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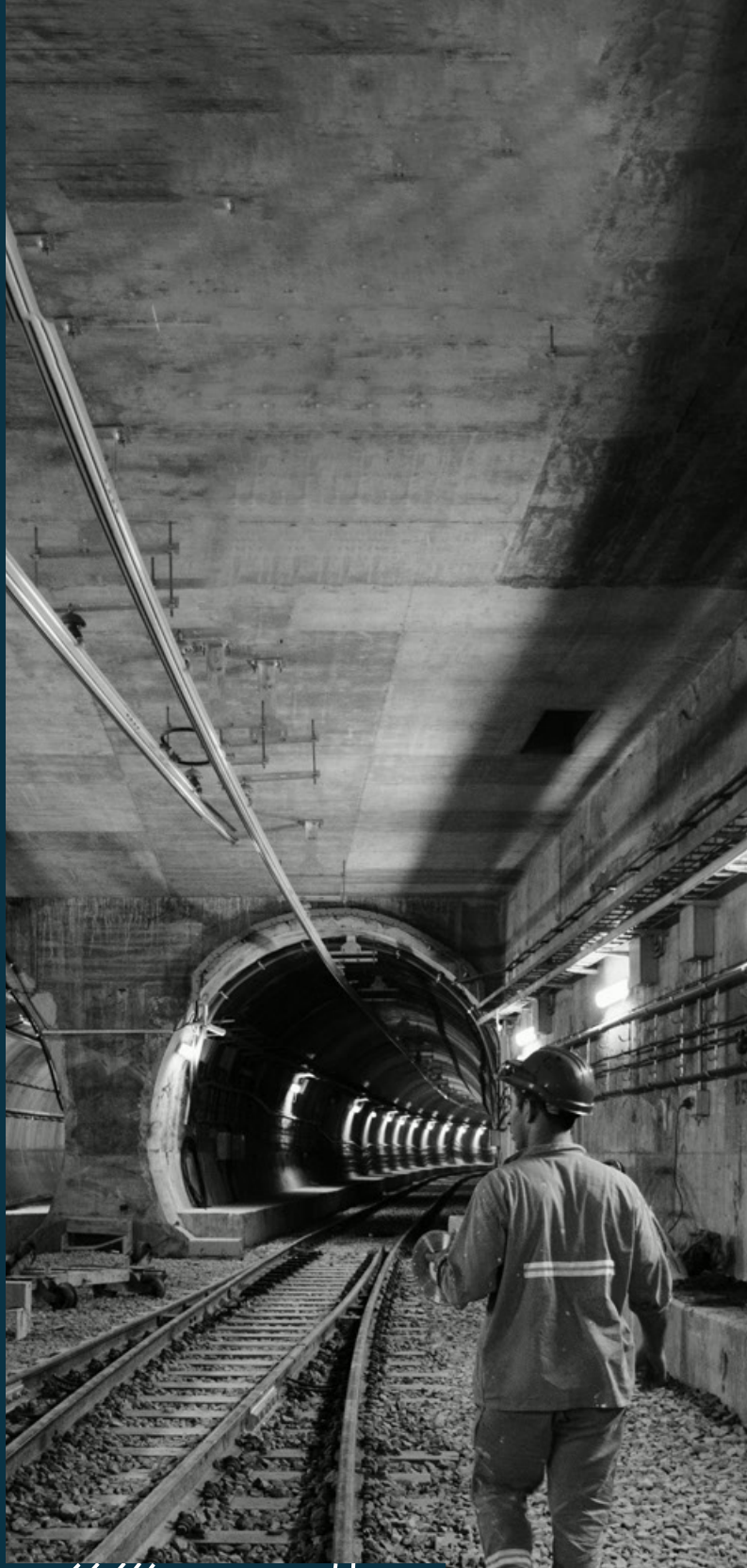
Owner's guide to change orders in construction

Minimizing their impact on project costs and schedules



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Projects are inherently complex, involving multiple stakeholders with varying objectives, unique circumstances, and the pressure to deliver within a specific time frame and budget. Change orders, which are revisions to a construction contract that modifies a contractor's scope of work, often pose significant challenges in the construction industry. Large projects may involve hundreds of stakeholders and can take years to complete. With so many moving parts, deviations from the original plan may be unavoidable; however, owners can take proactive measures to mitigate their impact.

Change orders stem from numerous sources and vary in their severity. Most change orders add time or effort to the construction schedule and often add expense to the construction budget.

Four common types of change orders

01

Lump-sum

A lump-sum change order is employed when an owner and contractor agree on a fixed price for a finished product. This type of change order results from a quantifiable alteration in the scope of work. In this instance, contractors assume more of the risk.

02

Time and materials

When the cost of a change in scope is uncertain, owners and contractors agree on an hourly rate (plus material costs) that is billed as it accrues. With a time and materials change order, owners bear more of the risk.

03

Unitary cost

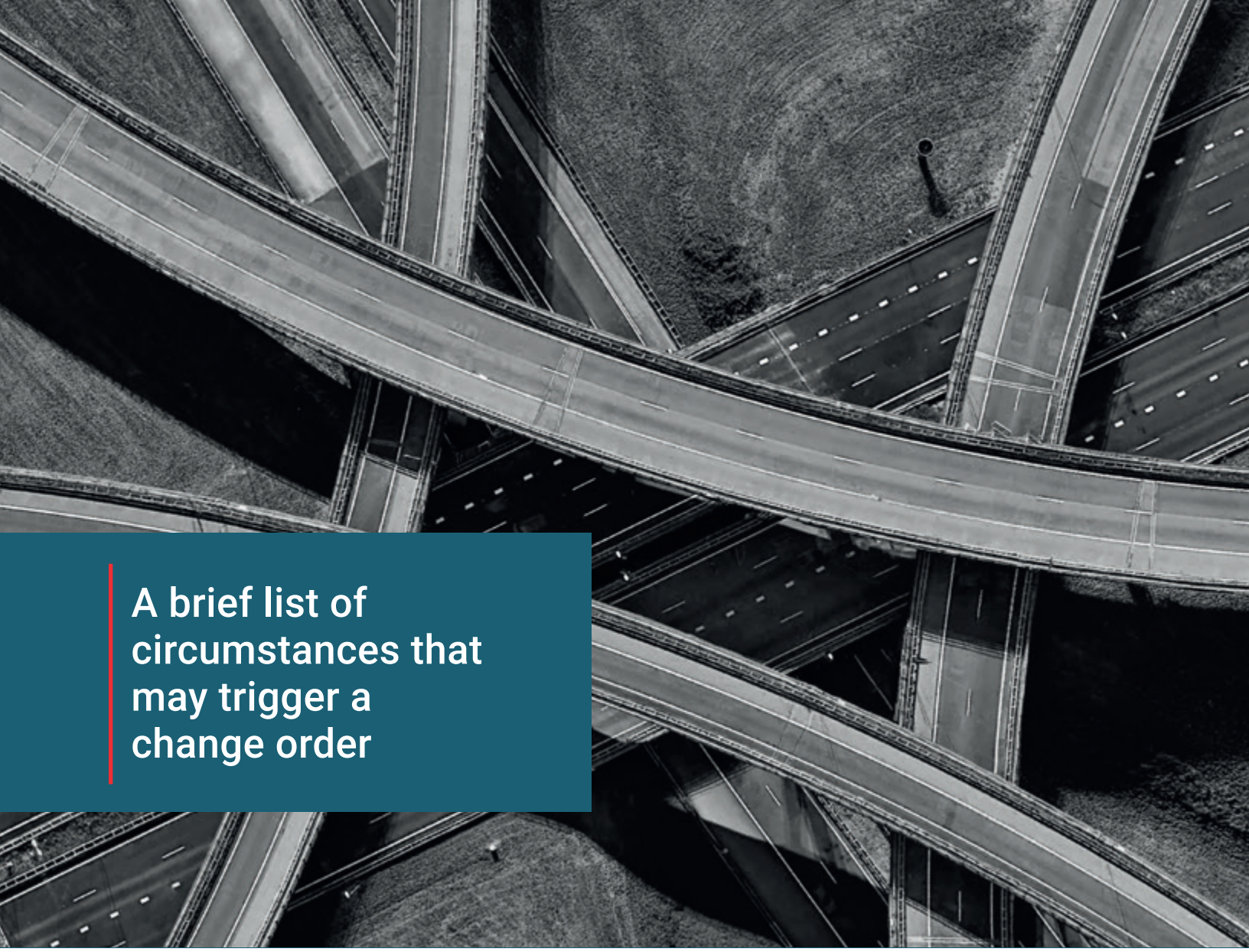
A contractor negotiates a unitary cost change order before initiating work related to the change. Specific measurement units define the work, and the fee is charged per unit. A unitary cost schedule provides some cost certainty for the owner when the quantity of work is beyond their control.

