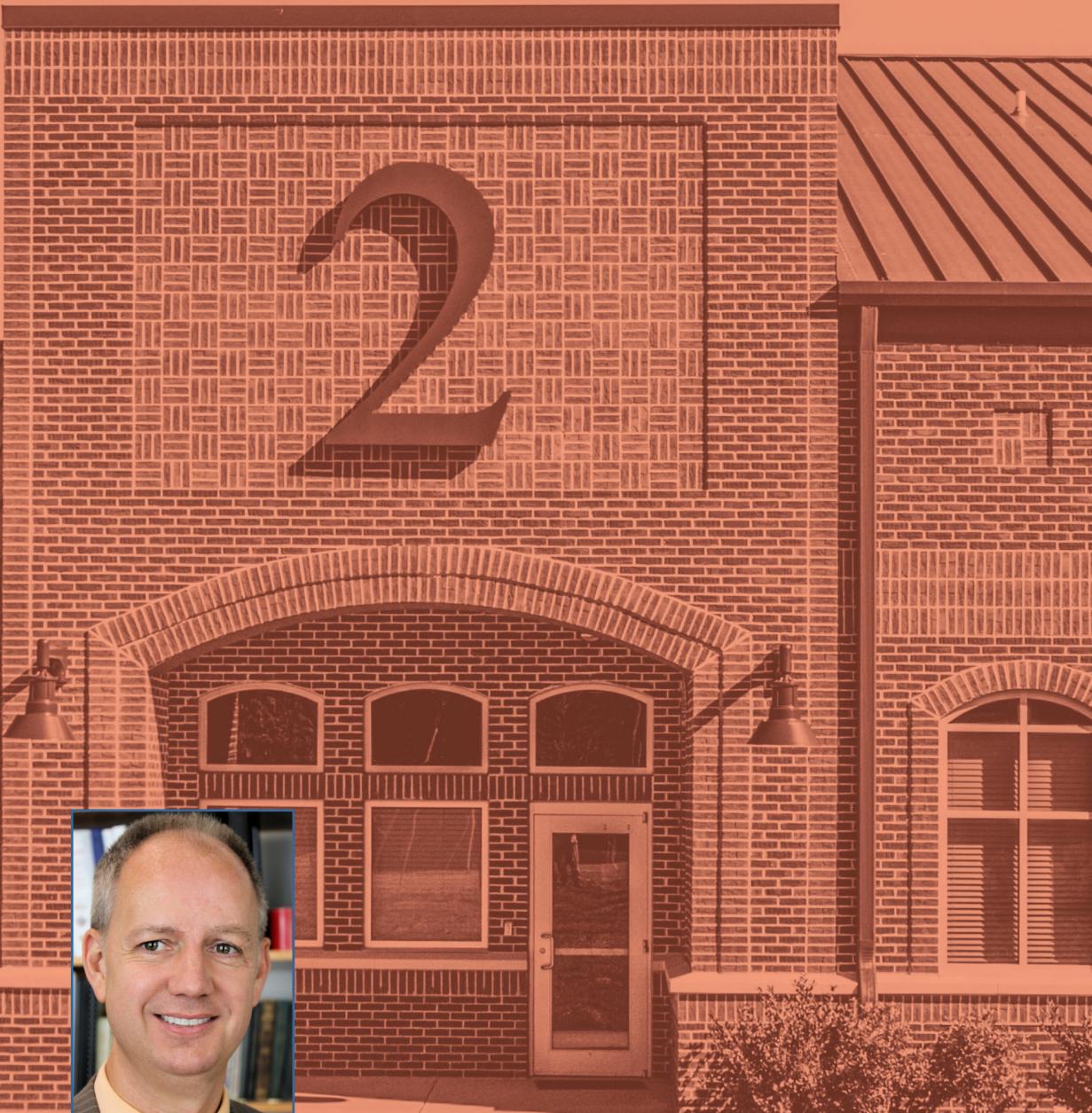


# Pitfalls to Avoid During Station Construction



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Architects

# Pitfalls to Avoid During Station Construction

*If your future includes a new station project,  
it makes sense to learn how others have encountered challenges*



By Ken Newell

There are people in the world that learn from their mistakes and experiences, and there are those who learn from others mistakes and experiences. Those in the latter category tend to have a longer, less stressful life. If your future includes a new or renovated station project, it makes sense to learn how others have encountered challenges in the process so that you can attempt to avoid the same problems.

