

Washington State Department of Transportation

Olympic Region *Quality Management Plan for Design*

Recommended for Approval:

Date 9-4-19 Date 8/13/19
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2019 Olympic Region Quality Management Plan for Design

Purpose:

The purpose of this Region Quality Management Plan is to consistently produce quality design engineering products by implementation of disciplined Quality Control (QC), Quality Assurance (QA), and Quality Verification (QV) practices during all aspects of Olympic Region design engineering.

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. QC also includes the independent check of your work product by your peers.

Quality Assurance (QA) –Refers to independent reviews at 30/60/90% completion and at the 100% Region Review. These independent reviews by peers and support groups provide assurance that the PS&E provide a biddable and constructible product. Also refers to those actions, procedures, and methods 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 Region Plans Office and Headquarters Design Office, to ensure quality management was implemented, the appropriate project development process was followed, and is reflected in the final contract document.

Commitments:

To successfully accomplish the above purpose, the following commitments are necessary:

1. The Olympic Region design engineering culture will adopt quality as a fundamental value and establish pride in the consistent quality of its engineering products. Region Construction will provide Lessons Learned feedback to the design team and Region Plans office resulting from the administration of the contract.
2. Engineering resources assigned to tasks/projects will be trained to conduct the assigned work using WSDOT policies and tools including QC/QA policies and tools. If the engineers and technicians do not have the training and tools they need, there is little chance that they will produce a quality product.
3. Task/project assignments will begin early enough and provide appropriate time for QC/QA activities as well as production. Time allocation and budget for QC/QA activities will be defined in project schedules. Contingency time will also be incorporated into the schedule to account for QC/QA activities. Invariably something will happen to slip the schedule. A schedule without contingency time is not a realistic schedule.

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4. All engineering work products will go through documented checking (QC), independent review (QC) and progress reviews (QA). If QC/QA is not documented, it was not accomplished.
5. Quality verification (QV) examinations by Region Plans and HQ Design will assure that appropriate and effective QC and QA processes are happening in each office.

Olympic Region Quality Management Plan (QMP)

1. Planning for Quality

All Olympic Region projects will have a quality management plan (QMP). Most projects can use this Region Quality Management Plan as its plan. The Project Engineer will determine if the project is large or complex enough to warrant a project specific QMP. Project Engineer will discuss the scale of the QMP with the respective Project Development Engineer. The Project Engineer (or Asst. Project Engineer) owns the project QMP. It is critical that time and resources for quality management are included in project planning.

2. **Scheduling for Quality – All projects will have a schedule that includes quality management.** There must be adequate time to produce a quality project. Quality Control and Quality Assurance must be planned into project schedules. Project schedules must also account for risk and have contingency time identified so that the unexpected does not eliminate quality control efforts.

- a. **Scoping** – Add contingency time to schedules to account for perceived risks and to perform the documented QC/QA processes. Projects designed by construction offices should ideally be scheduled to complete design documentation in one winter and PS&E the winter before ad.
- b. **Project Development** - Assign appropriate workload with adequate contingency time included in the schedule to deliver quality products, while addressing identified risks and performing the documented QC/QA processes.

3. Quality Control Processes (checking)

All Olympic Region design engineering products will go through documented Quality Control process (QC). QC is not scalable. Design engineering products is an inclusive term; surveying, computer models, reports, calculations, schedules, PS&E's, etc. In general it is any engineering product that will leave the office or supports a product leaving the office.

- a. All design engineers and technicians will thoroughly check their own work prior to submittal. This will be documented on the submitted work product.
- b. All design engineering products will be checked by an independent peer. This check will be documented on the submitted work product.
- c. Back-checks will be conducted and documented to ensure that deficiencies have been addressed and corrected.
- d. The Design Team Leader or Specialty Office Supervisor has primary responsibility for QC and assigning or performing checking and back checking.

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Appendix A contains several review checklists by discipline; these are checklists meant for a larger overall review of a project as a whole.

Appendix B has several checklists for internal review; these are meant for smaller data checks such as wall data, drainage design, or plan set review.

Appendix C contains QC procedure checklists; these documents explain the QC process and tracking tools.

Figure A is a typical checking flow chart. The Backchecker is usually the originator. The Corrector is either the Originator or the Checker. The Verifier is either the Checker or another qualified peer, but cannot be the Corrector.

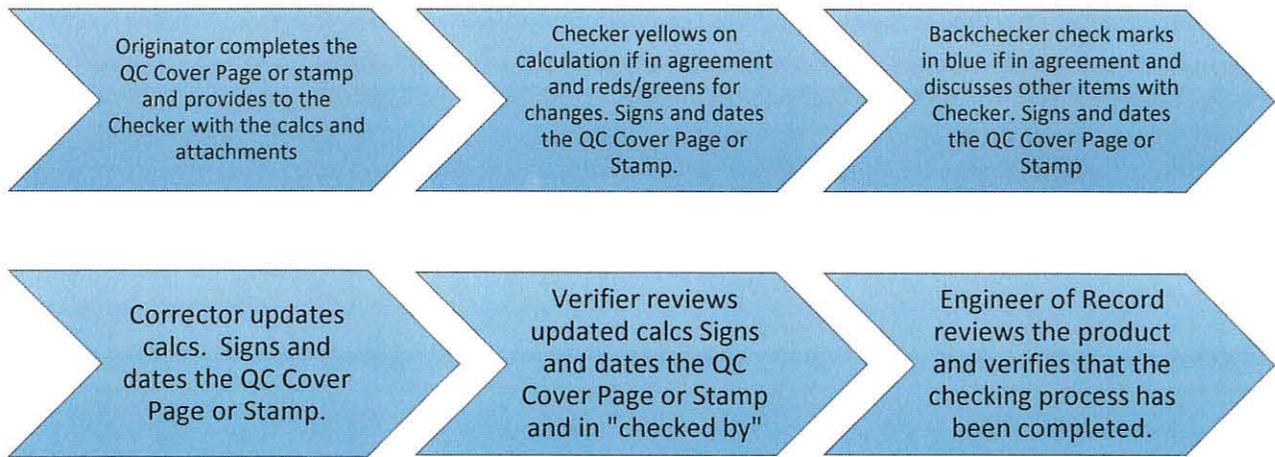


Figure A – Typical Checking Flow Chart

4. Project Reviews

Quality management will involve developmental project reviews. The project scope, WSDOT policies, discussion with PDE and this section of the Region QMP determine the number and type of project reviews.

- a. **30% and/or 60% Review** – All OR projects will conduct at least one interdisciplinary review during this range of development. The Project Engineer may choose to conduct both 30% and 60% level reviews on larger or more complex projects. Project Development Deliverable Checklists for 30% and 60% level reviews are found in Appendix B. Constructability and maintainability are the focus of these reviews.
- b. **Design Conflict Review** – All OR projects will conduct an interdisciplinary review to identify conflicting elements. This may be an electronic or paper review. This review happens after the majority of the project elements have been designed, including staging, drainage, utility relocations, electrical, guardrail/barriers and structural elements.

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- c. **“90%” PS&E Review** – “Pre-Region Review” is to ensure readiness for Region Review. This review can be conducted on selected projects as determined by the Project Engineer and is required for consultant-designed projects. The Project Development Deliverable Checklist for 90% level reviews is in Appendix B. Accuracy, consistency, conflicts and the ability to bid and administer the PS&E are the focus of this review.
- d. **100% Region PS&E Review** – Interdisciplinary review of all aspects of the PS&E. Applies to all OR projects. Accuracy, consistency, conflicts and the ability to bid and administer the PS&E are the focus of this review.
- e. **AD Ready Review** – Back-check on “Region PS&E Review” comments to ensure all comments have been addressed and deficiencies corrected. Applies to all OR projects.
- f. **Other Required Reviews** – Value Engineering Studies and other reviews required by WSDOT and FHWA policies.

