Columbia River CROSSING

Road Map Item #: 5.10

Product Name: **QUALITY ASSURANCE MANUAL**

PMP Appendix: APPENDIX E

Submittal Date: May 1, 2013

ABSTRACT: This deliverable provides requirements, responsibilities, and definitions for the implementation of the CRC's Quality Assurance (QA) program, whereas the Quality Control Plan (QCP) defines the techniques and procedures that the design team will use to implement an effective, documented control of the design process for the CRC program. Both of these documents are included as Appendices to the PMP as Appendix E and Appendix H, respectively, and combine to form the CRC Quality Management Program.

QUALITY ASSURANCE MANUAL

Draft Report

May 2013

Columbia River CROSSING

Title VI

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DOCUMENT REVISION RECORD

Columbia River Crossing – Quality Assurance Manual

Revision Number	Date Issued	Approval	Comments
Rev. 0	April 2012		
Rev. 1	May 2013		

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APPENDICES

ACRONYMS

ADA	Americans with Disabilities Act
AFR	Audit Finding Report
ASA	Aggregate Source Approval
CRC	Columbia River Crossing
DB	Design-Build
DBB	Design-Bid-Build
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GC/CM	General Construction/Construction Management
IA	Independent Assurance
LRT	Light Rail Transit
NCR	Nonconformance Report
ODOT	Oregon Department of Transportation
PMOC	Project Management Oversight Consultant
PMP	Project Management Plan
QA	Quality Assurance
QAM	Quality Assurance Manual
QC	Quality Control
QCP	Quality Control Plan
QMP	Quality Management Plan
QPL	Qualified Product List
QV	Quality Verification
RAM	Request for Material
RFC	Released for Construction
RFP	Request for Proposals
RFQ	Request for Qualifications
WSDOT	Washington State Department of Transportation

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1. Management Commitment Statement

The quality of the Columbia River Crossing (CRC) project is the ultimate measure by which the citizens of Oregon and Washington, and all people who will ultimately use this new facility, will judge the success of the project. The responsibility and commitment to quality belong to the highest level of management.

> ***Quality Policy:*** *It is the policy of the project team that the project will be planned and constructed with the highest regard for safety, quality in all areas such as environmental, scheduling, cost, design (both preliminary and final), geotechnical investigations, surveys, procurement, construction, and ongoing serviceability and usability for years to come.*

Quality assurance provides the means for controlling, guiding, and improving the planning, environmental concerns, scheduling, design, safety, costs, reliability, construction quality, and longevity of the constructed facility. As such, the CRC project team considers the use and implementation of sound quality assurance practices to be of the utmost importance and a critical element in the delivery of the CRC project.

The Project Management team will identify quality objectives, specify quality-related activities, and oversee solutions to any and all issues to achieve these objectives, and will assign responsibilities for implementation and successful completion of the project.

It is the intent of the CRC project team that quality assurance be a team effort encompassing all persons and organizations participating in the development of the project from initiation to completion. The entire project team, including those providing management, planning, scheduling, design, construction, consulting, or other services, is responsible for producing quality results, and is committed to the full and faithful execution of the CRC Quality Assurance Program.

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Nancy Boyd, P.E. Date
WSDOT, Program Director
Columbia River Crossing

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Kris Strickler, P.E. Date
ODOT, Program Director
Columbia River Crossing

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2. Introduction

As an obligation to the people of Oregon and Washington, to the Federal Highway Administration (FHWA), to the Federal Transit Administration (FTA), as well as to funding requirements relating to grantees undertaking capital programs, the CRC quality management team is required to prepare a Project Management Plan (PMP) that includes a quality program composed of written quality policies and procedures, as well as identification of a management team that supports and takes responsibility for quality and for the personnel who undertake quality assurance (QA) and quality control (QC) activities. The overall requirements of the project's quality program are outlined in the PMP.

The CRC Quality Assurance Program, including this QAM, is designed in response to the FTA's *Quality Management System Guidelines, 2012,* which are fully described at www.fta.dot.gov. The FTA guidelines specify 15 quality elements. These elements are used as the basis for Section 3 of this document.

QA and QC are related activities, but are different. The definitions are:

> Quality Assurance (QA) – All those planned and systematic actions necessary to provide adequate confidence that an item is in conformance with established contract requirements and will satisfy given needs. The activity provides the evidence needed to establish confidence that quality functions are being performed effectively. QA is a management tool.
>
> Quality Control (QC) – Those functions that provide a means to control and measure characteristics as related to established contract 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 Verification (QV) – verification of the contractor's QA procedures by the DOT HQ to ensure compliance with the contract requirements under the DB delivery method.

The CRC Quality Assurance Program provides for the implementation of administrative and QC measures from design through construction. The controls established within the QAM will facilitate early identification of conditions that might, if not identified, adversely affect satisfactory completion of the project or a phase of the project. The administrative and control measures adopted by the CRC project team will be prepared and implemented in such a manner as to contribute to and document the successful completion of a safe, reliable, economical, and convenient public transit/transportation system.

Throughout the CRC project, all proposal documents and contracts for engineering or other required services will be reviewed to determine the level of quality-related activities required to be implemented by the QAM. The quality program for each phase or contract is to be based on its size, complexity, uniqueness, and impact on the safe and efficient design of the CRC project.

It is important to note that the QA and QC procedures and protocols that are appropriate for the construction phase are not necessarily appropriate for the engineering phase and, as such, will be referenced separately, by delivery method, where applicable.

This Quality Assurance Manual (QAM) provides requirements, responsibilities, and definitions for the implementation of the project's QA program, whereas the Quality Control Plan (QCP) defines the techniques and procedures that the design team will use to implement an effective, documented control of the design process for the CRC project. Both of these documents are included within the PMP.

For packages developed under the Design-Bid-Build (DBB) delivery method, QA and QC procedures and protocols for design will follow the requirements of this QAM and the QCP. Construction QA requirements and QC procedures are to comply with the requirements of the FTA's 15 elements when transit is included in the contract, as well as the current requirements of Oregon Department of Transportation (ODOT), Washington State Department of Transportation (WSDOT), and TriMet as applicable for their respective contracts.

In addition, each of the contractors for the anticipated construction delivery methods—Design-Build (DB) and General Contractor/Contract Management (GC/CM)—is required to have an established Quality Management Plan (QMP) that provides detailed policies and procedures for quality control of its work activities. The CRC QAP, QCP and contractor required QMPs combine to make up the written quality program for the project.

Packages under the DB method must establish and implement a QMP specific to the CRC project. Activities will be monitored by representatives for ODOT, WSDOT, TriMet, and the CRC QA/QC Manager for compliance to the Design-Builder's plan, and will check that the requirements of ODOT, WSDOT, TriMet, and FTA are met. The QMP shall detail how the Design-Builder will provide QA and QC for design and construction of the project, and will verify that all environmental and permit commitments are met to ensure that the work conforms to the contract requirements.

The Design Builder's QMP should be consistent with the Summary Information submitted in the proposal, and shall be approved, in writing, by the Project Delivery Director, WSDOT, ODOT, TriMet, and the CRC QA/QC Manager.

2.1 Quality Policy

It is the policy of the project team that the project will be planned and constructed with the highest regard for quality in all areas such as environmental, scheduling, design (both preliminary and final), geotechnical investigations, surveys, procurement, construction, as well as non-project activities such as maintenance, ongoing serviceability, and usability for years to come.

2.2 Purpose/Objective

The CRC's quality objective is to minimize the occurrence of deficiencies and nonconforming work and services during the life of the project.

The purpose of the QAM is to provide sound QA practices and requirements, responsibilities, and definitions for implementation of the project's QA program. The objective is to attain the required level of quality from the planning phase through the end of construction test & start-up to the beginning of revenue service. The CRC project team considers the use and implementation of sound QA practices to be a critical element in the delivery of the CRC project.

2.3 Scope

2.3.1 Design-Bid-Build (DBB) Delivery Method

The QA program encompasses all activities related to the design and construction of the project produced under the DBB delivery method. Staff (including subconsultants and off-site consultants) will conform to the applicable QA program requirements.

It is the intent of the CRC project team to ensure that all quality requirements of ODOT, WSDOT, and TriMet are effectively and completely represented by the CRC QA program throughout the entire course of the project. As such, each consultant/subconsultant will be required to abide by the QAM.

2.3.2 Design-Build (DB) Delivery Method

For design-related and construction-related activities for the DB delivery method, quality procedures and policies shall be provided by the Design-Builder in its CRC project QMP

2.4 Responsibilities for Design

2.4.1 Design-Bid-Build (DBB) Delivery Method

The CRC QA/QC Manager is responsible for the administration of the project QAM. The CRC QA/QC Manager has been delegated the authority and organizational freedom to:

- Identify and evaluate any and all quality problems;
- Initiate, recommend, or provide solutions and to control nonconforming or deficient items or services related to design until proper disposition is obtained.

The CRC QA/QC Manager will ensure that schedule and cost considerations do not compromise quality and will have complete, unhindered, and ready access to the Director to report on quality concerns.

The CRC QA/QC Manager has specific authorization and authority to bring any and all quality issues directly to the attention of the Program Director.

The initial responsibility for compliance with the QA program falls to the Consultant Design Task Leads and the Consultant Design Quality Managers.

Design Consultants' submittals will be reviewed by the agency Task Managers on behalf of their respective agencies (ODOT, WSDOT, TriMet, and C-TRAN) for comment, approval, and acceptance prior to implementation. The basis for the review, approval, and acceptance may include this document, States of Oregon and Washington guidelines and requirements, TriMet

design criteria (where applicable), FTA quality guidelines for the quality-related specification sections in the contract documents, and other documents and requirements as deemed necessary. The Program Manager and/or Transit Manager will review, approve, and coordinate all Project Management Oversight Consultant (PMOC) interactions with the consultant team members and all PMOC review documents.

The organizational charts for the CRC project can be found at the end of this manual in Appendix A of this report. The organizational charts identify those with responsibility for QA (managers and leads for each specific CRC organizational element), the CRC QA/QC Manager, and project team members. Design-Build roles are as defined by the Design-Builder's QMP and shall be compliant with Chapter 28 of the Request for Proposals (RFP), Quality Management Plan Outline.

For activity descriptions and responsibility of tasks found within the QAM, a Consolidated QA/QC Responsibility Matrix (Appendix B of this report) describes the task and the responsibility thereof.

2.4.2 Design-Build (DB) Delivery Method

The Design-Builder is responsible for establishing and implementing a QMP that will provide, in detail, quality responsibilities for design and construction activities delivered under the DB method. The QMP must meet federal (FHWA), agency (ODOT/WSDOT), and FTA requirements and must be in compliance with this QAM and WSDOT Design Build Quality Management Plan Requirements, found in Chapter 28 of the RFP. The CRC Program Directors, WSDOT, ODOT, TriMet, and the CRC QA/QC Manager are responsible for approval of the Design-Builder's QMP.

2.5 Responsibilities for Construction

2.5.1 Design-Bid-Build (DBB) Delivery Method

The DBB Construction Contractor will assume the primary responsibility for the overall quality control of its construction work under the oversight of FHWA, TriMet, FTA, and the CRC QA/QC Manager. The DBB Construction Contractor will adhere to the QAM and will comply with the QC procedures and policies for construction activities, materials, and documentation of the project set forth in the QAM. The DBB Construction Contractor shall designate a dedicated qualified Construction Quality Control Manager and a designated quality team to perform the QA/QC functions for the construction activities of the project.

Table 2-1 Construction Quality Assurance Responsibility (DBB)

	Design-Bid-Build		
	Inspection	**Materials**	**Transit**
Oversight QA	QA/QC Mgr.		FTA/PMO
Program Audit	ODOT WSDOT	ODOT WSDOT	TriMet
Audit	FHWA	FHWA	Contractor TriMet
QV	DOT HQ	DOT HQ	Contractor TriMet
QA	DOT HQ	DOT HQ	TriMet
QC	Contractor	Contractor	Contractor

2.5.2 Design-Build (DB) Delivery Method

The Design-Builder will assume the primary responsibility for the overall quality of its construction and materials under the oversight of ODOT, WSDOT, FHWA, TriMet, FTA, and the CRC QA/QC Manager. The Design-Builder will develop and submit a Quality Management Plan, or QMP, that will describe how it will provide QA/QC procedures and policies for construction activities, materials, and documentation of the project. In developing its own QMP, the Design-Builder is encouraged to follow the organization and format of the WSDOT QMP Outline, as provided in the RFP. The Design-Builder may elect to use all or part of the WSDOT QMP Outline. When using the WSDOT QMP Outline, the Design-Builder shall make changes to section headings and text as needed to meet project-specific requirements and the Design-Builder's own quality approach. No construction work that requires inspection and testing shall begin until the Design-Builder's Final QMP for construction has been approved in writing by CRC management.

The Design-Builder shall designate a dedicated qualified Construction Quality Control Manager and a quality team to perform the QA/QC functions for the construction activities of the project. For further information on what should be included in the QMP, refer to the RFP contract, which includes guidance for QMP development. Table 2.1 below provides the QA responsibility for construction under the DB delivery method.

Table 2-2. Construction Quality Assurance Responsibility (DB)

	Design-Build		
	Inspection	**Materials**	**Transit**
Oversight QA	QA/QC Mgr.		FTA/PMO
Program Audit	FHWA	FHWA	TriMet
Audit	DOT	DOT	DB'r TriMet
QV	WSDOT ODOT	WSDOT ODOT	DB'r TriMet
QA	DBQA	DBQA	TriMet DB'r
QC	DB'r	DB'r	DB'r

2.6 Revisions

Revisions to and maintenance of the QAM are the responsibility of the CRC QA/QC Manager in collaboration with the Program Directors. Revisions will be made as they become necessary. An overall review of the QA program will be made annually, or more often if necessary, to determine whether any revisions are warranted. The CRC QA/QC Manager will implement changes to the QAM. The QAM is a CRC-controlled document, and revisions to the QAM are also controlled documentation. Therefore, the document control process detailed in Section 3.4 should be followed. Whenever revisions to the QAM occur, the Task Manager will be informed through the monthly Prolog report provided by Document Control that lists updated documents affecting their discipline. The Task Managers should then notify their staff that a revised manual has been produced and that all QA/QC policies and procedures shall be in compliance with the most recent QAM.

2.7 Precedence

If there is any discrepancy between the PMP, this QAM, the QCP, or the Design-Builder's QMP, the PMP will take precedence. The documents will be subsequently revised for consistency.

3. Quality Assurance Program Implementation (FTA's Fifteen Elements)

3.1 Management Responsibility (Element 1)

3.1.1 Purpose

This section describes the management responsibility, organizational structure, and chain of command for QA/QC activities to be implemented during the course of the CRC project by the consultants, subconsultants, DBB Construction Contractor (Contractor), DB Contractor (Design-Builder), and others involved in the successful completion of the CRC project. The Quality Policy and stated management commitment to it is provided in section 1 of the QAM.

3.1.2 Scope

These QA requirements apply to CRC management and its consultants, subconsultants, contractors, and all others who will perform activities that affect the overall quality of the project.

3.1.3 Policy

Design-Bid-Build

Authority, accountability, and responsibility of the CRC QA team must be identified for each organization, consultant, subconsultant, and contractor. The management structure, function, and chain of command of each contributing organization shall be clearly established.

An organizational chart of the QA and QC personnel, listing the number of full-time equivalent employees, specific responsibilities for each employee, and the lines of authority and reporting responsibilities during design is provided as an appendix to this QAM (Appendix A). An organizational chart of anticipated CRC construction QA personnel is also included in this QAM in Appendix A2.

Design-Build

WSDOT, ODOT, TriMet and the Design-Builder will form a joint Quality Assurance Team and develop an "Executive Committee".

Anticipated construction and design management quality responsibilities shall be included in the RFP package.

The Design-Builder shall be responsible for the quality management of QA/QC/QV related activities, including responsibility of the Design-Builder's overall Quality Management Team, also known as the Executive Committee, and will meet the minimum requirements as described in the RFP, Chapter 28, Design-Build Quality Management Plan.

3.1.4 Quality Program Procedures

Design-Bid-Build

Organization

The CRC organizational charts are included as Appendix A of this document.

The structure for any organization assigned to perform work affecting quality will be that organization's responsibility, subject to approval by the CRC QA/QC Manager or those delegated by the CRC project team. Each QA/QC program and staff organization will be structured in such a manner that:

1. Quality is achieved and maintained by those who have been assigned responsibility for performing the work. This is accomplished by utilization of QC plans and procedures already in place or by use of those embodied in the overall CRC Quality Assurance Program.

2. The DBB Quality Control Manager will have sufficient authority, access to work areas, and organizational independence to:

    - Identify quality problems,
    - Verify implementation of solutions,
    - Ensure that further processing or delivery is controlled until proper disposition of a deficiency, nonconformance, or unsatisfactory condition has been completed,
    - Verify compliance with all aspects of the Quality Assurance Program,
    - Perform planned and scheduled audits to determine the effectiveness of the Quality Assurance Program.
        - Audits will be performed by personnel who do not have direct responsibility for performing the activities being audited. These audits shall be in accordance with the CRC project's written procedures and/or checklists.
        - Audit results will be documented, reported, and reviewed by the CRC QA/QC Manager and responsible management. Follow-up responses and corrective actions will be implemented where appropriate.

3. Quality achievement is verified via quality audits, quality surveillance, and first-level QC reviews of work products performed by persons or organizations not directly responsible for performing the work.

Program Assessment

The adequacy and effectiveness of the project's quality program will be regularly and formally assessed by the management of the organizations or Agency implementing the programs and requirements and by the CRC QA/QC Manager.

Design-Build

Organization and Program Assessment

The Design-Builder shall include quality procedures describing the management responsibility and structure of its quality organization as well as procedures for program assessment in its QMP that meet contract, ODOT, WSDOT, TriMet, and any other agency or jurisdictional requirements. See Table 3.1 for references to the minimum requirements for management responsibility for the Design-Builder's QMP.

Table 3-1. References – Minimum Requirements for Management Responsibility for Quality

Topic	Manual	Location
Management Responsibility	WSDOT Design Build Quality Management Plan Requirements	RFP, Ch. 28
	WSDOT Construction Manual M 41-01.14, Jan. 2013	Sect. 9
	FTA Quality Management System Guidelines, 2012	Sect. 2.2.1
	TriMet Quality Assurance Program Manual, Rev. 3.2, June 2011	Sect. 1

3.1.5 Responsibilities

Design-Bid-Build

The CRC Program Directors are ultimately responsible for the overall quality of the CRC project.

The Program Directors have assigned the responsibility of ensuring the development, establishment, implementation, and evaluation of the project's QA program to the CRC QA/QC Manager.

The CRC QA/QC Manager is responsible for:

- Ensuring that the project's QA program is established and maintained.
- Providing consultation and direction regarding quality issues to design and other project tasks.
- Monitoring the quality program implementation and evaluating adequacy and effectiveness.
- Coordinating the project's QA program with the consultants' QA/QC plans to ensure that CRC project quality policies are not compromised.
- Resolving conflicts regarding the intent of the QA program.
- Reviewing and approving consultants' and subconsultants' QA programs for compliance.

The CRC QA/QC Manager is provided with the complete organizational freedom to investigate quality-related activities in all areas of the project and to identify any quality problems. The CRC QA/QC Manager retains authority to control further design, investigations, and/or public input for nonconforming or deficient items or service until proper disposition has been obtained; to

initiate, recommend, or provide solutions; and to verify implementation of solutions. In matters of quality, the CRC QA/QC Manager will have complete and ready access to the Task Manager, Consultant Project Manager and the Program Directors.

Any decision made by the CRC QA/QC Manager regarding the applicability or interpretation of the QA program to consultants, subconsultants, or others who may work on the project is subject to review only by the Program Directors or a satisfactory representative appointed by them.

For construction activities under the DBB delivery method, there shall be a designated Construction Quality Control Manager who shall have overall responsibility for implementation of the construction portion of the project. The Construction QC Manager shall be responsible for implementing, monitoring, and adjusting the processes to ensure acceptable quality. The Construction QC Manager shall report directly to the Project Quality Manager, or Program Directors.

It is the responsibility of the Construction QC Manager to implement quality planning; oversee the QA testing and inspection; and coordinate with WSDOT, ODOT, TriMet, and any other Agency for verification testing, inspection, and Independent Assurance (IA) requirements, as applicable. All duties listed for the Project Engineer in Section 1 of the WSDOT *Construction Manual* shall be the responsibility of the Construction QC Manager or designee.

Design-Build

The Design-Builder shall provide quality management responsibility related to QA/QC activities for the DB delivery method in its QMP, which must meet the minimum requirements as described in Chapter 28 of the RFP.

3.2 Documented Quality Management System (Element 2)

3.2.1 Purpose

This section describes a documented quality management system that will ensure that project quality objectives are satisfied.

3.2.2 Scope

The quality management system described here applies to all project quality-dependent activities and participants.

3.2.3 Policy

Design-Bid-Build

The Quality Policy Statement requires the QA program to ensure that the expected level of quality is achieved. Implementation and documentation of the project's QA program is described throughout this QAM, and is described in greater detail within the QCP for control of quality during the design phase. This QAM describes in writing the policies, procedures, and instructions for elements of the QA program as required for a documented quality management system and indicates areas where consultants, subconsultants, and the DBB Construction

Contractor, for the DBB delivery method, are responsible for meeting requirements of the program.

The QA program for the CRC project consists of three elements, as follows:

1. The governing policies and general requirements specified in the PMP's Quality Assurance and Quality Control Section.

2. This CRC Quality Assurance Manual, which addresses the 15 elements identified in FTA's QA/QC Guidelines.

3. The CRC Quality Control Plan provides specific tools, policy, and procedures for consultant and agency staff.

In general, all QA program policies will comply with FTA QA/QC guidelines; quality-related requirements of the contract documents; quality-related WSDOT, ODOT, and TriMet (where transit related) requirements, and other documents or requirements as deemed necessary.

The responsible DBB Construction Contractor performing work under the DBB delivery method shall have a documented and approved quality management system that complies with this QAM.

The CRC Quality Assurance Program will be subject to an annual review, and this QAM will be evaluated by CRC upper management (Consultant Project Manager and Program Directors) to ensure adequacy and effectiveness of policies and personnel.

Design-Build

The Design-Builder is required to prepare a QMP that includes requirements and procedures for a quality management system that meets contract, ODOT, WSDOT, and TriMet requirements.

Requirements for quality management systems are provided in the RFP Contract Documents under Chapter 28, Quality Management Plan Requirements. See Table 3.2 for references that also include requirements for a documented quality management system.

Table 3-2. References – Requirements for a Documented Quality Management System

Topic	Manual	Location
Documented Quality Management System	WSDOT Design Build Quality Management Plan Requirements	RFP, Ch. 28
	FTA Quality Management System Guidelines, 2012	Sect. 2.2.2 and Ch. 3
	TriMet Quality Assurance Program Manual, Rev. 3.2, June 2011	Sect. 1

3.2.4 Responsibilities

Design-Bid-Build

The CRC QA/QC Manager's responsibilities are outlined in Section 3.1.5.

CRC personnel performing quality functions for design will be qualified by training and/or experience and will be subject to the approval of the CRC QA/QC Manager and/or the Program Directors.

Consultants are responsible for developing, implementing, and maintaining a QC plan that satisfies the requirements of their current contract documents. However, if they choose not to use the CRC project QAM and/or QCP, the consultants' QC plans must be in compliance with this QAM. If a consultant subcontracts a portion of the work, the accountability for the QC plan remains with the primary consultant. The primary consultant may, however, delegate responsibility for portions of the plan to the performing subconsultant, subject to approval by the CRC QA/QC Manager.

The DBB Construction Contractor is responsible for maintaining a quality management system process for construction activities, which shall be in compliance with this QAM.

The CRC QA/QC Manager is responsible for verification of all review procedures and disposition of quality issues.

Design-Build

The Design-Builder is responsible for the development, implementation, and maintenance of a QMP for work activities under contract that must be in compliance with the FTA's 15 elements as well as ODOT, WSDOT, and TriMet requirements. It is the responsibility of the Design-Builder to ensure that only trained and experienced personnel perform the quality functions of the construction activities.

3.3 Design Control (Element 3)

3.3.1 Purpose

This section describes the requirements for the establishment and maintenance of procedures to control and verify design and design changes for DBB packages, and to ensure that design criteria and requirements of the relevant regulatory agencies are met. Design control activities more specific to control of design quality are detailed in the QCP.

3.3.2 Scope

The CRC QCP identifies the individuals responsible for design and quality , identifies the design criteria to be used as well as the verification process to assure the use of these elements.

These requirements apply to all transportation activities conducted within the CRC office and the off-site offices of any consultant or subconsultant.

The design control element applies to all major categories of work including:

- Street and highway activities
- River crossing
- Transit activities

- Structures
- All other transportation activities

3.3.3 Policy

Design-Bid-Build

All design consultants and subconsultants performing under DBB packages are required to conform to this QAM and the QCP and to govern their work in accordance with this QAM.

Design-Build

The Design-Builder shall include measures and objective evidence to ensure that appropriate quality standards are specified and included in the design documents and Released for Construction (RFC) documents, and to control deviations from the standards. The Design-Builder shall include design control elements in its QMP according to requirements of the contract, and of ODOT, WSDOT, and TriMet, and other relative Agency.

3.3.4 Procedures

Design-Bid-Build

Design control quality procedures are located in the QCP Chapter 4 – Design Review. Procedures for design control activities involving light rail transit (LRT) can be found in the PMP, Chapter 12 – LRT Design. Design control for highway design is located in the PMP, Chapter 13 – Highway Design.

Design changes that occur after RFC document acceptance shall have a notification of impending design change and shall be distributed in accordance with Section 14.3.5.4, Design Revisions Following Issuance of RFC Documents, of the PMP. Any design change must have a formal quality review in accordance with this QAM and the QCP. The DBB Construction Contractor will not construct any items affected by the identified changes until after the updated plans have been received 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 the QCP.

For each release of a plan or special provision, the sequential number of the release and the date it is released shall be provided by Document Control and tracked accordingly. Procedures for the controlling of design changes can be found in the PMP Chapter 3 – Management Control, Section 3.6.4.1, Design Change Control.

Design-Build

The Design-Builder shall include processes for design control in its QMP that must meet the requirements of the contract, ODOT, WSDOT, TriMet, and FTA's 15 QA/QC elements. Design control includes ensuring that the design requirements are understood, that planning and scheduling the design interfaces and the design verification activities, executing the design verification activities, and controlling design changes will be managed through project

completion. References providing minimum requirements for design control can be found in Table 3-3.

Table 3-3. References – Minimum Requirements for Design Control

Topic	Manual	Location
Design Control	WSDOT Design Build Quality Management Plan Requirements	RFP, Ch. 28
	FTA Quality Management System Guidelines, 2012	Sect. 2.2.3
	TriMet Quality Assurance Program Manual, Revision 3.2, June 2011	Sect. 3

3.3.5 CRC Quality Assurance

Design-Bid-Build

The CRC QA/QC Manager will perform audits and/or surveillance of the design QC process to verify that the QCP has been implemented. QA activities will include sampling design documents for adequacy, completeness, and compliance with relevant agency standards. QA staff will also examine the consultants' QC documentation to verify that the QC records are complete and that design criteria and requirements of relevant regulatory agencies have been verified.

Design-Build

QA procedures provide assurance that all materials, equipment, and elements of work have been provided for and designed to perform satisfactorily for the purpose intended. The Design-Builder will develop procedures for QA that describe the process for verifying QC of all plans, calculations, special provisions, drawings, and other items to ensure that they are independently checked and back-checked by experienced professionals, in accordance with generally accepted practices. The Design-Builder shall include QA procedures related to design control in its QMP.

3.3.6 Responsibility

Design-Bid-Build

The Task Managers are responsible to communicate with staff regarding design requirements and to develop, implement, and maintain procedures to control and verify the design in order to ensure that the design criteria, other specific requirements, and requirements of the relevant regulatory agencies are met. This includes internal QC review of deliverables according to the requirements of the QCP and this QAM. The Task Managers will designate staff responsible for review of designated deliverables.

In addition, Task Managers will participate to the extent necessary in reviews by CRC project team members exterior to the task groups (departments of transportation, etc.) and in reviews performed by outside entities, such as those required by the contract.

Design-Build

The Design-Builder is responsible for development of design requirements and procedures as well as for a process for verification of those procedures. Design control procedures must meet the requirements of the contract, ODOT, WSDOT, TriMet, and other jurisdictions as appropriate.

3.4 Document Control (Element 4)

3.4.1 Purpose

Procedures for control of project documents and data are established and maintained in the Document Control Plan of the PMP. The document control measures for controlled documents ensure that all relevant documents are current and available to all users who require them.

Controlled documents are key documents that are either developed internally or acquired from external sources and used as authoritative references during the development of design and construction of the CRC project.

3.4.2 Scope

The procedures for control apply to all third-party reference and project documents prepared by agency staff, consultants, off-site subconsultants, and the DBB Construction Contractor that are subject to a quality review. Document control for reference manuals, project work papers, and official project files are addressed in the PMP in Section 3.7.3, Records Management; 3.7.3.1(a), Reference Material; 3.7.3.1(b), Project Work Papers; and 3.7.3.1(c), Official Project Files.

3.4.3 Policy

Design-Bid-Build

Controlled documents are subject to controlled distribution to ensure that changes and updates are made in a systematic manner, and that all parties are working from the latest version of the documents. Individual discipline-specific managers are responsible for identifying project-specific documents that require controlled distribution. Each discipline is responsible for following the established document control procedures as defined in the PMP, Section 3.7.2, Controlled Documents, and this QAM.

All quality-reviewed project documents, including third-party reference documents, will be controlled in accordance with established document control procedures defined in the CRC PMP and the QCP. Quality assurance measures will be used to verify conformance as outlined in Section 3.2.

Design-Build

The Design-Builder shall provide an established policy for systematic control of documents in its QMP.

3.4.4 Procedure

Design-Bid-Build

Each discipline is responsible for following established document control procedures as defined in the PMP.

Within each discipline, the discipline-specific Task Managers are responsible for developing and issuing documents that are either developed internally or acquired from external sources, and that require controlled distribution for their respective discipline and related sub-disciplines. In accordance with the established document control procedures within the PMP, the author of each CRC-issued controlled document, under the direction of the discipline-specific Task Manager, defines the appropriate distribution and revision for that document or record. The discipline-specific task managers are each responsible for defining the distribution list, including a list of official electronic copies and printed copies, if applicable.

The discipline-specific task manager overseeing the distribution of a controlled document (whether prepared on-site or by off-site consultants) is responsible for any necessary updates, approvals, and subsequent redistribution of that controlled document, and for transmitting updates to Document Control (with the exception of engineering design drawings). All updates must be approved according to the QC requirements for that particular document.

Controlled documents prepared by consultants, subconsultants, and/or the DBB Construction Contractor shall be prepared in accordance with CRC requirements and procedures, which can be found in PMP Section 3.7.2, Controlled Documents, and approved or accepted by the responsible discipline-specific task manager. The discipline-specific Task Manager is responsible for distribution of these controlled documents, and for transmitting them, including any updates, to Document Control (with the exception of engineering design drawings).

Design drawings produced for DBB packages are designated as controlled documents and will be maintained by the CRC CAD Manager in ProjectWise.

Creation of controlled documents should follow procedures found in the Controlled Documents section of the PMP. To initiate an update to an existing controlled document and to distribute the updated document, the following procedures should be followed:

1. The Task Manager shall confirm with Document Control that the current version of the document that is intended to be updated and distributed is, in fact, the most recent version.

2. Once the updates have been completed and the document has undergone the required quality review process, the Task Manager shall then distribute the updates to the discipline and provide them to Document Control.

3. Document Control will file the controlled documents and their updates (with the exception of engineering design drawings) in the Controlled Documents folder under CRC on the G drive. Obsolete documents are placed in the obsolete folder and the pdf is stamped “VOID” in Adobe.

4. Document Control is responsible for the coding of controlled documents and their updates into the document control electronic system, Prolog. In the deliverable packages section, the following information is included:
    a. Document title and number
    b. Revision number and date
    c. Responsible document author
    d. Distribution list (electronic and physical)
5. Document Control will produce a report that lists updated documents from Prolog and distribute the report monthly to discipline-specific task managers. Discipline-specific task managers will be responsible for verifying the accuracy of these reports.

The same controlled updating and distribution procedures apply to externally issued reference documents that are used in the development of the CRC design and during construction, and that are designated as controlled documents.

Project quality reviews are also considered part of the project record, and therefore a series of document control measures shall be followed to ensure the integrity and accessibility of hard copy and electronic document reviews. For procedures regarding document control of quality-reviewed documents, see the QCP, Section 5.

All quality-reviewed documents, drawings, specifications, reports, cost estimates, and calculations must incorporate appropriate file codes in accordance with the project's standard file code system. Completed quality documents shall be filed electronically in the "QC Documents" folder of the "Work paper" CRC electronic file directory or a hard copy shall be placed in the project office as a record of the QC 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. These documents may not be purged until approved by the Business Manager or Program Director(s).

The project document control system and consultants' document and drawing control systems (including the project document control system of the DBB Construction Contractor) will be subject to review by the CRC QA/QC Manager at any time.

Design-Build

A document control system to establish processes for the systematic control of documents shall be developed for the project by the Design-Builder and outlined in the QMP. Following are examples of the types of documents requiring control:

- Drawings
- Specifications
- Inspection procedures
- Test procedures
- Special work instructions

- Operational procedures
- Project Management Plans
- Risk and Contingency Management Plans
- Real Estate Acquisition Management Plans
- Quality Assurance Manual
- Rail and Bus Fleet Management Plans
- Safety and Security Management Plans
- Shop drawings
- RFI's
- As-builts
- Repairs
- Non/conformance Reports (NCR's)
- Field records
- Contract change documents (change orders)

Table 3.4 below, is a partial list of the references that provide the requirements of a document control system. The DB QMP document must meet the requirements of the RFP document.

Table 3-4. – Requirements for Document Control System

Topic	Manual	Location
Document Control	FTA Quality Management System Guidelines, 2012	Sect. 2.2.4
	TriMet Quality Assurance Program Manual, Rev 3.2, June 2011	Sect. 4

3.4.5 Responsibility

Design-Bid-Build

Within each discipline, the discipline-specific Task Managers are responsible for developing and issuing documents in accordance with established document control procedures found in the Controlled Documents section of the PMP. Once an original document or an updated document is provided to Document Control, it is the responsibility of Document Control to file and record the document into Prolog.

It is the responsibility of the Design Quality Manager or Task Manager to ensure that the established quality review process was completed and to confirm that the quality review document was filed in the proper location.

The DBB Construction Contractor is responsible for developing and conforming to a document control system in compliance with this QAM and the PMP for documents produced during construction activities.

Design-Build

The Design-Builder shall accept sole responsibility for the documentation of all its work activities that meets the requirements of the project as described in the RFP.

3.5 Purchasing (Construction Only) (Element 5)

3.5.1 Purpose

The purpose of this element is to ensure that during construction, purchasing requirements are clear and complete, that the suppliers of the Construction Contractor(s) understand them, and that appropriate quality elements are made part of the purchasing contract. Additional requirements, such as on-site inspection and handling and receiving procedures, may be required.

3.5.2 Scope

A documented list of acceptable suppliers and contractors will be established for many of the desired service or product on the projects, consistent with applicable purchasing requirements. On WSDOT and ODOT projects, specific suppliers and contractors may not be specified, but products to be used for those projects must meet current agency materials requirements. Suppliers or contractors will be selected, in part, on the basis of their being able to meet contract requirements, including quality requirements. The quality requirements will depend upon the nature of the service or product provided by the supplier or contractor, and the minimum requirements must be initially provided in the RFP package and must be met before a contract or purchase order can be issued. Other construction materials required for the projects must meet applicable agency's construction program quality requirements specified in their Contract.

3.5.3 Policy

Design-Bid-Build

The DBB Construction Contractor shall have permanent materials approved prior to purchase or use for construction. The DBB Construction Contractor shall notify the engineer of all proposed materials. If involving WSDOT, the Contractor shall use the Qualified Product List (QPL), the Aggregate Source Approval (ASA) Database, or the Request for Approval of Materials (RAM) form (WSDOT Form 350-071). For ODOT purchasing requirements, refer to Table 3.5 which provides the location on where to find the purchasing requirements for ODOT work activities. For any transit components, FTA and TriMet requirements for purchasing must be adhered to.

All equipment, materials, and articles incorporated into the permanent work:

1. Shall be new, unless the Special Provisions or *Standard Specifications* permit otherwise;
2. Shall meet the requirements of the contract and be approved by the engineer;
3. May be inspected or tested at any time during their preparation and use; and
4. Shall not be used in the work if they become unfit after being previously approved.

Design-Build

A purchasing policy for the DB delivery method will be included in the Design-Builder's QMP and must meet the requirements of the contract, ODOT, WSDOT, TriMet, and other jurisdictions as applicable.

3.5.4 Procedure

Design-Bid-Build

Before use for construction, all permanent equipment and materials shall be proposed to the Engineer and approved. The DBB Construction Contractor shall use the QPL for supply and materials, where applicable. Both ODOT and WSDOT have their own lists which are maintained and are to use the most recent version available at the time of Award for the Project. For WSDOT, other options include the ASA Database, or the RAM form (WSDOT Form 350-071). The QPL is a listing of manufactured products that have already been evaluated and determined suitable for use in highway construction. The QPL identifies the approved products, the applicable specification section, and the basis for acceptance at the project level. The use of listed products shall be restricted to the standard specification for which they are listed and fulfillment of the acceptance requirement defined in the QPL. For equipment and materials for transit, purchasing requirements must adhere to FTA and TriMet requirements. Further information on these requirements can be found in the reference documents provided in Table 3.5.

Qualified products not conforming to the specifications or not fulfilling the acceptance requirements, or that are improperly handled or installed, shall be replaced at the DBB Construction Contractor's expense.

If the material is not listed in the QPL, the purchasing documents should be reviewed and approved by the Engineer or the Project Delivery Director for adequacy of specified requirements prior to release by submitting a RAM form. The DBB Construction Contractor should ensure that the supplier fully understands the contract, agrees with the contract, and has the capacity to perform as required.

The quality of materials used on the project will be evaluated and accepted in various ways, whether by testing of samples, visual inspection, or certification of compliance. Requirements for materials are further described in the references provided in Table 3.5.

The contract between the DBB Construction Contractor and the supplier should specify the right of the purchaser or other authorized CRC representatives to carry out inspection and testing at the source and upon receipt to verify that the work or product meets specifications. Such provision should not absolve the supplier of the responsibility to provide acceptable work or product, nor should it preclude subsequent rejection of the work or product.

Design-Build

WSDOT has requirements in place for the purchasing of materials and equipment for use on its projects. Please refer to the table below for the various agency requirements for purchasing. Procedures shall be as specified in the Design-Builder's approved QMP.

Table 3-5. References – Agency Requirements for Purchasing

Topic	Manual	Location
Purchasing	WSDOT Standard Specifications M 41-10, 2012	1-06, 1-05, 5-01.3(2), 6-13.3(2)1, & 9
	WSDOT Construction Manual M 41-01.14, Jan. 2013	Chapter 1-2.8C(3), 1-3.4, & 9
	ODOT Construction Manual, June 2012	Chapter 12B
	ODOT Manual of Field Test Procedures, 2010	Sect. 4D
	ODOT Standard Specifications, Vol. 1, 2008	00150.37, 00160.01, 00160.05, 00160.10, & 00160.20
	FTA Quality Management System Guidelines, 2012	Sect. 2.2.5

3.5.5 Responsibility

Design-Bid-Build

It is the responsibility of the DBB Construction Contractor to ensure that the materials and equipment used during the construction of the project meet agency requirements and product specifications, and the DBB Construction Contractor should have sufficient evidence that the product (materials or equipment) has been inspected and tested and is suitable for use.

Design-Build

The Design-Builder shall be responsible for the quality of construction and materials incorporated into the project. The Design-Builder's QC measures are intended to ensure that operational techniques and activities provide construction and material of acceptable quality.

3.6 Product Identification and Traceability (Element 6)

3.6.1 Purpose

This section describes the policy and procedures for the identification and traceability for documents, drawings, specifications, reports, cost estimates, and calculations that are created during the design process for the CRC project. Detailed standard document control procedures are established within the PMP.

Product identification and traceability in regards to construction materials and documents includes all materials, parts, components, equipment, and products, including partially fabricated or assembled components, produced for incorporation into the CRC project. For DBB method, the DBB Construction Contractor shall follow the requirements provided in this QAM and applicable agency policies and manuals and guidelines. The policy and procedure for identification and traceability for the DB delivery method will be established and maintained by the Design-Builder for identifying and controlling items of production (batch, materials, parts, and components) to prevent the use of incorrect or defective items and to ensure that only correct and acceptable items are used or installed. These measures should be included in the Design-

Builder's QMP and should meet the requirements of WSDOT, ODOT, TriMet, and the FTA's 15 Elements.

3.6.2 Scope

These requirements apply to all documents, drawings, specifications, reports, cost estimates, calculations, equipment, and materials, either created or used, for the CRC project.

3.6.3 Policy

Design-Bid-Build

Procedures for product identification and traceability for the engineering design phases are established within the CRC PMP in Section 3.7.2, Controlled Documents, and shall be followed during all stages of design to ensure that project documents, drawings, specifications, reports, cost estimates, and calculations are correct and easily traced by leaving an auditable trail.

For construction work, CRC contract documents and procurement specifications will, as applicable, contain requirements for control of materials. Procedures for product identification and traceability will be established to aid in the control of materials, to ensure that only correct and acceptable items are used, and to prevent the use of incorrect or defective items.

Physical identification and control of individual elements will be used to the extent possible. Where physical identification is impossible, other appropriate means outlined in agency construction materials requirements will be used. Inspection personnel will verify and document that items are identified properly. Documentation of identification and traceability activities is to be retained.

Design-Build

The Design-Builder must establish a policy to control the identification and traceability of materials and documents during construction in accordance with ODOT, WSDOT, TriMet, and FTA requirements. This policy shall be identified in the DB Contractor's QMP.

3.6.4 Procedures

Design–Bid-Build

Physical identification and traceability shall be incorporated into submittal documents, reports, cost estimates, and calculations through one or more of such means including: job number, deliverable identification number, identification markings (submittal name, date, etc.), and/or serial number. The contract, once approved, shall provide the required identification numbers that the Task Manager or Task Lead will reference on all submittal documents. The Controlled Documents and Design Criteria sections within the PMP indicate how to acquire an identification number (i.e., deliverable identifier) and list the requirements for the submittal format.

Equipment that is used to collect data for the design process shall have an identification number or serial number that shall be referenced in all reports and documents relating to that equipment. Physical identification and control will be used to the most reasonable extent possible. Where physical identification is impractical, other appropriate means, such as physical separation of products, will be used. The respective states' Department of Transportation (DOT) Headquarters, TriMet, and FHWA may complete surveillance of the process to verify conformance to this procedure.

Where possible, materials and equipment being used for construction of the CRC project shall reference some form of identification through means of a job number, identification markings, and/or serial number that can be referred to through an auditable trail. These markings shall be identified upon receipt of the material to verify that the material is correct and acceptable. Storage of the material shall be done so that there is:

- Protection from damage, deterioration, and loss;
- Inspection and maintenance during storage and handling;
- Utilization of special storage and handling facilities, as required; and
- Labeling with expiration dates for perishable items, or "Use By" dates.

Material records must be developed and maintained to document the identification of materials and traceability to the location where the materials are incorporated into the work. All material and each piece of equipment or element of work will be documented to indicate whether the material has been accepted. To preclude inadvertent bypassing or duplication of such inspections and tests, the items will be identified either when they have satisfactorily passed required inspections and tests or upon acceptance when the materials are delivered to the job site.

Products for construction will be verified by the Engineer to ensure the product is correct and acceptable and in conformance with CRC, FTA, and jurisdictional requirements.

For further direction on product identification and traceability, specifically agency and TriMet requirements, refer to Table 3.6, which lists the reference documents and the location of those requirements.

Design-Build

The Design-Builder must develop and establish procedures to control the identification and traceability of materials and documents during construction. Reference documents that provide the minimum requirements for this element can be found in Table 3.6, below.

Table 3-6. References – Minimum Requirements for Product Identification and Traceability

Topic	Manual	Location
Product Identification and Traceability	WSDOT Standard Specifications M 41-10.14, 2013	Sect. 1-06
	WSDOT Construction Manual M 41-01.14, Jan. 2013	Chapter 1, 9-1, 9-2, 9-3, 9-4
	ODOT Manual of Field Test Procedures, 2010	Section 2 QA Program
	TriMet Quality Assurance Program Manual, Revision	Sect. 2.2.6

Topic	Manual	Location
	3.2, June 2011 (Rails, systems, etc.)	
	FTA Quality Management System Guidelines, 2012	

3.6.5 Responsibility

Design-Bid-Build

It is the responsibility of the Task manager to ensure that all submittal documents include a deliverable identification number and that the format conforms to the procedures established within the PMP to allow for efficient tracking and provide a clear-cut audit trail. It is the Task manager's responsibility to verify with lower-tier consultants that each of them has an established QA/QC plan and that equipment used to collect data during the design process correlates to the equipment identifier provided on the test, report, or document.

It is the responsibility of the DBB Construction Contractor to ensure that all equipment, materials, and components used for construction of the project meet the applicable agency requirements of this element.

Design-Build

It is the responsibility of the Design-Builder to establish a policy and procedures for this element that meet the applicable requirements of ODOT, WSDOT, TriMet, and the FTA.

3.7 Process Control (Construction Only) (Element 7)

3.7.1 Purpose

This section briefly describes the policy in place to identify and plan the production and installation of special processes during construction. Further policy and procedures for this section can be found in the references provided in Table 3.7.

3.7.2 Scope

The process control requirements apply to all special processes, including but not limited to, welding, heat treatment, cleaning, coating, non-destructive examination and testing, production, repairs, erection procedures, disposal of contaminated materials, and installation processes during construction. This element applies to all materials, parts, components, equipment, and products, including partially fabricated or assembled components, produced for incorporation in the project by qualified personnel in the field.

3.7.3 Policy

Design-Bid-Build

An established plan is required for the control of special processes. Production and installation processes during construction that directly affect quality must be in place to ensure that these processes are performed under controlled conditions.

Design-Build

Policy controlling the special process control will be established within the DB QMP and will apply to all parts, components, equipment, and services specified in the approved contract documents. The policy will be implemented to ensure that special process control requirements are defined with appropriate engineering standards and codes established in the approved drawings, plans, and contract documents. This policy shall be defined in the Design-Builder's QMP.

3.7.4 Procedure

Design-Bid-Build

Special processes will be controlled and accomplished by qualified personnel using approved procedures and/or instructions in accordance with applicable codes, standards, or specifications, and as specified by contract. See Table 3.7, which provides the reference documents in which these requirements can be found. Records of procedure qualification as well as personnel qualification and certification are to be maintained in project files in accordance with agency document control procedures. Operations and maintenance procedures for equipment will be required as a deliverable in each procurement contract. Special process work plan and personnel certifications must be approved before the start of any work related to that process.

Continuous monitoring of and conformance with agency-documented procedures are required during special processes, such as welding, non-destructive testing, and heat treatment, where the results will impact quality of the final product, but where inspection after the fact will not reveal the deficiencies.

Design-Build

The Design-Builder will provide, in its QMP, procedures that address the following:

- Identification of special processes
- Special process production procedures and instructions in accordance with applicable codes, standards, specifications, and drawings
- Testing procedures and acceptance values
- A work plan for special process products or installation of those products that provides for an appropriate work sequence, suitable working environment, and appropriate equipment.
- Appropriate certifications for special process production procedures
- Appropriate qualifications and certifications for personnel performing or inspecting special processes
- Equipment warranty requirements

Table 3.7 provides a list of documents and locations of where to find the requirements for process control for each agency.

Table 3-7. References – Requirements for Process Control (Construction Only)

Topic	Manual	Location
Process Control	WSDOT Standard Specifications M 41-10.14, 2013	Sect. 1-06
	WSDOT Construction Manual M 41-01.14, Jan. 2013	Chapter 1, 9-1, 9-2, 9-3, 9-4
	ODOT Manual of Field Test Procedures, 2010	Section 2 QA Program
	TriMet Quality Assurance Program Manual, Revision 3.2, June 2011 (Rails, systems, etc.)	
	FTA Quality Management System Guidelines, 2012	Sect. 2.2.6

3.7.5 Responsibility

Design-Bid-Build

It is the responsibility of the DBB Construction Contractor to ensure that the procedures and policies for process control meet the applicable agency requirements for this element and that they are adhered to.

Design-Build

The Design-Builder and suppliers are responsible for performing special processes and special inspection in accordance with their contract documents and their QMPs.

3.8 Inspection and Testing (Element 8)

3.8.1 Purpose

Procedures and policies are required during design and construction for implementing and controlling inspection and testing activities to verify conformance to contract requirements and adherence to this QAM.

3.8.2 Scope

Inspections (i.e., quality control reviews with respect to design documents) and testing requirements apply to all project documents, drawings, specifications, reports, cost estimates, and calculations. Further details regarding inspection and testing of documents can be found in the CRC QCP.

All equipment, materials, and products delivered to the project site shall be inspected, marked, and tracked in accordance with this QAM and applicable agency requirements to ensure that only acceptable materials are used and that any rejected materials are removed from the project site.

3.8.3 Policy

Design-Bid-Build

All submittal documents shall have a formal QC review and shall provide evidence of such review according to the procedures found in the CRC QCP. Quality control reviews are monitored and audited routinely to ensure that they have been performed correctly and are in conformance with the CRC QCP.

All equipment used to collect data during the design phase must have records of all inspections and tests, which must be in compliance with the requirements of AASHTO R-18.

Applicable agency policies for inspection and testing for construction-related activities are implemented by the DBB Contractor in its QMP and monitored by FHWA, WSDOT, ODOT, and TriMet.

Design-Build

The Design-Builder will include a policy for inspection and testing under the DB delivery method within its QMP, and such policy must meet the requirements of ODOT, WSDOT, TriMet, and the FTA, as applicable.

3.8.4 Procedures

Design-Bid-Build

Procedures for QC reviews and audits for design are established and are covered in depth in the CRC QCP. All consultants are required to include procedures for QC reviews and audits thereof in their QC plans.

Audits are documented, and the documentation is stored electronically in the CRC project files for project record as a test of the quality review (inspection) process.

Any consultant that provides services using equipment is required to have a QC plan that includes thorough inspection and testing procedures for that equipment and that provides assurance that the inspections and tests will be performed according to contract requirements and standard industry practice.

For activities regarding construction components, daily inspection reports should be completed to document that construction practice, finished work, and sampling and testing meet the requirements of this QAM, as well as applicable ODOT, WSDOT, TriMet, and FTA requirements.

Quality sampling and testing will be performed in accordance with applicable agency requirements at random in accordance with a testing plan created for the project for each material item. The testing plan shall identify the frequency, location for testing, test procedures, attributes to test, material acceptance requirements, Sampling Plan developed using the applicable agency's process for Sampling, Testing and/or random number generator, as well as project quantity. The testing plan shall be submitted prior to the beginning of construction. The testing plan shall be submitted to the Engineer and tracked by the DBB Construction Contractor in accordance with contract requirements before placement of the material on the project.

Daily inspection reports meeting applicable agency requirements shall be created and maintained by the Engineer. Each inspection report will contain, at a minimum, each work activity that has been inspected. These reports are a part of the project file and should be available for verification.

The DBB Construction Contractor shall schedule regular documentation reviews to ensure that documentation and certification for all materials are complete before the material is installed on the project.

For construction work performed on WSDOT and ODOT projects, formal materials documentation reviews will be performed periodically during construction in accordance with the agency policies and practices. These reviews are intended to ensure that the DBB Construction Contractor is maintaining all necessary materials documentation and records. ODOT and WSDOT will also perform a final review at the completion of the project to verify compliance with all project requirements for the materials used.

Additional requirements and procedures for inspection and testing related to construction materials and equipment that are not included in this section are provided in agency documents listed in Table 3.8, below, and are considered to be requirements of this project.

Design-Build

The Design-Builder shall provide procedures for inspection and testing that meet the requirements of the contract, WSDOT, ODOT, TriMet, and the FTA. Table 3.8 provides the reference documents that include the requirements of WSDOT, ODOT, and the FTA.

Table 3-8. References – Requirements for Inspection and Testing

Topic	Manual	Location
Inspection and Testing	WSDOT Standard Specifications M 41-10.14, 2013	Sections 6-02.3(5), 9
	WSDOT Construction Manual M 41-01.12, Jan. 2012	Chapter 4-2.6, 5-2, 5-4, 5-5, 6-2, 6-3, 8-1, 8-2, 8-20, 8-21, & 9
	ODOT Construction Manual, June 2012	Chapter 23
	ODOT Standard Specifications Vol. 1, 2008	Sect. 00165-00165.04, 00165.10, 00165.20, 00165.30, 00165.35, 00165.50
	ODOT Manual of Field Test Procedures, 2010	Section 4D
	TriMet Quality Assurance Program Manual, Revision 3.2, June 2011 (Rails, systems, etc.)	Sect. 2.2.8
	FTA Quality Management System Guidelines, 2012	

3.8.5 Responsibility

Design-Bid-Build

It is the responsibility of the QA/QC Manager to monitor the project's adherence to the QCP and to provide oversight of the quality activities during construction. It is the Design Quality Manager's responsibility to assist the Task Manager in coordinating the quality control of the design and drafted products prepared by the Designers and Technicians.

The consultant and/or Task Lead is responsible for determining the required inspections and tests for equipment that is used during the design phase.

The DBB Construction Contractor is responsible to adhere to this QAM and also to provide a testing plan and maintain the inspection reports in conformance to the policy and procedures for

inspection and testing as outlined in the applicable WSDOT, ODOT and/or FTA/TriMet program guidelines referenced in Table 3.8, above.

Design-Build

The Design-Builder will include in its QMP the responsibility for activities pertaining to inspection and testing as specified in their contract.

3.9 Inspection, Measuring, and Test Equipment (Element 9)

3.9.1 Purpose

Inspection, measuring, and test equipment required to carry out inspection and testing should be identified, controlled, calibrated, and maintained in order to demonstrate the conformance of work to the specified requirements. Provisions should be made for recalibration of such equipment in a timely manner.

This section describes the requirements for controlling the performance of inspection, measuring, and testing equipment, such as instruments used for collection and testing of survey, geotechnical, and air quality data, as well as equipment used during construction.

3.9.2 Scope

These requirements apply to all inspection, measuring, and testing equipment used for determining the quality of materials, equipment, parts, components, and services for the project. This includes, but is not limited to, equipment for survey, geotechnical sampling, air quality measuring, and equipment used during construction on this project, all of which must be in compliance with applicable WSDOT, ODOT, FTA and industry guidelines.

3.9.3 Policy

Design-Bid-Build

The DBB Construction Contractor, as well as off-site subconsultants, suppliers, and subcontractors, are subject to the applicable WSDOT, ODOT and FTA requirements to include an inspection, measuring, and testing equipment policy, for all equipment maintained by them, in their QC plans or QMP, respectively, which must be approved by the CRC QA/QC Manager.

All survey equipment used on this project will be properly maintained and shall meet or exceed industry inspection and testing standards. A record of calibrations, previous inspections, and test results shall be maintained and filed according to project standards and should be readily available for a surveillance audit. Any equipment without such records or that does not meet the manufacturer’s specifications will not be accepted for use on this project.

Inspection and measuring of test equipment used for construction shall meet the requirements of WSDOT, ODOT, and the FTA. These requirements are included in the documents listed in Table 3.9.

Design-Build

The Design-Builder shall include the policy for inspection, measuring, and test equipment in its QMP.

3.9.4 Procedures

Design-Bid-Build

All consultant equipment used to obtain CRC design data must be maintained and have inspection, measuring, and test equipment procedures defined in the consultants' QC plans, which must be approved by the CRC QA/QC Manager.

Survey equipment shall be calibrated in accordance with the applicable agency's current survey equipment guidelines and policies.

Field survey crews are to provide the collected electronic field data and copies of the field notes to the office survey technicians, together with any photographs and other supporting information. The survey technicians will process the field data into lines, points, blocks, and terrain model information.

The survey technicians will fill out a processing log with the following information:

- The field file name
- A description of the work
- The field book number and page number
- The technician's initials and date that the survey data was processed
- Point numbers generated
- Any additional comments or field notes addressing or clarifying unusual or unexpected conditions or areas of conflicts or concern

The processing log and backup information for each field file (field notes, photographs, etc.) will be filed with the project records.

The Engineer is responsible for the inspection, testing, and measuring of all equipment, field samples, and equipment used on the job site. All measuring and testing devices shall be checked to evaluate the working order, condition, calibration, and certification of the equipment. The calibration verification of all testing equipment will meet the applicable agency's requirements and the calibration records shall be maintained in an organized manner and be made available upon request by the Construction QA Manager or CRC QA/QC Manager. Inspection and testing procedures shall follow applicable agency procedures for all work requiring acceptance tests in accordance with agency and/or local jurisdiction requirements.

Further procedures with regard to inspection, measuring, and test equipment for construction activities are provided in Table 3.9, which includes references to the documents that provide the requirements. These requirements must be adhered to and will be monitored for compliance by the CRC QA/QC Manager.

Design-Build

The Design-Builder is responsible for the inspection, testing, and measuring of all equipment, field samples, and equipment used on the job site. Procedures shall be established for the inspection and testing for all work requiring acceptance tests in accordance with AASHTO, ASTM, and/or local jurisdiction requirements and included in the Design-Builder's QMP.

Table 3-9. References – Requirements for Inspection, Measuring, and Test Equipment

Topic	Manual	Location
Inspection, Measuring, and Test Equipment	WSDOT Standard Specifications M 41-10.14, 2013	Sect. 1-05, 5-01.3(1), 6-02.3(10), 6-02.3(26), 6-03.3(33), 6-05.3(9), 6-07.3(8), 6-09.3(1), 9
	WSDOT Construction Manual M 41-01.12, Jan. 2012	Ch. 5-2.2, 5-4.2, 5-5.6, 6-02.2, 6-02.3, 6-03.3, 9
	ODOT Standard Specifications Vol. 1, 2008	Sect. 00165-00165.04, 00165.10, 00165.20, 00165.30, 00165.35, & 00165.50
	ODOT Manual of Field Test Procedures, 2010	Section 2
	FTA Quality Management System Guidelines, 2012	Sect. 2.2.9

3.9.5 Responsibility

Design-Bid-Build

It is the responsibility of the Task Lead to ensure that inspection, measuring, and testing equipment is performed in accordance with applicable agency requirements, is properly maintained, and that evidence of testing and maintenance is readily available.

It is the responsibility of the DBB Construction Contractor to ensure that all equipment used during construction is properly maintained and inspected in accordance with the equipment specifications and industry standards, as well as any agency contract requirements.

Design-Build

The Design-Builder shall include responsibility for inspection, measuring, and test equipment in its QMP and contract requirements.

3.10 Inspection and Test Status (Element 10)

3.10.1 Purpose

This section briefly describes the policy and procedures for identifying the inspection and test status of work during production and installation.

3.10.2 Scope

The requirements below include planning and design documents, as well as construction components.

3.10.3 Policy

Design-Bid-Build

Suitable work products, including materials used for installation during construction, should show evidence of successful testing and inspection, as prescribed by WSDOT, ODOT, and FTA, as applicable. These products should be identified by means of markings, stamps, tags, labels, routing cards, inspections records, test software, physical location, or other suitable means. The status identification indicates the conformance or nonconformance with regard to inspections and tests performed.

The DBB Construction Contractor must be in compliance with the applicable agency requirements and will be monitored by agency staff for adherence to these requirements.

Design-Build

Policies for inspection and test status of construction materials will be the responsibility of the Design-Builder, and will be included in the Design Builder's approved QMP.

3.10.4 Procedure

Design-Bid-Build

All work products and construction components should follow the requirements of Section 3.6, Product Identification and Traceability, and have evidence of inspection with a successful result. Design documents shall use the stamp process as provided in the QCP, Section 4.2, as evidence of acceptable review.

The status of completed, tested, and inspected construction components should be kept as an ongoing record in the daily inspection reports. Nonconforming materials or construction components should be recorded, with the location noted on inspection reports or nonconformance reports as applicable. Any product or equipment that is not in conformance should not be used.

Further procedures for inspection and test status for construction can be found in the list of documents provided in Table 3.10. These procedures are considered requirements of the project and must be adhered to.

Design-Build

The Design-Builder will include procedures for inspection and test status meeting contract requirements in its approved QMP. Requirements for this element are provided in the documents listed in Table 3.10, and the Design-Builder shall be monitored for compliance with these requirements.

Table 3-10. References – Requirements for Inspection and Test Status

Topic	Manual	Location
Inspection and Test Status	WSDOT Standard Specifications M 41-10.14, 2013	Sect. 1-05.9, 1-06, 6-02.3(28)H, 9
	WSDOT Construction Manual M 41-01.12, Jan. 2012	Ch. 1-2.2K(1), 1-3, 5-1.2, 9, 10
	ODOT Construction Manual, June 2012	Chapter 12 B-C

Topic	Manual	Location
	ODOT Manual of Field Test Procedures, 2010	Sect. 2 & 4D
	ODOT Standard Specifications Vol. 1, 2008	Sect. 00165

3.10.5 Responsibility

Design-Bid-Build

It is the Task Manager's responsibility to make sure the quality process has been completed for design documents, in conformance with the QAM and QCP.

The CRC QA/QC Manager is responsible for ensuring that design documents have evidence of a formal quality review.

The DBB Construction Contractor is responsible for all construction components and evidence of quality inspections and related test reports meeting contract requirements. The CRC QA/QC Manager is responsible for auditing the DBB Construction Contractor's records for inspections and test result reporting.

Design-Build

The Design-Builder will include responsibility for inspection and test status in its QMP in accordance with the contract requirements.

3.11 Nonconformance (Element 11)

3.11.1 Purpose

This section describes the procedures and requirements for identifying and tracking nonconforming work items and products to their resolution.

3.11.2 Scope

Nonconforming work or products shall be identified, documented, and evaluated to determine appropriate disposition. Activities affected by the nonconforming work or product shall be identified. Disposition of nonconforming work or product can include rework, acceptance, acceptance with price adjustment, use for alternative applications, removal, or use of a different product.

Disposition of nonconforming work or product should be documented. Reworked or repaired work should be re-inspected in accordance with documented procedures as described in the Procedures section, Section 3.11.4, below.

These requirements apply to all contracts, consultants, and the DBB Construction Contractor, all of whom are a part of the CRC project.

3.11.3 Policy

Design-Bid-Build

The DBB Construction Contractor should follow approved agency procedures to discover and maintain control of nonconforming work to ensure that such work is not used or installed and that any possible adverse effects are controlled. The final disposition of nonconforming work may include rework, acceptance, acceptance with price adjustment, use for alternative applications, removal, or use of a different product.

Design-Build

The Design-Builder's design and construction teams and designated quality staff are responsible for identifying nonconforming work. WSDOT, ODOT, or TriMet may also identify potential nonconforming work, and report it to the Construction QA Manager for appropriate action. Any completed work that does not meet the plans, specifications, and contract requirements is to be deemed nonconforming. The Design-Builder will include a policy for nonconforming work in its QMP.

3.11.4 Procedures

Design-Bid-Build

A nonconformance report (NCR) will be submitted for any significant instance of a nonconforming item, as identified by either the Task Manager or by the CRC QA/QC Manager, deriving from a quality audit for design activities. Construction activities can receive an NCR resulting from an inspection of material, equipment, or work, submitted by the Inspector, Engineer, or by the Contractor's quality team.

NCRs are controlled documents that give the Task Manager or Construction Project Manager notice of a nonconforming item. The NCR is used to track the actions taken to address the nonconformance. Once a nonconforming item is identified and an NCR form, located in the QCP as Appendix E, is initiated, the person responsible for managing the remediation of the nonconformance investigates the root cause of the nonconformance and tracks its disposition. The Task Manager or Construction QA Manager shall inform the CRC QA/QC Manager upon initiation of an NCR. The CRC QA/QC Manager will provide oversight during the entire NCR process. When the issue is resolved, the completed form shall be included in the project record. Any reworked or repaired work will be re-inspected, retested, or re-reviewed and documented for compliance with applicable requirements.

Design-Build

Procedures related to nonconformance will be included in the Design-Builder's QMP. Procedures must meet the applicable requirements of WSDOT, ODOT, and the FTA.

Table 3-11. References – Requirements for Nonconformance

Topic	Manual	Location
Nonconformance	FTA Quality Management System Guidelines, 2012	Sect. 2.2.11

Topic	Manual	Location
	TriMet Quality Assurance Program Manual, Revision 3.2, Jan. 2011	Sect. 11
	ODOT Standard Specifications Vol. 1, 2008	Sect. 00165
	WSDOT Standard Specifications M 41-10.14, 2013	Sect. 1-05.6

3.11.5 Responsibility

Design-Bid-Build

The Task Manager or the CRC QA/QC Manager is responsible for initiation and documentation of an NCR related to design.

It is the responsibility of the DBB Construction Contractor's Quality Assurance Manager or the CRC Construction QA Manager to initiate and maintain the documentation of an NCR for any nonconformance that is related to a construction activity. The CRC Construction QA Manager will be responsible for oversight during the investigation of the cause and shall monitor the status until it is resolved. The Construction QA Manager shall also keep the CRC QA/QC Manager notified of the status of all significant NCRs.

The DBB Construction Contractor's Quality Assurance Manager is responsible for maintaining communication with the CRC Construction QA Manager regarding the NCR and upon its resolution shall provide a completed copy to the Construction QA Manager. The CRC QA/QC Manager will distribute copies of significant NCR's to the Program Directors for their information, review, and any additional comment or action. If the Program Directors request further action, the NCR will remain in open standing until the Program Directors are satisfied with the result and they request the NCR to be closed.

Design-Build

The Design-Builder will include responsibility for NCRs in its QMP, and should comply with requirements as outlined in the DB contract and RFP requirements.

3.12 Corrective Action (Element 12)

3.12.1 Purpose

This section describes the procedure for implementing corrective actions when repetitive nonconforming work and product exists.

3.12.2 Scope

These requirements apply to all project team members on the CRC project.

3.12.3 Policy

Design-Bid-Build

Corrective action procedures are established to investigate root causes of nonconforming work or product, analyze processes to detect and eliminate causes of nonconforming work or product, initiate preventive measures to correct problems, ensure that corrective actions are effective, and implement and record changes in procedures resulting from corrective actions.

Design-Build

The Design-Builder shall include a policy for corrective action reports produced under the DB delivery method in its QMP.

3.12.4 Procedures

Design-Bid-Build

Deficiencies discovered during surveillance will require corrective actions and acceptance by the CRC QA/QC Manager, Construction QA Manager or designated staff.

Corrective action procedures will be invoked when conditions indicate that an error in the work or product has occurred. The need for a corrective action may be identified based on observations of work in progress.

The Construction QA Manager must implement corrective actions, as appropriate, when nonconformances are identified. Such action should include an investigation by the DBB Construction Contractor to determine what caused the deficiency or nonconformity, and what will be done to prevent its reoccurrence. Root cause analysis should be used by management to identify trends, based on analysis of nonconformances and audit findings.

When the need for a corrective action is identified, a Corrective Action Request (Appendix C of this report) shall be developed, implemented, and tracked to reduce the possibility of another occurrence. Corrective actions will be noted and conveyed to the Task Manager or Construction Project Manager who is responsible for that item.

Design-Build

The Design-Builder will provide procedures for corrective action under the DB delivery method in its QMP. These procedures should be consistent with the requirements of the FTA's 15 Elements and the project contract and RFP requirements. References where these requirements are provided are listed in Table 3.12, below.

Table 3-12. References – Requirements for Corrective Action

Topic	Manual	Location
Corrective Action	FTA Quality Management System Guidelines, 2012	Sect. 2.2.12
	TriMet Quality Assurance Program Manual, Revision 3.2, Jan. 2011	Sect. 12
	ODOT Standard Specifications Vol. 1, 2008	Sect. 00165

Topic	Manual	Location
	WSDOT Standard Specifications M 41-10.14, 2013	Sect. 1-05.6

3.12.5 Responsibility

Design-Bid-Build

Relative to design work, the CRC QA/QC Manager and/or Task Manager are responsible for initiation and documentation of a Corrective Action Request resulting from the occurrence of nonconforming work.

Relative to construction work, it is the responsibility of the DBB Construction Contractor to initiate and document a Corrective Action Request when repetitive nonconforming work or product that is related to a construction activity occurs. The CRC QA/QC Manager is responsible for oversight of the DBB Construction Contractor's corrective action procedure. At any time during, the CRC QA/QC Manager can initiate a Corrective Action Request if the Contractor has not already done so. In this event, the Contractor would have to address the concerns raised by the CRC QA/QC Manager prior to closing out the Corrective Action Request.Design-Build

The Design-Builder will include responsibility for corrective action in its QMP.

3.13 Quality Records (Element 13)

3.13.1 Purpose

This section describes the requirements for production, collection, filing, and maintenance of quality records.

3.13.2 Scope

These requirements apply to all quality records for the project, including test reports, nonconformance reports, corrective actions, and audit reports.

3.13.3 Policy

Design-Bid-Build

Written records of QA/QC activities will be prepared, compiled, and stored in a retrievable manner, as indicated in the PMP and according to the procedures described in this QAM, the QCP, and agency guidelines.

Design-Build

Policy related to quality records will be included in the Design-Builder's QMP and will be in compliance with contract and applicable agency requirements.

3.13.4 Procedures

Design-Bid-Build

Relative to design work, quality records will be collected, stored, and preserved in a manner that precludes damage, loss, or deterioration. Quality records may be in either hard copy or electronic form as per current agency guidelines.

Quality records will be maintained to demonstrate conformance to quality-related requirements and the effectiveness of the quality system. They will be available to authorized persons at any time when requested within a reasonable time frame.

Quality records will have unique identification,, and a database will be maintained that includes the item description, unique identification, location, and responsible authority.

Quality records will be categorized as: (1) permanent quality records, or (2) nonpermanent quality records. Retention time will be as required by applicable law and in accordance with contract and agency requirements.

Permanent quality records, as well as records that may be determined to be permanent at a later date, are those that involve the following:

- Final design development
- Demonstrated capability for proper function and safe operation of critical items
- Required baseline data
- NCRs and the resolution of NCRs

Nonpermanent quality records are those that do not meet any of the above criteria for permanent records.

Quality records are subject to QA audits and or surveillance.

Consultants/subconsultants and the DBB Construction Contractor are also responsible for retention of their own quality records throughout the period of preliminary investigations, design, etc., in accordance with these requirements.

Storage facilities for quality records should consist of steel file cabinets or other storage containers located within an area having features that minimize damage from fire, condensation, and extreme temperature variation, whenever possible. Alternatively, and where agency policies require, a second (backup) copy of each quality record should be maintained in an area remote from the primary storage area described above.

CRC project staff performing QC or QA activities are responsible for maintaining quality records in accordance with this section.

All quality records generated for the CRC projects and required by agency policy and contract provisions to be in the possession of agency will be filed in the CRC office at 700 Washington Street, Vancouver, Washington, or its successor location, or other location(s) approved by the CRC QA/QC Manager. Unless otherwise stated in the contract, the consultants'/subconsultants'

and the DBB Construction Contractor's permanent quality records will be turned over to the Design Quality Manager or CRC QA/QC Manager as they are generated throughout the contract to be placed in the project files.

Examples of quality records include:

- Quality control plans
- Quality assurance system audit and surveillance reports
- Quality reviews of deliverables
- CRC quality management training records (such as training attendance sheets)
- Audit plans
- Audit reports
- Nonconformance reports
- Corrective Action Requests
- Quality management meeting minutes
- Inspections of construction equipment, supplies, and materials
- Quality documentation of construction activities

Quality records for construction activities will be located in the project office. Construction quality documents and reports of construction activities must be maintained until approval from the CRC QA/QC Manager. The DBB Construction Contractor is responsible for maintenance of its quality reviews and 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.

Design-Build

Procedures for quality records will be established and maintained by the Design–Builder, and will be provided in its QMP and will meet the requirements of the RFP. Table 3.13 provides references for the documents where the requirements can be found.

Table 3-13. References – Requirements for Quality Records

Topic	Manual	Location
Quality Records	FTA Quality Management System Guidelines, 2012	Sect. 2.2.13
	TriMet Quality Assurance Program Manual, Revision 3.2, Jan. 2011	Sect. 13

3.13.5 Responsibility

The Design Quality Manager is responsible for maintaining, assembling, and preparing all quality records for archiving. While the files are in the possession of the Design Quality Manager, accessibility and retrievability of the documents must also be controlled.

Consultants/subconsultants, the DBB Construction Contractor, and the Design-Builder are responsible for establishing and maintaining a comprehensive set of quality records. This item is addressed in the QCP.

The Design-Builder is responsible for establishing the policy and procedures for quality records of construction activities under the DB delivery method. The CRC QA/QC Manager will provide oversight of the DBB Construction Contractor's quality process, and as such, the CRC QA/QC Manager is responsible for conducting verification audits, maintaining audit paperwork, and reporting to CRC management regarding quality audits of the DBB Construction Contractor under the DBB delivery method.

The CRC QA/QC Manager or delegated staff will perform audits or surveillance of quality records.

3.14 Quality Audits (Element 14)

3.14.1 Purpose

This section describes the requirements for performing audits of the quality management system.

3.14.2 Scope

These requirements apply primarily to QA audits of project QC activities performed principally by the CRC project's QA staff, including consultants, subconsultants, and the DBB Construction Contractor, related to overall project quality activities.

3.14.3 Policy

Design-Bid-Build

The QCP establishes a program for planned, periodic audits and routine surveillance of design activities to ensure full implementation of the project's QA program. Surveillance of construction activities shall follow the requirements of this QAM, in addition to any agency and FTA requirements. 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 as a scheduled audit and is performed to assist the CRC project team in verifying conformance to the QA program. Deficiencies discovered during the surveillance activity will require corrective action and acceptance of such corrective action by the CRC QA/QC Manager or designated staff.

Auditors should be free from bias and influences that could affect objectivity and should act in an ethical manner at all times. At a minimum, auditors must possess the following traits and experience:

- Sound quality principles, and be motivated, hard working, and an example to others.
- Achiever and team player, and have good judgment of human nature.
- Ability to conduct audits in an objective manner that is professional and ethical.

- Firm and confident, able to stand their ground and resolve conflict when appropriate.
- Knowledge of key team members and team structure.
- Knowledge and ability to interpret applicable codes, standards, and project requirements.
- Awareness of potential safety, legal, and financial risk-related issues and the ability to recognize and communicate risk potential.
- Ability to effectively facilitate an audit as defined in the QCP. Ability to verify, document, and communicate audit results and provide corrective action follow-up.
- A minimum of eight years of project experience in the professional field(s) being audited. A minimum of three years of this experience must be in a decision making position for which the authority to define, execute, or control a project's processes and outcome were the primary responsibility.

An auditor will be assigned for each audit performed and will be responsible for all elements of the audit. Audit personnel are to have no direct responsibility in the activities to be audited. Auditors will have experience or training commensurate with the scope, complexity, or special nature of the activities to be audited. It is preferred for the auditors to be ASQ or ISO certified, or have a nationally recognized quality auditing certification. Auditors will be given access to all records necessary to identify problems, recommend solutions, and evaluate corrective actions.

Design-Build

The Design-Builder will include a policy related to audits for activities under the DB delivery method in its QMP and should comply with all applicable requirements in the project RFP.

3.14.4 Procedure

Design-Bid-Build

A comprehensive program of planned, periodic audits is established to verify that applicable elements of the QA program and QC plans have been effectively implemented in accordance with specified requirements indicated in the QCP. The activities of consultants and subconsultants will be audited for compliance and implementation of contractually required quality activities, including evaluation of overall program effectiveness. The quality activities of the DBB Construction Contractor will also be subject to review by FHWA, ODOT, WSDOT, TriMet, and FTA.

Audits for design activities will be performed in conjunction with known deliverables, for which each Task Manager will provide a schedule to the auditor (see Appendix D of this report). The DBB Construction Contractor will provide a construction schedule to the Construction QA Manager and CRC QA/QC Manager.

This section also includes information for QA assessments of daily activities performed by CRC project personnel.

The management of the audited organization will be required to respond to the audit report within 15 working days after receipt of the narrative and the Audit Finding Report (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 CRC QA/QC Manager will be advised of any extensions to the required response time. The CRC QA/QC Manager is responsible for accepting or rejecting corrective action responses to audits. The reason for any rejection of a response will be stated in writing.

For construction activities, the DBB Construction Contractor's construction QA staff shall identify and document in an NCR all elements of work that have not, or are believed to have not, been constructed in accordance with the approved drawings and specifications, and the reason for nonconformance. The NCR shall be submitted to WSDOT and ODOT in writing within 24 hours of identification, and a copy sent to the Task Manager or designated engineers. Monitoring is also performed by FHWA and TriMet, and audits of the respective agencies will be performed on their own policy and procedures.

The auditor is responsible for scheduling closeout audits as necessary to verify completion and effectiveness of corrective actions. Deficiencies that continue to exist after the closeout audit may be closed to an appropriate document, such as an NCR, or remain open on the AFR to be addressed during a follow-up audit activity. Every reasonable effort will be made to close out audit findings on the AFR on which they originated.

Audit records are to be maintained and included as project quality records and made available for review. Records include audit schedules, audit logs (Appendix E of this report), audit reports, audit checklists, audit performance records, AFRs, and Corrective Action Requests, as applicable.

Design-Build

The Design-Builder will develop and establish procedures for audits performed under the DB delivery method and will include the procedures in its QMP. These procedures must be in compliance with applicable ODOT, WSDOT, and FTA policies and contract requirements.

Table 3-14. References – Requirements for Quality Audits

Topic	Manual	Location
Quality Audits	FTA Quality Management System Guidelines, 2012	Sect. 2.2.14
	TriMet Quality Assurance Program Manual, Revision 3.2, Jan. 2011	Sect. 14
	WSDOT Standard Specifications M 41-10.14, 2013	
	WSDOT Construction Manual M 41-01.12, Jan. 2012	
	ODOT Standard Specifications Vol. 1, 2008	Sect. 00150.20, 00150.25, & 00150.90

3.14.5 Responsibility

Design-Bid-Build

The CRC QA/QC Manager is responsible for performing or having performed QA audits and surveillance in accordance with these requirements.

Design-Build

The Design Builder is responsible for quality audits performed under their contract and the surveillance thereof. Further procedures and policy regarding quality audits for construction can be found in the Design Builder's QMP.

3.15 Training (Element 15)

3.15.1 Purpose

This section describes the requirements for training personnel performing activities affecting quality.

3.15.2 Scope

These requirements apply to all project personnel involved in or responsible for activities affecting quality.

3.15.3 Policy

Personnel performing quality-related activities will be technically qualified for their task and familiar with the applicable agency's QA program and project's QA program procedures.

3.15.4 Procedure

All personnel performing quality-related activities throughout the life cycle of the project will be technically qualified for their tasks on the basis of appropriate education, training, and/or experience. They will also be familiar with the project's QA program and approved QC plans and review procedures pertaining to their work responsibilities.

The consultant or subconsultant will attend training or briefings regarding the QA program and QC procedures. Records of participation of key project staff in training or briefings will be maintained in the project file. See Appendices G and H.

Specific training requirements for design are identified in Section 8 of the QCP. See Appendix F of this report.

The Design-Builder shall provide procedures related to training under the DB delivery method in its QMP.

3.15.5 Responsibility

The CRC QA/QC Manager is responsible for ensuring that quality training for CRC staff is adequate and complete. The consultant/subconsultant Project Managers are responsible for the training of their staff and QC Reviewers under their responsible charge.

For construction under the DBB delivery method, the Construction QA Manager is responsible for providing training for the quality procedures related to construction activities to its employees working on the CRC project, as well as to CRC staff involved with components and

activities during construction. This training shall be based on this QAM and any applicable agency's requirements.

For the DB delivery method, the Design-builder will be responsible for the training of its own staff as well as its Subcontractors, including designers.

4. Solicitation and Bidding Documents

4.1 Solicitation Documents (RFQ)

4.1.1 Purpose

The purpose of this section is to control the solicitation process to ensure quality is incorporated in the selection process.

4.1.2 Scope

The policy and procedures apply to the Request for Qualifications (RFQ) and reviews of the submittals for the Design-Build (DB), Design-Bid-Build (DBB) delivery methods.

4.1.3 Policy

The RFQ should be developed in accordance with the Controlled Documents section of the PMP and Document Control section of this QAM. A formal quality review should be performed and evidence of such maintained that can be easily retrieved upon request of the CRC QA/QC Manager. See the QCP, Section 8 for review procedures of the solicitation documents.

RFQ submittals that are received shall be evaluated and scored based on the RFQ requirements and criteria. A review and back-check shall be performed by a person designated by the Program Manager or Project Delivery Director (see Appendix A of this report for CRC organizational charts).

4.1.4 Procedure

Upon development, the RFQ shall have a formal quality review performed by using the review procedures found in the QCP in Section 8. The RFQ is subject to verification that the review procedures used are in compliance with this QAM and the QCP.

Incoming RFQ submittals shall be evaluated and graded based on the bidder's RFQ content as compared to the RFQ criteria. To assist with the evaluation, a checklist should be created specifically for each RFQ and respective delivery method addressing each RFQ requirement. After the initial grading process of the submittal has been completed, a back-check shall then be performed by a person designated by the Program Manager or Project Delivery Director to ensure that the scoring is accurate. A review stamp (Figure 4-2 of the QCP) shall be used as evidence that a review and back-check was performed and shall be displayed on the front cover. The quality review document is subject to review by the CRC QA/QC Manager.

4.1.5 Responsibility

It is the responsibility of the Program Manager and/or the Project Delivery Director to ensure a proper quality review of the RFQ has been performed before it is released for public viewing. The CRC QA/QC Manager is responsible for providing oversight of the quality review process of the RFQ.

4.2 Contract Bidding Documents (RFP)

4.2.1 Purpose

The purpose of this section is to control the Request for Proposal (RFP) process to ensure quality is incorporated in the proposal process.

4.2.2 Scope

The policy and procedures apply to the RFP and evaluations of the proposals for the DBB and DB delivery methods.

4.2.3 Policy

The RFP should be created in compliance to the Controlled Documents section of the PMP and Document Control section of this QAM. A formal quality review of the RFP should be performed, and evidence of a proper review should be provided.

The proposals that are received shall be evaluated and scored based on the RFP requirements and criteria. A back-check of the scoring process shall be performed by a person designated by the Program Manager or Project Delivery Director.

4.2.4 Procedure

Upon creation of the RFP, a formal quality review should be performed by using the review procedures found in the QCP, Section 8. The RFP is subject to verification that the review procedures used are in compliance to this QAM and the QCP. The documented review of the RFP shall be filed so that it can be easily retrieved upon request of the CRC QA/QC Manager. See the QCP, Section 8 for review procedures of the solicitation documents.

Once the proposals are received, each shall be evaluated and graded based on the proposal content as compared to the criteria requirements provided in the RFP by use of an itemized checklist that shall be created specifically for each of the delivery methods. The checklist should incorporate each requirement by section. After the initial grading process of the proposal has been completed, a back-check shall be performed by a person designated by the Program Manager or Project Delivery Director to ensure that the scoring is accurate.

Evidence that a review and back-check was performed shall be displayed on the front cover by use of a stamp (see Section 4.2 of the QCP). The checklist and document are subject to verification by the CRC QA/QC Manager to ensure that the process was followed in accordance with the QCP.

4.2.5 Responsibility

It is the responsibility of the Program Manager and/or the Project Delivery Director to ensure that a proper quality review of the RFP has been performed before it is released for public viewing. The CRC QA/QC Manager is responsible for providing oversight of the quality review process of the RFP.

5. Quality Assurance Program Definitions

The following definitions are provided to ensure a uniform understanding of terms as they apply to the project's QA program.

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 QA/QC program(s) have been developed, documented, and effectively implemented in accordance with specified requirements. An audit should not be confused with surveillance or inspection.

Certification – The action of determining, verifying, and attesting, in writing, to the qualifications of personnel in accordance with applicable requirements.

Certified (Personnel) – An individual certified by a recognized standard or approved as having successfully completed requirements of the standard or procedure.

Change Control – The systematic evaluation, coordination, and approval or disapproval of all changes to the established baseline configuration. It also includes the performance of those actions necessary to ensure that the actual configuration of a system completely matches its technical description in the approved engineering drawings, specifications, and related documents.

Characteristics – Any property or attribute of an item, process, or service that is distinct, describable, and measurable as conforming or nonconforming to specified quality requirements. Quality characteristics are generally identified in specifications and drawings, which describe the item, process, or service.

Configuration Management – A management method of producing an end result that comprises three elements: product identification, change control, and configuration accountability. Configuration management may be distributed throughout a number of organizational entities.

Conformance – An affirmative indication or judgment that an item has met the requirements of the relevant specifications or regulation.

Contractor – Any organization under contract for furnishing items or services. It includes the terms of but is not limited to architect, engineer, consultant, vendor, supplier, subconsultant, and sub-tier levels of these organizations where appropriate.

Controlled Document – A document that is intended for limited, specified, and tracked distribution and that must be periodically reviewed and updated as required. The use and distribution of controlled documents are tracked and monitored under configuration control procedures.

Corrective Action – Documented commitment of specific action planned or being implemented to resolve a known and identified condition, or conditions, adverse to quality. Typically used in reference to a nonconforming condition or item.

Corrective Action Request – A document issued to the Task Manager of a group whose activities are not meeting requirements. This is a significant document that, in effect, warns the consultant/subconsultants or others that continuing deficient activities will result in consideration of contract default.

Critical Preliminary Design Review – A design review that takes place prior to the issuance of the final preliminary design.

Deficiency – A minor deviation from the QAM and/or the QA/QC documents of the CRC project.

Design – Technical and management processes that create, fashion, execute, or construct documents according to a predetermined plan or requirement.

Design Defects – There are three classifications of design defects as follows:

> **Critical** – A defect of a specification, inspection, or test or a defect, which if not properly controlled, could result in a failure. Such a defect is one that judgment and experience indicates is likely to result in hazardous or unsafe conditions for individuals using or depending upon the product or is one that judgment and experience indicate is likely to prevent performance of the function of an end item.
>
> **Major** – A defect of a specification, inspection, or test or a defect, other than critical, which if not properly controlled, could result in excessive costs, defect rates, rework, or delays in scheduled shipping dates. Such a defect is likely to materially reduce the usability of the product or end item.
>
> **Minor** – A defect of a specification, inspection, or test or a defect, other than critical or major, which if not controlled, would not materially reduce the usability of the product or end item for its intended purpose, or is a departure from established standards having no significant bearing on the effective use or operation of the unit, or affects the appearance in a minor degree where appearance is a significant characteristic.

Design Input – Those criteria, parameters, basis or other design requirements upon which detailed final design is based.

Design Output – Documents such as drawings, specifications, and other documents defining technical requirements of structures, systems, and components.

Design Review – The formal review of an existing or proposed design for the purpose of detection and remedy of design deficiencies that would affect fitness-for-use and environmental aspects of the product, process or service, and/or identification of potential improvements of performance, safety, and economic aspects.

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.

Document – An original or official paper relied on as the basis, proof or support of something; a writing conveying information. Documents may include but are not limited to loose-leaf or bound books, drawings (tracings and/or reproductions), electronic mails, engineering calculations, procedures, specifications, standards, reports, manuals, and other material generated that affects quality.

Documentation – Any written or pictorial information describing, defining, specifying, reporting or certifying activities, requirements, procedures or results.

Equipment – For purpose of this document, equipment refers to equipment that is incorporated permanently into the project. The word “equipment” does not imply “construction equipment,” unless otherwise specified.

Examination – An element of inspection consisting of investigation of materials, components, supplies or services to determine conformance to those specified requirements, which can be determined by such investigation. Examination is usually nondestructive and includes simple physical manipulation, gauging, and measurement.

Final Design – Approved design output documents and approved changes therein.

Finding – (As it relates to a quality audit.) Issued at the completion of an audit to describe an item that is not in compliance with the approved procedure. Items assigned this status require that an Audit Finding Report be issued and formally responded to by the entity audited.

Guidelines – Particular provisions that are considered good practice, but which are not mandatory in programs intended to comply with the standard. The term “should” denotes a guideline; the term “shall” denotes a mandatory requirement.

Maintainability – Ability of an item’s stated conditions of use to be retained in, or restored to, within a given period of time, a specified state in which it can perform its required functions when maintenance is performed under stated conditions and while using prescribed procedures and resources.

Modification – A planned change in design or operation accomplished in accordance with the requirements and limitations of applicable codes, standards, specifications, and predetermined safety restrictions.

Nonconformance – A major deficiency in characteristic, documentation or procedure that may affect form, fit or function and renders the quality of an item unacceptable or indeterminate. Nonconformance items shall not be addressed with a Request For Information.

Preliminary Design Review – A design review that takes place after conceptual design and before release for construction.

Procedure – A document that specifies or describes how an activity is to be performed. It may include methods to be employed, equipment or materials to be used, and sequence of operation.

Qualification (Personnel) – The abilities gained through training to recognized standards, as well as practical experience, that enable an individual to satisfactorily perform a required function.

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 Audit – A systematic independent examination that verifies or evaluates compliance to the operational requirements of the quality program specification, or contract requirements of the product or service.

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

Recommendation – (As it relates to a quality audit.) Information provided as the result of an audit activity to inform the consultant, contractor, designer, etc. that while a reviewed item is not in violation of the approved procedure, it may be improved upon or brought closer in line to the procedure.

Specification – A detailed presentation of requirements that a product, material, service or process must meet.

Standard – Guidelines, benchmarks or examples established and approved by a recognized authority.

Storage – Holding items in an area other than their permanent location.

Technical Bases – Information that identifies the specific technology upon which the design criteria for materials, items, processes, or calculation methods and analyses are based.

Appendices

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APPENDIX A
CRC Organizational Charts

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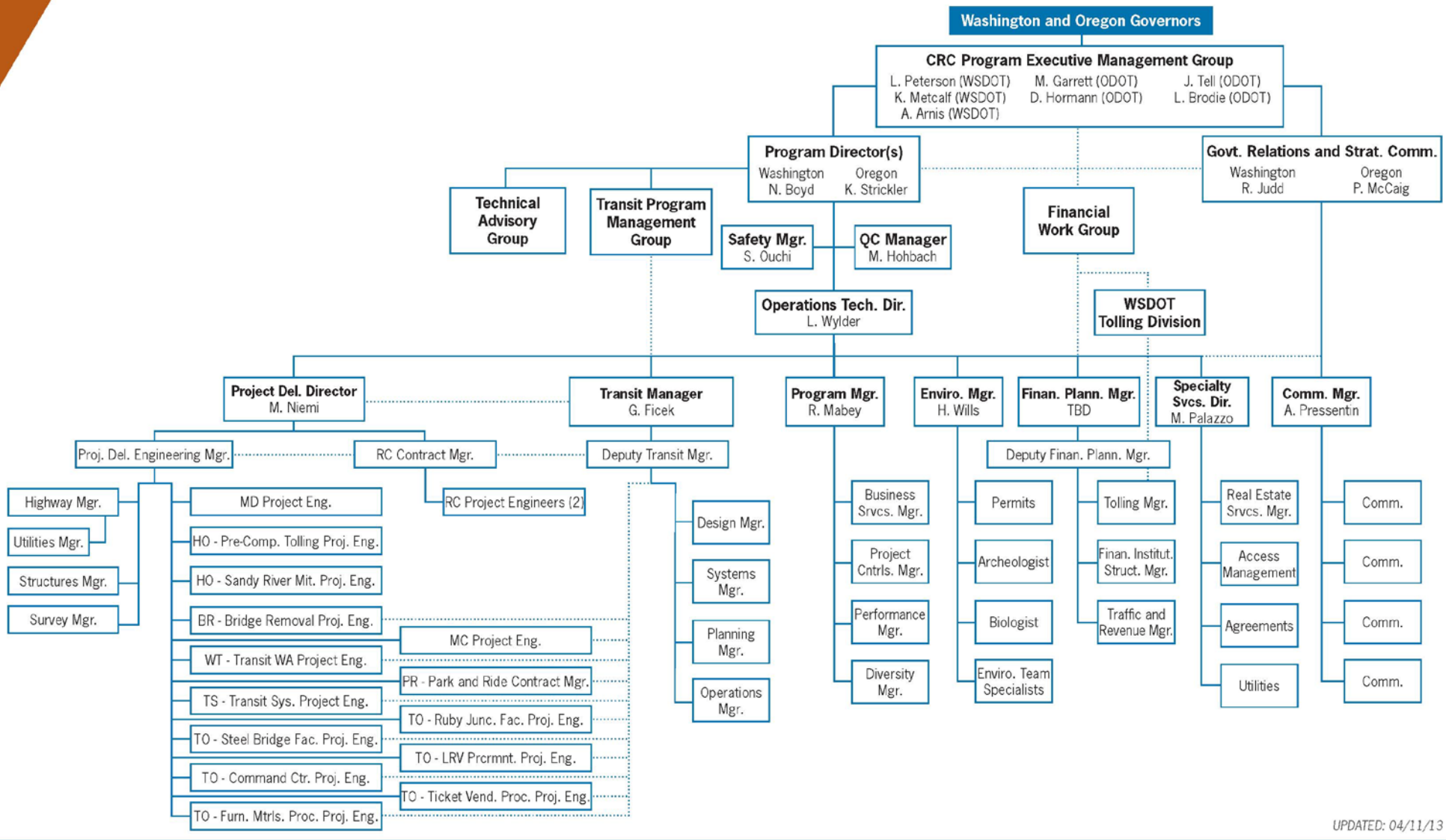
Columbia River CROSSING

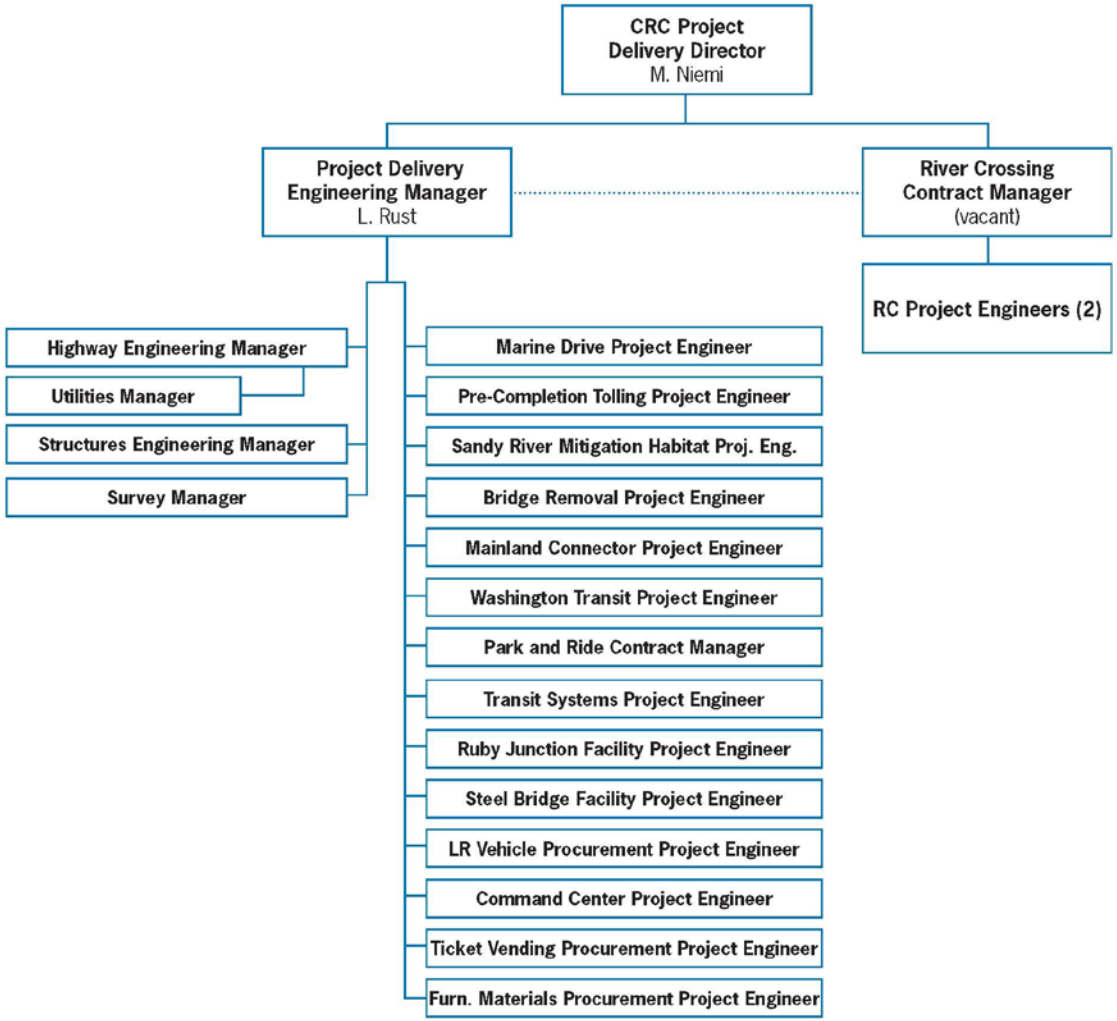
Organizational Chart - Executive and Senior Management



UPDATED: 04/11/13

Columbia River CROSSING

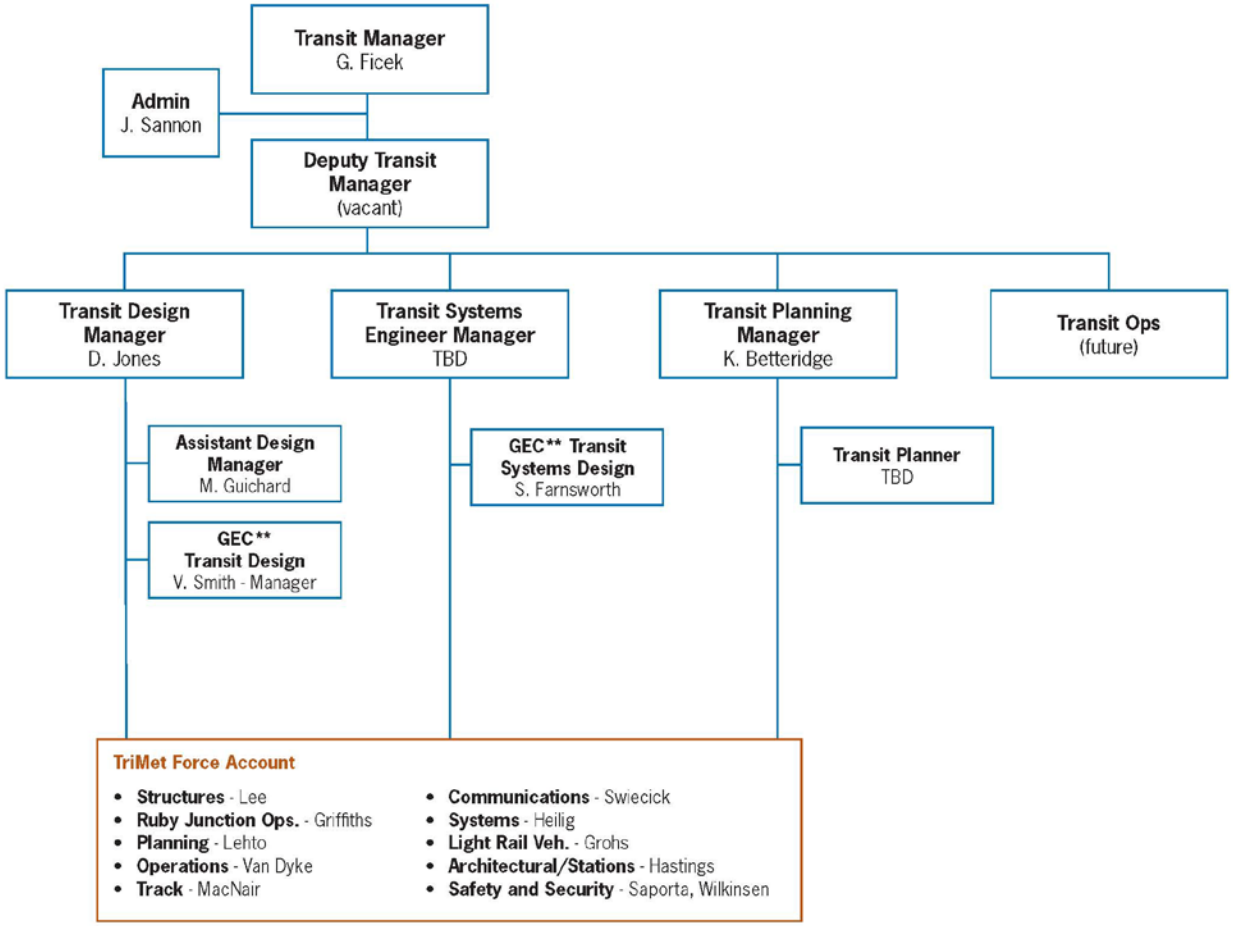
Organizational Chart - Project Delivery Team



UPDATED: 04/11/13

Columbia River CROSSING

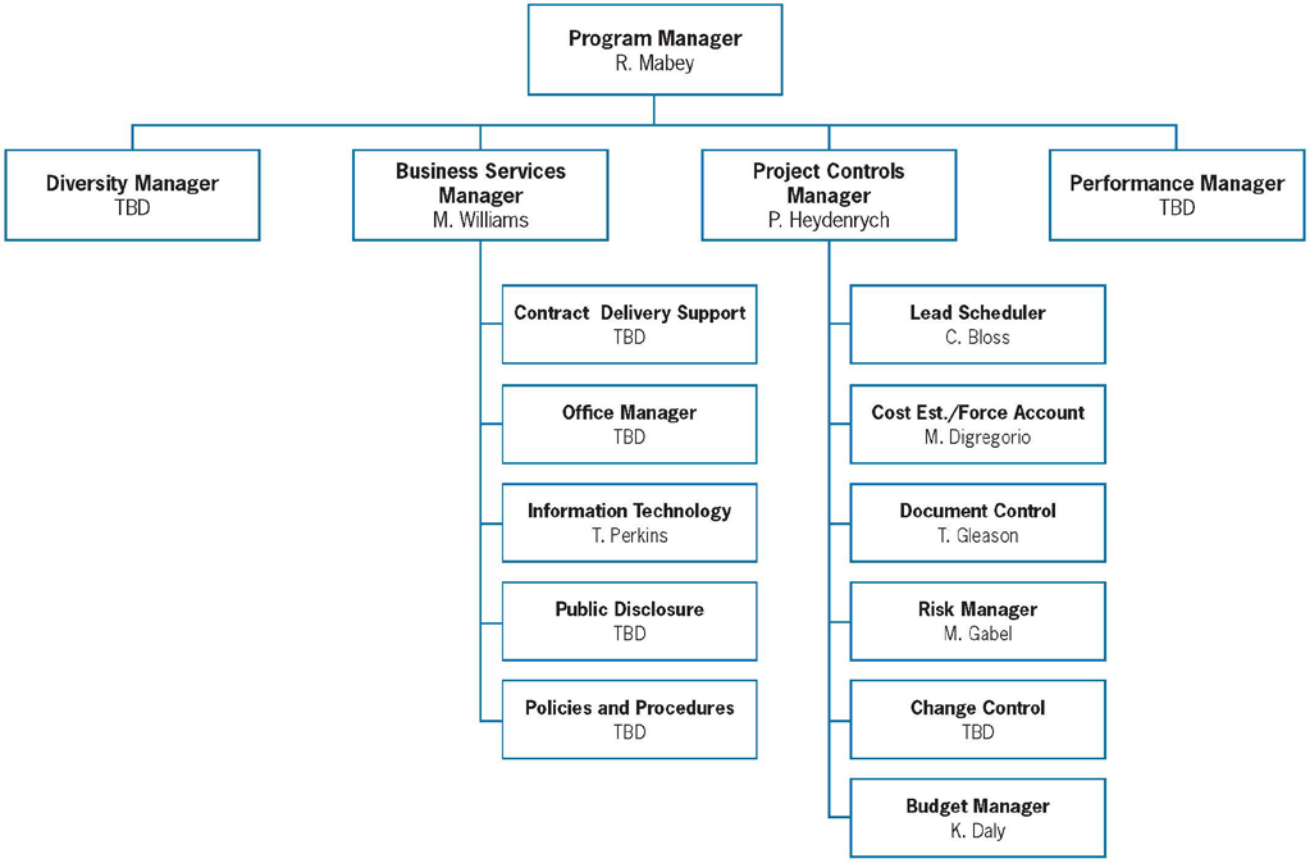
Organizational Chart - Transit Team



UPDATED: 04/11/13

Columbia River CROSSING

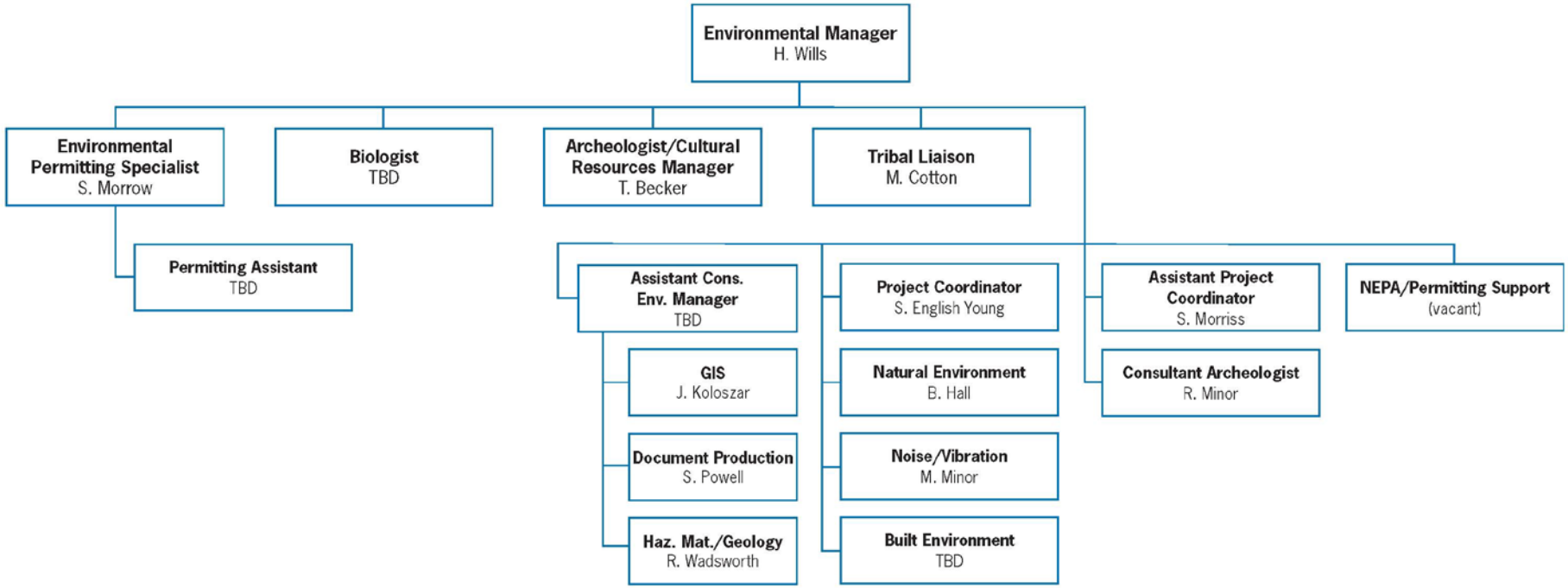
Organizational Chart - Program Management Team



UPDATED: 04/11/13

Columbia River CROSSING

Organizational Chart - Environmental Team



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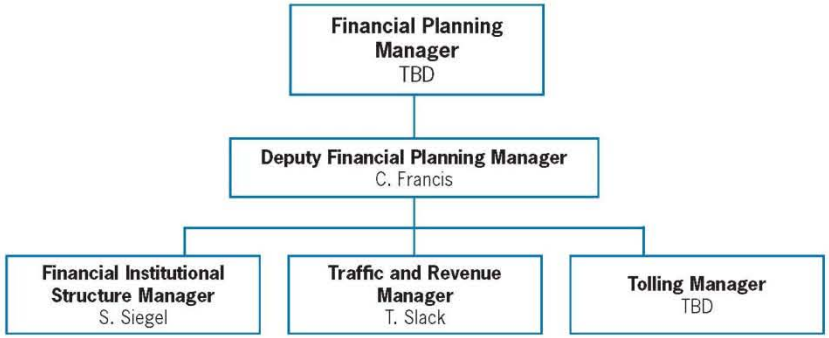
Columbia River CROSSING

Organizational Chart - Financial Planning Team



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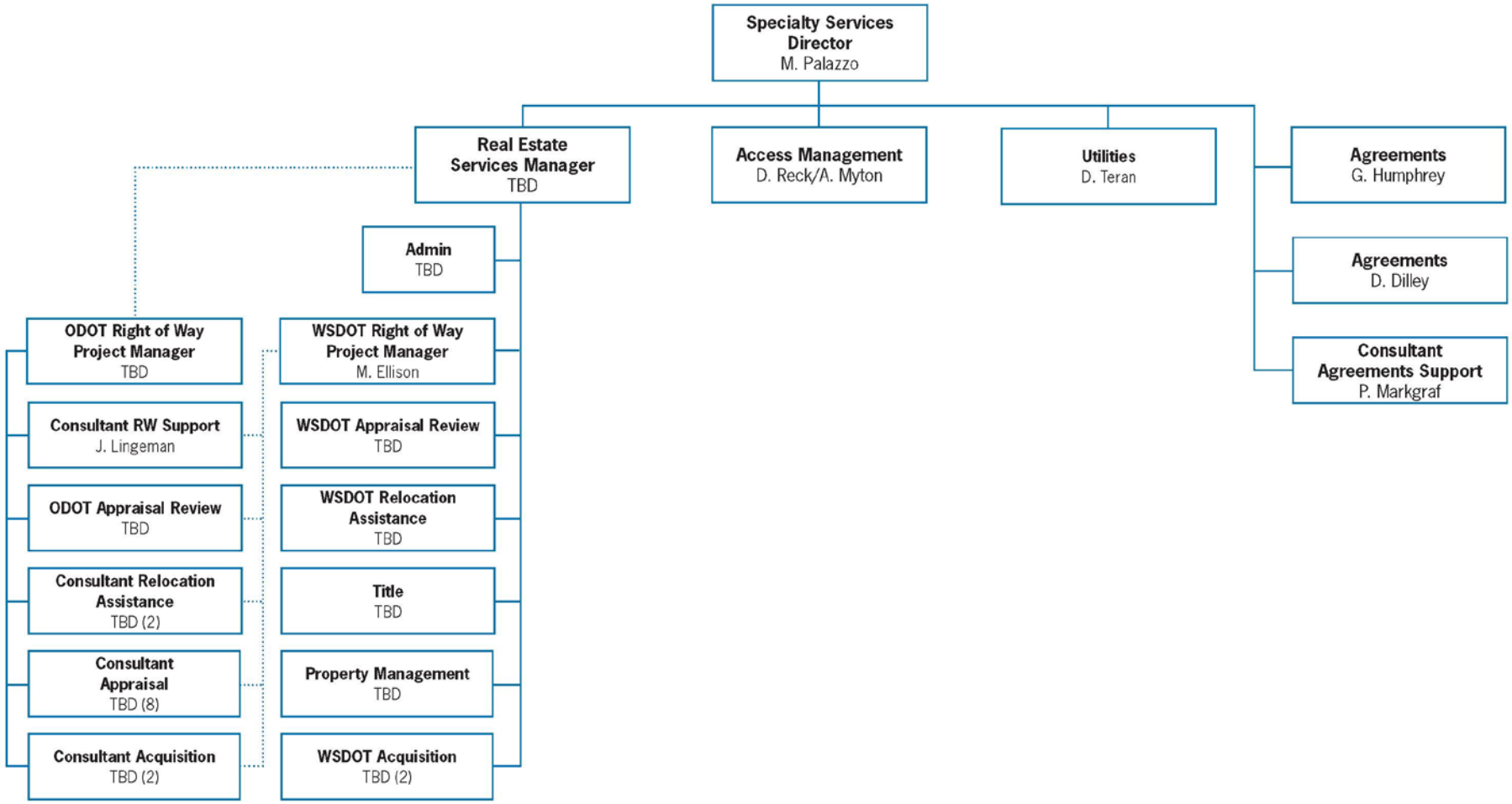
Columbia River CROSSING

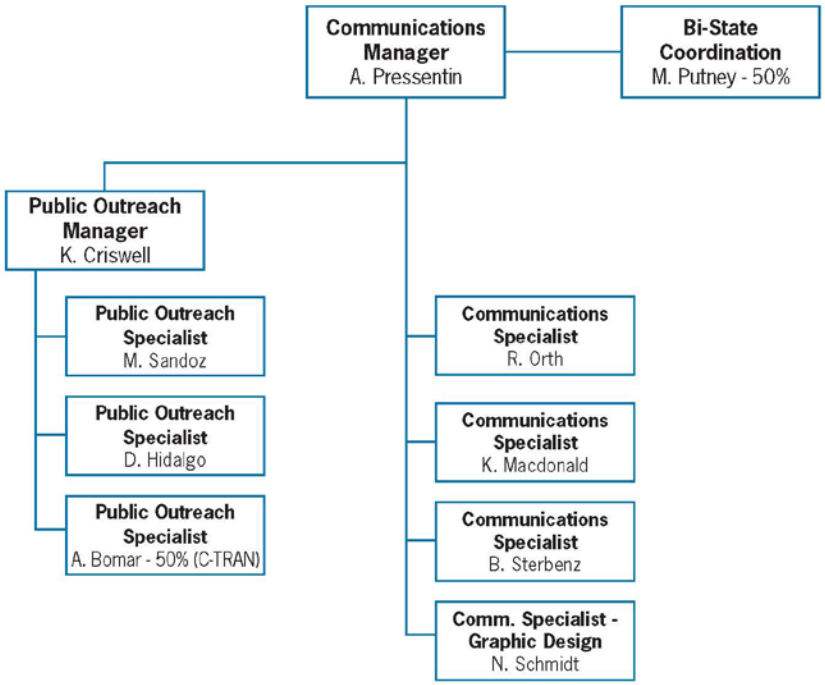
Organizational Chart - Specialty Services Team



UPDATED: 04/11/13

Columbia River CROSSING

Organizational Chart - Communications Team



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APPENDIX A
Construction QA Organizational Chart (by package)

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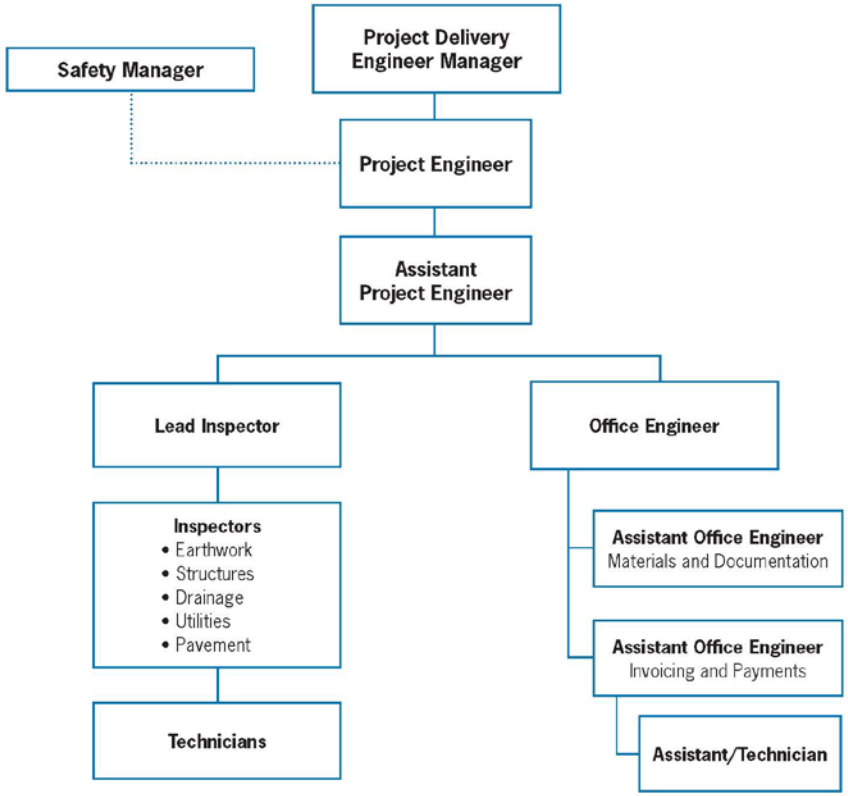
Columbia River CROSSING

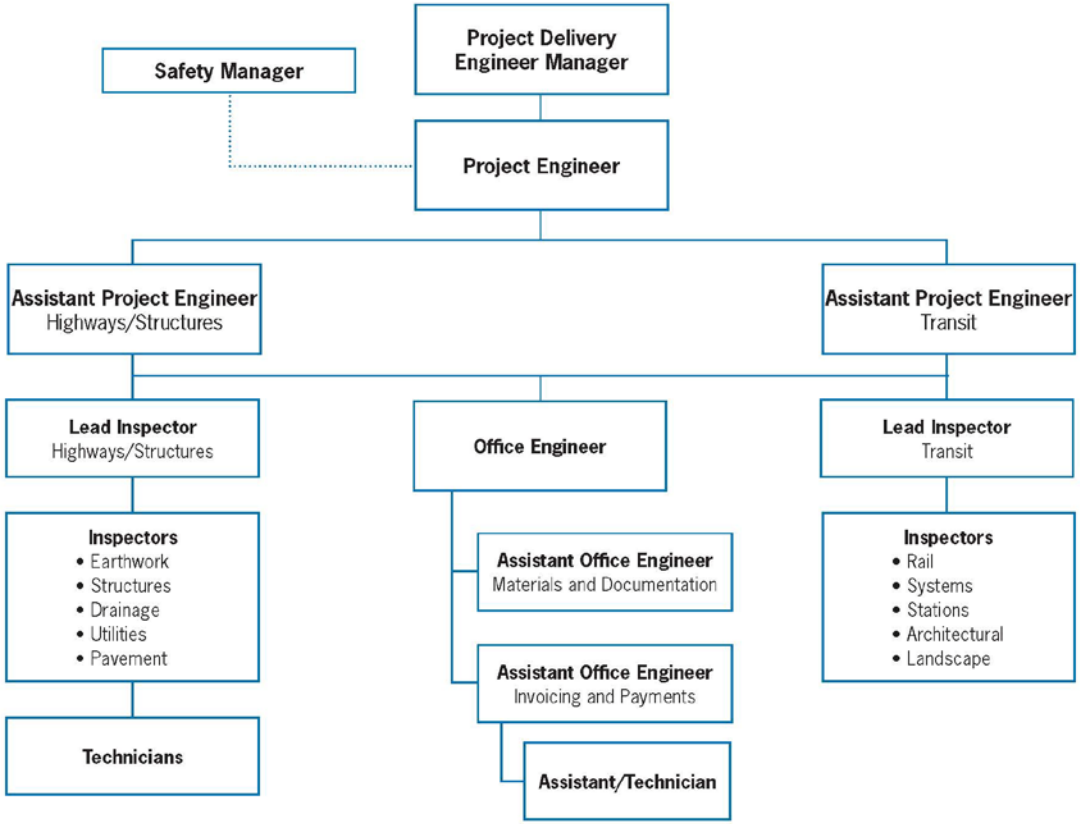
Organizational Chart - Marine Drive Package (construction phase)



UPDATED: 04/03/13

Columbia River CROSSING

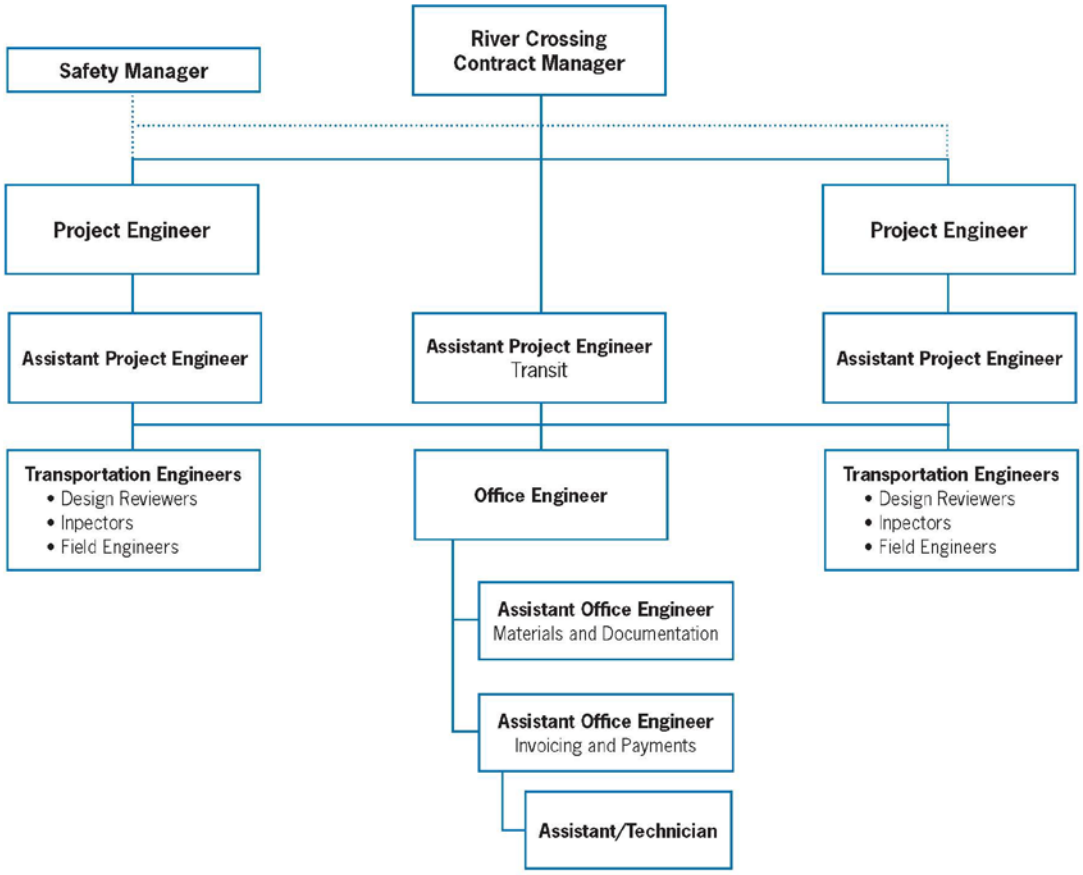
Organizational Chart - Mainland Connector Package (construction phase)



UPDATED: 04/03/13

Columbia River CROSSING

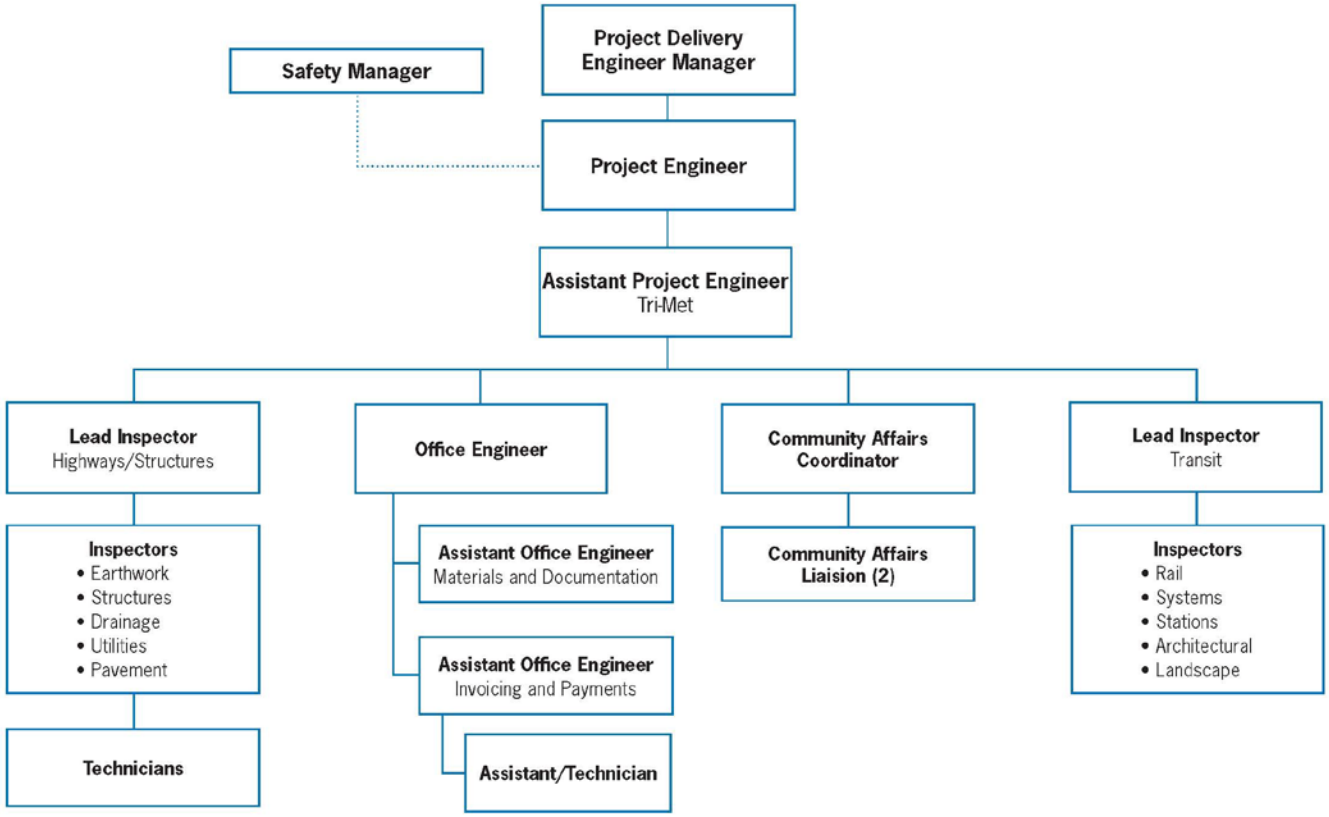
Organizational Chart - River Crossing Package (construction phase)



UPDATED: 04/03/13

Columbia River CROSSING

Organizational Chart - Washington Transit Package (construction phase)



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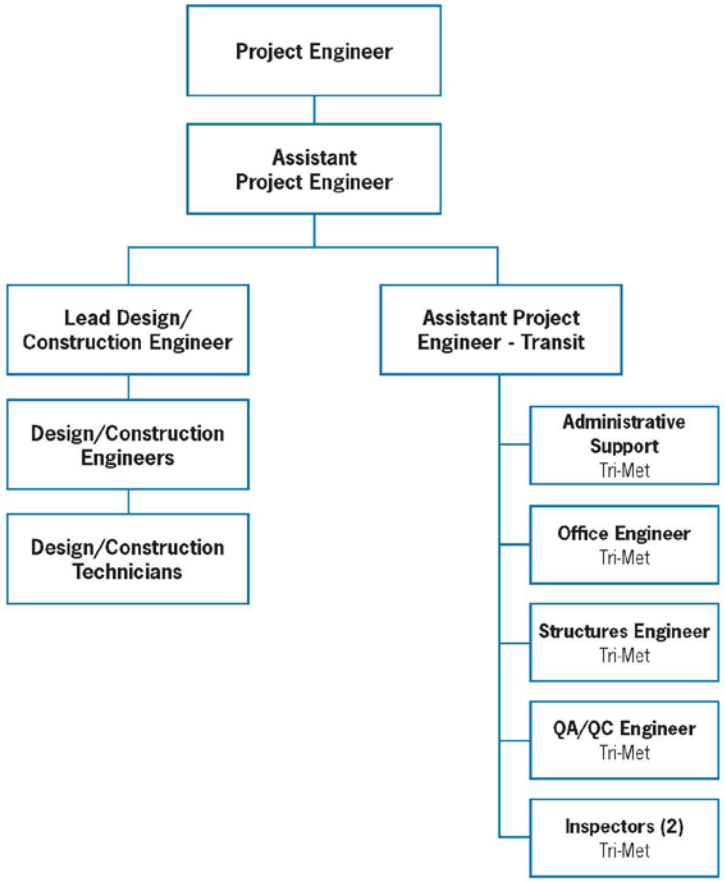
Columbia River CROSSING

Organizational Chart - Park and Ride Package (construction phase)



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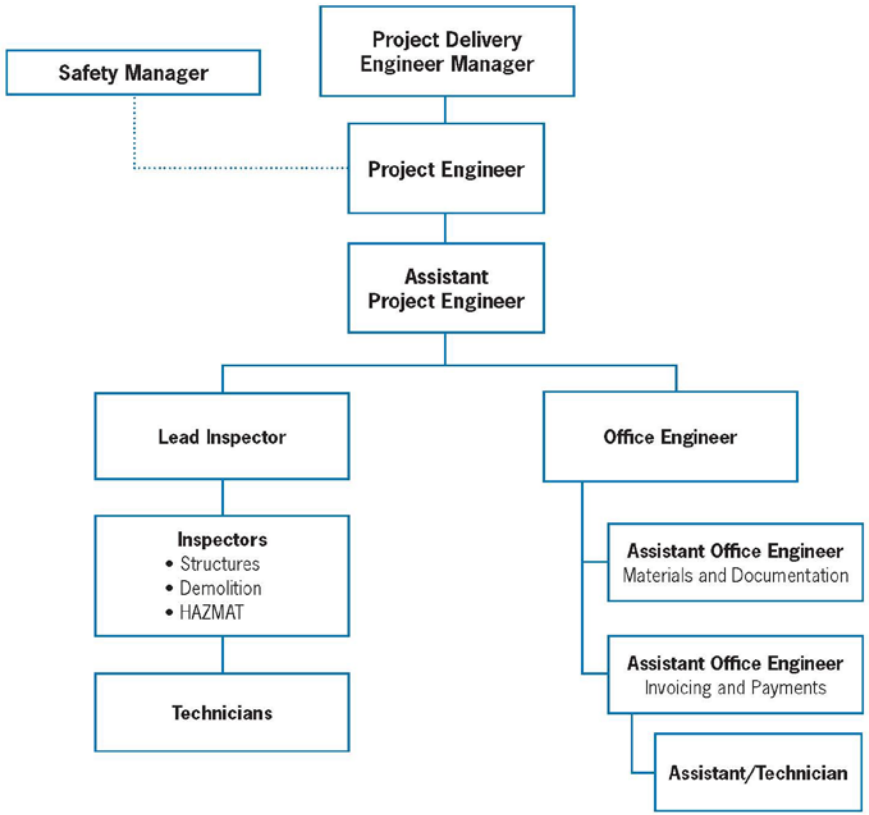
Columbia River CROSSING

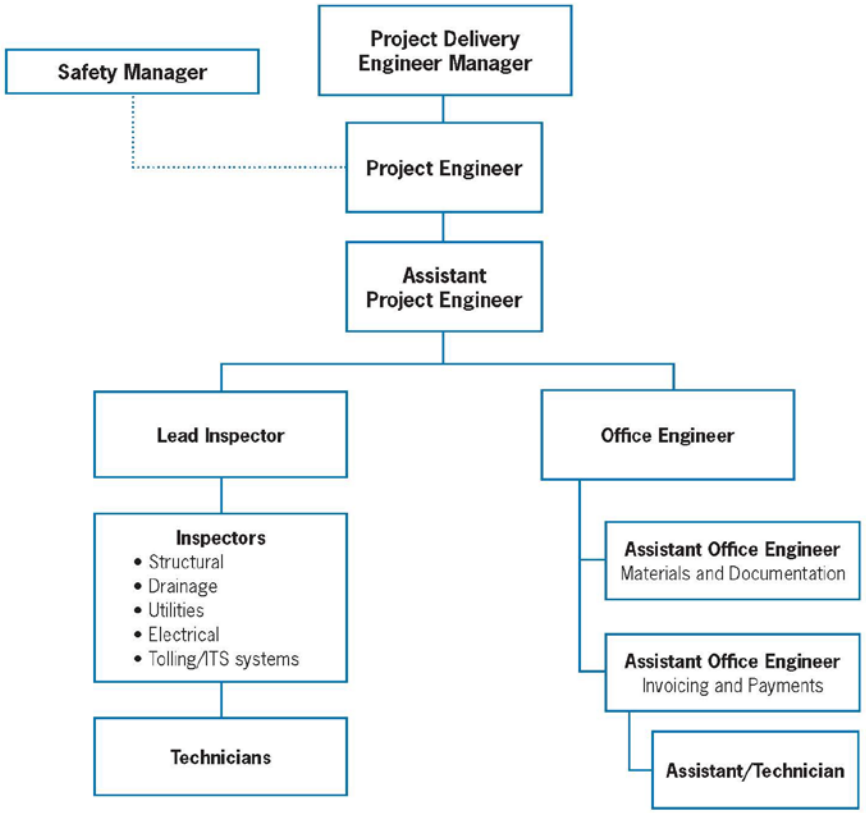
Organizational Chart - Bridge Removal Package (construction phase)



UPDATED: 04/03/13

Columbia River CROSSING

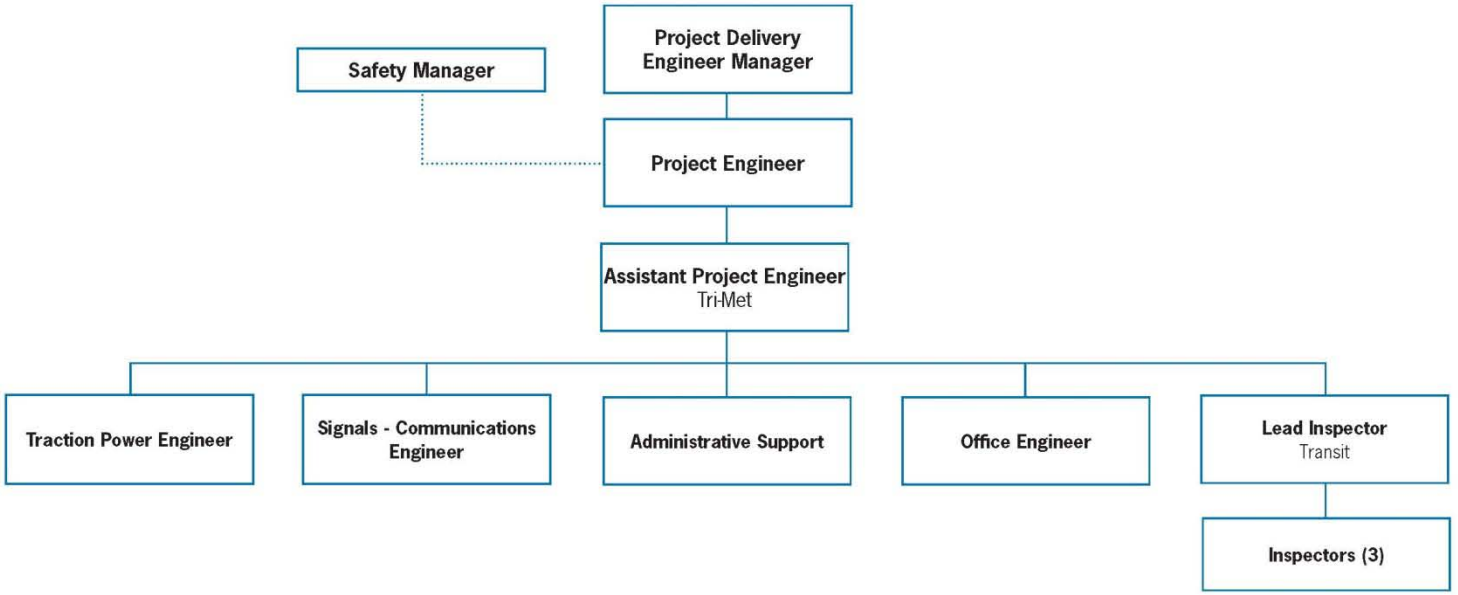
Organizational Chart - Highways Other (construction phase)



UPDATED: 04/03/13

Columbia River CROSSING

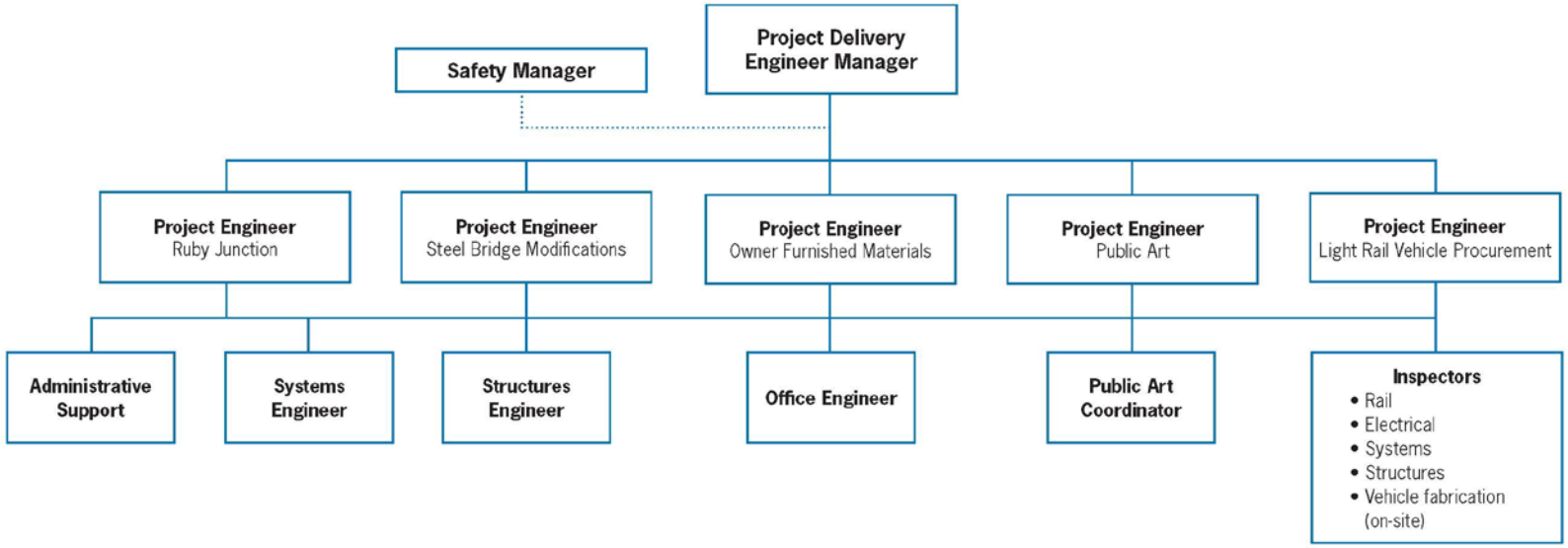
Organizational Chart - Transit Systems Package (construction phase)



UPDATED: 04/03/13

Columbia River CROSSING

Organizational Chart - Transit Other Package (construction phase)



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APPENDIX B
Responsibility Matrix

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Consolidated QA/QC Responsibility Matrix

Activity Description	Responsibility				
	Designer/Analyst	CADD Manager	Task Manager	Project Director, Director of Project Delivery, Consultant Project Manager	QA/QC Manager
Development, establishment, implementation, and evaluation of the QAM.					X
Day-to-day management of QAM requirements.			X	X	
Administration and implementation of the QAM.					X
Review all proposals prior to issuance and determine quality program requirements.					X
Review and comment on the contractor's proposed QC plan.					X
Verify the effectiveness of the QA manual.					X
Develop, implement, document, and maintain a QC plan for their work.	X		X		
Overall coordination of design effort.				X	
Coordination with Design Lead for electronic document management effort.	X	X	X		
Coordination of all items related to their assigned specialty.			X		
Oversight of design as it relates to cost/schedule (coordinate with Project Director).			X		
Audit the design process to verify that the QC plan has been implemented.	X		X		X
Examine the consultant's QC documentation to verify that the QC record is complete.					X
Perform design reviews in accordance with the PMP.	X		X		
Completeness and accuracy of design reviews.			X	X	
QA activities and quality issue disposition for design activities.					X
Development and implementation of the document control system.			X		X
Organization and control of internal files and for providing required documents to CRC for inclusion in the document control system.	X		X		
Document/drawing management system.	X	X	X		
QA verification of the document and drawing control systems.					X
Establishing and maintaining quality records.	X	X	X	X	X
Assembling, preparing, and maintaining all quality records for archiving.					X
Performing audits of quality records.					X
Performing or having performed quality assurance audits.					X
Training of their staff.	X		X		
Ensuring that training for CRC staff is adequate and complete.					X

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APPENDIX C
Corrective Action Request

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Columbia River CROSSING

CORRECTIVE ACTION REQUEST

Page _____ of _____

1. Contract No.	2. Item Location	3. Issue Date	4. CAR No.

5. Responsible Organization	6. Specification/Drawing No.	7. Originator of CAR ☐ Contractor ☐ Owner

8. Previously Issued Deficiency Notices, NCRs or AFRs	9. Response Date	10. Reviewed By (Supervisor)

11. Description of Recurring Condition and Contract Requirement _____

12. Root Cause of Problem _____

13. Action Taken to Prevent Recurrence _____

14. Response Prepared By	15. Response Date	16. CAR Proposed Implementation Date

17. RE Disposition	18. Approval	Date

19. Verification of Corrective Action

20. QA Disposition ☐ Acceptable ☐ Unacceptable	21. Approval	Date

22. Verification of Corrective Action _____

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APPENDIX D
Quality Assurance Audit Schedule

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Columbia River CROSSING

Quality Assurance Audit Schedule

	20____											
Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Prepared By: _____ Date: _____

Approved By: _____ Date: _____

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APPENDIX E
Quality Assurance Audit Log

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Columbia River
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QA/QC Manager:
Update:

		Task	Audit				Item Closed	
Deliverable ID	Deliverable Name	QM	Date	Findings	Corrective Action	Date Verified	Y	N

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APPENDIX F
Quality Assurance Manual Training Matrix

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Columbia River CROSSING

Quality Assurance Manual Training Matrix

	QAM Procedure Number														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Project Director, Director of Project Delivery, Consultant Project Manager	RA	RA	RA												RA
Design Managers, Task Leads (Transit, Environmental, Highway, Structures)	RA	RA	RA												RA
Specialty Leads (Survey, Structures, Highway, Stormwater, Utilities)	RA	RA	RA	RA									RA	RA	RA
Specialty Leads (CADD and Document Control) and Support (CADD and Document Control)	RA	RA	RA	RA									RA	RA	RA
Designers, Analysts, and Support	RA	RA	RA	RA									RA	RA	RA
Quality Assurance Staff	RA	RA	RA	RA									RA	RA	RA

RA = Read and Acknowledge training (See Note 1)

Procedure Number and Title

1. Management Responsibility
2. Document Quality Management System
3. Design Control
4. Document Control
5. Purchasing
6. Product Identification and Traceability
7. Process Control
8. Inspection and Testing
9. Inspection, Measuring, and Test Equipment
10. Inspection and Test Status
11. Nonconformance
12. Corrective Action
13. Quality Records
14. Quality Audits
15. Training

Note(s)

1. A 'Read and Acknowledge Form' (Appendix G) shall be filled out and signed by each individual participating in training on the CRC QAM.

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APPENDIX G

Read and Acknowledge Form for Quality Assurance Manual Training

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Read and Acknowledge Form
for
Quality Assurance Manual Training

The Quality Assurance Manual Training Matrix lists the positions within the Project that require training in quality procedures and documentation. The training is in the form of reading and becoming familiar with particular sections of the CRC Quality Assurance Manual.

Please note and perform the appropriate training for your position shown on the training matrix.

Please proceed with the "Read and Acknowledge" training at your earliest convenience.

You may contact the QA/QC Manager regarding any questions you have about the manual. When you have read and understand the assigned procedures in the Quality Assurance Manual **please circle the corresponding numbers listed below for the sections assigned to your position**, sign and complete the remainder of the form, and return it to the attention of the CRC QA/QC Manager.

Procedure Number

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

This is to acknowledge that I have read and understand the CRC Quality Assurance Manual procedure numbers identified above for my position as outlined in the QAM Training Matrix, Appendix F.

Name: _____

Signature: _____

Position: _____

Date: _____

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APPENDIX H
Read and Acknowledge Training Form Status

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Columbia River CROSSING

CRC Quality Assurance Manual
Read and Acknowledge Training Form Status

Forms Required			Completed Forms	
Name (Last, First)	Assigned To	Date	Name (Last, First)	Assigned To