Abstract
Despite the unique nature of every construction project and the different closeout procedures implemented by construction companies, the closeout process can be generalized sufficiently enough to establish the rudimentary procedures needed to help ensure a successful closeout. The following white paper details the closeout process and sets forth the recommended procedures in order to help achieve a successful project closeout.

Introduction
A construction project’s closeout is considered the last major phase of a project’s life cycle. Specifically, closeout entails a combination of both on-site and administrative tasks that substantiate that the project has been performed in accordance with the contract documents. The on-site obligations generally consist of completing all physical work in order to make a project ready for the owner to formally accept and occupy the project. Similarly, the administrative tasks encompass preparing and submitting all relevant documentation required per the contract, such as testing reports and warranties, for example.

Why a Project’s Closeout is Critical

A project’s closeout is considered a critical component of the successful completion of a project for several reasons. First, the complete closeout of a project is a contractual obligation that is heavily emphasized and can be rigorously detailed on both public and private contracts. The inability to close out a project will result in an open project that will require additional time and money while being interruptive to a contractor’s business practices.

Second, closeout is time-sensitive since it requires that time be committed to it (as a resource), it must be monitored starting at the commencement of the project, and it must be completed prior to the scheduled completion of the project. A contractor’s inability to follow the time requirements will occupy resources such as staffing and general conditions that may otherwise be slated for other commitments – thus impacting other projects as well. Moreover, the inability to manage the closeout will ultimately delay the completion of the project.

And third, there is a cost component similar and correlated to the time component which can hinder a project’s cash flow and result in additional costs. Specifically, a project’s complete closeout is a prerequisite to a contractor’s ability to collect any contract balances, inclusive of retention. A contractor’s inability to collect the contract balances will negatively impact the company’s cash flow. Moreover, if the closeout process requires extensive time and effort, it can easily begin to erode any potential profits, due to cost overruns such as additional management and administrative costs; penalties or liquidated damages; permit extension fees; and monies dedicated to insurance extensions, to name a few.

Why Project Closeout Needs to be Coordinated & Managed

A project’s closeout is rarely considered during the project planning or initial phases of the project; however, it is essential that project closeout be coordinated and managed from the
The inception of the project. Coordination and management of closeout are critical since projects are often completed by a variety of different entities over a potentially large span of time. Each entity is responsible for different aspects of a project, which often occur during different phases of the project. Moreover, construction projects often have different specialized scopes that also continuously evolve as a result of the ever-evolving materials, equipment, and methodology implemented that involve different closeout requirements. Lack of coordination and management can result in missing critical documents and information (which in the most extreme case can involve documents or information that cannot be reproduced) and incurred delays resulting from the attempt to collect/create the requisite information.

**Components of Project Closeout**
The components of a project’s closeout entail both on-site and administrative tasks. Prior to commencing the closeout, it is essential to read and understand the contract and associated contract documents, such as the specifications, as they set forth the closeout requirements. Most commonly, the on-site physical work is stipulated by the punch-list process while the administrative closeout is dictated by the contract documents.

The following sections detail the components generally required as part of a projects closeout requirements and that are needed in order to achieve a successful closeout.

**Punch List**
As physical work on the project nears completion, the project team and owner should develop a punch list intended to identify incomplete or defective physical work needing completion/remedying and administrative tasks remaining to be completed. Often the physical work on the punch list may not hinder the intended use of the project, but it’s completion and acceptance by the owner are contractually required as confirmation that all work has been completed in accordance with the contract documents. Common punch list items related to the physical work include:

- Inconsistencies and defects to the finishes (painting, millwork, ceilings, etc.)
- Incomplete work (signage, landscaping, finishes, etc.)
- Attic stock (spare parts and extra materials such as paint, ceiling tiles, and flooring)

Special attention should be noted for any items that require complex coordination, are specialty items, and/or require materials with long lead times. Additionally, completion of the punch list should be expedited in order to keep the list contained since owners often tend to add more items as time progresses.

**Permits and Inspections**
Commencement of any project requires proper permitting in order to ensure that the work is being completed in a quality manner by a qualified party. Confirmation that the work is being completed properly is done via inspections performed concurrent to and following the completion of specific scopes of work. Specifically, multiple inspections are performed on scopes of work such as mechanical, plumbing, and electrical in order to verify that specific phases such as rough-in and final installation were done in accordance with building regulations. Common permits with associated inspections required during construction include:

- Foundation
- Plumbing Rough-In and Final Plumbing
- Electrical Rough-In and Final Electrical
Confirmation of passed inspections is then recorded on inspection cards. The completed inspection cards allow for the closure of the respective permits, which is a requirement of the project’s closeout.

Accordingly, inspections require continuous coordination between the project team and the governing authorities for each respective scope. As such, it is critical that inspections be performed and documented. Missed inspections or lost inspection records can result in costly rework and delays, and may hinder the project’s closeout.

**Documentation**

The second crucial component of project closeout is the production and submission of the project’s closeout documents. The critical nature of this activity stems from the voluminous amount of documentation that is generated by multiple entities throughout the entire course of the project. The collection of the documents is required in order to reflect the project’s final results and to be archived for future reference. The following briefly describes the closeout documents typically required by the contract documents:

**Change Orders**
- The award of change orders may result in changes to the design that need to be recorded as part of the final project documents. Moreover, change orders will often require additional inclusions to the warranty and adjustments to the contract value.
- Change orders are required for the successful completion of other closeout documents such as the as-builts.

**Equipment Startup**
- Equipment startup is the act of starting individual pieces of equipment in order to ensure that the equipment is functioning. Documentation of all procedures performed must be developed and submitted.
- Equipment startup documentation relies on the ability of the responsible subcontractor or third-party commissioning agent to document the process adequately.