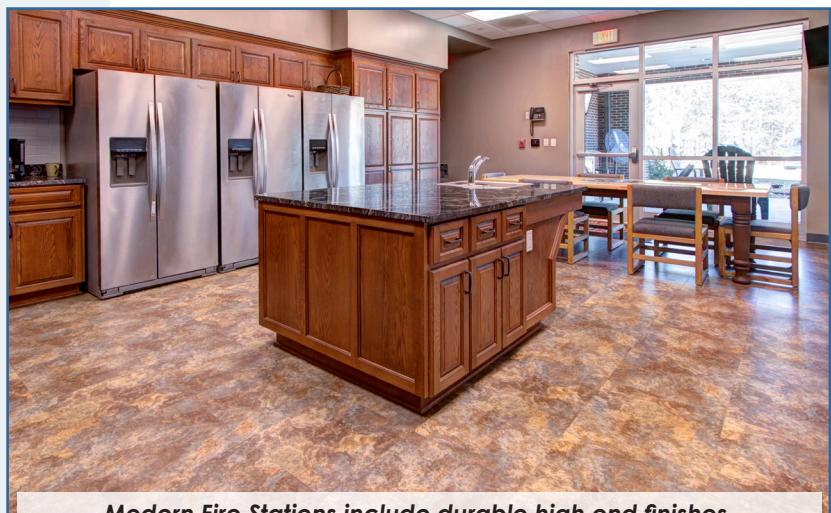
The planning, design, and construction of your station, whether new or a renovation, is one of the most rewarding endeavors that you will ever take on. Yes, it will be stressful at times, but when all is completed you will hopefully look back on the process with satisfaction. If difficulties in the project are encountered, they are most likely to occur during the construction phase. It seems that construction phase challenges are more prevalent than ever before in today's construction climate.

There are many reasons for this, including but not limited to:

- The on-going pandemic, as well as recent social and economic pressures that have been catastrophic to most building contractors, and which have resulted in many quality companies going out of business. Many of the companies that do survive lost their older, more experienced personnel.
- Now that the building industry is beginning to improve again, many builders will have more work than they can proficiently perform.

- For the past several decades, the role of the General Contractor has become more of a "broker" of sub-contractor services than a "performer" of construction activities. This results in the project outcome relying less on the qualifications of the General Contractor, and more on the quality of the specific sub-contractor's crew working at the job site.
- The ever-increasing technology systems added to facilities require more pre-construction and construction coordination than ever before.
- The customer's expectations are higher, including the demand for shorter construction schedules and project deliveries.
- Project delivery methods that only consider the lowest possible bid in the selection of the builder - often will not result in obtaining the most qualified builder for the project.

So let us consider some of the most prevalent construction phase pitfalls that municipalities and fire, police and public safety department's encounter, along with some suggestions on how to avoid them.



*Modern Fire Stations include durable high end finishes.  
The town of Harrisburg opted for a commercial-grade kitchen*

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### Unqualified General Contractors

Just because someone can qualify for a contractor's license and the necessary bonding, does not mean that they are qualified to build your next station project. Like many citizens in your community, many contractors have the misconception that building stations should be easy. After all, "they're just a big garage for parking trucks in," right? Wrong!

Emergency response, fire police and public safety stations are more complicated than ever. Plus, they are facilities that should legitimately be expected to serve the community for 50 to 75 years. So taking all possible steps to evaluate the general contractor before they are awarded your project is paramount. Just because the contractor may be a master at building big-box stores doesn't mean they will deliver to you the best station project.

Many municipalities and departments employ additional means of contractor evaluation, or even different project delivery methods in an attempt to

delivery methods such as Construction Management (CM) or Construction Management at Risk (CM@R) to evaluate the builder's qualifications, and not just their bid day price.

