

Washington State Department of Transportation
Eastern Region

Design Quality Management Plan

February 15, 2019

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Washington State Department of Transportation

Eastern Region

Quality Management Plan

Purpose

To provide a uniform approach to developing and implementing Quality Management Plans for projects developed within the Eastern Region.

Goal

To promote the overall quality of design documentation and plans, special provisions and estimate associated with projects developed in the Eastern Region

Background

On November 20, 2018, the Washington State Department of Transportation (WSDOT) Headquarters Design Office approved a memorandum emphasizing the importance of quality during the design phase. The memorandum states, “WSDOT has determined that it is a priority to provide for improvements to the process used in providing quality on each phase of Project Delivery. WSDOT has successfully been performing quality control (QC) and quality assurance (QA) in various ways from region to region, specialty office to specialty office, and program to program for many years. However, at this time there is no single policy or centralized process guiding the conduct of this function statewide.”

This memorandum goes on to direct Regions to develop and implement a Region Quality Management Plan that addressed various focus areas of quality management as they pertain to successful project development and delivery. As such, this document serves as Eastern Region’s Quality Management Plan.

Definition of Terms

Quality Control (QC) - Refers to those actions, procedures, and methods that are to be routinely employed at the production and administrative levels, under the jurisdiction of the Engineer of Record, during the development of work products to produce the desired quality. This includes procedures of checking the design and associated design documentation for completeness, accuracy of the calculations, consistency of the drawings, detecting and correcting design omissions and errors before the contract document are finalized, and in alignment with WSDOT design policy, practices and procedures.

Quality Assurance (QA) – Refers to those actions, procedures, and methods to be employed at management levels, under the jurisdiction of Engineer of Record, Project Development Engineer and Construction Engineer, to observe and ensure prudent quality control procedures are in place and are being carried out, and the desired results of quality are being achieved.

Quality Verification (QV) - Refers to those actions, procedures and methods employed at the Engineering Services Office and Headquarters Design Office, to review final products to

ensure quality management was implemented, the appropriate project development process was followed, and is reflected in the final contract document.

Designer - An individual directly responsible for the development of design calculations, drawings, specifications, contract documents and design documentation with a level of technical skills and experience commensurate with the complexity of the subject design they have been assigned.

Checker - An individual responsible for performing a full technical review of the design calculations, drawings, specifications, contract documents and design documentation.

Reviewer - An individual responsible for performing QA procedures for assuring that QC procedures have been performed.

Engineer of Record - This individual manages all aspects of project development and delivery and is responsible for all aspects the design and design documentation for a project under their direct supervision. They are a licensed professional engineer. The Engineer of Record normally stamps and signs the final contract plans and specifications.

Ancillary Engineer of Record – For projects that require stamped plan(s), special provision(s) and/or stamped discipline report(s) from one or more disciplines groups, this individual responsible for the design and design documentation for those aspect of the project under their direct supervision. They are a licensed professional engineer or landscape architect, based on specific requirements. The Ancillary Engineer of Record normally stamps and signs their contribution to the final contract plans and specifications.

Acronyms

AEOR – Ancillary Engineer of Record
EOR – Engineer of Record
PS&E – Plans, Special Provisions and Estimate
QA – Quality Assurance
QC – Quality Control
QMP – Quality Management Plan
QV – Quality Verification

General Approach/Provisions/Requirements

This document serves as the QMP and provides the framework of the Region's approach to design quality management practices, procedures and expectations. The QMP encompasses design quality (ensuring accuracy of the underlying engineering) and contract plan quality (ensuring that PS&E packages are comprehensive, clear and enforceable).

1. Project Management
 - a. EOR primary responsibility to lead PS&E development
 - b. TE3 has primary responsibility for all coordination with support groups.

- c. TE2 is lowest level of independent project coordination with support groups.
 - d. TE2 or higher attends all meetings with support groups and is included on all correspondence associated with the project development.
- 2. Accountability
 - a. Engineer of Record has primary responsibility for quality of PS&Es
 - b. Likewise, Ancillary Engineer(s) of Record are responsible for quality to their contributions of PS&Es (i.e. plan set stamped by discipline specific PE).
- 3. Training
 - a. To better promote the successful development of quality design and design documentation, Eastern Region will focus on in person training with the Region Construction Trainers.
 - b. The training is intended to ensure that designers are provided with the necessary training, skills and expertise to conduct assigned design work activities.
 - c. Included in all IDP for TT2s, TT3s, TE1s, TE2s, and TE3s and reviewed on an annual basis with employee's supervisor.
- 4. Scalability of Quality Management
 - a. Although quality is important for all projects, the level of effort necessary to achieve a quality of design varies between projects. For instance, larger, more complex projects require a substantially greater amount of effort to ensure quality than does a smaller, less complex project. To this end, and to help manage the level of effort necessary to achieve a minimum level of quality the projects will be assigned the following:
 - i. Level of Complexity (established at Endorsement Meeting)
 - 1. Low – Smaller projects with a low degree of complexity and/or risk
 - a. Typically small projects delivered almost entirely by a single Engineer of Record
 - b. Examples: paving, BST, rumble strips, signing, guardrail replacement
 - c. Use Standard QMP
 - 2. Medium – Larger projects with medium degree of complexity and/or risk
 - a. Typically includes contributions from multiple discipline groups and multiple Engineers of Record (e.g. bridge, geotech, traffic, etc.)
 - b. Preservation or Improvement projects that involve minor widening, re-channelization, constructability considerations, minor right of way acquisitions, etc.
 - c. Examples: culvert replacement, minor intersection improvement, deck repair
 - d. Use Standard QMP, amended as necessary
 - 3. High – Major roadway improvements with high degree of complexity and/or risk

- a. Major Preservation or Improvement projects that involve complex or high cost features, major constructability/staging considerations, significant right of way acquisitions, etc.
- b. Typically includes contributions from multiple discipline groups and multiple Engineers of Record (e.g. bridge, geotech, traffic, etc.)
- c. Examples: Interchange Reconstruction, bridge replacements, roundabout
- d. Use Project Specific QMP

Table 1.0 – Region Project Review and QMP Requirements

Level of Complexity	Review Requirements																Minimum Review Duration	QMP
	30% Review			60% Review				90% Review				AD Review						
	P	S	E	P	S	E	CN S	P	S	E	CN S	P	S	E	CN S			
Low			X	X		X		X	X	X	X	X	X	X	X	2 weeks	Standard	
																	Form	
Medium	X		X	X		X		X	X	X	X	X	X	X	X	3 weeks	Standard	
																	Form	
High	X		X	X	X	X	X	X	X	X	X	X	X	X	X	4 weeks	Project	
																	Specific	
	PS&E - Plans, Special Provisions & Estimate										AD - Advertisement Ready Plans							
	P - Plans										CN S - Construction Staging							
	S - Special Provisions										QMP - Quality Management Plan							
	E - Estimate																	

ii. All projects have:

1. PS&E Kick-off Meeting endorses:

- a. Project Schedule
- b. PMP
- c. Project Level of Complexity

b. Review Cycle

i. As specified in Table 1.0, projects will have periodic reviews.

1. Internal Office Review

- a. Prior to initiating a formal Region Review, Engineering of Record and Ancillary Engineer(s) of Record will conduct internal review
- b. As part of the Internal Office Review, the Checker will review the support documentation/calculations for accuracy.

