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SECRETARY

MEMORANDUM

TO: ALL CONSULTANTS
ALL BRIDGE DESIGNERS
ALL PROJECT MANAGERS

FROM: HOSSEIN GHARA, P.E.
BRIDGE DESIGN ENGINEER ADMINISTRATOR

SUBJECT: BRIDGE DESIGN TECHNICAL MEMORANDUM NO. 37 (BDTM.37)
BRIDGE DESIGN SECTION POLICY ON QC/QA

DATE: OCTOBER 30, 2012

The Quality Control and Quality Assurance (QC/QA) of bridge design plans is a subject that is currently of significant interest among the nation's State and Federal Transportation Agencies. The collapse of the I-35W highway bridge over the Mississippi River in Minneapolis, Minnesota, prompted the National Transportation Safety Board (NTSB) to investigate the causes of this tragic incident. The NTSB investigation has concluded in several findings among which was plan error and lack of the responsible bridge design firm QC/QA as well as insufficient Federal and State procedures for reviewing and approving bridge plans.

This finding led NTSB to make a recommendation to the Federal Highway Administration (FHWA) and the American Association of State Highways and Transportation Officials (AASHTO) asking the two organizations to work together to develop a more adequate program of quality control and assurance in bridge design to be used by the States and other bridge owners. In August 2011, FHWA and AASHTO jointly published "Guidance on QC/QA in Bridge Design In Response to NTSB Recommendation (H-08-17)" and asked State and Federal Transportation Agencies to develop and implement a QC/QA program for the design of highway bridges.

LADOTD, in response to FHWA and AASHTO's request, has developed the attached "LADOTD Bridge Design Section Policy on QC/QA", which complies with the requirements set in the aforementioned FHWA and ASSHTO Guidance. Effective November 1, 2012, this QC/QA Policy shall be implemented for all bridge design projects prior to 60% final plan stage.

All electronic files of the checklists included in the attached document will be posted on Bridge Design Section website under downloads/QC-QA.

A new border sheet and a new title block data field with a space added for reviewer's name have been developed and will be available as part of the new workspace and CAD standards to be published in November. The instructions on how to use the new border sheet and title block data field for existing plans and new plans will be posted on the Bridge Design Section website under download/QC-QA.

Please note that BDTM.25, Policy on Responsibility for Bridge Standard Plans and Special Details, and BDTM.35, Record Retention Policy, have been incorporated into the QC/QA policy.

This technical memorandum will be posted on the Bridge Design Website: http://wwwsp.dotd.la.gov/Inside_LaDOTD/Divisions/Engineering/Bridge_Design/Pages/Technical-Memoranda.aspx

Please contact Ms. Zhengzheng "Jenny" Fu (225-379-1321, zhengzheng.fu@la.gov) if you have questions or comments.

HG/zzf

Cc: Richard Savoie (Chief Engineer)
Janice Williams (Project Development Division Chief)
Art Aguirre (FHWA)
Ed Wedge (Project Management Director)
Chad Winchester (Road Design Administrator)
Steve Meunier (Pavement and Geotechnical Engineering Administrator)
Alan Dale (Consultant Contract Engineer)

Louisiana Department of Transportation and Development

Bridge Design Section

Policy on Quality Control and Quality Assurance

October 2012

Contents

1. Introduction

This document establishes the minimum requirements for the Quality Control (QC) and Quality Assurance (QA) for all LADOTD bridge design projects (in-house, consultant and design-build projects). This document complies with the "Guidance on QC/QA in Bridge Design In Response to NTSB Recommendation" (FHWA/AASHTO Guidance), which was published jointly by FHWA and AASHTO in August 2011. Any engineer who performs work for the LADOTD Bridge Design Section shall comply with these minimum requirements in addition to any relevant internal QC/QA policy. The QC/QA requirements must be implemented for all design activities in both design phase and construction support phase of the project.

2. Definitions of QC/QA in Bridge Design and the QC/QA Process

Quality Control (QC): Procedures of checking the accuracy and consistency of the calculations and the drawings, detecting and correcting design omissions and errors before the design plans are finalized, and verifying the specifications for the load-carrying members are adequate for the service and operation loads.

Quality Assurance (QA): Procedures of reviewing the work to ensure the quality control procedures are in place and effective in preventing mistakes, and consistency in the development of bridge design plans and specifications.

QC/QA Process:

Step 1: Selection of a Qualified Design Team

A supervisor or team leader and a design team with qualifications and experiences commensurate with the complexity of the bridges being designed shall first be selected. A supervisor or team leader must be licensed by the State of Louisiana as a professional engineer and must have substantial experience in the design of similar structures. For in-house projects, a supervisor or team leader is assigned by the Bridge Design Engineer Administrator for each project or task and is typically one of the Assistant Bridge Design Administrators or his/her designated engineer.

The supervisor or team leader is responsible for determining the necessary technical knowledge and experience required for the project. Team members responsible for performing various design and detailing activities and QC/QA must be identified by the supervisor or team Leader. On large projects there may be multiple personnel assigned to each role; however, if that is the case, each individual should be assigned a specific and definable portion of the project for which they are responsible.