5. QA Roles and Responsibilities

Quality Assurance (QA) includes the careful review of all design engineering products and ensures that checking has systematically been performed. This is the primary duty of the Licensed Project Engineer or Assistant (Specialty Office Manager in support groups).

There must be an auditable record of the QC/QA process. The QC/QA coversheet or stamp can be a place for this record. Project Engineers must provide certification that design engineering products have passed QC/QA processes as part of their transmittals to other WSDOT offices. Specialty Office Managers must provide certification to the Project Engineer that design engineering products have passed QC/QA as part of their transmittals.

a. Project Engineer (or Assistant Project Engineer)

The Project Engineer or licensed assistant (Engineer of Record) has primary responsibility for project QA. They perform a careful review of all design engineering products developed under their supervision, and verify that checking has systematically been performed. They certify that design engineering products have passed QC/QA as part of their transmittals to other WSDOT offices. The Project Engineer leads all project reviews other than the Region PS&E Review.

b. Specialty Office Managers

Specialty or Auxiliary Engineers of Record perform a careful review of all design engineering products developed under their supervision, and verify that checking has systematically been performed. They certify that design engineering products have passed QC/QA as part of their transmittals to other WSDOT offices.

c. Region Plans Office

- i. Reviews design analyses, Design Documentation Packages for Design Approval and/or Project Development Approval and the PS&E.
- ii. Manages the Region PS&E Review process.

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- d. **Project Development Engineer** - Reviews design analyses, Design Documentation Packages for Design Approval and/or Project Development Approval after the Region Plans Office review and reviews PS&E's.
- e. **Construction Engineer** – Reviews PS&E's and participates in constructability reviews.

6. **Quality Verification (Examinations)**

- a. **Region Plans Office** – Examines design project engineering office and specialty office QA/QC procedures, written documentation (one project per design office per biennium). Results are reported to the Project Development Engineer for corrective action if required. Specifically,
 - i. **Compare the Approved Project QMP to Project Delivery Schedule, dates**
 - ii. **Project Reviews and comment resolution process**
 - iii. **Documentation of QA processes**
- b. **HQ Design** – TBD by HQ

7. **Special Provisions** – Region special provisions and project-specific special provisions are engineering products subject to the above QC/QA process. Approval is by a Region Construction Engineer and HQ Construction.

8. **Staffing and Training**

a. **Project Engineer and Specialty Office Managers**

- i. Select and develop qualified and trained design staff
- ii. Develop and manage a development plan for design staff providing expectations, mentoring and training from the HQ Engineering Training Tool.

<http://www.wsdot.wa.gov/publications/fulltext/design/ASDE/EngineeringTrainingTool.xlsm>

- iii. Schedule design staff for training.

b. **Project Development Engineer** - Assign appropriate workload.

c. **ARA for Multimodal Development and Delivery**

- i. Authorize adequate staffing
- ii. Advocate for design training

9. **Self Discipline** – Region must be disciplined in completing QC/QA processes and documentation. Reviews must wait for products that are not ready and not checked for quality. We must be willing to miss an AD date if the product is not ready.

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10. Lessons Learned – Region will review the region QMP on a biannual basis for what is working or not working and make appropriate changes. The Region Project Development Engineer owns the region QMP and leads the region QMP review. The Region Plans Office will maintain the region QMP and approved checklists on their website. Region Construction offices will provide written input to Design team, Specialty Group and Region Plans Office on Lessons Learned as a result of administration of the construction contract.

APPENDIX A

Generic Checking Procedures for PS&E

DESIGN CHECKLIST: ALL DRAWINGS

Reviewer/Checker: _____ Organization: _____ Discipline: _____ Sheet _____ of _____
 Contract: _____ Project No.: _____ Date ____/____/____

I have reviewed the (drawings/specifications/calculations) for items checked on the following list. The items checked were found (generally acceptable/generally deficient/acceptable with exceptions) for the level of detail and completeness required of this submittals. I recommend this submittal be (accepted/reworked).

