



Ludlow Construction Company, Inc.

**QUALITY ASSURANCE/QUALITY CONTROL
PLAN**

**DURHAM MEADOWS WATERLINE REMIDIAL DESIGN,
DURHAM CT**

CONTRACT NO. W912WJ19C0002

Version 3 Date: September 1, 2019



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**PROJECT-SPECIFIC
QUALITY ASSURANCE/QUALITY CONTROL PLAN
CONSTRUCT WATERLINE
DURHAM MEADOWS,
DURHAM CT**

EPA CONTRACT NO. EP-S1-06-01

TASK ORDER NO. 0060-RD-RD-01D5

VERSION 3 DATE: September 1, 2019

By



19 Carmelina's Circle

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Quality Assurance/Quality Control Plan



SIGNATURE SHEET

Plan Preparer

This Ludlow Construction Company, Inc. Project Quality Control Plan was prepared in accordance with the contract specifications and requirements of the Ludlow Construction Company quality system and approved by:

Jeremiah Anderson 08 April 2019
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Approval by Company Officer

This Ludlow Construction Company, Inc. Project Quality Control Plan is approved by:

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Ludlow Construction Company, Inc. Project Quality Control Plan concurrence by:

Michael Pio
Michael Pio, Project Manager /April 8, 2019/ (413) 2620237

Jonathan Pio
Jonathan Pio, Project Superintendent /April 8, 2019/ (413) 313-2428



PROJECT-SPECIFIC QUALITY PLAN

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INTRODUCTION

This Construction Quality Control (CQC) Plan has been prepared by Ludlow and is submitted to the United States Army Corps of Engineers, New England District (USACE). The USACE was retained by the United States Environmental Protection Agency (EPA), Interagency Agreement - DW-96-958872, to contract and oversee the implementation of the Site Wide Groundwater – Alternative Water Supply component of the remedial action for the Durham Meadows Superfund Site in Durham, CT. Ludlow is under contract, W912WJ19C0002, with the United States Army Corps of Engineers, New England District (USACE) to implement the construction of the waterline extension and other related activities as defined by the contract documents, including but not limited to the project specifications and drawings and all approved plans.

The scope of this plan is to outline the Quality Control (QC) and Quality Assurance (QA) procedures to be followed and implemented for the project. Refer to the stand-alone Accident Prevention Plan (APP) and Quality Assurance Project Plan (QAPP) / Sampling and Analysis Plan (SAP) documents prepared by Ludlow for applicable site health and safety information, and sampling related project quality assurance information, respectively. After acceptance of the CQC Plan, Ludlow will notify the Contracting Officer in writing of any proposed changes. Proposed changes are subject to acceptance by the Contracting Officer as per Section 01 45 00 paragraph 3.2.3 Notification of Changes in the Technical Specifications.



BACKGROUND INFORMATION

CUSTOMER

USACE

PROJECT NAME

CONSTRUCT WATERLINE
DURHAM MEADOWS, DURHAM CT

PROJECT NUMBER

W912WJ19C0002

PROJECT LOCATION

DURHAM, CT

The Site is located in the Town of Durham, Middlesex County, Connecticut and includes an area of groundwater contamination generally centered on Main Street in Durham. The outer limits of the Site are defined by the extent of the groundwater contamination. Based on the current (through 2016) groundwater data, the groundwater contamination at the Site is generally bounded by Talcott Lane to the north; Brick Lane, Ball Brook and Allyn Brook to the East; wetlands west of Maple Avenue to the west; and, based on recent sampling, the intersections of Maple Avenue and Fowler Avenue with Main Street to the south. The Site is centered near the two source areas: Durham Manufacturing Company (DMC), a currently operating manufacturing facility located at 201 Main Street; and the former location of Merriam Manufacturing Company (MMC) at 281 Main Street. Contamination from volatile organic compounds (VOCs) has been detected in soil and groundwater on both industrial properties, as well as in residential drinking water wells surrounding the former MMC facility and DMC facility.

In the 1970s, concerns regarding the drinking water at the Strong Middle School prompted investigations. In 1982, CT DEEP began testing drinking water wells of residences near MMC and DMC along Main Street and a number of wells contained VOCs above the federal Maximum Contaminant Levels (MCLs). Under CT DEEP Water Supply orders, MMC and DMC installed carbon filters on impacted residential wells. Since then, up to 50 wells serving 54 locations have been found to contain VOCs and have carbon treatment systems. Of these, 10 locations were also found to contain 1,4-dioxane and are required to use bottled water for drinking water. The major contaminant at the Site is TCE, which continues to be detected in groundwater at concentrations as high as 1,400 parts per billion (280 times the 5 parts per billion EPA Safe Drinking Water Act standard).



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The Site was finalized on the EPA National Priorities List in October 1989. EPA completed the Remedial Investigation and Feasibility Study (RI/FS) to support the 2005 Record of Decision (ROD) authorizing and describing the cleanup actions to be performed at the Site. A summary of the cleanup related activities performed since the 2005 ROD is presented below:

MMC Study Area: EPA began the Remedial Design in 2006 and it was completed in 2010. The MMC Study Area Remedial Action began in 2011. The first Explanation of Significant Differences (ESD) for the 2005 ROD was signed in September 2011 and related to changes to the MMC Study Area component of the 2005 ROD. The MMC Study Area remedial action was completed in 2013.

DMC Study Area: The Remedial Design was begun by DMC in 2007 and continued through 2013, when EPA took over the Remedial Design. EPA completed the Remedial Design in 2015. The Remedial Action has not yet been initiated. A second ESD to the 2005 ROD was signed in 2018 and included changes to the selected remedy for the DMC Study Area.

Site-Wide Groundwater Study Area – Alternative Water Supply (Water Line): From 2009-2010, EPA participated in the revision of the Durham Water System Extension Feasibility Study, which was prepared by Fuss and O'Neill and funded by CT DEEP. In 2012, the City of Middletown signed a Memorandum of Understanding with the Town of Durham confirming its commitment to provide water to the Town of Durham. In 2013, EPA initiated the design for the Water Line, which was initially completed in 2015 but was revised in 2018 to incorporate the outcome of the public hearings for the wetland, variance, special exception permits and the 8-24 review. The construction for the water line is expected to begin in 2018. The 2018 ESD also identified changes to the selected remedy for the Water Line.

Site-Wide Groundwater Study Area - Source Zone and Dissolved Plume: The Remedial Design for this component of the 2005 ROD was initiated in 2016 and continues to be conducted.

Site-Wide Groundwater Study Area - Contingency Groundwater Extraction for Hydraulic Containment: No activities have been undertaken with respect to this component of the 2005 ROD.

The 2005 ROD identified the need for additional studies to assess potential vapor intrusion issues for structures in proximity to the DMC and former MMC facilities. These studies have been completed, and the results of the studies are described in the 2018 ESD.

The 2005 ROD also identified the need for additional studies to assess potential vapor intrusion at the DMC facility. DMC performed a Remedial Design for a sub-slab depressurization system from 2007 through 2012. The sub-slab depressurization system was installed and made operational during 2013, but does not extend throughout the entire DMC facility. Additional studies were performed in December 2017 to assess indoor air within the DMC facility. These studies have been completed, and the results of the studies are described in the 2018 ESD.

EPA completed the first Five-Year Review for the Durham Meadows Superfund Site in 2016.



Purpose

This document outlines the QC procedures to be followed by Ludlow Construction Company to provide the necessary supervision, control and testing of items of work. Items of work include those of the prime, suppliers and subcontractors. The overall purpose of the QC plan is to monitor work progress to assure that it is performed in conformance with the contract documents with respect to the contractor-furnished equipment, materials, workmanship, construction, finished product and functional performance.



A. QC ORGANIZATION

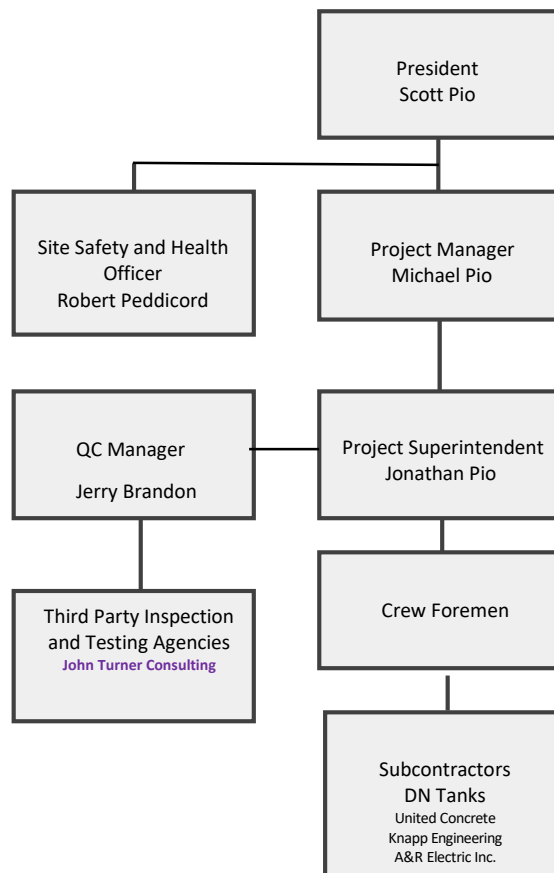
The Project QC Organization Chart shows the QC organizational structure. The chart includes job positions along with the name of each person appointed to that position. Figure A-1 shows the QC Organization Chart for this project.

The President defines the organization chart for the project. The organizational chart includes job titles, names of assigned personnel, and organizational and administrative interfaces with the customer. The organization chart defines lines of authority as indicated by solid connection; dotted lines indicate lines of communication. The lines of authority preserve independence of quality control personnel from the pressures of production.

The President assesses the qualification requirements for each position on the project organization chart, qualifications of each person, and then appoints only qualified persons to the project organization.

Additional detail on Ludlow Construction Company policies and procedures for the preparation of the project organization chart appear in Quality Manual section 2.3.1 Project Organization Chart.

Figure A-1





B. NAMES AND QUALIFICATIONS

Job qualifications for each person appointed to key project job positions are documented by their resumes.

Personnel qualifications exhibits are included in this subsection.

Table B-1 lists the positions, persons appointed, and their job qualifications documentation for all key project job positions.

Table B-1

Job Position	Name
QC Manager	Jerry Brandon
Project Superintendent	Forrest Brown
Project Manager	Michael Pio

The President has approved each person listed on the Project QC Organization Chart as having the qualifications necessary to carry out their duties, responsibilities and authority of their appointed positions.



Project Personnel Resumes



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Key Personnel Resume - QCM			
(a)	Name and Title:	Robert Peddicord	
(b)	Assignment:	QCM	
(c)	Years With Firm:		With other Firms: 27
(d)	Education:	B.S. in Liberal Arts	
(e)	Active Registration:	OSHA 30 Hour, OSHA 10 Hour, CPR/AED, First Aid, QCM, NICET, ACE Level I	
(f)	Specific Experience and Qualifications Relevant to this Project: SSHO: 1991 to Present		
	<p>Project Location: Colorado Springs \$30M Project Duration: 2 Years 3/2015-Present</p> <p>Project Description: Air Force Academy Vehicle Maintenance Facility</p> <p>Position Description: Served as QCM/SSHO. Responsibilities included, but were not limited to: Developing and reviewing of all AHA, jobsite conditions and methods of construction. Daily site safety inspections and reports of work. Held daily and weekly safety meetings with each trade project-wide. Held Preparatory Meetings with each trade over each specification section, including safety review of work being done. Reviewed AHA reports at each meeting per specification section. Kept designated government personnel and management staff apprised of status of work. Ensures all reports are prepared and submitted in accordance with the APP Plan, including the Daily Quality Control Report. Maintained all the project safety files. Reported and logged any work not meeting APP requirements. This project consisted of VMF, POL storage and 30,000 Gallon MOGAS and 20,000 Gallon Diesel Dispensing and storage.</p>		<p>USACE</p> <p><u>Scope of Work:</u></p> <p>Demolition</p> <p>Structural Steel</p> <p>Structural Concrete</p> <p>Electrical Systems</p> <p>Plumbing Systems</p> <p>HVAC Systems</p> <p>Electronic</p> <p>Safety/Security</p> <p>DDC Controls</p> <p>Asphalt Paving</p> <p>Interior Finishes</p> <p>Electrical</p> <p>Storm Sewer</p> <p>Telecom Systems</p> <p>Site work</p> <p>Roofing</p>
	<p>Project Location: Cherry Point \$22M Project Duration: 2 Years 1/2013-3/2015</p> <p>Project Description: Off Site Storm Drain System - MCAS, Cherry Point</p> <p>Position Description: Served as QCM/SSHO. Responsibilities included, but were not limited to: Developing and reviewing of all AHA, jobsite conditions and methods of construction. Daily site safety inspections and reports of work. Held daily and weekly safety meetings with each trade project-wide. Held Preparatory Meetings with each trade over each specification section, including safety review of work being done. Reviewed AHA reports at each meeting per specification section. Kept designated government personnel and management staff apprised of status of work. Ensures all reports are prepared and submitted in accordance with the APP Plan, including the Daily Quality Control Report. Maintained all the project safety files. Reported and logged any work not meeting APP requirements. This project consisted of 3 Miles of Storm Drainage and 5000 gallon POL storage facilities.</p>		<p>NAVFAC</p> <p><u>Scope of Work:</u></p> <p>Demolition</p> <p>Structural Steel</p> <p>Structural Concrete</p> <p>Electrical Systems</p> <p>Electronic</p> <p>Safety/Security</p> <p>DDC Controls</p> <p>Asphalt Paving</p> <p>Interior Finishes</p> <p>Electrical</p> <p>Storm Sewer</p> <p>Site work</p> <p>Roofing</p>
	<p>Project Location: Cherry Point \$31M Project Duration: 3 Years 2/2010 - 1/2013</p> <p>Project Description: P136 BEQ'S - MCAS Cherry Point</p> <p>Position Description: Served as QCM/SSHO. Responsibilities included, but were not limited to: Developing and reviewing of all AHA, jobsite conditions and methods of construction. Daily site safety inspections and reports of work. Held daily and weekly safety meetings with each trade project-wide. Held Preparatory Meetings with each trade over each specification section, including safety review of work being done. Reviewed AHA reports at each meeting per specification section. Kept designated government personnel and management staff apprised of status of work. Ensures all reports are prepared and submitted in accordance with the APP Plan, including the Daily Quality Control Report. Maintained all the project safety files. Reported and logged any work not meeting APP requirements. This project consisted of 65,000 SQFT Barracks facility and support bldgs..</p>		<p>NAVFAC</p> <p><u>Scope of Work:</u></p> <p>Demolition</p> <p>Structural Steel</p> <p>Structural Concrete</p> <p>Electrical Systems</p> <p>HVAC Systems</p> <p>Electronic</p> <p>Safety/Security</p> <p>DDC Controls</p> <p>Asphalt Paving</p> <p>Interior Finishes</p> <p>Storm Sewer</p> <p>Site work</p> <p>Roofing</p>



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	<p>Project Location: Ft Bragg \$12M Project Duration: 1.5 Years 6/2009-2/2010</p> <p>Project Description: Fueling Dispensing Facilities</p> <p>Position Description: Served as QCM/SSHO. Responsibilities included, but were not limited to: Developing and reviewing of all AHA, jobsite conditions and methods of construction. Daily site safety inspections and reports of work. Held daily and weekly safety meetings with each trade project-wide. Held Preparatory Meetings with each trade over each specification section, including safety review of work being done. Reviewed AHA reports at each meeting per specification section. Kept designated government personnel and management staff apprised of status of work. Ensures all reports are prepared and submitted in accordance with the APP Plan, including the Daily Quality Control Report. Maintained all the project safety files. Reported and logged any work not meeting APP requirements. This project consisted of 15,000 Gallon MOGAS and 10,000 Gallon Diesel Dispensing facility.</p>	<p>USACE</p> <p><u>Scope of Work:</u></p> <p>Demolition</p> <p>Structural Steel</p> <p>Structural Concrete</p> <p>Electrical Systems</p> <p>Plumbing Systems</p> <p>HVAC Systems</p> <p>Electronic</p> <p>Safety/Security</p> <p>Asphalt Paving</p> <p>Structural Steel</p> <p>Electrical</p> <p>Telecom Systems</p> <p>Site work</p> <p>Roofing</p>
	<p>Project Location: Raleigh, NC \$54M Project Duration: 4 Years 3/2005-6/2009</p> <p>Project Description: I-75 Widening RT 310 Bridge</p> <p>Position Description: Served asQCM/ SSHO. Responsibilities included, but were not limited to: Developing and reviewing of all AHA, jobsite conditions and methods of construction. Daily site safety inspections and reports of work. Held daily and weekly safety meetings with each trade project-wide. Held Preparatory Meetings with each trade over each specification section, including safety review of work being done. Reviewed AHA reports at each meeting per specification section. Kept designated government personnel and management staff apprised of status of work. Ensures all reports are prepared and submitted in accordance with the APP Plan, including the Daily Quality Control Report. Maintained all the project safety files. Reported and logged any work not meeting APP requirements. This project consisted of roadwork and bridge construction.</p>	<p>Industrial</p> <p><u>Scope of Work:</u></p> <p>Demolition</p> <p>Structural Steel</p> <p>Structural Concrete</p> <p>Asphalt Paving</p> <p>Structural Steel</p> <p>Electrical</p> <p>Storm Sewer</p> <p>Site work</p> <p>Roofing</p>
(g)	<p>01.A.17 Qualifications: QC Certificate – See Attached. Safety Certification – See Attached.</p> <p>Safety Training within the last 5 years:</p> <p>First Aid Instructor Card – NSC (Training Time: 8 Hours) – Scheduled for 5/30/2017</p> <p>CPR/AED Course Adult (Training Time: 2 Hours) - Scheduled for 5/30/2017</p> <p>Confined Space Safety Training (Training Time: 8 Hours)</p> <p>Base Safety Orientation (Training Time: 40 Hours – 8 Hours per Year)</p> <p>Safety Supervisor Training (Training Time: 80 Hours – 2 days of training per year)</p> <p>Environmental Safety & Health (Training Time: 8 Hours)</p> <p>Total Hours of Safety Training over 5 year: 146 Hours</p> <p>Average formal safety training each year for the past 5 years: 29.2 Hours per year</p>	



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OSHA

U.S. Department of Labor
Occupational Safety and Health Administration

This is to certify that

Rob Peddicord

has successfully completed a 30-hour Occupational Safety and Health Training Course in

Construction Safety & Health

J. Softow 2/25 19 99
(Instructor)

This acknowledges that **Rob C Peddicord**

has successfully completed Aerial Work Platform Training

on **5-9-15**

Operator Signature: *Rob C Peddicord*

Instructor & Evaluator: *Rob C Peddicord*

(See back for type and model trained)



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U.S. ARMY CORPS OF ENGINEERS
USACE LEARNING CENTER
HUNTSVILLE, ALABAMA

CERTIFICATE
Robert C. Peddicord
LRL091701192

has completed the Corps of Engineers and Naval Facility Engineering Command Training Course

CONSTRUCTION QUALITY MANAGEMENT FOR CONTRACTORS - #784

ABC Louisville	09/10 May 2017	LRL - Louisville	Darren L. Piedmonte, PE, LEED-AP BD+C
Location	Training Date(s)	Instructional District/ NAVFAC	CQM-2 Manager
James M. Brustzewski	james.m.brustzewski@usace.army.mil	502-315-2639	
Facilitator/Instructor	Instructor's Email	Telephone	