04

Zero-cost

A zero-cost change order, also known as a 'net-zero' change is employed when the revision does not affect the contracted price and serves solely as a method for documenting differences in the scope of work or schedule.

It is important to note that change orders can occur at any time during the construction process, from the moment the contract is signed until the project's completion. A change order is necessary whenever the scope deviates from the existing project plan.



A brief list of circumstances that may trigger a change order

Design errors or omissions

In these cases, the vision cannot be executed as specified. It may be missing a key piece of information, or one part of the design may clash unintentionally with another. These issues are often only caught in the field once construction is underway.

Regulatory changes

These usually arise when the government enforces new regulations in various situations. For instance, the Occupational Safety and Health Administration (OSHA) implemented altered regulations in response to the COVID-19 pandemic, which necessitated ad hoc adjustments in the construction industry.

Unforeseen site conditions

Challenges may arise from the physical terrain or environment once work begins at the construction site. An example of this circumstance is when a slope is steeper than initially anticipated, affecting the construction process.

Issues related to procuring materials

This has become especially relevant in recent times due to the supply chain's unreliability. Material costs may fluctuate more than expected or may have extended delivery lead times, resulting in delays. Procurement issues often impact both schedule and cost due to the predecessor relationship between material acquisition and subsequent installation.

Owner-initiated changes

In this scenario, the owner(s) elect to modify the project scope. For example, a hospital room might need to serve a different purpose than initially planned, prompting adjustments. Alternatively, an executive may request changes to the carpeting, lighting, or furniture style.

Other changes from the original plan

There are many other reasons that may necessitate changes when it comes to complex projects. Some changes might be challenging to classify. For example, a project or portion of it could be canceled for political reasons beyond the owner's control. If the land designated for the project becomes unavailable, several updates may be required at the new site.

Owner-contractor disputes

Disagreements between contractors and owners are common in construction projects. At times, the parties may be unable to agree on the existing scope, necessitating the involvement of a neutral third party to mediate and determine a course of action. This intervention may result in changes to the design or schedule.

How much do change orders affect a project?

A study published in the Journal of Legal Affairs and Dispute Resolution in Engineering and Construction discovered that "cumulative impact... is likely to occur when change exceeds 10%." The same study also revealed that 60% of projects with changes limited to 5% or less achieved their final run rate. However, when changes exceeded 20%, the projects were more likely to experience setbacks. In essence, a team's productivity is inversely proportional to the number of change orders. This is why those in the construction industry strive to avoid them. Consequently, the logical question arises: **What can be done to eliminate or at least minimize the need for change orders?**

Minimizing change orders to maximize cost savings

This section provides an overview of actions you can take to minimize change orders.

Minimizing design errors or omissions

Given the ever-increasing pressure on design teams to create and document plans and specifications within a short timeframe, it is understandable that mistakes may occasionally occur. A 2021 Construction Dive article noted that design problems had surpassed scope changes as the primary cause of claims and disputes. These errors and omissions can be costly if not caught before construction begins. Conducting a detailed review of all design documents helps safeguard the integrity of your budget and may prevent issues during construction.

