

Layton Construction Company *Quality Management Manual*

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“Quality defines the standards of excellence we build into every structure and every relationship.”

The Layton Quality Management Manual has been prepared by Layton Construction Co., Inc. Its purpose is to help guide Layton employees and subcontractor trade employees to fulfill the core quality value stated above. Fulfilling our commitment to quality requires the involvement of every project participant – Layton employees, owners, designers, suppliers, and subcontractors of every tier.

This Quality Management Manual outlines Layton's corporate quality assurance and quality control policies on construction projects.

The objective of the Layton Quality Management Manual is to:

- 1.** *Ensure that Layton projects meet or exceed the quality standards established by our customers as written in the Layton/owner contract.*
- 2.** *Ensure that we deliver quality services to our customers while creating a competitive market advantage.*
- 3.** *Provide direction to all project participants regarding our quality policies, standards, and procedures.*



The information herein does not provide details for managing every quality issue; however, this manual provides processes and practices directed towards ensuring the quality of work on Layton Construction projects.

Layton's Quality Steering Committee reviews and updates this program periodically.

Layton employees are required to implement the quality practices addressed in the Quality Management Manual. Other Layton service and support functions are required to follow the quality principles and practices in the manual relevant to their business function. All employees are expected to act responsibly and in accordance with these quality processes to promote the professional integrity of Layton Construction and to improve our customer service.



All Layton Construction project teams shall follow this manual in preparing their Project-Specific Quality Management Plan.

Many of the steps required in this Quality Management Manual go beyond Layton's contractual obligations to owners. While nothing in this Manual may be read to expand such obligations, following the procedures described here should help ensure that Layton exceeds its contract obligations, and meets its goal of successfully completing projects while exceeding client expectations.





1. Layton Construction Quality Management Program and Communication Plan

1.1. OBJECTIVES

- Minimize construction defects from occurring
- Ensure work conforms to contract documents and functional performance requirements
- Select quality-oriented subcontractors of all tiers
- Ensure that workmanship required by contract documents is performed by qualified craftsmen from every trade
- Perform contractually required inspections and tests in a timely manner
- Perform relevant inspections/observations as defined by the approved construction inspection checklists
- Strive for a zero item completion list at substantial completion
- Minimize rework during the course of construction
- Minimize final punch list
- Ensure warranties are preserved

1.2. PROJECT-SPECIFIC QUALITY MANAGEMENT PLANS (BIM 360 FIELD TEMPLATE)

Layton's project team shall prepare a Project-Specific Quality Management Plan patterned after the Layton Quality Management Manual. They will utilize the specific business unit template found in BIM 360 Field as an outline to develop the plan. Teams are encouraged to seek input from the owner, design team, and other project teams when developing their plan.

Layton's project team is responsible for reviewing and ensuring the project-specific plan complies with the quality assurance and quality control criteria specified in the Layton/owner contract.

Modification of the business unit template cannot occur without approval of the Quality Steering Committee and the associated business unit executives.

1.3. ROLES AND RESPONSIBILITIES

Responsibilities of the Quality Steering Committee:

- Evaluate the effectiveness of the program
- Identify opportunities for improvement and recommend appropriate corrective measures
- Keep abreast of construction industry quality issues and trends
- Coordinate all company functions in support of quality management best practices
- Establish quality-related metrics that measure Layton's performance relative to the industry





- Review quality-related issues and lessons learned
- Monitor compliance with this program

Responsibilities of Layton's Project Team:

- Prepare and implement a Project-Specific Quality Management Plan (BIM 360 Field Template)
- Assign a member of the Layton project team to be the project administrator for the BIM 360 Field management software
- Serve in a quality assurance role by requiring that quality control inspections, testing, and documentation are performed
- Designate a Layton site quality representative
- Identify project-specific quality requirements
- Modify (if necessary) inspection checklists to the specific project requirements
- Communicate with third-party inspectors, building code officials, owner and design consultants, and each subcontractor's (all tiers) site quality representative.
- Maintain current submittals, submittal logs, drawings, specifications, and record drawings in the field
- Collect, organize, and maintain project quality documentation. This includes photos and videos, an inspection and testing plan, an inspection and testing log, and other metrics that comprise quality management key performance indicators. BIM 360 Field software will be used for this process.
- Manage Layton's Zero Defect Program

Responsibilities of Subcontractors:

Nothing in this Manual relieves subcontractors from their independent contractual obligation to take all steps necessary to ensure quality control and assurance. Layton is relying on subcontractors, as the experts in their respective trades, to determine and advise Layton if additional or different steps are necessary under the circumstances at hand to avoid defective construction and ensure quality within the applicable scope of work. In general, however, Layton believes that the steps described here should assist in achieving successful results, subject to necessary subcontractor input.

- Adhere to the requirements of Layton's Project-Specific Quality Management Plan as it applies to the subcontractor's scope of work
- Submit the name of a site quality representative for approval by Layton's project team
- Once approved, a designated site quality representative shall be present at all times the subcontractor is performing work on-site.
- The site quality representative is required to respond to BIM 360 Field



Task assignments for completing regular quality inspections related to the subcontractor's scope of work.

- Participate in Layton's Zero Defect Program
- Utilize BIM 360 Field software daily as a communication, collaboration, and management tool
- Require that subcontractors of all tiers meet the same quality requirements that the first-tier subcontractor is contractually required to meet. The first tier subcontractor should manage the sub-tier quality in the same manner as Layton oversees and manages first-tier subcontractors.
- Submit any required jobsite photos to Layton's project team utilizing BIM 360 Field software
- Maintain a copy, in the field, of the subcontract, each approved submittal, shop drawing, and any manufacturer's installation instructions for their scope of work

2. Preconstruction Quality Activities

Preconstruction activities are those performed prior to commencing work at the jobsite. Pre-construction activities often involve decisions that affect constructability and quality.

Layton will coordinate its preconstruction services with the owner, architect, project consultants, key subcontractors, and others as required or appropriate.

The following describes the most common preconstruction activities:

- Design peer reviews
- Constructability reviews
- Review of plans and specifications
- Documenting existing conditions
- Samples, submittals, and procurement
- Subcontractor pre-qualification
- Material receiving at jobsite
- Mock-ups
- Water testing

3. Construction Quality Activities

3.1. ROLES AND RESPONSIBILITIES FOR PROJECT QUALITY CONTROL

Subcontractors associated with putting the work in place on a project shall bear the responsibility of managing the quality of their work. The work shall be done in a fashion that will meet or exceed the quality standards set forth in the Project-Specific Quality Management Plan and the project requirements set forth in the plans and specifications.





All such work is subject to approval by the Layton project team, owner, architect, consultants, manufacturer's recommendations, and any other governing body having jurisdiction.

3.2. QUALITY CONTROL ADMINISTRATION

Inspections and tests of the work are required on a regular basis to ensure conformance with the quality of materials, fit, finish, tolerances, workmanship, function, and performance as defined by the contract documents.

Every subcontractor's site quality representative will be assigned the tasks to complete the required inspections. The checklists are found in the BIM 360 Field project management software.

Workmanship Inspections

Layton's project team will seek to ensure that subcontractors are utilizing and completing their approved construction inspection checklists. Subcontractors are responsible for ensuring that their sub-tier subcontractors are utilizing and completing their approved inspection checklists.

An inspections checklist library has been developed by Layton's Quality Steering Committee as a guide to field personnel based on common errors and/or tolerances in fit, finish, and workmanship for each CSI section. These checklists are located in the BIM 360 Field templates for each business unit. Each project team will develop job-specific checklists utilizing these templates. Requirements from the project contract documents and pertinent subcontractor input will be incorporated into these checklists.

Layton will provide subcontractors a copy of the inspection checklists associated with their scope of work. Subcontractors will be asked to propose additions or modifications based on each project's specific requirements and their own work-related experience relative to these checklists. Final project inspection checklists will be approved by Layton's project team.

Any non-conforming work discovered through the inspection process must be rectified immediately by the responsible subcontractor. Once the non-conforming work is corrected, all parties involved will reinspect and approve the work. The inspection timing and methods are outlined below.

Documentation

Layton's project team will utilize BIM 360 Field to prepare and/or maintain timely records of quality control activities, inspections, and tests. The subcontractor's site quality representative will do the same for their quality control activities, inspections, and tests.

Inspection and Testing Log

All inspections and tests will be performed as contractually mandated. All inspections will be tracked utilizing the BIM 360 Field software.

Work Completion List

Near the completion of all work or any increment thereof, each site quality



representative will conduct an inspection of their work and develop a work completion list. The Layton project team will verify that the list is complete and note any additional items to be added to the work list. Each subcontractor will immediately complete the listed items to the satisfaction of Layton project team. This work completion list will be maintained in BIM 360 Field.

Punch List

Once Layton's project team has determined that all work completion lists are complete to their satisfaction and the project is ready for a final punch list, this completed work list can be presented to the owner/architect for review. When owners and design consultants also use BIM 360 Field, the punch list process can be expedited.

The intent of the work completion list is to produce a zero punch list based on the validation of items resolved as part of the work completion list process. If any items are found to be incomplete or unsatisfactory by the owner/architect, a formal punch list process would ensue, in which case the Layton project team would:

- Verify acceptance criteria in contract document.
- Recognize the item in question as a non-conformance item.
- Arrange for immediate involvement of the subcontractor that is responsible for the punch list item.
- Complete the work in a timely fashion.
- Reinspect the corrected work.
- Call for final validation from owner/architect.

Acceptance

A completed closeout process is key to delivering a quality project. The Layton team and the responsible subcontractors will complete the following items concurrent with the punch list:

- Final system testing
- System operation and sequence verification
- Ensure operation and maintenance manuals are in place
- Delivery of record drawings and warranties
- Instruction and training procedures
- Delivery and receipt of "attic" stock and extra keys/locking devices

3.3. QUALITY CONTROL PROGRAM

3.3.1. The Three Phases of Quality Control

Construction quality is a result of effective planning, coordination, communication, supervision, and testing. By following these steps, Layton project teams will plan, schedule, and install work in an orderly, consistent fashion that minimizes rework.



Layton's quality control program consists of three areas:

1. *Pre-mobilization meetings*
2. *First work-in-place meetings*
3. *Ongoing quality monitoring and inspections*

Layton's project team and its subcontractors of every tier will use the following templates found in BIM 360 Field project management software:

- Quality planning meetings
 - o Project management plan meeting
 - o Subcontractor pre-mobilization meeting
 - o Subcontractor coordination meeting (CMiC only)
 - o First work-in-place meeting
 - o Inspection checklists

3.3.2. Project Management Plan

All Layton project team members are required to attend the project management planning meeting. This meeting takes place prior to the actual commencement of work. In some situations, the complete Layton team may not be available during this meeting. At least a project manager, project superintendent, and project engineer should be in attendance. Assignments of responsibility will be made for each team member at this meeting.

3.3.3. Pre-mobilization Meeting

Prior to the start of any work on site, Layton's project team will hold a pre-mobilization meeting with the subcontractor(s) that will perform work. This pre-mobilization meeting will be conducted by Layton's project superintendent. Attendance to this meeting is mandatory for:

- The subcontractor project manager.
- The subcontractor project superintendent or foreman.
- The subcontractor site quality representative.

The items for discussion in the pre-mobilization meeting are found in the project-specific pre-mobilization checklist.

3.3.4. First Work-in-Place Meeting

Attendance to this meeting is mandatory for:

- The Layton project team member that will oversee the associated scope of work.
- The subcontractor site quality representative.
- Representation from each subcontractor tier that will be involved in the process.