Facilitator/Instructor Signature

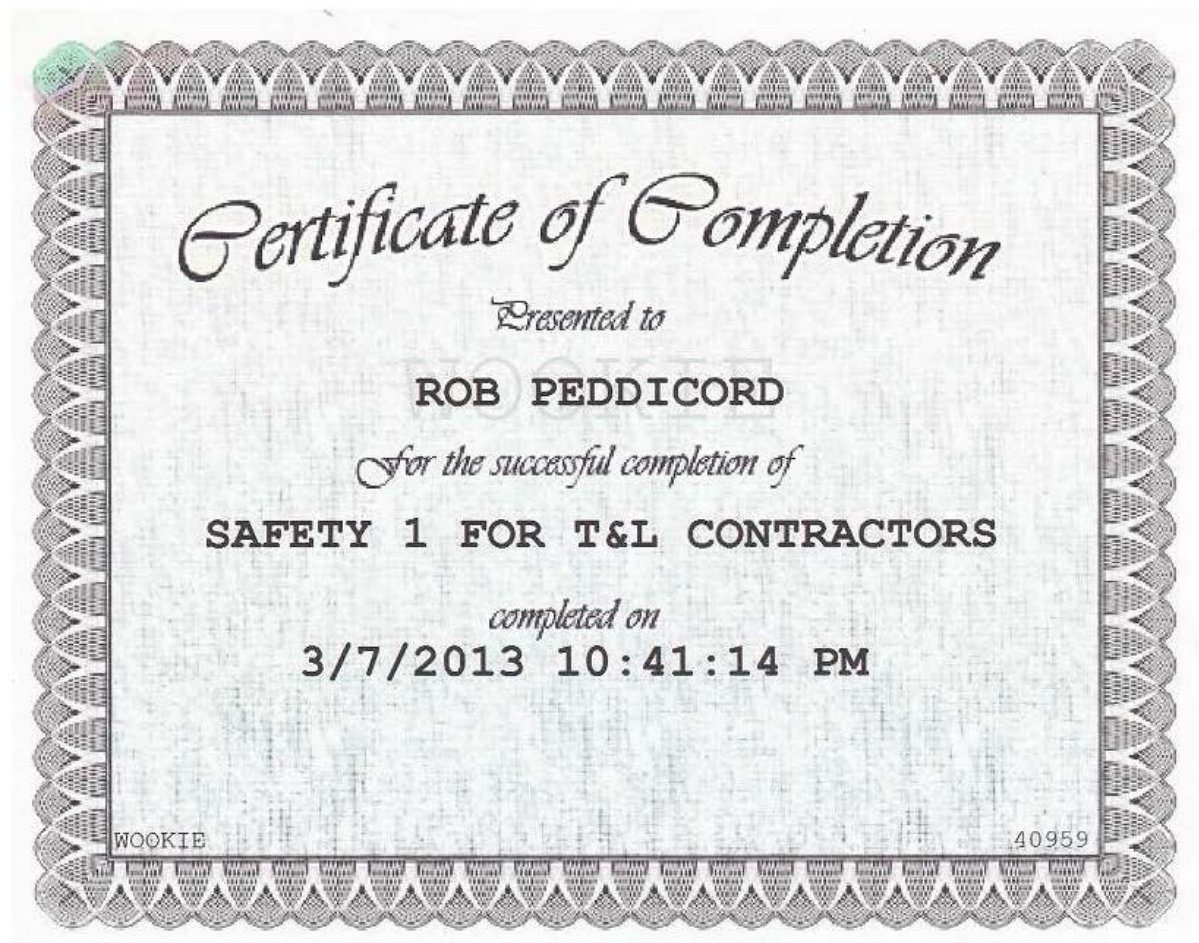
Chief, USACE Learning Center

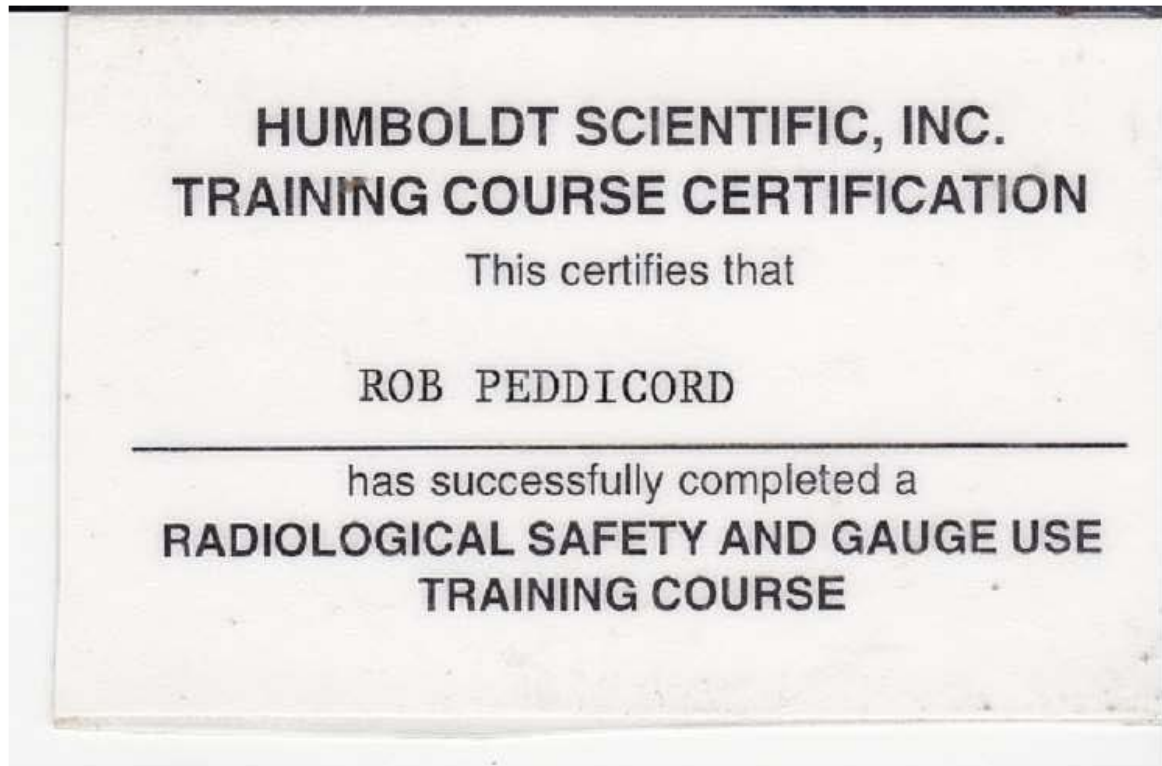
THIS CERTIFICATE EXPIRES FIVE YEARS FROM DATE OF ISSUE



Quality Assurance/Quality Control Plan









Quality Assurance/Quality Control Plan

Key Personnel Resume			
(a)	Name and Title:	Jerry Brandon, QCM	
(b)	Assignment:	Quality Control Manager	
(c)	Firm:		
(d)	Years With Firm:		With other Firms: 30
(e)	Education:	1970–1972 ARKANSAS A&M College MONTICELLO, AR • Construction Management Certification • High School Diploma • Quality Control School for Contractors (USACE Certification) Mod- 12/13/2016 • U S Army Wireman School (Certification) 1965 • U S Army Airborne School (Certification) 1966	
(f)	Active Registration:	• CPR & First Aid Certificate Mod- 11/5/2016 • OSHA 10 Certificate Re Certified 11/19/2016 • OSHA 30 Certificate RE Certified 12/23/2016 • USAFB Certification on Safety, Contractor Safety, DOD Assurance • Safe Driving Certification.	
(g)	Specific Experience and Qualifications Relevant to this Project:		
Relevant Project Experience: QCM: Jan 2005 – Present			
Project Title: DAP Construction Management – Phoenix, AZ Time on Project: 1 Year Position Description: QCM/SUP - Served as QCM/SUP on USAFB project. Responsibilities included, but were not limited to: Reviewing all submittals, plans and specifications and ensuring that all work performed met specification requirements. Processing of RFI's. Composing and final review of the Quality Control, Environmental Protection, Accident Prevention, Solid Waste Management, Construction Site, and Demolition Plans. Approving monthly subcontractor billing percentages and processing company billing to USACE. Updating the project schedule and project manager reports monthly. Conducting weekly QC meeting with subcontractors and government. Performing multiple daily site inspections and documenting findings in daily contractor quality control report. This Contract included working hand in hand with Entergy, the electrical supplier for electric on the Little Rock Air Force Base, located in Jacksonville, Arkansas. Entergy is changing the Electrical feeds from overhead power poles to underground service installing new transformers for the underground service to the base. DAP Const Management is responsible for the secondary off the transformers to inside the buildings. The Project was completed in a timely manner on under budget. The Pre-Final and Final Inspection found no deficiencies and the BOD was issued.			Similar Scope Similar Hazards Government



Quality Assurance/Quality Control Plan

<p><u>Project Title:</u> Comanche National Construction – Oklahoma City, OK <u>Time on Project:</u> 1 Year <u>Position Description:</u> QCM/SSHO - Served as QCM/SSHO on this project. Responsibilities included, but were not limited to: Reviewing all submittals, plans and specifications and ensuring that all worked performed met specification requirements. Processing of RFI's. Composing and final review of the Quality Control, Environmental Protection, Accident Prevention, Solid Waste Management, Construction Site, and Demolition Plans. Approving monthly subcontractor billing percentages and processing company billing to USACE. Updating the project schedule and project manager reports monthly. Conducting weekly QC meeting with subcontractors and government. Performing multiple daily site inspections and documenting findings in daily contractor quality control report. Project included repair and addition to the existing Ranger building for the USACE out of the Little Rock District in Conway, Arkansas.</p>	<p>Similar Scope Similar Hazards Government</p>
<p><u>Project Title:</u> MW Services – Temecula, CA <u>Time on Project:</u> 3 Years <u>Position Description:</u> QCM/SUP - Served as QCM/SUP on these projects. Responsibilities included, but were not limited to: Reviewing all submittals, plans and specifications and ensuring that all worked performed met specification requirements. Processing of RFI's. Composing and final review of the Quality Control, Environmental Protection, Accident Prevention, Solid Waste Management, Construction Site, and Demolition Plans. Approving monthly subcontractor billing percentages and processing company billing to USACE. Updating the project schedule and project manager reports monthly. Conducting weekly QC meeting with subcontractors and government. Performing multiple daily site inspections and documenting findings in daily contractor quality control report. Projects were for USAFB Saber. Projects included renovations as well as new construction for base facilities and infrastructure.</p>	<p>Similar Scope Similar Hazards Government</p>
<p><u>Project Title:</u> 19th Civil Engineering Squadron - LRAFB <u>Time on Project:</u> 3 Years <u>Position Description:</u> QCM - Served as QCM on Little Rock Air Force Base project. Responsibilities included, but were not limited to: Reviewing all submittals, plans and specifications and ensuring that all worked performed met specification requirements. Processing of RFI's. Composing and final review of the Quality Control, Environmental Protection, Accident Prevention, Solid Waste Management, Construction Site, and Demolition Plans. Approving monthly subcontractor billing percentages and processing company billing to USACE. Updating the project schedule and project manager reports monthly. Conducting weekly QC meeting with subcontractors and government. Performing multiple daily site inspections and documenting findings in daily contractor quality control report. Represented the Civil Engineer Commander in support of base development for construction programs, validated site issues and meet with key customers and coordinating officials to resolve problems to succeed in customer satisfaction and provided customer guidance and training on all systems and equipment installed on the many Government Projects. Projects included civil works for base facilities as well as interior and exterior upgrades to existing support structures</p>	<p>Similar Scope Similar Hazards Government</p>



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<p>Project Title: B&D Construction/Consultants – Odin, IN</p> <p>Time on Project: 1 Year</p> <p>Position Description: QCM/SSHO - Served as QCM/SSHO on this project. Responsibilities included, but were not limited to: Reviewing all submittals, plans and specifications and ensuring that all worked performed met specification requirements. Processing of RFI's. Composing and final review of the Quality Control, Environmental Protection, Accident Prevention, Solid Waste Management, Construction Site, and Demolition Plans. Approving monthly subcontractor billing percentages and processing company billing to USACE. Updating the project schedule and project manager reports monthly. Conducting weekly QC meeting with subcontractors and government. Performing multiple daily site inspections and documenting findings in daily contractor quality control report. Project included abatement of existing asbestos tile and piping insulation along with removal and replacement of existing walls for new pipe and wall layouts on Grissom AFB.</p>	<p>Similar Scope Military</p>
<p>Project Title: EMR-INC – St. Louis, MO</p> <p>Time on Project: 1 Year</p> <p>Position Description: QCM - Served as QCM on base project. Responsibilities included, but were not limited to: Reviewing all submittals, plans and specifications and ensuring that all worked performed met specification requirements. Processing of RFI's. Composing and final review of the Quality Control, Environmental Protection, Accident Prevention, Solid Waste Management, Construction Site, and Demolition Plans. Approving monthly subcontractor billing percentages and processing company billing to USACE. Updating the project schedule and project manager reports monthly. Conducting weekly QC meeting with subcontractors and government. Performing multiple daily site inspections and documenting findings in daily contractor quality control report. Tasks included removal and replacement of the existing water lines throughout the base. Hydro excavation and underground boring. Project also included the removal and replacement of new fire hydrants as well as replacing the fire lines into the buildings.</p>	<p>Similar Scope Military</p>
<p>Project Title: Pangea Group – St. Louis, MO</p> <p>Time on Project: 1 Year</p> <p>Position Description: QCM - Served as QCM on hanger project. Responsibilities included, but were not limited to: Reviewing all submittals, plans and specifications and ensuring that all worked performed met specification requirements. Processing of RFI's. Composing and final review of the Quality Control, Environmental Protection, Accident Prevention, Solid Waste Management, Construction Site, and Demolition Plans. Approving monthly subcontractor billing percentages and processing company billing to USACE. Updating the project schedule and project manager reports monthly. Conducting weekly QC meeting with subcontractors and government. Performing multiple daily site inspections and documenting findings in daily contractor quality control report. USAFB HANGER 224 Project, located at the Little Rock Air Force Base in Jacksonville, AR. Project included the demolition of the mezzanine area and the offices between Hanger 224 North and Hanger 224 South. Also included upgrades to emergency lighting, HVAC equipment as well as interior/exterior finishes and roofing for office areas.</p>	<p>Similar Scope Military</p>



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<p>Project Title: Tillage Construction, LLC – Baton Rouge, LA Time on Project: 1 Year Position Description: QCM - Served as QCM on HVAC project. Responsibilities included, but were not limited to: Reviewing all submittals, plans and specifications and ensuring that all worked performed met specification requirements. Processing of RFI's. Composing and final review of the Quality Control, Environmental Protection, Accident Prevention, Solid Waste Management, Construction Site, and Demolition Plans. Approving monthly subcontractor billing percentages and processing company billing. Updating the project schedule and project manager reports monthly. Conducting weekly QC meeting with subcontractors and government. Performing multiple daily site inspections and documenting findings in daily contractor quality control report. Project included installation a new HVAC System (Chiller and Cooling Tower) while removing the old HCAV System (Chiller and old Cooling tower). Also responsible for the installation of all the new pumps and piping. The work included the installation of 13 new Switch Gears along with 13 new Transfer Switches. Underground Electric was installed approximately 1000' underground to the new equipment.</p>	<p>Similar Scope Utilities</p>
<p>Project Title: SLG Contractors, INC – Grand Prairie, TX Time on Project: 2 Years Position Description: QCM - Served as QCM on JOC projects. Responsibilities included, but were not limited to: Reviewing all submittals, plans and specifications and ensuring that all worked performed met specification requirements. Processing of RFI's. Composing and final review of the Quality Control, Environmental Protection, Accident Prevention, Solid Waste Management, Construction Site, and Demolition Plans. Approving monthly subcontractor billing percentages and processing company billing to USACE. Updating the project schedule and project manager reports monthly. Conducting weekly QC meeting with subcontractors and government. Performing multiple daily site inspections and documenting findings in daily contractor quality control report. Project included three different locations including Pine Bluff Arsenal and LRAFB. Scope included installation of explosive proof film on base structures as well as upgrades to welcome mat on the flight line of LRAFB.</p>	<p>Similar Scope Military JOC Saber Contractor</p>



Quality Assurance/Quality Control Plan



USACE LEARNING CENTER
HUNTSVILLE, ALABAMA



CERTIFICATE

JERRY BRANDON

SWT-33-17-0043

has completed the Corps of Engineers and Naval Facility Engineering Command Training Course



CONSTRUCTION QUALITY MANAGEMENT FOR CONTRACTORS - #784

Tulsa, Ok	Dec 13-14, 2016	Tulsa District	Barry L. Pyles
Location	Training Date(s)	Instructional District/ NAVFAC	CQM-C Manager
Barry L. Pyles	barry.pyles@usace.army.mil	918-569-7039	<i>Barry L. Pyles</i>
Facilitator/Instructor	Email	Telephone	Facilitator/Instructor Signature
			<i>Jeffrey D. Dziedzic</i>
			Chief, USACE Learning Center
			Jeffrey D. Dziedzic

THIS CERTIFICATE EXPIRES FIVE YEARS FROM DATE OF ISSUE
CQM-C Recertification online course: <https://www.myuln.net>



Quality Assurance/Quality Control Plan

 <small>Occupational Safety and Health Administration</small>	26-006022378
<small>This card certifies that the recipient has successfully completed:</small>	
10-hour Construction Safety and Health	
<small>This card issued to:</small>	
Jerry	Brandon
Brad Spradlin	11/19/2016
<small>Trainer Name</small>	<small>Date of Issue</small>
 <small>Occupational Safety and Health Administration</small>	26-602007717
<small>the cardholder acknowledges that the recipient has successfully completed:</small>	
30-hr Construction Safe and Health	
<small>This card issued to:</small>	
Jerry Brandon	
Brad Spradlin	12/23/2016
<small>Trainer Name</small>	<small>Date of Issue</small>

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Jerry Brandon



Quality Assurance/Quality Control Plan

JONATHAN G. PIO

407 STATE STREET

LUDLOW, MA 01056

Supervisor at Ludlow Construction Co., Inc. -

2010 to Present	<p>LUDLOW CONSTRUCTION CO., INC. Construction Supervisor/Superintendent including job layout, job control, site safety and direct supervision of all facets of the following projects: Federal Street – Belchertown, MA - \$913,726.00 Sewer/Water – Westborough, MA - \$1,798,445.00 Drainage – Orange, MA - \$921,660.00 Sewer – Danbury, CT - \$3,382,378.00 Drainage – Southwick, MA - \$1,334,796.00 Water Main – Springfield, MA - \$1,624,671.00 Sewer – Bristol, CT - \$2,261,250.00 Sewer – Palmer, MA - \$4,611,753.00 Water Main – Southington, CT - \$3,691,976.00 Road Reconstruction - Belchertown, MA - \$8,888,621.37 Road Reconstruction – Warren, MA - \$1,571,411.00 Road Reconstruction – Westfield, MA - \$4,713,691.75 MDC – Water/Sewer – West Hartford, CT \$5,535,760.00 MDC – Sewer – Bloomfield, CT \$1,769,778.00</p>
2009 to 2010	<p>LUDLOW CONSTRUCTION CO., INC. Ludlow, MA Laborer on various jobs including installation of Water, Sewer and Drainage and all facets of job</p>
2005 to 2009	<p>UMASS, Amherst, MA Graduated with Bachelors in Economics Minor in Construction</p>
2002 to 2005	<p>LUDLOW HIGH SCHOOL Ludlow, MA 01056 Graduated 2005</p>



Quality Assurance/Quality Control Plan



Quality Assurance/Quality Control Plan



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C. DUTIES, RESPONSIBILITIES, AND AUTHORITY OF QC PERSONNEL

QC personnel assigned to this project have the duties, responsibilities and authority defined by their job position. Table C-1 shows the duties, responsibilities, and authority assigned to personnel on this project.

Table C-1

QC Personnel Name	Job Position
Jerry Brandon	QC Manager
Jonathan Pio	Project Superintendent
Michael Pio	Project Manager

QUALITY RESPONSIBILITIES

On this project, each job position has specific duties, responsibilities, and authorities defined as follows.

PRESIDENT: QUALITY DUTIES, RESPONSIBILITIES, AND AUTHORITY

The President is responsible for ensuring company-wide effectiveness of the Quality System. Regardless of other duties, the President is responsible for:

- Fully implementing all provisions of the Ludlow Construction Company Quality System and related documents.
- Manage the operation of the Ludlow Construction Company Quality System
- Implement and manage all phases of quality control
- Ensuring that the Quality System is established and implemented by persons doing work that impacts quality
- Ensuring that the Quality System is maintained
- Acting as Ludlow Construction Company liaison with parties outside the company on matters relating to quality
- Review and approval of all Quality System documents

PROJECT QC MANAGER: QUALITY DUTIES, RESPONSIBILITIES, AND AUTHORITY

The QC Manager is responsible for ensuring the overall effectiveness of the Quality System for a specific project. Regardless of other duties, the QC Manager is responsible for:

- Planning project quality controls required by the Ludlow Construction Company quality systems and contract requirements



Quality Assurance/Quality Control Plan

- Fully implementing all provisions of the Ludlow Construction Company Quality System and related documents on the project.
- Manage the operation of the Ludlow Construction Company Quality System on the project.
- Implement and manage all phases of quality control
- Communicating project-specific quality requirements to all affected departments, subcontractors and suppliers, and customers
- Ensuring that the Quality System is established and implemented by persons doing work that impacts quality
- Monitoring progress of activities
- Ensuring that the Quality System is maintained
- Acting as the project quality liaison with parties outside the company on matters relating to quality
- Reporting to senior management on performance of the Quality System, including needed improvements
- Review and approval of all project Quality System records
- Review and approval of project quality-related contract submittals
- Managing all project inspection and quality control activities
- Controlling corrective actions
- Resolving quality nonconformances

The QC Manager has the authority to:

- Stop work when continuing work may adversely affect quality or cover up a defect
- Prevent the use of materials that may adversely affect quality or cover up a defect
- To direct the removal and replacement of any non-conforming work or material by Ludlow Construction Company, any subcontractor, or any supplier.
- Suspend work and/or supply of materials by any staff member, subcontractor personnel, or supplier as deemed necessary to assure quality results.

Alternate QC Managers acting in the role of the project QC Manager has the same quality duties, responsibilities and authority as the project QC Manager. An Alternate QC Manager will be selected for dedicated night shift QC management. The Alternate night shift QC personnel will be selected and credentials submitted for acceptance prior to any night work being performed under this contract.

PROJECT MANAGER: QUALITY DUTIES, RESPONSIBILITIES, AND AUTHORITY

The Project Manager is the one person responsible for management of a specific project. Regardless of other duties, the Project Manager is responsible for:

- Demonstrating commitment to the Ludlow Construction Company Quality System and its integrity
- Ensuring achievement of project quality objectives
- Providing adequate resources for effective operation of the Quality System on the project
- Ensuring that each design employee understands his or her quality responsibilities as well as Ludlow Construction Company quality policies
- Ensuring that each project employee understands his or her quality responsibilities as well as Ludlow Construction Company quality policies
- Conducting management reviews of the Ludlow Construction Company Quality System



Quality Assurance/Quality Control Plan

- Ensuring the availability of necessary resources and information for effective operation of the Ludlow Construction Company Quality System

The Project Manager has authority to:

- Stop work when continuing work adversely affects quality or covers up a defect
- Prevent the use of materials that would adversely affect quality or cover up a defect
- Suspend work and/or supply of materials by any staff member, subcontractor personnel, or supplier as deemed necessary to assure quality results.

