Bridge Plan Development Quality Control and Quality Assurance Plan and Checklist

ALDOT Bridge Bureau

January 2021

THIS PAGE INTENTIONALLY LEFT BLANK

REVISIONS since May 2020 Edition

- Revised Section 1.2, updated Chief Engineer
- Revised Section 2.2, paragraph 14
- Revised Section 2.4, paragraph 1, deleted sentence "The Consultant contract……shop drawings and rating". Added paragraph concerning review of shop drawings and rating.
- Revised Section 3.15
- Revised Section 4.7
- Revised Section 4.9

Revisions March 2021

- Section 2.4; moved paragraph 5 to paragraph 3, added heading "Construction Documents Review and Bridge Rating" and revised language; moved paragraph 3 to paragraph 5, added heading "Consultant Responsibilities" and revised language

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

END OF DOCUMENT

SECTION 1. INTRODUCTION

1.1 GENERAL

This document establishes a Quality Control (QC) and Quality Assurance (QA) Plan for all ALDOT bridge, culvert or miscellaneous structure projects, whether developed by the ALDOT Bridge Bureau (in-house) or by Consultants (includes Local Transportation projects developed "in-house" by the Local Public Agency or by their retained Consultant and subject to review by ALDOT). This document conforms with the ***"Guidance on QC/QA in Bridge Design in Response to NTSB Recommendation (H-08-17)"*** (FHWA/AASHTO Guidance) which was published jointly by FHWA and AASHTO dated August 2011.

The Bridge Plan Development QC/QA Plan and Checklist was developed to implement a deliberate systematic process of checks and balances to ensure, to the greatest extent possible, that structure designs and plans are free of errors and omissions and prepared in accordance with applicable design codes, Bridge Bureau policies and procedures, ALDOT Construction Specifications and good detailing practice. It is designed to track the Bridge Bureau's QC/QA process (as applicable to Bridge Bureau or Consultant designed projects) through the design and development of all structure plans. This documentation shall be retained as a permanent record of each project.

THIS PAGE INTENTIONALLY LEFT BLANK

1.2 APPROVAL

This document is approved for implementation and is effective as of the date shown.

3/10/2021

William T. Colquett, P.E. Date
State Bridge Engineer

3/10/21

Edward N. Austin, PE Date
Chief Engineer

03/11/2021

Mark Bartlett, PE Date
Division Administrator
FHWA Alabama Division

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 2. QC/QA PROCESS

2.1 QC/QA DEFINITIONS

1. Quality Control (QC): Procedures of checking the accuracy of design calculations and their conformance with current governing design codes and ALDOT design policy including review of the contract drawings for conformity with current plan development procedures and detecting and correcting design / plan omissions and errors before the contract plans are submitted for a Quality Assurance review.

2. Quality Assurance (QA): Procedures of review to ensure that the quality control processes have been followed effectively preventing errors, omissions and inconsistencies in the development of the contract drawings. The QA review shall include a review of the plan drawings, designs, and sketches to ensure designs and plans conform to governing codes and ALDOT design policy and plan development procedures. The QA review shall also include rating of the bridge superstructure.

2.2 PERSONNEL DEFINITIONS AND RESPONSIBILITIES

1. State Bridge Engineer: An individual assigned as the Bureau Chief and charged with directing the operations of the Bridge Bureau. This person shall sign the first sheet of each set of bridge plans in the contract plan assembly, signifying that the final contract plans are ready for letting. This person shall possess a degree (B.S. or higher) in Civil Engineering from an accredited university and be licensed to practice engineering in the State of Alabama. The State Bridge Engineer shall have a classification of Professional Civil Engineer III (PCE III).

2. Assistant State Bridge Engineer, Design: An individual responsible for managing the design activities of the individual Design Sections. This person shall assign projects to Design Sections by matching experience and qualifications with respect to project complexity. This person shall possess a degree (B.S. or higher) in Civil Engineering from an accredited university and be licensed to practice engineering in the State of Alabama. The Assistant State Bridge Engineer, Design shall have a classification of Professional Civil Engineer II Senior (PCE II Senior).

3. Design Section: A unit of individuals consisting of Engineers and Detailers with the specific purpose of preparing designs and plans for contract Bridge Plans.

4. Consultant Management Section: A unit of individuals consisting of Engineers and Detailers with the specific purpose of reviewing (QA) consultant prepared contract Bridge Plans.

