



Welding QA/QC Manual Sample

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This is a sample, not a complete manual

Contact:

First Time Quality

410-451-8006

QUALITY MANUAL

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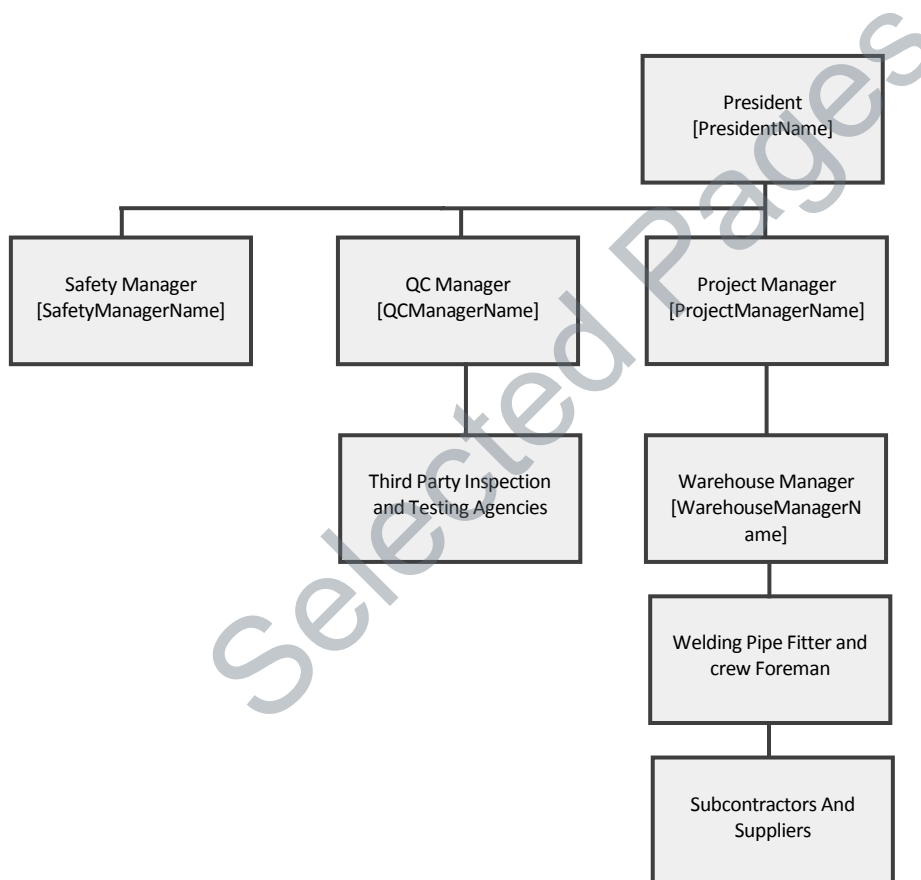
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2.3. PROJECT PERSONNEL AND QUALIFICATIONS

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 Warehouse Manager
- 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

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

PERSONNEL CERTIFICATION REQUIREMENTS

Personnel certifications are required for the following:

Certification or License Title	Reference Standard No.	Reference Standard Title
Pipeline	API-1104 (AWS)	Standard for Welding Pipelines and Related Facilities
Welders of structural steel	AWS D1.1/D1.1M	Structural Welding Code – Steel
Inspectors of structural steel welds	AWS D1.1/D1.1M	Structural Welding Code – Steel
Ultrasonic Inspectors	ASNT CP-101	Personnel Qualification and Certification in Nondestructive Testing

5. PROJECT-SPECIFIC QUALITY STANDARDS

APPLICABLE REGULATIONS, INDUSTRY, and COMPANY STANDARDS

5.1. OVERVIEW

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

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

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

5.2. REGULATORY CODES

All [CompanyName] fabrication 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 Warehouse Manager had jobsite access to relevant codes and government regulations.

5.3. INDUSTRY QUALITY STANDARDS

All [CompanyName] fabrication 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.

COMPLIANCE WITH INDUSTRY WELDING STANDARDS

Codes that may apply to this Project include those listed below.

