**DIRECTIONS:** Here are some real puzzlers for you! Decipher the hidden meaning of each set of words.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tr>
<td><strong>cry</strong></td>
<td><strong>MAN</strong></td>
<td><strong>11111</strong></td>
<td><strong>BUSINES</strong></td>
</tr>
<tr>
<td><strong>milk</strong></td>
<td><strong>campus</strong></td>
<td>another</td>
<td>another</td>
</tr>
<tr>
<td><strong>CANCELLED</strong></td>
<td><strong>MOVING</strong></td>
<td>another</td>
<td>another</td>
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<tr>
<td><strong>ME ME ME AL AL AL day</strong></td>
<td><strong>VIT _ MIN</strong></td>
<td><strong>ST EPP IN G</strong></td>
<td><strong>REVIRD TAE S</strong></td>
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<td><strong>NO NO CORRECT</strong></td>
<td><strong>head ache</strong></td>
<td><strong>be at the main</strong></td>
<td><strong>MOUNTAIN</strong></td>
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WFL Contractor Quality Control

17th Northwest Tribal Transportation Symposium
Portland Oregon
Contractor QC 2010

• What’s New
  – TRB
<table>
<thead>
<tr>
<th>Project Number</th>
<th>Problem Number</th>
<th>Title</th>
<th>Page No.</th>
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<tbody>
<tr>
<td>01-48</td>
<td>C-15</td>
<td>Integrating Pavement Preservation into the Design Process</td>
<td>1</td>
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<tr>
<td>01-49</td>
<td>D-14</td>
<td>Guidelines for Forensic Evaluation of Highway Pavements</td>
<td>1</td>
</tr>
<tr>
<td>08-77</td>
<td>B-03</td>
<td>Developing Regional Historic Contexts for Post-World War II Housing</td>
<td>2</td>
</tr>
<tr>
<td>08-78</td>
<td>B-10</td>
<td>Develop Bicycle/Pedestrian Demand Model to Measure Bicycle/Pedestrian Activity and Relationship to Land Use</td>
<td>3</td>
</tr>
<tr>
<td>08-79</td>
<td>B-23</td>
<td>Identifying Credible Alternatives for Producing 5-year CTPP Data Products from the ACS</td>
<td>4</td>
</tr>
<tr>
<td>09-49</td>
<td>D-06/D-08</td>
<td>Long Term Field Performance of Warm Mix Asphalt Technologies</td>
<td>4</td>
</tr>
<tr>
<td>10-81</td>
<td>D-13</td>
<td>Evaluation of Fuel Usage Factors in Highway Construction</td>
<td>6</td>
</tr>
<tr>
<td>10-82</td>
<td>D-16/F-06</td>
<td>Performance Related Specifications (PRS) for Pavement Preservation Treatments</td>
<td>8</td>
</tr>
<tr>
<td>10-83</td>
<td>D-24</td>
<td>Alternative Quality Systems for Application in Highway Construction</td>
<td>8</td>
</tr>
<tr>
<td>12-85</td>
<td>C-02</td>
<td>Roadway Bridges Fire Hazard Assessment</td>
<td>11</td>
</tr>
<tr>
<td>12-86</td>
<td>C-03</td>
<td>Bridge System Safety and Redundancy</td>
<td>12</td>
</tr>
</tbody>
</table>
Alternative Quality Management Systems for Highway Construction
http://www.trb.org/TRBNet/ProjectDisplay.asp?ProjectID=2714
Record Type: R/P

