

## Chapter 18

### Quality Assurance & Quality Control

The following are changes, additions or deletions to the January 2007, Topic #625-000-007, Plans Preparation Manual (PPM) - English, for use on Turnpike projects only:

#### 18.4 Turnpike Quality Control and Assurance Process

*Add the following Sections*

##### 18.4.1 Quality Goals and General Requirements

The Turnpike's definition of Quality is "**Conformance to Requirements**". The Turnpike's primary quality goal is that construction documents and reports be complete, orderly, correct, and appropriate for the intended purposes, so that they do not impose potential liability, or require supplemental agreements that increase construction time or cost, or require an inappropriate review effort on the part of the Turnpike. The preparation of the work shall meet or exceed normal, legally acceptable, "**Due Diligence**" ("**Due or Ordinary Care**") requirements that have been established by the following criteria, the standard of practice generally provided on Turnpike work.

The following is the general quality control and assurance process criteria that is required by each project Scope of Services, including - initiation, production, review and audit procedures.

- Designate the appropriate project staffing for each element of the work in the Project Staffing List form included at the end of this section. Also provide the required organization, planning, scheduling and project initiation. If the work produced is to comply with the quality requirements and goals, it will be imperative that the work **be prepared and checked by qualified professionals that know the Department and Project requirements**, and that they use and document the "Due or Ordinary Care" production and review quality control and assurance requirements stipulated in the Standard Project Scope of Services performance criteria. Designated Project Team personnel normally include - the qualified Responsible Professionals and associated project staff to produce the work, and Reviewers with professional qualifications necessary to be the Responsible Professional to review and confirm that the work is accurate and complete.
- Focus on the prevention of rework and production errors by the use of quality oriented Responsible Professionals and production procedures (including self and documented Responsible Professional checking) to produce high quality work. Production quality is achieved through the careful development of the work and the continuous checking, concurrence (back checking) and verification of changes on all work and documents during their preparation and review.

- Provide and document the required Coordination, Field and Biddability Reviews as provided in the Scope of Services to prevent production rework, errors and omissions.
- Support Value Engineering Studies and provide special supplemental Independent Peer, Constructibility, and/or Maintainability Reviews on designated projects.
- Provide and document, as required, the Submittal and Biddability Reviews by qualified and experienced Reviewers to confirm that the work produced is appropriate, complete, and correct. As a minimum, checking shall be required for each document before it is used for further development or before a required Phase Submittal.
- Utilize a standard check and balance checking procedure that meets the Standard Project Scope of Services performance criteria to document the thoroughness of the checking and review process and to provide the documentation of the agreement between two qualified (licensed if required) professionals in a given field that the work produced and reviewed conforms to all requirements, is appropriate, complete, accurate and correct. The checking process shall take place in accordance with the requirements of the Scope of Services and the established project schedule.
- Utilize Submittal Sufficiency and Quality Assurance Reviews to confirm completion and validate each submittal Certificate of Compliance.

The Standard Project Scope of Services performance criteria requires that a Standard Check and Balance Checking Procedure shall be used to document all checking and reviews. Project production and review team members shall also utilize the Completion Checklists, Quality Control Tracking Stamp and Quality Process Logs, (blank copy included at the end of this Chapter), to document the production and review checking of all work. Project production and review quality control procedures are to be performed in compliance with the Scope of Services.

The Standard Project Scope of Services performance criteria requires that the review documentation, which is developed during the production and review of the work, shall be retained in the project files, according to requirements of the Scope of Services, for Quality Assurance Review and audit purposes, and to demonstrate that the Project quality control requirements have been met.

If, under some extenuating circumstance an information print or document must be sent to the Turnpike before the required Submittal Review has been performed, this procedure is to be followed:

- The Principal or Officer-In-Charge approves the release of the documents.
- The documents are stamped "Advance Copy - For Information Only".
- The Turnpike is notified in the transmittal letter that the Submittal Review process has not been completed on the documents and that the Turnpike personnel should not review the documents until the Project Quality Control Process is complete.

The Turnpike will provide compliance and Biddability Reviews, PM Monitoring, and Quality Process Audits to complete the process.

The process required - Quality Control Tracking Stamp, Project Staffing List, Quality Process Log, and Certificate of Compliance forms are located at the end of this chapter. A Sample Project Quality Control Plan that meets the requirements of the Standard Project Scope of Services performance criteria is available through Turnpike Project Managers.