SUBMITTAL STATUS: 30% 60% 90% 100%

ALL DRAWINGS

	OK?			REMARK
	YES	NO*	N/A	
1. Check title block & border for correct format and size, client name, project name & number, design consultant name, Designed By, Drafted By, Checked By, drawing title and number, sheet number, revision data & number and file name, as applicable.				
2. See that initials for Designed By and Checked By are not the same.				
3. Compare sheet number, drawing number and description in the index with the title block of each drawing.				
4. Check North arrow direction and style uniformity.				
5. Check numerical and graphical scales.				
6. Compliance with CAD and drafting standards (sizes, font, weight, etc.)				
7. Check spelling, punctuation and grammar.				
8. Check proper use of referenced standard drawings.				
9. Check that match lines agree between sheets.				
10. Check layouts and dimensions.				
11. Check references to notes, other drawings and specifications.				
12. Check compatibility of Legend with design standards.				
13. Check abbreviations and symbols against Abbreviation List and Legend.				
14. Check compliance with third party requirements.				
15. Check compliance with fire life safety requirements.				
16. Compliance with response to design review comments.				
17. Check for adequate clearances for materials, equipment, construction and work space, access, and safety.				

*Explain in REMARKS column or in attachment

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Design Coordination Review Checklist

The purpose of this checklist is to focus review on multi-discipline plan elements that are major issues commonly encountered during the construction phase. This checklist is generic in nature and is not all-inclusive of all issues that may be encountered during construction.

Utility Conflicts

- Check for conflicts between existing utilities and proposed utilities
- Check for conflicts between existing utilities and ground disturbing activities
- Check for conflicts between existing/proposed and proposed drainage (including structure excavation areas)
- Check for (parallel and cross) conflicts between existing/proposed utilities and walls (including layback slope, straps, reinforcement strands, etc.)
- Check for conflicts between existing/proposed utilities and bridge footings, piers, etc.
- Check for conflicts between existing/proposed utilities and crane booms
- Temporary Roadways
- Temporary Construction Easement (TCE) needed?

Drainage Conflicts

- Check for conflicts between proposed drainage and existing drainage
- Check for conflicts between drainage and walls (including layback slope, straps, reinforcement strands, etc.)
- Check for conflicts between drainage structures and traffic barrier
- When quantifying earthwork for pond excavation, is liner depth included in the excavation quantities?
- Have existing drainage structures been field verified to ensure flow is as assumed in designed?
- TCE needed?

Conflicts with Traffic Elements (Foundations for Illumination, ITS, Sign Bridges)

- Check for conflicts between Traffic Elements and excavation areas
- Check for conflicts between Traffic Elements and existing/proposed utilities
- Check for conflicts between Traffic Elements and guardrail runs
- Check for conflicts between Traffic Elements and irrigation lines
- TCE needed?

OLYMPIC REGION

Quantities

- Ensure earthwork reports match Summary of Quantities
- Remove "fluff" from estimates

DESIGN CHECKLIST: ROADWAY

Reviewer/Checker: _____ Organization: WSDOT Discipline: _____ Sheet _____ of _____
 Contract: _____ Project No.: _____ Date / /
 Supervisor: _____ Designer: _____

I have reviewed the (drawings/specifications/calculations) for items checked on the following list. The items checked were found (generally acceptable/generally deficient/acceptable with exceptions) for the level of detail and completeness required of this submittals. I recommend this submittal be (accepted/reworked).