PROJECT SUPERINTENDENT: QUALITY DUTIES, RESPONSIBILITIES, AND AUTHORITY

A Project Superintendent verifies that work performed by subcontractors and suppliers and Ludlow Construction Company work crews conforms to Ludlow Construction Company quality standards. The President appoints one or more Project Superintendents for each project.

A Project Superintendent has specific responsibilities for:

- Ensuring that work meets government regulatory and code requirements, customer requirements, contract requirements, contract technical specifications, contract drawings, approved contract submittals, and company quality standards and specifications
- Ensuring that subcontractors and suppliers begin work in accordance with Ludlow Construction Company start-work policies
- Ensuring that subcontractors and suppliers receive a notice to work only when conditions will not adversely affect quality results
- Conducting quality inspections, tests, and recording findings
- Accurately assessing subcontractor quality and on-time performance
- Ensuring that quality standards are achieved before approving subcontractor or work crew completion of work

The Project Superintendent has the authority to:

- Stop work when continuing work may adversely affect quality or cover up a defect
- Prevent the use of materials that may adversely affect quality
- Direct the removal or replacement of any non-conforming work or material
- Suspend work and/or supply of materials as deemed necessary to assure quality results

Alternate Project Superintendent has the same quality duties, responsibilities and authority as the Project Superintendent. Multiple Project Superintendents may be assigned to the project.

ALL EMPLOYEES: QUALITY DUTIES, RESPONSIBILITIES, AND AUTHORITY

All employees have quality responsibilities that include:

- Conformance to project quality requirements
- Compliance with the project quality plan



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- Meeting or exceeding all applicable regulations, codes, industry standards, and manufacturer specifications as well as meeting or exceeding our customers' contract and individual requirements.
- Fully implementing and complying with all provisions of the Ludlow Construction Company Quality Manual.

All employees have the authority to:

- Stop work when continuing work may adversely affect quality or cover up a defect
- Prevent the use of materials that may adversely affect quality

Additional detail on Ludlow Construction Company policies and procedures regarding quality responsibilities appear in Quality Manual section 1.3 Quality Duties, Responsibilities, and Authority.



D. OUTSIDE ORGANIZATIONS

Outside organizations will be used to provide products, materials and/or services. Key outside organizations that will be used on this project are listed on the Source of Supply form. A Source of Supply form exhibit is included in this subsection.

QUALIFICATION OF SUBCONTRACTORS AND SUPPLIERS

The QC Manager qualifies outside organization and company work department capabilities to ensure that they are capable of completely carrying out their assigned quality responsibilities before approving and signing the contract, purchase order, or work order.

Subcontractors and suppliers must meet all Quality System requirements by either 1) working under the Ludlow Construction Company Quality System or 2) operating their own quality program as long as it meets Ludlow Construction Company Quality System requirements.

The QC Manager defines quality-related credentials for each project feature of work that affects quality including required:

- Organization and personnel licenses
- Personnel training
- Organization and personnel certifications
- Organization and personnel experience
- Senior person designated as QC Manager
- Knowledge of Company quality standards
- Demonstrated capability to complete work to Company quality standards
- Demonstrated skills, knowledge, and experience
- Effective self-inspection process
- Access to codes, standards and product instructions
- Equipment availability
- Production capacity
- Demonstrated results

For critical components, the QC Manager determines if a source quality inspection is necessary to validate supplier quality and delivery capabilities.

When the qualification assessment identifies minor nonconformances to the subcontract requirements, the QC Manager may approve a provisional subcontract. The provisional subcontract supplements the subcontract with requirements for actions that address correction of the nonconformances. All nonconformances must be corrected before work in the affected area begins.



PURCHASE ORDER APPROVAL

The Project Manager ensures that contracts and purchase orders are only issued to qualified outside organizations. The Project Manager must review, approve, and sign each purchase order.

The outside organization must agree to the purchase order terms and specifications, and then sign the contract or purchase order.



Quality Assurance/Quality Control Plan

Ludlow Construction Company, Inc. Project Subcontractor and Supplier List

Version April 8, 2019

Project ID	Project Name			Preparer/ Date
CONTRACT NO. W912WJ19C0002	DURHAM MEADOWS WATERLINE REMIDIAL DESIGN, DURHAM CT			April 8, 2019

Features of Work	Subcontractor and Supplier Name	Description of Materials / Services	Quality Control Method (Not Applicable/ Subcontractor and Supplier QC/Ludlow Construction Company QC)	Remarks
Protecting Underground Utilities	Ludlow Construction		LCC QC	
Connections to Existing Buried Pipelines	Ludlow Construction		LCC QC	
Site Prep	Ludlow Construction		LCC QC	
Earth Excavation, Backfill, Fill, & Grading	Ludlow Construction		LCC QC	
Rock Excavation	Ludlow Construction		LCC QC	
Site Cleaning	Ludlow Construction		LCC QC	
Dewatering	Ludlow Construction		LCC QC	
Riprap Placement	Ludlow Construction		LCC QC	
Flexible Paving	Ludlow Construction		LCC QC	
Painting	Ludlow Construction		LCC QC	
Hydroseeding	Ludlow Construction		LCC QC	



Quality Assurance/Quality Control Plan

Features of Work	Subcontractor and Supplier Name	Description of Materials / Services	Quality Control Method (Not Applicable/ Subcontractor and Supplier QC/Ludlow Construction Company QC)	Remarks
Plumbing -Mechanical	Ludlow Construcion		LCC QC	
Concrete Formwork	United Concrete		LCC QC	
Cast-In-Place Concrete	United Concrete		LCC QC	
Recast Structural Concrete	United Concrete		LCC QC	
Restressed Concrete Tanks	DN Tanks		LCC QC	
Utility Control Instrument Systems	A&R Electric Inc. Knapp Engineering		LCC QC	
Special Construction (Prestressed Concrete Tanks)	DN Tanks		LCC QC	
Electrical Work	A&R Electric Inc.		LCC QC	



E. APPOINTMENT LETTERS

Table E-1 lists the QC Personnel appointed to the project by the Ludlow Construction Company President.

Table E-1

Appointed Job Position	QC Personnel Name
QC Manager	Jerry Brandon
Project Superintendent	Jonathan Pio
Project Manager	Michael Pio

Each appointment is recorded on a Letter of Appointment. The project-specific Letter of Appointment exhibits are included as exhibits in this subsection.

Key project personnel have accepted their appointments and declared their ability to carry out the appointments as indicated by their signature.

Additional detail on Ludlow Construction Company policies and procedures for the appointment of key project personnel appear in Quality Manual section 2.3 Project Personnel and Qualifications.



Quality Assurance/Quality Control Plan

Ludlow Construction Company, Inc. QC Manager Appointment Letter

Version April 8, 2019

Project ID	W912WJ19C0002
Project Name	CONSTRUCT WATERLINE DURHAM MEADOWS, DURHAM CT
Appointed QC Manager	Jerry Brandon

Please be advised that you are hereby appointed as QC Manager for the above referenced project. Your responsibilities include managing and implementing the Ludlow Construction Company Quality System and the Project Quality Assurance/Quality Control Plan regarding the referenced project.

I assign you responsible for:

- Planning project quality controls required by the Ludlow Construction Company quality systems and contract requirements
- Fully implementing all provisions of the Ludlow Construction Company Quality System and related documents on the project.
- Manage the operation of the Ludlow Construction Company Quality System on the project.
- Implement and manage all phases of quality control
- Communicating project-specific quality requirements to all affected departments, subcontractors and suppliers, and customers
- Ensuring that the Quality System is established and implemented by persons doing work that impacts quality
- Monitoring progress of activities
- Ensuring that the Quality System is maintained
- Acting as the project quality liaison with parties outside the company on matters relating to quality
- Reporting to senior management on performance of the Quality System, including needed improvements
- Review and approval of all project Quality System records
- Review and approval of project quality-related contract submittals
- Managing all project inspection and quality control activities
- Controlling corrective actions
- Resolving quality nonconformances

I grant you unrestricted authority for carrying out the above responsibilities including:

- Stopping work when continuing work adversely affects quality or covers up a defect
- Prevent the use of materials that would adversely affect quality or cover up a defect
- To direct the removal and replacement of any non-conforming work or material by Ludlow Construction Company, any subcontractor, or any supplier.
- Suspend work and/or supply of materials by any staff member, subcontractor personnel, or supplier as deemed necessary to assure quality results.

President signature and date:

COMPETENT PERSON STATEMENT

I am the designated QC Manager capable and competent to carry out the responsibilities and authority as stated above.

QC Manager signature and date:



Quality Assurance/Quality Control Plan

Ludlow Construction Company, Inc. Project Manager Appointment Letter

Version April 8, 2019

Project ID W912WJ19C0002

Project Name CONSTRUCT WATERLINE DURHAM MEADOWS, DURHAM CT

Appointed Project Manager Michael Pio

Please be advised that you are hereby appointed as Project Manager for the above referenced project. Your responsibilities include managing and implementing the Ludlow Construction Company Quality System and the Project Quality Assurance/Quality Control Plan regarding the referenced project. The Project Manager is the one person responsible for management of a specific project. I assign you responsible for:

- Demonstrating commitment to the Ludlow Construction Company Quality System and its integrity
- Ensuring achievement of project quality objectives
- Providing adequate resources for effective operation of the Quality System on the project
- Ensuring that each project employee understands his or her quality responsibilities as well as Ludlow Construction Company quality policies
- Conducting management reviews of the Ludlow Construction Company Quality System.
- Ensuring the availability of necessary resources and information for effective operation of the Ludlow Construction Company Quality System
- I grant you unrestricted authority for carrying out the above responsibilities including:
 - Stopping work when continuing work adversely affects quality or covers up a defect
 - Prevent the use of materials that would adversely affect quality or cover up a defect
 - To direct the removal and replacement of any non-conforming work or material by Ludlow Construction Company, any subcontractor, or any supplier.
- Suspend work and/or supply of materials by any staff member, subcontractor personnel, or supplier as deemed necessary to assure quality results.

President signature and date: _____

COMPETENT PERSON STATEMENT

I am the designated Project Manager capable and competent to carry out the responsibilities and authority as stated above.

Project Manager signature and date: _____



Quality Assurance/Quality Control Plan

Ludlow Construction Company, Inc. Project Superintendent Appointment Letter

Version April 8, 2019

Project ID	W912WJ19C0002
Project Name	CONSTRUCT WATERLINE DURHAM MEADOWS, DURHAM CT
Appointed Project Superintendent	Jonathan Pio

Please be advised that you are hereby appointed as Project Superintendent for the above referenced project. Regardless of your other duties, in the role of Project Superintendent I assign you responsible for:

- Verification that work performed by subcontractors and suppliers and Ludlow Construction Company work crews conforms to Ludlow Construction Company quality standards.
- Ensuring that work meets government regulatory and code requirements, customer requirements, contract requirements, contract technical specifications, contract drawings, approved contract submittals, and company quality standards and specifications
- Ensuring that subcontractors and suppliers begin work in accordance with Ludlow Construction Company start-work policies
- Ensuring that subcontractors and suppliers receive a notice to work only when conditions will not adversely affect quality results
- Conducting quality inspections, tests, and recording findings
- Accurately assessing subcontractor quality and on-time performance
- Ensuring that quality standards are achieved before approving subcontractor or work crew completion of work

I grant you unrestricted authority for carrying out the above responsibilities including:

- Stopping work when continuing work adversely affects quality or covers up a defect
- Prevent the use of materials that would adversely affect quality or cover up a defect
- To direct the removal and replacement of any non-conforming work or material by Ludlow Construction Company, any subcontractor, or any supplier.
- Suspend work and/or supply of materials by any staff member, subcontractor personnel, or supplier as deemed necessary to assure quality results.

President signature and date: _____

COMPETENT PERSON STATEMENT

I am the designated Project Superintendent capable and competent to carry out the responsibilities and authority as stated above.

Project Superintendent signature and date: _____



F. SUBMITTALS PROCEDURES AND SUBMITTAL REGISTER

The QC Manager will review and sign approval of all submittals before they are submitted to the customer. The customer's specified submittal procedures will be followed when submitting records and documents to the customer.

Additional detail on Ludlow Construction policies and procedures for managing submittals appear in Quality Manual section 3 Contract Specifications.

Ludlow Construction Company is to provide the Government submittals as listed in the contract specifications of specific design and construction for approval and surveillance requirements. Design drawings may be prepared more like shop drawings to minimize construction submittals after final designs are approved. Therefore Ludlow Construction Company will prepare and submit with the design drawings, appropriate connection, fabrication, layout, and product specific drawings.

Note: Submittal Register is attached as an Appendix to this CQC Plan.



G. TESTING LABORATORY INFORMATION

Testing laboratories are required to perform quality tests as identified on the Test Plan.

Credentials of laboratories that will be performing tests for this project are included as an exhibit in this subsection.

Records of qualification approval are maintained on the Laboratory Qualifications form and included as exhibits in this subsection.

QUALIFICATION OF TESTING LABORATORIES

Independent laboratories performing tests or quality inspections have additional requirements for certification by a nationally recognized testing accreditation organization as appropriate for the scope of the inspection or test:

- NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
- NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- The American Association of State Highway and Transportation Officials (AASHTO)
- International Accreditation Services, Inc. (IAS)
- U. S. Army Corps of Engineers Materials Testing Center (MTC)
- American Association for Laboratory Accreditation (A2LA) program

Additional detail on Ludlow Construction Company policies and procedures for the selection and qualification appear in Quality Manual section 6.2Qualification of Outside Organizations and Company Departments and 6.8Project Purchase Order Approvals.



Quality Assurance/Quality Control Plan

Ludlow Construction Company, Inc. Laboratory Qualification Form			
Version April 8, 2019			
Company Name: Ludlow Construction Company		Scope of Work (specification sections):	
Project ID	Project Name	Approval	Approved By
CONTRACT NO. W912WJ19C0002	DURHAM MEADOWS WATERLINE REMIDIAL DESIGN, DURHAM CT	<input type="checkbox"/> Yes <input type="checkbox"/> Conditional <input checked="" type="checkbox"/> No	
Review Topics			
Project-Related Job Credentials			
Licenses required:		License and expiration dates:	
Certification required: NRTL: A nationally recognized testing laboratory according <input type="checkbox"/> to 29 CFR 1910.7. NVLAP: A testing agency accredited according to NIST's <input type="checkbox"/> National Voluntary Laboratory Accreditation Program. The American Association of State Highway and <input type="checkbox"/> Transportation Officials (AASHTO) International Accreditation Services, Inc. (IAS) <input type="checkbox"/> U. S. Army Corps of Engineers Materials Testing Center <input type="checkbox"/> (MTC) American Association for Laboratory Accreditation (A2LA) <input type="checkbox"/> program		Certifications and expiration dates:	
Training required:		Training completed and expiration date:	
Type and length of experience required:		Certifications and expiration dates:	
Personnel license, certification, and training required:		List each person's credentials on the Subcontractor and Supplier Certifications and Licenses form.	
Qualifications			
Senior person designated as QC Manager <input type="checkbox"/> Demonstrated skills and knowledge <input type="checkbox"/> Demonstrated experience		Production capacity <input type="checkbox"/> Staffing availability <input type="checkbox"/>	
QUALIFICATION NOTES:			
Provisional Approval: Action plan for improvement			
Follow-up results and date			



H. QUALITY TESTING PLAN AND LOG

The Quality Test Plan and Log lists the tests that will be performed on this project. The Quality Test Plan exhibit is included in this subsection.

PREPARATION OF INSPECTION AND TEST PLAN

The QC Manager prepares quality inspection and test plans for a project that identifies:

- Each required quality inspection and/or test
- Inspection and test specifications for each required quality inspection or test
- Hold points for customer quality inspection
- Specification requirements for each quality inspection and test

Additional detail on Ludlow Construction Company policies and procedures for the preparation of the test plan appears in Quality Manual sections 2.6 Project Quality Inspection and Test Plan and 8.2 Required Feature of Work Quality Inspections and Tests.



Quality Assurance/Quality Control Plan

Ludlow Construction Company, Inc. Quality Inspection and Test Plan

Project ID			Project Name						CONTRACTOR		
W912WJ19C0002			DURHAM MEADOWS WATERLINE REMIDIAL DESIGN						Ludlow Construction Company		
SPECIFICATION SECTION AND PARAGRAPH NUMBER	SCHEDUL E ACTIVITY ID	TEST REQUIRED	ACCREDITED/ APPROVED LAB YES /NO		SAMPLED BY	TESTED BY	LOCATION OF TEST ON/OFF SITE/SITE		DATE COMPLETED	DATE FORWARDED TO CUSTOMER	REMARKS
01 41 00		Construction Water Analytical Testing	X					X			
01 57 20		Hydrostatic Pressure Testing		X			X				
02 21 04		In-place Moisture & Density Content	X				X				
02 21 06		Gradation Analysis	X				X				
02 21 06		Liquid Limit, Plastic Limit & Plasticity Index	X				X				
02 21 013		Hydraulic Testing		X			X				



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SPECIFICATION SECTION AND PARAGRAPH NUMBER		SCHEDUL E ACTIVITY ID	TEST REQUIRED	ACCREDITED/ APPROVED LAB YES /NO		SAMPLED BY	TESTED BY	LOCATION OF TEST ON/OFF SITE/SITE		DATE COMPLETED	DATE FORWARDED TO CUSTOMER	REMARKS
30 30 06			Concrete Testing	X					X			



I. PROCEDURES COMPLETION OF REWORK ITEMS

Should a nonconformance be identified by an inspection, a systematic method will be used to control the item, correct it, and ensure that project quality is not adversely impacted by the event.

Nonconformances and their resolution are recorded on a Nonconformance Report form. A Nonconformance Report form exhibit is included in this subsection.

NONCONFORMANCE CONTROLS

Should a nonconformance be identified by an inspection there is a systematic method to control the item, correct it, and ensure that project quality is not adversely impacted by the event.

A nonconformance is any item that does not meet project specifications or Ludlow Construction Company Quality System requirements.

MARKING OF NONCONFORMANCES AND OBSERVATIONS

When the QC Manager, Project Superintendent, inspector, or customer identifies a nonconformance or an observation, the item is quickly and clearly marked by paint, tape, tag, or other easily observable signal to prevent inadvertent cover-up.

CONTROL THE CONTINUATION OF WORK

After the item is marked, the Project Superintendent determines if work can continue in the affected area:

CONTINUE WORK: When continuing work does not adversely affect quality or hide the defect, work may continue in the affected area while the disposition of the item is resolved. The Project Superintendent may place limitations on the continuation of work.

STOP WORK ORDER: When continuing work can adversely affect quality or hide the defect, work must stop in the affected area until the disposition of the item resolved. The Project Superintendent identifies the limits of the affected area. The Project Superintendent quickly and clearly marks the stop work area.

RECORDING OF NONCONFORMANCES

If nonconformances or observed items exist by the feature of work completion inspection, the Project Superintendent or inspector records the nonconformances on a nonconformance report.

The Project Superintendent sends the nonconformance report to the QC Manager.

QC MANAGER DISPOSITION OF NONCONFORMANCE REPORTS

When the QC Manager receives a Nonconformance Report, he or she makes an assessment of the affect the reported nonconformance has on form, fit, and function. The QC Manager may assign a disposition of either:



Quality Assurance/Quality Control Plan

REPLACE: The nonconformance can be brought into conformance with the original specification requirements by replacing the nonconforming product or material with a conforming product or material.

REPAIR: The nonconformance can be brought into conformance with the original requirements through re-machining, reassembly, reprocessing, reinstallation, or completion of the required operations.

REWORK: The nonconformance can be made acceptable for its intended use, even though it is not restored to a condition that meets all specification requirements. The QC Manager may specify standards that apply to the completion of rework. Rework nonconformances must be approved by the customer.

USE AS-IS: When the nonconforming item is satisfactory for its intended use. Any use as-is items that do not meet all specification requirements must be approved by the customer.

NONCONFORMANCE CORRECTIVE ACTIONS

The Project Superintendent verifies that corrective actions eliminate the nonconformance to the requirements of the original specifications or as instructed by the disposition of the nonconformance report, and then removes, obliterates, or covers the nonconformance marker.

Furthermore, the Project Superintendent ensures that previously completed work is reinspected for similar nonconformances and corrective actions are taken to avert future occurrences (see section 9.3 Corrective Actions).

CONTROL OF CORRECTIVE ACTIONS

When a nonconformance is found, the Project Superintendent ensures that:

- Previously completed work is reinspected for similar nonconformances
- Corrective actions are taken to avert future occurrences

The QC Manager identifies requirements for corrective actions with respect to frequency, severity, and detectability of quality nonconformances items found during and after completion of work activities.

When a solution requires changes to Ludlow Construction Company quality standards, the QC Manager makes modifications as necessary by making changes to:

- Material specifications
- Personnel qualifications
- Subcontractor and Supplier qualifications
- Company standards
- Inspection processes

CORRECTIVE ACTION TRAINING

The Project Superintendent initiates corrective action training to address quality nonconformances. Personnel and subcontractors and suppliers performing or inspecting work participate in the training.



Quality Assurance/Quality Control Plan

Heightened awareness during quality inspections verifies and documents compliance with the corrective action improvement items. A qualified Project Superintendent inspects corrective actions during regular quality inspections and records observations on the quality inspection form.

The Project Superintendent notifies affected subcontractors and suppliers of selected preventive action training requirements.

The Project Superintendent evaluates the effectiveness of the improvements. The QC Manager reviews improvement results recorded on quality inspection records and monthly field reviews. When the QC Manager determines that the improvement actions are effective, the item is no longer treated as a preventive action.

Additional detail on Ludlow Construction Company policies and procedures for the controlling nonconformances appear in Quality Manual section 9 Nonconformances and Corrective Actions.

NONCONFORMANCE PREVENTIVE ACTIONS

Fixing problems found during quality inspections is not sufficient. Systematic prevention of recurrences is essential for improving quality.

Ludlow Construction Company makes changes to solve the problem. Solutions may involve a combination of enhanced process controls, training, upgrade personnel qualifications, improved processes, or use of higher-grade materials.

Follow-up ensures that a problem is completely resolved. If problems remain, the process is repeated.

Additional detail on Ludlow Construction Company policies and procedures for the preventing nonconformances appear in Quality Manual section 10 Preventive Actions.



Quality Assurance/Quality Control Plan

**Ludlow Construction Company, Inc.
Nonconformance Report**

Version April 8, 2019

Nonconformance Report Control ID	Project ID	Project Name
	W912WJ19C0002	CONSTRUCT WATERLINE DURHAM MEADOWS, DURHAM CT
Preparer Signature/ Submit Date		QC Manager Signature / Disposition Date
Description of the requirement or specification		
Description of the nonconformance, location, affected area, and marking		
Disposition	Replace Repair Rework Use As-is	
	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
	Approval of disposition required by customer representative? Yes No	
	Customer approval signature /date: _____ <input type="checkbox"/> <input type="checkbox"/>	
Corrective Actions	Corrective actions completed Name/Date: _____	
	Customer acceptance of corrective actions required? Yes No	
	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Preventive Actions	Name/Date: _____	
	Preventive actions completed Name/Date: _____	

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J. DOCUMENTATION PROCEDURES

On this project, Ludlow Construction Company, Inc. will keep records of specific quality activities that occur through the duration of the project.

Additional quality records will be maintained using forms listed in Table J-1.

Table J-1

Form	Description
Project Quality Training Plan	Outlines project personnel responsible for training. (Attached as an Appendix)
Project Quality Communication Plan	Establishes quality meetings that should take place throughout the life of the project. (Attached as an Appendix)
Subcontractor & Supplier Quality Communication Plan	Establishes quality measures and scheduling with subcontractors and suppliers. (Attached as an Appendix)

Project quality records will be stored in the field office. As a backup, copies of records will be held offsite. The exact location will be determined at quality coordination meeting.

The Ludlow Construction Company, Inc. Quality Manual referenced in this quality plan is included as an appendix to this plan.

Project Quality Record Plan

The QC Manager identifies the quality records that will be maintained during the planning and execution of the project. Considerations include:

- Contract requirements for maintaining records
- The size of the project
- Types of activities
- The complexity of processes and their interactions
- The competence of personnel
- The duration of the project
- The need to demonstrate completion of work
- The need to demonstrate due diligence for quality system related activities
- Balancing the cost and benefits of maintaining the record



Project Quality Records Control

The QC Manager verifies the completeness, accuracy, and retention of project-specific Quality System records including:

- Inspection and test records
- Quality submittals to the customer
- Project quality system audits
- Field reviews
- Calibration certificates
- Daily log reports
- Incident reports
- Redline drawings
- Qualified personnel approvals
- Qualified subcontractor approvals
- Quality improvement records
- Project Quality records specified by customer contract, or contract technical specifications

The QC Manager assigns record control responsibilities and document location that apply to a specific project.

Project Quality Documents Control

The Project Manager controls documents related to specific customer contracts including:

- Customer contracts
- Contract technical specifications
- Contract drawings
- Shop drawing submittals and approvals
- Product data submittals and approvals
- Allowances and unit price submittals and approvals
- Requests for information and customer responses
- Subcontracts
- Inspection and test plans



K. LIST OF DEFINABLE FEATURES

Each feature of work is subject to the three phases of control and completion inspection described in the next subsection.

A listing of project features of work is included on the Quality Control Feature of Work List is included as an exhibit in this subsection.

The QC Manager identifies each phase of construction feature of work that requires separate quality controls. Each feature of work triggers a set of requirements for quality control inspections before, during and after features of work.

Additional detail on Ludlow Construction Company policies and procedures for the preparation of the feature of work appear in Quality Manual section 2.5 Identification of Quality Controlled feature of work.



Quality Assurance/Quality Control Plan

Ludlow Construction Company, Inc. Quality Controlled Feature of Work List

Version April 8, 2019

Project ID	Project Name	Preparer	Date
W912WJ19C0002	DURHAM MEADOWS WATERLINE REMEDIAL DESIGN, DURHAM CT	Jeremiah Anderson	April 8, 2019

Project Features of Work / Contract Section	Quality Controlled feature of work	Method for identification of Approved Inspection Status
02012	Protecting Existing Underground Utilities	QC Daily Report & Completed Inspection Checklist pg.67 of this plan
02013	Connections to Existing Buried Pipelines	QC Daily Report & Completed Inspection Checklist pg.67 of this plan
02100	Site Preparation	QC Daily Report & Completed Inspection Checklist pg.67 of this plan
02210	Earth Excavation, Backfill, Fill, & Grading	QC Daily Report & Completed Inspection Checklist pg.67 of this plan
02211	Rock Excavation	QC Daily Report & Completed Inspection Checklist pg.67 of this plan
02230	Site Cleaning	QC Daily Report & Completed Inspection Checklist pg.67 of this plan
02240	Dewatering	QC Daily Report & Completed Inspection Checklist pg.67 of this plan



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02371	Riprap Placement	QC Daily Report & Completed Inspection Checklist pg.67 of this plan
02740	Flexible Paving	QC Daily Report & Completed Inspection Checklist pg.67 of this plan
02820	Chain Link Fences and Gates	QC Daily Report & Completed Inspection Checklist pg.67 of this plan
02900	Paving	QC Daily Report & Completed Inspection Checklist pg.67 of this plan
02922	Hydroseeding	QC Daily Report & Completed Inspection Checklist pg.67 of this plan
03100	Concrete Formwork	QC Daily Report & Completed Inspection Checklist pg.67 of this plan
03300	Cast-in-Place Concrete	QC Daily Report & Completed Inspection Checklist pg.67 of this plan
03410	Precast Structural Concrete	QC Daily Report & Completed Inspection Checklist pg.67 of this plan
13225	Prestressed Concrete Tanks	QC Daily Report & Completed Inspection Checklist pg.67 of this plan
13300	Utility Control Instrument system	QC Daily Report & Completed Inspection Checklist pg.67 of this plan



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15400	Plumbing Systems	QC Daily Report & Completed Inspection Checklist pg.67 of this plan
16050	Electrical Work	QC Daily Report & Completed Inspection Checklist pg.67 of this plan



L. PROCEDURES FOR PERFORMING THE THREE PHASES OF CONTROL

Three phases of control and a feature of work completion inspection will be performed for each defined feature of work.

The controls and the forms that will be used to record control activities are included on table L-1.

Table L-1

Control	Form
Phase 1: Preparatory Phase	Preparatory Phase Checklist
Phase 2: Initial Phase	Initial Phase Checklist
Phase 3: Follow-up Phase	Contractor Quality Control Report
Feature of Work Completion Inspection	Feature of Work Inspection Form

Three Phases of Control and FOW Completion Inspection forms exhibits are included as an exhibit in this subsection.

PHASE 1: PREPARATORY PHASE

Phase 1 is the Preparatory Phase that plans quality for an upcoming feature of work. It includes a requirements review, site inspection, and a preparatory meeting. Records of the preparatory phase of control are recorded on the Preparatory Phase Checklist included as exhibits in this subsection.

Procedures that will be used on this project to conduct the Phase I preparatory phase of control are as follows.

PREPARATORY FEATURE OF WORK QUALITY CONTROL PLANNING

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

- Objectives and acceptance criteria of the feature of work
- Quality standards that apply to the feature of work



Quality Assurance/Quality Control Plan

- Work instructions, process steps, and product installation instructions that apply to the feature of work
- 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

PREPARATORY SITE INSPECTION

The Project 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 feature of work to begin
- Identifies potential problems

FEATURE OF WORK PREPARATORY QUALITY PLANNING MEETINGS

Prior to the start of a feature of work, the Project 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 Project Superintendent communicates the feature of work quality requirements and reinforces heightened awareness for critical requirements. Topics for a feature of work quality plan meeting include:

- Conflicts that need resolution
- Required quality documents and a verification of availability to personnel carrying out, supervising, or inspecting the feature of work
- 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
- Features of work quality inspection form

PHASE 2: INITIAL PHASE



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Phase 2 is the Initial Phase occurs when crews are ready to start work to ensure work begins only when it does not adversely impact quality results. Inspections are performed before work starts and after work starts.

Records of the initial phase inspection is maintained using the Initial Phase Checklist form appearing as an exhibit in this subsection.

Procedures that will be used on this project to conduct the Phase 2 initial phase of control are as follows.

JOB-READY INSPECTION BEFORE WORK BEGINS

For each feature of work, the Project Superintendent or a qualified inspector performs job-ready quality inspections to ensure that work activities begin only when they should begin. Job-ready quality inspections verify that conditions conform to the project quality requirements.

INITIAL WORK INSPECTION

For each feature of work, the Project Superintendent or a qualified inspector performs an initial work in process inspection when the first representative portion of a work activity is completed.

PHASE 3: FOLLOW-UP PHASE

Phase 3 is the follow-up phase that occurs while work is in process to assure that work conforms to quality project requirements and continues only when it does not adversely impact quality results.

Records of the follow-up phase inspection is maintained using the Initial Contractor Quality Control form appearing as an exhibit in this subsection. Records of the feature of work completion inspections is maintained using the Feature of Work Completion Inspection form appearing as an exhibit in this subsection.

Procedures that will be used on this project to conduct the Phase 3 Follow-up phase of control are as follows.

WORK IN PROCESS FOLLOW-UP

The Project Superintendent or a qualified inspector performs ongoing work in process quality inspections to ensure that work activities continue to conform to project quality requirements.

PUNCH ITEM CORRECTIONS

If the Project Superintendent or inspector observes an item for correction prior to a feature of work completion inspection, the item is identified for correction. During the feature of work completion inspection each punch item correction is verified.

Any outstanding punch items remaining after the feature of work completion inspection is deemed a nonconformance.

FEATURE OF WORK COMPLETION INSPECTION



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For each feature of work, the QC Manager inspects the completion of each feature of work to verify that work conforms to project quality requirements.

Completion quality inspections are performed for each feature of work. Completion quality inspections are conducted before starting other work activities that may interfere with an inspection.

Any outstanding punch items remaining after the feature of work completion inspection is deemed a nonconformance.



Quality Assurance/Quality Control Plan

PREPARATORY PHASE CHECKLIST		SPEC SECTION	DATE
(CONTINUED ON SECOND PAGE)			
CONTRACT NO	DEFINABLE FEATURE OF WORK	SCHEDULE ACT NO.	INDEX #
PERSONNEL PRESENT	GOVERNMENT REP NOTIFIED _____ HOURS IN ADVANCE: YES <input type="checkbox"/> NO <input type="checkbox"/> NAME _____ POSITION _____ COMPANY/GOVERNMENT _____		
SUBMITTALS	REVIEW SUBMITTALS AND/OR SUBMITTAL REGISTER. HAVE ALL SUBMITTALS BEEN APPROVED? YES <input type="checkbox"/> NO <input type="checkbox"/> IF NO, WHAT ITEMS HAVE NOT BEEN SUBMITTED? _____		
	ARE ALL MATERIALS ON HAND? YES <input type="checkbox"/> NO <input type="checkbox"/> IF NO, WHAT ITEMS ARE MISSING? _____		
	CHECK APPROVED SUBMITTALS AGAINST DELIVERED MATERIAL. (THIS SHOULD BE DONE AS MATERIAL ARRIVES.) COMMENTS: _____		
MATERIAL STORAGE	ARE MATERIALS STORED PROPERLY? YES <input type="checkbox"/> NO <input type="checkbox"/> IF NO, WHAT ACTION IS TAKEN? _____		
SPECIFICATIONS	REVIEW EACH PARAGRAPH OF SPECIFICATIONS. _____		
	DISCUSS PROCEDURE FOR ACCOMPLISHING THE WORK. _____		
	CLARIFY ANY DIFFERENCES. _____		
PRELIMINARY WORK & PERMITS	ENSURE PRELIMINARY WORK IS CORRECT and PERMITS ARE ON FILE. IF NOT, WHAT ACTION IS TAKEN? _____		



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PREPARATORY PHASE CHECKLIST page 2 (CONTINUED FROM FIRST PAGE)		SPEC SECTION	DATE
CONTRACT NO	DEFINABLE FEATURE OF WORK	SCHEDULE ACT NO.	INDEX #
TESTING	IDENTIFY TEST TO BE PERFORMED, FREQUENCY, and BY WHOM. _____		
	WHEN REQUIRED? _____		
	WHERE REQUIRED? _____		
	REVIEW TESTING PLAN. _____		
	HAS TEST FACILITIES BEEN APPROVED? _____		
SAFETY	ACTIVITY HAZARD ANALYSIS APPROVED? YES <input type="checkbox"/> NO <input type="checkbox"/>		
	REVIEW APPLICABLE PORTION OF EM 385-1-1.		
MEETING COMMENTS	NAVY/ROICC COMMENTS DURING MEETING.		
OTHER ITEMS OR REMARKS	OTHER ITEMS OR REMARKS:		
QC MANAGER _____ DATE _____			



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INITIAL PHASE CHECKLIST		SPEC SECTION	DATE
CONTRACT NO		DEFINABLE FEATURE OF WORK	SCHEDULE ACT NO.
		INDEX #	
PERSONNEL PRESENT	GOVERNMENT REP NOTIFIED _____ HOURS IN ADVANCE: YES <input type="checkbox"/> NO <input type="checkbox"/>		
	NAME	POSITION	COMPANY/GOVERNMENT
PROCEDURE COMPLIANCE	IDENTIFY FULL COMPLIANCE WITH PROCEDURES IDENTIFIED AT PREPARATORY. COORDINATE PLANS, SPECIFICATIONS, and SUBMITTALS.		
	COMMENT S: _____		
PRELIMINARY	ENSURE PRELIMINARY WORK IS COMPLETE and CORRECT. IF NOT, WHAT ACTION IS TAKEN?		
WORKMANSHIP	ESTABLISH LEVEL OF WORKMANSHIP.		
	WHERE IS WORK LOCATED? _____		
	IS SAMPLE PANEL REQUIRED? YES <input type="checkbox"/> NO <input type="checkbox"/>		
	WILL THE INITIAL WORK BE CONSIDERED AS A SAMPLE? YES <input type="checkbox"/> NO <input type="checkbox"/>		
RESOLUTION	RESOLVE ANY DIFFERENCES.		
	COMMENTS: _____		
CHECK SAFETY	REVIEW JOB CONDITIONS USING EM 385-1-1 and JOB HAZARD ANALYSIS		
	COMMENTS: _____		
OTHER	OTHER ITEMS OR REMARKS		
<div style="display: flex; justify-content: space-between;"> QC MANAGER _____ DATE _____ </div>			



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CONTRACTOR QUALITY CONTROL REPORT		DATE	
(ATTACH ADDITIONAL SHEETS IF NECESSARY)		REPORT NO	
PHASE	CONTRACT NO	CONTRACT TITLE	
PREPARATORY	WAS PREPARATORY PHASE WORK PERFORMED TODAY? YES <input type="checkbox"/> NO <input type="checkbox"/> IF YES, FILL OUT and ATTACH SUPPLEMENTAL PREPARATORY PHASE CHECKLIST.		
	Schedule Activity No.	Definable Feature of Work	Index #
INITIAL	WAS INITIAL PHASE WORK PERFORMED TODAY? YES <input type="checkbox"/> NO <input type="checkbox"/> IF YES, FILL OUT and ATTACH SUPPLEMENTAL INITIAL PHASE CHECKLIST.		
	Schedule Activity No.	Definable Feature of Work	Index #
FOLLOW-UP	WORK COMPLIES WITH CONTRACT AS APPROVED DURING INITIAL PHASE? YES <input type="checkbox"/> NO <input type="checkbox"/> WORK COMPLIES WITH SAFETY REQUIREMENTS? YES <input type="checkbox"/> NO <input type="checkbox"/>		
	Schedule Activity No.	Description of Work, Testing Performed & By Whom, Definable Feature of Work, Specification Section, Location and List of Personnel Present	
REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)		REWORK ITEMS CORRECTED TODAY (FROM REWORK ITEMS LIST)	
Schedule Activity No.	Description	Schedule Activity No.	Description
REMARKS (Also Explain Any Follow-Up Phase Checklist Item From Above That Was Answered "NO", Manuf. Rep On-Site, etc.)			
Schedule Activity No.	Description		
On behalf of the contractor, I certify that this report is complete and correct and equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report. DATE _____ AUTHORIZED QC MANAGER AT SITE			
GOVERNMENT QUALITY ASSURANCE REPORT		DATE	
QUALITY ASSURANCE REPRESENTATIVE'S REMARKS AND/OR EXCEPTIONS TO THE REPORT			
Schedule Activity No.	Description		
GOVERNMENT QUALITY ASSURANCE MANAGER		DATE	



Quality Assurance/Quality Control Plan

CONTRACTOR QUALITY CONTROL REPORT Page 2 (CONTINUATION SHEET) (ATTACH ADDITIONAL SHEETS IF NECESSARY)			DATE		
			REPORT NO.		
PHASE	CONTRACT NO.	CONTRACT TITLE			
FOLLOW-UP	WORK COMPLIES WITH CONTRACT AS APPROVED DURING INITIAL PHASE?		YES <input type="checkbox"/>	NO <input type="checkbox"/>	
	WORK COMPLIES WITH SAFETY REQUIREMENTS?		YES <input type="checkbox"/>	NO <input type="checkbox"/>	
	Schedule Activity No.	Description of Work, Testing Performed & By Whom, Definable Feature of Work, Specification Section, Location and List of Personnel Present			
	REMARKS (Also Explain Any Checklist Item From Above That Was Answered "NO"), Manuf. Rep. On-Site, etc.				
	Schedule Activity No.	Description			



Quality Assurance/Quality Control Plan

Ludlow Construction Company, Inc. Feature of Work Inspection Form

Version April 8, 2019

Feature of Work :

Project: Id#
W912WJ19C0002

Project Name:
CONSTRUCT WATERLINE DURHAM
MEADOWS, DURHAM CT

Subcontractor and Supplier Company
ID/Name:

Location/Area: NCTMAS LANT DET Cutler, Cutler, ME

Reference drawing version #:

Crew ID/Name

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 feature of work completion inspection requirements
- ☐ Compliance with inspection and test plan

Heightened Awareness Checkpoints

- ☐ [Insert items identified at project startup and preparatory meetings]
- ☐
- ☐
- ☐
- ☐

Production Notes:

Reported Nonconformances:

Verification of Feature of Work Completion (sign and date)

Subcontractor and Supplier Sign and date*:
Feature of work verified complete to specifications (sign and date)

Project Superintendent Sign and date*:
Feature of work verified complete to specifications (sign and date)

Project Superintendent score subcontractor/crew performance and feedback notes

Quality: 5 4 3 2 1
Safety: 5 4 3 2 1
Delivery: 5 4 3 2 1

QC Manager Sign and date*:
Feature of work verified complete to specifications (sign and date)

QC Manager score quality performance and feedback notes

Quality: 5 4 3 2 1

* On behalf of the contractor, I certify that this report is complete and correct and equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.



M. PERSONNEL MATRIX

A personnel matrix is not applicable to the project. The appointed quality control personnel have quality responsibility and authority for all features of work.



N. PROCEDURES FOR COMPLETION INSPECTION

Ludlow Construction Company, Inc. will conduct a series of completion inspections near the end of the project to assure that the project is completed to specifications. The inspections consist of a punch-out inspection, pre-final inspection, and final acceptance inspection.

A Record of each of the inspections will be maintained on the Project Completion Inspection form. If punch items are discovered during the inspection, a record of the punch items and their correction will be maintained on the Punch List form. Project Completion Inspection and Punch List form exhibits are included as an exhibit in this subsection.

PUNCH-OUT QC INSPECTION

Near the end of the project, or a milestone established in the Project Quality Inspection and Test Plan, the QC Manager will inspect the completed project and verify conformance to contract specifications.

The QC Manager records nonconforming items.

The Project Superintendent assigns a planned date by which the deficiencies will be corrected. The date may be assigned for all items or individual items as necessary. After corrections have been made, the Project Superintendent verifies the completion of each item.

Then the QC Manager conducts a follow-up inspection and verifies that all nonconforming items have been corrected to meet contract specifications. Any remaining deficiencies are recorded and managed as nonconformances.

When the pre-final Ludlow Construction Company inspection process is complete, the QC Manager then notifies the customer that the project is ready for the customer's final inspection. The customer is also notified of any remaining nonconformances and their planned resolution.

Electronic Files along with O&M documentation has already been listed to the Ludlow Construction Punch-List, thus ensuring these items will be delivered prior to close out of the project.