REGULATORY CODES AND INDUSTRY STANDARDS		
Description	Reference Standard No.	Reference Standard Title
Requirements for gas and arc welding of butt, fillet, and socket welds in carbon and low-alloy steel piping	API 1104	Welding of Pipelines and Related Facilities Pipeline Segment
Beveling, alignment, heat treatment, and inspection of weld	ASME B31.1	Power Piping
Requirements for piping of fluids	ASME B31.3	Process Piping
Workmanship and techniques for welded construction	AWS D1.1/D1.1M	Structural Welding Code – Steel
Welding standards	AWS B2.1/B2.1M	Specification for Welding Procedure and Performance Qualification
Framing and reinforcing openings through a steel deck	SDI DDP	Deck Damage and Penetrations
Minimum spacings and edge distances for screws	AISI SG02-KIT	North American Specification for the Design of Cold-Formed Steel Structural Members
Installation of chimneys, vents, and smokestacks	NFPA 211	Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances
Installation of bracing and permanent bracing and bridging	CFSEI	Field Installation Guide for Cold-Formed Steel Roof Trusses
Install high-strength bolts		RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts"

PROJECT -SPECIFIC WELDING PROCEDURE STANDARDS

The QC Manager approves welding procedures before they can be used to fabricate metal.

Records of approved welding procedures are maintained on Form QW-483 Welding Procedure Qualification Record, included as an exhibit.

5.4. MATERIAL AND EQUIPMENT SPECIFICATIONS

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

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 fabrication 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 Warehouse Manager verifies that materials have the specified lot identifications.

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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 [CompanyName] quality standards.

Qualified personnel inspect every project throughout the fabrication 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 WORK TASK QUALITY INSPECTIONS AND TESTS

The QC Manager identifies each Task that is a phase of fabrication 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 work tasks.

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.

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

8.3. MATERIAL INSPECTIONS AND TESTS

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

The Warehouse Manager ensures that each work task 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

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 Warehouse Manager ensures that each work task 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 work task, as work is conducted, and continues until the work task is complete.

8.4.1.1. INITIAL JOB-READY INSPECTIONS

For each work task, the Warehouse Manager 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 work task, the Warehouse Manager 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 Warehouse Manager 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 Warehouse Manager or inspector observes an item for correction prior to a work task completion inspection, the item is identified for correction. During the work task completion inspection, each punch item correction is verified.

Any outstanding punch items remaining after the work task 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.

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

- Contract technical specification
- Contract drawings
- Approved shop drawings
- Approved product submittals
- Approved allowances and unit prices
- Product identification requirements
- Approved submittals
- [CompanyName] quality standards

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

WELDING INSPECTION AND TESTING STANDARDS

Inspection and testing standards that may apply to this project include those listed below.

Inspection and Testing Standards	
ASNT SNT-TC-1A Q&A Bk C	Ultrasonic Testing Method
AWS B2.1/B2.1M	Specification for Welding Procedure and Performance Qualification
ASTM E 709	Standard Guide for Magnetic Particle Testing
ASTM E 164:	Standard Practice for Contact Ultrasonic Testing of Weldments
ASTM E 94.D	Standard Guide for Radiographic Examination
AISC 360 Section A3.3 and applicable ASTM material Standards	Material verification of high-strength bolts, nuts and washers
AISC 360, Section M2.5	Inspection of high-strength bolting
AISC 360, Section A3.5 and applicable AWS A5 documents	Material verification of weld filler materials

8.12. INSPECTION AND TEST STATUS

The status of each quality control inspection or test is clearly marked by tape, tag, or other easily observable signal to ensure that only items that pass quality inspections is accepted.

For each quality controlled work task, 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 Warehouse Manager. 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 Warehouse Manager. 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 work task. The QC Manager lists on the form checkpoints for heightened awareness including:

- Initial job-ready inspection requirements
- Inspection and tests
- Work in process inspection requirements
- Completion quality inspections
- Other quality requirements as necessary to reduce quality risks

The person responsible for the inspection, records work task inspection results on the work task 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

The Warehouse Manager 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 Warehouse Manager 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 [CompanyName] 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

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 Warehouse Manager 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 Warehouse Manager 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, Warehouse Manager, 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 Warehouse Manager 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.

14. EXHIBITS

Form QW-484A Welding Operator Qualification	51
Form QW-484B Welding Operator Qualification	52
Form QW-483 Welding Procedure Qualification Record	53
[CompanyName] Controlled Materials Form	55
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Consolidated Pipe and Supply Company Material Inspection and Receiving Report

Version September 04, 2013

Contract ID	Contract Name	Purchase Order No.	Supplier			Bill of Lading No.	Date	
[ProjectNumber]	[ProjectName]							
Item No.	Stock/Part No.	Description	Quantity Received	Condition	Marking	Accept	Conditional Use	Reject
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Receiving Quality Control

ACCEPTANCE

Listed items have been accepted by me or under my supervision

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

Signature of authorized person and date: _____

EXCEPTIONS:



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