Utility Construction QA/QC Manual Sample

Selected pages (not a complete plan)

- Quality Manual
- Reporting Forms
- Inspection Forms

Contact:
Ed Caldeira
410-451-8006

[CompanyName]

Construction

Quality Manual

Operating Policies of the [CompanyName] Quality System

Version: 20150128

Version	Version notes
20141228	Initial issue

Approval Signature and Date: _____ _____

President/ Date

QUALITY MANUAL

TABLE OF CONTENTS

5. PROJECT-SPECIFIC QUALITY STANDARDS

APPLICABLE REGULATIONS, INDUSTRY, and COMPANY STANDARDS

5.1. OVERVIEW

[CompanyName] personnel and subcontractors and suppliers are accountable for compliance to standards-based written specifications.

To achieve expectations reliably and consistently, specifications are clearly spelled out, not only for results but also for processes. Specifications apply to materials, work steps, qualified personnel and subcontractors and suppliers, safe work rules, and environmental work conditions.

Standards ensure that results are specified rather than left to discretionary practices.

5.2. REGULATORY CODES

All [CompanyName] construction activities comply with the relevant regulations. The Quality Manager identifies regulatory requirements applicable to the jurisdictions served, including:

- Applicable Federal regulations
- Applicable State regulations
- Applicable building codes and local addenda to building codes
- Applicable Fire Code
- Applicable Fuel and Gas Code
- Applicable Mechanical Code
- Applicable Plumbing Code
- Additional regulations specified by the customer contract

The Quality Manager identifies regulatory requirements that apply to a specific project on the Project Quality Assurance/Quality Control Plan.

The Superintendent had jobsite access to relevant codes and government regulations.

5.3. INDUSTRY QUALITY STANDARDS

All [CompanyName] construction activities comply with generally accepted good workmanship practices and industry standards.

The Quality Manager identifies supplemental requirements for industry standards that apply to a specific project on the Project Quality Assurance/Quality Control Plan when it is not otherwise specified by the contract, contract technical specifications, or approved drawings.

Regulatory Codes and Industry Standards

Division	Description	Reference Standard No.	Reference Standard Title
31,33	Bedding for buried piping and DIP installation	AWWA C600	Installation of Ductile-Iron Water Mains and Their Appurtenances
31	Welding lengths of pipe together for bore holes	AWS D1.1/D1.1M	Structural Welding Code - Steel
31	Geotextile storing and handling	ASTM D 4873	Identification, Storage, and Handling of Geosynthetic Rolls and Samples
31	Shoring installation	EM 385-1-1	Safety and Health Requirements Manual
31	Precast prestressed concrete pile installation	PCI JR-382	Recommended Practice for Design, Manufacture and Installation of Prestressed Concrete Piling
31	Drilled shaft foundation installation	ACI 336.1	Specification for the Construction of Drilled Piers
33	Clay sewer pipe installation	ASTM C 12	Standard Practice for Installing Vitrified Clay Pipe Lines
33	CMP installation	ASTM A798/A798M	Standard Practice for Installing Factory-Made Corrugated Steel Pipe for Sewers and Other Applications
33	Concrete gravity sewer piping installation	ACPA 01-103	Concrete Pipe Installation Manual
33	DIP polyethylene encasement installation	AWWA C105/A21.5	Polyethylene Encasement for Ductile-Iron Pipe Systems
33	PE pipe joining	ASTM D 2657	Heat Fusion Joining Polyolefin Pipe and Fittings
33	PE piping installation	ASTM D 2774	Underground Installation of Thermoplastic Pressure Piping
33	PVC piping installation	AWWA M23	Manual: PVC Pipe - Design and Installation
33	PVC piping installation	UBPPA UNI-B-3	Recommended Practice for the Installation of Polyvinyl Chloride (PVC) Pressure Pipe (Nominal Diameters 4-36 Inch)
33	PVC gravity sewer piping installation	ASTM D 2321	Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
33	RCP piping installation	AWWA M9	Manual: Concrete Pressure Pipe
33	Steel pipe installation	AWWA M11	Manual: Steel Water Pipe: A Guide for Design and Installation
33	Steel pipe welding	AWWA C206	Field Welding of Steel Water Pipe
33	Gas piping installation	NFPA 54	National Fuel Gas Code
33	Pipe hanger and support installation	MSS SP-69	Pipe Hangers and Supports - Selection and Application
33	Displacement water meter installation	AWWA C700	Standard for Cold Water Meters - Displacement Type, Bronze Main Case
33	Turbine water meter installation	AWWA C701	Standard for Cold-Water Meters - Turbine Type for Customer Service

33	Compound water meter installation	AWWA C702	Cold-Water Meters - Compound Type
33	Disinfection of water piping	AWWA C651	Standard for Disinfecting Water Mains
33	Water storage tank disinfection	AWWA C652	Disinfection of Water-Storage Facilities
33	Pipe jacking operations and installations	AREMA Eng Man	Manual for Railway Engineering
33	Structural plate installation	ASTM A807/A807M	Standard Practice for Installing Corrugated Steel Structural Plate Pipe for Sewers and Other Applications
33	Erection of steel water storage tanks	AWWA D100	Welded Steel Tanks for Water Storage
33	Underground electrical distribution installation	NFPA 70	National Electrical Code
33	Telecommunications installation	NFPA 70	National Electrical Code
33	Overhead pole line installation	NFPA 70	National Electrical Code

5.4. Material and Equipment Specifications

The Quality Manager ensures that all types of materials and equipment that affect quality are identified and controlled.

The Quality Manager evaluates the expected use of materials and equipment and identifies types of materials and equipment that may affect project quality. For each item, the Quality Manager sets specifications for their intended use, including:

- Compliance to contract requirements
- Compliance to code and industry standards and listing requirements
- Structural integrity
- Performance
- Durability
- Appearance
- Product identification for traceability.

The Quality Manager identifies controlled material and equipment that apply to the project.

The Quality Manager ensures that purchase orders for listed materials and equipment include the relevant specifications as specified in section 6.7 Purchase Order Requirements.

Only approved materials are used in the construction process.

5.5. Work Process Specifications

The Quality Manager ensures that work processes are controlled to ensure that the specified requirements are met. When appropriate, the Quality Manager will specify project quality standards for work processes that may include:

- References to documented procedures such as manufacturer's installation instructions
- Procedures for carrying out process steps
- Methods to monitor and control processes and characteristics
- Acceptability criteria for workmanship

- Tools, techniques and methods to be used to achieve the specified requirements.

5.6. Controlled Material Identification and Traceability

The Quality Manager determines types of project materials that require quality controls.

For each type of quality controlled material, the Quality Manager determines lot control traceability requirements, if any, and specifies the means of lot identification. Identification methods may include physical labels, tags, markings and/or attached certification documents.

When lot controlled materials are received, the Superintendent verifies that materials have the specified lot identifications.

The Superintendent maintains lot identification at all production phases from receipt, through production, installation, or assembly, to final completion. Acceptable methods for preserving lot identification include physically preserving observable lot identifications, recording the lot identification on a work task quality inspection form or other work record, or collecting the physical lot identifier as a record along with supplemented with location.

If lot controlled materials are without lot identification, the Superintendent deems the materials as nonconforming and segregates them and/or clearly marks them to prevent inadvertent use. The Superintendent treats the material according to the company policy for nonconformances. Only the Quality Manager can re-identify or re-certify the materials.

5.7. Measuring Device Control and Calibration

The Quality Manager evaluates the project requirements and determines if there are measuring devices that require controls to assure quality results.

For each type of device the Quality Manager identifies:

- Restrictions for selection
- Limitations on use.
- Calibration requirements including the frequency of calibration. All calibrations must be traceable to national measurement standards.

When a measurement device is found not to conform to operating tolerances, the Quality Manager validates the accuracy of previous measurements.

5.8. [CompanyName] Quality Standards

[CompanyName] quality standards supplement contract requirements when they are necessary to ensure quality.

The Quality Manager identifies supplemental requirements for [CompanyName] Quality standards that apply to a specific project on the Project Quality Assurance/Quality Control Plan.

When [CompanyName] quality standards differ from industry standards or product manufacturer instructions, the Quality Manager justifies that the standard reliably achieves quality results and then documents the justification.

All [CompanyName] construction activities conform to the company quality standards.

5.9. Application of Multiple Sources of Specifications

Should multiple sources of specifications apply to a work task, the higher level of specification applies. When there are equal levels of specifications that conflict, the specifications are applied in this order:

- Submittals approved by the customer
- Contract technical specifications
- Contract drawings
- Government regulations that exceed requirements of items below
- [CompanyName] quality specifications, including subcontract specifications
- [CompanyName] Quality Manual
- Product installation instructions
- Industry standards
- Generally accepted practices

Should multiple sources of conflicting specifications apply to a project, the Quality Manager defines the standards that apply to the specific project on the Project Quality Assurance/Quality Control Plan.

7. Process Controls

HOW WORK IS CARRIED OUT

7.1. Overview

The construction process plan defines how project work is to be done and approved for the overall project. The construction process plan is communicated to all key personnel, subcontractors and suppliers in a startup meeting. As the project proceeds, work task plans provide additional details of how each individual work task is carried out. Work tasks planning meetings are used to communicate expectations of the work task plan to key personnel responsible for carrying out the work task.

7.2. Project Startup and Quality Control Coordination Meeting

Prior to the commencement of work, the Project Manager holds a meeting to discuss and coordinate how project work will be performed and controlled. Key personnel from [CompanyName], subcontractors and suppliers meet to review expectations for project quality results as well as quality assurance and quality control policies and procedures including:

- Key requirements of the project
- The Project Quality Assurance/Quality Control Plan
- Required quality inspections and tests
- The project submittal schedule
- Quality policies and heightened awareness of critical quality requirements
- Project organization chart and job responsibilities
- Methods of communication and contact information
- Location of project documents and records

7.3. Preparatory Project Quality Assurance/Quality Control Plan Planning

7.3.1. Work Task Requirements Review

In preparation for the start of an upcoming work task, the Superintendent reviews an integrated and coordinated set of documents that collectively define quality requirements for the work task including:

- Objectives and acceptance criteria of the work task
- Quality standards that apply to the work task
- Work instructions, process steps, and product installation instructions that apply to the work task
- Shop drawings
- Submittals
- Tools and equipment necessary to perform the work
- License, certification, or other qualification requirements of personnel assigned to work
- Required records of the process and resulting product
- The subcontractor contracted to perform the work, if applicable
- Customer contract requirements
- Required quality inspections and tests
- Method for clearly marking nonconformances to prevent inadvertent use
- Location of quality system records and documents
- Personnel training

7.3.2. Preparatory Site Inspection

The Superintendent also performs a quality inspection of the work area and:

- Assesses completion of required prior work
- Verifies field measurements
- Assures availability and receiving quality inspection status of required materials
- Identifies any nonconformances to the requirements for the work task to begin
- Identifies potential problems

7.3.3. Work Task Preparatory Quality Planning Meetings

Prior to the start of a work task, the Superintendent conducts a meeting with key company, subcontractor personnel responsible for carrying out, supervising, or inspecting the work, and interested customer representatives.

During the meeting, the Superintendent communicates the work task quality requirements and reinforces heightened awareness for critical requirements. Topics for a work task quality plan meeting include:

- Conflicts that need resolution
- Required quality documents and a verification of availability to personnel carrying out, supervising, or inspecting the work task
- Record keeping requirements and the availability of necessary forms
- Review methods and sequences of installation
- Special details and conditions
- Standards of workmanship
- Heightened awareness of critical quality requirements
- Quality risks
- Work tasks quality inspection form

7.4. Weekly Quality Planning and Coordination Meetings

The Superintendent conducts a meeting with key company, subcontractor and supplier personnel responsible for carrying out, supervising, or inspecting the work, and interested customer representatives.

