

Preconstruction Quality Assurance Review Process

Introduction

Achieving quality in design is essential to providing a safe and efficient transportation system. In order to achieve quality, those responsible for the production of design plans should utilize consistent and on-going quality control practices. The goal is to create a design that is free of errors and also contains accurate documentation of decisions, recommendations, and assumptions. To supplement the quality control (QC) practices of the Regional Production Groups, Preconstruction Support will provide quality assurance (QA) reviews of designs and specifications. The intent of these reviews is to verify that consistent and on-going quality control has occurred and that statewide consistency with designs and specifications has been achieved. The QA reviews will not take the place of QC practices being performed by the Regional Production Groups. QA reviews will be a cooperative effort with those responsible for delivering the project and is intended to further minimize the chance for errors and omissions in completed designs and specifications.

Regional Production Group and Consultant Design Plans

QA reviews are available for the roadway and structural components of project concepts, design criteria, design plans, and specifications that are being developed by Regional Production Groups and their consultants. Information for review will be submitted to the discipline lead within the Preconstruction Support Section, i.e., roadway plans submitted to the Roadway Design Support Engineer, structural plans submitted to the Structural Design Support Engineer, and specifications submitted to the Letting Preparation Engineer. QA review submittals for Complete Plans (to include right-of-way and construction plans for roadway projects and 95% plans for bridge projects) are to include the full size working plans along with a cover letter from the Regional Production Group requesting the review by the Preconstruction Support discipline lead. Complete Plans are to contain all applicable initials from Department production staff (design leads, Design Manager, and Program Manager). Complete Plans are not required to be signed and sealed by the Engineer of Record unless deemed necessary as part of a contractual agreement governing the development of the plans. The cover memorandum should contain the name of the assigned Program Manager, project identification (file number, PCN, etc.), right-of-way obligation or letting date, type of review requested (preliminary, right-of-way, construction, others), the requested completion date for the review, and the charge code for the project. See page 8 for a sample cover memorandum.

Upon completion of the QA review, comments generated will be emailed to the Regional Production Engineer and carbon copied to the Regional Design Manager and the assigned Program Manager. Preconstruction Support will initial the title sheet on the working plans and return the plans if there are no critical design comments. If critical design comments are noted, the plans will be signed by Preconstruction Support upon mutual resolution of the comments.

Preconstruction Support will conduct a QA review on a select number of projects for hydraulic design, erosion control, and storm water management as described in the Hydraulic Design Support Section of this process. The Regional Production Group's Hydraulic Design Lead will perform the QA review for the hydraulic design, erosion control, and storm water management on all projects.

All required and optional QA reviews are detailed as follows:

Roadway Reviews for Roadway Projects and Roadway Approaches on Bridge Projects

Design Criteria (optional)

- Conformance of roadway, pedestrian, bicycle, and landscaping design criteria with AASHTO and state design standards, specifications, policies, and practices

Project Concept Reports and Conceptual Plans (optional)

(Dependent upon amount and level of detail provided)

- Conformance with AASHTO and state design standards, specifications, policies, and practices (roadway, bicycle, pedestrian, landscaping)
- Pedestrian/bicycle accessibility
- Landscaping opportunities

Preliminary Roadway Plans (optional)

(Dependent upon amount and level of detail provided)

- Conformance with AASHTO and state design standards, specifications, policies, and practices (roadway, bicycle, pedestrian, landscaping)
- Constructability and staging requirements
- Controlling design criteria (identify potential design exceptions)
- Pedestrian/bicycle accessibility
- Landscaping opportunities
- Considerations for special designs

Right of Way Plans (required)

- Conformance with AASHTO and state design standards, specifications, policies, and practices (roadway, bicycle, pedestrian, landscaping)
- Constructability and staging requirements
- Controlling design criteria (identify potential design exceptions)
- Pedestrian/bicycle accommodations
- Landscaping details, if applicable
- Plan format consistency
- Conformance of new right of way limits with Department design guidelines

Construction Plans (required)

- Conformance with AASHTO and state design standards, specifications, policies, and practices (roadway, bicycle, pedestrian, landscaping)
- Constructability and staging requirements
- Controlling design criteria (identify potential design exceptions)
- Verify plan quantities for major items of work
- Pedestrian/bicycle accommodations
- Landscaping details, if applicable
- Plan format consistency
- Review plan quantities for consistency with proposal

Structural Design Support

Structural Review of Roadway Projects

The Structural Design Support Group reviews geotechnical, seismic, and structural aspects as described below.

Design Criteria (optional)

- Conformance of geotechnical, seismic, and structural design criteria with AASHTO and state design standards, specifications, policies, and practices

Project Concept Reports (optional)

- Conformance with AASHTO and state design standards, specifications, policies, and practices (geotechnical, seismic, and structural)

Conceptual Bridge Plans (required, if applicable)

- Conformance with AASHTO and state design standards, specifications, policies, and practices (geotechnical, seismic, and structural)

Preliminary Bridge Plans (required)

- Conformance with AASHTO and state design standards, specifications, policies, and practices (geotechnical, seismic, and structural)
- Constructability and staging requirements
- Roadway Preliminary Geotechnical Report, if available

Right of Way Plans (required)

- Conformance with AASHTO and state design standards, specifications, policies, and practices (geotechnical, seismic, and structural)
- Constructability and staging requirements
- Roadway Preliminary Geotechnical Report
- Considerations for special designs and/or specifications
- Retaining walls and box culverts for appropriateness of foundation type, structure type, and location

Construction Plans (required)

- Conformance with AASHTO and state design standards, specifications, policies, and practices (geotechnical, seismic, and structural)
- Constructability and staging requirements
- Project specific special provisions
- Roadway Geotechnical Report
- Inclusion of appropriate bid items

Structural Design Support

Structural Review of Bridge Projects

The Structural Design Support Group reviews geotechnical, seismic, and structural aspects as described below.

