



# Quality Manual

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# CPS Quality Manual

## Introduction

The quality of a product or service refers to the perception of the degree to which the product or service meets client expectations... therefore *understanding* client expectations becomes the greatest challenge to quality.

The CPS quality manual outlines and defines the standards of excellence we pursue on every project. The CPS quality plan is a component of our overall project management plan that describes how our organization's quality policies will be defined, approached and implemented.

## Overview

CPS recognizes that in today's competitive marketplace effective quality systems are essential when providing quality cost-effective services to our clients. CPS is totally committed to providing project management services that comply fully with the specifications and expectations of our valued clients. We are fully aware that project management companies, to remain viable, must adhere to principles of quality-first and insist on elevated quality standards. Therefore, it is the policy of CPS to adhere strictly to this quality program and insure that the requirements of our customers are met on each and every project we execute.

One of the cornerstones of CPS's project delivery process is the implementation of a Contractor Quality Management Program (CQMP) which we will detail later. The project specifications generally spell out the quality standards for the project and by reference become a part of the contract between the project owner and the construction manager/contractor. The specifications usually reference standards, such as ASTM, ANSI, ACI, AWS, or other organizations which spell out quality or workmanship standards. In many cases, the specifications may use such terms as "normal and customary" or "function for its intended use or purpose" to define quality.

Workmanship on the other hand, is not defined in general requirements or general conditions of the construction contract. As such, the terms are not specific and subject to broad interpretation. To avoid misunderstandings or disputes, some effort should be made to bring specific and measurable standards to workmanship. If there is no way to clarify with written description, then a mockup or work sample should be made and approved to serve as a standard for comparison.

## Objective

The CPS quality manual has been prepared by company principals, senior staff and others to help guide CPS employees to fulfill the core quality values of the company. Fulfilling our commitment to quality requires the understanding and involvement of every project participant – CPS staff, owner staff, designers, suppliers, construction managers/contractors and subcontractors of every tier. This quality manual provides the framework for CPS's quality policies on construction projects. The objective of the CPS quality manual is to:

1. Ensure that CPS projects meet or exceed established quality standards.
2. Provide procedures and direction to all project participants and stakeholders.

The information herein does not provide infinite details for managing every quality issue; however, this manual provides typical industry-standard processes, practices and checkpoints directed towards ensuring the quality of work on CPS construction projects. CPS staff are required to implement the quality practices addressed in the quality manual. All staff members are expected to act responsibly and in accordance with these quality processes to promote the overall professional integrity of our company and to improve our client service. All CPS construction project teams shall follow this manual to ensure a project-specific quality management program is in-place. Many of the steps required in this quality manual go beyond CPS's obligations to the owners we serve and represent. While nothing in this manual may be read to expand such obligations, the procedures described herein should help ensure that CPS surpasses its obligations and meets its goal of successfully completing projects while exceeding client expectations.

## Obstacles

There are numerous elements affecting the quality of construction such as design, materials, equipment, topography, geology, hydrology, technology, methods, management and much more. Poor control of these factors may negatively impact the project. There are many factors that influence the effectiveness of a project quality management program. The primary obstacle is a project budget inadequate to match client expectation of quality. An inadequate budget leads to inadequate material, workmanship and staffing necessary to provide process management controls.

Some barriers to successful management system implementation involve the very nature of the construction process. Projects are unique, locations vary, staff changes, scope changes, project and weather delays, extensive supply chain, multiple organizations are involved that have differing visions, values, processes and simply put... some partners fail to deliver on their promises. To further complicate matters, the industry is generally confrontational rather than cooperative and relationships are driven by

general self-interest. In addition, the industry is conservative and slow to embrace change even with the onslaught of almost daily technological advancements. Most contactors are small and lack sophistication and resources. Effectively managing quality becomes challenging due to these and a multitude of other factors.

## Process

Many companies offering project management services make an effort to assure quality, but generally many of them do not have a robust quality management process in place. Such a process depends largely on the ability, knowledge, discretion, diligence and experience of the project management team. Having management oversight of the quality process will provide assurance that quality control standards are met. CPS project managers are responsible for their assigned project's quality assurance activities. Project managers may delegate the performance of their assigned duties to their respective project engineers and/or other qualified individuals but shall retain responsibility for completing their projects in strict accordance with established quality assurance policies in conjunction with specifications requirements. Having management oversight of the quality process will ensure that standards are met.

## Quality Staff, Technology, Working Environment

CPS has carefully developed an educated, experienced and highly motivated management staff, armed with state-of-the-art technology and housed in a modern highly-collaborative 21<sup>st</sup> Century working environment to support the successful implementation of a quality plan. Our educational and experience background requirements at the point-of-hire coupled with our on-going investment in continuing education and certification programs builds strength and value to our staff portfolio.

CPS has implemented Procore Technologies, the world's foremost construction management software that is designed to improve productivity, foster greater collaboration and significantly improve the quality of our client service. Procore's cloud-based construction project management platform will increase project quality through improved efficiency, security and streamline project communication, documentation and reporting.

## Quality Standards

Review of the specifications for any quality requirement is an important early step in understanding and managing the resulting project quality. Documentation of clarifications of any of the quality requirements, and understandings arrived at with the designer and/or project owner becomes part of the quality standards. This sets the foundation for the contractor's quality management program (COMP). This information must be provided to CPS project staff as well as the entire project team before 'the shovel hits the dirt'.

## Mock-ups

Rising labor rates and extensive material lead times make “getting it right the first time” an imperative for any construction project budget and schedule. A mock-up is a full-sized structural model made with the exact technique and materials that will be used on a project. The mock-up gives designers, contractors and building owners the opportunity to assess a design representation so that functionality, aesthetics and quality can be evaluated in detail. Doing a mock-up helps to create a consensus among the stakeholders for ‘quality of workmanship’ and serves as a comparative reference and evaluation tool. The overall benefits of mock-ups include saving our clients time, money, aggravation and waste.

## Procurement

Another early step to overcoming many of the quality obstacles is to endorse a procurement (delivery) process that requires proper vetting of all designers and construction managers/contractors; and enhance the Request for Proposal (RFP) by developing clear and comprehensible scopes and deliverables. Designers and construction managers/contractors, while appearing similar on paper, in reality are as different as night and day. A response to an RFP is viewed by many as a “promise” of performance. Checking references is a way to discover those that keep their promises... and those that do not.

As an integral part of the RFP, it is extremely important to require the successful respondent to submit a contractor quality management program (CQMP) to be reviewed, approved and incorporated into their final contract. To confirm the high-priority for project quality, the contractor quality management plan (CQMP) should be given significant weight (points) in the overall RFP evaluation process. This document ultimately becomes the very foundation of the quality control aspect of the overall quality plan which we will address in more detail later.

## Testing

Certain elements of the project, such as soil compaction, strength of concrete, welding, etc., are traditionally checked or ‘tested’ by a third-party (testing and inspection organizations) under their respective contracts with Metro. The CPS team will assure that these tests are conducted, determinations and observations are made and subsequent findings are communicated and included in routine daily reports.

## Metro Codes

Metro Department of Codes and Building Safety is vested with the authority and duty to administer the Metro Building Code as well as the Metro Zoning Code – therefore, the Department is logically able to function as the “umbrella” agency administering building and related trade permits along with contractor licensing.

### Primary Mission

- Safety of the public as occupants of buildings within Metropolitan Government and Davidson County
- “Better neighborhoods” through the administration and enforcement of Nashville’s Zoning code to ensure orderly development of buildings and property
- Economic development – through permit and inspection tracking systems for construction projects

CPS project managers will assist where necessary and verify that building and trade permits are acquired and properly displayed on the project jobsite.

As part of CPS University, CPS staff will develop a working level of knowledge and understanding of Metro Codes regulations and requirements.