While these and other processes or project delivery methods have proven value, none of them guarantee good results in selecting a qualified General Contractor. Most of the "low-bid" General Contractors who have disappointed the Owners, would have appeared qualified in the documents that they submitted in other selection processes. Whatever selection process is used, additional vetting should be performed prior to awarding the project to any builder. For instance, almost any contractor can provide five "good" references. But how much more you would learn if you asked them for every public safety facility project that they have built over the past five years, and then actually spoke with each one of these references? You should consider going to visit those stations or facilities to evaluate the quality of the construction.



**By hiring a qualified Architect to design your station, you'll be asked the hard questions you never thought you needed to answer - before the shovels hits the dirt.**

ensure better General Contractor selection. Some will "Pre-Qualify" bidders instead of allowing all who legally qualify to bid. Increasingly, Owners are using

### Hire A Qualified Architect in Construction Observation

There is much to be considered in Construction Observation. First, it is important to have the station designer involved throughout the entire construction phase. Some Owners even employ separate managers or observers to make sure that the intended design is being executed correctly by the contractor. Most fire or police departments have one or more members who have some construction experience, and will volunteer their oversight during this phase. While these folks can be a valuable supplements to construction observers, they do not replace the value of having the design architects and engineers present to protect the original design intent. Necessary design interpretations, and even changes will occur in the field. Architects are

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most likely to identify the ramifications of any modifications.

It is important to ensure that the design team (lead by the Architect) is actually qualified to perform construction observation. There are many talented Architects, who unfortunately have limited construction observation experience. Therefore, their cutting edge design solutions may lack constructability. Plus, the likelihood of them identifying problems during construction will also suffer.

The Architect that worked with you throughout the design process knows why the design decisions were made. That person should be involved with construction coordination to help protect the project's integrity. Often the design firm will also have a full-time Construction Administrator, who will play a major role in the process of construction oversight. That person will have the experience and credentials to evaluate potential problems long before they become an Owner's nightmare.

### Setting the Proper Tone for Interaction

In order for the construction process to be successful, all participants; Owner, Architect and Contractor, must be team players. Everyone must recognize and protect each other's interests in order for the project to be successful. The Owner wants a quality facility with little to no additional expense. The Architect protects the Owner's project and see that it is built properly – a project that can encourage future business. The General Contractor wants to provide a quality product, that again can foster new business. If each loses their opportunity to make a profit for whatever reason, the project is far less likely to go well. So the Owner and Architect should actually want the General Contractor to do well.

As team players, all three parties must work together and not against each other. One of the Architect's



Harrisburg opted for three drive thru bays in station 2 and two in station 3. The flexible design provides for adding more bays in the future.

roles during construction is to set the proper interaction and tone between all parties. Mutual respect and honesty are a must. However, if the Owner or General Contractor violate any of the principles to which they have agreed, each should be held accountable and given the opportunity to correct course. If no change is made, the Architect's role of mediator will become prominent for the remainder of the project.

### Submittal Reviews

Before the General Contractor begins ordering all of the materials and systems – everything they need to build the station - they are required to prepare and send documentation to the Architect and the design team. This documentation, also known as submittals, confirms that the contractor is actually ordering and using what was specified by the Architect in the design. If products are no longer available, then substitutions are suggested and approved. Some decisions like colors and styles are made during the submittal process. Sometimes the data provided with the submittals will reveal that a design modification is necessary to accommodate conflicting elements. By identifying these conflicts during this early phase of construction, the design modifications can usually be made with little to no additional cost.

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Since the submittal process is important to the construction phase, there are two major principles that should be followed.

**First,** the contractor must prepare and provide the proper submittals in a timely fashion. This is due to the fact that the submittal process can take time, and include multiple rounds before approval. General Contractors and their sub-contractors should begin this process as soon as they are awarded the project. If not, the construction schedule will likely be adversely impacted. Additionally, the submittals should match what has been specified as closely as possible. Submitting non-specified items will guarantee delays in the process. Only if the specified items are truly not available should deviations be submitted.

**Second,** the design team should quickly review the contractor's submittals for compliance with the specified items. If the design team finds that the submittal is not accurate or that sub-contractor submittals have not been reviewed by the General Contractor prior to sending them to the design team, they will reject the submittal and the process starts over. The design team should require the contractor to submit items in the order needed for construction. The design team will then review the submittals in the proper order.