Project delivery methods in the construction industry have evolved and so have quality management systems. Changes in the roles of owners and contractors in delivery systems range from the highway standard design-bid-build system to design-build/public-private partnership agreements where the responsibility for quality management is shared to varying degrees between the contractor and owner. The design-build system uses the traditional highway quality management system (referred to in this project as the baseline quality management system) with detailed contractor quality control requirements strictly monitored by the owner. The attraction of alternative project delivery methods is the transfer from owner to contractor of some measure of project responsibility that may include design, finance, and/or quality management. These alternatives may result in substantial savings to the owner from lack of design error and omission claims, lower cost of capital, and reduced employment of project management and inspection forces. These alternative project delivery methods have proven to be efficient and effective in many types of construction and are increasingly making inroads into the highway construction arena. One aspect of alternative project delivery methods that may be applied to highway construction now is the application of alternative quality control systems that emphasize contractor quality control and assurance. These new systems allow owners to have confidence through a verification of contractor quality system process. As an example, a formal quality management system, under the International Organization for Standardization (ISO)-ISO 9001 Quality Management Systems—Requirements integrates quality management from the suppliers through the contractors to the owners. It requires post-project reviews and publishes ratings of contractor performance. During the project, the owner verifies that the contractor’s quality management plan is in force, rather than providing extensive, detailed specifications and conducting the on-site tests required by the baseline quality management system. Another alternative method is the U.S. Army Corps of Engineers’ quality management system. This system provides extensive, detailed specifications and permits on-site testing by contractors. Research is needed to provide guidance on the use of alternative quality management systems for highway construction projects. The objectives of this research are to (1) identify and understand alternative quality management systems and (2) develop guidelines for their use in highway construction projects.
Start date: 2010/5/1
Status: Proposed
Contract/Grant Number: Project 10-83
Total Dollars: 500000
Source Organization: Transportation Research Board
Notes: Contract to a Performing Organization has not yet been awarded
Contractor QC 2010

What is Contractor QC supposed to do?

Why?
Tradition

• Historically, the industry has accepted a system of the contracting agency advising the contractor on what was right, wrong and what remained to be done.

• This restricts contractors and burdens contracting agencies, and places the details of the responsibility for control of quality on the owner.

• The entity that performs the work should be responsible for the quality of the work.
Mid 60’s, Libby, Montana
BPR Kootenai River Bridge Project
Past practices - FHWA QC
FHWA QC Montana style. We checked safety nets too!

Jerry Bruyer FHWA RET
FAR 52.246-12 Inspection of Construction

• The Contractor shall maintain an adequate inspection system and perform such inspections as will ensure that the work performed under the contract conforms to contract requirements.

The Contractor shall maintain complete inspection records and make them available to the Government.
Government inspections and tests are for the sole benefit of the Government and do not –

(1) Relieve the Contractor of responsibility for providing adequate quality control measures;

(2) Relieve the Contractor of responsibility for damage to or loss of the material before acceptance;

(3) Constitute or imply acceptance; or
less resources
more complexity
more oversight
contractor expertise
doing right the first time
improves efficiency
improves profitability
facilitates partnering
frees staff for management
a tool to help us do our job
A model is provided
# QC Plan Checklist

## Contractor Quality Control Plan Worksheet

<table>
<thead>
<tr>
<th>Work Feature:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bid items associated with the work:</td>
<td></td>
</tr>
<tr>
<td>Is a WFLHD 470 required for this feature of work?</td>
<td>Yes</td>
</tr>
<tr>
<td>Add pages (attachments) as necessary</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Contractor Quality Control Actions</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Who will perform the task?</td>
<td>What will be done to accomplish the task?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PREPARATION QC ACTIVITY 1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Independently and with contractor staff review contract requirements plans and specifications.</td>
<td></td>
</tr>
<tr>
<td>Assign QC individuals to be fully knowledgeable of requirements. Use this individual or staff to assist in determining requirements. Use this individual to verify that requirements will improve design, allowing maximum performance and maximum efficiency during startup.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PREPARATION QC ACTIVITY 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Check and verify submittals, plans and materials certifications for contract requirements and submit to FHWA. Provide statement and signature of verification.</td>
<td></td>
</tr>
<tr>
<td>Prompt and accurate review of submittals, plans and materials certifications. For fabricators and suppliers will ensure acceptance. Repeated submittals will result in excessive resources.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PREPARATION QC ACTIVITY 3</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Check site conditions for constructability, including staging, disposal and storage areas. Identify potential quality control issues, verify the materials delivered to the site conform to accepted materials certifications, submittals, plans and contract requirements.</td>
<td></td>
</tr>
<tr>
<td>A visual review of site conditions and materials delivered, will uncover some aspects of the work. Making a practice of this will increase efficiency during startup.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PREPARATION QC ACTIVITY 4</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Review construction staking to assure accuracy and sufficiency at each stage of construction. See Table 153-2 and Section 152 Construction Survey &amp; Staking</td>
<td></td>
</tr>
<tr>
<td>Completing a systematic check of sufficiency and accuracy can save the contract work because of inaccurate survey staking, ensure that layout and staking work is accurate. Develop an understanding of the site conveyed by the staking.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete operational work plan. Provide brief written narrative of the work activity describing methods, locations, crews, equipment and processes that will be used to complete the work.</td>
<td></td>
</tr>
<tr>
<td>Sharing that knowledge in written form is a best practice.</td>
<td></td>
</tr>
</tbody>
</table>