### Consultant / Vendor Interface

In addition to working with third-party vendors for testing, CPS will work in conjunction with LEED and commissioning consultants as well as outsourced companies under contracts with Metro to provide roofing, MP&E and various other trade work inspections. The CPS team will assure these inspections are completed at predetermined intervals, checkpoints and milestones; and subsequent findings are communicated and included in routine daily reports.

The procedure for engaging a vendor begins with the development of a scope of work to be approved by designee of Metro Department of General Services.

The scope of work and request for proposal is then sent to all appropriate contracted vendors. The requested proposal will include pricing for services, schedule for completion of work and a detailed description of work to be performed. All proposals received by CPS will be in turn delivered to the designee of Metro Department of General Services for final selection and issuance of purchase order to vendor. CPS will be copied on the final purchase order and track the ensuing work.

## Quality Control – Contractor Quality Management Program (CQMP)

At the outset of the project, CPS will receive a contractor's quality management program (CQMP) from the project construction manager / contractor of record; to be reviewed, approved by Metro Department of General Services and incorporated into their contract. At this point all parties are expected to have a full and mutual understanding of project requirements and client expectations.

The contractor's quality management program (CQMP) is a written document defining the contractor's processes, practices, and procedures, which are to ensure the project's quality requirements are understood, met or exceeded. The overall quality program has two elements which are the quality control plan and the quality assurance procedures.

A contractor must have a robust quality management program which is critical to the overall success of a construction project. An effective program creates a process for clarifying standards and requirements, describes means and methods for managing the process, defines responsibilities and accountabilities, thereby reducing potential conflict through misunderstanding. It effectively facilitates and manages the collection of data, identifies performance discrepancies and nonconforming work, and substantially increases efficiency by reducing defects and punch list work, which aids in improving the working relationship with the design team and the project owner. It systematically manages quality and enhances the contractor's project delivery, increases productivity and eliminates or reduces waste.

Quality control (QC) is comprehensively defined in the contractor management program (CQMP) which outlines how the project quality will be processed and managed during construction phase. Any unique project quality requirements must be defined in a project specific document. It defines who is responsible for achieving the quality standards and how this is to be accomplished. It establishes a framework with defined procedures and practices to ensure that the completed product meets or exceeds the project specified quality requirements.

### Contractor Quality Management Program (CQMP) Outline

#### 1. General Program Components

- Policy and Procedures
- Goals and Objectives
- Roles and Responsibilities
- Approvals and Reviews
- Document Control

## 2. Preconstruction

- Review of Plans and Specifications
- Quality standards
- Review Requirements
- Clarify Any Ambiguity
- Samples or Mockups
- Constructability Reviews
- Documenting Existing Conditions
- Material Management
- Transportation Factors
- Receiving at the Jobsite
- Storage and Protection
- Testing Requirements and Procedures
- Documentation

## 3. Construction

- Specified Quality Requirements
- Safety Plan
- Zero Defect Program
- Quality Control Administration
- Roles and Responsibilities
- Inspection and Testing Plan
- Inspection Checklists
- Quality Assurance Interface with CPS
- Inspections
  - Inspection schedule
  - Pre-Cover-Up and Pre-Closure Inspections
  - Documentation and Reporting
  - Digital Pictures and videos
- Nonconformance Procedures
  - Reporting
  - Tracking
  - Correction
- Material Verification
- Water Intrusion Prevention
- Protection of the Work



#### 4. Closeout

- Closeout Procedures
- As-Builts
- Punch List Management

#### 5. Systems Turnover

- Startup
- Testing of Systems
- Documentation
- O&M Manuals
- Final Acceptance
- Warranties Documents
- Warranty Management During the Warranty Period
- Warranty Callbacks after the Warranty Period

#### Quality Assurance

Quality assurance (QA) is the process or procedure the CPS team will engage in to confirm that the required quality of the project is achieved. This process defines the daily inspection and reporting requirements along with any corrective action and follow up. Quality assurance provides a necessary confirmation that quality control measures are being met by the construction manager/contractor. The role of the quality assurance personnel at CPS is to confirm that the quality control program as defined in the CQMP is functioning properly and its intent is carried out diligently by the construction manager/contractor.