The first work-in-place process occurs in two phases:

1. In the first meeting, the subcontractor crew and the Layton team review the project quality requirements and the plan on how to meet those requirements. They also identify a specific location to perform the first work to take place. The scope will be limited, allowing appropriate time



to inspect the work, scrutinize the quality, and agree on any remedial processes required.

2. Once the first phase is complete, the subcontractor crew will commence installation of the limited scope in the pre-determined location. After installation is complete, the Layton and subcontractor site quality representatives will review the first work-in-place, utilizing the BIM 360 Field checklist for the respective work. If the work does not meet all requirements, the crew will address the issue. The subcontractor is not authorized to continue with the rest of the work until all quality requirements are met in the first work-in-place meeting.

NOTE: At any time, if a new crew is assigned to the project or if the specified quality requirements have not been met, another first work-in-place meeting and inspection will be held.

3.3.5. Ongoing Inspections

Inspections will be performed utilizing the appropriate inspection checklist for the activity.

These inspection checklists will be made through the task process as defined in the Autodesk BIM 360 Field project management software.

The objectives for ongoing inspections/observations are to:

- Ensure work continues to conform to the contract document specifications.
- Verify required tests and inspections are being performed.
- Identify non-conforming or deficient work and ensure that corrective action follows.
- Verify the work is taking place safely and efficiently.

3.4. 100% Material Verification

All material received at the jobsite will be checked for strict compliance to contract documents. This is the primary responsibility of the subcontractor that is furnishing and installing the material. All subcontractor inspection checklists require a "yes" response confirming that the material meets the project requirements. The Layton project team should verify that subcontractors are following the material verification process.

Throughout the ongoing inspections and observations, Layton's project team should continue to verify that approved materials are being installed. Unapproved material substitutions can easily occur if not monitored on a regular basis.

3.5. Zero Defect Program

Objectives for the Layton Zero Defect Program:

- Complete all scopes of work with zero punch list items at the time of substantial completion
- Correct outstanding non-conforming work immediately or within a reasonable amount of time, so as not to delay current and/or subsequent activities as tracked in the project schedule.



It's Layton's goal to obtain 100% buy-in from its subcontractors of all tiers in implementing the Zero Defect Program.

The Layton team will schedule time for project tours specifically designed to focus on quality during the progression of the work. Layton and subcontractor site quality representatives should be invited to attend these tours and are encouraged to provide meaningful feedback. Owners, architects, and consultants should also be encouraged to attend these quality project tours. It's important that all parties involved in the project have similar quality expectations. An observation checklist can be found in the BIM 360 Field templates.

3.6. Photo Documentation

Photographs are an integral part of documenting the quality on a project. Most often, owners require some photo documentation during the construction process. Layton's photo documentation procedure covers both conforming and non-conforming work.

Layton's photo documentation guidelines are as follows:

- Take digital photos at regular intervals
- Be sure to photograph from several viewpoints and use the same viewpoints when reasonable
- If the scale of a photo will not be clear to others, include an object or scale in the picture for reference.
- Photos of non-conforming work will be elevated to an issue in BIM 360 Field. The responsible subcontractor must participate to remediate the issue. Photos are then required to illustrate adequate correction has taken place.



4. Meetings and Documentation

Below are a list of meetings and corresponding documents from the Layton Quality Management Manual. Each of these meeting agendas can be found in your BIM 360 Field business unit template.



1. Project Management Plan (PMP) – Internal Layton meeting with assignments for each team member associated with project setup.
2. Pre-Award – Prior to award of subcontract, this 'subcontractor interview' is meant to review scope and verify subcontractor capabilities.
3. Pre-Mobilization – Meeting with subcontractor after award of subcontract and prior to subcontractor mobilizing on-site.
4. Site-Specific Quality Control Orientation – Mandatory orientation for all personnel who will frequent the project site.
5. First Work-in-Place – Meeting and inspection for review and approval of first work in place prior to balance of subcontractor's scope.