PRE-FINAL CUSTOMER INSPECTION

If the customer performs a pre-final inspection, the QC Manager records nonconforming items and assigns a planned date by which the deficiencies will be corrected.

The Project Superintendent assigns a planned date by which the deficiencies will be corrected. The date may be assigned for all items or individual items as necessary. After corrections have been made, the Project Superintendent verifies the completion of each item.



Quality Assurance/Quality Control Plan

After corrections have been made, the QC Manager will conduct a follow-up inspection and verify that all nonconforming items have been corrected to meet contract specifications. Any remaining deficiencies are recorded and then managed as nonconformances.

When the pre-final customer inspection process is complete, the QC Manager then notifies the customer that the project is ready for the customer's Final inspection. The customer is also notified of any remaining nonconformances and their planned resolution.

FINAL ACCEPTANCE CUSTOMER INSPECTION

If the customer performs a final inspection, the Quality Control Manager, Project Superintendent, and Project Manager will participate in the inspection. The QC Manager records nonconforming items and assigns a planned date by which the deficiencies will be corrected. The date may be assigned for all items or individual items as necessary. After corrections have been made, the Project Superintendent verifies the completion of each item.

After corrections have been made, the QC Manager will conduct a follow-up inspection and verify that all nonconforming items have been corrected to meet contract specifications. Any remaining deficiencies are recorded managed as nonconformances.

When the final customer inspection process is complete, the QC Manager then notifies the customer that the project is ready for the customer's follow-up verification. The customer is also notified of any remaining nonconformances and their planned resolution.

Remedial Action Report:

Upon approval of Construction Completion Ludlow Construction Company will in accordance with Section 01 78 00 paragraph 1.4 Remedial Action Report, provide a statement from the company as well as a registered professional engineer (To be Determined). This statement will attest that construction of the system has been fully completed, and is functioning properly as designed. Ludlow Construction will provide a demonstration with supporting test results that construction of the system is completed and working as designed. Along with the demonstration and supporting test documentation Ludlow Construction will provide as copy of the as-built drawings stamped by a registered professional engineer licensed in the State of Connecticut (RPE to be named prior to completion of as-built drawings).



Quality Assurance/Quality Control Plan

Ludlow Construction Company, Inc. Punch List						
Version April 8, 2019						
Project ID	Project Name		Punch List Type			
W912WJ19C0002	DURHAM MEADOWS WATERLINE REMEDIAL DESIGN, DURHAM CT		<input type="checkbox"/> Features of Work <input type="checkbox"/> Project Final Punch <input type="checkbox"/> Pre-Final Customer Inspection <input type="checkbox"/> Final Acceptance Inspection			
Inspection Date	Preparer					
Item	Location	Description	Due Date	Compl. Date	Item Completion Verification	
					Super Initial	QA Initial
1	01 78 23 1.2	Operation and Maintenance Data				
2	01 78 00 1.5.1.3	Computer Aided Design & Drafting (CADD)				
Punch List Completion Date		Final QA Sign-off	Remaining Nonconformances Reported ID # and Description			



Quality Assurance/Quality Control Plan

Ludlow Construction Company, Inc. Project Completion Inspection Form

Version April 8, 2019

Project: ID:	Project Name:	Location/Area:	
W912WJ19C0002	DURHAM MEADOWS WATERLINE REMIDIAL DESIGN, DURHAM CT	DURHAM, CT	
Compliance Verification <input type="checkbox"/> Compliance with material inspection and tests <input type="checkbox"/> Compliance with inspection requirements <input type="checkbox"/> Compliance with functional tests if required <input type="checkbox"/> Compliance with inspection and test plan <input type="checkbox"/> Punch lists corrections complete		Heightened Awareness Checkpoints <input type="checkbox"/> [Insert items identified at project startup, preparatory and status meetings] <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Notes:			
Reported Nonconformances:			
Verification of Project Completion (sign and date)			
Project Superintendent verified complete to specifications (sign and date)		Sign and date*:	
QC Manager verified complete to specifications (sign and date)		Sign and date*:	
* On behalf of the contractor, I certify that this report is complete and correct and equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.			



O. TRAINING PROCEDURES AND TRAINING LOG

Ludlow Construction Company, Inc. will conduct project-specific training to assure all company and supplier personnel have the knowledge necessary to carry out their quality responsibilities.

A project training plan matrix identifies quality system training topics and categories of personnel that will be trained. The Project Quality Training Plan exhibit is included in this subsection.

Training assessments will be conducted during the preparatory planning for each feature of work, and findings will be recorded on the Training Plan and Log form.

Customer training related to operations and maintenance will be provided as the project nears its end. Specific customer training topics will be assessed at coordination meetings during the project. A record of planned customer training activities will be included on the Training Plan and Log form.

After a training activity is completed, a record of both the training activity and the training participants will be maintained on a Training Plan and Log form. A Training Plan and Log form is included as an exhibit in this subsection.

PROJECT QUALITY TRAINING

The QC Manager ensures that all employees receive training relevant to their quality responsibilities.

The QC Manager ensures that all subcontractors and suppliers receive training on relevant elements of the Ludlow Construction Company Quality System, Project Quality Assurance/Quality Control Plan, and quality standards.

The Quality Manager identifies the training needs of all personnel performing activities that affect quality. Training topics may include:

- The Ludlow Construction Company Quality System
- The Ludlow Construction Company Quality Policy
- Operating policies identified in the Quality Manual
- Quality standards cited in the Quality Manual, or project documents, or records
- Relevant quality standard operating procedures

Additional detail on Ludlow Construction Company policies and procedures regarding training appear in Quality Manual sections 2.8 Project Quality Training Plan, 2.3.3 Personnel Qualifications, 6.2 Qualification of Outside Organizations and Company Departments, and 7.3 Preparatory Project Quality Assurance/Quality Control Plan.



Quality Assurance/Quality Control Plan

Ludlow Construction Company, Inc.
Training Plan

Version April 8, 2019

Project ID	Project Name	Preparer	Date	
W912WJ19C0002	DURHAM MEADOWS WATERLINE REMIDIAL DESIGN, DURHAM CT		April 8, 2019	

Training Title/ID	Training Description	When Required (date, milestone or event)	Planned Participants (Job Position/Organization)	Notes



Ludlow Construction Company, Inc.
Training Log

Version April 8, 2019

Project ID	Project Name				
W912WJ19C0002	DURHAM MEADOWS WATERLINE REMIDIAL DESIGN, DURHAM CT				

Training Title/ID	Training Date	Participant Name	Participant Signature	Trainer Signature Of Completion	Notes



P. ORGANIZATION AND PERSONNEL CERTIFICATIONS

Ludlow Construction Company, Inc. has the organizational certifications required for this project. Certifications are listed on the Project License and Qualifications form and the certificates are included as an exhibit in this subsection.

Personnel working on this project will have certifications required for this project. Certifications of key personnel are listed on the Personnel Certifications and Licenses form and included as an exhibit in this subsection. Additional personnel that require certificates will be listed on the form and certificates included as an amendment to this quality control plan.

COMPANY QUALIFICATIONS

The QC Manager defines quality-related company credentials for each project feature of work that affects quality.

PERSONNEL CERTIFICATIONS

The QC Manager defines quality-related credentials for each project job position that affects quality.

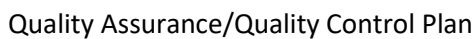


Quality Assurance/Quality Control Plan

**Ludlow Construction Company, Inc.
Project License and Qualifications**

Version April 8, 2019

Project ID	Project Name	Approval	Approved By
W912WJ19C0002	Durham Meadow Waterline Remedial Design, Durham, CT	<input type="checkbox"/> Yes <input type="checkbox"/> Conditional <input type="checkbox"/> No	
Review Topics	Project quality-related credential requirements		
	Licenses required:	License and expiration dates:	
	Certification required:	Certifications and expiration dates:	
	Training required:	Training completed and expiration date:	
	Type and length of experience required:	Certifications and expiration dates:	
	Personnel license, certification, and training required:	List each person's credentials on the Subcontractor and Supplier Certifications and Licenses form.	
	Qualifications		
	QUALIFICATION NOTES:		



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[illegible]



Q. DESIGN CONTROL

No design controls are required for this project.



R. QUALITY ASSURANCE SURVEILLANCE

We manage overall project performance by setting performance objectives, measuring actual performance, and managing performance improvements. Overall performance objectives will be designed to extend our customer's performance work objectives into Ludlow Construction Company operations. Each objective will have specific and verifiable measures.



S. ADDITIONAL QUALITY CONTROL REQUIREMENTS

Below is a list of project quality control requirements that have not been included elsewhere in this project quality plan, if any.

Additional Quality Control Requirements as Required by Contract Specifications or Quality Assurance:
(with reference to the section amended)



Ludlow Construction Company, Inc.

Quality Manual

Operating Policies of the Ludlow Construction Company Quality System

Version Date: April 8, 2019

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QUALITY MANUAL

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PROJECT QUALITY MANAGEMENT

The President forms a team consisting of a QC Manager, Project Manager, and Project Superintendent.

First, the QC Manager assembles a set of project specifications that includes customer specifications and requirements, regulations, industry standards, product instructions, and Ludlow Construction Company quality standards. Ludlow Construction Company operating policies assure compliance to the project specifications.

The QC Manager evaluates personnel, subcontractors and suppliers, materials, and suppliers, and ensures that only those that are capable and qualified are included on the project. Training is provided to ensure that all personnel involved understand their project feature of work requirements as well as their quality responsibilities and authorities.

The QC Manager then details how the quality is controlled throughout the construction process through a listing of all feature of work inspections and tests that will be performed.

As the project proceeds and prior to starting each construction feature of work, the Project Superintendent coordinates detailed quality requirements and resources, site conditions, and communicates them through a meeting with all interested parties. The Project Superintendent amends feature of work inspection checklists with items for heightened awareness based on the concerns of all parties.

The subcontractors and suppliers, Project Superintendent, and QC Manager use inspection checklists to monitor conformance of each feature of work to the project specifications before, during, and at completion. Laboratory and functional tests are performed to assure performance results.

Should quality nonconformance occur, they are systematically segregated, controlled and corrected. Improvements are made to prevent recurrences.

Throughout the project, the QC Manager performs on-site quality audits to ensure that the Ludlow Construction Company Quality System is operating effectively.



CROSS REFERENCES

The Ludlow Construction Company, Inc. Quality System complies with US Army Corps of Engineers Quality Control Requirements "USACE".

USACE Requirements Section	Quality Manual Section
1.5 QC Organization	2.3.1 Project Organization Chart
1.6 Quality Control Plan	2 Project Quality Assurance/Quality Control Plan
1.7 QC Plan Meetings	2 Project Quality Assurance/Quality Control Plan
1.8 Coordination and Mutual Understanding Meeting	7.3 Preparatory Project Quality Assurance/Quality Control Plan Planning
1.9 QC Meetings	7.4 Weekly Quality Planning and Coordination Meetings
1.10 Design Review and Documentation	3.7 Contract Review and Approval 4.2 Design Input Review
1.11 Three Phases of Control	7.3 Preparatory Project Quality Assurance/Quality Control Plan 8.4.1.2 Initial Work in process Inspection 8.4.1.3 Follow-up Work in Process Inspections
1.12 Submittal Review and Approval	3.4 Contract Submittals
1.13 Testing	6.2.1.1.1 Independent Laboratory Credential Requirements 8.14 Inspection and Test Records
1.14 QC Certifications	Daily Quality Control Report7.6 Daily Quality Control Report 8.15 Project Completion and Closeout Inspection
1.15 Completion Inspections	8.15 Project Completion and Closeout Inspection
1.16 Training	2.9 Customer Training On Operation and Maintenance
1.17 Documentation	12 Record and Document Controls
1.18 Notification of Noncompliance	9 Nonconformances and Corrective Actions



1. QUALITY SYSTEM MANAGEMENT AND RESPONSIBILITIES

SYSTEM OF PERSONAL QUALITY ACCOUNTABILITY

1.1. OVERVIEW

Responsibilities for quality are specified not only for compliance with policies and procedures but also so that decisions are based on principles that ensure quality.

Documented responsibilities ensure that expected behaviors are communicated throughout the company rather than left to discretionary interpretation.

1.2. LUDLOW CONSTRUCTION COMPANY, INC. QUALITY POLICY

Quality is everyone's responsibility. The President holds everyone in the organization personally accountable for adhering to the Ludlow Construction Company Quality System policies and procedures.

The Ludlow Construction Company, Inc. Quality Policy describes the Ludlow Construction Company commitment to quality and reinforces compliance with the Quality System.

The President communicates the Quality Policy message throughout the company so that all employees understand their respective quality responsibilities.

The President reviews the Ludlow Construction Company Quality Policy with all employees at least annually.

The President ensures that a copy of the Ludlow Construction Company Quality Policy is distributed to all employees and is posted in all offices.

1.3. QUALITY DUTIES, RESPONSIBILITIES, AND AUTHORITY

1.3.1. PRESIDENT: QUALITY DUTIES, RESPONSIBILITIES, AND AUTHORITY

While everyone is responsible for quality, the President is the one person in the company ultimately responsible for quality. Regardless of other duties, quality responsibilities of the President include:

- Ensuring that each employee understands his or her quality responsibilities as well as Ludlow Construction Company quality policies
- Establishing company quality policies and objectives
- Conducting management reviews of the Ludlow Construction Company Quality System
- Ensuring the availability of necessary resources and information for effective operation of the Quality System
- Demonstrating commitment to the Ludlow Construction Company Quality System and its integrity
- Ensuring achievement of Ludlow Construction Company quality objectives
- Continuously improving the Quality System



Quality Assurance/Quality Control Plan

1.3.2. QC MANAGER: QUALITY DUTIES, RESPONSIBILITIES, AND AUTHORITY

The QC Manager is responsible for ensuring the overall effectiveness of the Quality System for a specific project. Regardless of other duties, the QC Manager is responsible for:

- Planning project quality controls required by the Ludlow Construction Company quality systems and contract requirements
- Fully implementing all provisions of the Ludlow Construction Company Quality System and related documents on the project.
- Manage the operation of the Ludlow Construction Company Quality System on the project.
- Implement and manage all phases of quality control
- Communicating project-specific quality requirements to all affected departments, subcontractors and suppliers, and customers
- Ensuring that the Quality System is established and implemented by persons doing work that impacts quality
- Monitoring progress of activities
- Ensuring that the Quality System is maintained
- Acting as the project quality liaison with parties outside the company on matters relating to quality
- Reporting to senior management on performance of the Quality System, including needed improvements
- Review and approval of all project Quality System records
- Review and approval of project quality-related contract submittals
- Managing all project inspection and quality control activities
- Controlling corrective actions
- Resolving quality nonconformances

The QC Manager has the authority to:

- Stop work when continuing work may adversely affect quality or cover up a defect
- Prevent the use of materials that may adversely affect quality or cover up a defect
- To direct the removal and replacement of any non-conforming work or material by Ludlow Construction Company, any subcontractor, or any supplier.
- Suspend work and/or supply of materials by any staff member, subcontractor personnel, or supplier as deemed necessary to assure quality results.

Alternate QC Managers acting in the role of the project QC Manager has the same quality duties, responsibilities and authority as the project QC Manager.

1.3.3. PROJECT MANAGER: QUALITY DUTIES, RESPONSIBILITIES, AND AUTHORITY

The Project Manager is the one person responsible for management of a specific project. Regardless of other duties, the Project Manager is responsible for:

- Demonstrating commitment to the Ludlow Construction Company Quality System and its integrity
- Ensuring achievement of project quality objectives
- Providing adequate resources for effective operation of the Quality System on the project
- Ensuring that each design employee understands his or her quality responsibilities as well as Ludlow Construction Company quality policies
- Ensuring that each project employee understands his or her quality responsibilities as well as Ludlow Construction Company quality policies



Quality Assurance/Quality Control Plan

- Conducting management reviews of the Ludlow Construction Company Quality System
- Ensuring the availability of necessary resources and information for effective operation of the Ludlow Construction Company Quality System

The Project Manager has authority to:

- Stop work when continuing work adversely affects quality or covers up a defect
- Prevent the use of materials that would adversely affect quality or cover up a defect
- Suspend work and/or supply of materials by any staff member, subcontractor personnel, or supplier as deemed necessary to assure quality results.

1.3.4. PROJECT SUPERINTENDENT: QUALITY DUTIES, RESPONSIBILITIES, AND AUTHORITY

A Project Superintendent verifies that work performed by subcontractors and suppliers and Ludlow Construction Company work crews conforms to Ludlow Construction Company quality standards. The President appoints one or more Project Superintendents for each project.

A Project Superintendent has specific responsibilities for:

- Ensuring that work meets government regulatory and code requirements, customer requirements, contract requirements, contract technical specifications, contract drawings, approved contract submittals, and company quality standards and specifications
- Ensuring that subcontractors and suppliers begin work in accordance with Ludlow Construction Company start-work policies
- Ensuring that subcontractors and suppliers receive a notice to work only when conditions will not adversely affect quality results
- Conducting quality inspections, tests, and recording findings
- Accurately assessing subcontractor quality and on-time performance
- Ensuring that quality standards are achieved before approving subcontractor or work crew completion of work

The Project Superintendent has the authority to:

- Stop work when continuing work may adversely affect quality or cover up a defect
- Prevent the use of materials that may adversely affect quality
- Direct the removal or replacement of any non-conforming work or material
- Suspend work and/or supply of materials as deemed necessary to assure quality results

Alternate Project Superintendent has the same quality duties, responsibilities and authority as the Project Superintendent. Multiple Project Superintendents may be assigned to the project.

1.3.5. ALL EMPLOYEES: QUALITY DUTIES, RESPONSIBILITIES, AND AUTHORITY

All employees have quality responsibilities that include:

- Conformance to project quality requirements
- Compliance with the project quality plan
- Meeting or exceeding all applicable regulations, codes, industry standards, and manufacturer specifications as well as meeting or exceeding our customers' contract and individual requirements.
- Fully implementing and complying with all provisions of the Ludlow Construction Company Quality Manual.



Quality Assurance/Quality Control Plan

All employees have the authority to:

- Stop work when continuing work may adversely affect quality or cover up a defect
- Prevent the use of materials that may adversely affect quality

1.4. QUALITY SYSTEM PERFORMANCE MEASURES

Company-wide quality performance measures evaluate the effectiveness of the Quality System. The following indicators are the primary measures of quality performance:

- Number of customer correction items identified at the project closeout quality inspection
- Customer satisfaction feedback

At least annually, President(s) evaluate Ludlow Construction Company quality performance and set improvement goals.

1.5. CUSTOMER SATISFACTION PERFORMANCE MEASURES

Ludlow Construction Company obtains feedback after project completion on whether customer quality expectations are being met, and to what extent. The President analyzes customer satisfaction data to determine opportunities for improvement and address any items of customer dissatisfaction.

1.6. EXCEPTIONS

Exceptions to the Ludlow Construction Company Quality System and customer contract requirements are tightly controlled:

- Exceptions to compliance to contract specifications are approved only by the customer and the QC Manager.
- Exceptions to the Ludlow Construction Company Quality System not specified by contract requirements are approved only by President or the QC Manager.

Exceptions are recorded in memoranda, change orders (Section 3.4.6 Change Order), or otherwise clearly documented.



2. PROJECT QUALITY ASSURANCE/QUALITY CONTROL PLAN

2.1. OVERVIEW

After Ludlow Construction Company is awarded a contract to carry out a construction project, the President forms a team consisting of a QC Manager, Project Manager, and Project Superintendent.

First, the QC Manager develops a set of project specifications that align project requirements with customer specifications and requirements, regulations, industry standards, product instructions, and Ludlow Construction Company quality standards.

The QC Manager evaluates personnel, subcontractors and suppliers, materials, and suppliers, and ensures that only those that are capable and qualified are included on the project. Training is provided to ensure that all personnel involved in the project understand their quality responsibilities and authorities.

The QC Manager then details how the quality is controlled throughout the construction process through a quality inspection and test plan that specifies requirements and pass/fail criteria for quality inspections and tests. Ludlow Construction Company operating policies assure compliance to the project specifications.

As the project proceeds and prior to starting each construction task, the Project Superintendent coordinates detailed requirements and resources, site conditions, and communicates them through a meeting with all interested parties. The Project Superintendent amends inspection specific checklists with items for heightened awareness based on the concerns of all parties.

The subcontractors and suppliers and Project Superintendent use the quality inspection forms to monitor execution of the construction process through a series of quality inspections before, during, and at the completion of each construction task. Laboratory and functional tests are performed to assure performance results.

Should nonconformances occur, they are systematically controlled and corrected. Improvements are made to prevent recurrences.

Throughout the project there are standard operating procedures and forms for creating, maintaining, and controlling quality documents and records.

Throughout the project, the QC Manager performs on-site quality audits to ensure that the Ludlow Construction Company Quality System is operating effectively.

2.2. LUDLOW CONSTRUCTION COMPANY PROJECT LICENSE AND QUALIFICATION REQUIREMENTS

The QC Manager identifies company license and qualification credentials required by contract specifications and government regulators. The QC Manager obtains records, certificates, and license records that provide verification of Ludlow Construction Company credentials.

2.2.1.1. REQUIRED COMPANY LICENSES AND CERTIFICATIONS



Quality Assurance/Quality Control Plan

The QC Manager defines quality-related company credentials for each project feature of work that affects quality.