*\*Without the oversight of a rigorous on-site quality assurance process and program, a contractor-implemented quality control program will likely not be fully realized.*

#### Quality Assurance General Overview

- Determine if the work practices, quality standards and requirements as described in the contractor's quality management program (CQMP) are being met.
- Examine the quality of the ongoing and completed work to determine that it meets or exceeds the project standards and requirements.
- Determine if the materials and workmanship meets project quality standards.
- Examine the finished work to determine that it is sufficiently protected from harm or damage.
- Issue a report of acceptable work as well as any substandard work.
- Track the corrective work and issue status report until satisfactory completion.
- Review contractor's quality control documentation to confirm compliance.

## Project Quality Checklist Overview

The foundation of CPS's quality assurance plan is our project quality checklist.

The CPS project quality checklist is a tool used to guide our daily project field activities and direct the project team to consider all important and relevant aspects of project. Based on the size and nature of a project, some checklists may differ in scope and magnitude but generally the consistency of our standardized checklist will apply in part or in full.

Developed in conjunction with the contractor's quality management program (CQMP), CPS's project quality checklist which will serve as guide posts for our project teams' daily field activities, inspections and reports.

CPS's project quality checklists ultimately dovetails into daily reports and serve as a record of compliance verification to quality control policies and procedures. These daily reports currently archived in Procore; verify that critical details have been followed and the overall work conforms to specifications.

## Project Quality Checklist

### Contract

- Notice to Proceed
- Procore Set Up
- Owner Page set up in Procore
- Close Out Document Review
- Review of Metro Standards
- ITS Review
- FF&E Review

### Schedule

- Milestones Identified

### 3<sup>rd</sup> party testing

- Scope and Cost
- File Tree put into Procore

## Site Utilities

- Design and Review
- Sign-offs from main utility companies
- Sign-ups from responsible party (Owner)

## BAO Review

- % DBE Participation
- DBE Trades Review

## Environmental Review

- Demolition
- Soil Testing Reports
- Abatement
- Borings

## SDs

- Specs
- Review & Sign off
- Codes Review

## DDs

- Specs
- Review & Sign off
- Codes Review
- FF&E Review

## CDs

- Specs
- Review & Sign off
- Codes & ADA Review
- Grease Permit Review
- Specialty Contractors Noted
- Long lead items noted and scheduled
- FF&E Review
- ITS Review / ITS Bids for low voltage

## Long Lead Items Identified

- Noted on Schedule

## Subcontractor Bid Process

- Copies of all bids
- Copies of all awards

## Daily Schedule Review

- Photos and daily reports

## Civil

- Soil Removal & Excavation
- Blasting
- Sewer lines
- Storm Water lines
- Utilities – gas, water, NES, phone, data lines

## Structural

- 3<sup>rd</sup> Party Testing

## Concrete

- 3<sup>rd</sup> Party Testing
- Finished concrete wall rub map

## Steel (Including Rebar, welds, etc.)

- 3<sup>rd</sup> Party Testing

## Exterior Studs/Sheathing

- Layout Review

## Pre-Cast

- Color Match on Plant Visit

## Brick

- Size, Style and Color Verification

## Block

- Size, Style and Color Verification

## Roof

- Third Party Inspections

## Windows

- Caulk Review
- Testing and Commissioning

## Masonry

- 

## Walls (depending on type)

- Masonry
  -
- Steel Studs
  - Layout Review

## Mechanical

- Pads
- Rough in layout
- Testing and Commissioning

## Plumbing

- Rough in Layout
- Trim out and testing
- Commissioning

## Electrical

- Layout review Temporary power
- Permanent power
- Trim out and commissioning

## Finishes

- Walls
- Floors
- Ceilings
- Paint
- Doors and hardware
- Casework
- Window treatments
- Baseboard treatments
- Light Fixtures

## Specialty Equipment

- Food Service
- Elevators
- Medical
- Data Systems
- Detention Systems
- Access systems
- Parking systems

## Project Punch List

A punch list is a list of tasks or items that need to be repaired or completed before a construction project can be considered complete. A fun fact and mini history lesson is that the term punch list comes from the antiquated process of actually punching holes in a list to mark which items needed fixing.