5. Engineer of Record (EOR): An individual, identified as the Design Section Supervisor, selected by the Assistant State Bridge Engineer, Design with the concurrence of the State Bridge Engineer, responsible for directing the necessary activities of a Design Section. The EOR shall be responsible for a full technical review of the project including a design check of all the bridge's systems and components, review of the contract drawings (details) and applicable specifications. This shall include verifying the designer's calculations and conformance to the ALDOT Bridge Bureau Structural Design Manual. The EOR shall ensure that the drawings adequately and accurately depict the design information and are presented in conformance with the ALDOT Bridge Bureau Quality Control Manual for Bridge Plan Detailing. The individuals responsible for performing the various design and detailing tasks shall be selected and identified by the EOR. The EOR shall sign the first sheet of each set of bridge plans in the contract plan assembly. The EOR shall possess a degree (B.S. or higher) in Civil Engineering from an accredited university and be licensed to practice engineering in the State of Alabama. The EOR shall have a classification of Professional Civil Engineer II (PCE II).

6. Designer: An individual responsible for the development of the design calculations, design sketches, and review of shop drawings related to a specific structural design. This person shall have a level of technical skills and experience commensurate with the complexity of the subject structure being designed. The Designer shall possess a degree (B.S. or higher) in Civil Engineering from an accredited university and be licensed to practice engineering in the State of Alabama or be under the direct supervision of a State of Alabama licensed professional engineer. The Designer shall have a classification of Civil Engineering Graduate (CEG) or Professional Civil Engineer I (PCE I).

7. Detailer: The individual(s) responsible for detailing the contract bridge plans following the Designer's sketches using proper drafting techniques and using guidance found in the ALDOT Bridge Bureau Quality Control Manual for Bridge Plan Detailing. This person shall also be responsible for material take-offs for estimating quantities. This person shall have a level of technical skills and experience commensurate with the complexity of the subject structure being detailed. Detailers shall be identified as follows: (1) Bridge Detailer and have a classification of Engineering Assistant I, II or III (EAI, II or III) or Transportation Technician (TT); (2) Senior Bridge Detailer and have a classification of Transportation Technician Senior (TTS); (3) Design Section Squad Leader and have a classification of Transportation Manager (TM).

8. QC Detailing Checker: An individual responsible for performing a full review of the bridge drawings following the Quality Control Manual for Bridge Plan Detailing. The QC Checker shall be assigned by the Design Section Supervisor. The assigned individual shall be identified as follows: (1) Design Section Squad Leader and have a classification of Transportation Manager (TM); or (2) Senior Bridge Detailer and have a classification of Transportation Technologist Senior (TTS).

9. Assistant State Bridge Engineer, QA: An individual responsible for reviewing the QC/QA procedures, documentation, and bridge plans for all in-house designed bridge projects. The QA Engineer shall possess a degree (B.S. or higher) in Civil Engineering from an accredited university and be licensed to practice engineering in the State of Alabama. The Assistant State Bridge Engineer, QA shall have a classification of Professional Civil Engineer II Senior (PCE II Senior). This individual shall sign the first sheet of each set of bridge plans in the contract plan assembly, signifying the due processes of QC and QA have been completed and that the plans are ready for the signature of the State Bridge Engineer.

10. QA Administrator: An individual responsible for all aspects of the QA reviews of bridge plans for all in-house designed bridge projects, ensuring that bridge plans conform to ALDOT Bridge Bureau criteria and guidelines. The QA Administrator must be experienced in bridge plan review and familiar with ALDOT Standard Specifications. The QA Administrator shall also be responsible for review and processing of fabrication documents for structural steel items. The QA Administrator shall have a minimum classification of Transportation Administrator (TA).

11. QA Reviewer: An individual responsible for performing reviews of the bridge plans, reinforcing, and geometry for all in-house designed bridge projects. The QA Reviewer shall have a minimum classification of Transportation Manager (TM) and be under the supervision of the QA Administrator.

12. Rating Engineer: An individual responsible for performing a structural validation of the bridge superstructure through bridge rating analysis in accordance with the AASHTO Manual for Maintenance Inspection of Bridges. This person shall have a level of skills and experience commensurate with the complexity of the subject structure being analyzed. The Rating Engineer shall have a degree (B.S. or higher) in Civil Engineering from an accredited university and be licensed to practice engineering in the State of Alabama and shall have a minimum classification of Professional Civil Engineer I (PCE I).

13. Bridge Hydraulics Engineer: An individual responsible for performing hydraulic analyses of bridge sites at water crossings for determining the length of bridge(s), span arrangement, bridge type, minimum finish grade elevations, scour characteristics, etc. This person shall possess a degree (B.S. or higher) in Civil Engineering from an accredited university and be licensed to practice engineering in the State of Alabama. The Bridge Hydraulics Engineer shall have a classification of Professional Civil Engineer II (PCE II).