2.3. PROJECT PERSONNEL AND QUALIFICATIONS

2.3.1. PROJECT ORGANIZATION CHART

The President defines the organization chart for the project. The organizational chart includes job titles, names of assigned personnel, and organizational and administrative interfaces with the customer. The organization chart defines lines of authority as indicated by solid connection; dotted lines indicate lines of communication. The lines of authority preserve independence of quality control personnel from the pressures of production.

The President assesses the qualification requirements for each position on the project organization chart, qualifications of each person, and then appoints only qualified persons to the project organization.

2.3.2. APPOINTMENT OF KEY PROJECT PERSONNEL

The President forms a project management team consisting of:

- A QC Manager
- A Project Manager
- A Project Superintendent
- A QC Manager (if required)

The President appoints qualified persons to each project management job position with specific quality responsibilities and authorities. The President assesses the qualifications of each person before the appointment is made.

The President keeps a record of the appointment and signs the document. The person accepts the appointment by signing a declaration as a competent person.

Work steps for maintaining appointment of key project personnel are specified in Standard Operating Procedure 2.3.2 Appointment of Key Project Personnel.

2.3.3. PERSONNEL QUALIFICATIONS

The QC Manager qualifies employee capabilities to ensure that they are capable of completely carrying out their assigned quality responsibilities including the following capabilities:

- Knowledge of Company quality standards
- Knowledge of job responsibilities and authority
- Demonstrated skills and knowledge
- Demonstrated ability
- Demonstrated results
- Required training
- Required experience

The QC Manager also evaluates independent contractor personnel on the same standards that apply to employees.

2.3.3.1. REQUIRED LICENSES AND CERTIFICATIONS



Quality Assurance/Quality Control Plan

The QC Manager defines quality-related credentials for each project job position that affects quality.

2.4. PROJECT QUALITY ASSURANCE/QUALITY CONTROL PLAN

Before project work begins, the Project Manager prepares a construction process plan that defines the sequence of each feature of work and related quality inspections. The construction process plan is documented through an integrated and coordinated set of documents that includes:

- A schedule consisting of a sequence of each feature of work and activities required to complete a project
- The customer contract (Section 3 Contract Specifications) including contract technical specifications and contract drawings
- Required quality inspections and tests (Section 8.2 Required Feature of Work Quality Inspections and Tests) and the project Quality Inspection and Test Plan when required
- The Contract Submittal Schedule (Section 3.4.1 Contract Submittal Schedule)

2.5. IDENTIFICATION OF QUALITY CONTROLLED FEATURES OF WORK

The QC Manager identifies each phase of construction feature of work that requires separate quality controls. Each feature of work triggers a set of requirements for quality control inspections before, during and after features of work.

2.6. PROJECT QUALITY INSPECTION AND TEST PLAN

The QC Manager prepares quality inspection and test plans for a project that identifies:

- Each required quality inspection and/or test
- Inspection and test specifications for each required quality inspection or test
- Hold points for customer quality inspection
- Specification requirements for each quality inspection and test

2.7. PROJECT QUALITY COMMUNICATIONS PLAN

After Ludlow Construction Company is awarded a contract, the Project Manager plans the methods of communications among the customer, subcontractors and suppliers and Ludlow Construction Company.

2.8. PROJECT QUALITY TRAINING PLAN

The QC Manager ensures that all employees receive training relevant to their quality responsibilities.

The QC Manager ensures that all subcontractors and suppliers receive training on relevant elements of the Ludlow Construction Company Quality System, Project Quality Assurance/Quality Control Plan, and quality standards.

The Quality Manger identifies the training needs of all personnel performing activities that affect quality. Training topics may include:

- The Ludlow Construction Company Quality System
- The Ludlow Construction Company Quality Policy
- Operating policies identified in the Quality Manual
- Quality standards cited in the Quality Manual, or project documents, or records



Quality Assurance/Quality Control Plan

- Relevant quality standard operating procedures

2.9. CUSTOMER TRAINING ON OPERATION AND MAINTENANCE

During the project closeout phase, the QC Manager trains customers on the operation and maintenance of the completed project, including as applicable:

- A review of as-built drawings
- Installed product identification and warranty requirements
- A review of documentation regarding start-up, operation, and shutdown
- Normal adjustments and maintenance requirements
- Limitations on use

2.10. PROJECT RECORDS AND DOCUMENTATION PLAN

The QC Manager identifies the quality records that will be maintained during the planning and execution of the project. Considerations include:

- Contract requirements for maintaining records
- The size of the project
- Types of activities
- The complexity of processes and their interactions
- The competence of personnel
- The duration of the project
- The need to demonstrate completion of work
- The need to demonstrate due diligence for quality system related activities
- Balancing the cost and benefits of maintaining the record

2.11. PROJECT AUDIT PLAN

The QC Manager identifies the frequency of project quality audit that will be conducted during the project and the job position that will conduct the audits. Considerations include:

- The size of the project
- The complexity of processes and their interactions
- The duration of the project



3. CONTRACT SPECIFICATIONS

DEFINE CUSTOMER QUALITY EXPECTATIONS

3.1. OVERVIEW

Fulfilling customer contract expectations is a primary objective of the Ludlow Construction Company Quality System. To ensure that customer expectations will be fulfilled, Ludlow Construction Company clearly defines the requirements for each contract before it is approved.

The Project Manager ensures that the information in customer contracts clearly defines customer expectations and that the necessary details are provided to set requirements for construction.

3.2. CONTRACT TECHNICAL SPECIFICATIONS

The Project Manager obtains contract technical specifications from the customer.

For each specific contract, The President identifies supplemental technical specifications on the Project Quality Assurance/Quality Control Plan when they are not otherwise specified by the contract or the approved drawings. Project Superintendents have jobsite access to contract technical specifications for the construction activities they supervise.

All Ludlow Construction Company activities comply with the contract technical specifications.

3.3. CONTRACT DRAWINGS

The Project Manager obtains customer supplied drawings that have been approved by local government regulators. Project Superintendents have jobsite access to approved architectural drawings for the construction they supervise.

All Ludlow Construction Company activities comply with the drawing details and specifications cited in the drawings.

3.3.1.1. AS-BUILT RED-LINE DRAWINGS

As the project progresses, the Project Superintendent will mark the original design drawings to indicate as-built conditions including changes to specified materials, dimensions, locations, or other features.

3.4. CONTRACT SUBMITTALS

The QC Manager prepares submittals that provide additional details of how Ludlow Construction Company plans to carry out quality-related aspects of the customer contract, contract technical specifications, and contract drawings and reporting of quality records to the customer.

The QC Manager lists, schedules, and approves all quality-related submittals that are required by the project including submittals prepared by subcontractors and suppliers. The QC Manager must review all submittals for compliance with the requirements of the Ludlow Construction Company Quality System. The QC Manager must sign approval of each contract submittal.



Quality Assurance/Quality Control Plan

Ludlow Construction Company extends compliance to contract specifications to all customer approved submittals. All Ludlow Construction Company activities comply with customer approved submittals.

3.4.1. CONTRACT SUBMITTAL SCHEDULE

The Project Manager identifies submittals that apply to a specific contract and when they should be submitted, including:

- Contract requirement reference (if applicable)
- Submittal type: Shop drawing, product data, quality inspection and test plan, request for information, or allowances and unit prices
- Description
- Due date for submission to customer by Ludlow Construction Company
- Due date for approval by the customer. Due dates may be a number of days after a project plan milestone.
- Approval date

3.4.2. SHOP DRAWING SUBMITTALS

The Project Manager or Purchasing and Estimating Manager prepare shop drawing submittals that supplement contract drawings. Shop drawings are required when additional details are necessary for fabrication or installation. The following information is included, as applicable:

- Dimensions established by field measurement
- Relationships to adjoining construction
- Identification of products and materials
- Fabrication and installation drawings
- Diagrams showing locations of field-installations
- Shop fabricated manufacturing instructions
- Templates and patterns
- Design calculations
- Compliance with specified standards
- Seal and signature of professional engineer if required
- Additional requirements as specified in the contract, contract technical requirements, or contract drawings.

Ludlow Construction Company extends contract specifications to include customer approved shop drawings.

3.4.3. PRODUCT DATA SUBMITTALS

The Project Manager prepares product data submittals that consist of the manufacturer's product information. The information included in this submittal is:

- Manufacturer, trade name, model or type number
- Description
- Intended use
- Size and physical characteristics including drawings when applicable
- Finish and color characteristics
- Product manufacturer's installation instructions, when applicable



Quality Assurance/Quality Control Plan

- Additional requirements as specified in the contract, contract technical requirements, or contract drawings.

3.4.4. ALLOWANCES AND UNIT PRICES SUBMITTALS

When customer contracts specify allowances and unit prices that the customer will select after the contract is awarded, the Project Manager prepares an allowance and unit price submittal for customer approval.

When a customer selects or approves an allowances and unit prices, the customer indicates the allowance and unit price selection on the signed submission return.

Ludlow Construction Company extends compliance to contract specifications to customer approved allowances and unit prices.

3.4.5. REQUEST FOR INFORMATION (RFI) SUBMITTALS

The Project Manager submits a request for additional information to the customer when errors are found or when required information is not contained in the contract, contract technical specifications, or contract drawings.

Should any number of contract technical specifications or contract drawings result in conflicting requirements, the QC Manager submits a request for information to the customer to select the standard that applies.

Ludlow Construction Company extends compliance to contract specifications to customer requests for information.

3.4.6. CHANGE ORDER SUBMITTALS

Contract requirements or contract technical specifications may require a change after the contract is awarded. The Project Manager submits the change order to the customer for approval, including any contract price adjustments.

When a customer approves a change order, the customer signs the submission return.

Ludlow Construction Company extends contract specifications to include customer approved change orders.

3.4.7. MOCK-UP SUBMITTALS

The Project Superintendent prepares mock-up submittals as required by contract. Additionally, the QC Manager specifies mock-up requirements when they are necessary to ensure customer expectations are clearly identified.

The QC Manager ensures that each mock-up demonstrates specific elements of form and/or function, and that they are specified in the submittal documents.

Ludlow Construction Company extends contract specifications to include customer approved mock-up submittals.

3.5. CUSTOMER SUBMITTAL APPROVAL



Quality Assurance/Quality Control Plan

The Project Manager obtains the signature of an authorized customer representative on the submittal form.

Ludlow Construction Company extends compliance to contract specifications to customer approved submittals.

Work in the affected area of a pending submittal requirement does not start until the customer approves the submittal.

3.6. CONTRACT WARRANTY

The Project Manager ensures that customer contracts clearly specify warranty coverage including:

- Scope
- Starting date
- Duration

The Project Manager ensures that customer contracts also clearly specify owner responsibility for:

- Restrictions of use
- Maintenance requirements
- Exclusions for customer supplied materials or equipment
- Timely notification of problems

The Project Manager (Mike Pio) will ensure all warranty issues that may arise are handled by Ludlow Construction Company, or the responsible subcontracting company.

3.7. CONTRACT REVIEW AND APPROVAL

The President conducts customer contract reviews to ensure that:

- Customer requirements and specifications are complete
- Customer requirements and specifications are compatible with the relevant regulations, Ludlow Construction Company quality standards, and Quality System requirements
- Ludlow Construction Company has the capability to deliver the completed project in the time allotted

Before construction begins, the President makes sure that all contract requirements are clearly understood, all discrepancies are resolved, and all requirements are agreed upon. Once these requirements are met, the President signs the contract.



4. DESIGN REVIEW AND CONTROL

4.1. OVERVIEW

Ludlow Construction Company ensures that the designs have well defined specifications, stakeholders have input as the designs progress, qualified personnel carry out the design work, and final designs are verified to meet all contract and regulatory requirements. Design control applies to architectural and engineering design. Process controls apply to approved designs that have additional detail provided by shop drawings, product selections, or requests for information.

4.2. DESIGN INPUT REVIEW

The QC Manager ensures that the information in design inputs clearly defines customer expectations and that the necessary details are provided to set requirements for design.

The QC Manager obtains design specifications from the customer and conducts a customer design input review to ensure that:

- Customer design input requirements and specifications are complete
- Design process review milestones are specified when necessary
- Customer design output requirements and specifications are complete for review milestones as well as the completed design
- Customer design requirements and specifications are compatible with the relevant regulations, Ludlow Construction Company quality standards, and Quality System requirements
- Ludlow Construction Company has the capability to deliver the completed design in the time allotted

The QC Manager identifies supplemental design specifications that supplement customer specifications when they are needed to ensure a quality design.

Before design work begins, the QC Manager makes sure that all design requirements are clearly understood, all discrepancies are resolved, and all requirements are agreed upon. Once these requirements are met, the QC Manager approves the design input.

The QC Manager ensures that design input documents are verified by qualified personnel. The person responsible must verify:

- Design input specification are approved by a customer authority
- Design input specifications are complete
- Design input requirements and specifications are compatible with the relevant regulations, Ludlow Construction Company quality standards, and Quality System requirements
- Ludlow Construction Company has the capability to deliver the completed project in the time allotted

4.3. PROJECT DESIGN QUALITY ASSURANCE/QUALITY CONTROL PLAN

The QC Manager prepares a project-specific design review plan that includes:



Quality Assurance/Quality Control Plan

- A listing of company and customer stakeholders, reviews they will participate in, and how their input will be used to amended design requirements. The project organization chart Includes interfaces between various groups and personnel for producing and reviewing the design.
- Design output deliverables, including required drawings, and engineering calculations
- Identification of who will perform design output verification activities and the criteria they will use.
- The QC Manager reviews the design process project plan with the customer and other interested parties. The customer approves the plan after any discrepancies are resolved and the plan is agreed upon. Design work may begin only after the customer approves the plan.

4.4. DESIGN PROGRESS REVIEWS

The QC Manager holds review meetings with interested parties at key design milestones. The QC Manager identifies the key design milestones, the design output required for the review, and a list of reviewers.

Two design reviews are required: one is an input design review and the other is the final design review. The QC Manager identifies other design reviews necessary to ensure a quality result. Design reviews may be specified at the completion of design features of work, site assessments, preliminary engineering, preliminary design, percentage completion stages, and on a calendar schedule.

The QC Manager identifies customer and company reviewers appropriate for each design milestone. Reviewers may include persons that have a stake in any of the following: quality, safety, constructability, scheduling, maintenance, purchasing, estimating, or cost control.

At each review, the QC Manager reviews reviewer recommendations for amendments to the design specifications. The QC Manager submits selected design amendments for customer approval. Customer approved design amendments are design requirements.

4.5. DESIGN OUTPUT VERIFICATION AND APPROVAL

The QC Manager ensures that design output documents are verified by qualified personnel independent of the person performing the work. The person responsible must verify:

- The completed design meets requirements specified by the design input
- The completed design meets approved design amendments
- Engineering calculations are correct
- Completeness of records per the Design Project Quality Assurance/Quality Control Plan including inputs, reviews, communications, and verification activities.



5. PROJECT-SPECIFIC QUALITY STANDARDS

APPLICABLE REGULATIONS, INDUSTRY, and COMPANY STANDARDS

5.1. OVERVIEW

Ludlow Construction Company 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 materials, methods, and results are specified rather than left to discretionary practices.

5.2. REGULATORY CODES

All Ludlow Construction Company activities comply with the relevant regulations. The QC 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 QC Manager identifies regulatory requirements that apply to a specific project on the Project Quality Assurance/Quality Control Plan.

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

5.3. INDUSTRY QUALITY STANDARDS

All Ludlow Construction Company activities comply with generally accepted good workmanship practices and industry standards.

The QC 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.

5.4. MATERIAL AND EQUIPMENT SPECIFICATIONS

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



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

The QC 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 QC Manager ensures that work processes are controlled to ensure that the specified requirements are met. When appropriate, the QC 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 QC Manager determines types of project materials that require quality controls.

For each type of quality controlled material, the QC 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 Project Superintendent verifies that materials have the specified lot identifications.

The Project 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 feature of work 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 Project Superintendent deems the materials as nonconforming and segregates them and/or clearly marks them to prevent inadvertent use. The



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Project Superintendent treats the material according to the company policy for nonconformances. Only the QC Manager can re-identify or re-certify the materials.

5.7. MEASURING DEVICE CONTROL AND CALIBRATION

The QC 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 QC 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 QC Manager validates the accuracy of previous measurements.

5.8. LUDLOW CONSTRUCTION COMPANY QUALITY STANDARDS

Ludlow Construction Company quality standards supplement contract requirements when they are necessary to ensure quality.

The QC Manager identifies supplemental requirements for Ludlow Construction Company Quality standards that apply to a specific project on the Project Quality Assurance/Quality Control Plan.

When Ludlow Construction Company quality standards differ from industry standards or product manufacturer instructions, the QC Manager justifies that the standard reliably achieves quality results and then documents the justification.

All Ludlow Construction Company activities conform to the company quality standards.

5.9. APPLICATION OF MULTIPLE SOURCES OF SPECIFICATIONS

Should multiple sources of specifications apply to a feature of work, 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
- Ludlow Construction Company quality specifications, including subcontract specifications
- Ludlow Construction Company Quality Manual
- Product installation instructions
- Industry standards
- Generally accepted practices

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



6. PROJECT PURCHASING

SPECIFY and VERIFY Subcontractor and Supplier QUALITY CAPABILITIES

6.1. OVERVIEW

Ludlow Construction Company verifies the qualifications of subcontractors and suppliers to ensure that they are capable of completely carrying out their assigned responsibilities. Quality requirements are defined, verified, and documented before they are approved for a project.

6.2. QUALIFICATION OF OUTSIDE ORGANIZATIONS AND COMPANY DEPARTMENTS

The QC Manager qualifies outside organization and company work department capabilities to ensure that they are capable of completely carrying out their assigned quality responsibilities before approving and signing the contract, purchase order, or work order.

Subcontractors and suppliers must meet all Quality System requirements by either 1) working under the Ludlow Construction Company Quality System or 2) operating their own quality program as long as it meets Ludlow Construction Company Quality System requirements.

6.2.1.1. REQUIRED CREDENTIALS

The QC Manager defines quality-related credentials for each project feature of work that affects quality including required:

- Organization and personnel licenses
- Personnel training
- Organization and personnel certifications
- Organization and personnel experience

6.2.1.1.1. INDEPENDENT LABORATORY CREDENTIAL REQUIREMENTS

Independent laboratories performing tests or quality inspections have additional requirements for certification by a nationally recognized testing accreditation organization as appropriate for the scope of the inspection or test:

- NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
- NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- The American Association of State Highway and Transportation Officials (AASHTO)
- International Accreditation Services, Inc. (IAS)
- U. S. Army Corps of Engineers Materials Testing Center (MTC)
- American Association for Laboratory Accreditation (A2LA) program

6.2.1.2. REQUIRED CAPABILITIES

- Senior person designated as QC Manager
- Knowledge of Company quality standards
- Demonstrated capability to complete work to Company quality standards
- Demonstrated skills, knowledge, and experience
- Effective self-inspection process



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- Access to codes, standards and product instructions
- Equipment availability
- Production capacity
- Demonstrated results

For critical components, the QC Manager determines if a source quality inspection is necessary to validate supplier quality and delivery capabilities.

6.2.1.3. SUBCONTRACTORS AND SUPPLIERS AND COMPANY DEPARTMENT QUALIFICATION ASSESSMENTS

When the qualification assessment identifies minor nonconformances to the subcontract requirements, the QC Manager may approve a provisional subcontract. The provisional subcontract supplements the subcontract with requirements for actions that address correction of the nonconformances. All nonconformances must be corrected before work in the affected area begins.

6.3. QUALITY RESPONSIBILITIES OF KEY SUBCONTRACTOR AND SUPPLIER PERSONNEL

A subcontractor senior officer is required to appoint a Subcontractor QC Manager and Superintendent to the project with specific quality responsibilities and authorities.

6.3.1. SUBCONTRACTOR QC MANAGER: QUALITY DUTIES, RESPONSIBILITIES, AND AUTHORITY

The Subcontractor QC Manager is responsible for ensuring effectiveness of the Subcontractor QC Plan for the project. Regardless of other duties, the Subcontractor QC Manager is responsible for:

- Planning and fully implementing project quality controls required by the Ludlow Construction Company quality systems and contract requirements
- Manage the operation of the Subcontractor QC Plan on the project.
- Implement and manage all phases of quality control
- Communicating project-specific quality requirements to all affected departments, subcontractors and suppliers and Ludlow Construction Company
- Ensuring that the Subcontractor QC Plan is established and implemented by persons doing work that impacts quality
- Monitoring progress of activities
- Acting as the project quality liaison Ludlow Construction Company on matters relating to quality
- Review and approval of all project Quality System records
- Review and approval of project quality-related contract submittals
- Managing all project inspection and quality control activities
- Controlling corrective actions
- Resolving quality nonconformances

The Subcontractor QC Manager has the authority to:

- Stop work when continuing work may adversely affect quality or cover up a defect
- Prevent the use of materials that may adversely affect quality or cover up a defect
- To direct the removal and replacement of any non-conforming work.
- Suspend work and/or supply of materials by any staff member, subcontractor personnel, or supplier as deemed necessary to assure quality results.

Alternate Subcontractor QC Managers acting in the role of the project Subcontractor QC Manager has the same quality duties, responsibilities and authority as the project Subcontractor QC Manager.



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6.3.2. SUPERINTENDENT: QUALITY DUTIES, RESPONSIBILITIES, AND AUTHORITY

A Superintendent verifies that work conforms to Ludlow Construction Company quality standards. President appoints one or more Superintendents for each project.

