[CompanyName]

[CompanyAddress] • [CompanyPhone]

HVAC and Plumbing
Quality Assurance/Quality Control Plan

[ProjectName]
[ProjectNumber]

Management acceptance

This Construction Quality Assurance/Quality Control Plan has been reviewed and accepted.

Endorsed By: (Name / Title)	[QualityManagerName], Quality Manager		
Signature:	*[QualityManagerName]*	Date:	[Date]
Version	0	Notes	Initial Issue

The documents provided by [CompanyName] disclose proprietary company information. Please hold this quality document in confidence and do not share them with other organizations, even if you do not charge a fee.

PROJECT-SPECIFIC CONSTRUCTION QUALITY PLAN

TABLE OF CONTENTS

D. PROJECT QC PERSONNEL

[CompanyName] ensures that quality control personnel remain independent from the pressures of production through our organizational lines of authority as defined by our QC Organization Chart.

The President appoints a Quality Manager, Superintendent, and Project Manager, and then assigns each with specific quality responsibilities and authorities of their job position.

PROJECT QC JOB POSITION ASSIGNMENTS

Table D-1 shows the job positions assigned to personnel on this project.

Table D-1

QC Personnel Name	Job Position
[PresidentName]	President
[ProjectManagerName]	Project Manager
[SuperintendentName]	Superintendent
[QualityManagerName]	Quality Manager
[SafetyManagerName]	Safety Manager

DUTIES, RESPONSIBILITIES, AND AUTHORITY OF QC PERSONNEL

The President has overall responsibility for implementation safety including performance and results of the [CompanyName] Quality System, including quality on this project.

QC personnel assigned to this project have the duties, responsibilities and authority defined by their job position.

Key project personnel have accepted their appointments and declared their ability to carry out the appointments.

Table D-2 shows the quality responsibilities assigned to personnel on this project.

QUALITY RESPONSIBILITIES TABLE

Table D-2

Role	General QC Responsibilities	HVAC & Plumbing–Specific Responsibilities
Quality Manager	• Implement and manage Quality System • Plan and oversee inspections & QC activities • Approve records & submittals • Manage corrective & preventive actions • Liaison with customer on quality issues	• Ensure compliance with IPC/UPC, ASHRAE, SMACNA, NFPA • Confirm EPA 608 refrigerant certification • Approve plumbing tests (hydrostatic, air, disinfection) • Approve HVAC tests (duct leakage, TAB, commissioning) • Oversee subcontractor qualifications/licensing • Ensure calibration/use of HVAC/plumbing test instruments
Superintendent	• Verify work complies with drawings & specs • Conduct inspections and record findings • Ensure subcontractor/supplier quality • Authority to stop/suspend nonconforming work	Full Word version available upon purchase - Copywrite First Time Quality. All rights reserved.
Project Manager	• Ensure contracts define expectations • Qualify subcontractors/suppliers • Monitor project performance & quality compliance	• Verify submittals include shop drawings, cut sheets, O&M manuals • Ensure timely procurement of long-lead HVAC/plumbing equipment • Confirm warranties/service agreements for systems

Role	General QC Responsibilities	HVAC & Plumbing–Specific Responsibilities
		• Oversee commissioning documentation for plumbing fixtures, boilers, chillers, pumps, AHUs
Safety Manager	• Ensure compliance with OSHA/project safety • Monitor safe work practices • Implement corrective safety actions	• Verify plumbing crews follow OSHA trenching/shoring standards • Monitor HVAC confined space entry safety • Ensure safe handling/disposal of refrigerants & chemicals• Confirm LOTO procedures for HVAC/plumbing equipment during testing

G. Project Quality Specifications

Fulfilling customer contract expectations is a primary objective of the [CompanyName] Quality System. To ensure that customer expectations will be fulfilled, [CompanyName] 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.

[CompanyName] personnel, 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.

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

Compliance with Plumbing Industry Standards

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

Description	Reference Standard No.	Reference Standard Title
Installation of plastic pipe in fire-resistive construction	PPFA-01	Firestopping: Plastic Pipe in Fire Resistive Construction
Brazed joints	AWS B2.2/B2.2M	Brazing Procedure and Performance Qualification
Soldered joints	ASME B31.5	Refrigeration Piping and Heat Transfer Components

Gas-fired water heater and gas piping	NFPA 54	National Fuel Gas Code
Oil-fired water heater installation	NFPA 31	Installation of Oil-Burning Equipment
Accessibility of plumbing fixtures	ICC/ANSI A117.1	Accessible and Usable Buildings and Facilities

Backflow preventer installation	ICC IPC	International Plumbing Code
Disinfection of water mains	AWWA C651	Disinfecting Water Mains

Site preparation, excavation, and backfill	PIP CVS02100	Site Preparation, Excavation, and Backfill Specification
Underground installation of thermoplastic pressure piping	ASTM D2774	Underground Installation of Thermoplastic Pressure Piping
Concrete pressure pipe	AWWA C302	Reinforced Concrete Pressure Pipe