Step 2: Development of Project Design Criteria

Design criteria specific for each project must be developed and approved by the supervisor or team leader prior to initiating the design process. For consultant projects, the design criteria must be submitted for LADOTD's review and approval. Though the design criteria may change throughout the project, a current list of the criteria shall be maintained at all times. Any design assumptions made or design exemptions obtained shall be listed in the design criteria and referenced in the calculations and drawings as appropriate. A design criteria checklist is included in *Appendix A*.

Step 3: *Development of Designs and Plan Details by the Designer and the Detailer*

The designer is the engineer directly responsible for the development of design calculations, drawings, special provisions including Non-Standard items, and cost estimate. The designer must be licensed by the State of Louisiana as a professional engineer or certified as an engineer intern. The detailer is the individual directly responsible for the creation of CAD drawings.

During the design process, the designer must follow the design criteria established for the project. Bridge type, size and location (T, S &L) must be developed first and approved by the supervisor or team leader prior to proceeding with the design of structural components. The design calculations shall be organized and maintained in a standard calculation book format. The calculation book checklist is included in *Appendix B*. The designer must communicate with the detailer and supervise the detailing work to ensure that the drawings adequately and accurately present the design information. Both the designer and the detailer shall check their own work and minimize errors.

Step 4: Quality Control (QC) of Designs and Plan Details by the Design Checker and the Detail Checker

The design checker is the engineer responsible for performing a full technical review of the design calculations, drawings, special provisions including Non-Standard items, and cost estimate. The design checker must be licensed by the State of Louisiana a professional engineer or certified as an engineer intern; however, if the designer is an engineer intern, the design checker must be a professional engineer. The detail checker is the individual responsible for performing a full review of the CAD drawings. The detail checker can be a designer or a detailer. The design checker and detail checker shall not be the ones who perform the original design and detailing.

During the design check process, the design checker must verify the accuracy of the designer's calculations, pay items, quantities, special provisions including Non-Standard items, and cost estimate. The design checker may perform a redline check of the designer's calculations or produce an independent set of calculations and compare the results; the supervisor or team leader shall determine which method to use depending on the complexity of the project. Regardless of the checking method employed, the designer's calculations are the calculations of record and must be updated to correct any errors or omissions discovered by the design checker. The calculations of the design checker should also become a part of the calculation of record when independent checking calculations are produced. The design checker should also ensure that the drawings adequately and accurately present the design information.

During the detail check process, the detail checker must ensure the drawings are in accordance with the design information and CAD standards. All dimensions and quantity calculations must be verified.

The checker may begin the checking process at the completion of the entire design/detail process or may check components of the designer/detailer's work as it is completed. Likewise, the checker may provide feedback at the completion of the entire checking process or as each component of check is completed. Any discrepancies that arise should be resolved between the designer/detailer and the checker, and the calculations and plan details should be corrected accordingly. If the designer/detailer and the checker are unable to resolve their discrepancies, the issue should be brought to the attention of the supervisor or team leader.

After the designer, design checker, detailer, and detail checker are satisfied with the state of the design calculations, drawings, special provisions, and cost estimate as appropriate, the design and detail check shall be considered complete. Upon completion of the design and detail check, which shall be no later than the 95% Final Plans stage, the designer is responsible for preparing a QA information package, which includes the documents listed below, and providing the package to the reviewer to perform quality assurance (QA).

- QA information package check list (see *Appendix C*)
- Calculation book
- Plans
- Special provisions including Non-Standard items
- Cost estimate
- Any relevant documents, such as checklists, review comments, etc., utilized by the designer, design checker, detailer, and detail checker

If design revisions are required after the QA information package has been submitted, the reviewer must be notified of such revisions and supplied with the revised information.

Step 5: Quality Assurance (QA) of Designs and Plan Details by the Reviewer

The reviewer is the engineer responsible for ensuring that the QC process as described in Step 4 is complete and the design calculations, drawings, special provisions, and cost estimate are in accordance with LADOTD Bridge Design practices, policies, and procedures. The reviewer must be licensed by the State of Louisiana as a professional engineer and must have substantial experience in the design of similar structures.

During quality assurance process, the reviewer shall perform a cursory review of all documents in the QA information package submitted by the designer. This review should focus on the constructability of the plan details; areas of critical structural importance; areas where, based on the reviewer's experience, mistakes may be typically found; and areas that may be new to the design practice. The reviewer may, but need not, produce independent calculations to verify submitted information. The reviewer shall provide feedback to the designer and resolve all issues. Upon completion of the QA process, which shall be no later than the 98% final plans stage, the design calculations, plan details, special provisions, and cost estimate shall be considered as final. At this point, the QC/QA certification as included in *Appendix D* shall be signed by the designer, design checker, detailer, detail checker, and reviewer.