14. Consultant (Engineer of Record, EOR)(for Bridge Bureau purposes): A professional Engineering firm, wholly specializing in or within the company a Division specializing in Bridge Engineering, contracted by ALDOT to prepare designs and plans for contract Bridge Plans.

15. Consultant Manager: An individual responsible for ensuring the completion of the QA process applicable for bridge designs and plans prepared by consultants. The Consultant Manager shall possess a degree (B.S. or higher) in Civil Engineering from an accredited university and be licensed to practice engineering in the State of Alabama. The Consultant Manager shall have a minimum classification of Professional Civil Engineer II (PCE II).

16. Consultant Review Engineer: An individual or individuals responsible for the execution of the QA process applicable for bridge designs and plans prepared by consultants. This person shall possess a degree (B.S. or higher) in Civil Engineering from an accredited university and be licensed to practice engineering in the State of Alabama or be under the direct supervision of a State of Alabama licensed professional engineer. The Consultant Review Engineer shall have a classification of Civil Engineering Graduate (CEG) or Professional Civil Engineer I (PCE I).

2.3 PROCEDURE FOR BRIDGE BUREAU DESIGNED PROJECTS

Copy and complete the IN-HOUSE PLANS CHECKLISTS (SECTION 3) when designs and plans for contract Bridge Plans are prepared in-house by the Bridge Bureau. The Design Section Supervisor shall ensure that the QC/QA progression is followed and that the checklist is maintained through the various stages of the process.

When assignment of a project is made to a Design Section, a Project Binder shall be created. All pertinent information relative to the design and development of the contract Bridge Plans shall be gathered into this document. The minimum information requirements for the Project Binder is noted in Section 3.9. The Project Binder shall constitute the permanent record of the development of the contract Bridge Plans.

2.4 PROCEDURE FOR CONSULTANT DESIGNED PROJECTS

Copy and complete the CONSULTANT PLANS CHECKLISTS (SECTION 4) when Consultants are contracted by ALDOT to prepare designs and plans for contract Bridge Plans (includes Local Transportation projects as applicable). The Consultant Manager shall ensure that the QA progression is followed and that the checklist is maintained through the various stages of the process.

Similar to Section 2.3, when a Consultant developed bridge project is assigned to the Consultant Management Section, a Project Binder shall be created. All pertinent information relative to the development of the contract Bridge Plans shall be assembled into this document. The Project Binder shall constitute the permanent record of the development of the contract Bridge Plans.

Construction Documents Review and Bridge Rating: The State Bridge Engineer, at his discretion, may determine that certain construction documents such as shop drawings for fabrication of structural members, weld procedures and other related correspondence should be reviewed and approved by the Consultant (EOR) in lieu of in-house review and approval by the Bridge Bureau. Likewise, the State Bridge Engineer, at his discretion, may determine that certain Consultant designed bridge structures should be rated by the Consultant in-lieu of in-house rating by the Bridge Bureau. Accordingly, Consultant agreements should then contain appropriate provision for such tasks to be accomplished by the Consultant. See Sections 4.7 and 4.9.

Consultant Responsibilities: ALDOT's review of Consultant's bridge/structural designs and contract plans is considered a cursory Quality Assurance Review. Consultants preparing bridge plans shall perform both QC and QA design and plan reviews prior to submitting plans to the State Bridge Engineer for review. Fulfilment of this requirement shall be evidenced by submission of the Consultant's completed formal QC/QA process documentation and shall be retained as part of the permanent record for the project. This submittal shall contain a statement attesting to the satisfactory completion of this process and shall be signed and sealed by the Engineer of Record for the project.

Consultants shall maintain a permanent record of all design and check calculations, sketches, review comments and resolutions, final drawings and other pertinent documents/correspondence as well as the QC/QA documentation. When requested, an electronic file (pdf) of this information shall be furnished to the State Bridge Engineer. The Consultant Management Section of the Bridge Bureau shall be responsible for ensuring that this information, when furnished, is electronically stored in accordance with these procedures and in accordance with Step 4.10 of the QC/QA plan and checklist.

SECTION 3. IN-HOUSE PLANS CHECKLISTS

3.1 PROJECT INFORMATION

Project No.: _____
Description: _____
_____
_____

County(s): _____
BIN(s): _____
CPMS CN #: _____
CPMS PE #: _____
Asst. St. Bridge Engineer, Des.: _____
Bridge Hydraulic Engineer: _____

Design Section Supervisor: _____
Designer(s): _____
_____

Design Section Squad Leader: _____
Senior Detailer(s): _____
_____
_____

Detailer(s): _____
_____
_____
_____

QA Administrator: _____
QA Reviewer, Plans: _____
QA Reviewer, Reinforcing: _____
Rating Engineer: _____
Asst. St. Bridge Engineer, QA: _____
State Bridge Engineer: _____

3.2 HYDRAULIC REVIEW AND RECOMMENDED TYPE, SIZE AND LOCATION (TS&L) (WATERWAY CROSSINGS)

The Bridge Type, Size, and Location (TS&L) (otherwise known as the "Layout") recommendation(s) shall be completed at the GDCP Step 19.0 roadway plan submittal. The recommendations shall be prepared by the Bridge Hydraulic Engineer with concurrence by the Assistant Bridge Engineer, Design.

	Initial	Date
• Bridge Hydraulic Engineer Recommendation:	_____	_____
• Assistant Bridge Engineer, Design Concurrence:	_____	_____

3.3 FINAL TYPE, SIZE AND LOCATION (TS&L)

The final Bridge Type, Size, and Location (TS&L) (otherwise known as the "Layout") drawing(s) shall be prepared based on the GDCP Step 60 roadway plan submittal. The completed TS&L shall be reviewed and approved by the Section Supervisor, the Bridge Hydraulic Engineer (if over a waterway), and the Assistant Bridge Engineer, Design.

	Initial	Date
• Section Supervisor Approval:	_____	_____
• Bridge Hydraulic Engineer Approval:	_____	_____
• Asst. Bridge Engr., Design Approval:	_____	_____

For unusual/complex bridges on the National Highway System (NHS), the TS&L shall be submitted to FHWA for review and approval. Maps of the NHS routes for the State of Alabama can be found at the following web link:

https://www.fhwa.dot.gov/planning/national_highway_system/nhs_maps/alabama/index.cfm

	Initial	Date
• FHWA Approval Submitted:	_____	_____
• FHWA Approval Received:	_____	_____
	☐ Check if Not Applicable	

For bridges over or adjacent to railroad right-of-way, a preliminary layout and written summary shall be transmitted to the Design Bureau Rail Group for their use in requesting the railroad's approval.

	Initial	Date
• Layout and Summary Submitted:	_____	_____
• Prelim. Railroad Approval Received:	_____	_____
	☐ Check if Not Applicable	

For bridges over navigable waterways, a Bridge Permit Application shall be submitted to the U.S. Coast Guard for review and approval (see USCG Bridge Permit Application Guide). Coordinate, as needed, with the Design Bureau Environmental-Technical Section (ETS) to acquire information required for the USCG permitting process.

	Initial	Date
• Bridge Permit Application Submitted:	_____	_____
• Coast Guard Approval Received:	_____	_____
	☐ Check if Not Applicable	

3.4 BRIDGE GEOMETRICS

Bridge geometry shall be computed and independently verified within the Design Section. Check runs or calculations shall be scanned and saved as PDFs in the project directory.

	Initial	Date Started	Date Completed
• Geometrics computed:	_____	_____	_____
• Geometrics verified:	_____	_____	_____

3.5 DESIGN EXCEPTIONS, CALCULATIONS AND SKETCHES

The Designer(s) shall perform design calculations for all primary structural components including superstructure, bearings, joints, and substructure and prepare applicable sketches for use by plan Detailers. Design sketches should convey adequate information for the Detailer to prepare final contract drawings. The Engineer of Record (EOR) should perform sufficient independent design checks to assure the adequacy of the design and accuracy and completeness of sketches. Check calculations shall be scanned and saved as PDFs in the project directory. The Designer and EOR shall initial and date the front sheet of design program runs, and each sheet of design sketches.

	Initial	Date Started	Date Completed
• Superstructure Designs & Sketches:	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
• EOR Check:	_____	_____	_____
• Substructure Designs & Sketches:	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
• EOR Check:	_____	_____	_____

Document implemented exceptions to the Structural Design Manual (SDM) that require prior approval of the State Bridge Engineer (SBE). Describe SDM exceptions below and include date, excepted Section number and initials of the State Bridge Engineer denoting approval. Attach additional sheets following same format as necessary.

Date	Section No.	SBE Init.	Exception

3.6 PLAN SHEET PREPARATION

The Detailer(s) shall prepare bridge plan sheets in accordance with sketches provided by the Designer(s) and in compliance with the ALDOT Quality Control Manual for Bridge Plan Detailing using the Bridge Plans Checklist.

	Initial	Date Started	Date Completed
• Plan Sheet Detailing:			

3.7 QUANTITY COMPUTATIONS

Bridge quantities shall be independently computed and verified by Bridge Design Section personnel and placed on the applicable sheets and the Estimated Quantities summary on the front sheet.

