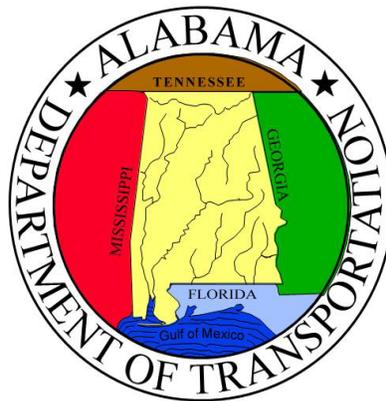


Bridge Plan Development Quality Control and Quality Assurance Plan and Checklist



ALDOT Bridge Bureau

March 2024



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Revisions since January 2021 Edition (revised March 2021)

Revisions to this document will be highlighted throughout.

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END OF DOCUMENT



ALDOT Bridge Plan Development QC/QA Plan and Checklist

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.



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1.2 APPROVAL

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

 3/11/2024

William T. Colquett, PE
State Bridge Engineer

Date

 4/4/24

Edward N. Austin, PE
Chief Engineer

Date



Mark Bartlett, PE
Division Administrator
FHWA Alabama Division

04/15/2024

Date



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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.



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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), **Civil Engineer, Licensed (CEL)**, 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



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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

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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 [Specialty] Engineer of Record (EOR):** A Professional Engineering firm wholly or in part specializing in Bridge Engineering, contracted by ALDOT to prepare designs and plans for contract Bridge Projects under the supervision of an Alabama Registered Professional Engineer. Specialty is identified as either Hydraulics, Bridge, or Rating.

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), **Civil Engineer, Licensed (CEL), 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 (**EOR**) 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

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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 **4.8 and 4.10**.

Consultant Responsibilities: ALDOT's review of Consultant's **designs, reports, and/or 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 Consultant 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

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other pertinent documents/correspondence as well as the QC/QA documentation. 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 is electronically stored** in accordance with these procedures and in accordance with Step **4.11** of the QC/QA plan and checklist.



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SECTION 3. IN-HOUSE PLANS CHECKLISTS

3.1 PROJECT INFORMATION

Project No.: _____
Description: _____

County(s): _____
BIN(s): _____
CPMS CN #: _____
CPMS PE #: _____

Bridge Hydraulics Engineer or
Consultant Hydraulics EOR: _____

Design Section Super. (EOR): _____
Designer(s): _____

QC Detailing Checker or
Design Section Squad Leader: _____
Senior Detailer(s): _____

Detailer(s): _____

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



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3.2 HYDRAULIC REVIEW AND RECOMMENDATION (WATERWAY CROSSINGS)

The **Hydraulic review and recommendation** shall be completed at the GDCP Step 19.0 roadway plan submittal. This shall be prepared by the Bridge Hydraulics Engineer **or a Consultant Hydraulics EOR** with concurrence by the State Bridge Engineer or Assistant State Bridge Engineer.

- | | Initial | Date |
|--|---------|-------|
| <ul style="list-style-type: none"> • Bridge Hydraulics Engineer or Consultant Hydraulics EOR
Recommendation: | _____ | _____ |
| <ul style="list-style-type: none"> • State Bridge Engineer
or Asst. State Bridge Engineer
Concurrence: | _____ | _____ |



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3.3 TYPE, SIZE AND LOCATION (TS&L)

The Bridge Type, Size, and Location (TS&L) (otherwise known as the "Layout") drawing(s) shall be prepared at the GDCP Step 60 roadway plan submittal. The completed TS&L shall be reviewed and approved by the Section Supervisor, the Bridge Hydraulics Engineer (waterway crossings), and the **State Bridge Engineer or** Assistant State Bridge Engineer.

- | | Initial | Date |
|---|---------|-------|
| • Section Supervisor Approval: | _____ | _____ |
| • Bridge Hydraulics Engineer Approval: | _____ | _____ |
| • State Bridge Engineer
or Asst. State Bridge Engineer Approval: | _____ | _____ |

For unusual/complex bridges on the National Highway System (NHS), the TS&L shall be submitted to FHWA for review. 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_map_s/alabama/index.cfm

- | | Initial | Date |
|---------------------------------|--|-------|
| • FHWA Review Submitted: | _____ | _____ |
| | <input type="checkbox"/> Check if Not Applicable | |

For bridges over or adjacent to railroad right-of-way, a preliminary layout shall be transmitted to the **Project Lead for their use in railroad coordination.**

- | | Initial | Date |
|-------------------------------|--|-------|
| • RR Layout Submitted: | _____ | _____ |
| | <input type="checkbox"/> 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) and **Project Lead to provide** information required for the USCG permitting process.

- | | Initial | Date |
|--|--|-------|
| • Bridge Permit Application Submitted: | _____ | _____ |
| • Coast Guard Approval Received: | _____ | _____ |
| | <input type="checkbox"/> Check if Not Applicable | |



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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 **and included in the Project Binder.**

	<u>Initial</u>	<u>Date Started</u>	<u>Date Completed</u>
• 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 and **QC/QA personnel.** Design sketches should convey adequate information for the Detailer to prepare final contract drawings **and for QC/QA personnel to perform checks/reviews.** 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.**

	<u>Initial</u>	<u>Date Started</u>	<u>Date Completed</u>
• Superstructure Designs & Sketches:	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
• EOR Check:	_____	_____	_____
• Substructure Designs & Sketches:	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
• EOR Check:	_____	_____	_____
• Asst. State Bridge Engineer Check:	_____	_____	_____



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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. **The computed calculations and the verifying calculations shall be initialed and dated and included in the Project Binder.**

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

3.8 DESIGN SECTION PLAN CHECK (QUALITY CONTROL)

Each individual plan sheet shall be checked by the **QC Detailing Checker or 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 Design Section Supervisor (EOR).

	Initial	Date Started	Date Completed
• Squad Leader Check:	_____	_____	_____
Corrections Made	_____	_____	_____
By Detailer:	_____	_____	_____
Corrections Verified	_____	_____	_____
By Squad Leader:	_____	_____	_____
	Initial	Date Started	Date Completed
• Designer(s) Check:	_____	_____	_____
Corrections Made	_____	_____	_____
By Detailer:	_____	_____	_____
Corrections Verified	_____	_____	_____
By Designer(s):	_____	_____	_____



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

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 **Check Run and Verifying Run**
- _____ Design Calculations
- _____ Design Sketches
- _____ Foundation Report and Addendums
- _____ Bridge Plans Detailing Checklist
- _____ Quantity Calculations **and Verifying Calculations**
- _____ Project Correspondence and other related documents

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 bridge special project drawings and E-sheets if applicable. Boring sheets not required.)



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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
• QA Review Submittal Received:	_____	_____	N/A
• QA Review Submittal Accepted:	_____	_____	N/A
• Geometric Review:	_____	_____	_____
<input type="checkbox"/> No Comments	<input type="checkbox"/> Corrections Required		
<input type="checkbox"/> Return FULL / HALF Size Plans			
<input type="checkbox"/> Corrections Verified By EOR:	_____	_____	_____
• Geometric Backcheck:	_____	_____	_____
• Plan Review:	_____	_____	_____
<input type="checkbox"/> No Comments	<input type="checkbox"/> Corrections Required		
<input type="checkbox"/> Return FULL / HALF Size Plans			
<input type="checkbox"/> Corrections Verified By EOR:	_____	_____	_____
• Plan Review Backcheck:	_____	_____	_____
<input type="checkbox"/> No Comments	<input type="checkbox"/> Corrections Required		
<input type="checkbox"/> Return FULL / HALF Size Plans			
<input type="checkbox"/> Corrections Verified By EOR:	_____	_____	_____
• Additional Backcheck:	_____	_____	_____
<input type="checkbox"/> No Comments	<input type="checkbox"/> Corrections Required		
<input type="checkbox"/> Return FULL / HALF Size Plans			
<input type="checkbox"/> Corrections Verified By EOR:	_____	_____	_____
• Additional Backcheck:	_____	_____	_____
<input type="checkbox"/> No Comments	<input type="checkbox"/> Corrections Required		
<input type="checkbox"/> Return FULL / HALF Size Plans			
<input type="checkbox"/> Corrections Verified By EOR:	_____	_____	_____

Check prints are to be scanned and stored in project directory upon receipt.

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.



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3.11 ASSISTANT BRIDGE ENGINEER REVIEW (QUALITY ASSURANCE)

All in-house designed plans shall be reviewed for conformance with the QC/QA Plan. The Project 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 by EOR : | _____ | _____ |
| • 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 Project 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: | _____ | _____ | _____ |



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3.14 STATE BRIDGE ENGINEER 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 Bridge Bureau Structural Design Manual**. 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 Date
 Started Completed

- Rating Engineer: _____

Check if rated as “Passing”



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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.

Revision #	Date	Plan/Bridge Sheet #	Revised By	EOR Review Initial/date	QA Review Initial/date
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

If plan revisions are made after the Letting date, and review is complete, two 11" x 17" copies of revised sheets along with the revision letter shall be provided to the QA Administrator.

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.



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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: | _____ | _____ |
| • Check prints: | _____ | _____ |
| • Administrative File: | _____ | _____ |
| • Shop Drawings (Prestressed Concrete Girders, Piling; Bearings): | _____ | _____ |

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

- | | Initial | Date |
|--|---------|-------|
| • Structural steel shop drawing check prints scanned and stored: | _____ | _____ |



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SECTION 4. CONSULTANT PLANS CHECKLISTS

4.1 PROJECT INFORMATION

Project No.: _____
Description: _____

County(s): _____
BIN(s): _____
CPMS CN #: _____
CPMS PE #: _____

Consultant Bridge EOR: _____
Contract ID: _____

Bridge Hydraulics Engineer or
Consultant Hydraulics EOR: _____

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

Consultant Rating EOR or
Rating Engineer: _____
Asst. St. Bridge Engineer, QA: _____
Asst. St. Bridge Engineer, Des.: _____
State Bridge Engineer: _____



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4.2 HYDRAULIC REVIEW AND RECOMMENDATION (WATERWAY CROSSINGS)

The Hydraulic review and recommendation shall be completed at the GDCP Step 19.0 roadway plan submittal. This may be prepared by the Bridge Hydraulics Engineer or a Consultant Hydraulics EOR with concurrence by the State Bridge Engineer or Assistant State Bridge Engineer.

- | | Initial | Date |
|---|---------|-------|
| <ul style="list-style-type: none">Bridge Hydraulics Engineer or Consultant Hydraulics EOR Recommendation: | _____ | _____ |
| <ul style="list-style-type: none">State Bridge Engineer or Asst. State Bridge Engineer Concurrence: | _____ | _____ |



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4.3 30% REVIEW (TS&L / PIH)

The submittal shall include the following information.

- _____ Bridge Hydraulic Report
- _____ 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

	Initials	Date Started	Date Completed
• TS&L Received:	_____	_____	N/A
• TS&L Review:	_____	_____	_____
<input type="checkbox"/> No Comments			
<input type="checkbox"/> Return HALF Size Plans			N/A
• TS&L Backcheck Review:	_____	_____	_____
<input type="checkbox"/> No Comments			
<input type="checkbox"/> Return HALF Size Plans			N/A
• Additional Backcheck Review:	_____	_____	_____
<input type="checkbox"/> No Comments			
<input type="checkbox"/> Return HALF Size Plans			N/A

COMMENTS:



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4.4 DISTRIBUTION OF APPROVED 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 at the GDCP Step 60 roadway plan submittal. The completed Layout shall be reviewed and approved by the Consultant Manager, the Bridge Hydraulics Engineer or Consultant Hydraulics EOR (if over a waterway), and the State Bridge Engineer or Assistant State Bridge Engineer.

- | | | |
|--|---------|-------|
| | Initial | Date |
| • Consultant Manager Approval: | _____ | _____ |
| • Bridge Hydraulics Engineer or
Consultant Hydraulics EOR Approval: | _____ | _____ |
| • State Bridge Engineer
or Asst. State Bridge Engineer 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. 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_map_s/alabama/index.cfm

- | | | |
|--------------------------|--|-------|
| | Initial | Date |
| • FHWA Review Submitted: | _____ | _____ |
| | <input type="checkbox"/> Check if Not Applicable | |

For bridges over or adjacent to railroad right-of-way, the Consultant Management Section shall transmit to the Project Lead the preliminary layout (prepared by the Consultant) for their use in railroad coordination.

- | | | |
|------------------------|--|-------|
| | Initial | Date |
| • RR Layout Submitted: | _____ | _____ |
| | <input type="checkbox"/> 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) and Project Lead to provide information required for the USCG permitting process.

- | | | |
|--|--|-------|
| | Initial | Date |
| • Bridge Permit Application Submitted: | _____ | _____ |
| • Coast Guard Approval Received: | _____ | _____ |
| | <input type="checkbox"/> Check if Not Applicable | |



ALDOT Bridge Plan Development QC/QA Plan and Checklist

4.5 60% REVIEW (PS&E)

The submittal shall include the following information.

- _____ 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)

	Initials	Date Started	Date Completed
• Plans Received:	_____	_____	N/A
• Plan Review:	_____	_____	_____
<input type="checkbox"/> No Comments			
<input type="checkbox"/> Return HALF Size Plans			N/A
• Plan Backcheck Review:	_____	_____	_____
<input type="checkbox"/> No Comments			
<input type="checkbox"/> Return HALF Size Plans			N/A
• Additional Backcheck Review:	_____	_____	_____
<input type="checkbox"/> No Comments			
<input type="checkbox"/> Return HALF Size Plans			N/A

COMMENTS:



ALDOT Bridge Plan Development QC/QA Plan and Checklist

4.6 95% REVIEW (CNR)

The submittal shall include the following information.

- _____ 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)

	Initials	Date Started	Date Completed
• Plans Received:	_____	_____	N/A
• Plan Review:	_____	_____	_____
<input type="checkbox"/> No Comments			
<input type="checkbox"/> Return HALF Size Plans			N/A
• Plan Backcheck Review:	_____	_____	_____
<input type="checkbox"/> No Comments			
<input type="checkbox"/> Return HALF Size Plans			N/A
• Additional Backcheck Review:	_____	_____	_____
<input type="checkbox"/> No Comments			
<input type="checkbox"/> Return HALF Size Plans			N/A

COMMENTS:



ALDOT Bridge Plan Development QC/QA Plan and Checklist

4.7 99% REVIEW (OE / FINAL PLANS)

The submittal shall include the following information.

- _____ Copy of Consultant's QC/QA Plan (Revised if needed)
- _____ Electronic copy of project data
- _____ One Half Size Sets of Contract Bridge Plans

All Consultant designed plans shall be reviewed for conformance with the QC/QA Plan by the Assistant State Bridge Engineer, Quality Assurance.

- | | Initials | Date Started | Date Completed |
|--------------------------------------|----------|--------------|----------------|
| • Plans Received: | _____ | _____ | N/A |
| • Asst. St. Bridge Engr., QA Review: | _____ | _____ | _____ |
- No Comments

 Corrections Required

COMMENTS:

- | | Initials | Date Started | Date Completed |
|--|----------|--------------|----------------|
| • Request and process "ORIGINAL CONTRACT DRAWINGS" for submittal to Office Engineer: | _____ | _____ | _____ |

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: | _____ | _____ |



ALDOT Bridge Plan Development QC/QA Plan and Checklist

4.8 BRIDGE RATING

The superstructure shall be analytically load rated in accordance with the **ALDOT Bridge Bureau Structural Design Manual**. 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.

- Rating Engineer: _____
- | Initial | Date
Started | Date
Completed |
|---------|-----------------|-------------------|
| | | |
- Check if rated by Consultant
 - Check if rated as "Passing"

If rated by Consultant Rating EOR:

- | Initial | Date
Received | Date
Accepted |
|---------|------------------|------------------|
| | | |
- Consultant Review Engineer: _____



ALDOT Bridge Plan Development QC/QA Plan and Checklist

4.10 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 the Consultant Manager and documented as shown below.

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

If checked in-house:

	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.



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4.11 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: | _____ | _____ |
| • Check Prints | _____ | _____ |
| • Administrative File: | _____ | _____ |
| • Shop Drawings (Prestressed Concrete | | |
| • Girders, Piling; Bearings): | _____ | _____ |

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

- | | Initial | Date |
|---|---------|-------|
| • Structural steel shop drawing
check prints scanned and stored: | _____ | _____ |



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