Step 6: Peer Review

Peer review should be performed only at the request of the Bridge Design Engineer Administrator for complex projects. The peer review is the process by which an independent engineering entity, with no prior involvement in the project, performs a check of the designs by producing an independent set of calculations based on the drawings or performs the review as specified in the scope of work. In the case of a consultant-designed project, the peer reviewer may not be employed by the same consultant with whom the designer or design checker is employed. Peer reviews are typically performed between 60% to 98% final plans stage depending on the scope of the review. The peer reviewer must be licensed by the State of Louisiana as a professional engineer and must have substantial experience in the design of similar structures. The peer review comments must be submitted to LADOTD and the design team for evaluation. Resolutions agreed upon by all parties including the designer, peer reviewer, and LADOTD shall be incorporated in the final design. A Peer Review Resolution Agreement (see *Appendix E*) must be signed by the peer reviewer, the supervisor or team leader of the design team, and LADOTD Representative.

Step 7: Sealing of Design Calculation Book and Plans by the Engineer of Record (EOR)

The supervisor or team leader shall assign an EOR for the project. The EOR is the engineer responsible for supervision and/or preparation of plans, sealing calculations, plans, and special provisions if required. The EOR must be licensed by the State of Louisiana as a professional engineer and must have commensurate experience in the design of similar structures. The EOR can be the designer, the design checker, the reviewer, or the supervisor/team leader who is directly involved in the project design activities.

The responsibilities of the EOR are as follows:

- Ensure the QC/QA certification is signed by all responsible parties. Ensure the geotechnical design information shown on bridge plans is co-stamped by a Geotechnical

Engineer and the hydraulic information shown on bridge plans is co-stamped by a Hydraulic Engineer. If practical, the hydraulic information and geotechnical information should be presented on separate sheets to reduce the engineering stamps on a sheet. When more than one engineering stamp is required on a sheet, the responsibilities for each engineering stamp shall be clearly defined.

- Assemble design calculations from all designers including the final geotechnical analysis report and the hydraulic report from the geotechnical engineer and the hydraulic engineer, finalize the calculation book, and seal the cover sheet of the calculation book.
- Ensure the names of the designer, design checker, detailer, detail checker, and reviewer are correctly shown on the title block of each plan sheet. Stamp all plan sheets or designate a designer, design checker, or reviewer who shall be licensed by the State of Louisiana as a professional engineer to stamp the sheets developed under their supervision. The EOR must stamp the general notes sheets.
- Ensure all special provisions are accurately shown on the construction proposal. The special provisions are typically stamped by the Specification Engineer as part of the construction proposal; however, if the Specification Engineer is not qualified or not willing to stamp the special provisions, the EOR must stamp these provisions.

Step 8: QC/QA for Design Activities after Final Plans are Signed by Chief Engineer

The same QC/QA process above shall apply to all design activities such as plan revisions, change orders, etc., occurring after the final plans are signed by Chief Engineer.

Step 9: Archiving Bridge Design Files

The EOR is responsible for archiving all bridge design files including calculation books, plans, special provisions, cost estimate, and other pertinent documents in accordance with the Bridge Design Section records retention policy (see *Appendix F*). For consultant projects, the supervisor or the team leader is responsible for delivering all bridge design files to the LADOTD Bridge Task Manger no later than 30 calendar days after the stamped final plans are delivered. Any revisions made to these documents due to plan revisions and change orders must be delivered with the signed plan revisions or change order sheets.

3. Consultant and Design-Build Projects

Responsibilities of the Prime Consultant and Design-Build Contractor

For consultant projects and design-build projects the Prime Consultant or Design-Build Contractor is fully responsible for QC/QA of their work and the work of all subconsultants. The Prime Consultant or Design-Build Contractor is also responsible for all expenses incurred from design omissions, ignorance, or errors.

The Prime Consultant or Design-Build Contractor is required to submit a QC/QA plan document as part of the proposal (SF 24-102) evaluation. Effective Nov. 1, 2012, the following QC/QA statement is included in the advertisement and contract for all Bridge Design projects:

Quality Control and Quality Assurance (QC/QA) for Bridge Design Projects

The Prime Consultant shall submit a QC/QA plan document specifically developed for this project as part of SF 24-102. The QC/QA plan document must comply with the minimum requirements set in the "Guidance on QC/QA in Bridge Design in Response to NTSB Recommendation (H-08-17)" (FHWA/AASHTO Guidance), which was published by FHWA and AASHTO in August 2011, and LADOTD Bridge Design Section QC/QA policies. The FHWA/AASHTO guidance and LADOTD Bridge Design Section QC/QA policies can be downloaded from LADOTD Bridge Design Section website. The QC/QA plan document must be implemented for all bridge design activities in both design phase and construction support phase of the project. The Prime Consultant is fully responsible for QC/QA of their work as well as the work of all sub-consultants. All project submittals must include a QC/QA certification that the submittals meet the requirements of the QC/QA plan document.

The bridge task manager for the project is responsible for evaluating and grading the QC/QA plan document. The grading instructions, evaluation matrix, and grading sheet are included in *Appendix G.*

Responsibilities of the LADOTD Bridge Task Manager:

LADOTD Bridge Task Managers shall not perform QC/QA of consultants' work.

The responsibilities of the LADOTD bridge task manager for a consultant project are as follows:

a. Develop bridge design scope of work, man-hour estimate, minimum personnel requirements, and evaluation criteria, and obtain agreement from the direct supervisor on these items. Provide the information required for the project manager to prepare the advertisement and review the draft advertisement to ensure that all bridge design requirements are included.

b. Serve as a member of the proposal evaluation committee and select the most qualified consultant team. Evaluate SF24-102 and QC/QA plan document in accordance with the

policies and procedures established by CCS and the instructions included in *Appendix G*. The final rating for SF24-102 and the QC/QA plan document shall be reviewed by the direct supervisor and the Bridge Design Engineer Administrator. SF24-102 for the selected consultant shall be retained for project duration.

c. Initiate a bridge design kick-off meeting with the consultant as soon as the project is awarded to meet key bridge design team members (supervisor or team leader, designers, design checkers, and reviewers); discuss staffing plan and implementation of QC/QA plan document; determine bridge design submittal schedules; share expectations and consultant rating criteria; discuss bridge design criteria; and discuss bridge design budget, supplemental requests, invoices, and the importance of avoiding claims. Reach an early agreement regarding bridge type, size and location (TS&L). A bridge design kick-off meeting agenda checklist is included in *Appendix H.*

d. Review and approve design criteria and TS&L and ensure the design criteria is updated as the project progresses.

e. Monitor consultant's implementation of the QC/QA plan document. Ensure each consultant submittal includes a QC/QA certification (see *Appendix I*).

f. Keep a project log sheet to record all major project activities such as project meetings, consultant submittals, DOTD review comments, major decisions made, etc. A project log sheet template is included in *Appendix J*.

g. Review consultant's submittals. Selectively check dimensions and details as a cursory review of the plans for constructability, consistency, and clarity but not as QC/QA of consultants' work. Communicate with consultants any concerns and schedule a face-to-face meeting if required to resolve differences in a timely manner. A consultant submittal review checklist is included in *Appendix K*.

h. Monitor project schedule and ensure on time delivery of project submittals.

i. Monitor budget, process supplemental agreements in a timely manner, and avoid claims. Ensure the consultant performs work with a signed contract in place.

j. Review and approve invoices. Ensure the original staff proposed in SF24-102 is reflected in the invoices. If personnel changes are required, the credentials of replacement staff must be equal to or exceed the qualifications of the original staff. The resumes of replacement staff must be approved by LADOTD.

k. Perform a consultant rating for each major submittal for the quality of work. The major project submittals include, but not limited to, the following items:

- Design Criteria
- Bridge Type, Size and Location (TS&L)
- 30%, 60%, 90%, 100% of Preliminary Plans
- 30%, 60%, 90%, 100% of Final Plans
- Design Calculation Book

Consultant ratings performed by the bridge task managers must be reviewed and approved by their direct supervisor; a copy of the rating must be sent to the Consultant.

l. Archive final bridge design files in accordance with Bridge Design Section record retention policy.

4. Standards Plans and Special Details

Development of Standard Plans and Special Details

Standard plans are plans signed by the LADOTD's Chief Engineer and stamped by a LADOTD bridge engineer. Special details are plans stamped by a LADOTD bridge engineer.

All standard plans and special details (hereafter jointly referred to as Standards) shall be developed following the same QC/QA process as described in Section 2. The DOTD Bridge Standards Manager shall be responsible for the coordination of creating or updating standard plans and special details that are maintained by the Bridge Design Section.

The following procedures shall be followed:

Step 1. The supervisor or team leader for each category of the Standards is assigned by the Bridge Design Engineer Administrator and is typically one of the Assistant Bridge Design Administrators or his/her designated engineers. The EOR for each category of the Standards will be assigned by the supervisor or team leader.

Step 2. The EOR shall fill out an online request with a brief description of the purpose on the Bridge Design Section website under Bridge Standards/Request Form.

Step 3. The LADOTD Bridge Standards Manager will receive an e-mail notification of the request, discuss it with the Bridge Design Engineer Administrator and the Assistant Bridge Design Administrators, and obtain approval from the Bridge Design Administrator to proceed.

Step 4. The EOR will develop or modify the Standards in accordance with the QC/QA process and inform the LADOTD Bridge Standards Manager when complete. The instructions for this step are posted on the Bridge Design Section website under Bridge Standards/Creating or Revising Standards.

Step 5. The LADOTD Bridge Standards Manager will request comments from the Bridge Design Engineer Administrator and the Assistant Bridge Design Administrators (or their designated engineers).

Step 6. After all comments have been received and are incorporated the LADOTD Bridge Standards Manager will obtain final approval from the Bridge Design Engineer Administrator to publish the Standards. A Bridge Design Technical Memorandum will be issued to notify all designers and consultants.