A Superintendent has specific responsibilities for:

- Ensuring that work meets government regulatory and code requirements, customer requirements, contract requirements, contract technical specifications, contract drawings, approved contract submittals, and company quality standards and specifications
- Ensuring that subcontractors and suppliers begin work in accordance with Ludlow Construction Company start-work policies
- Ensuring that subcontractors and suppliers receive a notice to work only when conditions will not adversely affect quality results
- Conducting quality inspections, tests, and recording findings
- Accurately assessing subcontractor quality and on-time performance
- Ensuring that quality standards are achieved before approving subcontractor or work crew completion of work

The Superintendent has the authority to:

- Stop work when continuing work may adversely affect quality or cover up a defect
- Prevent the use of materials that may adversely affect quality
- Direct the removal or replacement of any non-conforming work or material
- Suspend work and/or supply of materials as deemed necessary to assure quality results

Alternate Superintendent has the same quality duties, responsibilities and authority as the Superintendent.

Multiple Superintendents may be assigned to the project.

6.4. REQUIREMENTS FOR SUBCONTRACTOR QC PLAN

The Subcontractor QC Plan extends the Ludlow Construction Company Quality Assurance/Quality Control Plan into the subcontractor operations. The QC Manager identifies key subcontractors and suppliers that require a Subcontractor QC Plan.

The QC Manager must approve the Subcontractor QC Plan before the subcontractor can begin work.

Subcontractors and suppliers that do not require a Subcontractor QC Plan work under the Ludlow Construction Company Subcontractor QC Plan.

6.5. SUBCONTRACTOR AND SUPPLIER QUALITY POLICY

The QC Manager ensures that key subcontractors and suppliers adopt a quality policy that includes the following items:

Our objective is to safely deliver 100 percent complete construction work that meet all contract and Ludlow Construction Company Quality Assurance/Quality Control Plan requirements the first time, every time. Our commitment to quality means:

- Compliance with Ludlow Construction Company Quality Assurance/Quality Control Plan requirements.



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- Compliance for fully implementing and complying with all provisions of this Subcontractor QC Plan.
- Our quality standards meet or exceed all applicable regulations, codes, industry standards, and manufacturer specifications as well as with our customers' contract and individual requirements.
- We ensure that only knowledgeable, capable, and qualified employees carry out the planning, execution, and control of our work.
- We stand behind our work. We conduct a series of quality inspections for each feature of work: before work begins, at first article completion, while work is in process, and at completion.
- We inspect all materials before use.
- Should problems be found, we prevent them from cover-up, inadvertent use, and then quickly correct them.
- We are always improving. We make systematic improvements to remove quality risks and enhance quality performance.

We conduct our work with dignity and respect for the customer, our subcontractor partners, and ourselves.

6.6. PROJECT SUBCONTRACTOR AND SUPPLIER LIST

The QC Manager identifies key subcontractors and suppliers for each project feature of work on the Project subcontractor and supplier List form.

Each selected supplier must be previously qualified as specified in section 6.2 Qualification of Outside Organizations and Company Departments.

The selected suppliers are listed on the Project subcontractor and supplier List form.

6.7. PURCHASE ORDER REQUIREMENTS

The Project Manager ensures that materials, equipment and services are purchased only from the supplier listed on the Project Subcontractor and Supplier List form (see section 6.6 Project Subcontractor and Supplier List.)

The Project Manager holds outside organizations to the same quality requirements that must be met by Ludlow Construction Company. The Project Manager ensures that subcontracts and purchase orders clearly specify quality requirement expectations including:

- Conformance to the Ludlow Construction Company Quality System or the subcontractor's own quality program as long as it meets Ludlow Construction Company Quality System requirements.
- Conformance to contract specifications (Section 3 Contract Specifications)
- Conformance to project quality standards (Section 5 Project-Specific Quality Standards)
- Quality Management practices including
 - Performance of self-inspections.
 - Control of quality non-conformances and responsive corrections
 - Prevention of non-conformances
 - Controls that ensure completion of post-construction service work
 - Participation in quality training
- Preparation of submittals
- Participation in project planning meetings
- Participation in feature of work planning meetings



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- Handling, storage, packaging, and delivery, as applicable
- Product or material identification for traceability

6.8. PROJECT PURCHASE ORDER APPROVALS

The Project Manager ensures that contracts and purchase orders are issued only to qualified outside organizations. The Project Manager must review, approve, and sign each purchase order.

The outside organization must agree to the purchase order terms and specifications, and then sign the contract or purchase order.



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, feature of work plans provide additional details of how each individual feature of work is carried out. Features of work planning meetings are used to communicate expectations of the feature of work plan to key personnel responsible for carrying out the feature of work.

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 Ludlow Construction Company, 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. FEATURE OF WORK REQUIREMENTS REVIEW

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

- Objectives and acceptance criteria of the feature of work
- Quality standards that apply to the feature of work
- Work instructions, process steps, and product installation instructions that apply to the feature of work
- 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



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- 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 Project 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 feature of work to begin
- Identifies potential problems

7.3.3. FEATURE OF WORK PREPARATORY QUALITY PLANNING MEETINGS

Prior to the start of a feature of work, the Project 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 Project Superintendent communicates the feature of work quality requirements and reinforces heightened awareness for critical requirements. Topics for a feature of work quality plan meeting include:

- Conflicts that need resolution
- Required quality documents and a verification of availability to personnel carrying out, supervising, or inspecting the feature of work
- 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
- Features of work quality inspection form

7.4. WEEKLY QUALITY PLANNING AND COORDINATION MEETINGS

The Project 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 Project Superintendent facilitates coordination among the participants, communication among the participants, and reinforces heightened awareness for critical requirements.

The Project 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



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

The QC 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 QC 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

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

The QC 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 Project 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 Project 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 feature of work 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 Project 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 Project Superintendent reports such findings to the customer.



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

The Project 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).

7.5.5.1. CONTROLLED PRODUCT USE AND INSTALLATION

Ludlow Construction Company activities conform to manufacturers' product use and installation instructions that apply to the construction process.

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

7.6. DAILY QUALITY CONTROL REPORT

The Project 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 Project 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



8. INSPECTIONS AND TESTS

ASSURE COMPLIANCE

8.1. OVERVIEW

Inspections are necessary to verify that work processes and results conform to both contract requirements and Ludlow Construction Company quality standards.

Qualified personnel inspect every project throughout the construction process. Additional reviews validate the accuracy of the field quality inspections and ensure that the quality standards apply uniformly.

An inspection and test plan defines the quality inspections and tests required for a specific project.

Personnel may only inspect work activities for which they have been qualified by the QC Manager.

8.2. REQUIRED FEATURE OF WORK QUALITY INSPECTIONS AND TESTS

The QC Manager identifies each Task that is a phase of construction that requires separate quality controls to assure and control quality results. Each Task triggers a set of requirements for quality control inspections before, during and after features of work.

Tasks are divided into two categories:

- Discrete Tasks are standard type of work where a completion inspection is performed one time at the completion of a phase of work.
- Process Tasks are tasks where completion inspections are performed continuously. Continuous inspections are required when there is a limited window of time to perform a completion inspection before the next task begins. Process tasks may also be characterized by independent monitoring of a work process, such as welding, where the observer verifies conformance to work procedures.

Process tasks undergo additional quality controls that continuously monitor compliance to specifications.

Independent quality audits are conducted to verify that the task quality controls are operating effectively.

Construction projects may execute a feature of work multiple times in a project, in which case a series of quality inspections are required for each feature of work.

8.3. MATERIAL INSPECTIONS AND TESTS

Material quality inspections and tests ensure that purchased materials meet purchase contract quantity and quality requirements. The Project Superintendent inspects or ensures that a qualified inspector inspects materials prior to use for conformance to project quality requirements.

The Project Superintendent ensures that each feature of work that uses the source inspected materials proceed only after the material has been accepted by the material quality inspection or test.

8.3.1.1. SOURCE INSPECTIONS



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Source quality inspections are required when quality characteristics cannot or will not be verified during subsequent processing. The QC Manager determines if a source inspection is necessary to validate supplier quality before materials are delivered to the project jobsite.

The Project Superintendent ensures that each feature of work that uses the source inspected materials proceed only the material has been accepted by the source inspection.

8.4. WORK IN PROCESS INSPECTIONS

Work in process quality inspections continuously verify compliance project quality standards beginning at the start of a feature of work, as work is conducted, and continues until the feature of work is complete.

8.4.1.1. INITIAL JOB-READY INSPECTIONS

For each feature of work, the Project Superintendent or a qualified inspector performs job-ready quality inspections to ensure that work activities begin only when they should begin. Job-ready quality inspections verify that conditions conform to the project quality requirements.

8.4.1.2. INITIAL WORK IN PROCESS INSPECTION

For each feature of work, the Project Superintendent or a qualified inspector performs an initial work in process inspection when the first representative portion of a work activity is completed.

8.4.1.3. FOLLOW-UP WORK IN PROCESS INSPECTIONS

The Project Superintendent or a qualified inspector performs ongoing work in process quality inspections to ensure that work activities continue to conform to project quality requirements. Punch Items

If the Project Superintendent or inspector observes an item for correction prior to a feature of work completion inspection, the item is identified for correction. During the feature of work completion inspection each punch item correction is verified.

Any outstanding punch items remaining after the feature of work completion inspection is deemed a nonconformance.

8.4.2. ADDITIONAL INSPECTION REQUIREMENTS FOR PROCESS TASKS

For each process task, a qualified person inspects the ongoing completion work for conformance to project quality requirements. This is in addition to discrete task completion inspections that are performed one time at the end of a phase of work.

The continuous monitoring inspections are conducted before starting other work activities that may interfere with an inspection.

8.5. FEATURE OF WORK COMPLETION INSPECTIONS

For each feature of work, the QC Manager or a qualified inspector inspects the completion of each feature of work to verify that work conforms to project quality requirements.

Completion quality inspections are performed for each feature of work. Completion quality inspections are conducted before starting other work activities that may interfere with an inspection.



Any outstanding punch items remaining after the feature of work completion inspection is deemed a nonconformance.

8.6. INSPECTION OF SPECIAL PROCESSES

The QC Manager identifies special processes where the results cannot be verified by subsequent inspection or testing and determines if continuous work in process inspections are required. For these special processes, a qualified inspector continuously inspects the work process.

8.7. INDEPENDENT MEASUREMENT AND TESTS

The QC Manager ensures that quality tests that apply to a specific project are clearly identified. Tests for a project include:

- Customer required quality tests as specified by the contract, contract technical specifications, contract drawings, and approved submittals.
- Additional quality tests necessary to assure quality results.

8.8. COMMISSIONING FUNCTIONAL ACCEPTANCE TESTS

A functional test is performed on each functional system. A qualified inspector performs functional acceptance tests to verify that a system meets predetermined acceptance criteria including:

- The equipment and systems operate as intended
- The equipment and systems perform as intended
- Documentation for operation and maintenance is complete

Each functional test has a documented testing procedure that includes:

- Step-by-step work instructions for conducting the test
- Data recording requirements
- Acceptance criteria
- A determination of pass or fail

8.9. HOLD POINTS FOR CUSTOMER INSPECTION

The Project Superintendent stops work when reaching a hold point specified on the inspection and test plan. The Project Superintendent ensures that work proceeds only with customer approval.

8.10. QUALITY INSPECTION AND TEST SPECIFICATIONS

Specifications for each inspection or test are clearly understood before the inspection or test is performed including:

- Items to be inspected/tested
- Inspections/tests to be performed
- Testing schedule frequency
- Specification references including contract drawing identification number and version, if applicable, and/or contract technical specification number and version, if applicable
- Performing party
- Witness parties
- Certificates required



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- Checklists/procedures
- Reference standards

8.11. INSPECTION AND TEST ACCEPTANCE CRITERIA

Inspections assess conformance of materials or work for each feature of work to project quality requirements, including applicable:

- Contract technical specification
- Contract drawings
- Approved shop drawings
- Approved product submittals
- Approved allowances and unit prices
- Product identification requirements
- Approved submittals
- Ludlow Construction Company quality standards

The material or completed feature of work is accepted only when it meets all project quality requirements.

8.12. INSPECTION AND TEST STATUS

The status of each quality control inspection or test is clearly marked by paint, tape, tag, or other easily observable signal to ensure that only material or work that has passed the required quality inspections and tests is accepted.

For each quality controlled feature of work, the QC Manager determines the appropriate method of identification to show inspection and test status.

For each quality controlled material, the QC Manager determines the appropriate method for identifying quality inspection and test status.

8.13. INDEPENDENT QUALITY ASSURANCE INSPECTIONS

The QC Manager and/or qualified inspectors perform independent quality assurance inspections that verify that task quality controls are operating effectively.

The QC Manager selects a representative portion of task completion inspections performed by the Project Superintendent. Those tasks are independently inspected by the QC Manager and/or qualified inspectors. The findings are compared to the findings of the inspections performed by the Project Superintendent. Any deviations are addressed by corrective actions and preventive actions as necessary.

8.14. INSPECTION AND TEST RECORDS

8.14.1. INSPECTION RECORDS

The QC Manager prepares an inspection form for each feature of work. The QC Manager lists on the form checkpoints for heightened awareness including:

- Initial job-ready inspection requirements
- Inspection and tests



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- Work in process inspection requirements
- Completion quality inspections
- Other quality requirements as necessary to reduce quality risks

The person responsible for the inspection, records feature of work inspection results on the feature of work inspection form.

8.14.2. TEST RECORDS

Test result data include as appropriate:

- Reference to the inspection and test plan item
- Description or title of the inspection activity
- Drawing identification number and version, if applicable
- Technical specification number and version, if applicable
- Location of the inspection activity
- Acceptance criteria
- Nonconformances
- Validation that nonconformances are corrected, reinspected or retested, and confirmed to meet Quality System requirements.
- Any open items to be completed at a later date.
- Inspector's name and signature indicating compliance with all requirements of the Quality System
- Quality rating scores as appropriate
- Date of inspection or test
- Certificate, if applicable
- Conspicuous statement of final result as either "CONFORMS" or "DOES NOT CONFORM"

8.15. PROJECT COMPLETION AND CLOSEOUT INSPECTION

8.15.1. PRE-FINAL LUDLOW CONSTRUCTION COMPANY INSPECTION

Near the end of the project, or a milestone established in the Project Quality Inspection and Test Plan, the QC Manager will inspect the completed project and verify conformance to contract specifications.

The QC Manager records nonconforming items.

The Project Superintendent assigns a planned date by which the deficiencies will be corrected. The date may be assigned for all items or individual items as necessary. After corrections have been made, the Project Superintendent verifies the completion of each item.

Then the QC Manager conducts a follow-up inspection and verifies that all nonconforming items have been corrected to meet contract specifications. Any remaining deficiencies are recorded and managed as nonconformances.

When the pre-final Ludlow Construction Company inspection process is complete, the QC Manager then notifies the customer that the project is ready for the customer's final inspection. The customer is also notified of any remaining nonconformances and their planned resolution.

8.15.2. PRE-FINAL CUSTOMER INSPECTION



Quality Assurance/Quality Control Plan

If the customer performs a pre-final inspection, the QC Manager records nonconforming items and assigns a planned date by which the deficiencies will be corrected.

The Project Superintendent assigns a planned date by which the deficiencies will be corrected. The date may be assigned for all items or individual items as necessary. After corrections have been made, the Project Superintendent verifies the completion of each item.

After corrections have been made, the QC Manager will conduct a follow-up inspection and verify that all nonconforming items have been corrected to meet contract specifications. Any remaining deficiencies are recorded and then managed as nonconformances.

When the pre-final customer inspection process is complete, the QC Manager then notifies the customer that the project is ready for the customer's Final inspection. The customer is also notified of any remaining nonconformances and their planned resolution.

8.15.3. FINAL ACCEPTANCE CUSTOMER INSPECTION

If the customer performs a final inspection, the Quality Control Manager, Project Superintendent, and Project Manager will participate in the inspection. The QC Manager records nonconforming items and assigns a planned date by which the deficiencies will be corrected. The date may be assigned for all items or individual items as necessary. After corrections have been made, the Project Superintendent verifies the completion of each item.

After corrections have been made, the QC Manager will conduct a follow-up inspection and verify that all nonconforming items have been corrected to meet contract specifications. Any remaining deficiencies are recorded managed as nonconformances.

When the final customer inspection process is complete, the QC Manager then notifies the customer that the project is ready for the customer's follow-up verification. The customer is also notified of any remaining nonconformances and their planned resolution.



9. NONCONFORMANCES AND CORRECTIVE ACTIONS

9.1. OVERVIEW

Should a nonconformance be identified by an inspection there is a systematic method to control the item, correct it, and ensure that project quality is not adversely impacted by the event.

A nonconformance is any item that does not meet project specifications or Ludlow Construction Company Quality System requirements.

9.2. NONCONFORMANCES

9.2.1. MARKING OF NONCONFORMANCES AND OBSERVATIONS

When the QC Manager, Project Superintendent, inspector, or customer identifies a nonconformance or an observation, the item is quickly and clearly marked by paint, tape, tag, or other easily observable signal to prevent inadvertent cover-up.

9.2.2. CONTROL THE CONTINUATION OF WORK

After the item is marked, the Project Superintendent determines if work can continue in the affected area:

CONTINUE WORK: When continuing work does not adversely affect quality or hide the defect, work may continue in the affected area while the disposition of the item is resolved. The Project Superintendent may place limitations on the continuation of work.

STOP WORK ORDER: When continuing work can adversely affect quality or hide the defect, work must stop in the affected area until the disposition of the item resolved. The Project Superintendent identifies the limits of the affected area. The Project Superintendent quickly and clearly marks the stop work area.

9.2.3. NONCONFORMANCE REPORT

9.2.3.1. RECORDING OF NONCONFORMANCES

If nonconformances or observed items exist by the feature of work completion inspection, the Project Superintendent or inspector records the nonconformances on a nonconformance report.

The Project Superintendent sends the nonconformance report to the QC Manager.

9.2.3.2. QC MANAGER DISPOSITION OF NONCONFORMANCE REPORTS

When the QC Manager receives a Nonconformance Report, he or she makes an assessment of the affect the reported nonconformance has on form, fit, and function. The QC Manager may assign a disposition of either:

REPLACE: The nonconformance can be brought into conformance with the original specification requirements by replacing the nonconforming product or material with a conforming product or material.

REPAIR: The nonconformance can be brought into conformance with the original requirements through re-machining, reassembly, reprocessing, reinstallation, or completion of the required operations.



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REWORK: The nonconformance can be made acceptable for its intended use, even though it is not restored to a condition that meets all specification requirements. The QC Manager may specify standards that apply to the completion of rework. Rework nonconformances must be approved by the customer.

USE AS-IS: When the nonconforming item is satisfactory for its intended use. Any use as-is items that do not meet all specification requirements must be approved by the customer.

9.2.4. CORRECTION OF NONCONFORMANCES

The Project Superintendent verifies that corrective actions eliminate the nonconformance to the requirements of the original specifications or as instructed by the disposition of the nonconformance report, and then removes, obliterates, or covers the nonconformance marker.

Furthermore, the Project Superintendent ensures that previously completed work is reinspected for similar nonconformances and corrective actions are taken to avert future occurrences (see section 9.3 Corrective Actions).

9.3. CORRECTIVE ACTIONS

9.3.1. CONTROL OF CORRECTIVE ACTIONS

When a nonconformance is found, the Project Superintendent ensures that:

- Previously completed work is reinspected for similar nonconformances
- Corrective actions are taken to avert future occurrences

The QC Manager identifies requirements for corrective actions with respect to frequency, severity, and detectability of quality nonconformances items found during and after completion of work activities.

When a solution requires changes to Ludlow Construction Company quality standards, the QC Manager makes modifications as necessary by making changes to:

- Material specifications
- Personnel qualifications
- Subcontractor and Supplier qualifications
- Company standards
- Inspection processes

9.3.2. CORRECTIVE ACTION TRAINING

The Project Superintendent initiates corrective action training to address quality nonconformances. Personnel and subcontractors and suppliers performing or inspecting work participate in the training.

Heightened awareness during quality inspections verifies and documents compliance with the corrective action improvement items. A qualified Project Superintendent inspects corrective actions during regular quality inspections and records observations on the quality inspection form.

The Project Superintendent notifies affected subcontractors and suppliers of selected preventive action training requirements.

The Project Superintendent evaluates the effectiveness of the improvements. The QC Manager reviews improvement results recorded on quality inspection records and monthly field reviews. When the QC



Quality Assurance/Quality Control Plan

Manager determines that the improvement actions are effective, the item is no longer treated as a preventive action.



10. PREVENTIVE ACTIONS

PREVENT NONCONFORMANCES

10.1. OVERVIEW

Fixing problems found during quality inspections is not sufficient. Systematic prevention of recurrences is essential for improving quality.

Ludlow Construction Company makes changes to solve the problem. Solutions may involve a combination of enhanced process controls, training, upgrade personnel qualifications, improved processes, or use of higher-grade materials.

Follow-up ensures that a problem is completely resolved. If problems remain, the process is repeated.

10.2. IDENTIFY PREVENTIVE ACTIONS FOR IMPROVEMENT

The QC Manager identifies preventive action improvement priorities with respect to frequency, severity, and detectability of quality correction items found during and after completion of work activities. The QC Manager also reviews company quality performance and customer feedback.

More specifically, the QC Manager assesses:

- Customer corrective items
- Project Superintendent quality inspection results
- Code official inspection results
- Post-construction service
- Management field reviews
- Annual system review
- Customer satisfaction surveys

The QC Manager documents quality items requiring preventive action improvement.