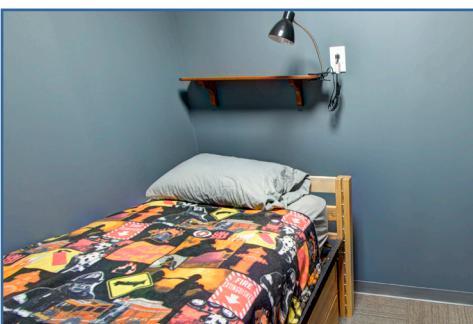
### Early Identification of Scheduling Problems

Obviously, it is always advisable to specify a completion date for the project, as part of the construction contract. You add teeth to the requirement of completing the project in a reasonable

amount of time, by establishing "liquidated damages." Liquidated Damages (LDs) are set monetary penalties that the General Contractor pays or forfeits, for each unexcused calendar day past the required completion date. Therefore, the required completion date is established as part of the contract. Shortly after the General Contractor is awarded the project, they are required to submit

their construction schedule, which shows all milestone dates, necessary to meet the project's completion date.

Each month, all parties should evaluate the progress made based on the General Contractor's originally submitted construction schedule. Extensions to the schedule, due to any defined weather delays are evaluated. If the on-site construction activities fall behind the established construction schedule, then the contractor will be required to submit a "make-up" schedule. A make-up schedule is the contractor's plan to the rest of the team on how he will catch-up construction activities to the schedule. Evaluation of construction activities to the schedule, should be a requirement for the team to review each month, prior to the contractor's payment application being approved. By identifying scheduling problems early and often, there will be many more opportunities to address delays in a manner that is satisfactory to all.



**Modern Fire Stations are designed to last 50 plus years!**

### Identifying and Correcting Non-Compliant Work

Several parties will observe and safeguard the quality of the work performed during construction. First, the project Owner will watch the daily progress

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with unmatched interest. Second, the design team, as discussed previously, should have the Construction Administrator included in their scope of work – mandating that they are safeguarding the Owner's interests during construction. Lastly, the governmental Authority Having Jurisdiction (AHJ) who provided the original building permit for the project, will perform inspections at specified intervals. Most stations fall under the requirements of the building code that calls for "Special Inspections." This will require the project Owner to hire a qualified, third party that will inspect specific structural components and systems. Even with all of these eyes on the work being performed, there is plenty of opportunity for non-compliant construction to occur.

"Non-compliant" work would be defined as any construction that does not satisfy the plans, specifications, or code requirements. The quicker that non-compliant work can be identified, the sooner that it can be corrected. Occasionally, it is beneficial to the project or construction schedule to determine a work-around for some minor issue of non-compliance. However, when the General Contractor regularly produces non-compliant work,

the other team members should require correction in order for the design intent and/or code requirements to be met.

### Payment Issues

Closely guarding the items previously discussed will help to avoid many of the potential payment issues with the General Contractor. The General Contractor will typically submit a payment request each month. They should not request or be paid for more than the value of the work performed at the date the payment is requested. Prior to the first payment request, the General Contractor should have to submit a Schedule of Values. This is a form that specifies all identifiable categories of materials and labor that will be utilized for construction. The payment application is evaluated each month against the Schedule of Values in order to ensure that overpayment does not occur.

Overpayment can lead to several problems. If problems arise regarding the contractor's performance or the performance of any of the sub-contractors, previous overpayment can weaken the Owner's position to ensure the contractor remedies the performance issues. If the contractor



**Modern fire stations include outdoor patio areas where on-duty personnel can relax outdoors in between response calls**

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happens to go out of business during construction, previous overpayments to him will decrease the funds available for hiring another contractor. If the contractor is overpaid for items assigned to his material suppliers or sub-contractors, he may be tempted to utilize those funds on other projects, which may hinder his ability to pay his sub-contractors when they are actually due the money. This points to another payment issue, non-payment of the General Contractor's sub-contractors and material suppliers.