Design Criteria (optional)

- Conformance of geotechnical, seismic, and structural design criteria with AASHTO and state design standards, specifications, policies, and practices

Project Concept Reports (optional)

- Conformance with AASHTO and state design standards, specifications, policies, and practices (geotechnical, seismic, and structural)
- Appropriateness of foundation type, structure type, alignment, and span arrangement
- Constructability and staging requirements

Conceptual Bridge Plans (required, if applicable)

- Conformance with AASHTO and state design standards, specifications, policies, and practices (geotechnical, seismic, and structural)
- Appropriateness of foundation type, structure type, alignment, and span arrangement
- Constructability and staging requirements

Preliminary Bridge Plans (required)

- Conformance with AASHTO and state design standards, specifications, policies, and practices (geotechnical, seismic, and structural)
- Appropriateness of foundation type, structure type, alignment, and span arrangement
- Bridge Preliminary Geotechnical Report
- Site specific Seismic Response Analysis Report
- Constructability and staging requirements
- Considerations for special designs
- Seismic Design Summary Report (for Consultant Projects)
- Plan format consistency

60% Bridge Plans (optional)

- Conformance with AASHTO and state design standards, specifications, policies, and practices (geotechnical, seismic, and structural)
- Review of proposed structure, foundation, and alignment
- Constructability and staging requirements
- Bridge Geotechnical Report, if available
- Considerations for special designs and/or specifications
- Plan format consistency

Structural Design Support

Structural Review of Bridge Projects (continued)

95% Bridge Plans (required)

- Conformance with AASHTO and state design standards, specifications, policies, and practices (geotechnical, seismic, and structural)
- Constructability and staging requirements
- Bridge Geotechnical Report
- Plan format consistency
- Project specific special provisions
- Inclusion of appropriate bid items

Letting Preparation

Roadway and Bridge Project Reviews

Construction Specifications (required)

- Conformance with SCDOT standard practices for data entry into the Proposals and Estimates System (PES) software
- Conformance of specifications with FHWA and state standards, policies, and practices

Hydraulic Design Support

Hydraulic Review of Roadway Projects

One roadway project from each Regional Production Group will be reviewed annually. The project will be selected by the Hydraulic Design Support Engineer.

The following items will be reviewed:

- Conformance of hydraulic design criteria with AASHTO and state design standards, specifications, policies, and practices to include “Requirements for Hydraulic Design Studies” - Latest Edition
- Controlling design criteria (identify potential design exceptions)
- Constructability requirements
- Plan format consistency
- Water quality requirements and BMP plans
- NPDES/water quality requirements to receiving water bodies
- FEMA Floodway involvement
- FEMA submittal (if required as part of the project)

Hydraulic Design Support

Hydraulic Review of Bridge Projects

One bridge project from each Regional Production Group will be reviewed annually. The project will be selected by the Hydraulic Design Support Engineer.

The following items will be reviewed:

- Conformance of hydraulic design criteria with AASHTO and state design standards, specifications, policies, and practices to include “Requirements for Hydraulic Design Studies” - Latest Edition
- Controlling design criteria (identify potential design exceptions)
- Constructability requirements
- Plan format consistency
- Water quality requirements and BMP plans
- NPDES/water quality requirements to receiving water bodies
- Bridge Hydrology Data
- Bridge scour computations
- FEMA Floodway involvement
- FEMA submittal (if required as part of the project)

Design-Build

QA reviews are to be performed by Preconstruction Support on the RFP package for design-build initiatives. It is essential for the RFP package to be reviewed by a multi-disciplinary team of engineering professionals. Subsequent design and specification submittals may be reviewed in accordance with the terms of the design-build contract. All comments generated as a result of QA reviews on design-build initiatives will be submitted directly to the designated point of contact within the Regional Production Group.

Local Project Initiatives

QA reviews are to be performed on roadway and structural designs and specifications for local project initiatives in accordance with the intergovernmental agreement. These QA reviews will be consistent with the process and content as specified for Regional Production Group and consultant prepared design plans.

Value Engineering Studies

QA reviews are to be performed by Preconstruction Support on reports generated as part of Value Engineering studies. The content of the review will be dependent upon the amount and level of detail provided. Comments generated by Preconstruction Support will be submitted directly to the responsible Regional Production Engineer.

September 9, 2009

RE: Preconstruction Advisory Memorandum Number 4 – Preconstruction Quality Assurance Review Policy

SAMPLE COVER MEMORANDUM

MEMORANDUM

TO: Rob Bedenbaugh, Roadway Design Support Engineer
Barry Bowers, Structural Design Support Engineer

FROM: Tommy Elrod, Program Manager Upstate Region

DATE: January 2, 2010

RE: QA Review of Right-of-Way Plans for I-85 Rehab from I-26 to U.S. Route 76

PROGRAM MANAGER: THIS FIELD CAN BE ELIMINATED IF THE PROGRAM MANAGER IS SHOWN BELOW AS A CC.

FILE NO.: 12.345A

PCN: 12345

CHARGE CODE: 88Q12ABC00122206

R/W OBLIGATION DATE: March 2010

LETTING DATE: December 2008

Attached are right-of-way plans for QA review. Please have your staff review and comment to me by Tuesday, January 15, 2010, in order to meet the project schedule.

Thank you for your cooperation in this matter.

Attachments

cc: Kevin Ulmer, Upstate Regional Design Manager

File: