with OSHPD impacts start dates, completion dates, inspection standards, and any changes made to the project scope. Impact on the construction schedule in turn results in a larger construction budget. Details for OSHPD projects are specific and often overdesigned, which also lead to increased project budgets. As a result, the budget for an OSHPD project amounts to about triple than what it would cost to build the same building in a different state. Outside of delays that originate from OSHPD, end user changes as directed by the owner also play a part in increased budget. End user changes are typical but result in major time loss and cost impacts, especially if the changes require OSHPD approval.

Equipment meeting the following requirements are subject to OSHPD approval: any equipment heavier than 20 lbs. to be wall-mounted, any equipment heavier than 40 lbs. to be mounted above ceiling, and any equipment to be anchored to the floor. In other words, any equipment that may tip or sway and potentially cause damage in the case of a seismic event requires OSHPD approval.



Wall Mounted
Equipment >20#

Above Ceiling Mounted
Equipment >40#

Equipment anchored
to floor

Depending on the size of the project, the approval process that ensues from a change in medical equipment may vary in time. For projects under \$5,000,000 USD, the initial review may take up to (60) days, followed by up to (30) days for each backcheck (up to (3)), and an additional (30) days for the permit to be issued. For projects over \$5,000,000, the initial review may take up to (90) days, followed by approximately (60) days for each backcheck (up to (3)), and (30) additional days once again for the issuing of the permit. Since the approval and permitting process for medical equipment requiring OSHPD approval often takes a while, it is not uncommon for new versions of equipment to be released by the manufacturers prior to the approval and permitting process is complete or just after the processes conclude. As a matter of fact, it is fairly common and happens all the time. This has been the case in the Cath Lab at the Good Samaritan Hospital ED, part of Phase 1 of the renovation. The Cath Lab has been in design for over (2) years and is in Backcheck No. 1 with OSHPD but the manufacturer has released a newer version of equipment that the end user has requested to replace the older version with. The first course of action taken on by the Layton has been to examine the structural and MEP changes necessary to design the ACD (Amended Construction Document) to follow the permitting process. Aside from taking this course of action, Allen notes that the most crucial steps for the management team to help facilitate the approval and permitting process are the ability to communicate efficiently, think critically, and solve problems with the Architect of Record and the Owner, as a team. Outside these

actions, however, Allen also notes that the speed in which equipment are approved is out of the contractors' jurisdiction. The vendors typically will already have mounting details and drawings for the new equipment to be directly communicated with OSHPD. Despite the restrictions as the contractor, coordinating with the owner and keeping them involved in the construction schedule updates will yield the best possible outcome and relationship with the client. As the Senior Project Manager, Allen notes that her primary and most important responsibility when it comes to coordinating changes in medical equipment is to communicate with OSHPD's IOR (Inspector of Records). Her primary focus is to address any potential blind spots and confirming that the utilities have been coordinated with MEP, structural components, and any special needs for the room or installation process.

Project Manager: Mary Veldkamp

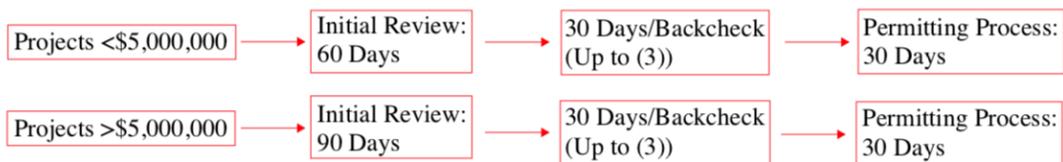
Project Manager Mary Veldkamp states that OSHPD primarily affect three areas of construction: drawing approval, submittal approval, and the work in place inspections approval process. These three areas of concerns are applicable for medical equipment meeting the aforementioned requirements. While there are guidelines and quantifiable requirements for medical equipment needing OSHPD approval, Veldkamp states that there are different levels of OSHPD review for equipment and that a good rule of thumb is to assume anything attached to the structure or requires MEP will need OSHPD review for installation details. "Bigger" medical equipment may need to go through a separate review process that may require a shaker table test. Following the shaker table test, an OSP (special seismic certification approval) or OPA (preapproval of anchorage) will be issued for that particular model type. If an OSP or OPA is noted in the drawing, Veldkamp states that it may help facilitate the initial drawing review process. Ensuring that an OSP or an OPA number is associated with a particular model on the drawings may help to greatly reduce or maintain the construction schedule by reducing the initial drawing review process time. However, obtaining an OSP or an OPA number could take up to (2) years and therefore its critical that the project management team initiates the process as soon as possible. This is especially the case when the client desires an updated version of the equipment or different equipment at any point in time prior to the completion of the project. An ACD containing the OSP or the OPA number associated with the newer piece of equipment must be submitted for review. ACD's are required for any changes that are considered material. In addition to compiling all required documentations for review as quickly as possible, Veldkamp also notes that it is also crucial that these documents are correct and complete. Incomplete and/or incorrect documents will ultimately result in further delays, as it would be sent back to the contractor for a redo. Contractors should double check even for the most obvious changes to the documents, such as confirming that the drawings contain the correct OSP or OPA number associated with the equipment specified in the drawings. Upon completion of the approval process, the project management team should ensure that all items are in place per the drawings. When the equipment arrives on site, the project management team should also assist the client with installation and commissioning of the equipment. Despite any frustration that may result from the approval process for medical equipment, Veldkamp asserts that it is absolutely critical that all interactions with OSHPD and the IOR must be in a friendly, non-aggressive manner and accommodating to provide any and all required documents in a timely manner, free of error, and complete. With regards to the medical equipment schedule, Veldkamp stresses the importance of all MEP being in place, tested, and ready to tie into the equipment, the floors being installed and level, and the space, conditioned.

