USC FPM
Facilities Planning and Management

Construction Quality Assurance Program (CQAP)



USC University of Southern California

CONSTRUCTION QUALITY ASSURANCE PROGRAM

Revision: Initial Release

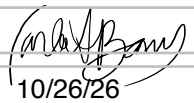
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Table of Contents

SECTION 1 - Program Overview 6
- Purpose: 6
- Scope: 6
- Construction Quality Policy: 6
- Quality Objectives: 7
- Quality Management System Framework: 8
- Relationship between CQAP, QMS, QC and QA: 9

SECTION 2 - Compliance, Governance, and Quality Authority 10
- Compliance: 10
- Governance: 10
- Quality Authority: 10

SECTION 3 - Roles and Responsibilities 12

SECTION 4 - Training and Competency 16

SECTION 5 - Quality Planning / Pre Construction 17
- Project Risk Assessment: 17
- Project Tier Classification: 17
- Scalable Quality Requirements: 19
- Project Quality Planning: 19
- Pre-Construction Quality Meeting: 20

SECTION 6 - Construction Quality Management 22
- Construction Quality Control: 22
- Three-phase Control (TPC): 22
- Inspections & Testing: 23
- Nonconformance Work and Corrective Actions: 23
- Hold Points / Witness Points: 24

- Quality Documentation and Record Keeping: 24
- Quality Audits: 25
- Change Management: 25
- Communication and Escalation: 25

SECTION 7 - Commissioning and Project Closeout / Turnover 27

SECTION 8 - Evaluation and Lessons Learned.....28

SECTION 9 - Continuous Improvement & Feedback 29

- Quality Performance Metrics: 29
- Program Evaluation / CQAP & QMS Updates: 29
- Stakeholder Feedback and Customer Satisfaction: 29

SECTION 10 - Appendices.....31

Appendix 1: Required Contents for Quality Control Plan 31

Appendix 2: Detailed Quality Requirements Matrix 34

Appendix 3: Project Risk Assessment Tool..... 41

Appendix 4: Scalable Three-Phase Control and Sample Checklists 45

Appendix 5: Acronyms and Abbreviations..... 50

How to Use This CQAP

If you want to know...	Go to...
What is the CQAP?	Section 1
How is the program governed?	Section 2
Who is responsible?	Section 3
Who must be qualified?	Section 4
What must be planned before construction?	Section 5
How is quality managed during construction?	Section 6
How is quality verified before turnover?	Section 7
How is project performance evaluated?	Section 8
How is the program continually improved?	Section 9
What about a plan template, tools, checklists?	Section 10
How is project risk scorecard	Appendix 3
Where do I find definitions and acronyms	Appendix 5

For University of Southern California Facilities Planning and Management Projects

SECTION 1 - Program Overview

- ## Purpose:

  The University of Southern California (USC) Facilities Planning and Management (FPM) has established the Construction Quality Assurance Program (CQAP) to provide a consistent, risk-based framework for managing quality throughout the planning, design, construction, commissioning, and turnover of capital projects. The CQAP establishes the University's quality policy, governance, roles, responsibilities, provides the framework for planning, designing, constructing, commissioning, and turning over capital projects and minimum quality requirements applicable to projects managed by FPM. Project-specific implementation requirements are addressed through the Design Quality Plan (DQP), Construction Quality Control Plan (QCP), and supporting quality procedures.

- ## Scope:

  This program establishes a scalable institutional quality framework applicable to all university capital, infrastructure, renovation, deferred maintenance, and utility projects funded by the University and managed by FPM. All projects shall comply with the minimum requirements of this Program. Additional project-specific requirements may be established by the University based on project risk and complexity. When the contractor conducts activities or provides items or services for those projects that may affect the safety and quality of USC facilities, it must conduct the work in accordance with the Quality Assurance (QA) requirements of this program unless otherwise stated explicitly in writing for exclusion of the works performed by the Contractor.

- ## Construction Quality Policy:

  FPM is committed to delivering safe, durable, functional, and maintainable facilities that meet applicable laws, codes, regulations, contract documents, University standards, and stakeholder expectations.

Quality is a shared responsibility of all project participants and shall be integrated into every phase of project delivery through effective planning, disciplined execution, documented verification, and continuous improvement.

The CQAP is guided by the following principles:

- **Quality always Starts with Me:** Individual ownership of quality leads to projects success.
- **Right the First Time**: Emphasize planning, coordination, and verification to prevent deficiencies, minimize rework, and improve project outcomes.
- **Collaborative Quality Culture**: Foster collaboration, accountability, and timely resolution of quality issues among all project participants.
- **Risk-Based Decision Making:** Apply and document quality management requirements and impact assessments commensurate with project complexity, operational risk, and institutional criticality.
- **Built-in Quality**: Integrate quality planning, inspections, testing, and verification throughout the project lifecycle rather than relying solely on final acceptance.
- **Continuous Improvement**: Use performance metrics, audits, lessons learned, and stakeholder feedback to improve future project delivery.

Quality Objectives:

FPM is committed to delivering capital projects that meet quality requirements while supporting successful project outcomes. The CQAP is intended to achieve the following quality objectives:

- Deliver safe, functional, and maintainable facilities that comply with applicable laws, codes, University standards, and contract requirements.
- Meet or exceed stakeholder expectations for quality, functionality, and operational performance.
- Minimize defects and nonconforming work through proactive planning, coordination and verification.
- Reduce rework, punch list items and quality-related delays.
- Maintain timely, complete and accurate project documentation and reporting throughout project lifecycle.
- Ensure proper commissioning, maintainability, and lifecycle performance.

- Promote collaboration and issue resolution that is delegated to the lowest appropriate level.

- ## Quality Management System Framework:

The Quality Management System (QMS) is the operational framework for implementing the CQAP. It establishes the processes, responsibilities, and controls used to plan, execute, verify, and continually improve quality throughout the project lifecycle.

The QMS provides a consistent, risk-based approach to quality management across all FPM projects while allowing implementation requirements to scale based on project complexity, operational risk, and institutional criticality. It integrates quality planning, contractor quality control, owner quality assurance, commissioning, documentation, and continuous improvement to promote consistent project delivery and long-term facility performance.

Major Components

The QMS consists of the following integrated components:

- **Quality Planning** – Establishes project-specific quality requirements, including project tier classification, risk assessment, DQP, QCP, and quality planning activities.
- **Quality Control (QC)** – Performed by the Contractor to plan, monitor, inspect, test, document, and correct work in accordance with the contract documents and the QCP.
- **Quality Assurance (QA)** – Performed by FPM or its authorized representatives to verify compliance with Contractor's quality control and contract requirements through oversight, reviews, audits, observations, and escalation of unresolved quality concerns.
- **Commissioning** – Verifies that building systems are installed, tested, and perform in accordance with the Owner's Project Requirements (OPR), Basis of Design (BOD), and contract documents.
- **Continuous Improvement** – Uses quality metrics, audits, lessons learned, and stakeholder feedback to improve project performance and strengthen the Quality Management System.

- Relationship between CQAP, QMS, QC and QA:

The QMS is the operational framework for implementing the CQAP through standardized, risk-based, tiered, and scalable quality management processes throughout the project lifecycle.
Within the QMS, the Contractor is responsible for QC to control and verify the quality of its work, while FPM performs Owner QA to verify the effectiveness of Contractor QC and compliance with project requirements. Quality planning, Contractor QC, Owner QA, commissioning, and turnover operate as integrated components of the QMS, supported by project evaluation, lessons learned, performance metrics, and stakeholder feedback for continuous improvement. Together, these elements form an integrated quality management framework, as illustrated in Figure 1.

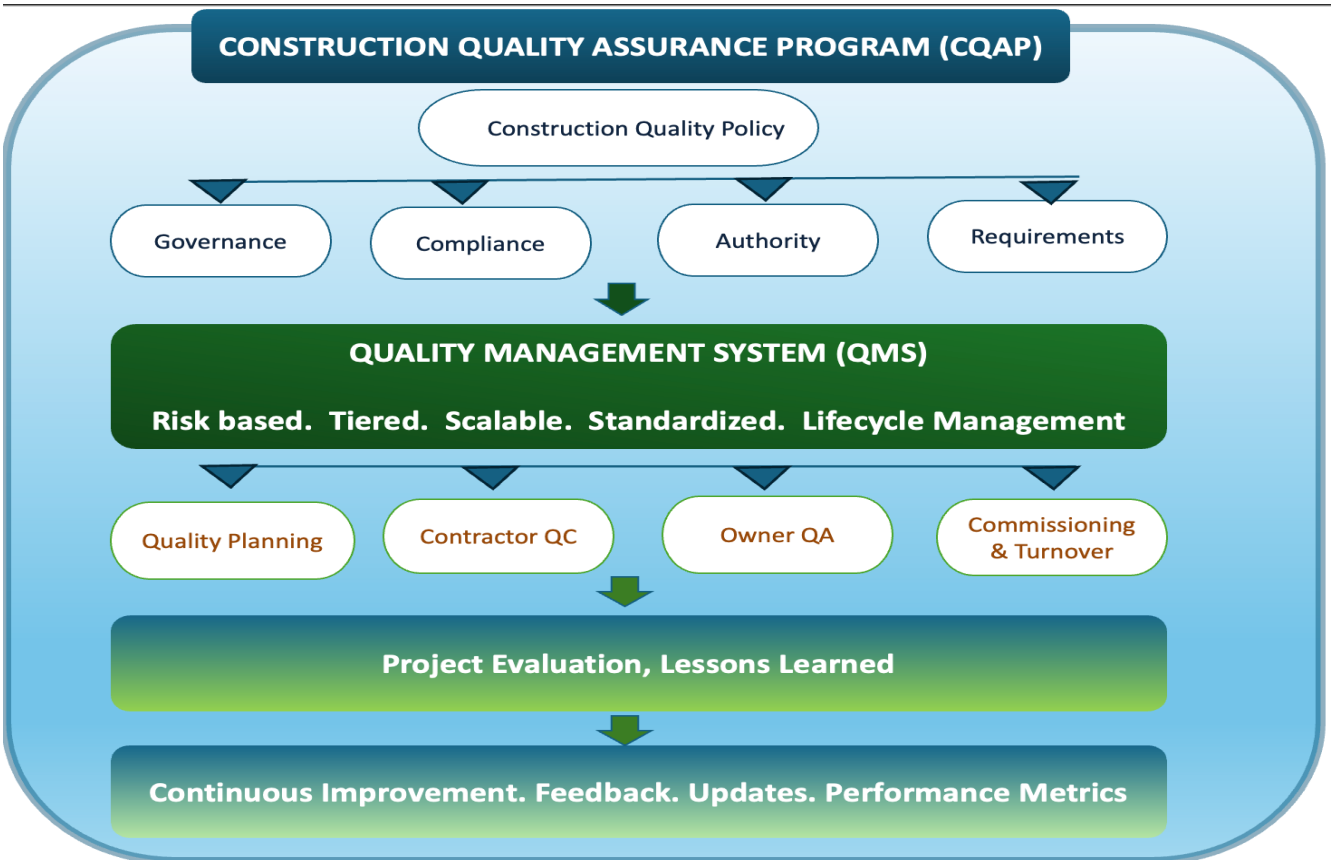


Figure 1. Construction Quality Management Framework

SECTION 2 - Compliance, Governance, and Quality Authority

- ### Compliance:

Compliance is the responsibility of each project participant within their respective scope of work. Projects shall comply with:

- Applicable laws and regulations.
- Building and fire codes.
- University standards.
- Contract documents.
- Applicable industry standards.

The Contractor is responsible for compliance during construction. The Design Professional, also known as Architect and Engineer (A&E), is responsible for design compliance. The Project Manager administers contract compliance. The QA Director verifies compliance through oversight activities.

- ### Governance:

Governance establishes the framework for decision-making, accountability, quality oversight, and compliance throughout the project lifecycle. It ensures that projects are managed in accordance with university policies, contract requirements, regulatory obligations, and FPM quality standards.

Governance is implemented through defined roles and responsibilities, phase gates, quality reviews, approval requirements, document controls, escalation procedures, and quality audits.

FPM utilizes a risk-based, scalable **Phase Gate Process,** a formal design and / or construction review point in project management where decision-makers evaluate a project's progress before allowing it to move to the next phase.

- ### Quality Authority:

Quality authority is established through the approval of the QA Charter and delegated by the Executive of FPM. The QA Director is responsible for developing, implementing, monitoring, and continuously improving the FPM CQAP.

The QA Director serves an oversight and advisory capacity independent of project management functions. The QA Director does not direct project execution, administer contracts, or issue instructions to contractors. Responsibility for

directing project activities, administering contract requirements, and implementing corrective actions remains with the designated Project Manager and other authorized FPM representatives.
An Authorized Quality Representative (AQR) may be designated by the QA Director or FPM Senior Leadership to perform QA activities on specific projects, programs, or initiatives.
The QA Director is authorized to evaluate project quality performance, document quality concerns, recommend corrective actions, and escalate unresolved quality issues through the FPM management structure. Quality issues should be resolved at the lowest appropriate level. Quality concerns that cannot be resolved at the project level, or that present significant risk to project objectives, regulatory compliance, life-cycle performance, or University assets, may be elevated to the appropriate FPM Senior Leadership and, when necessary, to the FPM Executive for review and resolution. The QA Director shall have direct access to FPM Executive Leadership regarding significant quality risks, systemic nonconformances, unresolved compliance concerns, or failures to provide reasonable support for QA activities.
QA requirements shall be incorporated into Requests for Proposals (RFPs), contracts, and other procurement documents to clearly define quality expectations, responsibilities, and performance requirements.

The Project Manager shall support QA activities by providing timely access to project information, records, meetings, personnel, and project sites necessary for quality oversight. Project team members, consultants, contractors, and other stakeholders shall cooperate with reasonable requests for information and assistance related to quality reviews, assessments, audits, inspections, lessons learned, and verification of corrective actions.

SECTION 3 - Roles and Responsibilities

QA by USC FPM provides independent oversight and verification. QA verifies compliance and supports Owner acceptance decisions. QA is not intended to replace QC or perform day-to-day inspections and scheduled testing. QC remains the responsibility of designers, construction managers, and contractors.

The Architect/Engineer of Record and the Contractor shall designate qualified personnel responsible for implementation and oversight of their respective quality management activities. Individuals assigned quality management responsibilities shall possess the experience, training, and authority necessary to enforce quality requirements, identify deficiencies, initiate corrective actions, and verify compliance with project requirements.

The Contractor is responsible for implementing a CQAP including a QCP, procedures and forms for the project that comply with the federal, state and local laws and regulations, the contractual requirements, BOD, applicable standards and best practices.

The Contractor is responsible for all activities necessary to manage, control, and document work to ensure compliance with the contract documents inclusive of the drawings and specifications. The Contractor's responsibility includes ensuring adequate QC services are provided for work-accomplished on-and off-site by his/her organization, suppliers, subcontractors, technical laboratories (where the contractor is required to hold testing and inspection responsibilities) and consultants. The work activities include safety, submittal management, and all other functions relating to the requirement for quality construction.

Regardless of the performer of the work, the Contractor is responsible for complying with the requirements of this CQAP. It is the responsibility of the Contractor to flow down the applicable requirements of this CQAP, to the extent necessary to subcontractors at any tier, as well as vendors, suppliers and service providers, to ensure the contractor's compliance with the requirements and the safe performance of work. A high-level list of roles and responsibilities of key personnel is provided below. The list can be expanded as needed.

Role	Responsibilities
Owner's QA Representative / QA Director	Administers and improves the CQAP for FPM. Reviews and evaluates DQP and QCP for adequacy and compliance. Provides independent quality oversight, monitors project quality performance, documents quality concerns, recommends corrective actions, facilitates lessons learned, conducts audits and escalates unresolved quality issues through the FPM management structure.
Owner's Representative / Project Manager	Implements project quality requirements and supports CQAP execution. Coordinates quality planning activities, ensures project team participation in quality processes, facilitates QA reviews and audits, addresses identified quality concerns, and maintains accountability for project quality performance. Participates in design and constructability reviews.
Architect/Engineer (Design Professional)	Responsible for the quality and coordination of the design documents and activities. Develops and implements the DQP. Performs design quality reviews, interdisciplinary coordination, constructability reviews, and code compliance verification. Provides construction administration services, including reviewing submittals, responding to RFIs and design-related quality issues, conducting site observations, and verifying that the work is generally consistent with the design intent, project specifications, drawings, and other contract requirements.
Contractor	Executes and coordinates construction activities and is responsible for the quality of the work and compliance with the contract documents. Develops and implements the QCP; performs and documents QC inspections; manages subcontractor, supplier, and vendor quality; identifies and corrects nonconforming work; maintains required quality

Role	Responsibilities
	records; and submits quality documentation, testing results, and project closeout deliverables.
Commissioning Agent	Plans and executes commissioning activities. Verifies that building systems are designed, installed, tested, integrated, and operated in accordance with the OPR, Facilities Design Guidelines, and contract documents.
Facilities Management Services / Operations & Maintenance	Participates in design reviews to promote maintainability, operability, accessibility, and life-cycle performance. Supports system acceptance, turnover, training, and transition to operations.
Quality Control Inspector / Quality Control Manager	Conducts inspections, testing, and verification activities in accordance with the contract documents. Documents results, identifies nonconforming work, tracks corrective actions, and verifies completion of required QC activities.
Design Quality Manager	Implements the DQP and oversees design quality control processes. Verifies compliance with design procedures, coordination requirements, quality standards, and project-specific design deliverable requirements prior to submission.

The Responsibility Matrix below shows the responsibilities of each project participants and how construction quality is managed.

Activity	Contractor	CCD	QA Director	Design Professional	CxA	FMS/O&M
Prepare QCP	✓		Review			
Prepare DQP			Review	✓		
Risk Assessment	Support	✓	Review	Support	Support	Support
Tier Classification		✓	Review			
QC Inspections	✓					
QA Oversight		✓	✓			
Site Observations		✓	✓	✓	✓	
Testing	✓	✓	Review	Review	✓	
Commissioning	Support	Coordinate	Observe	Support	✓	Participate
NCR Resolution	✓	Coordinate	Verify	Support	Support	
Audits	Support	Support	✓			
Closeout	✓	✓	Verify	Support	✓	Accept

SECTION 4 - Training and Competency

The Contractor is responsible for ensuring that personnel performing construction and QC activities are appropriately qualified, trained, and competent to perform their assigned duties. Competency may be demonstrated through a combination of education, experience, training, certifications, licenses, and demonstrated performance.

The Contractor shall identify personnel assigned to key quality-related roles and submit their qualifications, certifications, licenses, and relevant experience for review prior to commencement of the applicable work. Personnel performing QC functions shall meet the qualification requirements specified in the contract documents, QCP, and applicable regulatory or industry standards. Changes to designated quality personnel shall be communicated to the Owner's Representative and supported by documentation demonstrating equivalent or greater qualifications.

The Contractor shall not assign personnel to quality-critical functions unless the required qualifications and certifications have been verified and documented. The Contractor shall maintain records demonstrating compliance with applicable qualification, certification, and training requirements and shall make such records available upon request.

The Design Professional, Commissioning Agent, testing agencies, inspectors, and other project participants are responsible for providing qualified personnel and maintaining records of required qualifications and certifications. Where required by contract documents, applicable regulations, or project-specific quality plans, personnel shall maintain applicable licenses, certifications, professional registrations, or other credentials.

All personnel performing QC activities shall possess the qualifications, training, and experience necessary to effectively implement and maintain project quality requirements. Examples of required qualifications may include professional licensure, specialized inspection certifications, commissioning credentials, or Construction Quality Management for Contractors training provided by the U.S. Army Corps of Engineers (USACE), when required by the project.

Training and competency requirements shall be periodically evaluated and updated to address changes in project requirements, industry standards, lessons learned, and continuous improvement initiatives.

SECTION 5 - Quality Planning / Pre Construction

This section establishes the minimum quality planning requirements that shall be completed before construction begins. The level of planning and oversight shall be based on project complexity, operational risk, and institutional criticality. Effective quality planning promotes consistent project execution, reduces defects and rework, and supports successful project delivery.

- ## Project Risk Assessment:

This is to identify project risks that may affect quality, safety, operations, schedule, or long-term performance.

- A Project Risk Assessment shall be completed during project planning.
- The assessment shall consider project complexity, occupancy impacts, technical scope, regulatory requirements, utility outages, commissioning needs, and institutional criticality.
- The assessment shall be used to establish the appropriate project tier and determine project-specific quality requirements.

- ## Project Tier Classification:

Project tier shall be determined based on the combination of project-specific risk and construction complexity. The resulting tier establishes the baseline level of quality management requirements applicable to the project.

The tier level review must be done collaboratively by the PM and Capital Construction Development (CCD) directors. The PM and Director must do a critical review of the project requirements in its entirety prior to selecting the appropriate project tier.

FPM utilizes a three-tier classification as follows:

Tier 1 = **Simplified** Quality Management

Tier 2 = **Standard** Quality Management

Tier 3 = **Enhanced** Quality Management

	CONSTRUCTION COMPLEXITY		
PROJECT RISK	**LOW**	**MEDIUM**	**HIGH**
HIGH RISK High consequence of failure or significant impact to safety, operations, or institutional objectives.	**TIER 2**	**TIER 3**	**TIER 3**
MEDIUM RISK Moderate consequence of failure or moderate impact to operations or objectives.	**TIER 1**	**TIER 2**	**TIER 3**
LOW RISK Low consequence of failure or minimal impact to operations or objectives.	**TIER 1**	**TIER 1**	**TIER 2**

TIER ADJUSTMENT	**Tier Up:** FPM may increase the resulting project tier based on changes in project scope, complexity, operational impacts, regulatory requirements, institutional priorities, or other identified risks. **Tier Down:** Any downward adjustment requires documented justification and approval of the Executive Director and QA director. The basis for any adjustment to the matrix-derived tier shall be documented.

Example Project Classifications

The following examples are provided for guidance only. Project tier assignments shall be based on the overall project risk assessment, and the rationale for the selected tier shall be documented when factors other than construction value influence the classification.

Tier 1 – Minor maintenance, finishes, painting, flooring, small office renovations, minor deferred maintenance, and limited Mechanical, Electrical and Plumbing (MEP) work.

Tier 2 – Classroom renovations, roofing projects, building system replacements, moderate MEP upgrades, and medium-sized renovations.

Tier 3 – Occupied renovations, research laboratories, utility infrastructure, central utility plants, mission-critical facilities, major renovations, projects with complex phasing, and projects requiring significant commissioning.

- ## Scalable Quality Requirements:

  Project tier classification establishes the minimum quality management requirements for each project. Quality planning, oversight, documentation, verification, and control activities shall be implemented in accordance with the project's assigned tier.

  The minimum quality requirements for each project tier are identified in the **Quality Requirements Matrix** (Appendix 2). Project teams shall use the matrix during project planning and development of the QCP to determine the applicable quality management requirements.

- ## Project Quality Planning:

  Project quality planning establishes the quality requirements, responsibilities, and verification activities necessary to achieve project objectives. The level of quality planning shall be commensurate with the project's assigned tier and documented through the following project-specific plans, as applicable:

  - **DQP** – Prepared by the Design Professional before design completion to define the processes, design reviews, and QC activities used to verify

compliance with applicable codes, University standards, and contract requirements.

- **QCP** – Prepared by the Contractor before construction to describe the QC processes used to verify that construction complies with the contract documents and the requirements of this CQAP. Required contents are found in Appendix 1.
- **Inspection and Testing Plan (ITP)** – Prepared by the Contractor before construction to identify required inspections, testing activities, acceptance criteria, and responsible parties.
- **Commissioning Plan** – Prepared by the Commissioning Authority (CxA) before commissioning to define commissioning activities, functional testing, and system verification required for project acceptance and turnover.
- **Quality Documentation Requirements** – All project participants shall prepare, maintain, and submit quality records appropriate to their scope of work and respective responsibilities throughout the project to demonstrate compliance with contract requirements and this CQAP.

Pre-Construction Quality Meeting:

A Pre-Construction Quality Meeting shall be conducted after the Pre-Construction Conference and before construction begins. The meeting shall occur prior to the FPM's acceptance of the Contractor's QCP.

The meeting shall be attended, at a minimum, by the Contractor, Project Manager, QA Director or Authorized Quality Representative, and other key project participants, as appropriate.

The purpose of the meeting is to establish a common understanding of the project's quality requirements and responsibilities and confirm the implementation of the Contractor's QCP. The meeting shall address:

- Quality roles and responsibilities
- Contractor QCP
- Hold points and witness points
- Nonconformance reporting and corrective action procedures
- Communication protocols and issue escalation
- Coordination between Contractor QC and Owner QA

Additional Pre-Construction Quality meetings may be conducted during the project to address significant changes, recurring quality issues, or revisions to quality management processes.

SECTION 6 - Construction Quality Management

This section establishes the requirements for managing and verifying construction quality during project execution. Construction quality is achieved through the Contractor's QC Program and verified through the FPM's CQAP. The responsibilities of each project participant are defined in Section 3. The level of oversight and documentation shall be commensurate with the project's assigned quality tier.

- ## Construction Quality Control:

Construction QC is the Contractor's responsibility and shall be implemented in accordance with the FPM-accepted QCP. Utilizing the required contents of the QCP template in Appendix 1, the Contractor's QCP shall be submitted to the University for review prior to the start of construction.
The Contractor shall perform QC activities necessary to verify compliance with the contract documents, applicable codes, and the requirements of this CQAP. QC activities shall be documented in the Daily Quality Control Report (QCR) and other required quality records.

- ## Three-phase Control (TPC):

The Contractor shall implement the USACE TPC Process as the required field QC methodology for all applicable Definable Features of Work (DFOW). The TPC Process shall be implemented in accordance with the approved QCP.

The TPC Process consists of three sequential phases:

Preparatory Phase – Conducted before work begins to verify that all prerequisites, materials, approved submittals, inspections, testing requirements, and workmanship standards have been satisfied.
Initial Phase – Conducted at the start of each Definable Feature of Work to verify compliance with project requirements and establish the quality standard for the remaining work.
Follow-Up Phase – Conducted throughout the work to verify continued compliance with the established quality standard and contract requirements.
The level of implementation, documentation, and oversight for the TPC Process shall be commensurate with the project's assigned quality tier. Detailed TPC requirements, DFOW, and sample checklists are provided in Appendix 4.

- ## Inspections & Testing:

  The Contractor shall perform inspections and testing in accordance with the approved QCP, ITP, contract documents, and applicable codes and standards. Inspection and testing activities shall be coordinated with the project schedule and performed by qualified personnel, including independent testing agencies and special inspectors, where required.

  At a minimum, inspection and testing activities shall include, as applicable:

  - Daily QCRs prepared by the Contractor's QC Manager (or the Inspector of Record for California Department of Healthcare Access and Information (HCAI) projects, where applicable).
  - Inspections and testing performed by qualified third-party testing laboratories and special inspectors as required by the contract documents.
  - Pre-installation meetings required by the contract documents.
  - Photographic documentation of concealed work prior to cover-up, when required.
  - Documentation of inspection and testing results in the FPM's Project Management Information System (PMIS).

  The Owner may perform QA observations or independent verification of inspection and testing activities. Such activities do not relieve the Contractor of responsibility for QC or compliance with the contract documents.

- ## Nonconformance Work and Corrective Actions:

  Nonconforming work or deficiency that does not comply with the contract documents, approved submittals, applicable codes, or University standards shall be identified, documented, corrected, and verified prior to acceptance.

  At a minimum, inspection and testing activities shall include, as applicable:

  - Daily QCRs prepared by the Contractor's QC Manager (or the Inspector of Record for California Department of Healthcare Access and Information (HCAI) projects, where applicable).
  - Nonconforming work shall be documented using a Nonconformance Report (NCR) and managed in accordance with the approved QCP.

- The Contractor shall investigate the cause of significant or recurring nonconformances, implement appropriate corrective actions, and maintain an NCR Log that tracks nonconformances through resolution and closure.
- At a minimum, the log shall include the description of the nonconformance, date identified, responsible party, corrective actions, verification of completion, and closure status.
- Recurring or significant nonconformances shall be evaluated for trend analyses and to determine the underlying cause and appropriate preventive actions.
- Standard NCR forms and deficiency tracking templates are maintained in the FPM Quality Management Toolkit.

• Hold Points / Witness Points:

Hold Points and Witness Points are QC milestones established to verify compliance with project requirements at critical stages of construction. Required Hold Points and Witness Points shall be identified in the Contractor's QCP and coordinated with the project schedule.

- Hold Points require completion of specified inspections, testing, or verification activities before work may proceed beyond the designated point.
- Witness Points provide FPM with the opportunity to observe designated construction activities, inspections, or testing without delaying the work if FPM elects not to attend.

The Contractor shall provide advance notification of scheduled Hold Points and Witness Points in accordance with the contract documents and approved QCP. All required inspections, observations, testing, and resulting actions shall be documented as part of the project quality records.

• Quality Documentation and Record Keeping:

The Contractor shall prepare, maintain, and submit quality records in accordance with the approved QCP. All quality records shall be uploaded to and maintained within the University's PMIS and be readily available for review and audit.

At a minimum, quality documentation shall include, as applicable:

- Daily QCRs, inspection reports, and testing results.

- Submittals, Requests for Information (RFIs), and associated logs.
- NCRs and corrective action records.
- Commissioning documentation.
- As-built drawings and Operations & Maintenance (O&M) manuals.
- Photographic documentation of critical or concealed work.
- Quality summary information included in the Contractor's monthly progress report.

- ## Quality Audits:

Quality audits shall be conducted to verify compliance with the requirements of this CQAP, the Contractor's QCP, contract documents, and applicable quality standards. Audits may evaluate quality planning, documentation, inspections, testing, corrective actions, and implementation of quality management processes. Audit frequency and scope shall be commensurate with the project's assigned quality tier and risk profile. Audit findings shall be documented, communicated to the Project Manager, and tracked through resolution.

- ## Change Management:

Changes to the project scope, design, materials, equipment, construction methods, or sequencing shall be evaluated for their potential impact on quality, safety, commissioning, operations, and project risk. When a change affects project quality requirements, the Contractor shall update the applicable quality planning documents, including the QCP, ITP, or other supporting quality documentation, as appropriate.

The Project Manager shall ensure that quality impacts are considered during the review of proposed changes. Additional inspections, testing, commissioning activities, or quality verification measures may be required when changes affect critical systems, code compliance, or project performance.

- ## Communication and Escalation:

Quality issues identified during construction shall be communicated promptly. The Contractor shall notify the Project Manager and Owner’s Quality Representative of significant quality issues, nonconforming work, failed inspections or testing, and conditions that may affect project quality, safety, or schedule. The Project Manager shall ensure that quality issues shall be communicated promptly to the appropriate

project participants to facilitate timely evaluation and resolution. Unresolved issues shall be escalated in accordance with Section 2.

SECTION 7 - Commissioning and Project Closeout / Turnover

This section establishes the requirements for commissioning, project closeout, and turnover to verify that the completed facility meets the OPR, contract documents, and operational needs prior to occupancy.

Commissioning shall be planned and implemented throughout the project lifecycle in accordance with the approved Commissioning Plan and OPR. Building systems shall be tested, verified, and demonstrated to confirm that they perform as intended before final acceptance.

Project closeout shall include, at a minimum:

- Completion of functional performance testing.
- Resolution and verification of punch list items and nonconforming work.
- Final inspections by the Project Team and other required stakeholders.
- Completion and acceptance of as-built drawings, record documents, and O&M manuals.
- Training and demonstration of building systems for Facilities Management Services (FMS), with training documentation retained as part of the project records.
- Transfer of warranty information, asset data, and required turnover documentation to FMS.

Project turnover shall not occur until all required commissioning, closeout, and documentation requirements have been satisfactorily completed or otherwise accepted by the University.

SECTION 8 - Evaluation and Lessons Learned

This section establishes the process for evaluating project quality performance and documenting lessons learned.

Project evaluations shall be conducted at key milestones, including mid-project and post-occupancy, to assess the effectiveness of quality planning, quality control, QA, commissioning, and overall project delivery. At a minimum, project evaluation activities shall include:

- *Mid-Project Evaluation* – Conducted during construction to assess quality performance, identify emerging issues, and implement corrective actions, as *appropriate*.
- *Post-Occupancy Evaluation* – Conducted approximately within one year of substantial completion to evaluate facility performance, operational readiness, and occupant feedback.
- *Lessons Learned* – Documented throughout the project and finalized at project closeout. Lessons learned shall be shared with FPM project teams and other stakeholders to promote continuous improvement and improve future project delivery.

SECTION 9 - Continuous Improvement & Feedback

This section establishes the process for evaluating and continually improving the CQAP. Continuous improvement ensures that the CQAP remains effective, current, and responsive to changing project requirements, industry best practices, and organizational needs. FPM shall periodically evaluate the effectiveness of the QMS and implement improvements based on performance data, lessons learned, audits, and stakeholder feedback.

- ## Quality Performance Metrics:

FPM shall establish and monitor quality performance metrics to evaluate the effectiveness of the CQAP and QMS. Performance data shall be used to identify trends, evaluate project and program performance, measure the effectiveness of quality initiatives, and support continuous improvement. Examples of quality metrics are provided in the FPM Quality Management Toolkit.

- ## Program Evaluation / CQAP & QMS Updates:

FPM shall periodically evaluate the effectiveness of the CQAP and QMS to verify that quality objectives are being achieved. Program evaluations shall consider quality performance metrics, audit results, lessons learned, stakeholder feedback, and industry best practices to identify opportunities for improvement. As part of the evaluation process, FPM shall:

  - Conduct periodic reviews of the CQAP and supporting quality processes.
  - Benchmark the program against applicable regulatory changes, industry standards, emerging technologies, best practices, and peer institutions.

  Evaluation results shall be used to update the CQAP, supporting procedures, and quality management practices, as appropriate.

- ## Stakeholder Feedback and Customer Satisfaction:

FPM shall encourage feedback from Customers, building occupants, Project Managers, Design Professionals, Contractors, Commissioning Authorities, O&M personnel, and other project stakeholders to identify opportunities for improvement and customer satisfaction. Stakeholder feedback may be obtained through project closeout meetings, lessons learned sessions, surveys, and other appropriate

communication channels. Feedback shall be considered during periodic program evaluations and future revisions to the CQAP.