2. Region Review

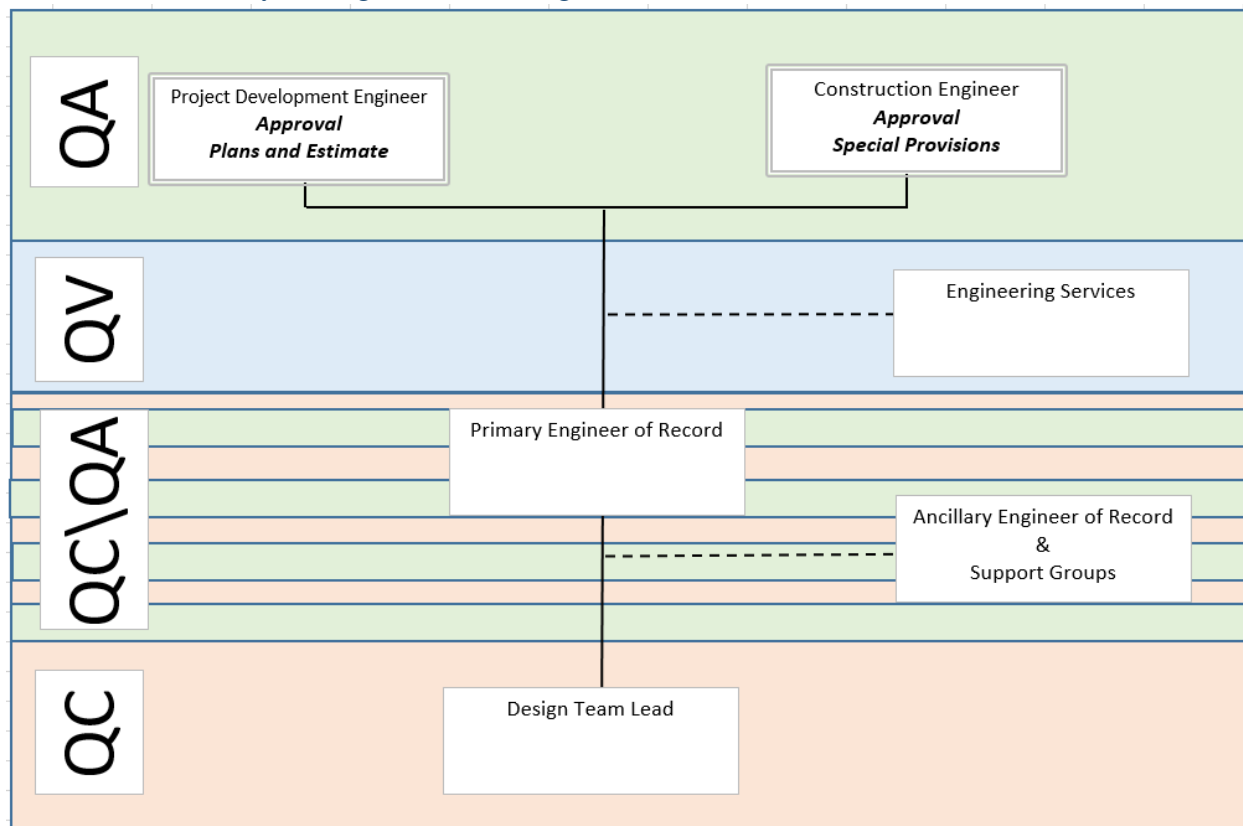
- a. Includes review by Support Groups (i.e. discipline specific reviews)
- b. All medium and high complexity projects have sit down reviews

c. Review Cycle Deliverables

i. 30/60/90/Ad Plan and Backup Review

1. Checklist for 30/60/90/Ad Plans and Backup Deliverables
 - a. Deliverable Expectation Matrix
 - b. Plans Preparation Manual
- ii. Engineering Services leads review, compile comments
 1. Office to provide responses to comments prior to AD
 2. Includes more than just plan sets (e.g. calculations, earth work, length of need, etc.)
 - a. Design checks for calculations
- d. Review Time Allowance
 - i. Scalable review time relative to complexity, size and level of completeness range 2 to 4 weeks
 1. Low – 2 weeks
 2. Medium – 3 weeks
 3. High – 4 weeks
- e. Region QA, QC, QV Roles and Responsibilities
 - i. Define roles and responsibilities for review (e.g. Area Office, Discipline Groups, Project Development Engineer, Construction Engineer and Engineering Services)
 1. QMP Organizational Chart

Exhibit 1.0 – Quality Management Plan Organizational Chart



- ii. Checklist for
 1. 30/60/90 Deliverable Expectation Matrix PS&E Review
 2. 30/60/90/Ad Review

- 3. Design Approval
 - 4. Project Development Approval
 - iii. QA Approval at AD Level
 - iv. Example: Each discipline responsible for review of their area of expertise and their own plan sets
 - 1. Tailored Review Checklist
 - 2. Should never check your own work, need independent review
- f. Region QV Process
 - i. Role of Engineering Services defined
- g. Performance Measures
 - i. Number of addenda, RFI, change orders, PE and CE costs
 - ii. Annual review of Region change orders
 - 1. Follow-up with each Engineer of Record
- h. Lessons Learned
 - i. Monthly Engineer's Meeting, Office Design Meetings, etc.
 - ii. Post CN lessons learned meeting with Designer and inspectors – for every project
 - iii. Region Lesson learned sessions. Highlights of ii above shared with all.
 - iv. PS&E Peer Exchange Meetings (Statewide)
 - 1. Yearly conference call in fall
 - 2. Yearly in person meeting in spring
- i. Annual Region Review of Design/Construction
 - i. Annual Design and Construction Conferences


Appendices

- a. November 18, 2018, WSDOT Quality Memo
- b. Sample Project Management Plan with Project Schedule
- c. Draft 30/60/90 Deliverable Expectation Matrix



November 20, 2018

TO: John Wynands, Olympic Region
Mike Gribner, Eastern Region
Dave Bierschbach, North Central Region
Mike Cotten, Northwest Region
Todd Trepanier, South Central Region
Carley Francis, Southwest Region
Brian Nielsen, AWW Program
Denise Cieri, SR 520 Program
Craig Stone, Puget Sound Gateway Program

FROM:  Jeff Carpenter, P.E.
State Design Engineer
Director, Development Division

SUBJECT: Design Guidance – Design-Bid-Build Quality Management

PURPOSE AND DIRECTION

Purpose

To document the process for ensuring quality of PS&E's for design-bid-build projects statewide. To adopt uniform definitions and define roles and responsibilities for quality management within each Region's quality plan.

Background

"Constructability and quality of design plans have been identified as significant national issues in need of being addressed and improved upon."¹ The situation with respect to quality is just as true today. WSDOT and other transportation agencies face increasing technical complexities, increasing regulation, and pressure to deliver quality projects on time, within budget and with no change to scope.

WSDOT has determined that it is a priority to provide for improvements to the process used in providing quality on each phase of Project Delivery. WSDOT has successfully been performing

¹ WSDOT, *A Manual of Instruction for the Implementation of the Constructability Review Process*, 1997.

quality control (QC) and quality assurance (QA) in various ways from region to region, specialty office to specialty office, and program to program for many years. However, at this time there is no single policy or centralized process guiding the conduct of this function statewide.

Executive action established a quality director to oversee WSDOT agency quality. This action is recognition of quality's importance and the need for more emphasis in this area. A significant amount of outreach has been conducted, with input from regions as well as industry partners, which has determined there is widespread need to establish baseline processes for ensuring quality and minimum expectations for statewide consistency.

The proposed quality process is expressed as two distinct phases. Design Quality (ensuring accuracy of the underlying engineering), and Contract Plans quality (ensuring that the various design packages are fully integrated and contractual expectations are clear and enforceable).

NCHRP Project 20-68A² concluded that in order to have a successful QA/QC program, "... it is important to have the support of upper management." As a result of this initiative, the Development Division hereby provides a framework for addressing quality on design-bid-build projects within WSDOT, as described below.

Definitions

The following uniform definitions of quality terms are adopted for WSDOT quality management:

- a. *Quality Control (QC)* refers to those actions, procedures, and methods that are to be routinely employed at the production and administrative levels, under the jurisdiction of the Project Engineer (or Engineer of Record), during the development of work products to produce the desired quality.
- b. *Quality Assurance (QA)* refers to those actions, procedures, and methods to be employed at management levels, under the jurisdiction of the Project Engineer (or Engineer of Record) and Project Development Engineer, to observe and ensure prudent quality control procedures are in place and are being carried out, and the desired results of quality are being achieved.
- c. *Quality Verification (QV)* refers to those actions, procedures and methods employed at the Region Plans Office and Headquarters Design Office, to review final products to ensure quality management was implemented, the appropriate project development process was followed, and is reflected in the final contract document.

² *Best Practices In Quality Control and Assurance In Design*, National Cooperative Highway Research Program, 2011.