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*Note: The above text is a sample of the table content. The actual document may contain more detailed information and specific requirements.*
Primary contractor QC functions

1. Independently and with contractor staff review contract requirements, plans and specifications
• Assign knowledgeable QC individuals to understand and share requirements.

• Knowledge of requirements will improve decision making allowing maximum performance and efficiency in completing work requirements.
Primary contractor QC functions

2. Inspect and verify submittals, certifications and plans
• Fully research and verify certification of project materials.
• Delays due to incomplete submittals are preventable.
Primary contractor QC functions

3. Inspect site conditions for constructability
• Verify the site conditions
• Identify potential issues ahead of time
• Promptly inform CO to facilitate resolution.
Primary contractor QC functions

4. Review construction staking
• Complete a systematic check on construction staking.
• Develop an understanding of the information that will be conveyed by the staking.
Primary contractor QC functions

5. Develop and share operational work plan
• Develop a work plan ahead of time is key to efficient performance.

• Sharing knowledge is instrumental in obtaining cost efficient performance.

• Sudden changes in work plan and methods due to oversight of essential requirements can be fatal to cost efficiency.
Primary contractor QC functions

6. Hold pre-work meeting with crews
• Keeping the crew and the CO informed of methods, special considerations and expectations is critical to a successful operation.

• Good communication should lessen misunderstood job requirements, inefficiency and re-work.
Primary contractor QC functions

7. Verify, inspect, measure, test, Table 153.1 and 153.2
• The key to timely Government acceptance is to ensure that adequate self inspection and quality control has been performed.

• Rejection of completed work is costly and can be avoided by practicing good quality control.
Primary contractor QC functions

8. Provide presence and communicate
• Close and prompt contact with the CO is beneficial to solving construction issues during early stages of work.

• The sooner that issues are resolved the more efficient and productive work can be.

• It is in both the contractors and the owners interest to solve problems promptly.

• Lengthy delays in finding the right personnel to resolve issues cost time and wastes resources.
Primary contractor QC functions

9. Verify completed work – 470 process
• Final self verification of work provides for hold and witness points to allow work to be incrementally incorporated into the final product.