Definitions of terms utilized into the Standard Project Scope of Services performance criteria and explanations of these requirements are included in the following section.

## **18.4.2 Quality Control Procedure Requirements**

### **18.4.2.1 Completion Checklists Requirements**

The Standard Project Scope of Services performance criteria requires that the Design Consultant use appropriate Completion Checklists to document the thoroughness of their production and review efforts and to reduce rework on each work element. Design Consultant will furnish the Turnpike review copies of their Completion Checklists for each project element at the negotiation meeting.

### **18.4.2.2 Quality Control Tracking Stamp Requirements**

The Standard Project Scope of Services performance criteria requires that the Design Consultant use the standard Quality Control Tracking Stamp or an equivalent CADD cell, with the exact production certification shown in the stamp below, to document and track the completion of the check and balance checking procedure on all types of checking and reviews. The stamp is applied by the Responsible Professional to the cover of a bound set of documents or to individual sheets, if unbound or uses different project personnel. The stamp is designed to track, guide, and document the quality review process and the Standard Checking Procedure described herein. The person responsible for each step of the Submittal Review procedure is required to "sign-off" and to date the document being reviewed on the Quality Control Tracking Stamp as a record that their part of the procedure has been carried out. The Responsible Professional (RP) and Reviewer (R) that produce the work and conduct the Submittal Review will be those designated in the Project Staffing List. The Project Manager must secure the Department approval of any changes of designated project staff.

<b>QUALITY CONTROL TRACKING STAMP</b>			
<b>PHASE ____ SUBMITTAL REVIEW</b>			
Responsible Professional (RP)	Reviewer (R)	Signature	Employee No.    Date

<b>PRODUCTION CHECKING COMPLETE</b> <b>READY FOR SUBMITTAL REVIEW (RP)</b>
<b>CHECKED (R)</b> Correct (Yellow) Change (Red)
<b>CONCURRENCE (RP)</b> (Red Check OK or X-Out for Disagree)
<b>CHANGE INCORPORATION (RP)</b> (Yellow Highlighter)
<b>VERIFICATION (R)</b> (Green Check or Circle & Remark Incorrect)

### 18.4.2.3 Quality Process Log Requirements

The Standard Project Scope of Services performance criteria requires that the Design Consultant utilize the standard Quality Process Log form to monitor, track and document the production and review process for each element, work product and deliverable. Quality Process Logs provide a record of the progress of the project and document the completion of each major phase of the submittal production and review process. In addition, the Project Team members are to utilize their Completion Checklists, as well as the Quality Control Tracking Stamp to promote the thoroughness of the checking process and to eliminate oversights and omissions.

### 18.4.2.4 Standard Documentation Procedure

The Standard Project Scope of Services performance criteria requires that the Design Consultant utilize the standard forms (Completion Checklists, Quality Process Logs, Quality Control Tracking Stamp) included in this section.

## 18.4.3 Definitions

**Biddability Review** - A review of construction contract documents, prior to bidding, which seeks to identify errors, omissions, conflicts, ambiguities, inaccuracies, and deficiencies in and among the construction documents. Biddability Reviews are made in addition to Quality Control (QC) reviews and focus on pay items and uniformity between the plan quantities, the computation book, and the Construction Estimating System (CES) input forms.

**Constructibility Review** - A supplemental and specialized review of construction plans and specifications which seeks to identify construction requirements that are impractical, unnecessarily costly, or difficult to build. Constructibility Reviews are made in addition to Quality Control reviews, and considers such items as contractor access, site constraints and relationship to other project work.

**Coordination Review** - A review of combined work elements to identify and resolve any conflicts that may exist among the elements such as lighting and drainage (i.e. foundation conflicts with pipe runs).

**Deliverable** - A professional service product that is to be furnished to the Department or others.

**Field Review** - Mandatory visits to the project site to verify compatibility of the design with the field conditions to be encountered during construction.

**Kick-Off Meeting** - A meeting held before any work begins on a project in which the Project Work Plan and quality control requirements are discussed by the Consultant's Project Manager, the Responsible Professionals, the Reviewers, and others as appropriate.