Bring the designer and contractor together early in the process to uncover any potential constructability issues with an asset. The earlier this occurs, the more time and money can be saved. A 2019 study showed that design-build projects experienced fewer change orders than traditional design-bid-build projects.

Involve subcontractors as soon as possible, even during the design phase. In many instances, subcontractors provide valuable insights into the constructability of the design and identify issues that may arise during the construction phase.

Allow the design team ample time to complete and thoroughly review the construction documents. Do not rush to bid (or begin construction) before finalizing the drawings and specifications. To progress to bid, you will first want to have at least Design Development (DD) document issuance. Construction should not be commenced without Construction Drawing (CD) issuance. You may even need to have the contractor review the documents to ensure that all necessary information is included and accurate. This is why methods such as Design-Build (DB) are often more successful, as contractors are heavily involved during the design process, minimizing the chance of missing pertinent information.

When the design team clearly communicates their intent and has a deep understanding of conditions on-site, their design is more likely to be successfully realized. If the design is rushed due to pressure from the owner or internal resource constraints, change orders will likely arise from errors and omissions.

Utilize Building Information Modeling (BIM) to analyze the design documents and determine if there are any clashes or coordination issues. If you do not yet require your design team or contractors to use this powerful tool, it is undoubtedly worth it to do so. By modeling the building and the construction process, BIM can help you avoid potential problems by instantly scanning building plans and alerting you to possible design conflicts long before you break ground.

Emphasize the importance of accurate budgeting and estimating. Generally speaking, the more information a contractor has to base their estimates on, the more precise the pricing will be. With comprehensive approximations, you can make educated decisions on material selection and address any value engineering needs.

Minimizing regulatory changes

Sometimes design changes become necessary when the Authority Having Jurisdiction (AHJ) changes the requirements for construction due to zoning or code updates. Staying current with these requirements is imperative to ensure that the design complies with the code, and there are no surprises at the design review and permitting stages.

Stay informed about code and zoning changes in your development areas, and motivate your design team to remain up-to-date on relevant regulations. Local designers often have the most in-depth knowledge of an authority's requirements. So, if you employ a national firm or have in-house design, collaborating with a local firm can ensure that the design satisfies all AHJ's stipulations before submitting for permits. This strategy can help conserve time and resources on design adjustments and additional submittals. You should always try to work with local permit expeditors whenever feasible.

Leverage effective lobbying to shape local codes and regulations, making them more favorable for your development. Building relationships with city and county officials in the areas where you develop can keep you informed of proposed code amendments and provide opportunities for you to voice concerns about the impact of these changes on your community.

Engage in local events and philanthropic endeavors. Participating in these activities will enhance your influence within the local community and establish you as a committed partner in its betterment.

Solicit public feedback early in the design process. Engaging with community leaders, building departments, and neighbors ensures their concerns are acknowledged. This proactive approach will allow you to address potential issues before finalizing the plan and budget.

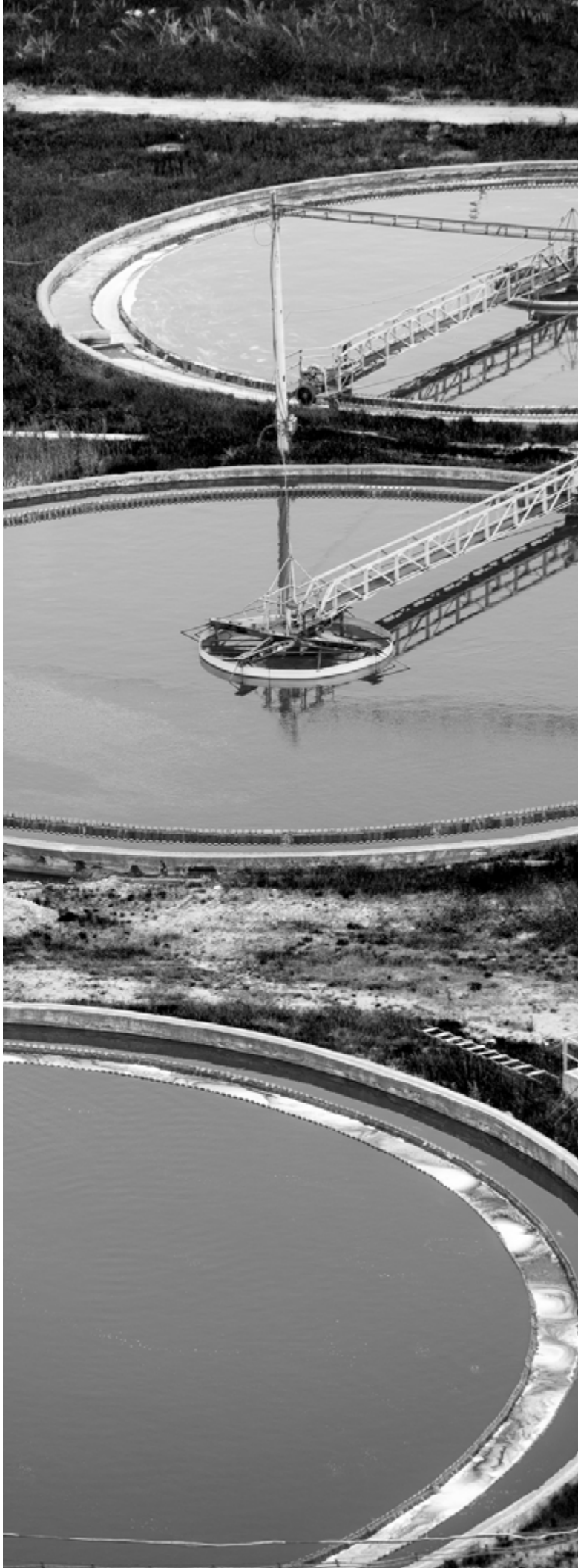
Minimizing issues related to materials procurement

The selection and ordering of materials can significantly affect a project's cost and schedule. In particular, recent delays in manufacturing and supply chain disruptions caused by the pandemic have severely affected construction projects. Proactive planning is the key to minimizing their effect on a project.

Ordering materials early can help prevent delays and keep costs from spiraling. Material procurement can influence a project's schedule, with some resources seeing extended lead times. Comprehending these time frames is crucial for scheduling and ensuring the project meets its milestones.

Establish and maintain strong relationships with frequently used vendors. These relationships can prove valuable, occasionally resulting in preferred ordering or priority shipping. Factors like these can assist with contingency selections.

Request vendors to provide visibility during the manufacturing and shipping processes, so you will know the exact location of the materials. Accurate tracking can help contractors stay prepared and reschedule work if necessary.



Minimizing owner-initiated changes

Owner-requested changes can occur anytime during a project, but they tend to be most problematic after construction has begun. For instance, moving a wall during the design phase likely incurs no additional costs. Moving a wall after framing has been completed could increase expenses for the owner and cause project delays. Therefore, it is essential to finalize the design process entirely before soliciting bids and selecting a contractor.

Proactive communication must be established among the project team members to ensure that the owner's requirements are implemented according to the project scope. In the absence of open communication, there is a higher likelihood of changes later in the process, leading to increased costs and project completion delays. Utilizing a shared set of project documents or data fosters accountability, as team members must account for their time and work. Addressing issues or mitigating risks becomes manageable when everyone is aware of who raised the concern, what caused it, and take the appropriate next steps. Teams that communicate effectively are better equipped to adapt and a cloud-based system where responsibilities are visible to everyone can be advantageous.

Owners should select finish materials as early as possible, preferably during the design phase. Finishes often affect work in other phases and usually require long lead times. Altering finishes after installation can be expensive and result in delays while contractors wait for the new materials to arrive on-site.

It is essential to clarify project priorities, particularly regarding schedules and costs. When the owners' priorities are well-defined, the design team and contractors can easily meet their expectations. For example, if a change in finish is requested late in the project, it could significantly extend the schedule.

Establish processes early in the construction life cycle and maintain a consistent approach across your agency for handling changes in the work. Consider creating a one-page document that explains and simplifies the process for new contractors. Agree on the process before construction begins to ensure that the necessary processes and stakeholders are in place to address it in the event of a disagreement or an issue.