The meeting is held on a nominal weekly schedule. During the meeting, the Superintendent facilitates coordination among the participants, communication among the participants, and reinforces heightened awareness for critical requirements.

The Superintendent maintains a record of the meeting event on the Daily Quality Control Report.

7.5. Process Control Standards

7.5.1. Job-ready Start Work Standards

Work on a work task starts only when conditions do not adversely impact quality, comply with government regulations, contract technical specifications, industry standards, or product installation instructions.

The Quality Manager identifies supplemental start-work requirements that apply to a specific project when they are necessary to assure quality results.

7.5.2. Work in Process Standards

Work is conducted only when conditions do not adversely impact quality; comply with government regulations, contract technical specifications, industry standards, or product installation instructions.

The Quality Manager identifies supplemental work in process requirements that apply to a specific project when they are necessary to assure quality results.

7.5.3. Protection of Completed Work Standards

[CompanyName] will preserve and protect work in process, completed work, component parts, materials, and when applicable, delivery to the destination so as to maintain so that compliance with project requirements and standards. This includes handling, storage, protection from natural elements, and reducing risks of damage.

Completed work is protected from damage as specified by government regulations, contract technical specifications, industry standards, or product installation instructions.

The Quality Manager identifies supplemental protection requirements that apply to a specific project when they are necessary to assure quality results.

7.5.4. Material storage

The Superintendent ensures all materials will be delivered, stored and handled in a manner that protects them from damage, moisture, dirt and intrusion of foreign materials.

Delivery of materials will be planned according to the work progress to minimize storage on site, where there are higher possibilities of damages and deterioration of materials.

Stored materials will be segregated to prevent cross contamination and limit losses should a delivery be rejected.

The Superintendent surveys stored materials during daily jobsite reviews and identifies any material that have incurred damage or otherwise become defective and therefore unfit for use.

7.5.5. Controlled Use of Materials

The Project Manager ensures that contracts and purchase orders are awarded only to outside organizations qualified to perform the work task and/or supply materials as required for the specific project.

Only approved materials are used in the construction process. Only approved materials are specified in purchase and/or subcontracts.

Materials that are defective, deteriorated, damaged, or not approved are not used. The Superintendent clearly marks such materials for non-use or otherwise holds them aside.

When customer-supplied materials are lost, damaged, or otherwise found unsuitable for use, the Superintendent reports such findings to the customer.

When subcontractor–supplied materials are damaged or otherwise found unsuitable for use, the Superintendent reports such findings to the subcontractor.

The Superintendent ensures that construction uses only materials specified in the contract technical specifications, contract drawings, and approved submittals. Substitutions are made only by agreement of the customer and documented by a change order (see section 2.1.3.6).

7.5.6. Controlled Product Use and Installation

[CompanyName] construction activities conform to manufacturers' product use and installation instructions that apply to the construction process.

When installing a product, the Superintendent has access to all applicable product installation instructions.

7.6. Daily Quality Control Report

The Superintendent records a summary of daily work activities. The report will include:

- Schedule Activities Completed
- General description of work activities in progress.
- Problems encountered, actions taken, problems, and delays
- Meetings held, participants, and decisions made
- Subcontractor and Supplier and Company Crews on site
- Visitors and purpose
- General Remarks
- Improvement Ideas
- Weather conditions

7.7. Monthly Quality Control Report

When a monthly quality control report is required by the Project Quality Plan, the Superintendent records a monthly status report. The report includes:

- A summary of work completed and work in progress
- Outstanding issues
- Issues resolved during the reporting period
- Outstanding potential change orders
- Project status with current project costs and estimated completion date
- A cost analysis summarizing actual costs to date and estimated future costs
- Project pictures as appropriate

14. FORMS

[CompanyName]
Material Inspection and Receiving Report

Version 20150128

Contract ID	Contract Name	Purchase Order No.	Supplier	Bill of Lading No.	Date
[ProjectNumber]	[ProjectName]				