**Independent Peer Review** - A supplemental Quality Control review performed on selected projects, or portions of a project, by an independent team of qualified reviewers. This review is performed in addition to the regular Submittal Reviews and is conducted under the direction of the Consultant's Project Manager. Normally, members of the Independent Peer Review team are not assigned to the same organizational unit or location that managed and produced the project. The Independent Peer Review is a comprehensive examination of the technical aspects of the project design that is made in addition to Submittal Reviews.

**Project Work Plan (PWP)** - A document that programs the assignment from the Kick-Off Meeting through production, submittal review, coordination, delivery of the product, and archiving of the project records.

**Quality Assurance (QA) Review** - The Principal or Officer-In-Charge review and certification procedure to determine whether or not production and review quality control procedures have been performed effectively and appropriately.

**Quality Control (QC) Process** - Prescribed production and review on procedures by which deliverables are produced, reviewed and brought into compliance with Department and project requirements, professional standards, contractual obligations, and commitments.

**Standard Checking Procedure** - A color-coded checks and balance process for reviewing and correcting work products before they are released for use by the Turnpike or otherwise released as a final work product.

**Submittal Review** - Review of submittal documents by the designated Reviewer, a qualified professional other than the Responsible Professional for each element of the work, to see that the work is accurate, conforms to the project requirements, and is free of errors and omissions. The Reviewer checks concepts, methods of preparation, and presentation.

**Project Staffing List** *(Expand or reduce list to include all Sub consultants, elements & deliverables)*

The following key Project Team members are dedicated to the production and review of the project elements, tasks and deliverables shown below. Resumes of the Principal or Officer-In-Charge, Project Manager, Responsible Professionals and Reviewers for all work elements are attached. The Project Manager shall revise the Project Staffing List and secure the approval of the Client (if required) for any changes in key Project Team personnel during the production and review of the project. Show Professional Registration.

**Principal or Officer-In-Charge** *(Oversees Project & provides QA Review):* Name

**Project Manager** *(Oversees Quality Control & Coordination, provides part of the QA Review):* Name

ELEMENT / TASK	Deliverable	Responsible Professional (RP)	Reviewer (R)
<b>ROADWAY</b>			
Typical Sections	Package		
Pavement Design	Package		
Geometry & Alignment	Roadway Plans		
Design Documentation	Calculation Book		
Traffic Control Plans	Roadway Plans		
Utility Adjustments	Roadway Plans		
Geometry & Alignment	Roadway Plans		
Drainage Design	Roadway Plans		
Geotechnical	Report		
Drainage Report	Report		
Quantity Computation	Computation Book		
Specifications	Package		
Mitigation Plans	Roadway Plans		
<b>SURVEY / RIGHT OF WAY</b>			
Design Survey	Field Notes		
Right of way Survey	Field Notes		
Right of way Control Survey	Plans		
Right of way Maps	Maps		
Legal Descriptions	Descriptions		

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**Project Staffing List (Cont.)**

<b>ELEMENT / TASK</b>	<b>Deliverable</b>	<b>Responsible Professional</b>	<b>Reviewer</b>
<b>SIGNING &amp; MARKING</b>			
Signing Plans	Signing & Marking Plans		
Signing - Summary of Quantities	Signing & Marking Plans		
Pavement Marking	Signing & Marking Plans		
Quantity Computation	Computation book		
Specifications	Package		
<b>SIGNALIZATION</b>			
Signal Design	Signalization Plans		
Phasing & Timing Design	Signalization Plans		
Summary of Quantities	Computation Book		
Pole Calculations	Computation Book		
Specifications	Package		
<b>LIGHTING</b>			
Lighting / Electrical	Lighting Plans		
Quantity Computation	Lighting Plans		
Intensity & Voltage Calcs.	Computation Book		
<b>ENVIRONMENTAL</b>			
Mitigation Report	Report		
Permits	Report		
Wetland Assessment	Report		

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**Project Staffing List (Cont.)**