	Initial	Date Started	Date Completed
• Computed or Verified:	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

3.8 DESIGN SECTION PLAN CHECK (QUALITY CONTROL)

Each individual plan sheet shall be checked by the Design Section Squad Leader for accuracy and compliance with the Quality Control Manual for Bridge Plan Detailing. The Designer(s) shall also check all applicable structural details to ensure that they are in conformance with their design. Finally, the full set of bridge plans shall be checked by the Section Supervisor.

	Initial	Date Started	Date Completed
• Squad Leader Check:	_____	_____	_____
Corrections Made:	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
Corrections Verified:	_____	_____	_____

	Initial	Date Started	Date Completed
• Designer(s) Check:	_____	_____	_____
Corrections Made:	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
Corrections Verified:	_____	_____	_____

	Initial	Date Started	Date Completed
• Section Supervisor (EOR) Check:	_____	_____	_____
Corrections Made:	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
Corrections Verified:	_____	_____	_____

	Initial	Date Started	Date Completed
• Quantity Verification:			
Quantities Verified:	_____	_____	_____

3.9 QUALITY ASSURANCE REVIEW SUBMITTAL

The QA Submittal should include the following information neatly organized and labeled in the Project Binder, and be submitted to the Assistant State Bridge Engineer, QA.

_____ Bridge Plan Development QC/QA Plan and Checklist
_____ Bridge Hydraulic Report
_____ 11” x 17” copy of the Approved TS&L
_____ Geometry Run
_____ Design Calculations
_____ Design Sketches
_____ Foundation Report and Addendums*
_____ Bridge Plans Detailing Checklist
_____ Quantity Calculations
_____ Project Correspondence and other related documents

*May be in separate folder

The QA submittal shall also include the following:

_____ Current Roadway Plans (GDCP Step 60 minimum)
_____ One Full Size Set of Complete Bridge Plans Rolled Up (Includes all applicable standard, bridge special project drawings and E-sheets if applicable. Boring sheets not required.)

3.10 BRIDGE PLAN REVIEW (QUALITY ASSURANCE)

The entire bridge plan set shall be reviewed by QA personnel for accuracy and compliance with Bridge Bureau design practices and detailing standards. This includes reviews of geometry, reinforcing, and quantities.

	Initial	Date Started	Date Completed
• Bridge Plans Submitted:	_____	_____	N/A
• Bridge Plans Accepted:	_____	_____	N/A
• Geometric Review:	_____	_____	_____
☐ No Comments	☐ Corrections Required		
☐ Return FULL / HALF Size Plans			
☐ Corrections Verified By:	_____	_____	_____
• Geometric Backcheck:	_____	_____	_____
• Plan Review:	_____	_____	_____
☐ No Comments	☐ Corrections Required		
☐ Return FULL / HALF Size Plans			
☐ Corrections Verified By:	_____	_____	_____
• Plan Review Backcheck:	_____	_____	_____
☐ No Comments	☐ Corrections Required		
☐ Return FULL / HALF Size Plans			
☐ Corrections Verified By:	_____	_____	_____
• Reinforcement Review:	_____	_____	_____
☐ No Comments	☐ Corrections Required		
☐ Return FULL / HALF Size Plans			
☐ Corrections Verified By:	_____	_____	_____
• Reinforcement Backcheck:	_____	_____	_____
☐ No Comments	☐ Corrections Required		
☐ Return FULL / HALF Size Plans			
☐ Corrections Verified By:	_____	_____	_____
• Br. Plans Verified by QA Admin.:	_____	_____	_____

Verification of corrections shall be by the Design Section Supervisor (EOR).

Design calculations and sketches shall be reconciled with the QA review comments.

Detailing disputes with the QA Reviewers must be resolved to the mutual satisfaction of the Engineer of Record and QA Administrator.

3.11 ASSISTANT BRIDGE ENGINEER REVIEW (QUALITY ASSURANCE)

All in-house designed plans shall be reviewed for conformance with the QC/QA Plan. The design binder, an 11" x 17" set of complete bridge plans and the latest roadway plan set are required for submittal.

	Initial	Date Started	Date Completed
• Asst. Bridge Engr., QA Review:	_____	_____	_____

3.12 DISPOSITION OF QA MARK-UPS

QA comments as well as any comments or issues from outside the Bridge Bureau should be addressed and documentation added to the design binder.

	Initial	Date Completed
• Corrections Verified:	_____	_____
• PS&E Comments Received:	_____	_____
• Final Backcheck Comments Rec'd:	_____	_____
• CN Review Plans Submitted:	_____	_____
• CN Comments Received:	_____	_____
• Disposition of Comments Sent:	_____	_____

3.13 ASSISTANT BRIDGE ENGINEER BACK CHECK (QUALITY ASSURANCE)

This review should be conducted after all other reviews (listed above) have been performed. The design binder, an 11" x 17" set of corrected bridge plans, the Asst. Bridge Engineer QA check prints, and the latest roadway plan set will be required for this backcheck.