5. Software

A pre-approved list of software is posted on Bridge Design Section website under downloads. If any other software is required for unique applications for which pre-approved software cannot be used, a synopsis of the software shall be submitted to the Bridge Design Engineer Administrator for approval prior to use. The synopsis shall include the name of the software and the developer, a general description of the functions, a certification from the software developer stating that it is maintained in accordance with the latest AASHTO LRFD Bridge Design Specifications, and an account of the requester's experience and the experience of other organizations or agencies that use the software. Data/results from in-house software will not be accepted as part of the deliverable.

Appendix A
Design Criteria Checklist

Design criteria for each project shall include, but not limited to, the following sections:

__ **Cover sheet**

The following information must be included on the cover sheet:

- LADOTD project number
- Project name
- Revision date
- The Supervisor or Team Leader's signature and date

__ **Governing Design and Construction Specifications and Other References**

A list of governing design and construction specifications and other references used for the project shall be included in this section. The edition number, interim revisions, and/or publication date must be specified for each reference.

__ **Design Assumptions and Design Exceptions**

All design assumptions and design exceptions received must be included in this section along with supporting documents.

__ **General Information**

The general information as listed below should be included in this section:

- Bridge information (no. of bridges, bridge clear width, length, no. of lanes, lane width, shoulder width, etc.)
- Road information (roadway classifications, design speed, traffic data, etc.)
- Vertical datum
- Vertical and horizontal clearances
- Other relevant information

__ **Hydraulic Design Criteria**

All hydraulic design criteria (design year, design water elevations, scour depth and scour elevation, etc.) shall be included in this section and the information shall be provided by the Hydraulic Engineer.

__ **Design Factors**

The ductility factor η_D, redundancy factor η_R, and operational importance factor η_I shall be listed in this section.

__ **Design Loads**
All design loads (dead load, live load, wind load, thermal loads, vessel collision loads, seismic load, wave loads, etc.) used for the project shall be included in this section.

__ **Limit States**
All applicable limit states for this project shall be listed in this section.

__ **Bridge Barrier**
The design criteria, types, and test levels for bridge barriers shall be listed in this section. Standard plans and special details should be listed if they are utilized.

__ **Guardrail**
The design criteria, types, and test levels for guardrails shall be listed in this section. Standard plans and special details should be listed if they are utilized.

__ **Approach Slab**
Design criteria for approach slab shall be included in this section. Standard plans and special details should be listed if they are utilized.

__ **Deck and Deck Drainage**
All design criteria for deck and deck drainage design shall be included in this section. Standard plans and special details should be listed if they are utilized.

__ **Bearing**
All bearing types and design criteria for each bearing type shall be included in this section. Standard plans and special details should be listed if they are utilized.

__ **Joint**
All joint types and design criteria for each type shall be included in this section. Standard plans and special details should be listed if they are utilized.

__ **Superstructure**
All superstructure types and design criteria for each type shall be included in this section. Standard plans and special details should be listed if they are utilized.

__ **Substructure**
All substructure types and design criteria for each type shall be included in this section. Standard plans and special details should be listed if they are utilized.

__ **Piles and Drilled Shafts**
All pile types, sizes, and structural design criteria shall be included in this section. Standard plans and special details should be listed if they are utilized.

__ **Geotechnical Design**

All geotechnical design criteria shall be included in this section and the information shall be provided by the Geotechnical Engineer. Standard plans and special details should be listed if they are utilized.

__ **Mechanical Design**

All mechanical design criteria shall be included in this section if applicable. Standard plans and special details should be listed if they are utilized.

__ **Electrical/Lighting Design**

All electrical design criteria shall be included in this section if applicable. Standard plans and special details should be listed if they are utilized.

__ **As-Designed Bridge Rating Criteria**

All as-designed bridge rating criteria shall be included in this section.

__ **Software**

All software used for design and check shall be included in this section.

Appendix B
Final Calculation Book Checklist

The final calculation book for each project shall include, but not limited to, the following sections:

__ **Cover Sheet**

The following information must be included on the cover sheet:

- LADOTD project number
- Project name
- The title of "Final Calculation Book"
- The EOR's seal with signature and date

__ **Final Calculation Book Check List**

__ **QC/QA Certifications**

__ **Peer Review Resolution Agreement (if peer review is performed)**

__ **Design Criteria**

__ **Final Hydraulic Analysis Report from Hydraulic Engineer**

__ **Final Geotechnical Analysis Report from Geotechnical Engineer**

__ **Superstructure Design Calculations**

__ **Substructure Design Calculations**

__ **Quantity Calculations**

__ **Special Provisions/NS-Items**

__ **Construction Cost Estimate**

__ **As-Designed Rating Report**

__ **List of All Final Electronic Design Files and File Locations (ProjectWise directory name)**

Consultants shall submit the final calculation book to LADOTD bridge task managers; the submittal shall be on a CD or Flash Drive or placed to a designated ProjectWise folder including the following information:

__ **A PDF File of the Calculation Book**

__ **All Electronic Design Files**

__ **A PDF File of the As-Designed Rating Report Only**

Appendix C
QA Information Package Checklist

Project No.:
Project Description:

_____ Calculation Book

_____ Plans

_____ Special Provisions

_____ Cost Estimate

_____ Other Documents _____

Appendix D
QC/QA Certification

Project No.:
Project Name:

We, the undersigned designers, detailers, checkers and reviewers for this project, have reviewed and accepted the calculations, plans, quantities, special provisions, and cost estimate prepared for the project. We certify that the work for which we are responsible has been completed in accordance with the LADOTD Bridge Design Section policy on QC/QA.

Team Members	Name	PE Registration No.	Responsible Plan Sheets	Responsible Special Provisions	Construction Cost Estimate	Signature
Designers						
Design Checkers						
Detailers						
Detail Checkers						
Reviewers						
Peer Reviewer						
Geotechnical Engineer						
Hydraulic Engineer						
EOR						

Appendix E
Peer Review Resolution Agreement

Project No.:
Project Name:

We, the undersigned Peer Reviewer, Supervisor or Team Leader of the design team, and LADOTD Representative for this project, have reviewed and accepted the attached peer review resolutions. We certify that the peer review has been performed in accordance with the LADOTD Bridge Design Section policy on QC/QA.

Team Members	Name	Signature
Peer Reviewer		
Supervisor or Team Leader		
LADOTD Representative		

Appendix F

Bridge Design Section Records Retention Policy

Item No.	Record Title	In Office Retention Period (by Bridge Design Section)	DOTD Total Retention (by General Files)	Archiving Instruction	Responsible Party
001	Design Manuals/Guidance and Bridge Design Technical Memoranda	Life of the Agency	Life of the Agency	Archive electronically in Project-wise under Documents\ Reference Materials\Bridge Design Section Archive\Design Manuals-Guidance	Assistant Bridge Design Administrator responsible for design manuals
002	Bridge Design Standard Plans and Special Details	Life of the Agency	Life of the Agency	Archive electronically in Project-wise under Documents\ Standard Drawings *(Instructions for archiving standards are posted on bridge design website under Standards/Revising or Creating Standards)*	Bridge Design Standards Manager
003	Final Plans, Revisions, and Change Orders (CAD files)	Life of the Agency	Life of the Agency	Archive electronically in Project-wise under Project folder\Bridge-Facilities\Discipline\Plans *(Subfolders for each revision and change order should be created under Plans)*	Bridge Task Managers
004	Final Plans, Revisions, and Change Orders (Original signed hard copies)	Life of the Agency	Life of the Agency	Transmit to General Files and archive electronically in DOTD Network Plan Room by General Files	Bridge Task Managers
005	Final Plans, Revisions, and Change Orders (Digital signed copies in pdf format, to be implemented)	Life of the Agency	Life of the Agency	Archive electronically in Project-wise under Project folder\ Published Submittals\Project Drawings\ Final Plans	Bridge Task Managers
006	Shop Drawings and Erection Drawings (Final Distribution Copy in pdf format)	Life of the Agency	Life of the Agency	Archive electronically in Project-wise under Project folder\ Published Submittals\Project Drawings\Construction Drawings\Shop Drawings *(See BDTM.26 for instructions)*	Bridge Task Managers
007	Shop Drawings and Erection Drawings (Final Control Set hard copies)	Life of the Agency	Life of the Agency	Transmit to General Files and archive electronically in DOTD Network Plan Room by General Files *(See BDTM.26 for instructions)*	Bridge Task Managers

Item No.	Record Title	In Office Retention Period (by Bridge Design Section)	DOTD Total Retention (by General Files)	Archiving Instruction	Responsible Party
008	Final Design Calculation Files for In-House and Consultant Projects (Stamped calculation book in pdf format, stamped final reports, and final electronic design models)	Life of the Agency	Life of the Agency	Archive electronically in Project-wise under Project Folder\ Published Submittals\Project Documents\Final Design Calculations & Reports	Bridge Task Managers
009	Bridge Rating Reports	Life of the Agency	Life of the Agency	Archive electronically in Project-wise under Documents\ Reference Materials\Bridge Design Section Archive\Bridge Rating Reports	Bridge Rating Engineer
010	Truck Permits	Life of the Agency	Life of the Agency	Archive electronically in Project-wise under Documents\ Reference Materials\Bridge Design Section Archive\Truck Permits	Bridge Rating Engineer
011	Chief Engineer Orders (Bridge Posting)	Life of the Agency	Life of the Agency	Archive electronically in Project-wise under Documents\ Reference Materials\Bridge Design Section Archive\Chief Engineer Orders (Bridge Posting)	Bridge Rating Engineer
012	Project Related Correspondences (Hard Copies)	Final project acceptance date + 3 years	Life of the Agency	Archive electronically in Content Manager under Design Projects. At the end of in office retention period, the hard copies shall be boxed, marked with project number and record item No. with description, and then transmitted to General Files for their handling.	Project Managers/Bridge Task Managers
013	Project Related Correspondences (Emails) *(Note: If the email is considered as important project correspondence and needs to be kept for the life of agency, then the email should be printed and treated as item 012.)*	Final project acceptance date + 3 years	Final project acceptance date + 3 years	Archive electronically in Project-wise under Project Folder\ Published Submittals\Project Documents\Project Correspondence Emails	Project Managers/Bridge Task Managers
014	Administrative or Other Types of Correspondences	Life of the Agency	Life of the Agency	Archive electronically in Content Manager under Bridge Design Subject Files	Everyone

Appendix G
Evaluation Instructions for Consultant's QC/QA Plan Document

Instructions for Grading the QC/QA Plan Document

The Bridge Task Manager for the project is responsible for evaluating the QC/QA plan document in accordance with the QC/QA plan document rating matrix. A score shall be given for each of the six evaluation criteria. An average score of the six evaluation criteria will be calculated. If the average score is above or equal to 3.5, an overall rating of "Excellent" shall be given. If the average score is above or equal to 3 and below 3.5, an overall rating of "Good" shall be given. If the average score is above or equal to 2.0 and below 3, the overall rating of "Acceptable" shall be given. If the average score is below 2.0, the overall rating of "Not Acceptable" shall be given. If an overall rating of "Not Acceptable" is given, justifications must be provided. The grading sheet shall be filled out by the Bridge Task Manager and signed by both the bridge task manager and his or her direct supervisor. The grading sheet for the QC/QA plan document, along with justifications when required, must be transmitted to the Project Manager in writing through a transmittal letter. The overall rating for the QC/QA plan document for each consultant team will be presented to the Secretary in addition to the shortlist.

Prior to performing the evaluation, the Bridge Task Manager must review the FHWA/AASHTO "Guidance on QC/QA in Bridge Design In Response to NTSB Recommendations (H-08-17)" and LADOTD Bridge Design Section QC/QA policies, which are the references for the Consultant to develop their QC/QA plan document. These documents can be downloaded from DOTD Bridge Design website.

Evaluation Criteria	QC/QA Plan Document Rating Matrix			
	4 - Excellent	3 - Good	2 -Acceptable	1 - Not Acceptable
A. Understanding of Consultant's and DOTD's role in QC/QA of Consultant's work	Demonstrate clear understanding that the Consultant is fully responsible for QC/QA of their work and DOTD is not responsible for performing QC/QA of consultant's work.	Demonstrate good understanding that the Consultant is fully responsible for QC/QA of their work and DOTD is not responsible for performing QC/QA of consultant's work.	Demonstrate basic understanding that the Consultant is fully responsible for QC/QA of their work and DOTD is not responsible for performing QC/QA of consultant's work.	Demonstrate poor understanding that the Consultant is fully responsible for QC/QA of their work and DOTD is not responsible for performing QC/QA of consultant's work.
B. Understanding of the QC/QA concepts in Bridge Design	Demonstrate clear understanding of QC/QA concepts in bridge design. Definitions of QC/QA are clearly defined.	Demonstrate good understanding of QC/QA concepts in bridge design. Definitions of QC/QA are clearly defined.	Demonstrate basic understanding of QC/QA concepts in bridge design. The definitions of QC/QA are defined.	Demonstrate poor understanding of QC/QA concepts in bridge design. The definitions of QC/QA are not clearly defined.
C. Responsibilities of Designer, Checker, Reviewer, and Engineer of Record	Responsibilities of Designer, Checkers, Reviewer, and Engineer of Record are clearly defined.	Responsibilities of Designer, Checker, Reviewer, and Engineer of Record are well defined.	Responsibilities of Designer, Checker, Reviewer, and Engineer of Record are defined.	Responsibilities of Designer, Checker, Reviewer, and Engineer of Record are not clearly defined.
D. Description of the QC and QA processes and its effectiveness to ensure the accuracy of the design and the plan details	QC/QA processes are clearly described and should be very effective to ensure the accuracy of the design and the plan details.	QC/QA processes are clearly described and should be effective to ensure the accuracy of the design and plan details.	QC/QA processes are described and should be effective to ensure the accuracy of the design and the construction plan details.	QC/QA processes are not clearly described and do not seems to be effective to ensure the accuracy of the design and the construction plan details.
E. Identification of personnel qualified to perform the bridge design and QC/QA of the design and plan details	The designers and QC/QA personnel are clearly indentified and are exceedingly qualified to perform the work.	The designers and QC/QA personnel are clearly indentified and are qualified to perform the work.	The designers and QC/QA personnel are indentified and are qualified to perform the work.	The designers and QC/QA personnel are not clearly indentified or not identified and the qualifications of the personnel identified are questionable.
F. Use of QC/QA tools, such as Checklists, Standard Forms, Training materials, etc.	QC/QA tools, such as checklists, standard forms, training materials, etc., have been developed and well documented. These tools are well suited for the scope and the complexity of the project.	QC/QA tools, such as checklists, standard forms, training materials, etc., have been developed and documented. These tools are suitable for the scope and the complexity of the project.	QC/QA tools, such as checklists, standard forms, training materials, etc., have been developed and are acceptable to be used for this project.	QC/QA tools, such as checklists, standard forms, training materials, etc., have not been developed or the developed ones are not suitable for this project.