During construction, RFIs should be linked to Potential Change Orders (PCOs) and Change Orders (COs). Tracking design changes in this manner can help prevent similar issues in future projects. As a best practice, consider linking the CO process to your budget change process and implementing proper project controls to prevent overspending.

Use field orders to expedite work up to a certain dollar value. Empower your project managers to maintain construction progress by issuing a fieldwork directive instead of halting work to await a change order. This approach can minimize schedule impacts while controlling risk, as the dollar value is included in your process routing, ensuring that changes are directed to the appropriate level for approval.

Track changes and disputes during the OAC meetings. Any disagreements should be articulated in this meeting with designated action items, responsible parties, and deadlines. This information should be reviewed before the subsequent meeting.

Prompt payment processing facilitates smooth relations. Ensure your field order and change order processes are tied to your payment app process to avoid delays.

Minimizing changes due to unexpected site conditions

If earthwork or site work is included in a project's scope of work, changes and unforeseen conditions can significantly affect both cost and schedule. The best ways to prevent these changes are to protect the site and plan ahead.

Plan for potential weather effects. Whether it is heat or cold, rain or snow, or extreme weather, proper preparation is the best way to protect the site from damage and maintain worker safety as well as productivity. While contractors handle most of the details, owners can actively participate in planning, particularly when it comes to scheduling work. Timely scheduling of key activities during favorable weather conditions can help prevent damage and delays, ensuring consistent project progress.

Review the plan for temporary roads, structures, and water detention. Often, temporary roads and structures need to be constructed to facilitate the construction process. For instance, a gravel road may be required to keep trucks from getting stuck on a muddy site. It is essential to verify that the procedures in place account for severe weather conditions.

Ensure that the site is adequately protected. Owners should explore several jobsite security methods, such as perimeter fencing, hoisting expensive heavy equipment into the air, contracting security officers, or installing video cameras. Implementing these measures could help prevent theft and vandalism during construction.

The importance of having insurance to mitigate the effects of change orders

General liability and builder's risk insurance policies can help reduce the costs associated with change orders related to specific claims and damages.

General liability for contractor's insurance should be required before allowing a contractor or subcontractor to begin work at the site. This type of insurance offers protection to both you and your contractors in various ways, including:

- **Claims from third parties alleging property damage or bodily injury**
- **Claims alleging property damage or bodily injury caused by employees**
- **Claims alleging slander or libel**
- **Coverage of legal representation in claims**

Builder's risk insurance covers materials, equipment, and labor costs to replace installed work that is damaged due to:

- **Fire, lightning, or hail**
- **Weather or other acts of God**
- **Impacts from vehicles or aircraft**
- **Vandalism or burglary**
- **Building or land collapse**

The owner or contractor typically purchases the builder's risk insurance and protects a project while it is under construction. Once the project is completed and turned over to the owner, they become responsible for securing future insurance coverage as part of their operating expenses.

Final thoughts

As an owner, ensuring your project is completed on schedule and under budget is crucial. These requirements are often compromised when projects are riddled with change orders, which can add time and cost as well as cause stress and frustration. The increase in change orders could potentially turn your dream project into your worst nightmare.

Change orders should be categorized by cause as a best practice to mitigate these issues. Doing so can help you spot trends across projects, such as specific project types consistently having numerous owner-requested changes or code changes in certain locations that significantly impact projects. Artificial intelligence (AI) can be invaluable for analyzing data and identifying similarities across your program.

It also pays to document your lessons learned and share this information with project managers, planners, and other relevant parties. It is advisable to assign someone to this task; otherwise, no one may take responsibility. Although there may be nothing you can do about unforeseen conditions, it is essential to at least document them.

To manage change orders effectively, it is necessary to have clear and detailed contracts, open communication, thorough documentation, and a proactive approach to identifying and addressing potential changes. With proper planning and execution, change orders can be successfully navigated to ensure the timely completion of construction projects led by public agencies.

About Aurigo Software

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