	Initial	Date Started	Date Completed
• Asst. Bridge Engr., QA Backcheck:	_____	_____	_____

3.14 STATE BRIDGE ENGR. APPROVAL (FINAL CONTRACT PLANS)

Present full-size complete bridge plans embossed as "ORIGINAL CONTRACT DRAWINGS" to the State Bridge Engineer for signing. The plans should be signed by the EOR, Assistant State Bridge Engineer-QA and initialed by the designer.

	Initial	Date
• State Bridge Engineer Approval:	_____	_____

3.15 BRIDGE RATING

The superstructure shall be analytically load rated in accordance with the ***ALDOT Maintenance Bureau Manual for Bridge Inspection Appendix I***. An 11" x 17" set of the final bridge plans (bridge superstructure only, including the General Plan and Elevation) will be required for the rating. The rating shall be accomplished at the completion of the contract bridge plans and prior to project letting. The rating report and results shall be added to the Project Binder and a copy of the report forwarded to the Bridge Rating Section of the Maintenance Bureau.

	Initial	Date Started	Date Completed
• Rating Engineer:	_____	_____	_____

☐ Check if rated as "Passing"

3.16 PLAN REVISIONS

Any changes made to plan drawings after the Letting Authorization date shall be flagged, numbered and handled in accordance with GFO 3-5. Flagged revisions shall be reviewed by the Engineer of Record and QA Administrator and be documented below before distribution is made.

Revision #	Date	Plan/Bridge Sheet #	Revisor initial	EOR Review Initial/date	QA Review Initial/date

3.17 SHOP DRAWINGS

Fabrication drawings for elastomeric bearings, prestressed girders and piling will be reviewed by the designer.

	Reviewer Initial	Date Received	Date Approved	Date Distributed
Prestressed Girders:				
Bearings:				
Prestressed Piling:				
Other:				

For structural steel items, the QA Administrator is responsible for review and processing of fabrication drawings, welding procedures and related documents. The QA Administrator is responsible for record keeping.

3.18 COMPLETED PROJECT RECORD STORAGE

Project records should be retained indefinitely. Upon receipt of the project completion letter from the Construction Bureau, the project shall be processed for permanent record storage. A copy of the completion letter will be distributed to the EOR and the QA Administrator.

	Initial	Date
• Completion letter received (EOR):	_____	_____
• Completion letter received (QA Administrator):	_____	_____

The QA Administrator shall purge the contract plans from the plan rack. The contract plans will be offered to the EOR for retention if desired

	Initial	Date
• Plans purged:	_____	_____

The EOR (Design Section Supervisor) shall be responsible for retention (scanning) and electronic storing of project records. Completed records shall be stored in the project directory using portable document format (pdf).

	Initial	Date
• Project Binder:	_____	_____
• Administrative File:	_____	_____
• Shop Drawings (Prestressed Concrete Girders, Piling; Bearings):	_____	_____

The QA Administrator shall be responsible for retention (scanning) and electronic storage of the original first check prints after receipt of the project completion letter. Check prints shall be stored in pdf.

	Initial	Date
• Check prints scanned and stored:	_____	_____

The QA Administrator shall be responsible for retention (scanning) and electronic (pdf) storage of project records for structural steel fabrication items.

3.19 PROJECT DIRECTORY MAINTENANCE

To minimize computer storage space requirements, project directories should be periodically purged of non-essential files (roadway files, reference plans, etc.). Photos, pdfs should be compressed in size. This periodic maintenance, when required, shall be accomplished by the Bridge Programs/IT Engineer in coordination with the Design Section Supervisors.

	Initial	Date
• Completed:	_____	_____

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 4. CONSULTANT PLANS CHECKLISTS

4.1 PROJECT INFORMATION

Project No.: _____
Description: _____
_____
_____
_____

County(s): _____
BIN(s): _____
CPMS CN #: _____
CPMS PE #: _____
Consultant: _____
Contract ID: _____

Asst. Bridge Engr., Design: _____
Bridge Hydraulic Engineer: _____

Consultant Manager: _____
Conslt. Review Engineer(s): _____
_____
_____
_____

Rating Engineer: _____
Asst. Bridge Engineer, QA: _____
State Bridge Engineer: _____

4.2 QUALITY ASSURANCE REVIEW SUBMITTALS

Consultants shall submit the following information for review at the steps of completion noted below. If not applicable, signify by N/A.

- Bridge hydraulic submittal (GDCP Step 19):

_____ Bridge Hydraulic Report*

- 30% Review (TS & L) (Plan-In-Hand, GDCP Step 64):

_____ Copy of Consultant's QC/QA Plan
_____ TS & L
_____ Roadway Plans (GDCP Step 60 minimum)*
_____ Documentation of approved exceptions to the ALDOT Structures Design Manual**

- 60% Review (PS&E, GDCP Step 85):

_____ Foundation Report and Addendums*
_____ Bridge Hydraulic Report (Revised)*
_____ Approved TS & L (Revised)
_____ Roadway Plans (GDCP Step 60 minimum) (Revised)*
_____ Two Half Size Sets of 60% Complete Bridge Plans (Review for general conformance with ALDOT Practices and Procedures and comments from 30% review, basic QA review of plan details)

- 95% Review (Construction Review, GDCP Step 95):

_____ Foundation Report and Addendums (Revised)*
_____ Copy of Consultant's QC/QA Plan (completed)
_____ Roadway Plans (GDCP Step 95)*
_____ Three Half Size Sets of Complete Bridge Plans (QA Plan review and Construction Bureau submittal)

- Final Plans (Office Engineer, GDCP Step 99):

_____ Copy of Consultant's QC/QA Plan (Completed, revised if needed)
_____ Electronic copy of project data (if requested)
_____ One ½ Size Set of Contract Bridge Plans (Final stamped, certified and signed plans ready for Assistant State Bridge Engineer's QA review)

*May originate ''in-house'' (prepared by ALDOT or by other Consultants); complete Section 3.2 and include in completed checklist.

**See Page 3-5 for format of documentation.

4.3 TYPE, SIZE AND LOCATION (TS&L)

The Consultant, when part of the agreement, shall furnish the Bridge Type, Size, and Location drawing (otherwise referred to as the "Layout") which shall be prepared based on the GDCP Step 60 roadway plan submittal. The completed Layout shall be reviewed and approved by the Consultant Manager, the Bridge Hydraulic Engineer (if over a waterway), and the Assistant Bridge Engineer, Design.

	Initial	Date
• Consultant Manager Approval:	_____	_____
• Bridge Hydraulic Engineer Approval:	_____	_____
• Asst. Bridge Engr., Design Approval:	_____	_____

For unusual/complex bridges on the National Highway System (NHS), the Consultant Management Section shall submit the TS&L to the FHWA for review and approval. Maps of the NHS routes for the State of Alabama can be found at the following web link:

https://www.fhwa.dot.gov/planning/national_highway_system/nhs_maps/alabama/index.cfm

	Initial	Date
• FHWA Approval Submitted:	_____	_____
• FHWA Approval Received:	_____	_____

☐ Check if Not Applicable

For bridges over or adjacent to railroad right-of-way, the Consultant Management Section shall transmit to the Design Bureau Rail Group the preliminary layout and written summary (prepared by the Consultant) for their use in requesting the railroad's approval.

	Initial	Date
• Layout and summary Submitted:	_____	_____
• Prelim. Railroad Approval Received:	_____	_____

☐ Check if Not Applicable

For bridges over navigable waterways, the Consultant Management Section shall submit the Bridge Permit Application (Consultant prepared) to the U.S. Coast Guard for review and approval (see USCG Bridge Permit Application Guide). The Consultant Management Section is also required to coordinate, as needed, with the Design Bureau Environmental-Technical Section (ETS) to obtain information required for the USCG permitting process.

	Initial	Date
• Bridge Permit Application Submitted:	_____	_____
• Coast Guard Approval Received:	_____	_____

☐ Check if Not Applicable

4.4 QUALITY ASSURANCE REVIEW (CONSLT. MANAGEMENT)

◉ 30% Review (Plan-In-Hand, GDCP Step 65):

	Initials	Date Started	Date Completed	
• TS & L Received:	_____	_____	N/A	
• TS & L Review:	_____	_____	_____	
☐ No Comments	☐ Corrections Required			
☐ Return HALF Size Plans	_____	_____	N/A	

COMMENTS:

◉ 60% Review (PS&E, GDCP Step 85):

	Initials	Date Started	Date Completed	
• Plans Received:	_____	_____	N/A	
• Plan Review:	_____	_____	_____	
	_____	_____	_____	
☐ No Comments	☐ Corrections Required			
☐ Return HALF Size Plans	_____	_____	N/A	

COMMENTS:

◉ 95% Review (Construction Review, GDCP Step 95):

	Initials	Date Started	Date Completed	
• Plans Received:	_____	_____	N/A	
• Constr. Bur. Submittal	_____	_____	N/A	
• Constr. Bur. comments received:	_____	_____	N/A	
☐ No Comments	☐ Corrections Required			
• Return marked plans to Consultant:	_____	_____	N/A	
• Receive corrected plans:	_____	_____	N/A	*
• Review corrected plans:	_____	_____	_____	*
	_____	_____	_____	*
☐ No Comments	☐ Corrections Required			
☐ Return HALF Size Plans	_____	_____	N/A	*