Project Superintendent: Brandon Bergener

Superintendent Brandon Bergener states that it is important to note that OSHPD does not have its own regulations but rather, is a regulatory agency or enforcement team for the state of California with a process in place to enforce the California Building Code and other national code regulations. Collaborating with OSHPD is more extensive, difficult, and even frustrating than working with a typical city municipality because OSHPD is, generally speaking, much stricter in enforcing the codes. Additionally, working with OSHPD also entails longer periods of time to review plans and a strict policy stating that no work can be put in place until plans regarding the work has been approved by OSHPD. The longer wait times result in a construction schedule that is approximately tripled in time and a budget that is approximately doubled in cost. The silver lining, however, is that the clients do end up with a better product.

Bergener confirms the review process Allen has aforementioned, detailed in the figure below.

Medical Equipment Approval Timeline



Bergener also adds that usually, the first two backchecks come back with comments that need to be addressed prior to resubmission. Despite the tedious process, Bergener also notes that for smaller equipment, the client may expect to have approved plans in about (120) days.

Contrary to Allen’s statement that end user changes occur all the time, Bergener states that the clients’ input does not usually alter the construction process. He goes on to clarify that clients risk delaying the project and increasing the budget by making changes during the construction and that most clients wait until OSHPD has signed off on the permit. This was not the case at the Good Samaritan Hospital, however. Scanners for the Cath Lab were updated per client’s request in the plans and resubmitted to OSHPD for review. As this is a scope change that is part of a contract exceeding \$5,000,000, this change must go through the process entailing (90) days for initial review, (30) days per backcheck (up to (3)), and another (30) days for the permitting process. Although uncommon and not the case at the Good Samaritan Hospital, Bergener states that some reviews could take place on the field and only take a few weeks for approval, as opposed to going through the entire (120+) day process. In order for field reviews to take place, Bergener stresses and reconfirms the importance of building a solid relationship with the IOR. In addition to maintaining healthy relationships with the IOR, Bergener asserts that as a project team, it is important to communicate efficiently with the vendors and constantly communicate the project status to ensure that required equipment is ordered and delivered on time. Allowing bi-weekly site visits to verify what is being built is going to work for what is being installed is also beneficial. As the project superintendent, Bergener states that his most crucial responsibility is to provide the constant updates and perform great QA/QC of the area so that there are no issues once the equipment arrives on site.

Project Engineer: Camille Magadia

Project engineer Camille Magadia states that while drawings, RFIs, submittals, and design changes undergo a more stringent process on an OSHPD job, OSHPD work ultimately ensures safer and better quality healthcare facilities. While OSHPD jobs ensure safer and better quality healthcare facilities all around, it may result in frustration for all parties involved, including the client. Clients may suggest and provide input for what they would like in their facilities and communicate these details to the contractor and design team. However, prior to construction and installation of the equipment desired by the client, OSHPD must approve of the scope of work. Without OSHPD’s approval, no work can proceed, regardless of the clients’ wishes. OSHPD has the governing jurisdiction. Magadia confirms that equipment attached to structural components may be subject to OSHPD review and further clarifies that structural detail for mounting and anchoring the equipment needs to be included in the drawings and approved prior to commencing construction.