Grading Sheet for the QC/QA Plan Document

Project No.:
Project Description:

Prime Consultant	Evaluation Criteria	Score	Overall Rating	Justifications/Comments
Consultant 1	A			
	B			
	C			
	D			
	E			
	F			
	Average			
Consultant 2	A			
	B			
	C			
	D			
	E			
	F			
	Average			
Consultant 3	A			
	B			
	C			
	D			
	E			
	F			
	Average			
Consultant 4	A			
	B			
	C			
	D			
	E			
	F			
	Average			
Consultant 5	A			
	B			
	C			
	D			
	E			
	F			
	Average			

Prepared by: _____ _____ _____
Name Signature Date

Approved by: _____ _____ _____
Name Signature Date

Appendix H
Consultant Project Bridge Design Kick-Off Meeting Agenda Checklist

A kick-off meeting with the Consultant's bridge design team shall be initiated by the LADOTD Bridge Design Task Manager once the project is awarded. The meeting agenda shall include, but not limited to, the following items:

__ Introduce LADOTD Bridge Task Manager and the Consultant's Key Team Members (The Supervisor or Team Leader and Key Designers/Design Checkers/Reviewers)

__ Discuss Consultant's Staffing Plan and Implementation of QC/QA Plan Document
(The staffing plan should include names and responsibilities of the designers, detailers, checkers, reviewers, and the EOR.)

__ Determine Schedules for Project Submittals
(Design Criteria, TS & L, 30%, 60%, 90%, 100% of Preliminary Plans and Final Plans, Final Calculations, etc.)

__ Share Expectations and Consultant Rating Criteria
(Consultant rating will be performed for all project submittals shown on the project submittal schedule.)

__ Discuss Design Criteria

__ Discuss Budget, Supplemental Requests, Invoices, and Importance of Avoiding Claims
(Staff shown on invoices will be reviewed in accordance with the staffing plan.)

Appendix I
Consultant Submittal QC/QA Certification

Project No.:
Project Name:

I, the undersigned Supervisor or Team Leader for this project, certify that the information included in this submittal has been prepared in accordance with the QC/QA plan documents and LADOTD Bridge Design Section policy on QC/QA and the information presented is accurate and meets the requirements of this submittal. All CAD drawings meet LADOTD CAD standards.

_____
Submittal Description

_____	_____	_____
Supervisor or Team Leader Name	Signature	Date

Appendix J
Project Activity Log Sheet

Project No.:
Project Name:
Bridge Task Manager:

Date	Project Activity	Comments

Appendix K

Consultant Submittal Review Checklist

Items	Submittals												
	Design Criteria	**TS&L**	**30% PP**	**60% PP**	**90% PP**	**100% PP**	**30% FP**	**60% FP**	**90% FP**	**100% FP**	**Final Calculation Book**	**Plan Revisions**	**Change Orders**
Consultant Submittal QC/QA Certification			R	R	R	R	R	R	R	R	R	R	R
Design Criteria	C												
TS&L		C											
Bridge Index			D	D	D	D	D	D	C	S			
General Notes			D	D	D	D	D	D	C	S			
Summary of Estimated Quantities			D	D	C	C	D	D	C	S			
General Plans			D	D	C	C	C	C	C	S			
Typical Sections			D	D	C	C							
Superelevation Diagram				D	D	C	C	C	C	S			
Construction Phasing Details				D	D	C	C	C	C	S			
Traffic Controls Details				D	D	C	C	C	C	S			
Foundation/Pile Layout				D	D	C	C	C	C	S			
Pile Loads/Details					D	D	D	C	C	S			
Pile Data Tables							D	D	C	S			
Bent Details							D	D	C	S			
Fender Details							D	D	C	S			
Girder Details							D	D	C	S			
Span Details							D	D	C	S			
Joint Details								D	C	S			
Bearing Details								D	C	S			
Approach Slab								D	C	S			
Guardrail Details								D	C	S			
Bridge Barrier/Railing Details								D	C	S			
Bridge Drainage Details								D	C	S			
Detour Bridge Details								D	C	S			
Revetment Details								D	C	S			
Signing/Lighting Details								D	C	S			
Year Plate								D	C	S			
Rebar Support								D	C	S			
Misc. Details								D	C	S			
Project Specific Standard Plans and Special Details								D	C	S			
Electrical/Lighting Details								D	C	S			
Mechanical Details								D	C	S			
As-Built Plans								D	C	C			
Special Provisions/NS-Items							D	D	C	C			
Cost Estimate					D	D	D	D	C	C			
Final Calculations											S		
Revised Plans/Calculations												S	S

Legends:

“R” = The item is required and shall be included in the submittal.

“C” = The item shall be complete and shall be included in the submittal.

“D” = The item shall be in development and shall be included in the submittal.

“S” = The item is stamped by the EOR and shall be included in the submittal.