



# **NREL Job Task Analysis: Quality Control Inspector**

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# **NREL Job Task Analysis–Quality Control Inspector**

## **Introduction**

A Job Task Analysis is a foundation for any valid credentialing program and helps identify the core knowledge areas, critical work functions, and/or skills typically found across a representative sampling of current practitioners or job incumbent workers. Empirical results from a job analysis provide examinees and the public with a valid, reliable, fair, and realistic assessment that reflects the skills, knowledge, and abilities required to competently perform a job.

In July of 2010, a group of 13 Subject Matter Experts (SMEs) met to perform the Job Task Analysis and to create an examination blueprint that would serve as the basis for the worker certification. A trained psychometrician facilitated the meeting and helped guide the development of these analyses. In the fall of 2010, an online survey was administered to validate the results of the JTA and to finalize the examination blueprint. More than 180 Quality Control Inspectors from across the United States responded to the survey.

This report contains the Quality Control Inspector Specifications and a content outline. In addition, the attached Exam Blueprint builds on these specifications by providing the optimum percentage of exam questions that should be asked about each task.

## **Scope**

A Quality Control Inspector is a residential energy efficiency professional who ensures the completion, appropriateness, and quality of energy upgrade work by conducting a methodological audit/inspection of the building, performing safety and diagnostic tests, and observing the work. A committee of SMEs considered to be experts in the field created the Quality Control Inspector Job Task Analysis.

This document is intended to include all of the tasks a Quality Control Inspector may perform, as well as the knowledge, skills, and abilities required to do these tasks.

Please note that certification is not a license to practice. All certificants must comply with applicable federal, state, and local laws and regulations governing the profession.

## **Content**

- A Job Task Analysis for a Quality Control Inspector
- An Exam Blueprint for a Quality Control Inspector

## Quality Control Inspector Specifications and Content Outline

Job Description: A Quality Control Inspector is an evaluator who verifies the work performed against the work plan, specifications and standards, performs building diagnostics, records/reports findings and concerns, and specifies corrective actions; by conducting a methodological audit/inspection of the building, performing safety and diagnostic tests, and by observing the retrofit work; in order to ensure the completion, appropriateness and quality of the work providing for the safety, comfort, and energy savings of the building occupants.

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### Domains/Tasks

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#### **Domain 1: Conducting Quality Checks - In-Process Visual/Sensory Inspections**

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**Task 1:** Verify worker compliance with safety rules

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**Task 2:** Assure worker professionalism

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**Task 3:** Address work problems

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**Task 4:** Evaluate client satisfaction regarding the in-process work

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#### **Domain II: Conducting Quality Checks - Post-Work Visual/Sensory Inspection**

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**Task 1:** Review client file and the work scope

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**Task 2:** Perform an exterior and interior visual/sensory inspection

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**Task 3:** Evaluate client satisfaction

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**Task 4:** Determine pass/fail of the work

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#### **Domain III: Conducting Quality Checks - Post-Work Diagnostic Inspections**

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**Task 1:** Conduct health and safety tests

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**Task 2:** Conduct diagnostic tests

---

**Task 3:** Identify work problems

---

#### **Domain IV: Ensuring Worker Professionalism**

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**Task 1:** Perform spot checks

---

**Task 2:** Provide feedback regarding professionalism

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#### **Domain V: Ensuring Program or Project Compliance**

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**Task 1:** Maintain professional credentials

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**Task 2:** Confirm the allocation of public/private funds

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**Task 3:** Evaluate installed measures against the field guide, SWS and state/local codes

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**Task 4:** Close out the project

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**Task 5:** Maintain files and records

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## Quality Control Inspector Content Outline

### DOMAIN 1: Conducting Quality Checks - In-Process Visual/Sensory Inspections

#### *Task 1: Verify Worker Compliance with Safety Rules*

##### **Ability to:**

- Walk around the job site
- Observe the workers
- Observe the site conditions
- Interview the crew chief
- Work in confined spaces

##### **Knowledge of:**

- Basic construction knowledge
- Codes and standards adopted by the local jurisdiction
- Federal Regulations (OSHA, EPA, etc.)
- First aid
- Interview techniques

##### **Skill in:**

- Communication
- Observation techniques

#### *Task 2: Assure Worker Professionalism*

##### **Ability to:**

- Conduct client interviews
- Evaluate the job site (trash, cleanliness, etc.)
- Verify that workers are familiar with their employers' code of conduct
- Observe the behavior of the workers

##### **Knowledge of:**

- Awareness of the employers' requirements
- Knowledge of positive reinforcement techniques

##### **Skill in:**

- Communication
- Observation
- Remaining tactful

#### *Task 3: Address Work Problems*

##### **Ability to:**

- Review the work against the work plan
- Observe worker skills
- Check materials being installed (proper materials and quality of materials)
- Observe sequencing of the components being installed
- Verify the condition and capacity of the equipment
- Determine need to conduct diagnostic tests
- Conduct diagnostic tests
- Document process issues and missed opportunities for change orders
- Revise work orders
- Redirect retrofit work

- 
- Discuss issues with the crew chief
  - Demonstrate proper methods to installers
  - Discuss missed opportunities with the auditor
- 

**Knowledge of:**

- 
- Basic building science
  - Codes and standards adopted by the local jurisdiction
  - Building materials
  - Construction tools and use
  - Construction work practices
  - Documentation procedures
  - Installation methods
  - Standards and specifications
  - Test protocols
  - Various diagnostic tests
- 

**Skill In:**

- 
- Communication
  - Being diplomatic
  - Observation
  - Training
- 

***Task 4: Evaluate client satisfaction regarding the in-process work***

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**Ability to:**

- 
- Interview the client
  - Observe client behavior (is the client uncomfortable, are the workers affecting the client, etc.)
  - Document findings
  - Communicate findings to the crew chief or other responsible parties
- 

**Knowledge of:**

- 
- Interview techniques
- 

**Skill in:**

- 
- Communication
  - Observation
-

## DOMAIN 2: Conducting Quality Checks - Post-Work Visual/Sensory Inspections

### *Task 1: Review Client File and the Work Scope*

#### **Ability to:**

- Review the audit
- Review the work order
- Review the invoices or job completion report
- Review diagnostic test results provided by installers
- Interpret diagnostic test results
- Interpret invoices
- Interpret work order
- Reconcile audit to work order to invoice

#### **Knowledge of:**

- Program or project requirements
- Diagnostic procedures
- The audit process
- Job costing

### *Task 2: Perform an Exterior and Interior Visual/Sensory Inspection*

#### **Ability to:**

- Perform exterior and interior walk around
- Compare observations of exterior/interior to the client file (work order, audit, invoices, etc).
- Verify installed components
- Note any anomalies or potentially missed opportunities or audit discrepancies
- Identify damage done by contractors/workers
- Document non-conformance or exceptional work with camera
- Identify additional building specific diagnostic tests

#### **Knowledge of:**

- Audit processes
- Basic building science
- Building materials
- Codes and standards adopted by the local jurisdiction
- Construction work practices
- Installation methods
- Standards and specifications
- Test protocols
- Various diagnostic tests

#### **Skill in:**

- Analytical thinking
- Basic math
- Basic tool use
- Observation
- Organization

### *Task 3: Evaluate Client Satisfaction*

#### **Ability to:**



- 
- Conduct client specific interview (behavior changes, client education, comfort, satisfaction)
- 
- Conduct program specific interview (worker performance, process, scheduling, value, opportunities for improvement)
- 
- Observe client behavior (thermostat settings, attire, manual weather stripping, windows open, etc)
- 
- Document client feedback
- 
- Take corrective actions (as necessary)
- 

**Knowledge of:**

- 
- Client education
- 
- Installed components
- 

**Skill in:**

- 
- Communication
- 
- Listening
- 
- Mediation
- 
- Observation
- 
- Remaining tactful
- 

***Task 4: Determine Pass/Fail of the Work***

**Ability to:**

- 
- Review results of visual/sensory inspection
- 
- Review results of diagnostic tests
- 
- Make a pass/fail determination
- 
- Obtain client sign-off if passed
- 
- Report inspection approval if passed
- 
- Identify work problems if failed
- 
- Generate a punch list if failed
- 

**Knowledge of:**

- 
- Basic building science
- 
- Diagnostic thresholds
- 
- Codes and standards adopted by the local jurisdiction
- 
- Standards and specifications
- 

**Skill in:**

- 
- Making decisions
- 
- Being accurate
- 
- Analytical thinking
- 
- Attention to detail
- 
- Remaining tactful
-

## DOMAIN 3: Conducting Quality Checks - Post-Work Diagnostic Inspections

### *Task 1: Conduct Health and Safety Tests*

#### **Ability to:**

- Perform combustion tests (heating systems, domestic water heater, ovens, stoves, fireplaces, etc.)
- Perform ventilation system tests
- Conduct moisture evaluations
- Conduct electrical safety tests

#### **Knowledge of:**

- Codes and standards adopted by the local jurisdiction
- Combustion safety protocols
- First aid
- Heating systems
- Moisture issues
- Safety issues

#### **Skill in:**

- Analytical thinking

### *Task 2: Conduct Diagnostic Tests*

#### **Ability to:**

- Perform blower door tests
- Perform pressure pan test
- Conduct zone tests
- Perform fan flow tests
- Perform infrared scans
- Perform duct leakage tests
- Perform electric circuit tests
- Perform refrigerant tests
- Conduct appliance tests
- Conduct domestic water heater temperature tests
- Record the results of all tests

#### **Knowledge of:**

- Basic building science
- Diagnostic testing protocols
- Manufacturers' specifications
- Program requirements

#### **Skill in:**

- Attention to detail

### *Task 3: Identify Work Problems*

#### **Ability to:**

- Review the results of all tests
- Compare results against field guide notes
- Compare results against pre-test data
- Compare results against work plan projections
- Identify missed opportunities

- 
- Determine deficiencies
  - Target deficiencies for corrective actions
  - Generate a punch list
  - Interpret data
  - Make decisions
  - Read a flowchart
- 

**Knowledge of:**

- 
- Basic building science
  - Field guides
  - Codes and standards adopted by the local jurisdiction
  - Standards and specifications
  - Testing protocols
- 

**Skill in:**

- 
- Analytical thinking
  - Communication
- 

**DOMAIN 4: Ensuring Worker Professionalism**

***Task 1: Perform Spot Checks***

**Ability to:**

- 
- Visit in-process job sites
  - Conduct random sampling of job site documents
  - Conduct random sampling of worker credentials
  - Observe the workers
  - Interview the client
  - Interview trade workers on the job
  - Interview others at the job site
  - Ability to observe without interfering
- 

**Knowledge of:**

- 
- Credentialing requirements for workers
  - Professional behavior and code of conduct
  - Program and agency guidelines
  - Required documentation
-

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**Skill in:**

- Attention to detail
  - Communication
  - Listening
  - Observation
  - Remaining tactful
- 

***Task 2: Provide Feedback Regarding Professionalism*****Ability to:**

- Document incidences of lack of professionalism
  - Document positive incidences of professionalism
  - Communicate with crew chief or appropriate party regarding professionalism incidences
  - Assure client of corrective measures
  - Assist in training workers
- 

**Knowledge of:**

- Professional behavior and code of conduct
  - Required documentation
- 

**Skill in:**

- Remaining impartial
  - Communication
- 

**DOMAIN 5: Ensuring Program or Project Compliance*****Task 1: Maintain Professional Credentials*****Ability to:**

- Continue education and training
  - Maintain professional licenses and/or certifications
  - Maintain memberships in professional organizations (REPA, ACI, Energy Outwest, NARI, etc.)
  - Participate in industry activities (JTAs, etc.)
- 

**Knowledge of:**

- Licensure and certification requirements
- 

***Task 2: Confirm the Allocation of Public/Private Funds*****Ability to:**

- Review work orders
  - Flag instances where work completed doesn't match funding requirements
  - Guard against cost overruns
  - Report disallowed costs
- 

**Knowledge of:**

- Scopes of work
  - Allowable activities under funding sources
  - Maximum allowable caps on funding sources
- 

**Skill in:**

- Analytical thinking
  - Attention to detail
-

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**Task 3: Evaluate Installed Measures Against the Field Guide, Standard Work Specifications and State/Local Codes**

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**Ability to:**

- Compare work completed with the accepted practices
- Identify work that does not meet accepted practices
- Determine if problem is a material problem or a work problem
- Suggest program change recommendations
- Recommend education for auditors and installers
- Ability to aggregate information
- Ability to identify gaps in training
- Ability to write a report

**Knowledge of:**

- Basic building science
- Codes and standards adopted by the local jurisdiction
- Industry standards
- Program requirements
- Training curriculum

**Skill in:**

- Analytical thinking
- Remaining tactful

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**Task 4: Close out the Project**

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**Ability to:**

- Ensure all punch-list items have been completed
- Assemble all required documentation paperwork (certificates, photos, etc.)
- Confirm all required signatures were obtained
- Prepare completion reports (checklists, required agency reports, etc.)
- Submit authorization for payments/reimbursements/invoices

**Knowledge of:**

- Agency/company processes
- Program requirements
- Required paperwork
- Required signatures

**Skill in:**

- Organization
- Report writing

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**Task 5: Maintain Files and Records**

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**Ability to:**

- Maintain job logs and notes in the files
- Maintain photos in the files
- Maintain information on any anomalies on the job
- Maintain information on any ongoing complaints
- Maintain documentation from program monitoring (federal, utility, etc.)

**Knowledge of:**

- Legal responsibilities
- Program requirements
- Recordkeeping best practices

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**Skill in:**

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- Attention to detail
  - Organization
-

## Quality Control Inspector Exam Blueprint

<b>A</b>		<b>Conducting Quality Checks - In-Process Visual/Sensory Inspections</b>	<b>10%</b>
	1	Verify worker compliance with safety rules	2%
	2	Assure worker professionalism	2%
	3	Address work problems	3%
	4	Evaluate client satisfaction regarding the in-process work	3%
<b>B</b>		<b>Conducting Quality Checks - Post-Work Visual/Sensory Inspections</b>	<b>30%</b>
	1	Review client file and the work scope	7%
	2	Perform an exterior and interior visual/sensory inspection	8%
	3	Evaluate client satisfaction	7%
	4	Determine pass/fail of the work	8%
<b>C</b>		<b>Conducting Quality Checks - Post-Work Diagnostic Inspections</b>	<b>40%</b>
	1	Conduct health and safety tests	13%
	2	Conduct diagnostic tests	14%
	3	Identify work problems	13%
<b>D</b>		<b>Ensuring Worker Professionalism</b>	<b>10%</b>
	1	Perform spot checks	5%
	2	Provide feedback regarding professionalism	5%
<b>E</b>		<b>Ensuring Program or Project Compliance</b>	<b>10%</b>
	1	Maintain professional credentials	2%
	2	Confirm the allocation of public/private funds	2%
	3	Evaluate installed measures against the field guide, SWS and state/local codes	2%
	4	Close out the project	2%
	5	Maintain files and records	2%
			100%