

Construction Quality Partnership

Q/C Plans

Construction & Materials Conference

March 7, 2006

Construction Quality Partnership

● Initiative by Industry to:

- Enhance Construction Quality
- Address Need for Current and Future Personnel Skills
- Produce Training and Skills to Enhance Value to Taxpayers

Construction Quality Partnership

- Construction Quality – Not Just Contractor Quality
- Ultimate Goal: Improve Michigan's Roads & Bridges

Michigan's Construction Quality Partnership

MDOT

MITA

FHWA

MCPA

CRAM

APAM

MML

MRPA

ACEC

Construction Quality Partnership

● Will ultimately lead to:

- Contractor, Consultant and MDOT Personnel Certification
- Corporate Contractor Certification

Who Gets Training?

- Strategic

- DOT and Contractor Senior Management

- Technical

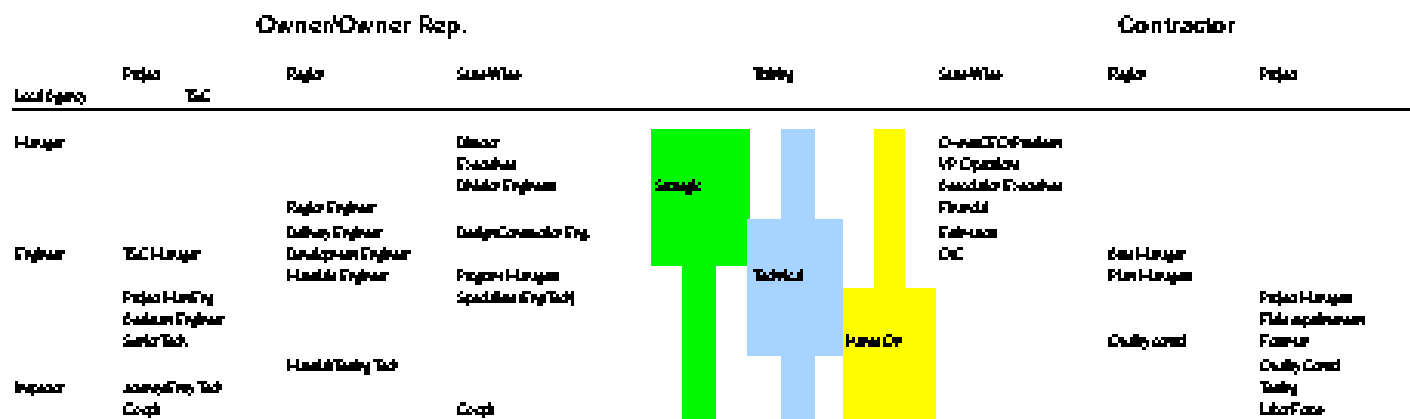
- Project level engineering and management

- Hands On

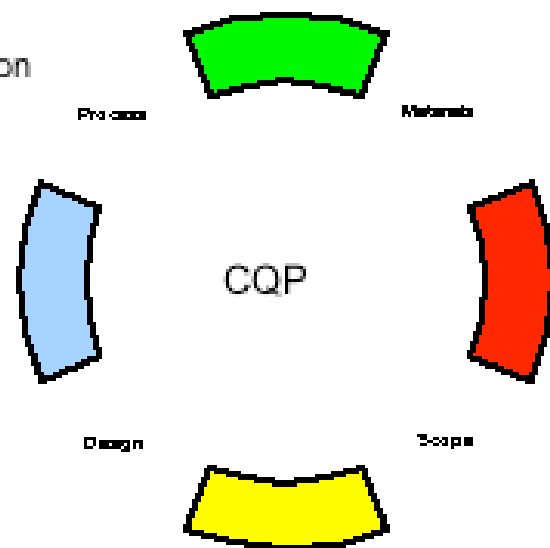
- Inspection and labor force

CQP

Construction Quality Partnership

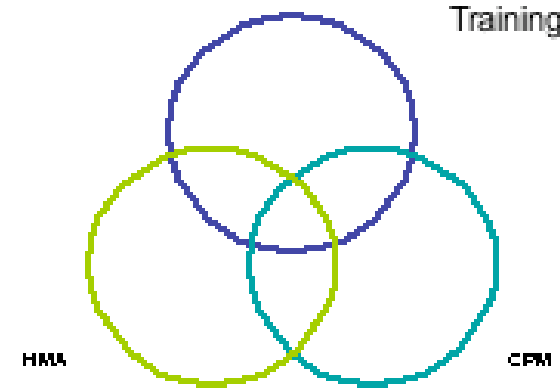


Construction



PCC

Training



Paradigm Shift

*Move focus
from:
End-product
inspection
and
post-
construction
warranties*



*To:
Continual Quality
Process Control
At All Stages
Design (MDOT, Consultants)
Bidding (Contractor)
Construction (MDOT,
Consultants, Contractors)*

Training Development

- Technical Advisory Groups Formed to develop curriculum
- Begin with the “Core Three”
 - HMA Paving Operations
 - Concrete Paving Operations
 - Capital Preventative Maintenance

Training – First Class 2006

- Quality Control Plan Development and Review
 - “Basics” of QC Plans
 - Focus on Process
 - Unique to each project
- Present to CQP Executive Steering Committee February 3rd

Training – First Class 2006

● Three Classes –

- MCPA Annual Conference – February 16th
- MDOT Construction & Materials Conference – March 7th
- APAM Annual Conference – March 8th

Where Do We Go From Here?

- Get the Charter Signed
- Obtain Nation Partnership for Highway Quality (NPHQ) Accreditation
- Continue Curriculum Development
- Identify resources available/needed to deliver curriculum
- More classes in 2006

What a Q/C Plan is

- It's the Contractor's plan for constructing the item of work
 - The Q/C Plan documents the contractor's process for delivering the level of construction quality required by the contract
 - The Q/C Plan is a framework for delivering quality construction
 - The Q/C Plan is a tool to help the contractor avoid problems, not create new ones

What a Q/C Plan is not

- The Q/C Plan is not a new specification
 - The contract documents define the expected results or outcome
 - The Q/C Plan outlines how those results will be achieved
- The Q/C Plan is not unchangeable
 - A good plan is not written in general terms; it must include specific details
 - Because it includes specific details, expect to modify it as conditions change
 - It should be followed unless modifications have been approved by the Owner

Who should develop the plan?

- The person(s) responsible for making decisions
 - It's a tool to help make good decisions
 - The person who develops the plan will have the best understanding of it (Great training aid)
 - A person may tend to work harder to make their own plan work
 - It should start at the foreman level
 - When field personnel are key authors they are available to modify the plan with minimal delay
- A complete plan will likely have several authors

What should a Q/C Plan contain?

- Detail of process – what you expect to see
- List of personnel, equipment and anticipated production rates
- Personnel assignments
- List of tests with action and suspension limits
- How to document the quality of the work completed
- How to train the workforce

How do you write a Q/C Plan?

- Answer the following questions for each operation:
 - Who will be responsible during the operation
 - What will that person do to ensure contract compliance
 - Where will tests and inspections be done
 - When will these activities be performed
 - How will inspections be performed

Who

- Initially, the Q/C manager may be assigned testing, documentation, and training tasks
 - It is unlikely he/she will have time to stay with each operation
- The foreman will probably be assigned more responsibility during the project.
- Who will have responsibility and authority to change the operation
 - This should be specifically identified

Q/C Organization

Separate quality and operational staffs

- Testing is a very specialized function, but testing and documentation are only a part of a quality process
- Inspection performed by separate staff, looks like traditional contractor inspector relationship
- It is important to define the relationship between inspection and production; clear authority lines are required
- Define who can stop production & under what circumstances
- When can production resume?