• It allows for a clear and mutual understanding of acceptance requirements
<table>
<thead>
<tr>
<th>CONTRACTOR QUALITY CONTROL PLAN WORKSHEET</th>
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<td>Work Feature:</td>
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<th>Purpose</th>
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<td>Who will perform the task?</td>
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</tr>
<tr>
<td>What will be done to accomplish the task?</td>
<td></td>
</tr>
<tr>
<td>When and where will activities be performed and at what frequency?</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PREPARATION QC ACTIVITY 1</th>
<th>Independently and with contractor staff review contract requirements plans and specifications.</th>
<th>Assign QC individuals to be fully knowledgeable with requirements. Use this individual staff to assist in determining requirements. Ensuring requirements will improve design and allow maximum performance of project requirements.</th>
</tr>
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<tr>
<td>PREPARATION QC ACTIVITY 2</td>
<td>Check and verify submittals, plans and materials certifications for contract requirements and submit to FHWA. Provide statement and signature of verification.</td>
<td>Prompt and accurate review of submittals, plans and materials certifications. Suppliers and subcontractors will ensure acceptance. Repeated submittals to resource.</td>
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<tr>
<td>PREPARATION QC ACTIVITY 3</td>
<td>Check site conditions for constructability, including staging, disposal and storage areas. Identify potential quality control issues, verify the materials delivered to the site conform to accepted materials certifications, submittals, plans and contract requirements.</td>
<td>A visual review of site conditions, including staging, materials delivered and other aspects of the work. Making a practice of this will increase maximum efficiency during startup.</td>
</tr>
<tr>
<td>PREPARATION QC ACTIVITY 4</td>
<td>Review construction staking to assure accuracy and sufficiency at each stage of construction. See Table 153-2 and Section 152 Construction Survey &amp; Staking</td>
<td>Completing a systematic check of accuracy and sufficiency can save time and effort because of accurate surveying maintained to that layout and staking work. Develop an understanding of critical tasks conveyed by the staking.</td>
</tr>
<tr>
<td>PREPARATION QC ACTIVITY 5</td>
<td>Complete operational work plan. Provide brief written narrative of the work activity describing methods, locations, crews, equipment and processes that will be used to complete the work.</td>
<td>Developing a work plan ahead of the operation. Sharing that knowledge in written form.</td>
</tr>
</tbody>
</table>
FORM WTHD 472 (02/2008)
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
Regional Highway Division
610 E. 5th St., Vancouver, Washington 98661.

Project Name: __________________________ Project Number: _______________________

Date of inspection: __________________________ Weather __________________________

Contractor Daily Quality Control Report

Work reviewed/inspected:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Testing/measurement activities:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Deficiencies found:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Corrective action taken:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
How has it been working?
Contractor QC 2010

• Specification Improvements
Emphasize Contractor Inspection of Work

Section 153. CONTRACTOR QUALITY CONTROL

Delete the text of this Section and substitute the following:

Description

153.01 This work consists of providing inspection, exercising management control, obtaining samples for quality control testing, performing quality control tests to ensure that all work conforms to the contract requirements. See FAR Clause 52.246-12 Inspection of Construction.
Emphasize Contractor Quality Control
Site Presence

153.03 General. Provide a quality control system and personnel that plans, performs, and documents quality control activities.

Alternative quality control systems that meet the intent of this specification may be approved by contract modification if approved by the CO.

Except as authorized by the CO provide a quality control manager or designated quality control staff on-project during the execution of all work with the authority to stop work not in compliance or cease work that will result in non-compliance with contract requirements.
Develop Mutual Understanding At Beginning of Project

Within 14 days after the preconstruction meeting a contractor quality control coordination meeting will be held to achieve mutual understanding of contractor quality control and review initial quality control plans.
Eliminate Extraneous Activities

Do not designate superintendents, foremen, and traffic and safety supervisors as quality control manager or other quality control personnel.

Except as authorized by the CO duties other than quality control activities described under this section shall not be performed by contractor quality control staff.
(7) Ensure construction methods and test procedures are followed that will result in the end product meeting the contract requirements. Verify by including as a minimum the:

- quality control inspection and measurement requirements in Table 153-2;
- quality control sampling and testing requirements in Table 153-1; and
- quality control inspection of start up of work activities
- sampling and testing requirements at the end of each specific Section.
Enhance Coordination

(8) Conduct weekly quality control coordination meetings with the CO to develop and maintain mutual understanding of completed and upcoming quality control activities, and also provide immediate on-site presence to communicate status of work to the CO and contractor personnel for rapid quality control issue resolution;
Allow Expansion of 470 Requirement

(2) Notification of Completion of Work - Submit a completed “Notification of Completion of Work” (Form WFLHD 470) when work listed in Subsection 153.06 or other work as directed by the CO is ready for Government quality assurance inspection.
Other Ideas
• Contractor Workshop
Yearly in WFL
On-site with selected projects
• Construction Manual Guidance
  – FAQ
  – Plans
Project Development

Customize specification for particular project requirements.
Pay Factor
Third party
Survey past
Testing past
Inspection
CFL
Contractor performance evaluation
Expectations

Continue QC

Realize common understanding between ourselves and contractors

Develop the expectation of the requirements

Deal with promptly

If not working

Address in stages

It is a tool for our benefit