Direction

Regions are ultimately responsible for the delivery of their assigned projects within the Highway Construction Program; including the quality of the final PS&E developed for each project, with specific responsibilities as follows:

- Region design office staff, including those working in specialty offices (Bridge, Geotechnical, etc.), are responsible for QC and QA of their own engineering and design work products. This work includes the engineering requirements associated with special provisions.
- The Design Project Engineer is responsible for QV of the QC and QA work performed by their staff, as well as QC and QA of the work required to integrate the design work products developed by various specialty offices. This work includes conflict recognition and resolution, as well as finalizing all special provisions. Although QC and QA responsibilities of the Project Engineer can be delegated, QV responsibilities cannot.
- The Region Plans Engineer has the responsibility for quality verification efforts as part of their plan review process. This work includes documenting compliance with provisions of the WSDOT Plans Preparation Manual and Special Provisions approval as outlined in the Region's quality plan.
- The Region Project Development Engineer is responsible for QV associated with the QC and QA work performed by their region staff.

The HQ Design Office is responsible for stewardship of the quality function as it applies to PS&Es statewide. This work includes statistical sampling of PS&Es, reviewing design error change orders, modifying policies and guidance as needed, ensuring the WSDOT Design and Plans Preparation Manual provides clear guidance, while allowing flexibility to maximize innovation. HQ Design also provides research and support in the form of access to proven quality management tools via a website.

Region Quality Management Plans

It is recommended that region quality management plans address and incorporate the following provisions:

- a. *Project Specific Quality Management Plans & Scalability* – Every project identifies formal QC/QA processes for both design & contract plan development either in the project management plan or in a standalone project specific quality management plan. Smaller less complex projects may utilize the project management plans to document

quality process, whereas larger more complex projects require a standalone quality management plan. Regions identify the criteria that will be used to determine complexity based on project risk, cost, etc. to be used in this determination.

- b. *Review Cycles* – All projects receive multi-disciplinary reviews, scaled to the complexity of the project. The level and number of reviews are generally dependent on project type, complexity, risk, cost, etc. In order to provide consistent expectation for project review, regions develop their own criteria for formal project review cycles (30/60/90/Ad) based on project type, complexity, risk, and any other appropriate factors that may affect the project quality.
- c. *Review Cycle Deliverables* – In order for the review cycles to be successful, regions will identify a set of common deliverables that need to be developed by the project team for performing the multi-disciplinary, and constructability, project reviews for each review cycle (30/60/90/Ad). Additional project specific deliverables may also be identified by the project team at the start of the project as part of their program of quality reviews.
- d. *Review Time Allowance* – In order to provide a thorough review, appropriate time allowance for each review cycle is necessary and is included in the project schedule. Guidance for review time allocation for various quality reviews (2-4 weeks), depending on project complexity, can improve adherence to project timelines, and may also be considered as standards in the region quality plan.
- e. *Region QA Roles and Responsibilities* – The Region's quality management plan defines quality assurance responsibilities, in addition to those given in "Direction" above, for the Project Engineer, Plans Engineer, Project Development Engineer, Region Construction Engineer and Engineering Manager, as well as their roles in multi-disciplinary quality reviews.
- f. *Specialty Office Quality Management and Review* – Specialty Offices are responsible for QC and QA of their design work products. Regions will include QC/QA guidance for region support offices in their quality management plan, and define their roles in the multi-disciplinary review cycles including review of design office plan integration of their work products.
- g. *Region QV Process* – Define the Plans Office roles and responsibilities in quality verification for both Design and Contract Plan review elements of a project.
- h. *Performance Measures* – Performance metrics to track performance through contract completion are included in the quality plan. Examples include measures such as: number of addenda; number of plan error change orders; variance of bids to the estimate; and number of clarifying questions from contractors during the bid period.

- i. *Lesson's Learned* – Include guidance on identifying, tracking, and sharing lesson's learned among region project teams and offices.
- j. *Annual Region Review of Design/Construction* – Provide for an annual meeting of construction and design offices (normally during the winter) to discuss lessons learned, best practices, and potential improvements to guidance on quality, design, etc.

Special Provisions

- a. *Special Provision Guidance*: For any given project, there may be multiple authors with different levels of expertise preparing special provisions for their respective disciplines. Special provisions override WSDOT Standard Specifications, and can result in costly change orders if not written clearly. Special provisions that are clear, concise and utilize performance based specifications over prescriptive (method) specifications are preferred. HQ Design Office has guidance for preparing contract special provisions in the Plans Preparation Manual. This guidance will be revised as necessary based on lessons learned and change order trends. Regions are expected to monitor revisions and updates to this guidance, and update to their region quality management plan accordingly.
- b. *Special Provisions Approval*: The approval of project specific special provisions currently resides with HQ Construction Office. Special provisions approvals, which have been provided by the HQ Construction Office, are hereby delegated to the regions upon adoption of a formal review and approval process for project specific special provisions in the region quality management plan. When a region takes responsibility for special provision approval, it is recommended that the approval role be assigned to the Engineering Manager/Region Construction Engineer level or higher.

Quality Verification (Region)

- a. *PS&E reviews* – Regions conduct 100% PS&E and Ad Ready PS&E reviews that focus on compliance with the WSDOT Plans Preparation Manual, and may, at their discretion, include QV reviews by the HQ Design Office.
- b. *WSDOT Peer Exchange* – Regions participate in a semi-annual statewide HQ PS&E Engineer peer exchange convened by HQ Design. The expectation is that region staff are prepared to share lessons learned, best practices, new methods and developments, emerging policies, etc. regarding project design and PS&E quality processes.

Quality Verification (Headquarters)

To ensure consistency in quality verification, HQ Design Office will develop a quality verification plan that includes:

- a. *Process Reviews* – Identify scope and frequency of process reviews on region quality management processes and develop standardized checklist for utilization during process audits.
- b. *PS&E Reviews* – Perform PS&E reviews on 15%-25% of the projects by volume on specific focus areas based on data and design/plan error trends in collaboration with HQ Construction.
- c. *Change Order Trend Tracking* – Track change order trends in order to drive policy changes based on the root cause of the design and/or contract administration related change orders. Review “design error” change orders over for opportunities to change policy or guidance.
- d. *Lesson’s Learned Evaluation* – Provide coordination services for Regions and HQ Construction that facilitate an evaluation of lesson’s learned for incorporation into the design guidance as necessary.
- e. *Peer Exchange* – Organize and lead the statewide Design/Plans Engineer peer exchange.
- f. *Provide training in estimating and plans development* – A new cost estimating class is now being deployed and is available through LMS. Other PS&E training is being reviewed for updating and future implementation.
- g. *Provide results and progress reporting* – This will be provided semi-annually to the Development Division Director.
- h. *Keep Up To Date on National Discussions* – This will be accomplished through established AASHTO and TRB websites and committees.
- i. *Submit Research Need Statement* – There is a tremendous amount of research on Design-Build and Construction quality, but very little on Design-Bid-Build quality. Working title for this statement is: “Performance Measures of Managing Design-Bid-Build Quality.”

Headquarters Quality Management Website

HQ Design will maintain a website devoted to design and PS&E quality management. The website will contain downloadable tools (templates, checklists, etc.) that have been proven to enhance the quality of PS&E’s. Over time, effective quality tools being used by individual regions can be added to the website to make them available statewide.

To John Wynands et al.
November 20, 2018
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ACTIONS REQUIRED

1. Regions to develop region quality management plan in accordance with the requirements of this memo by February 15, 2019.
2. HQ Design Office to develop quality verification plan and establish a quality management website including a library of quality management tools.

Additional information

Please contact your region's Assistant State Design Engineer for any additional information.

JC:bd

cc: Region Project Development Engineers
Assistant State Design Engineers
Chris Christopher
John Milton

XL5791

Project Management Plan

US 195 - Thorpe Rd - Intersection Improvements

Project Engineer: Chad Simonson, P.E.

Project Manager: Joe Ausband

Begin Construction Date: Summer 2019



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Project Description

This collision reduction project includes I2 PIN 619509Q. It is located on US 195 from MP 94.44 to MP 95.44, within the City of Spokane Corporate Limits, in T. 25 N. R. 42E. W. M.