Q/C Organization

Combined quality/production staff

- Quality management experts generally discourage separating quality control personnel from production personnel
- Separation pits one part of the organization against another
- Ideally, QC should be achieved by developing an organizational culture of quality
- However, while an organization is transitioning from a traditional to a quality management system, a separate staff may make sense while the culture is being developed

What

- What authority will the person responsible for quality have over the operations
- What part of their time during operations will they be present
- What should the materials and equipment used in the construction look like
- What should the operation look like
- What weather conditions do you expect
- What will make you change the operation

Where

- Where are the process control tests going to be performed
- Where will manufactured materials be tested or certified
- Where will control charts be posted

When

- When will tests be made
- When will test results be available
 - Note: This is a Key component
- When will adjustments to the process be required

The ability to respond and adjust operations before they get out of specification is the basis for quality control.

How

Will you meet the specifications?

Will inspections be performed?

- A standard checklist is a possible method
- Develop a “step by step” description of the work
- The more general and vague, the less effective
- The QC plan must go beyond just stating the contract specifications
- How will the contractors process consistently deliver those requirements
- How are you going to do it?

Subcontractors and Suppliers

- The plan should be clear on whether their Q/C responsibilities will be independent or part of the prime contractor's
- If independent, a supplier Q/C plan should be developed and submitted through the prime
- The prime contractor is contractually responsible for all of the work, but it is not the same as having an active role in the quality delivery process
- The prime needs to know what his subcontractor is doing

Project Specific

- Many operations are conducted with typical construction crews and equipment
 - Use a generic operational plan
 - Detail the unique project specific issues
- Every project has unique specific details that should be addressed
 - Physical layout
 - Haul routes
 - Material delivery timing
 - Seasonal restrictions
 - Special conditions

How do you use the Q/C Plan

- Use it as a guide to help you determine if you are in control of your work
 - Are you proceeding as planned
 - Or are you constantly forced into reacting to conditions as they occur
- Use it as a check to make sure you are not forgetting anything required by specifications – no surprises

When should you change a Q/C Plan

- When environmental conditions are outside the expected ranges
- When operations are changed due to equipment and personnel availability
- When traffic restrictions or other events dictate a change to the planned operation
- When you are not able to meet the project specifications using it
- When you have a better idea or method for completing the work
- When changes are agreed and approved by the agency engineer

How do you change a Q/C Plan

- Stop and re-evaluate your product
- Think through and document a new plan of operation
- Review the proposed changes with the engineer
- Go over the details of the new plan with the project personnel – provide training
- Monitor the progress of the new plan – is it working? – if not, change it again

Guardrail, Preliminary

Poor

All guardrail materials will be checked for contract compliance before use. All employees are empowered to inspect and reject materials not complying with the contract.

Fair

All guardrail materials will be checked by the Quality Control Technician (QCT) for contract compliance before use. Materials not in compliance will be isolated and rejected. Survey crew will layout guardrail in accordance with the plans before construction.

Good

Upon delivery of guardrail, posts, and hardware, QCT will check for proper identification, certification, and damage during shipment. Before scheduled construction, components will be reinventoried, checked, and compared to layout requirements. QCT will review layout procedures with the Project Engineer (PE). Will coordinate with survey crew on stakeout. Will check each stakeout for possible transition problems. Will notify the PE of opportunity to check.

Guardrail, Startup

Poor

QCT will inspect guardrail crew's operations during startup. Any deficiencies will be brought to the attention of the Foreman.

Fair

QCT will continuously work with stakeout crew and installation crew when operations begin, to assure a common understanding of contract requirements and standards/tolerances etc.

Good

Prior to scheduled beginning of installation, QCT will verify that stakeout has been accomplished in accordance with requirements. QCT will go over a checklist of required quality characteristics with the Foreman. The Foreman will be responsible for routine quality monitoring after startup.

Guardrail, Production

Poor

The QCT will periodically check on operations during construction to assure contract compliance.

Fair

The QCT will inspect installation operations every day to verify specification compliance and document completion of each installation.

Good

The QCT will inspect installation operations at least twice a day, verifying compliance with stakeout, as well as rail height, post plumbness, etc. The QCT (or the Foreman if QCT is not available) will document completed work and cleanup and advise the PE of such completed work for acceptance. Additional inspection/training will be provided if installation crew personnel changes or deficiencies are noted.

Poor Q/C Planning:

