

# ENGINEERING DESIGN QUALITY CONTROL PLAN

September 2011

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# *Columbia River Crossing*

## **Quality Control Plan**

**Rev. 0**

*August 2011*

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# ACRONYMS

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ADA	Americans with Disabilities Act
AFR	Audit Finding Report
CRC	Columbia River Crossing
DB	Design-Build
DBB	Design-Bid-Build
FTA	Federal Transit Administration
GC/CM	General Construction/Construction Manager
IDR	Interdisciplinary Review
ODOT	Oregon Department of Transportation
PMOC	Project Management Oversight Consultant
PMP	Project Management Plan
RFC	Release for Construction
RFP	Request for Proposal
RFQ	Request for Qualifications
SOQ	Statement of Qualifications
QA	Quality Assurance
QC	Quality Control
QCP	Quality Control Plan
QMP	Quality Management Plan
WSDOT	Washington State Department of Transportation

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# 1. Introduction

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## 1.1 Purpose and Need

The purpose of the Quality Control Plan (QCP) is to define the techniques and procedures that the design team will use to implement an effective, documented control of the design process for the Engineering Design phase of the Columbia River Crossing (CRC) project (the Project). Quality procedures with respect to construction activities by the Design-Build (DB), Design-Bid-Build (DBB), and General Construction/Construction Manager (GC/CM) delivery methods are defined in depth in the Construction Contractors' Quality Management Plans (QMPs) and will be referred to herein as the Construction Contractor. As such, the QCP complies with applicable provisions of the Federal Transit Administration's (FTA's) *Quality Assurance and Quality Control Guidelines*. The QMP of the Construction Contractor is also required to follow the FTA's *Quality Assurance and Quality Control Guidelines*. Copies of the QCP shall be made available to all CRC staff, Washington State Department of Transportation (WSDOT), Oregon Department of Transportation (ODOT), TriMet, and C-Tran. Upon completion of the Construction Contractor's QMP, copies will also be made available to the previously mentioned parties.

The QCP describes the organization of the Project team and the quality responsibilities of each of the team's participants. Quality standards identified within the QCP will provide the basis for quality of the design and will further guide the activities of the design consultant throughout the Project. Design control and document control procedures are outlined for the day-to-day performance of the design team, as well as for the review and response activities associated with formal milestone submittals. These procedures will result in achieving consistent quality control during the design execution process. Verification, design review, and auditing processes are also described, and these will result in achieving quality assurance. This QCP outlines the intended staff training related to the QCP, and the appendices further reference a number of forms, checklists, and tools available to enable the team to reach the objectives of this plan.

This QCP is a living document and may be modified to increase the efficiency or effectiveness of the design quality program at any time by the QA/QC Manager, with concurrence from the Director.

The team will design the Project with the highest regard for quality. To achieve this, a team effort encompassing all persons and organizations participating in the design process is required. For design team members, quality will guide any approach to the daily work tasks of all personnel, from upper-level management to first-tier designers and technicians.

The quality management goals for this Project will be to:

- A. Complete tasks correctly the first time;
- B. Find and rectify the exceptions to this first goal through the checking and review process; and

### C. Have no surprises.

The documentation of procedures in this QCP is the team's first step toward meeting these goals and producing a quality design. Training, implementation, review, and improvement of these procedures will be an ongoing process throughout the development of the engineering documents for the Project.

## 1.2 Definitions and Abbreviations

**Audit** – A documented activity performed in accordance with written procedures or checklists to verify, by examination and evaluation of objective evidence, that applicable elements of the Quality Assurance (QA)/Quality Control (QC) program(s) have been developed, documented, and effectively implemented in accordance with specified requirements.

**Backcheck** – Procedure by which an individual other than the drafter or editor (individual who physically made the changes to a document) verifies and provides the proper documentation that the marked changes have been accomplished.

**Checker/QC Reviewer** – A Design team member who is not responsible for creation of the document (calculation, drawing, specification, or report), who performs the QC activities for specific work products and who has the technical skills and education sufficient to thoroughly understand the material being checked. The Checker (QC Reviewer) shall be a licensed Professional Engineer in the State of Washington, State of Oregon, or the equivalent. The Checker signs the first line in the required Check Print Stamp for formal QC reviews.

**Check Print** – Original document (calculation, drawing, specification, or report) that includes all evidence of the detailed independent check as required by this QCP.

**Confirmed by** – Part of the required Check Print Stamp procedure by which the Designer or originator of the document (calculation, drawing, specification, or report) reviews and accepts, rejects, or modifies the marked changes to the document made by the QC Reviewer.

**Corrected by** – On the Recommended Check Print Stamp for in-progress prints, the Editor incorporates redlines into the electronic design file and initials and dates the second row titled "Corrected by," indicating that the review edits and comments have been completed or addressed.

**Designer** – Design team member who is responsible for design of the particular element under consideration. The Designer is the originator of the document (calculation, drawing, specification, or report) and his/her initials will be on the final signed and sealed drawing.

**Design Review** – A quality assurance process by which senior technical professionals review a set of documents for consistency, clarity, coordination, and technical details. This is not a detailed check of the documents.

**Editor (Edited by)** – A Design team member, usually the originator of a document, who incorporates redline comments and changes from a QC review into the document. This person signs the third line in the required Check Print Stamp during formal QC reviews.

**Originated by** – The Designer who performs an informal in-progress review and provides redlines, then signs and dates this signature line on the recommended in-progress Check Print Stamp.

**Quality** – The features and characteristics of an item that determine its ability to satisfy given needs.

**Quality Assurance (QA)** – All those planned and systematic actions necessary to provide adequate confidence that an item is in conformance with established requirements and will satisfy given needs. The activity of providing the evidence needed to establish confidence that quality functions are being performed adequately. QA is a management tool.

**Quality Control (QC)** – Those functions that provide a means to control and measure characteristics as related to established design requirements. The techniques and activities that sustain quality of an item to satisfy given needs; also the use of such techniques and activities. QC is a production tool.

**Quality Control (QC) Reviewer/Checker** – Design team member who is not responsible for creation of the document (calculation, drawing, specification, or report), but is qualified for checking of the document as required by this QCP. The QC Reviewer shall be a licensed Professional Engineer in the State of Washington, State of Oregon, or the equivalent. For purposes of this definition, “equivalent” shall mean equivalent registration if not an engineering discipline, a senior professional who has the equivalent qualifications (education and/or experience) in the specific discipline, or a Professional Engineer in another state. The QC Reviewer’s initials will be handwritten on the final signed and sealed drawing.

**Quality Manager (QM)** – Person responsible for coordinating and monitoring QC activities for deliverables required for their particular professional discipline.

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## **2. Management and Quality Responsibilities**

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The following section describes the principal management and quality responsibilities of the individual staff on the design team.

**Director** – Is responsible for coordination and communication of all policy and technical issues with partnering local jurisdictions. The Director also provides effective communications to the Executive Management Team.

**Construction Contractor** – Responsible for the construction of the project and the quality of the components thereof.

**Consultant Project Manager** – Is responsible for the management of consultant design activities and is ultimately responsible for the quality of design for all consultant engineering design elements of the Project.

**QA/QC Manager** – Is responsible for training the Consultant Design Quality Managers and for development, implementation, and oversight of the QCP; also serves as the liaison between the design team and all external quality representatives including FTA's Project Management Oversight Consultant (PMOC). The QA/QC Manager will report directly to the Director. He/she will perform audits on the Project and provide quality assurance that the Project deliverables for each discipline meet the quality objectives of this QCP for the Project.

**Consultant Deputy Project Manager** – Is responsible for assisting the Consultant Project Manager with management of consultant design activities.

**Consultant Design Manager** – Works for the Consultant Project Manager and the Consultant Deputy Project Manager, and leads the design and production of documents for his/her discipline. Consultant Design Managers are responsible for second-tier quality control of the design and drafted products prepared by the Designers. As the immediate supervisors of the production staff for each discipline, Consultant Design Managers shall:

- Exercise day-to-day control of work quality through clear directions and periodic, conscientious review of in-progress materials.
- Support the QA/QC Manager in ensuring the quality of the contract deliverables at each milestone submittal.
- Maintain coordination between the various disciplines and subconsultants involved in individual design tasks.

**Consultant Design Task Lead** – Reports to the Consultant Design Manager and assists with the design and production of documents for his/her discipline.

**Consultant Design Quality Manager** – Works directly for the Consultant Design Manager and Consultant Design Task Lead (where applicable) and leads the quality control efforts for his/her

discipline. Consultant Design Quality Managers are responsible for assisting the Consultant Design Manager and Consultant Design Task Lead with second-tier quality control of the design and drafted products prepared by the Designers and Technicians. Consultant Design Quality Managers shall:

- Exercise day-to-day control of work quality through clear directions and periodic, conscientious review of in-progress material.
- Perform or assign qualified technical professionals to perform the detailed check of all documents as required by this QCP.
- Ensure the quality of the design project through integrated reviews of the collective tasks under their management.
- Support the QA/QC Manager in ensuring the quality of the contract deliverables at each milestone submittal.
- Train assigned Project team members in the QC process, provide orientation and guidance, and explain the QCP to project team members.
- Ensure that appropriate QC professionals review all plan sheets for conformance with appropriate design standards and guidelines.
- Define which particular engineering tasks are to be checked.
- Ensure that the designs are reviewed and checked for completeness and accuracy.
- Maintain coordination between the various disciplines and subconsultants involved in individual design tasks.
- Complete the QC Tracking and Certification Form for each submittal and use the form to manage the progress of the QC procedures. See Appendix A.
- Sign and date the QC Tracking and Certification Form to document completion of the QC procedures for a given submittal package. See Appendix A.
- Stop and subsequently coordinate corrections for any and all work that does not meet the standards, specifications, and/or criteria established for the Project.
- Work with the Consultant Design Manager to refine the work processes to meet quality requirements.

***Quality Control (QC) Reviewer*** – Works directly for the Consultant Design Quality Manager and reviews the design and production of documents for his/her area of expertise. This person is a design team member who is not responsible for creation of the document (calculation, drawing, specification, or report) and has the technical skills and education sufficient to thoroughly understand the material being checked. The QC Reviewer shall be a licensed Professional Engineer in the State of Washington, State of Oregon, or the equivalent (see definition, Section 1.2). The responsibilities of the QC Reviewers include the following:

- Perform the appropriate level of review and checking of Project design documents, including, but not limited to: calculations, reports, figures, exhibits, plans, and estimates.
- Perform a thorough check of design documents in accordance with this QCP.
- Confirm that design documents reflect the appropriate level of completion indicated by using the appropriate design review checklists. Completed checklists are to be filed for future reference and audit. See Appendix B.
- Evaluate the methodology for consistency with engineering practice, conformance with the contract and project criteria, and overall completeness.
- Review all deliverables for conformance with appropriate design standards and guidelines.
- Track QC completion using the QC Tracking and Certification Form as delegated by the Consultant Design Quality Manager. See Appendix A.

***Project Team Members*** – Each Project team member, regardless of discipline, is responsible for first-tier quality control of his or her own work. Team members shall implement methods to routinely “check” their own work, especially when significant subsequent design will be based on their work. Team members shall exercise a standard of practice that seeks to:

- Complete their assigned work in accordance with project criteria, standards, the contract, and this QCP.
- Generate work that minimizes errors and is conscious of all components of the Project to minimize errors and omissions.
- Confirm that work products are consistent with scope and applicable design criteria.

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## 3. Basis of Design

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Generally speaking, design standards for each agency will be applied within their own respective jurisdictions. The 2008 American Association of State Highway and Transportation Officials (AASHTO) Green Book provides the minimum design standards for most components applied to the roadway elements of the Project. Should CRC not meet the minimum standards, a Design Deviation/Exception will document why the standard could not be met and any mitigation measures taken.

Staff shall reference Chapter 12, LRT Design, and Chapter 13, Highway Design, of the PMP for the expected use of the baseline standards to be used for the design and preparation of the plans for this Project. It is each Consultant Design Manager's and/or Consultant Design Task Lead's responsibility to ensure that his or her staff have these standards in their possession and are knowledgeable in standards appropriate to their roles on the Project.

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## 4. Design Review

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The submittal levels, deliverables required, and schedules for delivery are defined in the Project scope of work. Unless noted otherwise in the scope, QC procedures will begin no later than five business days before the submittal date. The following defines the major milestone submittals for the Engineering Design Tasks:

15% Design (Transit only)	60% Design (All disciplines)
25% Design (Transit only)	90% Design (All disciplines)
30% Design (All disciplines)	100% Design (All disciplines)

Quality is not the sole responsibility of any one person on the Project team. Quality control begins with each Project team member completing an initial review of his/her work. Throughout his/her work, a team member's initial review is critical to ensure that significant changes are not required later, after further examination by the QC Reviewer. Upon reaching an appropriate level of completion and prior to each milestone submittal, the QC Reviewer assigned by the Consultant Design Quality Manager for the particular task or design document will perform the QC review. QC reviews, including Interdisciplinary Reviews (IDRs), are performed by qualified individuals and are within the reviewer's area of professional expertise.

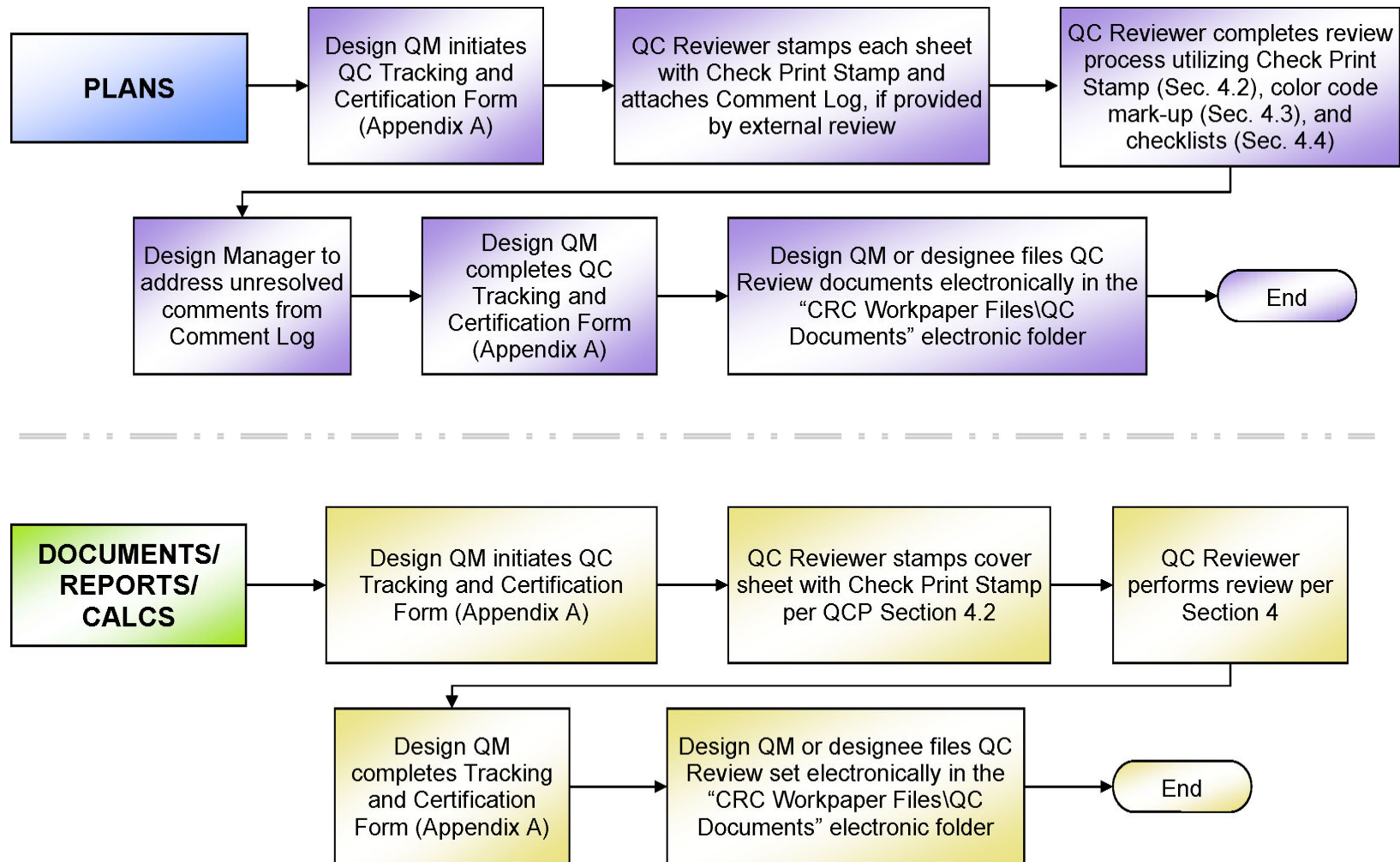
The objective of the QC review is to improve the quality of the product before it is distributed externally to a client or reviewing Agency; therefore, the process described here is intended to be completed before making any submittal outside of the Project office. The design review process and procedures that are a part thereof are intended to define the systematic requirements that ensure that the day-to-day performance and milestone submittal review process of the design team meet the quality standards for the Project and the normal standards of practice of the various technical disciplines contributing to the design of the Project. Figure 4-1 represents the processes the team shall follow to ensure that quality procedures are performed properly.

Design review procedures for documents produced for Design-Build (DB) delivery should be included in the Construction Contractor's Quality Management Plan (QMP). CRC staff is responsible to audit the quality review of all engineering documents prepared by the Design-Builder, including compliance to the project design standards and technical requirements. The CRC QA/QC Manager or Delivery Manager is responsible for providing oversight of the Construction Contractor's compliance to its QMP, as well as the CRC QAM and QCP.

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**Figure 4-1. Quality Review Process**



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## 4.1 QC Tracking and Certification

A QC Tracking and Certification Form, as provided in Appendix A, will be developed for each deliverable before the QC reviewing and checking begins. It will identify the submittal package, submittal date, the appropriate Consultant Design Quality Manager for the deliverable, and a list of all documents that are required to be included in the QC review. Each document in the list will require initials and a date for document completion and QC completion. Prior to submittal of the deliverable, the Consultant Design Quality Manager will sign the QC Tracking and Certification Form to certify completion of the QC review.

The Consultant Design Quality Manager or designated representative shall file all of the completed QC documentation and final deliverable for each submittal according to the Project document control standards.

## 4.2 Review Stamps

During review, the Red-Green-Blue Color Code System defined in Section 4.3 shall be followed. A Check Print Stamp must be used for formal QC review of plan sheets and documents, placed on each plan sheet or on the cover or first page only of text documents or calculations, as shown in Figure 4-2. This stamp will help to ensure that the intended design is appropriately represented and that it has been reviewed. It should be used during the internal review for each key deliverable.

**Figure 4-2. Required Check Print Stamp (for QC review)**

<b>CHECK PRINT</b>	
<input type="checkbox"/> Drawing checked against calcs, and calc check confirmed	
Checker:	Date:
Confirmed by:	Date:
Edited by:	Date:
Backchecker:	Date:

The procedure for using this stamp will follow these steps:

**Step 1** – Provide documents to the QC Reviewer (Checker). The QC Reviewer should stamp each plan sheet or the first page only of text documents or calculations. Following the review/check, the QC Reviewer initials and dates within the first row, titled “Checker,” indicating that the review/check has taken place. As needed, the QC Reviewer should coordinate any changes with the Designer, engineer, or author. While performing the QC review, the QC Reviewer should use the color code system, as described in Section 4.3. This Red-Green-Blue Color Code System applies to plan sheets only; text documents can be a single, colored markup. These marked-up documents are referred to as “redlines.”

**Step 2** – The QC Reviewer then gives redlines to the Designer, engineer, or author for confirmation and response to the QC Reviewer comments and questions. Once the

Designer, engineer, or author has agreed to the comment or answered the question, or makes a note why it is not pertinent, that person initials and dates the second row titled “Confirmed by,” indicating that the review comments have been confirmed or discussed, as appropriate, with the QC Reviewer. Redlines are then given to the editor (or drafter) for changes to be made.

**Step 3** – Redline comments shall be highlighted in yellow by the editor when revisions are completed. The editor then provides initials and dates the stamp within the third row titled “Edited by,” indicating that the revisions have been made.

**Step 4** – The original QC Reviewer, or a suitable qualified and unbiased replacement, will receive the redlines and revised plan sheets, text documents, or calculations for verification that the revisions have been made. The QC Reviewer will confirm that his/her comments have been properly addressed by using a blue highlighter over the top of the yellow. The combined colors are green, and this highlighting shows that the redline revisions are complete. The QC Reviewer initials and dates the fourth row of the stamp titled “Backchecker,” indicating that the revisions have been made and his/her comments have been properly addressed. If some of the original review comments have not been addressed, they should be resolved and this process begins again.

For each submittal review, it is recommended that only one set of Check prints be circulated in order to minimize duplication or conflicting comments. However, when time constraints or distance considerations dictate, the Consultant Design Manager or Consultant Design Quality Manager may allow multiple copies to be distributed for concurrent reviews. The Consultant Design Manager or Consultant Design Task Lead is responsible for coordinating the resolution of comments in the event that multiple comments are made concerning the same issue.

**Figure 4-3. Recommended Check Print Stamp (for In-progress prints)**

CHECKPRINT		
	NAME	DATE
ORIGINATED BY:		
CORRECTED BY:		
REVIEWED BY:		

For In-progress prints, the stamp shown in Figure 4-3 is recommended for use in a similar manner as the “Check Print Stamp” shown in Figure 4-2. The difference between the stamps is that the “In-Progress Check Print Stamp” is blue and has three signature/date boxes. This stamp is intended to provide evidence of edits and backcheck on prints that are in progress. This is a design tool. The procedure for using this stamp will follow these steps:

**Step 1** – The Designer performs an informal in-progress review and design redlines. He/she then initials and dates the first signature line, “Originated by.” Then the Designer provides redlines to the Editor (usually the drafter).

**Step 2** – The Editor then incorporates redlines into the electronic design file and initials and dates the second row, titled “Corrected by,” indicating that the review edits and comments have been completed or addressed. The document is then ready for a backcheck and is provided to the Designer.

**Step 3** – The original Designer performs a backcheck and confirms that all suggestions, comments, and edits have been addressed by placing his or her initials and date on the third row titled “Reviewed by.”

### 4.3 Color Code Markup

All design documents requiring quality control shall be reviewed using a Red-Green-Blue Color Code System, which is defined below in Figure 4-4:

**Figure 4-4. Red-Green-Blue Color Code Summary**

Color	Who Uses it?	How?
RED	QC Reviewer	Identifies corrections needed
GREEN	QC Reviewer	Identifies items to delete by crossing out marking
BLUE (COMMENTS IN PENCIL OKAY)	QC Reviewer	Comments to Designer or drafter
HIGHLIGHT YELLOW	Editor	Indicates that comment has been addressed
HIGHLIGHT BLUE	Backchecker	Confirms that comment has been addressed

### 4.4 Checklists

QC Reviewers shall utilize checklists that have been tailored for use on the specific QC reviews identified. These checklists should be used during all reviews for a given deliverable and filed in appropriate QC folders for reference. Use of the checklists will help to ensure that items necessary for a given deliverable are included and that the accuracy of elements is verified. Many checklists have been developed; they can be found in Appendix B. The use and completion of checklists for each deliverable are mandatory. The checklists will become part of the permanent QC record and are subject to review during Project QA audits.

### 4.5 Calculation Review

Primary calculations supporting the design of the Project should eventually become bound documents and be included in the Project files. An orderly and concise calculation format should be used. The Designer’s name and date should be included on each page of calculations as well as the QC Reviewer’s name and the date the check was performed. This is in addition to the use of the review stamp.

The QC Reviewer is responsible for a detailed check of the original design calculations. The Designer shall provide the QC Reviewer with copies of the original design calculations to serve as “Check prints.” The QC Reviewer shall thoroughly check each calculation, including assumptions, reference data, formulas, mathematical accuracy, and appropriate use of computer software. The QC Reviewer should indicate items that are correct with appropriate marks, such as yellow highlighter or red check mark, and should mark any revisions in red. The QC Reviewer should use good judgment and avoid making unnecessary or inconsequential revisions.

Design elements that are not calculated, but that are derived from standard details or other resources from the Designer’s experience, should be noted with a reference to the source and filed with the calculations.

Printouts from computer design programs that are to be a permanent part of the design files should be included as a part of manual design calculations. At a minimum, computer printouts are to be checked by verifying the input data. It is acceptable to list the Project Title, Design Element, Designer (and date), and QC Reviewer (and date) on the first sheet of the computer printout only, although Sheet Number (x of xx) should be included on each page. A hard copy of output values used directly in the design should be printed entirely or summarized within the calculations. Typically, a hard copy of the entire input files should be included within the body of the calculations, accompanied by some indication of the software name and version for which the input is valid.

Sketches that illustrate or clarify design assumptions and the final configuration of designed elements should accompany the pertinent design calculations. The sketches should contain sufficient detail such that the QC Reviewer can use them in confirming that the information on the plans represents the actual design.

Engineering calculations shall be prepared by or under the direct supervision of a Professional Engineer registered to practice in the state where the project components are located. The level of design checking depends on the complexity of the project and is at the discretion of the Professional Engineer.

The QC Reviewer should meet with the Designer to discuss questions regarding the design approach, assumptions, and results. Both the Designer and QC Reviewer should agree on what corrective action will be taken, if needed. Original calculations should be revised to reflect the agreed-upon resolution, and the QC Reviewer then initials the original calculation sheets after confirming that the revisions have been completed correctly.

## **4.6 Interdisciplinary Review**

The Consultant Design Quality Managers are responsible for maintaining coordination between the various disciplines and off-site consultants involved in individual design tasks. This coordination shall occur throughout the Project in the form of communication between disciplines (highway, structure, river crossing, survey, and transit) during production as needed, as well as through Interdisciplinary Reviews (IDRs) of design. These IDRs will be performed as required for specified milestone submittals. The Consultant Design Manager will define for each submittal the disciplines that are required to be included in the IDR. The Consultant Design

Quality Manager for each specified discipline will distribute a review-ready set of prints to the other specified Consultant Design Quality Managers for an IDR. Attached to the front of each set will be the Interdisciplinary Review Tracking Form, as found in Appendix C, or the Review Comments Form, as provided in Appendix D, each of which is used to track the progress and document the completion of the review. If quick resolution of the IDR comments cannot be attained between the Consultant Design Quality Managers, they shall seek input and obtain resolution from the Consultant Design Manager.

The Consultant Design Quality Manager shall file the completed IDR documentation for each submittal according to the Project document control standards. See Section 5.

#### **4.7 Off-site Consultant Work Products**

Each off-site consultant shall be responsible for QC reviews of their own work product, using procedures and methodologies that are the same or similar to those required in this QCP, before the document is submitted to the Consultant Design Quality Manager. The Consultant Design Quality Manager shall provide each off-site consultant with the QCP and training in its use so that the consultants can gain a complete understanding of the quality procedures expected of the CRC team. The Consultant Design Quality Manager is responsible for verifying the completed review of each document before it is submitted to the client and reviewing agency.

It is also the Consultant Design Quality Manager's responsibility to confirm that the off-site consultant's work product is completed in accordance with the approved scope of work and in accordance with the applicable supplements to the contract.

The Consultant Design Quality Manager shall file the QC documentation and final deliverable for each off-site consultant's work product according to the Project document control standards. See Section 5.

#### **4.8 Comment Resolution and Tracking**

Comment markups on design documents by external reviewers and resolution by the Project design team shall be tracked using a Review Comments Form, as shown in Appendix D, and shall be created for each milestone submittal. All comments received will be compiled to allow for easy sorting of comments by each assigned responder or reviewer, or by resolution status. If the form with comments is not provided by the external reviewer, the design team will transfer all external comments from the reviewed document to the master spreadsheet to ensure that all comments are documented and tracked. Ownership of the master Review Comments Form will be with, or as designated by, the Consultant Design Manager.

Team members will pursue the resolution of the comments. Unresolved comments will be brought to the Consultant Design Manager's attention with recommendations for possible actions.

The Consultant Design Quality Manager shall file the completed master Review Comments Form and accompanying documents, with comment markups, according to the Project document control standards. See Section 5.

## **4.9 Constructability Review**

A constructability review shall be performed prior to submittal of the 90% and Final Construction documents. This review will be performed by staff with extensive experience working in the engineering and construction industry. The reviewer is expected to pay particularly close attention to the details of the design, checking that it can be built compliant with the appropriate jurisdictional standards as defined in the PMP. Review of the associated construction cost estimate will check for missing or incorrect pay items, confirm that unit costs reflect current market trends, and check that spreadsheet formulas tabulate properly.

## **4.10 Release for Construction (RFC) Documents**

After the Final Design submittal review is complete, the design team shall make the necessary revisions to the design documents to address the comments. The Design Manager will ensure all review comments have been addressed, resolved, and incorporated prior to developing the RFC Package. Detailed procedures for Design Oversight For Design-Build Delivery can be found in the PMP, Chapter 14, Section 14.3.5, Released For Construction (RFC) Review. Upon assembly of the RFC Package, the Design Manager must submit the package to the QA/QC Manager for an audit, with the QC Tracking and Certification Form (Appendix A) attached to the front cover. When the audit is complete and the form has been approved by the QA/QC Manager, the package will be returned to the Design Manager to submit to Document Control. Document Control will then log, file, and distribute in accordance with the Document Control procedure found in Section 3.7 of the PMP.

## **4.11 Design Changes During Construction**

Design changes that occur after RFC acceptance should have a notification of impending design change that will be distributed in accordance with Section 14.3.5.4, Design Revisions Following Issuance of RFC Documents, of the PMP. The Construction Contractor will not construct any items affected by the identified changes until after the updated plans have been through the RFC process. All plans, calculations, and special provisions with design changes must be in compliance with the quality review procedures found in Chapter 4 of this QCP. This includes revisions to Plans or Specifications that require a re-release of documents. Once the updated design has been audited, the Design Manager will follow the procedures in the PMP for distribution of RFC documents.



## 5. Document Control

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Standard document control procedures for all documents, drawings, specifications, reports, cost estimates, and calculations can be found within the CRC PMP. To create an auditable trail of quality reviews performed on submittal documents, a series of document control measures for quality control documents and reference materials shall be used to ensure the integrity and accessibility of hard copy and electronic document reviews.

### 5.1 File Code System and Central Filing System

For proper identification and tracking purposes, documents shall incorporate appropriate file codes in accordance with the Project's standard file code system for electronic and hard copy documents. Off-site consultants are required to follow this same system for Project quality control documents and reference documentation that they are involved with.

### 5.2 Drawing File System

Section 7 describes the documentation procedure to be used for any Check print drawings required in preparation of plans for the Project. Design team members are required to use this system, and drawing files shall be maintained in the offices of each design discipline involved in the Project. The folders for In-Progress prints and three-ring binders for Check prints shall be stored in central locations, as appropriate for design disciplines, and shall be accessible to Project personnel on the design team.

### 5.3 Submittal Documents

An electronic copy of all drawings and reports shall be made for each milestone submittal and stored at the Project office. The quality control review document for each milestone submittal shall be filed electronically in the "QC Documents" folder in the "Work Paper" electronic file directory or a hard copy shall be placed in the Project office as a record of the quality control review process. The documents shall be clearly labeled as to milestone submittal and dated. No other notations or markings shall be placed on these documents.

### 5.4 Calculations and Technical Reports

The original technical documents, such as specifications, calculations, and technical reports, either should be filed electronically or a hard copy should be placed in a three-ring binder, with the design elements clearly labeled. Check prints of technical documents shall be stored electronically in the "QC Documents" folder located in the "Work Paper" electronic file directory, and the document should be clearly identified. The binders shall be maintained and stored in central locations in each design discipline area, as appropriate, and shall be accessible to Project personnel on the design team.

## **5.5 Electronic File (Drawing) Control Procedure**

Design drawings will reside on the server at the Project office. All disciplines working on the drawings will be required to use the procedures established by the Project Controls Manager and as defined in the PMP for updating their drawings daily. In-progress drawings shall be maintained by the Design Manager in the “Work Paper” electronic file directory, in the file created for the deliverable. The final version for the deliverable shall be submitted to the Document Control department, which, in turn, will place the final drawing submittal in the official project file. The Design Quality Manager is responsible for placing the quality control documents for the drawings in the “QC Documents” folder of the “Work Paper” electronic file directory. Each Designer, Technician, or Consultant Design Task Lead (as appropriate) will coordinate with the Project Controls Manager for additions or deletions to the final drawing files.

## **5.6 Construction Documents**

All quality, inspection, and test activities, delays encountered, nonconforming work, and corrective action in regards to nonconforming work shall be documented. All this information shall be stored in the Construction Contractor’s database or hard copies should be kept in an organized manner and should be readily available to provide upon request of the CRC QA/QC Manager or Director. The Construction Quality Manager is responsible for the maintenance of the quality documents (inspections, logs, testing) and records. All documents must be controlled in accordance with the PMP, Quality Assurance Manual (QAM), QCP, and the Construction Contractor’s QMP.

## 6. Audits

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The QA/QC Manager is responsible for performing or coordinating others to perform monthly QA audits and random surveillance during the Preliminary Engineering phase and in coordination with deliverables for the Final Engineering phase, in accordance with the requirements of the QAM. Planned periodic audits and routine surveillance will ensure full implementation of the Project's QA program and the QC plans. Formal audit findings will be prepared and reviewed with the affected project participants and maintained in quality records for review by the FTA and others.

Surveillance will be performed on a random basis to check and verify conformance to the QA program. Surveillance is not considered a scheduled audit and is performed to review and assist the Project team in verifying conformance to the QAM. Deficiencies discovered during the surveillance activity will require corrective actions and acceptance by the QA/QC Manager or designated staff.

After each audit, the QA/QC Manager will prepare an Audit Finding Report (AFR) (see Appendix E) documenting successes and failures of the team efforts audited. Corrective actions will be noted and conveyed to the Consultant Design Manager. Audit documentation shall be used by the QA/QC Manager in conformance with the QAM. The management of the audited discipline or organization will be required to respond to the audit report within 15 working days after receipt of the narrative and the AFR. Circumstances may arise in which responses require additional time or further clarification. Such instances will be resolved directly with the auditor and appropriately documented. The QA/QC Manager will be advised of any extensions to the required response time. The QA/QC Manager is responsible for accepting or rejecting remedial action responses to audits. The reason for rejection will be stated in writing.

Audit records are to be maintained and included as part of the Project's quality records and made available for review. The QA/QC Manager will meet with the Director of Project Delivery monthly to report the findings of the monthly and random surveillance audits. Corrective actions communicated by the Director of Project Delivery will be conveyed to the design team and implemented as necessary.

The Construction Contractor must provide and maintain a Quality Management Plan (QMP) and assign a Quality Manager. Each Construction Contractor is responsible for quality inspections of its respective construction activities. The CRC QA/QC Manager will provide oversight of the Construction Contractor's quality process, and as such, the QA/QC Manager is responsible for conducting verification audits, maintaining audit paperwork, and reporting to CRC management regarding quality audits of the Construction Contractors. Further procedures and policies regarding quality audits for construction activities can be found in the Construction Contractor's QMP.

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## 7. Document Retention

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A set of plan In-Progress prints, constituting a “paper trail” for drawings, shall be maintained for the Project until the Project has been constructed and closed out. In-Progress and Check prints may be purged only upon approval by the Consultant Project Manager and only after any document retention requirements of the contract have been met.

Check prints for each milestone submittal shall be stored separately by discipline in a three-ring binder or electronically.

Construction quality documents and reports of construction activities must be maintained until approval from the QA/QC Manager. Each Construction Contractor is responsible for maintenance of its quality audits for its construction activities. All records must be kept in an organized manner on file, either electronically or by hard copy, and must be made available upon request. The QA/QC Manager is responsible for verification of quality activities during construction and can request records at any time during the length of the construction contract. Construction documents may not be purged until approved by the Consultant Project Manager and after contract retention requirements have been met.

### **Transit Only:**

Quality control prints are to be retained in individual file folders (one folder per plan sheet) and clearly labeled for ease in identification and retrieval. It is acceptable for a discipline to group several plan sheets in one folder (i.e., by bridge location or station) when this results in a more efficient work approach. If grouped, prints for each individual drawing must be stapled together in reverse chronological order, and the drawings must be in ascending order. Photocopies of the Check prints shall be stored in the individual file folders to maintain continuity of the drawing history.

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## 8. Design-Build, Design-Bid-Build, and GC/CM Solicitation and Bidding Documents

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The CRC Project will be bid in three delivery methods, Design-Build (DB), Design-Bid-Build (DBB), and the General Construction/Construction Manager (GC/CM) method. All potential bidders for the DB and GC/CM delivery methods are to submit their Statement of Qualifications (SOQ) as provided in the RFQ document.

The RFQs for each delivery method shall be thoroughly reviewed for quality and provide evidence that a formal review was performed. The evidence shall be use of a stamp (see Figure 4.2) or a separate electronic file of the quality review performed using “Track Changes” mode in MS Word. If the review is performed from a hard copy, the color code system should be used. Each review shall go through a four-step process:

**Step 1** – Provide completed RFQ documents to the QC Reviewer (Checker). The QC Reviewer should stamp the first page only. Following the review/check, the QC Reviewer initials and dates within the first row, titled “Checker,” indicating that the review/check has taken place.

**Step 2** – The QC Reviewer then gives the document to the author(s) for confirmation and response to the QC Reviewer comments and questions. As needed, the QC Reviewer should coordinate any changes with the author(s). While performing the QC review, the QC Reviewer should use the color code system, as described in Section 4.3. This Red-Green-Blue Color Code System applies to plan sheets only; text documents can be a single, colored markup.

Once the author has agreed to the comment or answered the question, or makes a note why it is not pertinent, that person initials and dates the second row titled “Confirmed by,” indicating that the review comments have been confirmed or discussed, as appropriate, with the QC Reviewer. Redlines are then given to the editor (or author) for changes to be made.

**Step 3** – Redline comments shall be highlighted in yellow by the editor when revisions are completed. The editor then provides initials and dates the stamp within the third row titled “Edited by,” indicating that the revisions have been made.

**Step 4** – The original QC Reviewer, or a suitable qualified and unbiased replacement, will receive the redlined copy for verification that the revisions have been made. The QC Reviewer will confirm that his/her comments have been properly addressed by using a blue highlighter over the top of the yellow. The combined colors are green, and this highlighting shows that the redline revisions are complete. The QC Reviewer initials and dates the fourth row of the stamp titled “Backchecker,” indicating that the revisions have been made and his/her comments have been properly addressed. If some of the original

review comments have not been addressed, they should be resolved and this process begins again.

It is recommended that a checklist be developed for the review process to ensure all of the RFQ requirements and components are included and clear to the potential bidder.

For submitted SOQs, each shall be thoroughly reviewed for content in accordance to the RFQ criteria requirements and receive a score based on the content review. Once the SOQ review and grading is complete, it should then be checked for any errors by a designated person “checker.” Once the quality review and back-check is complete, the document will then be verified to ensure a quality review was performed of the submittal by the QA/QC Manager or designated individual. A checklist should be used for review of these documents encompassing all of the criteria requirements of the RFQ and should also be provided as evidence that a quality review was performed. The checklist should be attached to the front of each SOQ identifying as such.

The same procedure above applies to the creation of the Request for Proposal (RFP) document and submittals. A checklist should be created and used incorporating each of the RFP criteria requirements provided. Each proposal submitted shall have the checklist attached to the front cover to provide evidence that a quality review has been completed.



## 9. Construction

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The Construction Contractors are responsible for the quality procedures for all construction related activities and components and will provide the procedures in their QMP. The contractor's QMP will be in accordance with the FTA's *Quality Assurance and Quality Control Guidelines* including the Fifteen (15) Elements as well as meet the requirements of the states, Oregon and Washington, and any local jurisdiction of this Project. All equipment, materials, documents, and design work products produced for the CRC Project should follow the procedures and requirements as provided within this QCP and the QAM.

## 10. Training

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Training in the effective implementation of the QCP is mandatory for staff performing major activities on the Project. The QA/QC Manager shall train the Consultant Design Quality Managers, and the Consultant Design Quality Managers shall train their QC Reviewers. Initial training of Consultant Design Quality Managers will include:

- Review of the Consultant Design Quality Manager responsibilities.
- Overview of the baseline standards according to which the Project is to be conducted.
- Review of the quality control procedures required as part of the responsibilities of Project personnel.
- Review of the document control procedures and documentation requirements of the Project.
- Overall discussion of the QCP.

The QA/QC Manager or his or her designee shall document all training conducted, including the date and an attendance list.

The Construction Contractors shall ensure their QA team is knowledgeable on the quality procedures established in their QMP and have received training for the mandatory quality procedures on this Project. The Construction Contractor shall identify and provide training for all of the Construction Contractor's personnel who perform activities affecting quality, and the Construction Contractor shall keep records that document the training and qualifications of these personnel.



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**Appendix A**  
**QC Tracking and Certification Form**

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## QC Tracking and Certification Form

Submittal Package: \_\_\_\_\_

Submittal Date: \_\_\_\_\_

Deliverable / Document	Planning		Tracking		Notes
	Designer	QC Reviewer	QC Start Date	Document Completion Date	

Design Quality Manager: \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_

Signature by the Design Quality Manager certifies that the Quality Control process has been completed for the deliverables and documents listed above.

QA/QC Manager: \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_

Signature by the QA/QC Manager certifies that the Quality Control performed for the deliverables and documents listed above is in accordance with the requirements of the QCP, and that the deliverables are ready for submittal.

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# **Appendix B**

## **Review Checklists**

- B.1 CAD Checklist
- B.2 Designer Checklist – Drainage
- B.3 Designer Checklist – Roadway
- B.4 Bridge Type, Size, & Location/Preliminary Plan Checklist
- B.5 Designer Checklist – Structures
- B.6 Designer Checklist – Highways
- B.7 Designer Checklist – Transit
- B.8 Design Survey Review Checklist
- B.9 Legal Descriptions Checklist
- B.10 Oregon Record of Survey Checklist

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## CAD Checklist

**Project Number:** \_\_\_\_\_ **Deliverable Name:** \_\_\_\_\_  
**Design Task Lead:** \_\_\_\_\_  
**QC Reviewer:** \_\_\_\_\_  
**Date:** \_\_\_\_\_

General	Y	N	N/A
1. Does the project use the right CAD platform as specified by the client or scope of work?			
2. Does the CAD file follow a client-specified format?			
3. Are all words spelled correctly?			
4. Is grammar correct?			
5. Is the correct sheet border used?			
6. Is the title block complete with all pertinent information?			
7. Is the project name correct?			
8. Is the project number correct?			
9. Are the appropriate levels or layers turned on for the appropriate plan sheet?			
10. Are the appropriate levels or layers turned off for the appropriate plan sheet?			
11. Is the current date shown on all sheets?			
12. Is the filename shown on all sheets?			
13. Have all abbreviations been defined by the client or specification or legend?			
14. Have all dimensions been checked and cross-checked?			
15. Are all of the appropriate plan sheets included in the review set?			
16. Are the match lines labeled correctly?			
17. Are all the match lines labeled consistently?			
18. Is there missing data between match lines?			
19. Is the appropriate PE stamp shown?			
20. Has all overlapping text been corrected?			

Plan Sheets	Y	N	NA
1. Is a legend shown if needed?			
2. Is the legend correct on all sheets?			
3. Is the north arrow shown on all sheets?			
4. Is the correct scale bar shown on all sheets?			
5. Is the alignment name shown on all sheets?			
6. Are the bearings shown on the alignment sheets?			
7. Are the curve data tables shown on the alignment sheets?			
8. Is there a distinction between existing and proposed?			
9. Are retaining walls labeled?			
10. Is the project name correct?			

## CAD Checklist (Continued)

<b>Profile Sheets</b>	<b>Y</b>	<b>N</b>	<b>NA</b>
1. Do the profile sheet match lines match the spacing of the plan sheets?			
2. Is there a distinction between existing and proposed?			
3. Are existing and proposed grades labeled?			
4. Is the vertical alignment data (PVI, PVC, PVT) shown for the entire length?			
5. Has all overlapping text been corrected?			
6. Does the elevation label match the vertical alignment?			
7. Does the elevation label shown on the right side of the sheet match the left side of the sheet?			
8. If appropriate, are existing utilities shown in the profile?			

## Designer Checklist - Drainage

**Deliverable Name:** \_\_\_\_\_  
**Deliverable Identification #:** \_\_\_\_\_  
**Design Task Lead:** \_\_\_\_\_  
**QC Reviewer:** \_\_\_\_\_  
**Date:** \_\_\_\_\_

General	Y	N	N/A
1. Are catch basins provided at every sag?			
2. Are catch basins provided at ramp ends and superelevation transitions?			
3. Are catch basins provided at low spots on median curbs and islands?			
4. Do the drainage structure numbers match consistently between the drainage report, structure notes, drainage plan sheets, drainage profile sheets, and design calculations?			
5. Is there a profile for every new pipe or pipe extension?			
6. Was the drainage design checked for any conflicts with existing utilities or proposed work items?			
7. Do the plans show all the appropriate details?			
8. Are culvert end types identified and located?			
9. Has the drainage design been verified to have no utility conflicts?			
10. Has the drainage design been verified to have no conflicts with existing or proposed illumination, retaining walls, or concrete barriers?			
11. Has the drainage design been coordinated with other project team members to avoid conflicts?			
12. Is riprap provided at culvert/pipe ends?			
13. Are utility crossings shown on the profiles?			
14. Have pipe slopes and lengths been checked?			
15. Are Type 1L CBs used for 18" pipes?			
16. Are Type 2 CBs used when depth to invert is greater than 5 feet?			
17. Have rim elevations been checked?			
18. Have offsets been checked?			
19. Is pipe type identified?			
20. Are shallow pipes identified with special material?			
21. Are structures and pipes to be adjusted, abandoned, and removed identified?			
22. Do ponds have overflow structures and spillways?			
23. Do flow control structure details match the hydraulic report?			
24. Do pond plans have cross-sections, fences, gates, access roads, water surface elevations, and topsoil if needed?			
25. Has design provided consideration for on-going maintenance and operational needs?			

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# Designer Checklist - Roadway

**Deliverable Name:** \_\_\_\_\_  
**Deliverable Identification #:** \_\_\_\_\_  
**Design Manager:** \_\_\_\_\_  
**QC Reviewer:** \_\_\_\_\_  
**Date:** \_\_\_\_\_

## CADD Files

	Y	N	NA
1. Are all the lane widths correct?			
2. Are all the sidewalk, curb, gutter, median, and landscape widths correct?			
3. Are all elements on the proper level or layer?			
4. Does the design match the goal of the project?			

## Horizontal Alignments

	Y	N	NA
1. Are all tangents "really" tangents to the curve?			
2. Have all the angles between the tangents and center of arc been calculated by hand, and are they equal to 90 degrees?			
3. Are the bearings shown and correct in all locations?			
4. Are the PCs, PTs, and PIs shown and labeled correctly?			
5. Is the information in the curve data correct?			
6. Do all curves meet the SSD guideline?			
7. Are all SSD calculations complete, and have they been verified by the QC Reviewer?			

## Vertical Alignments

	Y	N	NA
1. Do all grades have a minimum of 0.5%?			
2. Do any grades exceed the maximum grade as defined by the guidelines?			
3. Do all vertical curves meet the SSD?			
4. Do any of the SSD calculations need adjustment for grades?			
5. Have all the vertical curve lengths been rounded?			
6. Is there adequate cover over existing drainage pipes or culverts?			
7. Is there adequate cover over existing utilities?			

## Superelevations

1. Do the superelevations meet the appropriate guidelines?			
2. Are the superelevation calculations complete, and have they been verified by the QC Reviewer?			
3. Do the superelevation runoff lengths meet the minimum guidelines?			
4. Does the roll-over difference between the traveled way and shoulder meet the guidelines?			

## Designer Checklist - Roadway (continued)

<b>Cross-Sections</b>	<b>Y</b>	<b>N</b>	<b>NA</b>
1. Do the sideslopes meet the client criteria?			
2. Does the ditch slope match the foreslope, and provide the required ditch depth below the subgrade shoulder?			
3. Are the clear zone criteria met?			
4. Does the design accommodate guardrail flare rates and offsets to terminal ends?			
5. Is there sufficient distance behind roadside barriers for deflection or sliding?			
6. Are retaining walls shown in the sections?			
7. Are all catch slopes within ROW?			
8. If required, have easements been identified?			
9. Does pavement section and HMA type match geotech report?			
10. Have pavement sections been identified?			
11. Have all curb and barrier types been identified?			

<b>Intersections</b>	<b>Y</b>	<b>N</b>	<b>NA</b>
1. Has the design vehicle been documented and accepted by the client?			
2. Do the curb radii accommodate the design vehicle?			
3. Does the intersection angle meet the client's criteria?			
4. Do all legs of the intersection meet SSD criteria?			
5. Are the sight triangles drawn so they can be verified by the QC Reviewer?			
6. Have turning templates been verified for all movements?			
7. For opposing left-turn movements, is there a four-foot gap between vehicles?			
8. If provided, do the acceleration/deceleration lane lengths meet the client's criteria?			
9. Has top of curb data been provided?			
10. Have ADA ramps and landings been provided and referenced to standards?			

<b>Utilities</b>	<b>Y</b>	<b>N</b>	<b>NA</b>
1. Have utility conflicts been reviewed and determined?			
2. Has the design addressed restrictions with overhead utilities?			



## Designer Checklist - Roadway (continued)

<b>Retaining Walls</b>	<b>Y</b>	<b>N</b>	<b>NA</b>
1. Is an alignment created for each wall?			
2. Has the retaining wall alignment been tied to the roadway alignment?			
3. Is a section drawn for each wall to show the location of the alignment or work line?			
4. Have the quantities been adjusted to take into account structure excavation and backfill zones? Avoid double counting.			
5. Has each wall been identified as a standard wall or a special design wall?			
6. Is a gutter included at the top of fill wall?			
7. Has the side slope taken into account the width of the gutter?			
8. Does the wall design account for a barrier, if needed?			
9. Does the wall need fall protection?			
10. Have fall protection details been included in the plan set?			
11. Are fall protection callouts included in the typical sections?			
12. Has the wall design identified the outfall for the underdrain?			
13. At the wall ends, has the designer identified tie-in construction?			
14. Has the ground elevation at the base and/or top of wall been verified?			

<b>Channelization</b>	<b>Y</b>	<b>N</b>	<b>NA</b>
1. Do the left-turn storage lengths match the traffic analysis?			
2. Are the lane widths the correct dimension?			
3. Have you included or called out the channelization details?			
4. Are there call-outs for all the striping, pavement markings, stop bars, and crosswalks?			
5. Are delineators required and are they detailed?			
6. Have all the markings materials been identified?			
7. Are shoulders, shy distance, and bike lane widths identified?			
8. Have taper length calculations been provided?			

<b>Facility</b>	<b>Y</b>	<b>N</b>	<b>NA</b>
1. Has design provided consideration for on-going maintenance and operational needs.			

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## Bridge Type, Size, & Location/Preliminary Plan Checklist

The following checklist is a combination of ODOT TS&L and WSDOT Preliminary Plan requirements

Deliverable Name: \_\_\_\_\_

Deliverable Identification #: \_\_\_\_\_

Bridge: \_\_\_\_\_  
 Designed By: \_\_\_\_\_ Date: \_\_\_\_\_  
 Drafted By: \_\_\_\_\_ Date: \_\_\_\_\_  
 Checked By: \_\_\_\_\_ Date: \_\_\_\_\_

Check	Item No.	Item Description	Comments
		<b>PLAN</b>	
	1	Survey Lines and Station Ticks	
	2	Survey Line Intersection Angles	
	3	Survey Line Intersection Stations	
	4	Survey Line Bearings	
	5	Roadway and Median Widths	
	6	Lane and Shoulder Widths	
	7	Sidewalk Width	
	8	Connection/Widening for Guardrail/Barrier	
	9	Profile Grade and Pivot Point	
	10	Roadway Super elevation Rate (if constant)	
	11	Edge of deck/taper data	
	12	Traffic Arrows	
	13	Mileage to Junctions along Mainline	
	14	Back to Back of Pavement Seats	
	15	Span Lengths and Numbers	
	16	Lengths of Walls next to/part of Bridge	
	17	Bridge Drains, or Inlets off Bridge	
	18	Existing drainage structures	
	19	Existing utilities Type, Size, and Location	
	20	New utilities - Type, Size, and Location	
	21	Luminaries, Junction Boxes, Conduits	
	22	Bridge mounted Signs and Supports	
	23	Contours/Base Map	
	24	Top of Cut, Toe of Fill	
	25	Bottom of Ditches	
	26	Test Holes (if available)	
	27	Riprap Limits	
	28	Stream Flow Arrow	
	29	R/W Lines and/or Easement Lines	
	30	Points of Minimum Vertical Clearance	
	31	Horizontal Clearance	
	32	Existing structures shown	
	33	Exist. Bridge No. (to be removed, widened)	
	34	Section, Township, Range	
	35	City or Town	
	36	North Arrow	
	37	Bearing of Piers, or note if radial	
	38	Detour/Temporary structures shown	
	39	Railroad clearances	



## Bridge Type, Size, & Location/Preliminary Plan Checklist

The following checklist is a combination of ODOT TS&L and WSDOT Preliminary Plan requirements

40	Type of bridge rail shown	
41	Columns and cross-beams	
42	Call out approach slabs/end panels	

### TYPICAL SECTION

43	Bridge Roadway Width	
44	Lane and Shoulder Widths	
45	Profile Grade and Pivot Point	
46	Super elevation Rate	
47	Survey Line	
48	Barrier Face Treatment	
49	Limits of Pigmented Sealer	
50	BP/Pedestrian Rail dimensions	
51	Stage Construction, Stage traffic	
52	Locations of Temporary Concrete Barrier	
53	Closure Pour	
54	Structure Depth/Prestressed Girder Type	
55	Conduits/Utilities in bridge	
56	Substructure Dimensions	
57	Type of bridge rail shown	

### ELEVATION

58	Full Length Reference Elevation Line	
59	Existing Ground Line x ft. Rt of Survey Line	
60	End Slope Rate	
61	Slope Protection	
62	Pier Stations and Grade Elevations	
63	Profile Grade Vertical Curves	
64	BP/Pedestrian Rail	
65	Barrier/Wall Face Treatment	
66	Construction/Falsework Openings	
67	Minimum Vertical Clearances	
68	Hydraulic Data (Water Surface & Flow data)	
69	Water Surface Elevations, OHW	
70	Riprap	
71	Seal Vent Elevation (if applicable)	
72	Datum	
73	Bearing Fixity, Indicate F, H, P, or E	
74	Type of bridge rail shown	
75	Proposed Ground Lines	
76	Show Pier and Abutment Foundations	



## Bridge Type, Size, & Location/Preliminary Plan Checklist

The following checklist is a combination of ODOT TS&L and WSDOT Preliminary Plan requirements

### TITLE BLOCK

	76	Structure name	
	77	Project name	
	78	Highway and mile post	
	79	County name	
	80	Existing structure number	
	81	New structure number	
	82	WA Stamp/Seal	

### LEFT MARGIN

	83	Deck Protective System	
	84	USCG Permit Status (water crossings)	
	85	Railroad Agreement Status (if applicable)	
	86	Points of Minimum Vertical Clearance	

### RIGHT MARGIN

	87	Control Section	
	88	Project Number	
	89	Region	
	90	Highway Section	
	91	SR Number	
	92	Structure Name	

### MISCELLANEOUS

	93	Structure Type	
	94	Live Loading	
	95	Undercrossing Alignment Profiles/Elevs.	
	96	Superelevation Diagrams	
	97	Curve Data	
	98	Riprap Detail	
	99	Plan Approval Block	
	100	Note about data date	
	101	Names and Signatures	

rev.3 (4/22/2010)

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## Designer Checklist – Structures

Deliverable Name: \_\_\_\_\_

Deliverable Identification #: \_\_\_\_\_

QC Reviewer:	Date review to be completed:	Today's date:
Design Manager:	Review status <input type="checkbox"/> 60% <input type="checkbox"/> 90% <input type="checkbox"/> Final	

Names of Agency representative and CRC representative that met to discuss design issues and/or concerns:

\_\_\_\_\_

CRC:

\_\_\_\_\_

Agency:

Structures		Comments	Response / Resolution
Title	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Legend and list of abbreviations	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
North arrow	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Construction notes and reference bubbles	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Existing and proposed structures shown and labeled	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Dimensions proper and cross checked	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Mathematics checked and is accurate	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
General notes	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Structural calculations match design drawings	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Retaining walls, plan and profile	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Keynotes	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		

**Designer Checklist – Structures (continued)**

Design live loads	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Schedule of drawings	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Framing schedule, column schedule, etc.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Consideration for on-going maintenance and operational needs	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Correct codes and loads verified	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Notes:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Steel			
Concrete			
Masonry			
Timber			
Concrete			
Calculations			



## Designer Checklist - Highways

Deliverable Name: \_\_\_\_\_

Deliverable Identification #: \_\_\_\_\_

QC Reviewer:	Date review to be completed:	Today's date:
Design Manager:	Review status <input type="checkbox"/> 60% <input type="checkbox"/> 90% <input type="checkbox"/> Final	
Names of Agency representative and CRC representative that met to discuss design issues and/or concerns:		
CRC:		
Agency:		

### Tasks Included in Contract Work

Are these components in the deliverable package?	Comments	Response / Resolution
Title Sheet and Vicinity Map	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	
General Construction plans with roadway and drainage work	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	
Horizontal alignment	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	
Vertical alignment (Profile Sheet)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	
Evidence that templates and models ran	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	
Toe of slope shown	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	
Roadway details	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	
Roadway cost estimate and bid items	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	
Roadway cross-sections	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	
Roadway cost estimate and bid items	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	
Roadway redline special provisions	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	
Drainage plans (w/ water quality)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	

## Designer Checklist – Highways (continued)

Drainage details	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Drainage cost estimate and bid items	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Drainage redline special provisions	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Staging layout base map	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Staging cross sections	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Staging cost estimate (roadway items)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Staging redline special provisions (roadway items)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Erosion Control plans	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Erosion Control cost estimate and bid items	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Erosion Control redline special provisions	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Striping plans	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Striping cost estimate and bid items	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Striping redline special provisions	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Design Exception Letters	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Comment response worksheet	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Project Design Narrative	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Construction Schedule	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
<b>Title Sheet</b>		<b>Comments</b>	<b>Response / Resolution</b>
State map and project arrow	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
"V" number or project status stamp	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Project title	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Type of work	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
County of project work	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		

**Designer Checklist – Highways (continued)**

Type of work	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
County of project work	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
PE stamped and signed	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Title block and sheet numbers	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Oregon Transportation Commission listing of names	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
OTIA stamp (if applicable)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Attention stamp for Oregon Utility Notification	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Jurisdiction or owner name if applicable or required	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Overall length of project	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Township, range and section lines	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Index sheets	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Sheet Order	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Standard drawing numbers used in project	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
<b>Typical Sections</b>		<b>Comments</b>	<b>Response / Resolution</b>
Sheet(s), including sheet title and sheet number to jurisdictional or DEA standard	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		Proj
Project logo and Engineer	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Detail specifications and general notes agree with project conditions and requirements	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Is there enough information shown to construct the project	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Are details current and correct for jurisdiction	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		

## Designer Checklist – Highways (continued)

Stacked sections (when necessary)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Reference(s) to standard drawings	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Insert with “blow-up” to show more detail (only when necessary)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Bridge details checked (only when structure shown)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Right-of-Way map number (first sheet only, or “No RAW Map” when there is no impact to the RAW as a result of the project)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Signature block	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Surfacing depths checked against Surfacing Design	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Cut and fill slopes in conformance with Geotech Report	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Structure stations match bridge plans, if applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
<b>Details</b>		<b>Comments</b>	<b>Response/ Resolution</b>
Sheet title, sheet number, “V” number	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Plan sheet border per agency standard	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
CRC logo and Engineer’s seal	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
General notes in lower right hand corner	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Separation lines between details on any given sheet (when necessary)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Tables to clearly indicate tapers, sizes, or other information, which cannot be properly shown within the detail (only when necessary)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Different types of details grouped together (drainage, earthwork, etc.)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		

## Designer Checklist – Highways (continued)

Construction Staging		Comments	Response / Resolution
Review construction staging layout	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Review construction staging cross-sections	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
TP and DT signing	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Construction Plan, Profile and Notes		Comments	Response / Resolution
Combined Construction Plan Sheets	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Standard agency borders and title block	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Title	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
CRC logo and Engineer's seal	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Legend	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
North arrow	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Sheet number and "V" number	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Match lines per jurisdictional or DEA standard	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
CAD file name, path and print date	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Scale (vertical and horizontal)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Existing topography, drainage and utilities	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Begin project and end project notations	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Offset dimensions at right-of-way line angle points	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
New travel lanes, dimensions and tapers	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
New approaches and street/road connections and information (sta., width, existing material)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
New guardrail and flares	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		

## Designer Checklist – Highways (continued)

New fences	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
New culverts and pipes	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
New structures (bridges, box culverts and walls)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
New manholes and inlets	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Removal symbology and legend	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Text read from bottom left (readable as traveling upstation along the centerline stationing)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Have the results of the latest design calculations been incorporated	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Are interfaces with various discipline drawings correct	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Have comments on previous check prints been incorporated	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Does the design conform to all applicable codes, standards, etc.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Has the accessibility for maintenance, repair, and in-service inspection been provided	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Title blocks complete with all pertinent and matching information	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Are detail cross-references correct	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Dimensions cross-checked across plan types (i.e. roadway dimensions match erosion control dimensions)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Is spelling and grammar correct	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Are all of the appropriate plan sheets included in the review set	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Special and technical specifications agree with project plans, conditions, and requirements	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		

### Designer Checklist – Highways (continued)

Cost estimate included and matches plans	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Are special provisions, engineer's estimate and other contract deliverables included in the review package	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Is material selection proper	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Are the items constructible as shown	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
<b>Drainage</b>		<b>Comments</b>	<b>Response / Resolution</b>
Standard agency borders and title block	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
CRC logo and Engineer's seal	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Hydraulic report by Agency complete and matches information shown in the plan and profile sheets	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Local agency and regulatory agency requirements and standards complied with	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Appropriate construction notes and reference bubbles included	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Roadway and/or utility alignment showing geometry labels and stationing	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Wetland and/or wetland mitigation areas shown	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Horizontal dimensioning proper and cross checked	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Plan and profile mathematics is checked and is accurate	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Size, type and invert elevations of existing utilities shown (i.e., telephone storm sewer, sanitary sewer, gas, power and water)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		

## Designer Checklist – Highways (continued)

Valve covers, manhole lids, etc. raised/lowered and protected	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Location and type of catch basins or drainage facilities are shown	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Catch basins located at low or rollover points	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Special notes	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Size of pipe shown on plan and profile	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Slope between MH's or cleanouts on plan or profile	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Type of backfill	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Check lengths with scale and verify agreement between plan and profile	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Manholes and cleanout inverts shown in plans and profile – underground or overhead, size, depth, material	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Groundline or top of manhole elevation indicated or a note shown to match existing ground	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Horizontal tie and stationing for all manholes, catch basins or cleanouts	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Soils profile information shown (i.e., rock elevations, material type, etc.)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Warning tape and/or tracer cable shown in details	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Details for highway and stream crossing, if required	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Typical trench sections with compaction specification shown	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Slopes, invert elevations and lengths cross-checked and are accurate	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		



## Designer Checklist – Highways (continued)

Details for manholes, catch basins cleanouts, area drains, outfall details and other drainage structures shown and matches requirement of jurisdiction	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Water Quality and/or detention facilities shown	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Check for use of correct details	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Has roof and foundation drainage been addressed	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Check for water vault drainage	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Are sewers out of structures including buildings, carports and sidewalks	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Jurisdiction requirement for water quality/detention	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Calculations for water quality/detention	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
<b>Pipe Data</b>		<b>Comments</b>	<b>Response / Resolution</b>
<b>General</b>			
Standard agency borders and title block	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
CRC logo and Engineer's seal	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
CAD file name, path and print date	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Standard drawings identified	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Size and length of pipe or pipe arch	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Use and installation criteria	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Terminal treatment	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Alternative materials identified	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Appurtenances (manholes, inlets, etc.)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Pipe extensions	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Remarks	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		

### Designer Checklist – Highways (continued)

A blank space at the beginning and end of each list of plan sheet note numbers, when possible	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
A heavy line to separate pipe data for each plan sheet	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
pH and Resistivity test results	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Separate line for each run of pipe (normally)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Size, type and class of pipe shown on profile, notes or specifications	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
<b>Permanent Signing</b>		<b>Comments</b>	<b>Response / Resolution</b>
Title	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Legend	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
North arrow	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Scale	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Match lines per jurisdictional or DEA standard	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Construction notes and reference bubbles	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Include topographic information: edge of pavement, sidewalks, curbs, etc.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Show major roadway construction centerlines with stationing	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Street or road names	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Existing and/or proposed striping shown, as appropriate	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Edge of pavement or curb/sidewalk shown	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Major existing and construction features as required	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Location of new signs	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		

## Designer Checklist – Highways (continued)

Details of existing signs (dashed) sign key legend	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Details of proposed signs sign key legend	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Reference to standard drawings	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Sign and post installation table w/station, offset, and materials designation for each new sign	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
<b>Striping</b>		<b>Comments</b>	<b>Response / Resolution</b>
CRC logo and Engineer's seal	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
North arrow	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Scale	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Standard Agency Traffic borders and title block, if applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Major and minor sheet titles	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Copy of roadway layout with revised symbology	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Major roadway construction centerlines with stationing	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Major existing and construction features, as required	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Centerline match lines when necessary	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Construction notes and note bubbles	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Width and color of proposed pavement markings	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Dimensions for stripe offsets or spacing of lane lines	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Legend details	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Storage lengths shown	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		

### Designer Checklist – Highways (continued)

Edge of pavement or curb/sidewalk shown	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Street or road names, including designations as avenues, lanes, etc. (NW, NE, SE, SW)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Reversing curve radii shown	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Reference to standard drawings	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Striping table	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Breaks in striping at street intersections	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Include topographic information	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Tapers shown	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
<b>Erosion Control</b>				<b>Comments</b>	<b>Response / Resolution</b>
<b>Plans</b>					
Standard agency borders and title block	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
CRC logo and Engineer's stamp (all sheets)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Proposed erosion control items	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Title	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
General notes in lower right hand corner	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Legend	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
North arrow	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Scale	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Reference to standard drawings	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Match line per jurisdictional or DEA standard (when needed)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		

### Designer Checklist – Highways (continued)

Existing and/or proposed right-of-way or easements shown, labeled, and dimensioned	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Jurisdictional reference and standard note	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Erosion control construction notes and reference bubbles	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Include topographic information affecting erosion control (i.e., buildings, edge of pavement, vegetation, streams, sidewalks, curbs, ditches, etc.)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Appropriate contour interval shown	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Alignment showing centerline labels and stationing	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Street road names, including designations as avenues, lanes, etc. (NW, NE, SW, SE)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Existing and proposed structures shown	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Appropriate structures labeled	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Stage and phase callout	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Special notes	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Wetland and/or wetland mitigation areas shown	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Significant natural areas	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Finish floor elevations shown	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Proposed erosion control items	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Proposed grading contours (optional)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Existing ground contour lines, screened (optional) and labeled	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		

## Designer Checklist – Highways (continued)

Natural drainage features (lakes, swales, rivers, streams, etc.)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Cut and fill line and topography outside cuts and fills	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Delineation of clearing limits	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Arrows indicating drainage patterns and flow directions	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
General construction notes	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Legend of ODOT standard symbols actually used per plan sheet, if applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Existing and proposed storm sewer shown	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Design shows positive drainage	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Appropriate details included	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Gravel construction entrance, sediment fence locations, inlet barriers, bio-bags, and erosion control blankets shown in appropriate location	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Erosion control details	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		

### Specifications and Special Provisions

Specifications		Comments	Response / Resolution
Proper specifications for overseeing jurisdiction	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Special Provisions		Comments	Response / Resolution
Title matches contract plans	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
CRC logo and Engineer's seal	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Content matches plans	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Bid item list included	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		

## Designer Checklist – Highways (continued)

Include jurisdictional details when appropriate	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
With current content, is the project buildable without contractor dispute?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
<b>Cost Estimate</b>			
<b>Are these components in the report?</b>		<b>Comments</b>	<b>Response / Resolution</b>
Cover/Header	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
List of Preparers	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
<b>Formatting</b>		<b>Comments</b>	<b>Response / Resolution</b>
Are headings consistent (e.g., heading level format, capitalization)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Are page headers consistent throughout document	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Does the date in the header or footer (if any) match the date on the cover and/or title page	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Is the document compliant with all items listed on the SOW and does it conform with specifications	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
<b>Proofreading</b>		<b>Comments</b>	<b>Response / Resolution</b>
Did you electronically check the report for spelling and grammatical errors	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Was Excel formula information checked	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
<b>Content Quality</b>		<b>Comments</b>	<b>Response / Resolution</b>
Information included in document appears accurate	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Calculations checked for every item	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Review of plan quantities matches cost estimate quantities	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		

### Designer Checklist – Highways (continued)

CE Staff has reviewed final quantities	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
All necessary bid items are included	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		
Backup documentation for all bid item quantities and unit cost	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA		



# Designer Checklist – Transit

## Check Print Checklist (Permit Review & 100%)

Deliverable Identification #: \_\_\_\_\_  
 Deliverable Name: \_\_\_\_\_  
 Design Manager: \_\_\_\_\_  
 QC Reviewer: \_\_\_\_\_  
 Date: \_\_\_\_\_

<i>Response</i>	<i>Item</i>	<i>Notes</i>
Y N NA	1. All supporting calculations germane to this discipline on these drawings are checked.	_____ _____ _____
Y N NA	2. The plans are consistent with the calculations.	_____ _____ _____
Y N NA	3. All agency comments from past submittals are addressed/incorporated unless noted.	_____ _____ _____
Y N NA	4. All reference notes to other drawings are correct.	_____ _____ _____
Y N NA	5. Current reference drawings from other disciplines are used and coordinated.	_____ _____ _____
Y N NA	6. All applicable geometric calculations (i.e., horizontal and vertical geometry) are checked.	_____ _____ _____
Y N NA	7. All referenced details are appropriate to the application shown on these drawings.	_____ _____ _____
Y N NA	8. Clear, concise construction notes are used for all work to be constructed, installed, supplied, etc.	_____ _____ _____
Y N NA	9. All items of work to be supplied/constructed under another contract are clearly identified.	_____ _____ _____

## Designer Checklist – Transit (continued)

- |   |   |    |   |       |
|---|---|----|---|-------|
| Y | N | NA | 10. All applicable codes, standards, and design criteria have been used.  | _____ |
| Y | N | NA | 11. The materials shown are appropriate and consistent with the project design criteria.  | _____ |
| Y | N | NA | 12. All items shown for construction are covered in the project specifications.   | _____ |
| Y | N | NA | 13. Accessibility and maintenance have been considered and addressed appropriately.   | _____ |
| Y | N | NA | 14. Dimensions shown on these drawings are correct.   | _____ |
| Y | N | NA | 15. All drawing titles and numbers agree with the Index of Drawings.  | _____ |
| Y | N | NA | 17. The drawings are consistent and conform to the project's drafting standards.  | _____ |
| Y | N | NA | 18. The drawings are consistent with the applicable permit review drawings that have been previously submitted and "approved" by the permitting agencies. | _____ |

**Legend:** NA = Not Applicable  
Y = Yes  
N = No

*This checklist has been completed by:*

\_\_\_\_\_  
(Signature of Checker)



## Design Survey Review Checklist

**Deliverable Identification #:** \_\_\_\_\_ **Task Lead:** \_\_\_\_\_

**Deliverable Name:** \_\_\_\_\_

**Date to Reviewer:** \_\_\_\_\_ **Delivery Due Date:**  

**Survey Technician:** \_\_\_\_\_ **Review Date:** \_\_\_\_\_

**QC Reviewer:** \_\_\_\_\_ **Review Date:** \_\_\_\_\_

**Back Check:** \_\_\_\_\_ **Review Date:** \_\_\_\_\_

**Final Check:** \_\_\_\_\_ **Review Date:** \_\_\_\_\_

### Title Block

Survey Tech	QC Review	Back Check	Final Check	Items for Review
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Surveyor's Seal
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Drafted By
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Checked By
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Revisions
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bench Mark
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DEA's Block
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Owner's / Client's Name
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Project Name
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	City, County, State
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Date
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Scale
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Project Number
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sheet No.

### General Information

Survey Tech	QC Review	Back Check	Final Check	Items for Review
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	North Arrow
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Graphic Scale
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Legend
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Drawing File Path
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Vicinity Map
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Electronic File – levels, layers, and standards adhered to

## Design Survey Review Checklist

### Notes

Survey Tech	QC Review	Back Check	Final Check	Items for Review
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Boundary Establishment Note
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Basis of Bearings
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Datum Notes (Horz. / Vert. / Coordinates)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Topography / Aerial Note
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Source of Utility Information
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Utility Note

### Drawing

Survey Tech	QC Review	Back Check	Final Check	Items for Review
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Record Boundary Data
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Streets (Name & Width)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Railroads
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Other Rights-Of-Way
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Record Easements
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Apparent Easements
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Water Courses
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Encroachments Across Property Lines
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Access to Streets
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Buildings & Structures
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Building Ties to PL
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Fences and Walls
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Utilities per record
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Visible Utilities (Size, type, and material labeled)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Rim and Invert Elevations
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Confirm flow direction
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Evidence of Underground Utilities
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Parking Areas, Striping
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Curbs, Drives and Sidewalks
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Monuments (Found or Set)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Contours
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Index Contours Labeled
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Spot Elevations
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	TIN Review
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Confidence Point Check</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Field Check Completed
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Trees; species and size (dbh)

**Design Survey Review Checklist**

**Drawing (continued)**

Survey Tech	QA/QC Review	Back Check	Final Check	Items for Review
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Environmental features; wetlands, high water mark, hazmat sites
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pavement type limits
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Geotechnical and pavement design sampling locations shown
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pothole locations shown

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## Legal Descriptions Checklist

**Deliverable Identification #:** \_\_\_\_\_ **Task Lead:** \_\_\_\_\_

**Deliverable Name:** \_\_\_\_\_

**Date to Reviewer:** \_\_\_\_\_ **Delivery Due Date:**  

**Project Surveyor:** \_\_\_\_\_ **Review Date:** \_\_\_\_\_

**QC Reviewer:** \_\_\_\_\_ **Review Date:** \_\_\_\_\_

**Back Check:** \_\_\_\_\_ **Review Date:** \_\_\_\_\_

**Final Check:** \_\_\_\_\_ **Review Date:** \_\_\_\_\_

### Written Description Format

Project Surveyor	QC Review	Back Check	Final Check	Items for Review
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Letterhead
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Title – “Exhibit A”
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Subtitle – “Legal Description”
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Footer Information:
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Page x of y
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	File path
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Date printed
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Grid distance note (as applicable)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Combination factor note (as applicable)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	...”more or less”
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sq. ft. used when area <1.000 acres
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sq. ft. = 1234 (to the nearest sq. ft.)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Acres = 123.123 (to the nearest 3 decimals)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Prepared by or under the direct supervision note
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Name & license number
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Surveyor’s seal (some agencies require wet seal only)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sideline extension or foreshortening note

### Closure and Research

Project Surveyor	QC Review	Back Check	Final Check	Items for Review
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Record docs and maps for checker
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Boundary of description
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Mathematical lot closure
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

## Legal Descriptions Checklist

### Caption

Project Surveyor	QC Review	Back Check	Final Check	Items for Review
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	“That portion of...”
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lot or Parcel number
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Book and Page numbers
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Donation Land Claim
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Document reference
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Public Lands
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Section, Township, Range, and Meridian
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Court Case Reference
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	City, County, and State
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

### Body

Project Surveyor	QC Review	Back Check	Final Check	Items for Review
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Basis of Bearings note
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Point of Commencement / Beginning / TPOB clearly established
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	True Point of Beginning shown in BOLD
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No conflicting deed calls
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No conflicts with other descriptions in the same project
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Record data shown in parenthesis ( )
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Call to adjoiners
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Original intent of existing legal retained
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All parts of the bearing shown in the same line
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Correct use of commas
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Correct use of general directions and use of capitals
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Curve concavity shown from the middle of the curve to the radius pt.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Parts of curve shown: Central Angle (delta), radius and length
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No abbreviations
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Recording information shown is same line
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Grammar and spelling correct
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____



## Legal Descriptions Checklist

### Exhibit Format

Project Surveyor	QC Review	Back Check	Final Check	Items for Review
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Title – “Exhibit ‘B’”
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	North Arrow
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Graphic Scale
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Drawing file path
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Project Number
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Project Title
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Drafted By:
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Checked by:
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Scale
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Page number
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DEA block
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Date
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Point of Commencement/ True Point of Beginning
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bearings and distances to TPOB
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bearing direction shown as cited in legal description
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Distances to 0.01’
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bearing/Angles to 1 second
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Delta/Radius/Length for curves
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Radial bearings for all non tangent curves (radial bearing from Rd. Pt. to PT)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Adjoining properties shown and annotated
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Streets labeled and R/W annotated
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Underlying map or document recording data shown
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Area: <1.000 acre shown as sq. ft. to nearest foot
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Area: >1.000 acre shown as acres to 0.0001 acre
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Spelling is correct
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____





## Oregon Record of Survey Checklist

**Deliverable Identification #:** \_\_\_\_\_ **Task Lead:** \_\_\_\_\_

**Deliverable Name:** \_\_\_\_\_

**Date to Reviewer:** \_\_\_\_\_ **Delivery Due Date:**

**Project Surveyor:** \_\_\_\_\_ **Review Date:** \_\_\_\_\_

**QC Reviewer:** \_\_\_\_\_ **Review Date:** \_\_\_\_\_

**Back Check:** \_\_\_\_\_ **Review Date:** \_\_\_\_\_

**Final Check:** \_\_\_\_\_ **Review Date:** \_\_\_\_\_

### Map Title

Project Surveyor	QC Review	Back Check	Final Check	Items for Review
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Name of City, if applicable _____
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Name of County, OR _____
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	“RECORD OF SURVEY”
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Description of Land or line surveyed
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Section, Township, Range
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Date of Survey _____
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sheet Numbers _____
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Firm Name and Address

### Backup Data

Project Surveyor	QC Review	Back Check	Final Check	Items for Review
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Two Check prints
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Maps used to prepare survey
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Deeds used to prepare survey

### Statements

Project Surveyor	QC Review	Back Check	Final Check	Items for Review
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	County Recorder’s Block (in upper right hand corner)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Surveyor’s Stamp, signed with renewal date
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Narrative; explaining the purpose of survey, basis on which lines were established, and which found monuments and deed elements controlled the line(s), established or reestablished

**Oregon Record of Survey Checklist**

**Surveyor's Notes**

Project Surveyor	QC Review	Back Check	Final Check	Items for Review
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Basis of Bearings; monuments used and citation of record State Plane Coordinates (include Epoch, combination factor, and convergence angle or LDP Coordinates) Found monuments and symbol (Recommend solid) Set monument symbols (Recommend open) Symbols and non-standard abbreviations defined Surveyor's Notes and Legend
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**Measured Data**

Project Surveyor	QC Review	Back Check	Final Check	Items for Review
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bearings shown (degrees, minutes, and seconds) Distances shown (feet and hundredths of a foot) Overall Bearings shown Overall distances shown Sum of parts equal total of distance or delta Traverse calculations G.P.S. data All curve data shown (delta, radius, arc length, chord bridge and distance) All radial bearings shown where required Non-tangent curves noted All areas shown (if required) Map loop closures within 0.02 feet Measured course and distance to an existing (monumented) section corner or corner of a recorded subdivision, partition, or condominium plat
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Oregon Record of Survey Checklist

Map Body

Project Surveyor	QC Review	Back Check	Final Check	Items for Review
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Map material; 3 millimeters minimum polyester base film; with permanent black ink
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Map size: 18" x 24"
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Minimum 1/2" border
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	A 2 1/2" square shape in the upper right hand corner (inside border) for a recording stamp
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	North Arrow
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Scale
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Reference to adjacent tracts or other maps of record when pertinent
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Legibility of map data (acceptable text height; min. uppercase size is .08 and min. lowercase is .10)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Street names, County Road Numbers (if applicable) and widths shown
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Reference for all found monuments and acceptance of non-record monuments
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Reference to deeds of official records if necessary for the establishment of lines or points
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Record data shown when beneficial to the interpretation of lines or points
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bearings _____ Distances _____
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Curve Data _____ Other _____
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Detail for clarity
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Arrows to clarify dimensions
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Detailed description of found and set monuments
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Symbols match the legend (same size and shape)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The relationship of all shown found monuments by course and distance

Survey Procedures

Project Surveyor	QC Review	Back Check	Final Check	Items for Review
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proportions and other adjustments correct
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sectional breakdowns correct
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Deed interpretations correct
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Monuments tagged, as required
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ties to adjacent lines of record when pertinent
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Survey based upon proper control
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Methods of establishment of lines or points shown where necessary



**Appendix C**  
**Interdisciplinary Review Tracking Form**

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## Interdisciplinary Review Tracking Form

**Deliverable Identification #:** \_\_\_\_\_  
**Deliverable Name:** \_\_\_\_\_  
**QC Reviewer:** \_\_\_\_\_  
**Design Manager:** \_\_\_\_\_

Discipline	IDR Required?	IDR Checker		IDR Confirmed by		IDR Edited by		IDR Backchecker	
		Initials	Date	Initials	Date	Initials	Date	Initials	Date

**Notes:**

**QC Reviewer (Checker):** The Checker reviews the IDR check print and validates all information related to his/her specific discipline on the document, and may elect to make other comments as deemed worthy. When the check is complete, the Checker initials and dates this form and routes the set to the other specified task leader or designated Backchecker.

**Confirmed by:** Procedure by which the Designer or originator of the document reviews and accepts, rejects, or modifies the marked changes to the document made by the QC Reviewer and initials and dates this form.

**Editor:** The Editor makes the revisions to the original document according to the agreed-upon changes marked on the check print. The Editor confirms that he/she has completed updates by highlighting the changes in yellow. When updates are complete, the Editor initials and dates this form.

**Backchecker:** The Backchecker (usually the QC Reviewer, but may be another designated project team member other than the Checker) reviews the Checker comments. If the Backchecker agrees with the comments, a blue check mark or highlight is placed next to the comment or on the change. If the Backchecker does not agree with the comments and then explains to the Checker a valid reason why the original item is correct, the Backchecker then writes the word "stet" in blue adjacent to the Checker's comment to indicate that the Checker has withdrawn his/her comment. Once all corrections/comments are reviewed and disagreements resolved, the Backchecker initials and dates this form and incorporates all corrections.

All Checker comments shall be resolved. The Backchecker may not disregard or dismiss any Checker comments without concurrence from the reviewer. If disagreement occurs and quick resolution is not attained, the Originator and the Checker shall seek input and obtain resolution from the Design Manager. NOTE: For preliminary and intermediate milestone submittals, complete resolution of all items may not be possible and items may be carried forward to the next design level with Consultant Project Manager approval.

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**Appendix D**  
**Review Comments Form**

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**REVIEW COMMENTS FORM**

Deliverable Title:		Deliverable Identification #:				
Job Charge: N/A	Reviewed By	Name and Agency:	Phone:	Date:	Sheet	of
#	Sht/ Pg	Reviewer's Comment	Initial/ Date	Designer's Response	Item Resolved Y/N	Designer Initial/ Date
1						
2						
3						
4						
5						

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# **Appendix E**

## **Audits**

- E.1 Audit Finding Report
- E.2 Auditor Review Checklist
- E.3 Nonconformance Report

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## Audit Finding Report

1. Project Task		2. Project Identifier		3. AFR No.:	
4. Subject:		5. Audit Number:	6. Discussed With:		7. Issue Date:
8. Responsible Authority:		Phone Number:	9. Auditor		Phone Number:
10. Requirement Reference and Description of Condition:					
11. Causes of the Problem:					
12. Corrective Action:					
13. Responsible Authority:		14. Response Due Date:		15. Response Date:	16. Effective Date:
17. Corrective Action: <input type="checkbox"/> Accept <input type="checkbox"/> Reject			18. Auditor:		Date:
19. Verification of Corrective Action(s):					
20. Implementation: <input type="checkbox"/> Accept <input type="checkbox"/> Reject			21. Auditor:		Date:



## Auditor Review Checklist

**Project Number:** \_\_\_\_\_  
**Project Manager:** \_\_\_\_\_  
**Auditor Name:** \_\_\_\_\_  
**Audit Date:** \_\_\_\_\_

	Y	N	NA
1. Has QC tracking and certification form been completed and provided for audit?			
2. Has the check print stamp been properly used?			
3. Did QC Reviewers follow the color code system?			
4. Have checklists been completed for each deliverable?			
5. Have calculations been properly reviewed and provided for audit?			
6. Has interdisciplinary review been properly performed and IDR Tracking Form provided for audit?			
7. Have QC documents for off-site consultant work products been provided for audit?			
8. Do off-site consultant QC documents comply with QCP?			
9. Has Review Comments Form been properly completed and provided for audit?			
10. Has a constructability review been properly performed and documents provided for audit?			
11. Has all documentation for each deliverable been completed properly?			
12. Does a nonconformance report need to be completed?			

Auditor Signature: \_\_\_\_\_  
 Date: \_\_\_\_\_



# Nonconformance Report

**Deliverable Identification #:** \_\_\_\_\_  
**Deliverable Name:** \_\_\_\_\_  
**Design Manager:** \_\_\_\_\_  
**Date:** \_\_\_\_\_  
**QA/QC Manager/Author:** \_\_\_\_\_  
**Date:** \_\_\_\_\_

**Nonconforming Items and Description:**

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**Resolution Actions:**

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