SECTION 10 - Appendices

Appendix 1: Required Contents for Quality Control Plan

Purpose and Overview:

The Contractor's QCP is the foundation upon which quality work is based. It is an outline of the planned QC activities and is vital to the QC system. The QCP is a key component of the Contractor's QC system and must be comprehensive, detailed, and logical to be effective. While experience and knowledge of the construction industry are necessary in developing a good QCP, the contractor must consider fully the specific contract requirements and special factors particular to a project as well.

The QCP is construction-focused and is the means to assure that the Contractor's construction, which includes his subcontractors, vendors, and suppliers, complies with the requirements of the contract documents (drawings and specifications). The controls need to be adequate to cover all construction operations, including both onsite and offsite, and will be keyed to the construction schedule.

General Requirements:

The contractor shall establish and maintain an effective QC system that consists of plans, procedures, and organization necessary to produce a product which complies with the Contract requirements. The QC system covers all design and construction operations, both onsite and offsite, and is keyed to the proposed design and construction sequence. It is pertinent that the Contractor's QC Manager does not report into the job site superintendent to be effective in his or her decision making, be the author or co-author of the QCP to assure that all quality requirements contained in the contract are included and that the Contractor's QC Manager is thoroughly familiar with the plan. The Contractor's QC Manager or a qualified designee maintains a physical presence at the site while construction is in progress and is responsible for all construction and related activities at the site, except otherwise stated in writing. All work must align with the OPR. It is noted that this plan must describe how design-related deficiencies or reworked items discovered during construction will be addressed. Always refer to the contract for specific QC requirements.

All projects shall develop a QCP commensurate with the project tier and associated risks. The QCP shall be submitted for review and acceptance prior to commencement of construction activities.

In the event of any conflict or discrepancy between this QCP and the Contract Documents, the requirements of the Contract Documents shall govern and take precedence.

Acceptance and changes:

The QCP, interim or final, must be received, reviewed, and formally accepted by the Project Manager and the Owner's Quality Representative before any construction work begins. If the initial review reveals that changes are necessary, the changes must be made by the contractor before the plan can be accepted. In some cases, this requirement can be met by an interim plan applicable to the feature of work to be started. If an interim plan is provided by the contractor, it must include, as a minimum, the general plan for quality control, plus the specifics for the work that is about to begin. A final acceptable plan must be received within the time specified in the contract. USC always reserves the right to affect necessary changes in the QC Plan and in contractor operations to obtain the specified quality. After the plan has been accepted, if some part of the plan is not working as intended, USC may require changes to be made.

If the contractor wants to make changes in the QC Plan during construction, USC must be notified in writing. The contractor cannot implement any changes until USC has formally accepted the changes in writing. If deficiencies are occurring, the plan needs to be studied to see if the problem is non-adherence or if revisions should be made to correct shortcomings in the QC Plan.

Archive and Distribution:

After the QC Plan has been reviewed, changed as necessary, and accepted, the contractor shall distribute to all personnel involved in QC and project management activities including all subcontractors and consultants. The approved plan will be submitted and archived in the USC's Trimble / e-Builder as a formal submittal. Detailed requirements are contained in the separate QCP template which is maintained as part of the FPM Quality Management Toolkit. At a minimum, the QCP shall include the following sections as indicated in the QCP template:

1. Title Page
2. Table of Contents
3. Purpose
4. Project Information
5. Quality Management Organization
6. Appointment Letter
7. Roles and Responsibilities
8. Review and Approval Matrix
9. Project Risk Summary
10. Definable Features of Work
11. Inspection and Testing Plan
12. USACE Three-Phase Control Procedures
13. Hold Points and Witness Points
14. QC Documentation & Records Requirements
15. Material Control and Traceability
16. Deficiency, NCR Management and Corrective Actions
17. Commissioning Coordination
18. Turnover and Closeout Requirements
19. Project-Specific Quality Requirements
20. Appendices

Appendix 2: Detailed Quality Requirements Matrix

Purpose:

This matrix establishes the minimum quality management requirements applicable to each project tier. Additional quality requirements may be imposed by FPM based on project-specific risks, operational impacts, technical complexity, occupancy conditions, utility dependencies, commissioning scope, regulatory requirements, or institutional priorities.

Project value alone shall not determine project tier classification.

A. Program Governance, Compliance & Oversight

(CQAP Sections 1 & 2)

Quality Requirement	Tier 1	Tier 2	Tier 3
Project Tier Classification Approval	Required	Required	Required
Quality Governance Review	Not Required	As Required	Required
Executive Quality Review	Not Required	Not Required	As Required
Quality Escalation Process	Required	Required	Required
Program Compliance Review	Optional	Recommended	Required
Regulatory Compliance Verification	Required	Required	Required
Quality Performance Reporting	Not Required	Project-Level	Project and Program-Level

B. Roles, Responsibilities & Competency

(CQAP Sections 3 & 4)

Quality Requirement	Tier 1	Tier 2	Tier 3
QC Organization and Reporting	Simplified	Required	Required
Appointment Letters	As needed	Required	Required
Quality Training	Basic	USACE CQM or equivalent	USACE CQM or ISO9001
Competency Verification	Required	Required	Required
Duties, responsibilities, and authorities	Simplified	Documented	Detailed
Contractor QC Manager	Designated Individual	Designated Individual	Dedicated QC Manager
Quality Authority Defined	Required	Required	Required
Owner QA Representative	As Needed	Assigned	Assigned
QA/QC Coordination Meetings	As Needed	Periodic	Routine
Specialized Training Requirements	As Needed	As Needed	Required
Functional Review and Approval Matrix	As Needed	Required	Required
Outside Organizations	As Needed	Required if used	Required if used

C. Quality Planning & Preconstruction

(CQAP Section 5)

Quality Requirement	Tier 1	Tier 2	Tier 3
Project Risk Assessment	Required	Required	Required
QCP	Simplified	Standard	Enhanced
DFOW	Major Activities	Required	Required
Inspection & Testing Plan (ITP)	As Required	Required	Detailed Project-Specific
Hold Point Matrix	As Required	Required	Required

Quality Requirement	Tier 1	Tier 2	Tier 3
Witness Point Matrix	Limited	Required	Expanded
Quality Kickoff Meeting	Required	Required	Required
Quality Partnering Meeting	Required	Required	Required
Design Quality Review	Recommended	Required	Required
Constructability Review	Optional	Recommended	Required
Coordination Reviews	Limited	Required	Enhanced
BIM/VDC Coordination	As Required	As Required	Required
Mockups / Benchmarks	As Required	Select Systems	Required for Critical Systems
Preconstruction Quality Gate	Required	Required	Required
Construction Start Authorization	Required	Required	Required

D. Quality Control & Quality Assurance During Construction

(CQAP Section 6)

Quality Requirement	Tier 1	Tier 2	Tier 3
USACE Preparatory Phase	Major Activities	Required	Required
USACE Initial Phase	Required	Required	Required
USACE Follow-Up Phase	Periodic	Routine	Daily Active Work
First Work Verification	Required	Required	Required
Independent Testing Agency	As Required	Required	Required
Third-Party Special Inspections	Code Required Only	Code Required	Required
Above-Ceiling Inspections	As Required	Required	Required
Daily QC Reports	Optional	Required	Required
QA Surveillance Reports	As Needed	Periodic	Routine
Quality Documentation	Basic	Standard	Comprehensive