SUBMITTAL STATUS: 30% 60% 90% 100%

ROADWAY DRAWINGS	OK?			REMARK
	YES	NO*	N/A	
Reminder: Do also ALL DRAWINGS Checklist and attach.				
1. Construction Notes and other notes				
2. Stationing, Distances, Bearings and Coordinates				
3. Verify curb limits match curb profile limits.				
4. Grades, grade breaks and vertical curve data				
5. Street alignment and curve data				
6. Match Existing station, offset (horizontal)				
7. Match Existing Curb and Gutter data (horizontal)				
8. Required curb cuts for ADA and driveways				
9. Agreement with Street Cross Section drawings				
10. Compliance with Design Standards on geometry, e.g. min. sight distance, merging lane length, radii & clearances				
11. Coordinate turning lane requirements and turning radii				
12. Coordination with traffic signal plans				

DESIGN CHECKLIST: ROADWAY

Reviewer/Checker: _____ Organization: WSDOT Discipline: _____ Sheet _____ of _____
 Contract: _____ Project No.: _____ Date / /
 Supervisor: _____ Designer: _____

I have reviewed the (drawings/specifications/calculations) for items checked on the following list. The items checked were found (generally acceptable/generally deficient/acceptable with exceptions) for the level of detail and completeness required of this submittals. I recommend this submittal be (accepted/reworked).

SUBMITTAL STATUS: 30% 60% 90% 100%

ROADWAY DRAWINGS	OK?			REMARK
	YES	NO*	N/A	
13. Existing pavement join locations (horizontal and vertical)				
14. Existing ground shown on Profile				
15. Profile geometry/ stationing				
16. Coordination with bridge plans				
17. Coordination with utility drawings (profiles)				
18. Coordination between low points and catch basins				
19. Coordination with geotechnical report pavement recommendations				
20. Typical sections coordination with the plans and cross sections				

OLYMPIC REGION FINAL CONSTRUCTABILITY REVIEW CHECKLIST

PROJECT _____

PROJECT # _____ REVIEWER: _____ DATE _____

• **PUBLIC INVOLVEMENT**

Item	Action/who, what, when, where	Impacts		
		Scope	Sched	Cost
Community Meeting scheduled				
Public Involvement Newsletter/flyers				

• **PERMITS**

Item	Action/who, what, when, where	Impacts		
		Scope	Sched	Cost
Utilities agreements				
Detour/Haul Agreements				
Participatory Agreements				
Environmental permits:				
U.S. Corps of Engineers (Section 10 and Section 404)				
Hydraulic Project Approval (Wash. Dept. of Fish and Wildlife)				
U.S. Coast Guard				
U.S. Forest Service				
Federal Aviation Administration				
Wash. State Dept. of Natural Resources				
Wash. State Dept. of Ecology				
Sensitive Area Ordinance or Public Agency Utility Exemption (SAO/PAUE)				
grading/clearing				
noise variance				
Temporary Erosion and Sedimentation Control plan				
temporary water quality modification				
National Pollution Discharge Elimination System permit application (NPDES)				
storm water site plan				
Other Agreements				

OLYMPIC REGION FINAL CONSTRUCTABILITY REVIEW CHECKLIST

PROJECT _____

PROJECT # _____ REVIEWER: _____ DATE _____

• **GEOTECHNICAL / EARTHWORK**

Item	Action/who, what, when, where	Impacts		
		Scope	Sched	Cost
Structure excavation				
Fill				
Stockpiling / storage / dumpsites				
Materials usage / salvage				
Stabilization				
Site conditions (topography, profiles, etc.)				
Boring / drilling				
Soil compaction				
Clearing / grubbing / roadside cleanup				
Removal of structures and obstructions				
Earthwork haul				
Slope treatment				
Subgrade preparation				
Watering				
Ditch and channel excavation				
Trimming and cleanup				

OLYMPIC REGION FINAL CONSTRUCTABILITY REVIEW CHECKLIST

PROJECT _____

PROJECT # _____ REVIEWER: _____ DATE _____

• **ROADWAY SURFACE**

Item	Action/who, what, when, where	Impacts		
		Scope	Sched	Cost
Pavement (cement concrete, asphalt concrete, bitumen)				
Base and subbase				
Sidewalk				
Curb				
Shoulders / shoulder repair				
Sawcutting				
Slopes				
Lanes (narrow lane widths must match roadway sections)				
Stationing (road, paving, striping, etc.)				
Pavement method				