It is important to point out that one of the early project objectives should be a zero-punch list. The first step to being able to move closer to a zero-punch list is to have a complete set of construction documents and a contract between the owner and the contractor that clearly defines expectations of the contractor. The architects shall provide the contractor with a complete set of construction documents that will include drawings and set of project specifications. The specifications define in detail the scope of the work that the contractor is responsible to perform, materials to be used, methods

to be used and the quality of the workmanship. It is important to understand what is required in the specifications in order create a punch list.

The specifications require the contractors to develop a Contractor Quality Management Plan (CQMP). The CQMP is a written plan that details how the contractor will manage quality on a construction project. The plan will include how the contractor plans to manage testing and inspections to ensure construction quality. This will reduce end-of-project rework and help contractors greatly reduce the number of items on the contractor's punch lists. Having said that, in reality there will always be a punch list. It's needed to document items that remain to be completed and/or repaired.

Whatever the project delivery method is used, design-bid-build or design-build, the punch list process is essentially the same. The main difference is with the design-bid-build method, the architect is hired by the owner. The architect acts as an agent to the owner and is responsible for verifying that the contractor has completed the work in accordance with the contract documents. The architect has the same punch list responsibilities with the design-build delivery method.

The punch list process starts with the Contractor using their preferred software, prepares a comprehensive list of items that have to be completed or corrected prior to "Substantial Completion." Substantial completion is a legal term used within the construction industry that marks the point at which some of the responsibilities of the contractor are transferred to the owner such as insurance for the building and its' contents, utility charges, trash pick-up, etc. The American Institute of Architects determine substantial completion at the moment the owner can occupy the building, or when the building can be used as intended.

The contractor then submits their punch list to the architect. The architect then takes the list and schedules a walkthrough with the owner and/or owner representative and the contractor to inspect the work to determine if the work is substantially completed. At that time, the owner and/or owner representative and architect may add additional items to the punch list. If the work is substantially completed, the architect will issue a notice of substantial completion to the contractor. The punch list is attached to the notice of substantial completion.

Once the punch list is deemed by the contractor to be complete, the contractor will schedule a final walkthrough with the architect, owner and/or owner representative to confirm the items on the punch list are indeed complete. Please note that any recommendations and input by contractor, owner and/or owner representative does not constitute a release of project architect's overall authority and responsibility for the project. The project architect will deliver to the contractor, owner and/or owner representative a letter of completion and approval for the final punch list.

It is important to note that other lists may be developed for example by the building occupant and perhaps others along the way during and after the move-in. These lists should be reviewed, and each line item categorized into maintenance and warranty groupings to be addressed accordingly.

## CPS University – Continuing Education

CPS University is a company-based learning program offering professional development specific to the construction industry to enhance the aptitude and expertise of CPS's staff and associates. The specific courses (not related to an accredited university or college curriculum) will be presented by qualified in-house and outside industry experts.

Courses include but are not limited to the following:

- Architectural - Building Envelope
- Architectural - Foundations
- Architectural - Barrier Walls
- Architectural - Cavity Walls
- Architectural - Exterior Walls/Curtain Walls
- Architectural - Roofing
- Architectural - Windows and Glass
- MEP - Electrical
- MEP - Fire Suppression Systems
- MEP - HVAC Systems
- MEP - Plumbing Systems
- MEP – Commissioning
- Project Management
- Metro Codes
- Environmental Risk Management
- Mold and Moisture Control
- Safety Awareness
- Procore
- Cost Tracking
- Schedule Tracking
- LEED Interface