Region 4 Tech Center Project Delivery Quality Plan

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Oregon Department of Transportation
63055 N. Highway 97

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SECTION 1. INTRODUCTION

1.1 Purpose

The purpose of this document is to assist Project Delivery professionals in the Region 4 Tech Center in creating biddable and constructible contract documents that comply with ODOT design standards and can be used to build projects within established construction budgets.

1.2 Culture of Quality

The uncertainty generated by funding issues, political influence, personnel turnover, and advancing technologies requires project teams to adapt contract documents to changes in scope with short timeframes. This high-pressure environment can undermine efforts to maintain quality. Accordingly, quality must be built into the daily activities of project development. Activities that support a culture of quality include, but are not limited to, the following:

- Regularly reviewing work products with a qualified technical reviewer
- Ensuring the qualified technical reviewer commits a block of time to provide thorough Quality Control (QC) reviews
- Incorporating QC tools and resources, such as those provided in the attached Appendices to assist in organization and communication of technical reviews
- Incorporating readily available digital collaboration tools (such as ProjectWise) to communicate changes across disciplines in real time
- Incorporating readily available technology (such as 3-D visualization) in review of engineering design work
- Assigning a lead technical resource on project teams (appropriate to the type of work) to assist Project Leaders when necessary
- Establishing technical core team designer exchanges within the project development teams to problem-solve issues efficiently. Include stakeholders (maintenance, PM crews, etc.) where possible
- Providing real time construction support and soliciting feedback on how contract documents are used in the field on project sites while under construction

1.3 Format

This document is divided into 3 sections corresponding to key contract document delivery milestones: Design Acceptance (Section 2), PS&E (Section 3), and Construction (Section 4).

Appendices are provided that include tools/checklists for several Tech Center technical disciplines. These tools/checklists may be selected by the pertinent Project Delivery professional to better structure QC reviews of the work.

1.4 Definitions

Project Lead Technical Resource: A project delivery professional that specializes in the area of technical focus for a project. For example, a project focused on bridge rehabilitation may assign the bridge designer as the Project Lead Technical Resource. The assigned resource is responsible to ensure that the supporting disciplines are coordinating and communicating with each other about technical items. The resource also assists the Project Leader with technical issues that require resolution within the team and from internal/external stakeholders.

Quality: the features and characteristics (degree of excellence) of a product which bear on an ability to create biddable and constructible contract documents that comply with ODOT design standards and can be used to build projects that satisfy the Project Business Case (formerly the Project Prospectus) within the established construction budgets.

Quality Control (QC): Refers to processes, activities, tools, and oversight techniques intended to ensure that Quality requirements have been fulfilled. The goal of QC is to identify process steps that best predict favorable outcomes.

Quality Improvement (QI): Incorporating adequate controls further upstream and on-line in the process to produce a better return. Identifying and correcting potential problem areas early in the design process can improve Quality by eliminating rework, scrap, re-inspection, and other delays.

Quality Assurance (QA): Refers to the certainty that products and services meet the requirements for Quality. The objective of QA is the continual improvement of the total delivery process to enhance Quality as well as productivity and customer satisfaction. Essentially, QA ensures that an appropriate QC process was implemented to develop Quality (as defined above) contract documents.

Technical Core Team Exchanges: routine meetings amongst a core sub-team, coordinated and led by a project team member outside of project team meetings. For example, a Project Lead Technical Resource for a bridge project may schedule bi-weekly meetings attended by the roadway, hydraulics, and traffic control designer to keep each other updated on design changes. Another example may include a right-of-way agent coordinating and leading a meeting attended by environmental, survey, and roadway personnel to evaluate data needed for environmental permitting. These meetings provide opportunities to improve Quality as well as provide opportunities for innovation early in the design process.

R4 Tech Center Project Delivery Quality Plan

Section 2:
Design Acceptance

Section 3:
PS&E

Section 4:
Construction

SECTION 2. DESIGN ACCEPTANCE

The Design Acceptance Phase (DAP) milestone is complete when the project's final footprint is established. The footprint takes into account incorporation of practical design principles, pertinent design variables, impacts and mitigation requirements. It also confirms the purpose and need, scope, schedule, s and budget for the project as described in the project Business Case (formerly the Project Prospectus). This milestone signifies that the decision has been made to move forward with Right-of-Way (R/W) and/or Environmental processes and the project team can move into the next phase in developing contract documents.

2.1 Design Acceptance (DA) Package

The DA Package includes the Project Narrative. This document is a key component of QA because it documents the design decisions and accepted risk associated with the baseline project scope at DAP. The purpose of the narrative is to describe items and/or issues that have an impact on the project footprint, cost, environmental or R/W process, and identify risks associated with the project to date. Decisions made regarding scope change as the project progresses to PS&E milestone reference this baseline project scope.

The Roadway Designer produces the roadway design portion of the project narrative (see Appendix A). The R/W, Utilities, Hydrology, Traffic Design, Traffic Control, Geology, Environmental, Access Management, Hazardous Materials, Material Source, Geotechnical, Traffic Safety, Mobility, Structures and other related disciplines produce their respective portions of the design narrative, which are compiled into the complete Project Narrative.

The project narrative is supplemented with appendices for DAP Plans, Estimate, Business Case, and Draft Traffic Management Plan. The narrative, appendices, and other related project documents are included in the Design Acceptance Package.

2.2 DAP Technical Design Reviews

Each Tech Center project delivery professional on the project team is responsible for the preparation of pertinent information for the DA Package. Additionally, project delivery professionals are responsible for soliciting reviews and input from a qualified technical reviewer, as described in Section 1.2 of this document. Appendices D through L follow this document and provide resources and tools for Tech Center disciplines to utilize during technical QC reviews.

Design reviews may occur prior to DA Package distribution date, or the review may occur concurrently with the Tech Center Comment Log review, as described in Section 2.3.

2.3 DA Package Comment Log

The R4 Tech Center Project Delivery Comment Log (see Appendix B) is a key Quality Improvement (QI) tool submitted along with the Project Narrative electronically to the project team, R4 unit managers, R4 District personnel, Construction, Tech Center Manager, Area Manager, and local agency stakeholders and staff. Comments are compiled by the Roadway

Designer, and responses are completed by the appropriate technical designer prior to the Design Acceptance Workshop (DAW) comment review meeting. Resolution of outstanding comments is completed before the Design Acceptance Certification Memo (DACM) is submitted for signature. The signed DACM is included in the DA Package and certifies that the Design Acceptance Phase Milestone (as defined above) is complete.

R4 Tech Center Project Delivery Quality Plan

Section 2: Design Acceptance	**Section 3:** Plans Development to PS&E	**Section 4:** Construction

SECTION 3. PLANS DEVELOPMENT TO PS&E

After the DAP milestone is complete, Tech Center project delivery professionals develop contract plans in phases until the project plans, special provisions, and estimate documents are ready to advertise for bid. As discussed in Section 1.2, quality must be built into the daily activities of project development during these interim phases.

3.1 Plans Development Technical Design Reviews

After the DAP milestone has been completed, project delivery professionals often develop the contract documents in phases. The phases include internal milestone reviews (such as Preliminary, Advance, and/or Final Plan distributions) in order to further communicate the scope, schedule, and budget for the project as approved at DAP to each other and project stakeholders.

Each Tech Center project delivery professional on the project team is responsible for the preparation of pertinent information for the internal milestone review. Additionally, project delivery professionals are responsible for soliciting reviews and input from a qualified technical reviewer, as described in Section 1.2 of this document. Appendices D through L follow this document and provide resources and tools for Tech Center disciplines to utilize during technical QC reviews.

Design reviews may occur prior to internal milestone review distribution date, or the review may occur concurrently with the Tech Center Comment Log review, as described in Section 3.2.

3.2 Internal Milestone Review Comment Log

The R4 Tech Center Project Delivery Comment Log (see Appendix B) is a key Quality Improvement (QI) tool submitted electronically to the project team, R4 unit managers, R4 District personnel, Construction, Tech Center Manager, Area Manager, and local agency stakeholders and staff. Comments are compiled by the Roadway Designer, and responses are completed by the appropriate technical designer prior to the Preliminary, Advance, and/or Final Plan comment review meeting. Resolution of outstanding comments is usually completed prior to the next scheduled internal milestone review.

3.3 Statement of Technical Quality

Each Tech Center project delivery discipline unit is responsible for preparing and completing a final internal technical review of the documents provided for the PS&E Acceptance Package. Designers, technical reviewers, and unit mangers sign the Statement of Technical Quality (STQ) indicating that:

> *independent technical reviews have been conducted that are appropriate to creating biddable and constructible, contract documents that comply with ODOT design standards and can be used to build projects within established construction budgets, as defined in the Quality Plan. During the development of the project, these reviews included assumptions, exceptions, practical design principles and alternatives pertaining to the final products. The products were also reviewed to determine whether the selected design supports the project need as described in the Project Business Case and developed by the Project Team.*

The STQ is a key Quality Assurance (QA) tool and certifies not only that the PS&E documents have been evaluated by a qualified technical reviewer, but that the development of the documents has been done in accordance with the appropriate assumptions, approved exceptions, selected alternatives, constructability constraints, and in accordance with the purpose and need identified in the project Business Case (formerly the Project Prospectus). STQ Forms for each Tech Center unit are provided in Appendix C.

3.4 PS&E Acceptance Package

The PS&E Acceptance Package is provided to ODOT's Office of Project-Letting (OPL) and includes the sealed plans and project-specific special provisions generated by Tech Center project delivery professionals. A final confidential cost estimate based on bid item quantities calculated by Tech Center staff is also provided.

Several other key certifications required from Tech Center professionals that are not provided on sealed plans are also included in the package. OPL's Final PS&E Submittal / Final PS&E Completeness Checklist summarizes additional items/certifications included in the PS&E Acceptance Package.

R4 Tech Center Project Delivery Quality Plan

Section 2: Design Acceptance	**Section 3:** Plans Development to PS&E	**Section 4:** Construction

SECTION 4. CONSTRUCTION

The Construction phase begins when the project is advertised for bid. At the project advertise milestone, the responsibility for the project transfers from the Project Leader (PL) to the Project Manager's (PM) office. In the case where a project will be administered by a Certified Local Agency, the Local Agency representative reports to the Local Agency Liaison (LAL). In each case, the PM's Office or LAL serves as the Agency's representative regarding questions from bidders during the bid advertise phase. Additionally, the PM/LAL works with the Area Manager (AM) and OPL to evaluate bids and eventually provide Notice to Proceed to the awarded construction contractor.

4.1 Project Advertise Support

Tech Center Project Delivery professionals provide support to the PM's Office during the project advertise milestone by assisting with responses to questions from the contractor, as well as preparing and submitting Project Addenda when needed. All technical providers incorporate the independent technical review described in Section 3.3 for PS&E contract documents prior to submitting addenda.

If a contract addendum involves changes to the standard specifications language, technical providers will obtain concurrence from the Technical Expert and Construction Project Manager prior to forwarding the addendum to the Specifications Writer.

4.2 Design Document Transition

After Notice to Proceed, the PL facilitates the transition of construction-related project documentation, as described on Page 81-83 of ODOT's Project Delivery Guide. The documents transferred to the PM are subject to the QC methods described above.

In addition to items listed in the PDG, the roadway designer also provides a Construction Survey Handoff Package, as described in Appendix M of the Highway Design Manual (HDM). Best practices for QC of the roadway Construction Survey Handoff Package are provided in Appendix N of the HDM.

4.3 On-Site Work Construction Support

Tech Center Project Delivery professionals provide support to the PM's Office once the Contractor begins work on the site. Change Orders require the PM to contact the Tech Center Project Delivery professional for input and support, per Chapter 15 (15-3) of the ODOT's Construction Manual. When revised contract documents are required, Tech Center staff prepares and provides the sealed documents. The revised documents are subject to the same independent technical review described in Section 3.3.

In addition to providing support for change orders, project delivery staff also provide an element of QA by visiting the project sites during construction. Design staff has the opportunity to contribute to the Culture of Quality described in Section 1.2 by evaluating first-hand how their designs are communicated and implemented during construction. Opportunities for innovation

and improvement in quality of future designs are direct products of these visits. Additionally, the relationship between construction and design staff are enhanced and designers are often included as trusted advisors during construction issues outside of the change order process.

4.4 Post-Construction Reviews

An annual meeting is organized by the region construction PMs to collaborate with tech center staff regarding construction administration of contract plans, specifications and quantities. The meeting is often held during the winter months, between construction seasons. Although project-specific feedback during the active construction season (as described in Section 4.3) is essential, an annual review of the construction program from a region-wide perspective provides opportunity for large-scale improvements to design processes.

The PMs describe specific issues related to project plans and specifications, as well as suggestions for improvements to plans and specifications. PMs also make specific note of design elements that were particularly useful during the administration phase of the project. Tech Center staff review contract change orders with the PMs during this meeting, and are able to provide specific feedback on the outcome of changes to design during construction.

Both construction staff and tech center staff are able to dialogue candidly on ways to improve design and construction methods. The agreed upon improvements that result from these reviews are often incorporated in time for the upcoming construction season.

Appendix A

Design Acceptance (DA) Package Narrative

Design Acceptance (DA) Package Narrative

As stated in Section 2.1 of the Quality Plan, the DA Package includes the Project Narrative. This document is a key component of QA because it documents the design decisions and accepted risk associated with the baseline project scope at DAP. The purpose of the narrative is to describe items and/or issues that have an impact on the project footprint, cost, environmental or R/W process, and identify risks associated with the project to date. Decisions made regarding scope change as the project progresses to PS&E milestone reference this baseline project scope.

The Project Narrative template is maintained by the Region Roadway Crew and is located on the following crew share:

\\Sn-reg4hq-1\crew4650shar\Design_Information\Roadway_QC

If you do not have permissions to access this share folder, please contact a region roadway designer.

Appendix B

Project Delivery Comment Log

Project Delivery Comment Log

As stated in the Quality Plan, the R4 Tech Center Project Delivery Comment Log is a key Quality Improvement (QI) tool submitted electronically to the project team, R4 unit managers, R4 District personnel, Construction, Tech Center Manager, Area Manager, and local agency stakeholders and staff. Comments are compiled by the Roadway Designer, and responses are completed by the appropriate technical designer prior to the Preliminary, Advance, and/or Final Plan comment review meeting. Resolution of outstanding comments is usually completed prior to the next scheduled internal milestone review.

The comment log template is maintained by the Region Roadway Crew and is located on the following crew share:

\\Sn-reg4hq-1\crew4650shar\Design_Information\Roadway_QC

If you do not have permissions to access this share folder, please contact a region roadway designer.

Appendix C

Statement of Technical Quality

Statement of Technical Quality

As stated in the Section 3.3 of the Quality Plan, each Tech Center project delivery discipline unit is responsible for preparing and completing a final internal technical review of the documents provided for the PS&E Acceptance Package. The Statement of Technical Quality (STQ) is a key Quality Assurance (QA) tool and certifies not only that the PS&E documents have been evaluated by a qualified technical reviewer, but that the development of the documents has been done in accordance with the appropriate assumptions, approved exceptions, selected alternatives, constructability constraints, and in accordance with the purpose and need identified in the project Business Case.

The STQ template is maintained by the Region Roadway Crew and is located on the following crew share:

\\Sn-reg4hq-1\crew4650shar\Design_Information\Roadway_QC

If you do not have permissions to access this share folder, please contact a region roadway designer.

Appendix D

Environmental Discipline
Quality Control Tools/ Resources

Environmental Quality Control Tools/Resources

A highway department environmental technical reviewer has to have thorough knowledge of the current state and federal environmental laws, administrative rules, accuracy requirements and highway department standards in order to properly quality control the environmental work for the department. The intent of Appendix D is to provide a list of resources to aid the reviewer during the quality control process. The following links include resources that are routinely selected as tools to assist the environmental professional and the environmental technical reviewer with quality control of a wide variety of environmental products:

Cultural Resources: Historic and Archeology

http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/Pages/guidance_resources.aspx#Cultural_Resources

http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/Pages/guidance_resources.aspx#Cultural_Resources:_Archaeology

http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/Pages/guidance_resources.aspx#Cultural_Resources:_Historic_Resources

Environmental Engineering: Acoustics, Air Quality, Erosion Control, Hazardous Materials, Water Resources:

http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/Pages/guidance_resources.aspx#Environmental_Engineering

http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/Pages/guidance_resources.aspx#Environmental_Engineering:_Accoustics

http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/Pages/guidance_resources.aspx#Environmental_Engineering:_Air_Quality

http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/Pages/guidance_resources.aspx#Environmental_Engineering:_Erosion_Control

http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/Pages/guidance_resources.aspx#Environmental_Engineering:_Hazardous_Materials

http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/Pages/guidance_resources.aspx#Environmental_Engineering:_Water_Resources

Natural Resources: Aquatic, Roadside Development, Terrestrial, Botany, Wetlands

http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/Pages/guidance_resources.aspx#Natural_Resources

http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/Pages/guidance_resources.aspx#Natural_Resources:_Aquatic

http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/Pages/guidance_resources.aspx#Natural_Resources:_Roadside_Development

http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/Pages/guidance_resources.aspx#Natural_Resources:_Terrestrial/Botany

http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/Pages/guidance_resources.aspx#Natural_Resources:_Wetlands

Guidance for NEPA projects

http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/Pages/guidance_resources.aspx#NEPA

Advisories, Bulletins and additional information:

http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/Pages/guidance_resources.aspx#

Appendix E

Geology Discipline
Quality Control Tools/Resources

Geology Quality Control Tools/Resources

The information provided here is offered to assist the Geology technical reviewer in providing feedback to the designer regarding the quality of the design and/or data as it pertains to the pertinent project delivery milestone. As design and construction technologies continue to evolve, the review process will also evolve. The following link includes documents that are routinely selected as tools to assist with organization and communication between designer and reviewer when evaluating Geology design data:

\\SN-REG4HQ-1\Geo_Bridge_enviro\QC_QA_Geo_HazMat

In addition, the geology design portion of the project is subject ODOT's Guidance provided in:

http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/Pages/guidance_resources.aspx#Geology/Geotechnical

Appendix F

Geotechnical Design Quality Control Tools/Resources

Geotechnical Quality Control Tools/Resources

The information provided here is offered to assist the Geotechnical technical reviewer in providing feedback to the designer regarding the quality of the design and/or data as it pertains to the pertinent project delivery milestone. As design and construction technologies continue to evolve, the review process will also evolve. The following link includes documents that are routinely selected as tools to assist with organization and communication between designer and reviewer when evaluating Geology/Geotech/HazMat design data:

\\SN-REG4HQ-1\Geo_Bridge_enviro\QC_QA_Geo_HazMat

In addition, the geotechnical design portion of the project is subject ODOT's Guidance provided in:

http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/pages/geotechnical_design_manual.aspx

Appendix G

Hazardous Materials Discipline Quality Control Tools/Resources

Hazardous Materials Quality Control Tools/Resources

The information provided here is offered to assist the Hazardous Materials technical reviewer in providing feedback to the designer regarding the quality of the design and/or data as it pertains to the pertinent project delivery milestone. As design and construction technologies continue to evolve, the review process will also evolve. The following link includes documents that are routinely selected as tools to assist with organization and communication between designer and reviewer when evaluating Geology/Geotech/HazMat design data:

\\SN-REG4HQ-1\Geo_Bridge_enviro\QC_QA_Geo_HazMat

In addition, the hazardous materials portion of the project is subject ODOT's Guidance provided in:

http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/Pages/haz_material1.aspx

Appendix H

Hydraulic Design Quality Control Tools/Resources

Hydraulic Design Quality Control Tools/Resources

The information provided here is offered to assist the hydraulic technical reviewer in providing feedback to the designer regarding the quality of the design and/or data as it pertains to the pertinent project delivery milestone. As design and construction technologies continue to evolve, the review process will also evolve. The following link includes documents that are routinely selected as tools to assist with organization and communication between designer and reviewer when evaluating hydraulic design data:

\\Sn-reg4hq-1\crew4650shar\Design_Information\Hydro_QC

In addition, the hydraulic design portion of the project is subject ODOT's Hydraulic Design Manual (HyDM). Chapter 4 of the HyDM described documentation needed and checks to perform during development of the Hydraulic Report. As shown in Appendix 4-B of the HyDM, the report is to be sealed and submitted at PS&E. The designer's organization of documentation and recommendations included in this report in its draft stage provides another way for hydraulic design professionals to organize and communicate design reviews at the Final Plans milestone.

Appendix I

Right-of-Way Discipline
Quality Control Tools/Resources

Right-of-Way Quality Control Tools/Resources

A right of way technical reviewer must have a thorough knowledge of the right of way process, applicable state and federal laws and department policies and procedures to properly quality control the right of way process done. The intent of Appendix I is to provide a list of resources to assist both the right of way professional and the right of way technical reviewer with the quality control process. The following links cover the different aspects of right of way products including the processes and procedures used to insure adherence to state and federal laws.

ODOT Right of Way Manual:
http://www.oregon.gov/ODOT/HWY/ROW/Pages/row_manual_info.aspx

ODOT Right of Way Engineering Manual:
http://www.oregon.gov/ODOT/HWY/GEOMETRONICS/ROW_Eng/RW_Manual/RW_Eng_Manual.pdf

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970:
http://www.fhwa.dot.gov/real_estate/uniform_act/

Public Law 91-646:
http://www.fhwa.dot.gov/real_estate/uniform_act/program_administration/lpa_guide/ch01.cfm

Guide to Appraising Real Property:
http://www.oregon.gov/ODOT/HWY/ROW/docs/

Oregon Administrative Rules Division 35 Right of Way and Real Property
http://arcweb.sos.state.or.us/pages/rules/oars_700/oar_734/734_035.html

Code of Regulations 49 CFR Part 24:
http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title49/49cfr24_main_02.tpl

Railroad and Utility Relocation program:
http://www.oregon.gov/ODOT/HWY/ROW/Pages/rail_utility.aspx

Appendix J

Roadway Design Quality Control Tools/Resources

Roadway Design Quality Control Tools/Resources

The information provided here is offered to assist the roadway technical reviewer in providing feedback to the designer regarding the quality of the design and/or data as it pertains to the pertinent project delivery milestone. As design and construction technologies continue to evolve, the review process will also evolve. The following link includes documents that are routinely selected as tools to assist with organization and communication between designer and reviewer when evaluating roadway design data:

\\Sn-reg4hq-1\crew4650shar\Design_Information\Roadway_QC

In addition, the roadway design portion of the project is subject to Tech Bulletin RD15-02(B), which provides the clarity and direction of the practice of sealing final roadway design calculations that support construction documents. The organization and review of this "Roadway PE Calc Book" provides another way for roadway design professionals to organize and communicate design reviews.

Chapter 16.5 and Appendix N of ODOT's Highway Design Manual are resources that may be accessed to assist with technical reviews of roadway digital data. These documents provide quality control guidelines and best practices for review of roadway digital data, including 3D Roadway Design Models. Appendix N provides digital design checklists, comment forms, and examples of projects reviewed by technical professionals.

Appendix K

Survey Discipline Quality Control Tools/Resources

Survey Quality Control Tools/Resources

A highway department land surveyor/technical reviewer has to have thorough knowledge of the current state laws, administrative rules, accuracy requirements and highway department standards in order to properly quality control a modern survey product. The intent of Appendix K is to provide a list of resources to aid the reviewer during the quality control process. As survey, design and construction technologies continue to evolve; the review process will also evolve. The following links include resources that are routinely selected as tools to assist the land surveyor/technical reviewer with quality control of a wide variety of survey products:

For the current survey product check lists:
\\Sn-reg4hq-1\Region4_Survey\QA_QC_Tools

Survey Policy and Procedure Manual @
http://www.oregon.gov/ODOT/HWY/GEOMETRONICS/docs/SPPMan2015.pdf

Right of Way Engineering Manual @
http://www.oregon.gov/ODOT/HWY/GEOMETRONICS/ROW_Eng/RW_Manual/RW_Eng_Manual.pdf

Construction Surveying Manual for Contractors @
http://www.oregon.gov/ODOT/HWY/GEOMETRONICS/docs/ConstructionSurveyingManualForContractors2014.pdf

Oregon Survey Laws and Administrative Rules @
http://www.oregon.gov/ODOT/HWY/GEOMETRONICS/pages/survey_law.aspx

Appendix L

Traffic Design Quality Control Tools/Resources

Traffic Design Quality Control Tools/Resources

The information provided here is offered to assist the traffic technical reviewer in providing feedback to the designer regarding the quality of the design and/or data as it pertains to the pertinent project delivery milestone. As design and construction technologies continue to evolve, the review process will also evolve. The following link includes documents that are routinely selected as tools to assist with organization and communication between designer and reviewer when evaluating traffic design data:

\\SN-REG4HQ-1\R4_Traffic\Traffic QA-QC

In addition, the traffic design portion of the project is subject ODOT's Highway Design Manual, Signal Design Manual, Sign Design and Sign Policy Manual, Lighting Policy and Guidelines , Traffic Lighting Design Manual, Striping Manual, Traffic Control Plans Design Manual, Mobility Procedures Manual, Access Management in Project Delivery (OAR 734-051-5120), Project Delivery Leadership Team Operational Notice PD-03, Access Management Manual and MUTCD.