**Testing and Balancing**
- Testing and balancing are conducted in order to achieve proper operation of systems, such as HVAC systems. Documentation of all procedures performed, inclusive of test results, must be prepared and submitted.
- Testing and balancing are often required to be performed on multiple occasions in order to capture seasonal changes.
- Testing and balancing documentation relies on the ability of the responsible subcontractor or third-party commissioning agent to provide the test results.

**Commissioning**
- Commissioning entails verifying that all systems/components are fully functional, operating in the most efficient manner; function in conjunction within the reliant systems, and are in compliance with the design parameters.
- Commissioning must be performed by a certified third-party commissioning agent.

Training
- Following the commissioning process, owner training is to be provided by both the third-party commissioning agent or a qualified party. The training ensures that the end user is properly trained in the required care, maintenance, and operations of the project.
- Specialized training may be required for specialized projects/equipment.

As-Builts
- The as-built drawings are a set of drawings that reflect the changes made to the original project plans during construction. Sometimes called the “record drawings”, the as-built drawings record the final dimensions, materials, and locations of all components as installed on the completed project.
- The production of as-builts requires vast amounts of documentation, which is collected throughout the entire project, and collaboration from all subcontractors/vendors.
- If design changes are not documented continuously, as-builts can be difficult and costly to reproduce.

LEED
- When a project requires LEED certification, the certification is determined by the amount of credits earned throughout the building process. Credits are primarily awarded for the use of green materials and building practices. Ample documentation is required in order to substantiate and obtain the accreditation.

O&M Manuals
- Operations and maintenance (O&M) manuals consist of the documentation needed for both the operation and maintenance of a project. The manuals are specific to the materials, equipment, and systems installed on a project.
- Coordination is required in order to obtain and verify the contents of each manual since they are prepared by the respective subcontractors, vendors, and engineers.

Warranties (GC/Sub/Vendor)
- Warranties, guaranteeing both the workmanship and materials incorporated in a project, are required from the general contractor, subcontractors, and vendors as part of the closeout. Warranties must include the defined scope as well as their term or expiration date.
- Oftentimes, a project will require a warranty inspection prior to the expiration date of the warranty.

Lien Waivers
- Lien waivers are formal statements wherein a party relinquishes its rights to issue any claims or liens on a project in exchange for the payment of their contract funds. Lien waivers are required from the contractor, subcontractors, and vendors, and are typically collected following any payments remitted to each of the parties.
- Conditional lien waivers are conditioned upon something (typically a payment), whereas Unconditional Lien Waivers are conditioned only upon the execution of the waiver.
Certificates (Substantial Completion and/or Final)
- Substantial completion certificates are awarded when a project is deemed sufficiently complete for a project’s owner to use it for its intended purpose.
- Final completion certificates
- Requirements for the substantial and final certificates are typically stipulated within the contract documents. The determination is to be made by the owner’s designated representative, such as the construction manager, owner’s representative, architect, and/or engineer.

All of the aforementioned components require a vast amount of coordination between the project team, subcontractors, vendors, and the owner to ensure that closeout is completed in accordance with the contract documents within the project timeline and budget. In addition to the stipulated requirements within the contract documents, special attention should be given to any governing statutes that may apply to the closeout documents. In some jurisdictions, documentation must be maintained for a period of time longer than that required by the contract documents.

Issues and Concerns
The closeout phase of a project is the last major phase of a construction project. As such, closeout efforts are commonly prioritized last and may present various additional challenges attributable to technical, personnel/project team, administrative, and owner issues. The following provides examples of some issues which may be encountered:

Technical Issues
- Lack of technical expertise required to understand or meet technical requirements
- LEED/commissioning requirements may be insufficient to meet required rating
- Lack of planning and resource allocation results in resources being unavailable
- Unclear directives for closeout in specifications and contractual requirements
- Inability to achieve technical requirements/test results

Project Team/Personnel Issues
- Change in project personnel following demobilization (supervisors and managers are often removed near the end of a project to focus on new projects)
- Decreased motivation and/or stress from project team/personnel
- Subcontractor availability and responsiveness diminishes as subcontractors complete their scope and demobilize

Administrative Issues
- Compounding schedule delays/compressed schedule decrease the time available to complete closeout
- Improper/missing documentation may be difficult to obtain or may require time to reproduce
- Multiple punch lists and lack of coordination in the completion of the punch lists may require extra effort and time
- Shortages or long lead times for resources required for closeout
- Insufficient budget or time allotted to closeout

Owner Issues
- Procedural inexperience from owner/owner’s representatives
- Owner-directed change orders and/or disputed changes
- Owner requirements exceeding project requirements

**Best Practices**
The best practices to help ensure that closeout is achieved both promptly and successfully should primarily implement traits supporting communication, timeliness, and teamwork. Additionally, the following practices are recommended:

- Read and understand the contract/contract documents.
- Start the process early & prepare for closeout before scopes are completed.
- Include closeout discussions & documentation requirements at the start of the project.
- Communicate the expectations often.
- Adopt a formal closeout process inclusive of a timeline as part of the standard operating procedures.
- Implement project management systems to ensure the collection, organization, management, and accessibility of closeout information throughout the lifecycle of a project.
- Document and organize the closeout documents routinely.
- Develop and implement adequate record retention practices in support against claims for patent or latent defects and/or warranty claims.
- Develop and assign a dedicated closeout team.
- Assign a dedicated team member to serve as an expert for the particular closeout at hand and to focus on expediting the closeout process.
- Remember that time is of the essence.

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