COMPLIANCE WITH HVAC INDUSTRY STANDARDS

Description	Reference Standard No.	Reference Standard Title
Color coding of all piping systems	ASME A13.1	Scheme for the Identification of Piping Systems
Metal and flexible ductwork construction	SMACNA (latest edition)	HVAC Duct Construction Standards – Metal and Flexible
Duct supports for sheet metal ductwork	SMACNA (latest edition)	HVAC Duct Construction Standards – Metal and Flexible
Underground ductwork installation	ACCA Manual 4	Installation Techniques for Perimeter Heating & Cooling

Brazed joints	AWS B2.2/B2.2M	Brazing Procedure and Performance Qualification
Refrigeration piping	ASME B31.5	Refrigeration Piping and Heat Transfer Components
Air terminal units installation	NFPA 90A	Standard for the Installation of Air Conditioning and Ventilating Systems
Fuel oil system installation	NFPA 31	Installation of Oil-Burning Equipment
Radiant floor heating systems	HYI-400	Radiant Floor Heating Systems

H. INSPECTION AND TEST PLAN

[CompanyName] identifies inspections and tests that will be performed during the project. A test report is completed for each test. The test reports are then used for monitoring compliance with the plan and tracking results.

If independent laboratories are required to perform tests or quality inspections, we ensure that the laboratories are certified by a nationally recognized testing accreditation organization as appropriate for the scope of the inspection or test.

The Quality Inspection and Test Plan form lists inspections and tests (other than work task inspections) that will be performed on this project.

Results of inspections and tests will be recorded on the Inspection and Test Form.

Form exhibits are included as an exhibit in this subsection.

CONTROL OF INSPECTION, MEASURING, AND TEST EQUIPMENT

Inspection, measuring, and test equipment that will be controlled, calibrated, and maintained.

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

For each type of device, the Quality Manager identifies:

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

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

PLUMBING INSPECTION AND TESTING STANDARDS

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

Description	Reference Standard No.	Reference Standard Title
Plumbing pipe weldments	ASME B31.1	Power Piping
Plumbing system tests	ICC IPC	International Plumbing Code
Vertical pump tests	HI 2.6	Vertical Pump Tests
Compressor & instrumentation tests	ASME PTC 10	Performance Test Code on Compressors & Exhausters
Concrete pressure line testing	AWWA C302	Reinforced Concrete Pressure Pipe

Hydrostatic testing of ductile iron pipe	AWWA C600	Installation of Ductile-Iron Water Mains & Appurtenances
Pressure & leakage testing of PVC	AWWA C605 / ASTM D1599	Underground PVC Pressure Pipe Installation & Hydrostatic Testing

Deflection testing – plastic pipe	ASTM D2412	External Loading Characteristics of Plastic Pipe
Fire/smoke testing of insulation materials	ASTM E84	Surface Burning Characteristics of Building Materials

HVAC Inspection and Testing Standards

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

Description	Reference Standard No.	Reference Standard Title
HVAC ductwork leakage tests	SMACNA 1143	HVAC Air Duct Leakage Test Manual
Testing, adjusting, and balancing (TAB)	AABC MN-1	National Standards for Total System Balance

Heat trace cable systems testing	IEEE 515	Testing/Installation of Electrical Resistance Heat Tracing
HVAC installation testing	NFPA 90A	Standard for the Installation of Air Conditioning and Ventilating Systems

[CompanyName]
Testing Plan and Log

Project ID	Project Name	CONTRACTOR

Technical Specification Section	Scheduled Activity	Inspection/Test Required	Inspected/ Tested By	Location Of Inspection/Test On/Off Site		Date Conducted	Date Sent to Engineer	Accepted/ Rejected

[CompanyName]
Testing Plan and Log

Project ID	Project Name	CONTRACTOR
[ProjectNumber]	[ProjectName]	[CompanyName]

Legend: (W) Witness; (H) Hold

Technical Specification Section	Inspection/Test Required	Inspected/ Tested By	Date Conducted	Date Sent to Engineer	Accepted/ Rejected
DIV 22 PLUMBING					
221116 Domestic Water Piping	Roughing-in Piping Inspection				
221116 Domestic Water Piping	Final Piping Inspection (H)				
221116 Domestic Water Piping	Test for leaks and defects				
221119 Domestic Water Piping Specialties	Test each reduced-pressure-principal backflow preventer according to local standards and device's reference standards				
221316 Sanitary Waste and Vent Piping	Roughing-in Inspection (H)				
221316 Sanitary Waste and Vent Piping	Final Inspection (H)				
223400 Fuel-Fired Domestic Water Heaters	Inspect components, assemblies and equipment installations, including connections				
223400 Fuel-Fired Domestic Water Heaters	Leak Test after installation and charging of system				
223400 Fuel-Fired Domestic Water Heaters	Operational Test after electrical circuitry has been energized				
223400 Fuel-Fired Domestic Water Heaters	Test and adjust controls and safeties				