<b>ELEMENT / TASK</b>	<b>Deliverable</b>	<b>Responsible Professional (RP)</b>	<b>Reviewer (R)</b>
<b>STRUCTURES</b>			
Bridge Development Report (BDR)	Report		
Bridge Hydraulics Report (BHR)	Report		
Geotechnical	Report		
Structures Plans	Structures Plans		
Design Documentation	Computation Book		
Specification	Package		
Quantity Computation	Computation Book		
<b>TOLL PLAZA(S)</b>			
Roadway	Toll Plaza Plans		
Civil Site including utilities	Toll Plaza Plans		
Signing & Pavement Markings	Toll Plaza Plans		
Traffic Control Plan	Toll Plaza Plans		
Landscape & Irrigation	Toll Plaza Plans		
Architectural	Toll Plaza Plans		
Structural	Toll Plaza Plans		
Electrical, Lighting & Toll Equipment Conduit	Toll Plaza Plans		
Mechanical / Plumbing & HVAC	Toll Plaza Plans		
Demolition	Toll Plaza Plans		
Design Documentation	Calculation Book		
Specifications	Package		
Quantities	Computation Book		

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**PROJECT STAFFING LIST** (Cont., for PD&E projects, list all elements & deliverables, including those provided by sub consultants)

Element / Task	Deliverable	Responsible Professional (RP)	Reviewer (R)
<b>PD&amp;E</b>			
State Environmental Impact Report	Reports - Draft & Final		
Type 2 Categorical Exclusion	Reports - Draft & Final		
Environmental Assessment	Reports - Draft & Final		
Finding Of No Significant Impact (FONSI)	Reports - Draft & Final		
Environmental Impact Statement	Reports - Draft & Final		
Preliminary Engineering Report	Reports - Draft & Final		
Noise Impact Study	Reports - Draft & Final		
Air Quality Report	Reports - Draft & Final		
Wetlands Evaluation Report	Reports - Draft & Final		
Biological Assessment	Reports - Draft & Final		
Conceptual Stage Relocation Plan	Reports - Draft & Final		
Contamination Screening Evaluation Report	Reports - Draft & Final		
Cultural Resources Assessment Report	Reports - Draft & Final		
Traffic Report	Reports - Draft & Final		
Location Hydraulics Report	Reports - Draft & Final		
Geotechnical Report	Reports - Draft & Final		
Bridge Development Analysis	Reports - Draft & Final		

**Exhibit 18-A, Page 4 of 5**

**Project Staffing List** *(List for special projects, list all elements & deliverables, include all Sub consultants)*

[illegible]

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Project: \_\_\_\_\_ FPID No.: \_\_\_\_\_

[illegible]

**CERTIFICATE OF COMPLIANCE** (Complete And Submit on Consultant's Letterhead)

**TO:** Nancy A. Clements, P.E., Turnpike, Director of Planning and Production  
 William F. Sloup, P.E., Turnpike Design Engineer  
 Chris J. Lory, P.E., PBS&J, Program Manager, Project Management  
 Michael J. Davis, P.E., PBS&J, Design Program Manager  
 Peter Kühne, P.E., Production Project Manager  
 Joe Hitterman, P.E., PBS&J, Quality Initiatives Manager

**DATE:** \_\_\_\_\_

**RE:** **QUALITY ASSURANCE (QA) REVIEW - PHASE \_\_\_\_ SUBMITTAL**

**FPID:** \_\_\_\_\_

**DESCRIPTION:** \_\_\_\_\_

**COUNTY:** \_\_\_\_\_

**COMPONENT SETS:** \_\_\_\_\_

**CONSULTANT:** \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_ (\_\_\_\_) \_\_\_\_\_

**SUBCONSULTANTS:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_ (\_\_\_\_) \_\_\_\_\_

This is to certify that we have monitored the quality control (QC) process during production and review of the above submittal. That I have completed and signed the attached QC Checklists for each element of the project. That I have completed and documented (in the Quality Process Log) the required QA Review of the production and review quality control documentation for all component sets (elements) of the above phase submittal. This QA Review was conducted at the above office on \_\_\_\_\_ (day, month, year), after all QC procedures were complete. Submittal plans, associated production and review check prints, and quality control documents for the referenced elements (including those of the Sub consultants) have been evaluated, initialed, and are available for review upon request.

This certificate is issued to document our reviews and to confirm that "due or ordinary care" processes were followed in producing the submittal documents. In our professional opinions, these documents meet the standards of the Turnpike and the Florida Department of Transportation, and are ready for review. These requirements include those stipulated in the Project Scope of Services performance criteria and Florida Department of Transportation requirements.

**SIGNED:** \_\_\_\_\_, P.E.  
 Consultant Principal or Officer-In-Charge

**SIGNED:** \_\_\_\_\_, P.E.  
 Consultant Project Manager

**Exhibit 18-C**