Although awaiting OSHPD review prior to starting work could be frustrating, some exceptions can be made and reviews can be done on site, aforementioned by Bergener. Magadia confirms that field reviews are indeed possible but also clarifies that field reviews not only depend on harvesting solid relations with the IOR, but on the magnitude of the change as well. If the OSHPD officials can agree to do a field review to produce the ACD, the FLSO (Fire Life Safety Officer), DSE (District Structural Engineer), and/or the ACO (Area Compliance Officer) will be on site to do the review. If the matter at hand can be approved on site, the responsible parties will sign and issue the stamp

of approval on site. The contractor will then send the signed plans to the architect, to be formally returned to the contractor by the architect.

As stated by Allen, Veldkamp, and Bergener, extended construction schedules and increased budget costs may occur as a result of the clients' wishes to upgrade to the newest and greatest version of equipment. On the contrary, Magadia notes that extended construction schedules and increased budget costs may occur independently of the clients' wishes, as manufacturers often stop manufacturing the old version of equipment once they release a newer version. In any case, Magadia communicates that there are crucial steps to be taken to properly address any impacts and delays that may result from OSHPD's approval process for medical equipment. Prior to construction and access to the space, it is critical to perform a thorough QC/construction review of the drawings. Making sure that the architectural, structural, mechanical, electrical, plumbing, and manufacturer drawings make sense with one another and looking for potential conflicts is also a critical step prior to having access to the space. Once trades have access to the space, it is important that the trades layout and coordinate with one another. In the case of a renovation, as it is for the Good Samaritan Hospital, it is also critical to verify the existing structure with what is shown on the drawings. Additionally, Magadia adds that as the "middle man," ensuring that the project team delivers quality information to the design team will help to facilitate the approval process and eliminate potential future conflicts.

As the project engineer, Magadia states that her most crucial role in the approval process is document control. This entails making sure all records (drawings, RFIs, ACDs, DAs, meeting minutes) are current, accurate, and moving where they need to be in a timely manner. It is crucial for the documents to be current so all parties involved are working off the correct documents. Updates to the drawings are constant, especially in renovation projects such as the Good Samaritan Hospital, as a result of previously unknown discrepancies continuously arise.

OSHPD

Complaints against OSHPD's approval process timeline have been around for a while. OSHPD explains that reasons for delays range from the degree of complex seismic-safety regulations to inexperienced architects and designers (Ferenc, 2007). Executive Vice President of the Hospital Association of Southern California Jim Lott asserts that a backlog of \$23 billion in hospital construction is a result of OSHPD's 15-month average timeframe to review and approve design plans prior to projects breaking ground. Anne Drumm, Assistant director of legislative and public affairs at OSHPD, denies Lott's claims regarding the \$23 billion backlog (Ferenc, 2007). Regardless, delays in the review and approval process continue to exist and remain a frustrating aspect of healthcare construction in the State of California. Roger Richter, Senior Vice President of the California Hospital Association, claims that a good number of delays results from out-of-state firms having trouble complying with the Alfred E. Aiquist Hospital Seismic Safety Act, which requires hospitals to remain operational during earthquakes (Ferenc, 2007). Drumm also adds that delays magnify because architects and designers hold onto the drawings during review process. However, Drumm notes that the collaboration between OSHPD and design team early on in the project has reduced the review and approval process by an average of 5 months and hopes to see this practice continue in the future (Ferenc, 2007).

Conclusion

Collaborating with OSHPD may entail longer wait times that require skilled project management teams to work around the review and approval processes and keep the project moving. Despite the frustrations and stress that may ensue from dealing with the tedious wait times, the reality is that OSHPD jobs provide the client with safer products designed to withstand seismic activity that may occur during critical surgical operations.

Recommendation

While the project team may not be able to control the process OSHPD utilizes to review and approve drawings and submittals for the medical equipment specified by clients, it is crucial to note that the efficiency in which all parties operate at are within control of the project management team, as the "middle man." First and foremost, communicating any changes the client wants with the architect and the IOR and constantly updating all parties with the current schedule and any schedule changes is critical—all involved parties must be on the same page at all times. For this reason, document control—confirming that all RFIs, ACDs, DAs, and meeting minutes are current, accurate

and distributed to necessary parties in a timely manner—is crucial. Next, the contractor should analyze any structural, MEP, and installation changes that may take place and provide recommendations for the architect, engineers, and OSHPD. While the review and approval process takes place with OSHPD, the project management team should then perform a thorough QA/QC to ensure the room is ready for installation of equipment when it arrives on site. This entails ensuring all utilities have been coordinated with structural and MEP components, all MEP has been tested and ready to tie into the equipment, and that floors are level and flooring installed. Above all, however, the contractor should maintain healthy relationships with all involved parties. Healthy relationships translate to efficient communication, efficient collaboration and problem solving abilities as a team, and favorable outcomes for all parties involved.

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