Section 9: Quality Management
Quality Management is the process that will be used to help ensure that the desired quality is achieved in design and deliverables.
Quality Management

This topic covers the following:

- Learning Objectives
- Quality Assurance vs. Quality Control
- Why does the PDP include Quality Management?
- Example of a Quality Management Plan
- What is the PM’s role in Quality Management?
- How to create a Quality Management Plan
- Class Quiz
- Summary
Learning Objectives

Participants will:

- Recognize the value and purpose of a Quality Management Plan
- Be able to complete a Quality Management Plan
Quality Assurance vs. Quality Control

- Quality Assurance and Quality Control are two aspects of Quality Management
- The terms are sometimes used interchangeably, but really have different meanings
  - **Quality Assurance** is the activity or set of activities for ensuring quality processes are in place and that they are followed
  - **Quality Control** is the activity or set of activities for producing/monitoring/inspecting deliverables and services to ensure they meet quality expectations
Why Include Quality Management?

Can you think of an example where more attention to quality could have benefitted a project?

- Wrong or missing standard special provisions
- A supplemental survey used the wrong vertical control
- New bridge vertical alignment doesn’t tie-in to new roadway vertical alignment
Why Include Quality Management?

Potential Consequences of Poor Quality Management

- Revisions Under Ad needed because the Plans/Specs were unclear or incomplete
- More CMOs required to address errors and omissions
- Cost and Scope growth during construction
  - Incomplete plans
  - Design busts
  - Inability to fulfill Owner contractual obligations, etc.
- Disputes and Claims during construction
- Transportation facilities with less than desirable safety performance
Why Include Quality Management?

FY 2017
463 change orders

- Plan or Spec Errors, 48%
- Differing Site Conditions, 23%
- LA Request, 3%
- Other, 9%
- Material Changes/Out of Spec, 5%
- Utility Delay, 0.4%
- Urgent Need, 5%
- Time or Schedule, 5%

223 of 463!
Why Include Quality Management?

Can you think of some benefits of effective Quality Management?

• Less rework
• Lower overall costs (design and construction)
• Increased likelihood of meeting or beating schedule
• Increased Stakeholder satisfaction
• Improved Safety
Why Include Quality Management?

The earlier that an error is caught, the greater the savings.

QA/QC saves Time & Money

Amount of Influence

Initiate:
DSR Meeting → Scoping → Execute (FIR/FOR/AD) → Transition to Construction

Opportunity of Influence

Cost of Change

High

Low
Quality Plan

Each discipline will be responsible to conduct a detailed check of their plans, specifications and reports prior to submittal for FIR, FOR and Final design. Because there are multiple disciplines with overlapping elements of their design, Interdisciplinary Reviews (IDR) will be conducted prior to submittal of the FIR plan/specs, FOR plans/spec and Final PS&E package. Reviewers of FIR & FOR plans will be directed to provide comments in writing, 3 days in advance of the review meeting, using the Review Comment Summary/Resolution Form linked below. This form will also be used for all IDRs. The Roadway Designer will complete the Form #1299 at FIR, FOR and final, with input from the team.

The following matrix lists the anticipated quality reviews, responsibilities and completion dates.
### Example Quality Plan (Matrix)

<table>
<thead>
<tr>
<th>Quality Assurance/Control Tracking Matrix</th>
<th>Person to Ensure QC is Done (QA)</th>
<th>Person Responsible for QC</th>
<th>Planned QC Completion Date</th>
<th>Actual Completion Date</th>
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</thead>
<tbody>
<tr>
<td><strong>FIR – Preliminary Design (30%)</strong></td>
<td></td>
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<tr>
<td>Detailed Check (DC) of Preliminary Hydraulics Report</td>
<td>Al Waters</td>
<td>Tina Turbidity</td>
<td>2-15-18</td>
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<tr>
<td>DC of Structure Section Report</td>
<td>Paula Piers</td>
<td>Bridgette Doe</td>
<td>2-15-18</td>
<td></td>
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<tr>
<td>DC of Prelim Geotech Report</td>
<td>Joe Dirt</td>
<td>Allison Agg</td>
<td>2-15-18</td>
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<tr>
<td>DC of Materials Pavement Recommendation</td>
<td>Joe Dirt</td>
<td>Pam Pavers</td>
<td>1-15-18</td>
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<tr>
<td><strong>FOR – Preliminary Design (90%)</strong></td>
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<tr>
<td>Detailed Check (DC) of FOR Plans &amp; Specifications (refer to Form 1299)</td>
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<tr>
<td>Roadway</td>
<td>Rudy Rhodes</td>
<td>Lora Lane</td>
<td>9-1-18</td>
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<td>Structures</td>
<td>Bridgette Doe</td>
<td>Paula Piers</td>
<td>9-1-18</td>
<td></td>
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<tr>
<td>Hydraulics/WQ</td>
<td>Al Waters</td>
<td>Tina Turbidity</td>
<td>9-1-18</td>
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<td>Materials</td>
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<td>9-1-18</td>
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<td>TSM&amp;O/Traffic</td>
<td>Sally Stripe</td>
<td>Steve Sign</td>
<td>9-1-18</td>
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<td>ROW/Survey</td>
<td>Mark Controls</td>
<td>Tom Transit</td>
<td>9-1-18</td>
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<td>Utilities</td>
<td>Paul Powers</td>
<td>S. Ewers</td>
<td>9-1-18</td>
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<td>Interdisciplinary Review of Plans and Specs</td>
<td>Jill Jones</td>
<td>All Discipline Leads</td>
<td>9-8-18</td>
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<tr>
<td>DC of FOR Estimate</td>
<td>Penny Wise</td>
<td>Dora Dollar</td>
<td>9-15-18</td>
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</table>
What is the PM’s Role in Quality Management?

- Discuss QA/QC objectives
- Develop a Quality Management Plan
- Perform Quality Assurance activities
- Manage Quality; analyze outcomes and adjust as needed
What is the PM’s Role in Quality Management?

- Sometimes the PM serves as a designer and/or checker
- The PM’s **main role** is managing the project and coordinating the many stakeholders
- The PM is the conductor of the orchestra
How to create a Quality Management Plan

Quality Management Planning defines the methods for implementing quality practices, and identifies:

• Roles and Responsibilities
• Key deliverables
• What will be reviewed and when
Can you think of types of activities/reviews that might be included in a Quality Management Plan?

• Interdisciplinary
• Constructability and Biddability
• Technical Review
• Policy Review
• Design Review
• Detailed Check
How to create a Quality Management Plan

When should quality reviews be conducted on key deliverables?

- Reports
  - Prior to draft and final submittals
- Calculations
  - Prior to incorporation into plans or reports
- Plans & Specs
  - Prior to major milestones - FIR, FOR, Final Plans*

*TETP has an eLearning class on Plan Checking
How to create a Quality Management Plan

Quality Resources:

- https://www.codot.gov/library/manuals/
How do you handle FIR and FOR comments?

- Best practice: use a comment tracker/resolution log:

  how to create a quality management plan

- Best practice: have a note-taker to capture verbal comments/agreement live in the meeting
Using a comment tracker/resolution log to make review meetings more efficient (and shorter):

- With team concurrence, state in the PDP (and team concurs) that written comments will be submitted using the log, 3 days prior to the review meeting.
- The PM (or designee) will consolidate all comments into a single log. Highlight the comments needing discussion; suggest graying-out the agreed-to comments to discourage discussion.
- Limit discussions in review meetings to those issues/comments that need resolution. If you agree with a comment and plan to implement it, don’t spend any time discussing it.
What is a Detailed Check?

- Example of a detailed check form

MnDOT DC Sample
Take a couple of minutes and complete the quiz that is being handed out

Correct Answers:
Workshop Discussion Questions

- Do you currently use quality checks for project deliverables?
- Do you ask Team members/Specialty Units to perform quality assurance checks on their submittals?
- What should you do if you receive a request/directive from your manager to submit project documents or plans, prior to checking?
Summary

- The Quality Management plan is a roadmap for the QA/QC activities planned for the project.
- There are many benefits to a formalized quality management process.
- CDOT has several existing quality tools and training modules available:
  - Forms and manuals
  - eLearning for Plan Checking (see LMS to register for this course)
  - Some regions have NPS contracts to procure design checking services from a consultant.
Questions/Discussion
Form 1299 if there are questions about it