This project will reconfigure the intersections on US 195 at Thorpe Road by removing the at-grade crossings and implementing Restricted Crossing U Turns (RCUT) / (J-Turns), including deceleration and storage lanes. It will allow right turns only out of Thorpe onto US 195 and provide U-turn locations with “loons” beyond the intersections. The J-turns will be located at 1,580 and 1,780 feet north and south of Thorpe. By removing the left turns and crossing movements made from Thorpe, the number of possible conflict points and the incidence of at-angle crashes will be reduced.

Other construction items of work will include HMA pavement, installation of Class A construction signing, installation of drainage structures, installation of guardrail. Other items of work may include: mitigating environmental impacts, illumination system, enhanced signing and other work. Geosynthetic fabric may be utilized if soil conditions require.

Construction of the project is anticipated to begin early summer of 2019 and be operationally complete by late fall of 2019.

Team Mission/Assignment

The project team will deliver a PS&E package that fulfills the intent of the project scope and its purpose, working within the guidelines of our Design Manual, Standard Specifications, Standard Plans, EEDS and other WSDOT manuals. With a unified effort the team will produce an ad-ready set of plans, specials and estimate for November 2018 ad date.

Major Milestones

The following project milestones are critical to complete the contract as planned:

PE Phase Start	April 2018
PMP Endorsed	July 2018
Design Approval	July 2018
Environmental Documentation Complete	September 2018
Region Review	September 2018
Project Development Approval	October 2018
Construction Funding Approved	November 2018
Ad Date	November 2018

Boundaries

The boundaries for this project are as follows:

- Physical project limits – MP 94.44 to MP 95.44
- Funding limits – PE \$122,639.00 & CN \$1,3000,000
- Major Milestone dates including environmental documentation completion, PS&E review and ad date.
- Design consistent with WSDOT design standards and policies that meet Practical Design Solutions.

Team Identification

Chad Simonson's Project Engineer Office is the lead for project design with the following team members:

- Project Engineer – Chad Simonson, P.E.
- Assistant Project Engineer – Jody Qualley, P.E.
- Project Manager – Joe Ausband
- Design Team – Haitham Mohamed & Utpal Datta (Consultant)

The following groups will play a role during project design, advertisement, and/or award:

- | | |
|---------------------------|-------------------------|
| ○ Signal Shop/Maintenance | ○ Design/Plans |
| ○ Utilities | ○ Environmental |
| ○ Program Management | ○ Materials Lab |
| ○ Traffic/TMC | ○ Geotechnical Services |
| ○ Right of Way | ○ Planning |

The following outside entities could be involved with some portion of the project:

- WSP
- Technical Advisory Committee
- City of Spokane
- Various serving utilities
- Task Force Group

Roles & Responsibilities:

The following groups agree to provide/perform the following tasks:

Project Office – (team members listed above)

- Define and uphold the projects purpose and mission.
- Produce plans, specials and estimate for a complete package for advertisement.
- Project Engineer will be the Engineer of Record for contract plans.
- Provide information and support to support groups to accomplish their tasks.
- Consider, coordinate and incorporate information from other groups into design file and PS&E.
- Monitor/manage schedule (PMRS) and budget.
- Present schedule and confidence reports at monthly status review meetings.
- Communication lead.
- Provide/acquire information to/from outside entities listed above who could have stakes in the project.
- Identify and manage risks.

Traffic Office/Transportation Management Center – Glenn Wagemann, P.E.

- Transportation Management Plan and work zone review
- Electrical details for illumination system
- PS&E review participant
- Permanent signing package

Signal Shop - Dave Brinkley

- Investigate potential electrical impacts
- Provide input for electrical system modification
- PS&E review participant

Maintenance – Ken Heale, and Ernie Sims

- Investigate and provide input regarding maintenance concerns within project limits
- PS&E review participant

Design/Plans – Ken Olson, P.E./ Dan McKernan, P.E.

- Provide design and plan development technical assistance
- Provide design documentation review
- PMRS support
- Coordinate PS&E reviews
- Final review & funding request
- Submittal of PS&E to HQ for Ad
- PS&E review participant

Materials Lab – Kevin Littleton, P.E. / Chad Swenson

- Pavement design report
- PS&E review participant

Utilities – Brian Marquette, P.E.; ER Utilities Engineer/ Mike Burdick

- Provide utility information and technical assistance for design
- PS&E review participant

Environmental – Tammie Williams

- Identify and assist with completing environmental requirements
- Lead environmental commitment meeting
- Complete NEPA/SEPA process
- Cultural resource survey/documentation
- Biological assessment
- PS&E review participant

Geotechnical Services – Chris Heathman

- Subsurface field investigations
- Soil cut and fill stability design
- Assist with geotextile selection
- PS&E review participant

Program Management – Darrel McCallum, P.E.

- Funding approval
- PS&E review participant

Right-of-way – Todd Emmerson, PLS

- Survey control
- Develop/check R/W basemap
- Develop/check parcel basemap
- Red/green R/W sheets

Planning – Char Kay, P.E.

- Stakeholder and public involvement support
- PS&E review participant

Operating Guidelines

The project team agrees to operate under the following guidelines:

- Decision making process

- Team members will voice and respect each other's opinions
 - We will involve key players early for timely solutions
 - Team consensus of major decisions
- Team meetings
 - Meetings will be held prior to major milestone dates when necessary to ensure schedule adherence and task deliverability.
- Communication
 - We will keep open lines of communication
 - The team will communicate verbally and through emails, memos, and letters.
 - Important verbal communication will be documented and placed in the correspondence file which can be found under O:\464307\XL5791 – US 195 Thorpe Rd – Intersection Improvements
- Managing team change
 - Early notice of team changes that could affect scheduled deliverables and awareness of available resources to overcome such changes.
- Managing team conflict
 - Resolve conflicts at earliest sign and at the lowest level possible before elevating up the chain of decision making.

Risk Management

The following items are areas of possible risk to the project and strategies to reduce and monitor these risks:

1. Ad date adjustment
2. Environmental concerns
 - Potential for environmental concerns within project area.
 - Modification to existing culverts impact on fish habitat
 - Erosion and sediment control
 - Possibility of unsuitable soils
3. Location selection due to the Public Involvement Process

Mitigation for these risks includes:

1. Develop spending plan to address begin/ end of biennium cash flow concern
2. Early identification of environmental impacts
3. Early identification of final R-Cut locations
4. Work with Eastern Region Environmental Office so a Biological Assessment may be completed.
5. TESC plan is a contract requirement. BMP's will be installed under contract and monitored upon contract completion.
6. Work with HQ Mats lab geotechnical office to conduct soils survey and perform soil logs to identify any unsuitable soils. If poor soils are present R-Cut locations will be adjusted or relocated as needed.
7. Seeding in a timely manner for the protection of slopes

Communication Plan

This project adopts the Eastern Region Common Communication Plan with no revision. The Region Common Communication Plan can be viewed on the Eastern Region Project

Management Support Website: [WSDOT - ER Project Management - Support](#). The project office staff is the primary contact for all project activities. A list of the project office and local contacts are as follows:

The Project Office staff:

Project Engineer	Chad Simonson	324-6252
Asst. Project Engineer	Jody Qualley	324-6251
Project manager	Joe Ausband	324-6155
Design Team	Haitham Mohamed	324-6246
	Utpal Datta (Consultant)	324- 6257

Support Group contacts:

Traffic Engineer	Glenn Wagemann	324-6550
Signal Shop	Dave Brinkley	323-8475
Design	Ken Olson	324-6100
Environmental	Tammie Williams	324-6134
Materials Lab	Kevin Littleton	324-6170
Maintenance	Ernie Sims	324-6586
Program Management	Darrel McCallum	324-6025
Construction Engineer	Robert Blegen	324-6021
Utilities	Brian Marquette	324-6121
Real Estate Services	Tim Golden	324-6280
Geotechnical	Chris Heathman	(360) 709-5592
Right-of-way	Todd Emerson	324-6115

Change Management Plan - Construction

This project adopts the Eastern Region Common Change Management Plan with no revision. The Region Common Change Management Plan can be viewed on the Eastern Region Project Management Support Website @