OLYMPIC REGION FINAL CONSTRUCTABILITY REVIEW CHECKLIST

PROJECT _____

PROJECT # _____ REVIEWER: _____ DATE _____

• **RIGHT OF WAY / ACCESS CONTROL**

Item	Action/who, what, when, where	Impacts		
		Scope	Sched	Cost
Existing/proposed right of way limits				
Appraisal				
Transaction				
Acquisition				
Condemnation				
Relocation				
Cattle passes				
Pit, stockpile, and waste sites (haul road, detour routes)				
Utility				
Railroad				
International boundaries				
Easement/construction permits				
Programming for funds				
Access control				
Access report/access hearing plans				
Monuments (alignment, property corner)				
Fencing				
At the Project Definition stage:				
right of way estimate				
purchase cost				
relocation assistance benefits payments				
other land management staff expenses (acquisition services, relocation services, interim property management services)				

OLYMPIC REGION FINAL CONSTRUCTABILITY REVIEW CHECKLIST

PROJECT _____

PROJECT # _____ REVIEWER: _____ DATE _____

• **UTILITIES**

Item	Action/who, what, when, where	Impacts		
		Scope	Sched	Cost
Electricity / power lines / power poles				
Wire conduits				
Power sources location				
Gas				
Cable				
Telephone				
Sewer lines				
Utility conflicts				

OLYMPIC REGION FINAL CONSTRUCTABILITY REVIEW CHECKLIST

PROJECT _____

PROJECT # _____ REVIEWER: _____ DATE _____

• **ENVIRONMENTAL MITIGATION**

Item	Action/who, what, when, where	Impacts		
		Scope	Sched	Cost
Planting / wetland planting and revegetation				
Seeding / fertilization				
Trees / shrubs removal				
Sandbag diversion dams				
Hazardous waste cleanup				
Pollution control				
Groundwater contamination				
Dust control				

OLYMPIC REGION FINAL CONSTRUCTABILITY REVIEW CHECKLIST

PROJECT _____

PROJECT # _____ REVIEWER: _____ DATE _____

• **LANDSCAPING**

Item	Action/who, what, when, where	Impacts		
		Scope	Sched	Cost
Irrigation system				
Planting (seeding, fertilizing)				
Plant establishment period				
Fencing				

OLYMPIC REGION FINAL CONSTRUCTABILITY REVIEW CHECKLIST

PROJECT _____

PROJECT # _____ REVIEWER: _____ DATE _____

• **TRAFFIC**

Item	Action/who, what, when, where	Impacts		
		Scope	Sched	Cost
Traffic Control/Staging:				
number of closed lanes				
night operations				
Influence on surrounding streets				
construction traffic control				
detour roads				
sequential arrows				
closure (days and hours)				
labor (number of hours)				
Design:				
Delineation -- (pavement markings, guideposts, barrier delineation, raised pavement markers, impact attenuator markings)				
intersections				
interchanges				
auxiliary lanes				
signalization				
signage				
detection systems				
safety items (crash cushions)				
barriers, guardrails				
work zones				
illumination and lighting				
ramp meters				
transitions				
climbing lanes (for slow vehicles)				
special shoulder designs				
bicycle paths				
HOV lanes				

OLYMPIC REGION FINAL CONSTRUCTABILITY REVIEW CHECKLIST

PROJECT _____

PROJECT # _____ REVIEWER: _____ DATE _____

• **STRUCTURES**

Item	Action/who, what, when, where	Impacts		
		Scope	Sched	Cost
Site data report				
Timber structures				
Bridges:				
concrete mix / steel				
bearings				
girder				
foundation				
expansion joints				
piles / columns				
reinforcement				
bridge railing				
Walls/retaining walls:				
material (concrete mix)				
live poles between wall layers				
foundation				
panels				
reinforcement				
panels/stem panels				
Appurtenant structures:				
pedestrian				
animal (habitat for fish, animal passage, etc.)				
Tunnel:				
mud slab/waterproofing				
roof slab				
Pavement method				
Painting				
Waterproofing				
Cribbing				

OLYMPIC REGION FINAL CONSTRUCTABILITY REVIEW CHECKLIST

PROJECT _____

PROJECT # _____ REVIEWER: _____ DATE _____

• **CONTRACT/BID DOCUMENTS**

Item	Action/who, what, when, where	Impacts		
		Scope	Sched	Cost
consistency between/within documents				
consistency of presentation				
Organization of plans				
Completed Special Provisions				

• **CONSTRUCTION**

Item	Action/who, what, when, where	Impacts		
		Scope	Sched	Cost
Access roads				
Construction signs				
Temporary signals / striping / illumination / impact attenuators				
Site preparation				
Construction space				
Field office building location				
Equipment / material				
Construction schedule / sequence				
Survey control staking and monuments				
Construction equipment:				
cranes, derricks				
trucks				
graders				
bulldozers				
excavators				

OLYMPIC REGION FINAL CONSTRUCTABILITY REVIEW CHECKLIST

PROJECT _____

PROJECT # _____ REVIEWER: _____ DATE _____

• **MAINTENANCE**

Item	Action/who, what, when, where	Impacts		
		Scope	Sched	Cost
Roadside cleanup				
Drainage cleanup				
Fire protection systems				
Noise Wall Accessibility				
Drainage accessibility:				
to detention/retention ponds				
to downdrains/underdrains				
special drainage features/structures				
Slope accessibility:				
top of cut / toe of fill				
Environmental/maintenance special permit				

• **CONTINGENCIES**

Identified Item	Action/who, what, when, where	Impacts		
		Scope	Sched	Cost
5 percent				

FINAL CONSTRUCTABILITY PS&E REVIEW CHECKLIST

PROJECT _____

PROJECT # _____ REVIEWER: _____ DATE _____

Item No.	Item	Check (Y/N)	Action
1	PLANS		
1.1	<i>Completeness</i>		
1.1.1	All originals provided with the PS&E submittal		
1.1.2	All original plan sheets signed		
1.1.3	Required information complete:		
a	Typical layouts		
b	typical sections		
c	profiles, grade lines, superelevations		
d	contour grades, topo, original ground elevations		
e	summary of quantities, stationing		
f	Construction details		
g	Construction area signing		
h	drainage profiles		
i	Earthwork		
j	Structural details		
k	Quantity and unit designations		
l	utilities		
m	Illumination		
n	traffic signal systems		
o	final pay designations		
p	other		
1.2	<i>Accuracy and clarity</i>		
1.2.1	Clarity of plans in general (readable)		
1.2.2	Limits of work		
1.2.3	Details		
1.2.4	Terminology, abbreviations, symbols (legends on drawings)		
1.2.5	Summary of quantities (exactitude and appropriateness)		
1.2.6	Cross references		
1.2.7	Final pay designations		
1.2.8	Other		

FINAL CONSTRUCTABILITY PS&E REVIEW CHECKLIST

PROJECT _____

PROJECT # _____ REVIEWER: _____ DATE _____

Item No.	Item	Check (Y/N)	Action
1	PLANS (cont.)		
1.3	<i>Conformance to policy</i>		
1.3.1	Drafting and plans manual followed		
1.3.2	High and low risk policy		
1.3.3	Use standard plans		
1.3.4	Final pay items		
1.3.5	Traffic control		
1.3.6	Trade names		
1.3.7	Required local agency plans		
1.3.8	Other		