Quality Requirement	Tier 1	Tier 2	Tier 3
Photo Documentation	Key Milestones	Required	Extensive
QA/QC Record Review	As Needed	Periodic	Routine
Quality Audit Program	As Needed	Periodic	Routine
Internal QA Audits	Optional	Recommended	Required
Contractor Quality System Audit	As Needed	As Needed	Required

E. Specialized Controls

(CQAP Section 6)

Quality Requirement	Tier 1	Tier 2	Tier 3
Utility Shutdown Planning	As Required	As Required	Enhanced Requirements
Occupied Renovation Controls	As Required	As Required	Required
Infection Control Measures	As Required	As Required	Risk-Based / Required as Applicable
Temporary Conditions Verification	As Required	Required	Enhanced
Firestopping Verification	As Required	Required	Required
Building Envelope Verification	As Required	As Required	Required
Waterproofing Verification	As Required	Required	Required
Life Safety System Verification	As Required	Required	Required
Critical Utility Verification	As Required	As Required	Required
Environmental Controls (Dust, Noise, Vibration)	As Required	Required	Enhanced
Operational Continuity Planning	As Required	As Required	Required
Research Facility Controls	Not Required	As Required	Required as Applicable

Quality Requirement	Tier 1	Tier 2	Tier 3
Phasing & Swing Space Verification	As Required	As Required	Required
Temporary Protection Measures	As Required	Required	Enhanced

F. Deficiency & Nonconformance Management

(CQAP Section 6)

Quality Requirement	Tier 1	Tier 2	Tier 3
Deficiency Tracking Log	Required	Required	Required
NCR Process	Required	Required	Required
Corrective Action Verification	Required	Required	Required
Root Cause Analysis	Significant NCRs	Significant NCRs	All Major NCRs
Quality Trend Tracking	Not Required	Optional	Required

G. Commissioning & Project Closeout / Turnover

(CQAP Section 7)

Quality Requirement	Tier 1	Tier 2	Tier 3
Commissioning Plan	As Required	Select Systems	Required
Pre-Functional Checklists	As Required	Select Systems	Required
Functional Performance Testing	As Required	Select Systems	Required
Systems Readiness Review	Not Required	As Required	Required

Quality Requirement	Tier 1	Tier 2	Tier 3
Controls Integration Verification	As Required	As Required	Required
Operational Acceptance Verification	As Required	As Required	Required
Pre-Punchlist Review	As Required	Required	Required
Punchlist Development	Required	Required	Required
Punchlist Tracking & Closure	Required	Required	Required
Final Quality Verification Walk	Required	Required	Required
O&M Documentation	Required	Required	Comprehensive
Maintenance Training	Required if Applicable	Required	Enhanced Training Program
Spare Parts Verification	As Required	Required	Required
Asset Data Verification	Optional	Required	Required
Deferred Deficiency Tracking	Required	Required	Required
Substantial Completion Review	Required	Required	Required
Turnover Readiness Review	Required	Required	Required
Final Completion Gate	Required	Required	Required

H. Evaluation, Lessons Learned & Continuous Improvement

(CQAP Sections 8 & 9)

Quality Requirement	Tier 1	Tier 2	Tier 3
Post-Occupancy Evaluation	Optional	Recommended	Required
Warranty Review	Recommended	Required	Required
One-Year Warranty Review	Optional	Recommended	Required

Quality Requirement	Tier 1	Tier 2	Tier 3
Lessons Learned Review	Recommended	Required	Required
KPI Reporting	Not Required	Project-Level	Project and Program-Level
Continuous Improvement Review	Optional	Recommended	Required
Program Feedback Integration	Optional	Recommended	Required

Notes:

1. The requirements identified in this matrix represent minimum expectations. Additional quality management requirements may be imposed based on project-specific risks or FPM direction.
2. Project tier classification shall be established during project planning and may be revised if project conditions change.
3. Projects involving research facilities, central utility plants, critical infrastructure, significant utility shutdowns, life-safety systems, occupied renovations, complex phasing, or other high-risk activities may require enhanced quality management measures beyond those identified in this matrix.
4. Requirements for inspections, testing, hold points, witness points, commissioning, documentation, and turnover activities shall be further defined in the project-specific QCP.

Appendix 3: Project Risk Assessment Tool

Purpose:

This tool is used to evaluate project complexity and risk to support project tier classification and establish appropriate quality management requirements.

Instructions:

The Project Risk Assessment shall be completed during project planning by the Project Manager in coordination with applicable stakeholders. For each risk category below, select the score that best represents the project's anticipated conditions and impacts.

The following scoring criteria shall be used:

Low Risk (1 Point)
The condition presents minimal complexity, limited coordination requirements, low operational impact, and a low likelihood of affecting project quality, schedule, operations, or stakeholder activities.

Moderate Risk (3 Points)
The condition presents moderate complexity, coordination requirements, or operational impacts that may require additional planning, oversight, inspections, testing, stakeholder coordination, or quality controls.

High Risk (5 Points)
The condition presents significant complexity, operational impacts, technical challenges, stakeholder coordination requirements, or potential consequences that warrant enhanced quality planning, oversight, inspections, testing, commissioning, documentation, or specialized controls.

The difference between each category is 2 points which provides a better separation between risk levels making a high-risk condition more visible. To reach Tier 3, the project must score high in several categories or trigger a mandatory Tier 3 condition.

For each category:

1. Review the project characteristics and associated risks.
2. Assign a score of 1, 3, or 5 based on the definitions provided in the assessment matrix.
3. Record the selected score in the Score column.

4. Sum all category scores to determine the Total Risk Score.
5. Compare the Total Risk Score against the Project Tier Guidance table.
6. Consider whether any Mandatory Tier 3 Triggers apply.
7. Submit the completed assessment for review and approval.

The resulting score provides a recommended project tier; however, the final project tier shall be determined and approved by FPM based on the overall risk profile of the project. FPM may elevate a project to a higher tier when project-specific risks, operational impacts, research requirements, utility dependencies, life-safety considerations, stakeholder concerns, or institutional priorities warrant enhanced quality management requirements.