<http://wwwi.wsdot.wa.gov/Eastern/ProgramManagement/ProjectManagementSupport.htm>

Quality Plan

This project adopts the Eastern Region Common Quality Plan with no revision. The Region Common Quality Plan can be viewed on the Eastern Region Project Management Support Website @

<http://wwwi.wsdot.wa.gov/Eastern/ProgramManagement/ProjectManagementSupport.htm>

Transition and Closure Plan

This project adopts the Eastern Region Common Transition and Closure Plan with no revision. The Region Common Transition and Closure Plan can be viewed on the Eastern Region Project Management Support Website @

<http://wwwi.wsdot.wa.gov/Eastern/ProgramManagement/ProjectManagementSupport.htm>

Appendix A

(Risk Matrix)

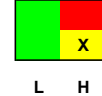
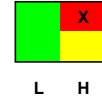

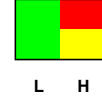
PROJECT RISK MANAGEMENT PLAN

Project TitleXL5791 - US 195/Thorpe Rd - Intersection Improvements

Project PIN #619509Q

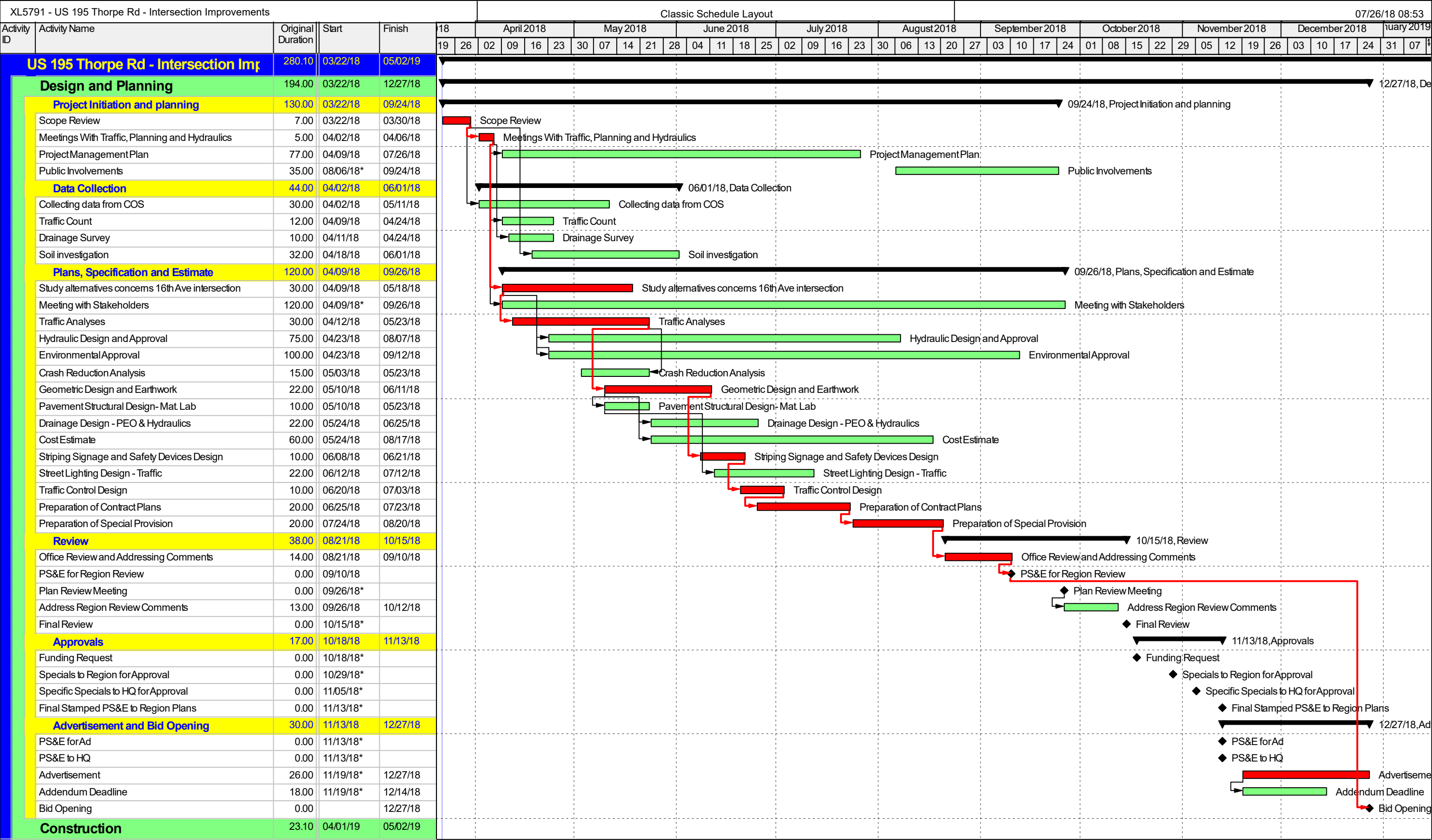
Date5/17/2018

Project ManagerJoe AusbandTelephone Number (509) 324-6155

Priority	PROJECT RISK MANAGEMENT PLAN															
	Risk Identification								Qualitative Analysis			Risk Owner	Risk-Response Strategy		Monitoring and Control	
	Status	ID #	Date Identified Project Phase	Risk Event (threat/opportunity)	SMART Column	Risk Trigger	Impact Area	Affected MDL/WBS Level 2 process	Probability	Impact	Risk Matrix		Strategy	ACTION TO BE TAKEN (include advantages and disadvantages)	Status Interval or Milestone Check	Date, Status and Review Comments
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
				Threat	The intersection	Simonson PEO Office mav	Scope									
1	Active	R1	4/1/2018 Design/PS&E	Opportunity	Environmental concerns • Erosion and sediment control • Possibility of unsuitable soils • Hydraulics Report	• Potential for environmental concerns within project area	Schedule	Design and Construction	Low	High	Probability H L  L H Impact	Simonson PEO	Acceptance	1. Early identification of environmental impacts 2. Early identification of final R-Cut locations 3. Work with HQ Mats lab geotechnical office to conduct soils survey and perform soil logs to identify any unsuitable soils. If poor soils are present R-Cut locations will be adjusted or relocated as needed.		
2	Active	R2	7/24/2018 Design/PS&E	Threat	Delivery from groups providing support may impact the schedule or AD Date	The Traffic Office stated their concern regarding their busy schedule with several projects.	Schedule	Design and Construction	High	High	Probability H L  L H Impact	Simonson PEO	Acceptance	Further Coordination with the groups providing support to get the progress and schedule updates.		
											Probability H L  L H Impact					
											Probability H L  L H Impact					

Appendix B

(Project Schedule)



Appendix C

(Endorsements)

Project Team Commitment

XL5791

US 195 - Thorpe Rd - Intersection Improvements

Work Plan Endorsement Statement

By endorsing this Work Plan the Executives and Senior Managers agree to undertake the duties, responsibilities and directives per Executive Order E 1032.00 dated July 1, 2005.

“We have provided information to the best of our knowledge regarding our role in this project. We endorse this Work Plan and are committed to actively supporting it. We accept responsibility for fulfilling any aspect of the plan that applies to us, including providing information and resources, actively participating, and effectively communicating. Our endorsement is an active and positive statement that we are committed to fulfilling the responsibilities designated in this plan.”

Name:	Initials	Role
Chad Simonson	_____	Project Engineer
Jody Qualley	_____	Asst. Project Engineer
Joe Ausband	_____	Project Manager
Haitham Mohamed	_____	Project Designer
Utpal Datta (Consultant)	_____	Project Designer
Glenn Wagemann	_____	Traffic Engineer
Ernie Sims	_____	Area 1 Maintenance Superintendent
Dave Brinkley	_____	Electronics Supervisor
Ken Olson	_____	Design/Plans Engineer
Kevin Littleton	_____	Materials Engineer
Tammie Williams	_____	Environmental Coordinator
Brian Marquette	_____	Utilities Engineer
Chris Heathman	_____	Geotechnical Engineer - HQ
Todd Emerson	_____	Survey Coordinator
Tim Golden	_____	Real Estate Services

NOTE: Initials not required for endorsements obtained through email.
Documentation of endorsement is attached.

Management Endorsement
XL5791 – US 195 - Thorpe Rd - Intersection Improvements

Work Plan Endorsement Statement

By Committing to this Work Plan, the **Executives** and **Senior Managers** agree to undertake the duties, responsibilities, and directives per **Executive Order E 1032.00** dated **July 1, 2005**.

“We have provided information to the best of our knowledge regarding our role in this project. We endorse this Work Plan and are committed to actively supporting it. We accept responsibility for fulfilling any aspect of the plan that applies to us, including providing information and resources, actively participating, and effectively communicating. Our endorsement is an active and positive statement that we are committed to fulfilling the responsibilities designated in this plan.”

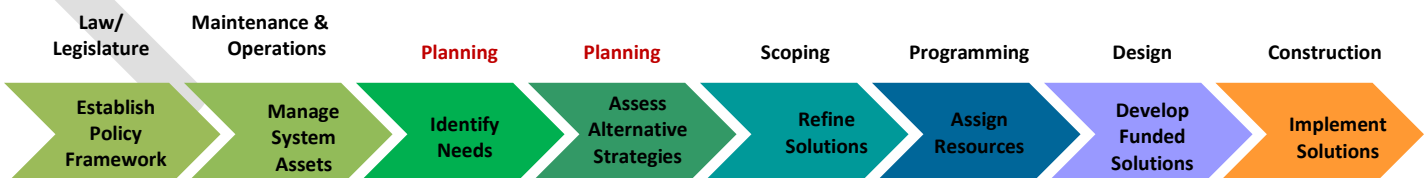
Name	Initials	Role
Mike Frucci	_____	ARA Maintenance & Operations
Larry Larson	_____	ARA Development Engineer
Robert Blegen	_____	ARA Construction Engineer
Darrel McCallum	_____	Region Program Manager
Mary Jensen	_____	Engineering Manager
Ken Heale	_____	Maintenance Manager

NOTE: Initials not required for endorsements obtained through email.
Documentation of endorsement is attached.

		can be planning, scoping or design teams		typically design teams preliminary engineering		final design and contract documents (ps&e) development			transition to construction	
<p>This tool offers “at-a-glance” information about deliverables during design and project development.</p> <p>Check appropriate resources and subject matter experts for details regarding specific deliverables for your project.</p>		Planning <i>corridor sketch strategies</i>	Scoping	Pre 30%	geometric design review (design approval)	constructability review	pre-contract review	Contract documents ready	Contract ad and award	Design Phase Closure
					~30%					
contents		consult or discuss with								
1	Timeline actions and purpose									
2	Project Management									
3	Cost Estimates									
	Maintenance Review and Coordination									
5	Pavement									
6	Utilities and Railroad									
7	Access – limited/managed									
8	Right-Of-Way									
9	Community Engagement									
10	Design Documentation									
11	Roadway Geometrics and Plans									
12	Channelization and Pavement Marking Plans									
13	Hydraulics-Water Quality									
14	Survey & Mapping									
15	Structures, Bridges, et al									
16	Illumination, signals and ITS									
17	Geotechnical Recommendations									
18	Work Zone Traffic Control									
19	Traffic Analysis									
20	Safety Analysis									
21	Signing									
22	Temporary Erosion and Sediment Control (TESC)									
23	Specifications									

LEGEND

	Blue shading = a new row, added since the last deliverables expectations matrix
	Orange shading = if applicable these groups/activities may be involved at these times in your project
	Orange pattern = sometimes these activities are happening during this time frame



	Scoping	project management plan development	geometric design review	constructability review	pre-contract review	contract ready (final review)	Contract Ad and Award	Design phase Closure
	<i>corridor sketch / planning study</i>	<i>~10%</i>	<i>~30%</i>	<i>~60%</i>	<i>~90%</i>	<i>100%</i>	<i>bid letting</i>	<i>Transition to construction</i>
¹ Timeline actions and purpose	project profile informs scoping and design start; begin Basis of Design with initial baseline project need	Identify team members <ul style="list-style-type: none">consultants, wsdot staff, or combinationcore team membersextended team membersroles and responsibilities project endorsementdesign criteria draftassumptionsdeliverable requirements project delivery method	design criteria finaldesign decisionsdesign approvalDesign Manual Ch. 300Basis of Design complete	major design elements completedunderground & overhead conflicts identifiedresolve conflicts: utilities, drainage, etc.review constructability3D modeling complete	deliverables substantially completedocument to reviewers	Region PS&E review (typically 10 weeks).	WSDOT publicly solicits bids from contractors to construct the project.	organized cessation of activities; transition work or staffArchive required records
² Project Management	corridor level vision	PMP & work plan (DBE goals) Scoping review and Proj. Management Handoff mtg. Baseline schedule Budget known Risk Management Plan Communication plan Change management plan Quality Plan (QA, QC, QV) Kickoff Meeting & Endorsement (Use Initiate and Align Worksheet) Executing work	Current project management plan (and work plan) – Capital Program Development & Management Office (CPDM) Manual, Design Manual 305; monitor & control (Quarterly Project Report) Quality: Control – actions at the production levels to produce the desired quality and professional services. Assurance – actions to ensure prudent quality control procedures are in place. Verification – actions to ensure a Quality Management Plan (QMP) was implemented and followed.				Official closure and handoff Lessons learned recognized accomplishments organized end of design activities transition of work or staff documentation per retention requirements	
³ Cost Estimates	Basis of Estimate Preliminary cost estimate developed for Project Definition	updated estimate & basis Budget assumptions communicated Determine if project needs: Value Engineering and/or Risk Assessment updated estimate & basis	Begin item by item Project Estimate (update basis of estimate) R/W Project Funding Estimate completed Side by side scope and estimate review	Estimate item quantities and unit costs. (update basis of estimate) updated estimate & basis Pay groups and pay items determined	Check that all items are included and correct. (update basis of estimate) Cost estimate completed with below the line items. Summary of quantities completed, item prices determined, lump sum cost detail completed	engineer’s estimate at ad Verify that all items are included and correct. (final basis of estimate) Construction estimate finalized		
Maintenance Review and Coordination	Drive project with Maintenance Discuss Maintenance issues Maintenance practical solutions incorporation into Scope	Identify Maintenance Review and Coordination Schedule Scoping review	Maintenance Review	Maintenance Review	Maintenance Review	Maintenance Review		
⁴	Identify and confirm level of required environmental documentation.							

Environmental Review, Permitting, & Documentation	Environmental Review Summary completed.	Verify permits and documentation needed Environmental budget and schedule submittal Agreement on Area of Potential Affect for Section 106 and Action Area for ESA coordination with agencies Environmental surveys of project footprint Complete necessary Env docs and permits to complete Geotech work	Coordination with agencies NEPA/SEPA compliance documentation	Coordination with agencies NEPA/SEPA Compliance documentation Environmental Permit Applications	Coordination with agencies NEPA/SEPA compliance documentation	Coordination with agencies NEPA/SEPA Compliance documentation Environmental Permit Applications		
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	Scoping	project management plan development	geometric design review	constructability review	pre-contract review	contract ready (final review)	Contract Ad and Award	Design phase Closure
	<i>corridor sketch / planning study</i>	<i>~10%</i>	<i>~30%</i>	<i>~60%</i>	<i>~90%</i>	<i>100%</i>	<i>bid letting</i>	<i>Transition to construction</i>
⁵ Pavement	Scoping Level Pavement Design Report completed, including: <ul style="list-style-type: none">o WSPMS/Historical Data/Maintenance Inputo Projected Traffic Type/Usageo Existing Conditions/Primary Deterioration	Scoping Level Pavement Design reviewed Region materials Pavement Design Report requested Preliminary Pavement Type Selection Completed Field and Core Investigation completed Draft Pavement Design Report completed	Draft Pavement Type Selection completed Draft Pavement Design Report approved by Region, (sent to Pavement Office for concurrence)	Pavement Type Selection submitted to Pavement Office for Final Approval Draft Pavement Design Report completed Final Pavement Design Document stamped by Region and forwarded to Pavement Office for signed concurrence	Final Pavement Design Report with Region stamp and Pavement Office signed concurrence to Region for Plan Review		Pavement Repair quantities and locations reviewed with Construction PEO for verification of field accuracy	
⁶ Utilities and Railroad	Potential utility relocations identified Responsibility for costs established	Utilities within the project limits notified. Washington Utilities Transportation Commission (WUTC) permit application for railroad crossings submitted Utility As-Built's requested. Railroad (RR) issues identified. Relocation cost responsibility defined. Franchise and permit documentation collected. Utility relocation strategy for project established.	Utility Conflict Report & Plan with as-built info. Preliminary Utility conflicts identified. Utility Object Relocation Record-UORR sent to Utilities. Project Overview Meet w/Utility Owners Utility Quality Level C & D completed. Determine need for Subsurface Utility Engineering, SUE Utility Quality Level A & B. Relocation plans/schedule request from Utilities. Franchise/Permit process initiated; cost recovery accounts initiated. Utility property rights verified. Railroad standard Construction Maintenance Agreement (CMA) obtained	Utility conflicts confirmed and relocation letters sent to Utilities. Utility relocation meeting held. Utility Relocation Plans and schedules obtained. Utility and railroad agreements completed Utility Franchise/Permit obtained. Finalize utility agreements (costs responsibility estimate complete)	Utility Relocation Plan information and specifications incorporated in PS&E. Letters of Understanding issued to Utilities requiring relocation. Utility, service, and railroad agreements completed. Utility relocation and schedule monitored and coordination completed. Construction and Maintenance Agreement completed.		Utility relocation work completed or timeline established	

	Scoping	project management plan development		geometric design review	constructability review	pre-contract review	contract ready (final review)	Contract Ad and Award	Design phase Closure
	corridor sketch / planning study	~10%		~30%	~60%	~90%	100%	bid letting	Transition to construction
⁷ Access – limited/managed DM 520, 530, 540, 550, 1103 DM 210 (hearings)	Define existing access status for the project; managed access and/or limited access A choice to change current or planned access is to be consistent with the contextual information, desired performance targets, and modal priorities. DM 1103. Evaluate Access Master plan - determine most appropriate access control. Document in BOD Section 3. Identify general project impacts to access.	Limited access	Identify affected abutters for access report and hearings. Determine if an access hearing is required. Evaluate access connections and identify improvements. Limited Access Change Access hearing required or notice of opportunity for a hearing. Access hearing Access Report and Access Report Plan prehearing packet	Access Hearing Plan and hearing process Findings and Order Plan Appeal Period Resume	New Limited Right of Way Limited Access Plan				
			Review grandfathered approaches and existing permitted approaches. Evaluate access connections and identify improvements. Is it appropriate to combine or close connections and reduce traffic conflicts?	Managed Access Control Permits in the RAMPS database, reviewed and updated. <i>RAMPS = Roadway Access Management Permit System</i>	Note: Managed Access connections are not noted on the Right-Of-Way plans. There is no Right-Of-Way plan change unless WSDOT requires Right-Of-Way.				
⁸ Right-Of-Way Right of Way Manual, Chapter 6 Design Manual 510	Property required for a public facility, includes square footage, access rights, easements, and any property impacts. Consider significant right of way elements in accordance with the <i>Right of Way Manual</i> .	Real Estate Services assists in minimizing right of way costs, defining route locations and acquisition areas, and determining potential problems and possible solutions. Appraisals and Acquisition information		Plan development: “red line R/W plan” R/W cost estimates made by Real Estate Services. Request title reports for identified right of way parcels. Real Estate Services performs field inspections as appropriate.	Confirm status of right of way acquisition. • Examine Title reports. • Add easements to right of way and limited access plan. • Obtain utility, railroad, haul road, detour routes, or other essential agreements. <i>Utilities Manual</i> and the <i>Agreements Manual</i> . • Plan right of way acquisition, disposal, and maintenance. • Plan easements and obtain permits (to accommodate activities outside of the right of way).	Right-of-way acquisitions complete.			

Project Development >	Scoping	project management plan development	geometric design review	constructability review	pre-contract review	contract ready (final review)	Contract Ad and Award	Design phase Closure
	<i>corridor sketch / planning study</i>	<i>~10%</i>	<i>~30%</i>	<i>~60%</i>	<i>~90%</i>	<i>100%</i>	<i>bid letting</i>	<i>Transition to construction</i>
⁹ Community Engagement	multimodal, multiagency, multidisciplinary engagement concept team launch create stakeholders list <i>get input from region communications</i>	community engagement plan complete confirm need & context Design controls Alternatives Analysis preferred alternative Elements/Dimensions Identified Dimensioned	Investigate design concepts that Incorporate community feedback	Investigate design concepts that Incorporate community feedback	Community engagement ideas fully implemented into contract plans			
¹⁰ Design Documentation	Context Management Assessment Report (CMAR) complete BOD initiated	Section 1 and 2 of the BOD complete. Baseline and contextual needs including performance metrics and targets. Context determined. Section 3 and 4 in draft form circulated for concurrence.	All sections of BOD complete and BOD approved	If a separate Design Approval is necessary, it should be completed in this phase. Design Analysis completed.	Project Development Approval complete or combined Design Approval/Project Development Approval complete.	Design Documentation Package complete		Design documentation transferred to construction project office.
¹¹ Roadway Geometrics and Plans	Project limits identified Affected alignments identified New versus existing alignment Target speed Preliminary design criteria established	Design criteria and parameters approved Preliminary footprint designed	Typical roadway section(s) completed; station to station roadway geometrics, surfacing type & depth, slope information, guardrail, vertical cut locations, and construction notes Mainline and major horizontal, & vertical alignments, and superelevations designed	All horizontal & vertical alignments & superelevations completed Design Analysis approved DDP updated as required	All geometric plans completed (alignment, profiles, roadway sections, interchange contours, site preparation, road approach plans, etc.) Design compared to endorsed design criteria/parameters	Final Plans for PS&E contract		

Project Development >	Scoping	project management plan development	geometric design review	constructability review	pre-contract review	contract ready (final review)	Contract Ad and Award	Design phase Closure
	corridor sketch / planning study	~10%	~30%	~60%	~90%	100%	bid letting	Transition to construction
¹² Channelization and Pavement Marking Plans		Intersection Control Analysis (ICA) approved (if not already complete in scoping)	Roundabout Geometric Design Peer Review complete. Intersection Plans for Approval submitted for review. Signal permits completed. Striping material selected.	Design Analysis submitted and approved Intersection plans for approval complete	All plans completed Approved Channelization Plan verified for consistency with pavement marking plans and specifications		prefinal	
¹³ Hydraulics & Water Quality see Temporary Erosion and Sediment Control (TESC) -	Drainage needs identified in accordance with Maintenance and Regional Hydraulics	Design criteria identified Storm water Management requirements identified Water quality requirements identified Retrofit Cost-Effectiveness and Feasibility (RCEF) Analysis Confirm specific criteria for: - Fish Passage - Chronic Env Deficiency - Major Drainage - Bridge Scour/replacement	Storm water Management strategies, including locations for treatment identified (hydraulic and water quality issues identified) Sensitive Area Documentation completed (Water Resource Inventory). Stormwater Management Strategy endorsed by region or HQ hydraulics engineer	60% check-in using Hydraulic Report Checklist TS&L of drainage facilities determined draft Hydraulic Report, - Documentation of needs - Existing basins and flows for anticipated Threshold Discharge Areas - Identification of Minimum -- Requirements from Highway Runoff Manual (HRM). Storm Water Report submitted to region for review and approval Hydraulic Report Submitted Preliminary Stormwater Mgmt options to identify R/W needs completed Preliminary Hydraulics Design, i.e. stream design	Hydraulic Report Final approved verified for consistency with plans and specifications Storm water details completed If applicable, transfer stormwater retrofit funds over to the I-4 Subprogram, Stormwater Retrofit Category Final Hydraulic Design, i.e. stream design			
¹⁴ Survey & Mapping	LIDAR or existing aerial photos or other preliminary information.	Project survey requirements finalized, including areas that may be outside roadway corridor improvements. Project survey control completed Cadastral survey performed. Topographic Survey complete.	Design level mapping completed Record of Survey completed and filed Right of Way plan completed and approved Relocation plan completed	Mapping of new roadway features completed Field review of proposed features completed	DNR Permits to Destroy Monuments obtained	Preliminary construction staking data completed		

Project Development >	Scoping	project management plan development	geometric design review	constructability review	pre-contract review	contract ready (final review)	Contract Ad and Award	Design phase Closure
	corridor sketch / planning study	~10%	~30%	~60%	~90%	100%	bid letting	Transition to construction
15 Structures (Bridges, Retaining Walls, Noise Walls, high mast lighting, sign structures) Also, refer to "Expectation for Structural Reviews" matrix.	Determine needed structure and/or geotech work. Square footage cost estimates of structures	Contact Bridge & Structures Office to discuss scheduling needed information and Scope for Type, Size and Location (TS&L). Determined Structural Input on Environmental Documentation and Permits Provided Structural Participation in Agency Coordination Provided	Complete: TS&L (Preliminary Bridge Plan) Bridge and Wall Site Data for Preferred Structural Alternative Structural Permitting Submittal Review (constructability review for construction method, sequence, and schedule)			Final plans complete	prefinal	
16 Illumination, Signals and ITS	Establish required light levels (roadway and pedestrian classification). Determine ITS needs and preliminary equipment locations.	Coordinate with signal operations for any proposed new or modified traffic signal systems. Signal operations will develop signal-phasing plan(s) as part of signal system analysis. Start speed study for existing intersections. Begin collection of as-built data for existing locations.	As-built information collected and verified on-site with maintenance. Illumination Light Level Analysis complete. Signal phasing plan complete. Preliminary signal plan approved. Pole locations provided to design for coordination of grading and drainage Confirm lateral bearing pressure design for poles Wind load charts for signal standards Contact structural designer for poles mounted on structures. Determine preliminary utility connections (power or communications) and initiate coordination with serving utilities.	Box/vault, cabinet, and conduit layout complete. Wiring / network (fiber) diagram complete. Signal display and detection laid out and identified. Provide data to Bridge and Structures Office for any special design equipment or foundations.	All notes and schedules complete, including review and approval of supporting calculations. Supporting detail plans complete. Provide service agreement requests (power or communications) to utilities office for processing.	Final plans complete. Service agreements complete.		

Project Development >	Scoping	project management plan development		geometric design review	constructability review	pre-contract review	contract ready (final review)	Contract Ad and Award	Design phase Closure
	corridor sketch / planning study	~10%		~30%	~60%	~90%	100%	bid letting	Transition to construction
Geotechnical Recommendations	Scoping level cost estimate for project/workforce planning, based on project size, location, known elements & historical costs.	Support for TS&L <u>Submittal:</u> TS&L (when required)	<u>Required Information from Others:</u> <ul style="list-style-type: none">• PMP• Work Request• Scope of Work Agreement• Draft Schedule <u>Submittal:</u> Cost estimate provided, based on project size, location, known elements & historical costs. <u>End of Phase Document:</u> <ul style="list-style-type: none">• PMP endorsement• Scope of Work agreements initiated• Draft Schedule	<u>Required Information from Others:</u> <ul style="list-style-type: none">• Project Site Data;<ul style="list-style-type: none">○ Mainline and major horizontal & vertical alignments○ Typical roadway section(s)○ TS&L of all Structures○ Wall Site Data○ Hydraulic/Storm water features• Field Exploration Clearances, ROE and cultural resources.• Preliminary Hydraulic Design (PHD) <u>Submittal:</u> <ul style="list-style-type: none">• Geotechnical Information for Bridge Preliminary Plan• Drilling Exhibit for ESA <u>End of Phase Document:</u> <ul style="list-style-type: none">• Final SOW Agreement• Final Cost estimate & Schedule	<u>Required Information from Others:</u> <ul style="list-style-type: none">• Approved Bridge Preliminary Plan• Roadway sections• Draft Bridge Scour Recommendations• Survey Borehole locations <u>Submittal:</u> <ul style="list-style-type: none">• Field Exploration Plan & utility locates• Soils Data to Hydraulics• Geotechnical Information for Bridge Sub-Structure Design	<u>Required Information from Others:</u> <ul style="list-style-type: none">• Final Hydraulic Design (FHD) <u>End of Phase Document:</u> <ul style="list-style-type: none">• Final Geotechnical Recommendations (Report/Memorandum)	<u>Required Information from Others:</u> <ul style="list-style-type: none">• PS&E Review Set <u>Submittal:</u> <ul style="list-style-type: none">• PS&E review comments <u>End of Phase Document:</u> <ul style="list-style-type: none">• Summary of Geotechnical Conditions	<u>End of Phase Document:</u> <ul style="list-style-type: none">• Decommissioning of wells	Project close out & transition to Construction support
¹⁸ Work Zone Traffic Control	Basic traffic control strategies & alternatives identified. Projects of significance must have Traffic Management Plan (TMP) scoped.			Preliminary Traffic Management Plan/Traffic Control Plan	TMP showing construction sequence and staging completed	Final TMP completed. Final detour plans completed	TMP, including traffic control plans completed and associated Specials approved		
¹⁹ Traffic Analysis Operations Analysis Interchange Justification Report (IJR) / Access Revision Report (ARR)	<ul style="list-style-type: none">• Scoping level operational analysis complete for alternatives consideration	<ul style="list-style-type: none">• Operations analysis scope determined• Traffic data collected• Perform Operations Analysis• Intersection Control Analysis (ICA) approved (if not already complete in scoping)		Operations analysis complete. IJR/ARR complete	Assumptions and conclusions in Operations Analysis verified for consistency with design.				
²⁰ Safety Analysis Crash Analysis Report (CAR)	Reference Safety Analysis Guide for what will be needed for safety analysis for the funding program. CAR is complete if funded from the Collision Reduction program.	Gather data necessary for Safety Analysis. Perform Safety Analysis		Safety Analysis complete.	Assumptions and conclusions in Safety Analysis verified for consistency with design.				

Project Development >	Scoping	project management plan development	geometric design review	constructability review	pre-contract review	contract ready (final review)	Contract Ad and Award	Design phase Closure
	corridor sketch / planning study	~10%	~30%	~60%	~90%	100%	bid letting	Transition to construction
²¹ Signing		<ul style="list-style-type: none">• Contact Region Traffic Office to discuss scheduling, scope of project, and needed information for sign design• Gather and deliver signing information to the Traffic Office	<ul style="list-style-type: none">• Existing signs to reuse and relocate defined• Existing sign inventory complete(include electrical items for sign lighting, flashing beacons, or variable/dynamic message signs)• Potential conflicts between light standards, camera poles, and signal poles with signs identified• Requests for sign structures submitted to HQ Bridge and Structures• Preliminary Guide Sign Plan developed• Preliminary Lump Sum Estimate calculated	<ul style="list-style-type: none">• Visual standards for corridor coordinated with Landscape Architect• Signing plans, notes, sign specifications completed• Conflicts with illumination, camera poles, and/or signal features, drainage or utilities identified• Coordination with luminaires on structures or walls identified and mounting/foundation details completed• Updated Lump Sum Estimate• Utility Agreement and Utility Relocation Requests submitted• Sign layout complete, include overhead signs	<ul style="list-style-type: none">• Updated Sign Design Plan Sheets (Sign Specification Sheets – Removal, Relocation, & Roadside Sign Structures; Sign Plans; Sign Details)• Overhead Sign Structure Plan Sheets completed• Update Lump Sum Estimate			
²² Temporary Erosion and Sediment Control (TESC)			Preliminary TESC completed	TESC plan submitted to region for review and approval	Final TESC approved, including site visit Construction Water Quality Monitoring Plan submitted	Approved TESC letter transmitted to PS&E Erosion Control Plans and Notes completed	Staking of TESC measures and construction reviewed	
²³ Specifications			Start writing specials for non-standard bid items.	Specifications preliminary run list completed	Specifications run list completed All special provisions submitted for review and approval. Specialty groups specifications and special provisions completed Pay groups and pay items determined	Approved Specifications included in PS&E		