*Repeat cycle as/if necessary

COMMENTS:

◉ Final Plans (Office Engineer, GDCP Step 99):

	Initials	Date Started	Date Completed
• Plans Received:	_____	_____	N/A
• Submit half size plans (including Roadway Plans) to Assistant Bridge Engineer, QA	_____	_____	N/A
• Resolve any Assistant Bridge Engineer or Bridge Engineer comments	_____	_____	_____
☐ No Comments	☐ Corrections Required		
• Process originals for submittal to Office Engineer:	_____	_____	_____

COMMENTS:

4.5 ASST. BRIDGE ENGR. REVIEW (QUALITY ASSURANCE)

All Consultant designed plans shall be reviewed for conformance with the QC/QA Plan. A half size set of complete bridge plans, current roadway plan set and the completed QC/QA Plan and Checklist will be required.

	Initial	Date Started	Date Completed
• Asst. Bridge Engr. (QA) Review:	_____	_____	_____

4.6 STATE BRIDGE ENGR. APPROVAL (FINAL CONTRACT PLANS)

Full size completed bridge plans with Consultant certification, PE stamps, signatures and embossed “ORIGINAL CONTRACT DRAWINGS” (embossing done in-house) shall be presented to the State Bridge Engineer for signing.

	Initial	Date
• State Bridge Engineer Approval:	_____	_____

4.7 BRIDGE RATING

The superstructure shall be analytically load rated in accordance with the ***ALDOT Maintenance Bureau Manual for Bridge Inspection Appendix I***. An 11" x 17" set of the final bridge plans (bridge superstructure only, including the General Plan and Elevation) will be required for the rating (not required if rating is done by Consultant). The rating shall be accomplished at the completion of the contract bridge plans and prior to project letting. The rating report and results shall be added to the Project Binder and a copy of the report forwarded to the Bridge Rating Section of the Maintenance Bureau.

	Initial	Date Started	Date Completed
• Rating Engineer:	_____	_____	_____

☐ Check if rated by Consultant
☐ Check if rated as "Passing"

4.8 PLAN REVISIONS

Any necessary revisions to the plan drawings after the Letting Authorization date shall be executed by the Consultant and flagged and numbered appropriately. The Consultant Manager or Consultant Review Engineer shall coordinate revisions as necessary with the Consultant and revised sheets shall be handled in accordance with GFO 3-5 and documented below.

Revision #	Date	Plan/Bridge Sheet #	Consultant Manager/ Consultant Review Engineer Initials/Date

4.9 SHOP DRAWINGS

Per Section 2.4, when the State Bridge Engineer has directed the review and approval of fabrication documents by the Consultant (EOR), the reviewed and approved documents will be stamped and distributed by Consultant Management and/or the QA Administrator as appropriate and documented as shown below.

When drawings are reviewed in-house, Section 3.17 shall be completed.

	Date Received	Date Distributed/Initial
Prestressed Girders:	_____	_____
Prestressed Piling:	_____	_____
Bearings:	_____	_____
Other:	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

4.10 COMPLETED PROJECT RECORD STORAGE

Project records should be retained indefinitely. Upon receipt of the project completion letter from the Construction Bureau, the project shall be processed for permanent record storage. A copy of the completion letter will be distributed to the Consultant Manager and the QA Administrator.

	Initial	Date
• Completion letter received (Consultant Manager):	_____	_____
• Completion letter received (QA Administrator):	_____	_____

The QA Administrator shall purge the contract plans from the plan rack. The contract plans will be offered to the Consultant Manager for retention if desired.

	Initial	Date
• Plans purged:	_____	_____

The Consultant Manager shall be responsible for retention (scanning) (or obtaining an electronic copy as applicable) and electronic storage of project records. Completed records shall be stored in the project directory using portable document format (pdf).

	Initial	Date
• Project Binder:	_____	_____
• Administrative File:	_____	_____
• Shop Drawings (Prestressed Concrete		
• Girders, Piling; Bearings):	_____	_____

The Consultant Manager shall be responsible for scanning and electronic storage of the final check prints after receipt of the project completion letter. Final check prints shall be stored in pdf.

	Initial	Date
• Check prints scanned and stored:	_____	_____

The QA Administrator shall be responsible for retention (scanning) and electronic (pdf) storage of project records for structural steel fabrication items.

THIS PAGE INTENTIONALLY LEFT BLANK

END OF DOCUMENT