Non-payment of the sub-contractors and material suppliers by General Contractors happens far too often, and for a variety of reasons. It will almost always cause problems for the project and the Owner. The Owner may begin receiving legal notices, or getting phone calls from the sub-contractors. The sub-contractors might begin filing liens against the project, and may cease performing critical work until they are paid. Before the General Contractor receives final payment on the project, they should always be required to provide a signed lien waiver from all sub-contractors and material suppliers. If during the course of construction the Owner begins to learn of non-payment issues to sub-contractors, then the Owner can consider requiring partial lien waivers from the affected sub-contractors with each month's payment request from the General Contractor.

### Surety Involvement

It is usually necessary, and always wise to require that the General Contractor provide a material and labor Performance Bond on the project. This brings a third party into the project; a Surety Agent is an insurance factor willing to assure performance of the General Contractor. If the contractor defaults on the project, the Surety Agent is required to have the contracted project completed. If the contractor fails to pay the sub-contractors or material suppliers, the Surety Agent takes on that responsibility.

If significant performance or payment issues arise, it is often necessary for the Owner to contact the Surety Agent in order to solicit their involvement. The Surety Agent has a vested interest to make sure that the General Contractor performs correctly. Otherwise, the Surety Agent will have to spend their funds to satisfy the requirements of the construction contract. Since the General Contractor's personal property or holdings is often the collateral for the Performance Bond, the Surety Agent has significant influence.



### Project Completion

One would think that after months of construction, getting to the project's completion would be a fairly straightforward process. Just let the General Contractor finish, hand over the keys, then the Owner moves in, and all is finished - right? Unfortunately, it can be more complicated than that. There are many processes that can be encountered when construction is nearing completion, and until well after the station is occupied. It is helpful to understand some of these items, and how to benefit from them, as well as how to avoid the problematic issues.

**Temporary Certificate of Occupancy/Certificate of Occupancy:** Before the project Owner can legally occupy the facility, the Authority Having Jurisdiction (AHJ), or the building inspector is required to issue a Certificate of Occupancy (CO), which indicates that to the best of his knowledge, the facility has

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been built to meet the building codes and is safe to be occupied. Many jurisdictions offer a Temporary Certificate of Occupancy (TCO) that allows limited occupancy of the facility. Sometimes a TCO will only allow utilities to get started and furnishings and equipment to be installed. Occasionally, the TCO will allow the Owner to move into the building with the agreement that a few, often insignificant items are still necessary to be completed.

**Substantial Completion Date:** By definition is the date construction has ended. This official date is important for several reasons. If liquidated damages (penalties to the General Contractor for completing the project later than the contracted completion date) are part of the construction contract, Substantial Completion (SC) is the date when those damages cease to accrue. Typically, it is the Architect who determines this date. Notice that the definition does not say "the date the Owner begins using the facility." It is most common for SC to be reached prior to the Owner's occupancy. Sometimes the Owner can begin gaining limited access to the facility before it achieves SC, for the purpose of self-performance activities, such as furniture, technology or communications installations.

An important point to make here, is the relationship between Substantial Completion and the Certificate of Occupancy. While the facility can never be deemed entirely complete at this date, it does not mean the facility is Substantially Complete.

The Certificate of Occupancy only shows that the inspector believes the facility to be safe for

occupancy. There can still be unfinished items that keep the facility from being "used for its intended purpose." Examples of this in a fire station could be that the apparatus room floors cannot yet be parked on, or bunk rooms and showers are not yet finished.

### Warranty

Most construction contracts require that the General Contractor warrant all material and labor that has been provided on the project for a designated period of time, typically one year. Several items in the project should carry a much longer warranty, such as the roof and the HVAC system. But everything in the project should be covered by the general warranty. Only normal wear and user abuse is excluded from the warranty. Individual product warranties should be documented in writing and provided to the Owner prior to the project completion. After the Owner occupies the facility, but before the end of the warranty period, a warranty inspection of the entire facility should be performed in order to identify all items that require attention by the contractor.

The planning and construction of a facility – be it new or renovation to a station or a multi-use public safety complex – is something most people do not have overwhelming experience about. The typical Owner cannot be expected to know all the aspects needed to protect their interests during a construction project, especially when a construction project comes along very infrequently. However, utilizing a qualified Architect and his design team for such an occasion, will guard against Owner inexperience and any resulting problems that might arise, as well any other pitfalls to be avoided.