Note: Select only one score per category. If project conditions fall between two categories, select the higher score. With 12 categories, minimum score = 12 and maximum score = 60

Risk Category	Low (1)	Moderate (3)	High (5)	Score
Project Complexity	Simple scope with limited disciplines	Multiple disciplines requiring coordination	Highly complex systems or phased work	
Occupancy Impact	Unoccupied area	Limited occupancy impacts	Occupied building with significant impacts	
Utility Impact	No utility outages	Minor outages	Critical utility outages or shutdowns	
Life Safety Impact	No life-safety systems affected	Minor life-safety modifications	Significant life-safety systems affected	
Research / Mission Impact	No research impact	Limited operational impacts	Significant research or mission-critical impacts	
Commissioning Scope	No commissioning	Limited commissioning	Extensive commissioning required	

Risk Category	Low (1)	Moderate (3)	High (5)	Score
Building Systems Complexity	Standard building systems	Moderate MEP complexity	Advanced controls or specialized systems	
Phasing Complexity	Single phase	Moderate phasing	Multiple phases or swing-space requirements	
Regulatory Requirements	Standard permitting	Multiple authorities having jurisdiction	Complex regulatory approvals	
Schedule Constraints	Flexible schedule	Moderate constraints	Highly compressed or critical schedule	
Stakeholder Coordination	Limited stakeholders	Multiple stakeholders	Extensive stakeholder coordination required	
Quality History / Lessons Learned	No known concerns	Some recurring issues	Significant historical quality concerns	

Total Score

Total Score: _____

Project Tier Guidance

Total Score	Recommended Tier
12 – 24	Tier 1 – Low Complexity / Low Risk
25 – 48	Tier 2 – Moderate Complexity / Moderate Risk
49 – 60	Tier 3 – High Complexity / High Risk Critical Project

Mandatory Tier 3 Triggers

Regardless of total score, projects involving any of the following Mandatory Tier 3 Trigger should be evaluated for Tier 3 classification:

- Research laboratories
- Central utility plants
- Critical infrastructure
- Major utility shutdowns
- Significant life-safety system modifications
- Occupied renovations with substantial operational impacts
- Complex phased construction
- High-risk commissioning activities
- Other conditions identified by FPM

This prevents a project from being mathematically classified too low or incorrectly classified due to a scoring artifact.

Final Determination

Recommended Tier: _____

Approved Tier: _____

Project Manager (Enter Name and Signature): _____

Date: _____

Approving Authority (FPM Management: Name and Signature): _____

Date: _____

Comments:

Appendix 4: Scalable Three-Phase Control and Sample Checklists

This appendix describes how the TPC (Preparatory Phase, Initial Phase, and Follow-up Phase) process scales by the rigor and frequency across project tiers (Tier 1–3).

The TPC is a structured QC process. Each phase includes required activities, documentation, and participants that scale based on project tier.

Applicability by Project Tier (Scalable)

Tier	Applicability of TPC
Tier 1	Used selectively for complex or high-risk work items
Tier 2	Required for major DFOW
Tier 3	Required for all DFOW with enhanced documentation and oversight

Required Attendees by Project Tier (Scalable)

Tier	Required Attendees
Tier 1	Contractor superintendent (PM optional)
Tier 2	Contractor Superintendent + PM + major subcontractor
Tier 3	Superintendent + PM + subcontractors + design/architect & engineer(A&E) team (as needed)

Preparatory Phase

It ensures that all prerequisites for a DFOW are in place before work begins.

Preparatory Phase Required Activities

- Review contract documents, drawings, and specifications
- Verify submittal approvals
- Confirm material availability and compliance
- Review safety requirements
- Review testing and inspection requirements
- Conduct pre-installation coordination (MEP, Building Information Modelling (BIM), sequencing)
- Identify risks and mitigation measures
- Review workmanship standards and mock-up requirements

Preparatory Phase - Required Documentation (Scalable)

Tier	Documentation
Tier 1	Brief preparatory notes with any action items
Tier 2	Meeting Agenda, Standard preparatory meeting form, Inspection and Test Plan, Meeting minutes and action items
Tier 3	Meeting Agenda, Full preparatory checklist + DFOW documentation, Inspection and Test Plan, Quality Plan for the DFOW, Meeting minutes and action items

Preparatory Phase Checklist

- Meeting Agenda
- Meeting minutes with action items
- DFOW / Specification Section
- Accepted submittals verified (Yes/No)
- Current drawings/specs available (Yes/No)
- Materials on site and compliant (Yes/No)
- Equipment/tools ready and calibrated (Yes/No)
- Qualified personnel assigned (Yes/No)
- Safety requirements reviewed (Yes/No)
- Testing/inspection requirements identified (Yes/No)
- Hold/witness points established (Yes/No)
- Comments / Action Items / Responsible Party

Initial Phase

It verifies that the first portion of work is installed correctly and establishes the standard for the remainder of the DFOW.

Initial Phase Required Activities

- Inspect initial work for compliance
- Verify workmanship meets specifications
- Confirm testing and inspection requirements
- Validate installation sequencing
- Identify deficiencies and corrective actions
- Establish the "benchmark" for ongoing work

Initial Phase - Required Documentation (Scalable)

Tier	Documentation
Tier 1	Brief initial inspection notes with any action items
Tier 2	Meeting Agenda, Standard initial inspection report, Inspection and Test Plan, Meeting minutes and action items
Tier 3	Meeting Agenda, Full initial inspection report with photos + applicable third-party reports, Meeting minutes and action items

Initial Phase Checklist

- DFOW / Location
- Work started in accordance with preparatory phase (Yes/No)
- Materials installed per accepted submittals (Yes/No)
- Workmanship meets standards (Yes/No)
- Tolerances/alignments verified (Yes/No)
- Testing initiated as required (Yes/No)
- Deficiencies identified (Yes/No – describe)
- Corrective actions taken (Yes/No)

Follow-up Phase

It ensures ongoing compliance and verifies that all work continues to meet the standard established during the Initial Phase.

Follow-up Phase Required Activities

- Conduct recurring inspections
- Verify corrective actions have been completed
- Confirm testing and special inspections
- Monitor workmanship and consistency
- Document progress and deficiencies
- Coordinate with commissioning activities

Follow-up Phase - Required Documentation (Scalable)

Tier	Documentation
Tier 1	Periodic QC notes with any action items
Tier 2	Meeting Agenda, Standard QC inspection logs, Meeting minutes and action items
Tier 3	Meeting Agenda, Daily QC Reports with photos+ QA verification, applicable third-party reports, Meeting minutes and action items

Follow-up Phase Checklist

- Date / Inspector
- DFOW / Location
- Status of ongoing work
- Previously identified deficiencies corrected (Yes/No)
- New deficiencies identified (Yes/No – describe)
- Overall compliance status

Appendix 5: Acronyms and Abbreviations

Abbreviation	Acronym
Architect and Engineer	A&E
Authorized Quality Representative	AQR
Building Information Modelling, a 3D digital model to plan, design, build, and manage a construction	BIM
Basis of Design	BOD
Capital Construction Development	CCD
Construction Quality Assurance Program	CQAP
Commissioning Authority	CxA
Definable Features of Work	DFOW
Design Quality Plan	DQP
Facilities Management Services	FMS
Facilities Planning and Management	FPM
California Department of Healthcare Access and Information, formerly known as the Office of Statewide Health Planning and Development	HCAI, OSHPD
Inspection and Testing Plan	ITP
Mechanical, Electrical and Plumbing	MEP
Nonconformance Report	NCR
Operations & Maintenance	O&M
Owner's Project Requirements	OPR
Project Management Information System	PMIS
Quality Assurance QA	QA
Quality Control	QC
Construction Quality Control Plan	QCP
Quality Control Report	QCR

Quality Management System	QMS
Requests for Information	RFI
Requests for Proposals	RFPs
Three-Phase Control	TPC
U.S. Army Corps of Engineers	USACE
University of Southern California	USC