The QC Manager leads the company in finding solutions to address the causes of problems.

When a solution requires changes to Ludlow Construction Company quality standards, the QC Manager makes modifications as necessary by making changes to:

- Material specifications
- Personnel qualifications
- Subcontractor and Supplier qualifications
- Company standards
- Inspection processes

10.3. TRAIN PREVENTIVE ACTIONS FOR IMPROVEMENT

The QC Manager initiates preventive action training to address quality improvement items. Personnel and subcontractors and suppliers performing or inspecting work participate in the training.



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Heightened awareness during quality inspections verifies and documents compliance with the preventive action improvement items. A qualified Project Superintendent inspects hotspots during regular quality inspections and records observations on the quality inspection form.

The QC Manager notifies affected subcontractors and suppliers of selected preventive action training requirements.

The QC Manager evaluates the effectiveness of the improvements. The QC Manager reviews improvement results recorded on quality inspection records and monthly field reviews. When the QC Manager determines that the improvement actions are effective, the item is no longer treated as a preventive action.



11. QUALITY SYSTEM AUDITS

AUDITS and IMPROVEMENT

11.1. OVERVIEW

Audits ensure that the elements of the Ludlow Construction Company Quality System are functioning as intended.

11.2. PROJECT QUALITY SYSTEM AUDIT

The QC Manager conducts monthly Project Quality System audits that verify proper operation of the Quality System on a project. At least monthly, the QC Manager audits:

- Quality system framework
- Quality system management and responsibilities
- Customer contract specifications
- Design control
- Project-specific quality standards
- Project purchasing
- Process control plans
- Inspections and tests
- Nonconformances and corrective actions
- Preventive actions
- Quality records and documents

The QC Manager takes corrective actions to ensure compliance with Quality System requirements. The effectiveness of changes is then evaluated and documented.

Requirements for managing audit nonconformances are addressed in section 9.2 Nonconformances.

11.3. COMPANY-WIDE QUALITY SYSTEM AUDIT

At least annually, the QC Manager audits the suitability and effectiveness of the Ludlow Construction Company Quality System.

The audit assesses:

- Ludlow Construction Company quality improvement activities
- Customer performance evaluations and satisfaction measurement results
- Quality performance measures
- Monthly field reviews
- Internal and external Quality Audit results
- Process performance and product conformance results
- Preventive and corrective action status
- Follow up on actions from previous Management Reviews
- Other changes (i.e. business climate, scope of work changes, etc.) that could affect the Quality System



Quality Assurance/Quality Control Plan

Changes are initiated to improve Quality System performance. The QC Manager documents Quality System changes in the Ludlow Construction Company Quality Assurance Manual, initiates needed improvements, and assesses their effectiveness.



12. RECORD AND DOCUMENT CONTROLS

12.1. OVERVIEW

Ludlow Construction Company ensures that quality related documents and records are created, current versions are in use, complete, identifiable, and stored properly.

12.2. QUALITY SYSTEM DOCUMENTS

12.2.1. QUALITY MANUAL

The QC Manager maintains the Ludlow Construction Company Quality Manual that documents Ludlow Construction Company quality policies. Each policy identifies the titles of personnel responsible.

The QC Manager ensures that the Quality Manual and documents related to a feature of work are accessible to personnel performing the work.

The QC Manager maintains, improves, and updates the manual as necessary. At least annually, the QC Manager determines if updated versions of standards and product installation instructions are available. If so, the QC Manager updates the Quality System documentation accordingly.

12.3. DOCUMENT CONTROLS

The President controls all company-wide quality system documents including:

- Approval of all quality system documents and for adequacy prior to issue or reissue.
- Ensures that applicable documents are available and usable at points of use
- Prevents unintended use of obsolete documents

The QC Manager controls project-specific quality system documents including:

- Approval of all project quality documents and for adequacy prior to issue or reissue.
- Ensures that applicable documents are available and usable at points of use
- Prevents unintended use of obsolete documents

12.3.1. CONTROL OF SYSTEM DOCUMENTS

The QC Manager controls documents related to the Ludlow Construction Company Quality System including:

- Quality System Manual
- Quality System Procedures
- Project Management Procedures (including interface and coordination with customers and regulatory agencies with jurisdiction over jobsites)
- Government regulations
- Industry standards
- Procurement specifications

The QC Manager ensures that records of the distribution of Quality System documents are kept. When new versions are distributed, obsolete versions are destroyed or controlled to prevent inadvertent use.



12.3.2. CONTROL OF PROJECT DOCUMENTS

The Project Manager controls documents related to specific customer contracts including:

- Customer contracts
- Contract technical specifications
- Contract drawings
- Shop drawing submittals and approvals
- Product data submittals and approvals
- Allowances and unit price submittals and approvals
- Requests for information and customer responses
- Subcontracts
- Inspection and test plans

12.4. RECORD CONTROLS

The QC Manager verifies records for conformance to the Quality System Requirements and approves all Quality System records.

Records demonstrating conformance with and operation of the Quality System are retrievable for at least five years. The QC Manager verifies records for conformance to the Quality System Requirements.

12.4.1. QUALITY SYSTEM RECORDS CONTROL

The QC Manager verifies the completeness, accuracy, and retention of project-specific Quality System records including:

- Annual reviews
- Quality improvement records

12.4.2. PROJECT RECORDS CONTROL

The QC Manager verifies the completeness, accuracy, and retention of project-specific Quality System records including:

- Inspection and test records
- Quality submittals to the customer
- Project quality system audits
- Field reviews
- Calibration certificates
- Daily log reports
- Incident reports
- Redline drawings
- Qualified personnel approvals
- Qualified subcontractor approvals
- Quality improvement records
- Project Quality records specified by customer contract, or contract technical specifications

The QC Manager assigns record control responsibilities and document location that apply to a specific project.



13. APPENDIX

13.1. DEFINITIONS OF TERMS

Acceptance - The process of deciding, through inspection, whether to accept or reject a product.

Audit – An audit determines if the quality system is performing as documented and whether the quality system is implemented. An audit consists of a systematic and objective examination to determine whether quality management activities and associated results comply with planned arrangements, and whether these arrangements are implemented effectively and suitably to achieve set objectives.

Certification - Statements by inspectors, officials, engineers, or product manufacturers attesting that product, system or material meets stated specification requirements.

Conformance – An item meets the requirements of relevant specifications, contracts or regulations; also the state of meeting the requirements.

Contract Project Quality Assurance/Quality Control Plan – See Project Quality Assurance/Quality Control Plan.

Corrective Action – a specific action to resolve a known condition or conditions, which adversely affect quality. Corrective Action must address remedial action to correct the known discrepancy whereas preventive action prevents reoccurrence based on the identified root cause.

Definable feature of work – See Task.

Design Data - Calculations, mix designs, analyses or other data pertaining to a part of work.

Disposition – A statement describing the manner in which a nonconformance is to be resolved.

Experienced - When used with an entity or individual, "experienced" means having successfully completed work similar in nature, size, and extent.

Feature of Work – See Task.

FOW – Feature of Work

Inspection and Test Plan – A record of requirements, frequency and responsibilities for activities such as measuring, examining, testing and gauging one or more characteristics of a product or service, and comparing the results with specified requirements to determine conformity to the Contract Specification. Inspections and tests are detailed in the applicable procedures and results recorded on forms appended to these procedures.

Inspection - The act of examining, measuring, or testing to determine the degree of compliance with requirements.

ISO 10005 – an international standard titled *"Quality Management – Guidelines for Quality Plans"* that specifies required elements of a project-specific quality plan.

ISO 9001 – an international standard titled *"Quality Management System – Requirements"* that specifies required elements of a quality management system.



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Mock-up Sample – an assembly or portions of an assembly constructed on the project site that establishes standards by which the ensuing work can be judged. Mockups are constructed to verify selections made under sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples.

Nonconformance – Non-fulfillment of a specification which affects form, fit or function and renders the quality of an item or service unacceptable or indeterminate in regard to meeting all relevant specifications. Examples of nonconformance include: physical defects, test failures, incorrect or inadequate documentation or deviation from prescribed processing, inspection or test procedures.

Non-conformance Report – A record of the identification, and resolution of a nonconformance.

Product Data - Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and brochures illustrating size, physical appearance and other characteristics of materials, systems or equipment for some portion of the work.

Observation – Feedback provided to work crews for the purposes of heightened awareness of an item that if not addressed by a completion inspection may result in a nonconformance.

Procedure -- Specified way to perform an activity.

Product Samples - Physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged. Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project

Project – Unique process consisting of a set of coordinated and controlled activities with start and finish dates, undertaken to achieve an objective conforming to specific requirements, including the constraints of time, cost and resources.

Project Quality Assurance/Quality Control Plan - A document setting out the specific quality objectives, practices, resources and sequence of activities relevant to a particular Contract or project.

Quality Assurance - Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed work will comply with requirements.

Quality Audit - A formal review/investigation to determine whether the quality characteristics of a product or service meet the defined quality criteria.

Quality Control – the performance of tasks which ensure that work is performed according to plans and specifications

Quality Manual – Documents consisting of Ludlow Construction Company policies for quality management methods instituted as a company. Standard operating procedures supplement the quality manual policies with work steps. This manual is copyright 2011 Ludlow Construction Company. Forms are also part of this manual with step by step instructions.



Quality Assurance/Quality Control Plan

Records - Documentary evidence of the specification of individual items, standards of work, and compliance with the Quality Management System requirements.

Reject – A disposition of a nonconformance for an item unsuitable for its intended purpose and economically or physically incapable of being reworked or repaired.

Repair – A disposition of a nonconformance for an item acceptable for its intended use even though it is not restored to a condition which meets all specification requirements.

Rework – A disposition of a nonconformance for an item that can be brought into conformance with the original requirements through re-machining, reassembling, reprocessing, reinstallation, or completion of the required operations.

Shop Drawings - Drawings, diagrams and schedules specifically prepared to illustrate some portion of the work. Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to integrate the product or system into the project. Shop drawings show how multiple systems and interdisciplinary work will be coordinated

Standard Operating Procedure - A document that details the purpose and scope of an activity, and specifies how it is to be carried out. The output from a procedure provides objective evidence (in the form of records) of the compliance to the quality system requirements.

Subcontractor - A company, organization or individual providing a service or product, which may include labor, plant, materials or other facilities or resources

Task – A definable features of work. A task which is separate and distinct from other tasks and has separate control requirements. A task could be identified by different trades or disciplines, or it could be separate phases of work by the same trade. At minimum each section of the specifications is a task; however, there are frequently more than one definable feature under a particular section.

Test Reports - Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements.

Use-As-Is – A disposition of a nonconformance for an item that will satisfy its intended use, even though it does not meet all design/functional requirements.

Verify - The process of confirming the soundness or effectiveness.



13.2 SUBMITTAL REGISTER



Quality Assurance/Quality Control Plan

SUBMITTAL REGISTER												CONTRACT NO.					
TITLE AND LOCATION						CONTRACTOR											
Construct Water Line, Durham Meadows, Durham, Connecticut																	
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY						REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	MAILED TO CONTR/ DATE RCD FRM APPR AUTH	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 11 00	SD-01 Preconstruction Submittals														
			Maintenance and Plan of	1.4	G RO												
			Operation (MAPO)														
			Two-Week Schedule of Work	1.9.4.2													
			Activities														
			Progress Report	1.12	G RO												
			Quality Assurance Project Plan	1.3	G DO												
			(QAPP)														
			Public Relations Liaison	1.7	G DO												
			Green Remediation Practices	1.25.1													
			SD-07 Certificates														
			Request Application	1.9.1	G RO												
			SD-11 Closeout Submittals														
			CT DPH Certificate	1.28													
		01 22 00	SD-05 Design Data														
			Quantity Surveys														
		01 32 01	SD-01 Preconstruction Submittals														
			Project Scheduler Qualifications	1.3	G RO												
			Preliminary Project Schedule	3.4.1	G RO												
			Initial Project Schedule	3.4.2	G RO												
			Periodic Schedule Update	3.6.2	G RO												
		01 33 00	SD-01 Preconstruction Submittals														
			Submittal Register	1.9	G RO												
		01 33 29	SD-01 Preconstruction Submittals														
			Documentation Requirements	1.5	G RO												
		01 35 28	SD-01 Preconstruction Submittals														



Quality Assurance/Quality Control Plan

SUBMITTAL REGISTER											CONTRACT NO.						
TITLE AND LOCATION						CONTRACTOR											
Construct Water Line, Durham Meadows, Durham, Connecticut																	
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS	
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
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		01 35 26	Accident Prevention Plan (APP)	1.11.5	G RO												
			SD-02 Shop Drawings														
			Work Zones	1.19.1	G RO												
			Decontamination Facilities	1.19.1	G RO												
			SD-03 Product Data														
			Amendments to the APP/SSHP	1.8													
			Exposure Monitoring/Air	1.14													
			Sampling Program														
			Site Control Log	1.20													
			Employee Certificates	1.13.4													
			Certificate of Worker/Visitor														
			Acknowledgement														
			SSHO's Daily Inspection Logs														
			Safety and Health Phase-Out														
			Report														
			SD-06 Test Reports														
			Monthly Exposure Reports	1.5													
			Notifications and Reports	1.28													
			Accident Reports	1.28.2	G RO												
			LHE Inspection Reports	1.28.3													
			SD-07 Certificates														
			Crane Operators/Riggers	1.9.1.8													
			Standard Lift Plan	1.11.1	G RO												
			Critical Lift Plan	1.11.2	G RO												
			Activity Hazard Analysis (AHA)	1.24													
			Hot Work Permit	1.26.1													



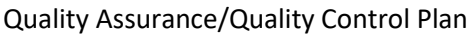
Quality Assurance/Quality Control Plan

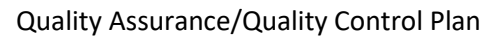
SUBMITTAL REGISTER											CONTRACT NO.						
TITLE AND LOCATION						CONTRACTOR											
Construct Water Line, Durham Meadows, Durham, Connecticut																	
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASS OR A/E REVIEW OR OWNER	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS	
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
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		01 35 26	Certificate of Compliance	1.28.4													
			License Certificates														
		01 39 00	SD-02 Shop Drawings														
			Qualification Data		G RO												
			Field Reports		G RO												
			Key Plan		G RO												
			Digital Photographs		G RO												
			Video Recordings		G RO												
			Transcript		G RO												
		01 41 00	SD-01 Preconstruction Submittals														
			Sampling and Analysis Plan		G RO												
			SD-06 Test Reports														
			Test Reports		G RO												
			Field Notes		G RO												
		01 45 00	SD-01 Preconstruction Submittals														
			Contractor Quality Control (CQC)	3.2	G RO												
			Plan														
		01 50 00	SD-01 Preconstruction Submittals														
			Construction Site Plan	1.4	G RO												
			Temporary Electrical System	3.10.6	G RO												
			Traffic Control Plan	3.6	G RO												
			SD-03 Product Data														
			Barricades	2.2													
			Safety Fence	2.2													
		01 57 20	SD-01 Preconstruction Submittals														
			Environmental Protection Plan	1.7	G RO												



Quality Assurance/Quality Control Plan

SUBMITTAL REGISTER											CONTRACT NO.						
TITLE AND LOCATION						CONTRACTOR											
Construct Water Line, Durham Meadows, Durham, Connecticut																	
ACTIVITY NO	TRANS MITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARA GRAPH	S O V T C L A S S I F I C A T I O N R	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	A C T I O N C O D E	DATE OF ACTION	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	A C T I O N C O D E	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 57 20	Wood Turtle Protection Plan	3.4.5	G RO												
			Encroachment Permit	3.1	G RO												
			CT DEEP General Permit	3.1	G RO												
			Self-Verification Notification Form	3.2	G RO												
		01 57 23	SD-07 Certificates														
			Mill Certificate or Affidavit	2.1.3													
		01 71 23	SD-07 Certificates														
			Qualifications	1.3													
		01 74 19	SD-01 Preconstruction Submittals														
			Waste Management Plan	1.5	G RO												
		01 78 00	SD-03 Product Data														
			As-Built Record of Equipment	1.5.2													
			and Materials														
			Warranty Management Plan	1.6.1													
			Spare Parts Data														
			Warranty Tags	1.6.5													
			SD-08 Manufacturer's Instructions														
			Instructions	1.6.1													
			SD-11 Closeout Submittals														
			Record Drawings	1.5.1													
			Interim Form DD1354	1.8	G RO												
			Checklist for Form DD1354	1.8	G RO												
			Construction Completion Report	1.3	G RO												
			Remedial Action Report (RAR)	1.4	G RO												
		01 78 23	SD-10 Operation and Maintenance														
			Data														

SUBMITTAL FORM, Jan 96

ENG FORM 4025-R, MAR 2012

REPLACES EDITION OF MAR 95, WHICH IS OBSOLETE.

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Quality Assurance/Quality Control Plan

INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.
2. Each Transmittal shall be numbered consecutively. The Transmittal Number typically includes two parts separated by a dash (-). The first part is the specification section number. The second part is a sequential number for the submittals under that spec section. If the Transmittal is a resubmittal, then add a decimal point to the end of the original Transmittal Number and begin numbering the resubmittal packages sequentially after the decimal.
3. The "Item No." for each entry on this form will be the same "Item No." as indicated on ENG FORM 4288-R.
4. Submittals requiring expeditious handling will be submitted on a separate ENG Form 4025-R.
5. Items transmitted on each transmittal form will be from the same specification section. Do not combine submittal information from different specification sections in a single transmittal.
6. If the data submitted are intentionally in variance with the contract requirements, indicate a variation in column h, and enter a statement in the Remarks block describing the detailed reason for the variation.
7. ENG Form 4025-R is self-transmitting - a letter of transmittal is not required.
8. When submittal items are transmitted, indicate the "Submittal Type" (*SD-01 through SD-11*) in column c of Section I.
Submittal types are the following:

SD-01 - Preconstruction	SD-02 - Shop Drawings	SD-03 - Product Data	SD-04 - Samples	SD-05 - Design Data	SD-06 - Test Reports
SD-07 - Certificates	SD-08 - Manufacturer's Instructions	SD-09 - Manufacturer's Field Reports	SD-10 - O&M Data	SD-11 - Closeout	
9. For each submittal item, the Contractor will assign Submittal Action Codes in column g of Section I. The U.S. Army Corps of Engineers approving authority will assign Submittal Action Codes in column i of Section I. The Submittal Action Codes are:

A -- Approved as submitted.	F -- Receipt acknowledged.
B -- Approved, except as noted on drawings. Resubmission not required.	X -- Receipt acknowledged, does not comply with contract requirements, as noted.
C -- Approved, except as noted on drawings. Refer to attached comments. Resubmission required.	G -- Other action required (<i>Specify</i>)
D -- Will be returned by separate correspondence.	K -- Government concurs with intermediate design. (<i>For D-B contracts</i>)
E -- Disapproved. Refer to attached comments.	R -- Design submittal is acceptable for release for construction. (<i>For D-B contracts</i>)
10. Approval of items does not relieve the contractor from complying with all the requirements of the contract.



Quality Assurance/Quality Control Plan

Ludlow Construction Company, Inc. Project Quality Training Plan

Version April 8, 2019

Project ID	Project Name	Preparer	Date		
W912WJ19C0002	Construct Waterline Durham Meadows, Durham CT		April 8, 2019		

Job Position

Training Subject	President	Project Manager	Project Superintendent	Purchasing and Estimating Manager	Foremen	False	Customer	
Project Quality Plan	X	X	X	X	X	X		
Company Quality Policy	X	X	X	X	X	X		
Quality System (Quality Manual Overview)	X					X		
Quality System Operating Policies and related Standard Operating Procedures		X	X	X	X			
Project Quality Standards and Specifications (itemize as necessary)								
Work Procedures (itemize as necessary)								
Customer Training on Operation and Maintenance							X	



Quality Assurance/Quality Control Plan



Quality Assurance/Quality Control Plan

Ludlow Construction Company, Inc. Project Quality Communications Plan

Version April 8, 2019

Project ID	Project Name	Preparer	Date
W912WJ19C0002	Construct Waterline Durham Meadows, Durham CT		
Distribution of project organization chart and assigned responsibility and authority of the Project Manager, QC Manager, and Project Superintendent:			
Points of contact list distribution:			
Project startup meeting participants, date, location:			
Feature of work quality plan meeting participants, nominal location:			
Weekly project communication meeting participants, and nominal day of week, time, and location:			
Daily quality report distribution, frequency, and due date:			
Monthly project quality status report distribution and due date:			
Distribution of quality inspection and test records, and due date:			



Quality Assurance/Quality Control Plan

Nonconformance report distribution and customer approval authority:
Location of project quality records storage and point of contact for records access:
Nominal frequency of project quality audits and the job position that will conduct the audits:
Warehousing of customer supplied materials/equipment location, security, damage prevention.



**Ludlow Construction Company, Inc.
Subcontractor and Supplier Quality Communications Plan**

Version April 8, 2019

Project ID	Project Name	Subcontractor and Supplier	Preparer / Date
W912WJ19C0002	Construct Waterline Durham Meadows, Durham CT		
Points of contact list distribution:			
Weekly project communication meeting participants, and nominal day of week, time, and location:			
Daily quality report distribution, frequency, and due date:			
Distribution of quality inspection and test records, and due date:			
Location of project quality records storage and point of contact for records access:			
Nominal frequency of project quality audits and the job position that will conduct the audits:			



Quality Assurance/Quality Control Plan