Technical Specification Section	Inspection/Test Required	Inspected/ Tested By	Date Conducted	Date Sent to Engineer	Accepted/ Rejected
224700 Drinking Fountain & Water Cooler	Water Cooler Testing after electrical circuitry has been energized				
224700 Drinking Fountain & Water Cooler	Test and adjust controls and safeties				
DIV 23 HVAC					
231123 Natural Gas Piping	Test, inspect and purge natural gas according to the International Fuel Gas Code and local authority				
232113 Hydronic Piping	Test hydronic piping				
232300 Refrigerant Piping	Test refrigerant piping, specialties and receivers				
232300 Refrigerant Piping	Test high- and low-pressure piping of each system separately				
233113 Metal Ducts	Leakage Test in compliance with SMACNA's HVAC Air Duct Leakage Test Manual. Test no less than 25 percent of total installed duct area for each designated pressure class				
235216 Condensing Boilers	Test and adjust controls and safeties				
237223.19 Packaged Indoor Fixed Plate Energy Recovery Units	Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation				
237413 Packaged Outdoor Central Station Air-Handling Units	Test Packaged Outdoor Central Station Air-Handling Units for compliance with requirements				
237413 Packaged Outdoor Central Station Air-Handling Units	Operational Test to confirm proper motor rotation and unit operation				
237413 Packaged Outdoor Central Station Air-Handling Units	Test and adjust controls and safeties				

J. Quality Control of Corrections, Repairs, and Nonconformances

Should a problem occur in the quality of work, we systematically contain the issue and quickly make corrections. Our first action is to clearly mark the item by tape, tag, or other easily observable signal to prevent inadvertent cover-up.

Fixing problems found is not sufficient. [CompanyName] systematically prevents recurrences to improve quality. First enhanced controls and management monitoring are put into place to assure work proceeds without incident. Then using a structured problem-solving process, [CompanyName] identifies root causes and initiates solutions. Solutions may involve a combination of enhanced process controls, training, upgrading of personnel qualifications, improved processes, and/or the use of higher-grade materials. Follow-up ensures that a problem is completely resolved. If problems remain, the process is repeated.

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

[CompanyName] Nonconformance Report		
Nonconformance Report Control ID	**Project ID**	**Project Name**
	[ProjectNumber]	[ProjectName]
Preparer Signature/ Submit Date		**Quality 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 Approval of disposition required by customer representative? Yes ☐ No ☐ Customer approval signature /date: _____	
Corrective Actions	☐Corrective actions completed Name/Date:_____ Customer acceptance of corrective actions required? Yes ☐ No ☐ Name/Date:_____	
Preventive Actions	☐Preventive actions completed Name/Date:_____	

HVAC INSPECTION CHECKLIST

TABLE OF CONTENTS

Heating// Ventilating// and Air Conditioning (HVAC) - Air Outlets and Inlets 23.37.00

Project:	Phase:	Contract#:	Subcontractor:	Crew:

Compliance Verification

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

Reported Nonconformances and incomplete items:

YES	NO	***Heightened Awareness Checkpoints***
☐	☐	Appearance of Air Outlets and Inlets approved by the ARCHITECT prior to ordering and installation
☐	☐	Registers// grills// and diffusers are compatible with wall and ceiling systems
☐	☐	Air Outlets and Inlets clean of dirt// dust// rubbish// and debris
☐	☐	Air Outlet and Inlet connections to duct work is airtight
☐	☐	Additional supports provided for registers// grills// and diffusers in drop-in ceiling tile systems
☐	☐	Internal fans are mounted with vibration isolators
☐	☐	Drive belts properly tensioned
☐	☐	Ventilators installed with clearance for inspection and maintenance
☐	☐	Gravity Ventilators installed level and plumb
☐	☐	Ventilator mountings weatherproof

Scores and Completion Sign-off

Field Mgmt.-91.45.01

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

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

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

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

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

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

PLUMBING INSPECTION CHECKLIST

TABLE OF CONTENTS

Plumbing - Plumbing Insulation 22.07.00

Project:	Phase:	Contract#:	Subcontractor:	Crew:

Compliance Verification

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

Reported Nonconformances and incomplete items:

YES	NO	***Heightened Awareness Checkpoints***
☐	☐	Plumbing and equipment tested and operational before applying Insulation
☐	☐	Area to be insulated is free of rust// scale// dirt// and moisture
☐	☐	Adhesive/Anchors/Staples/Wrapping utilized is compatible with Insulation type
☐	☐	Insulation through penetrations maintains fire rating of structure
☐	☐	Insulation protected from chafe at all supports and contact points
☐	☐	Insulation protected from weathering and moisture intrusion
☐	☐	Operation of valves and actuators not hindered by insulation
☐	☐	Insulation joints sealed
☐	☐	Cladding applied in high abuse/traffic areas
☐	☐	Openings/Holes caused by testing closed/repaired

Scores and Completion Sign-off

Field Mgmt.-91.45.01

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

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

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

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

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

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

For More Information:

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