Item No.	Stock/Part No.	Description	Quantity Received	Condition	Marking	Accept	Conditional Use	Reject
						☐	☐	☐
						☐	☐	☐
						☐	☐	☐
						☐	☐	☐
						☐	☐	☐
						☐	☐	☐

Receiving Quality Control

ACCEPTANCE

Listed items have been accepted by me or under my supervision

☐ Conform to contract specifications EXCEPT as noted herein or on supporting documents.
☐ Received in apparent good condition EXCEPT as noted

Signature of authorized person and date: _____

EXCEPTIONS:

LIST OF INCLUDED INSPECTION FORMS

EARTHWORK

- Bored Piles
- Caissons
- Clearing and Grubbing
- Driven Piles
- Excavating and Fill
- Grading

UTILITIES

- Public Water Utility Distribution Piping
- Sanitary Utility Sewerage Force Mains
- Sanitary Utility Sewerage Piping
- Water Utility Distribution Equipment

EXTERIOR IMPROVEMENTS

- Base Courses

Earthwork - Excavating and Fill 31.23.00

Project:	Phase:	Contract#:	Subcontractor:	Crew:

Compliance Verification

- ☐ Compliance with initial job-ready requirements
- ☐ Compliance with material inspection and tests
- ☐ Compliance with work in process first article inspection requirements
- ☐ Compliance with work in process inspection requirements
- ☐ Compliance with Task completion inspection requirements
- ☐ Compliance with inspection and test plan
- ☐ Compliance with safety policies and procedures

Reported Nonconformances and incomplete items:

Heightened Awareness Checkpoints

FTQ	2TQ	
☐	☐	Underground Facilities are located and marked
☐	☐	Prevent damage to Underground Facilities in equipment traffic areas
☐	☐	Understand regulatory requirements for disposal of excavation water
☐	☐	Prevent utility trenches fro directing muddy runoff into structures
☐	☐	Trenches allow for proper utility separation distances (horiz. +& vert.)
☐	☐	Compaction / moisture inspection services are scheduled as needed
☐	☐	Compact where utilities enter structures to prevent settlement damage
☐	☐	Do not backfill in excessive lifts that cannot be adequately compacted
☐	☐	Below grade walls are properly supported prior to adjacent backfilling
☐	☐	Protect appurtenances and openings from intrusion by Flowable Fill

FTQ Scores and Completion Sign-off

Field Mgmt.-91.45.01

Quality **5 4 3 2 1** *Notes:*

On-Time **5 4 3 2 1** *Notes:*

Safety **5 4 3 2 1** *Notes:*

Sign and date*: Cell # / ID #:: _____ Signed: _____ Date: _____

Task has been has been verified complete and in compliance with contract drawings and specifications except for non-conformances and incomplete items reported above.

Quality Score	*5 = 100% NO problems*	*4 = 1 minor problems*	*3 = Hotspot or 2-3 minor*	*2 = 6+ or major problems*	*1 = Excessive problems*
On-Time Score	*5 = On Time*	*4 = Late*	*3 = Late by 1 day*	*2 = Late by 2 days*	*1 = Late more than 2 days*
Safety Score	*5 = 100% NO problems*	*4 = 1 minor problem*	*3 = Hotspot or 2-3 minor*	*2= 4+ or major problem*	*1= Injury*

Exterior Improvements - Base Courses 32.11.00

Project:	Phase:	Contract#:	Subcontractor:	Crew:

Compliance Verification

- ☐ Compliance with initial job-ready requirements
- ☐ Compliance with material inspection and tests
- ☐ Compliance with work in process first article inspection requirements
- ☐ Compliance with work in process inspection requirements
- ☐ Compliance with Task completion inspection requirements
- ☐ Compliance with inspection and test plan
- ☐ Compliance with safety policies and procedures

Reported Nonconformances and incomplete items:

Heightened Awareness Checkpoints

FTQ	2TQ	
☐	☐	Course material source and gradation approved by ENGINEER
☐	☐	Course materials from different sources and for different uses stockpiles separately
☐	☐	Drainage layer / piping outlets to surface or pervious area
☐	☐	Course material free of organic material// silt// clay// or other objectionable material
☐	☐	Aggregate evenly graded and not segregated
☐	☐	Base Course of even thickness and true to grade
☐	☐	Bituminous Base Course joints offset from underlying course joints
☐	☐	Edge material compacted and brought even with finished course surface
☐	☐	Sieve analysis// field density// and moisture content tests provided to ENGINEER
☐	☐	Finished surface free of irregularities// soft spots// debris// and excess moisture

FTQ Scores and Completion Sign-off

Field Mgmt.-91.45.01

Quality **5 4 3 2 1** *Notes:*

On-Time **5 4 3 2 1** *Notes:*

Safety **5 4 3 2 1** *Notes:*

Sign and date*: Cell # / ID #:: _____ Signed: _____ Date: _____

Task has been has been verified complete and in compliance with contract drawings and specifications except for non-conformances and incomplete items reported above.

Quality Score	*5 = 100% NO problems*	*4 = 1 minor problems*	*3 = Hotspot or 2-3 minor*	*2 = 6+ or major problems*	*1 = Excessive problems*
On-Time Score	*5 = On Time*	*4 = Late*	*3 = Late by 1 day*	*2 = Late by 2 days*	*1 = Late more than 2 days*
Safety Score	*5 = 100% NO problems*	*4 = 1 minor problem*	*3 = Hotspot or 2-3 minor*	*2= 4+ or major problem*	*1= Injury*

Utilities - Public Water Utility Distribution Piping 33.11.13

Project:	Phase:	Contract#:	Subcontractor:	Crew:

Compliance Verification

- ☐ Compliance with initial job-ready requirements
- ☐ Compliance with material inspection and tests
- ☐ Compliance with work in process first article inspection requirements
- ☐ Compliance with work in process inspection requirements
- ☐ Compliance with Task completion inspection requirements
- ☐ Compliance with inspection and test plan
- ☐ Compliance with safety policies and procedures

Reported Nonconformances and incomplete items:

Heightened Awareness Checkpoints

FTQ	2TQ	
☐	☐	Piping has sufficient cover for anticipated traffic
☐	☐	Piping bury below frost line
☐	☐	Proper separation between water and sewer lines maintained (10' horizontal// 18" vertical with water on top)
☐	☐	Mechanically restrained joints tight and secure
☐	☐	Push-on joints fully inserted
☐	☐	Thrust blocking and anchors in contact with piping and firmly attached
☐	☐	Fittings and accessories compatible (material// pressure rating// connection type) with the piping utilized
☐	☐	Protective coating/wrap is intact// uniform// and free of damage
☐	☐	Valve boxes do not rest on the piping
☐	☐	Indicator tape or tracer wire installed above piping

FTQ Scores and Completion Sign-off

Field Mgmt.-91.45.01

Quality **5 4 3 2 1** *Notes:*

On-Time **5 4 3 2 1** *Notes:*

Safety **5 4 3 2 1** *Notes:*

Sign and date*: Cell # / ID #:: _____ Signed: _____ Date: _____

Task has been has been verified complete and in compliance with contract drawings and specifications except for non-conformances and incomplete items reported above.

Quality Score	*5 = 100% NO problems*	*4 = 1 minor problems*	*3 = Hotspot or 2-3 minor*	*2 = 6+ or major problems*	*1 = Excessive problems*
On-Time Score	*5 = On Time*	*4 = Late*	*3 = Late by 1 day*	*2 = Late by 2 days*	*1 = Late more than 2 days*
Safety Score	*5 = 100% NO problems*	*4 = 1 minor problem*	*3 = Hotspot or 2-3 minor*	*2= 4+ or major problem*	*1= Injury*

For More Information:

Contact: Ed Caldeira

410-451-8006

www.firsttimequality.com

EdC@FirstTimeQuality.com