Item No.	Item	Check (Y/N)	Action
2	SPECIFICATIONS		
2.1	<i>Completeness</i>		
2.1.1	All items of work covered		
2.1.2	Order of work		
2.1.3	Method of payment included for each item of work		
2.1.4	Obstructions included		
2.1.5	Cooperation included		
2.1.6	Railroad requirements included		
2.1.7	Special conditions covered		
2.1.8	State furnished materials complete		
2.1.9	Method of measurements explained		
2.1.10	All documents provide (soils, borings report)		
2.1.11	Other		
2.2	<i>Accuracy and clarity</i>		
2.2.1	Accepted terms and abbreviations well used or correct		
2.2.2	Conflicting or ambiguous requirements solved		
2.2.3	Structures requirements properly integrated		
2.2.4	Materials needed known (concrete)		
2.2.5	Stationing correct		
2.2.6	Order of work		
2.2.7	Other		

FINAL CONSTRUCTABILITY PS&E REVIEW CHECKLIST

PROJECT _____

PROJECT # _____ REVIEWER: _____ DATE _____

Item No.	Item	Check (Y/N)	Action
2	SPECIFICATIONS (cont.)		
2.3	<i>Conformance to policy</i>		
2.3.1	Specific Special Provisions edited correctly		
2.3.2	Standard specifications reworded or repeated		
2.3.3	Specific Special Provisions instructions followed		
2.3.4	Standard format and style used		
2.3.5	Required local agencies specs included (fills in, permits)		
2.3.6	Standard pay clauses used		
2.3.7	Special construction procedures		
2.3.8	Other		
2.4	<i>Specific Special Provisions</i>		
2.4.1	Material		
2.4.2	Combining structures		
2.4.3	Order of work		
2.4.4	Maintenance of traffic		
2.4.5	Traffic control		
2.4.6	Pavement (PCC, AC)		
2.4.7	Existing highway facility		

Item No.	Item	Check (Y/N)	Action
3	ESTIMATES		
3.1	<i>Completeness</i>		
3.1.1	All pay items of work covered		
3.1.2	Specialty items included		
3.1.3	Supplemental work complete		
3.1.4	State furnished materials and expenses complete		
3.1.5	Structures items included		
3.2	<i>Accuracy and clarity</i>		
3.2.1	Correct item code numbers and descriptions		
3.2.2	Use of standard units of measure		
3.2.3	One-time items (specialty items) in correct order		
3.2.4	Correct quantities		
3.2.5	Reasonable prices		
3.3	<i>Conformance to policy</i>		
3.3.1	Rounding of quantities correct		
3.3.2	Decimal quantities correct		
3.3.3	Other		

FINAL CONSTRUCTABILITY REVIEW MEETING PLANNING CHECKLIST

PROJECT _____

PROJECT # _____ REVIEWER: _____ DATE _____

• **FINAL REVIEW PLANNING ITEMS**

Item	Action/who, what, when, where
Final point in project PS&E development	
Scheduled date for review meeting:	
Location for review meeting:	
Review meeting agenda developed	
Final checklists/meeting agenda/ Project Documentation sent to each function/discipline	

• **FINAL REVIEW TEAM**

Function	Representative	Involved	Not Involved	Date Contacted
Management				
Local Programs				
Design				
Construction				
Maintenance				
Environmental				
Traffic Design				
Traffic Operations				
Bridge				
Geotechnical				
Hydraulics				
Plans Review				
Right of Way				
Utilities				
Active Transportation				
Other				

FINAL CONSTRUCTABILITY REVIEW MEETING PLANNING CHECKLIST

PROJECT _____

PROJECT # _____ REVIEWER: _____ DATE _____

• **DOCUMENTATION REQUIRED FOR FINAL REVIEW**

Document	Action/who, what, when, where
Completed Traffic plans	
Utility relocations complete	
Completed Bridge plans	
Completed plans, specifications, and estimates	
Environmental Permits received	
Local Agency agreements received	
Right of Way certification date	
Design modifications and/or variations from preceding reviews:	
PDR review and/or 0% review	
30% review	
60% review	
Alternatives recommended to meet the approved schedule, scope of work, and budget	
Other	

FINAL CONSTRUCTABILITY REVIEW MEETING PLANNING CHECKLIST

PROJECT _____

PROJECT # _____ REVIEWER: _____ DATE _____

• **CONDUCTING THE FINAL REVIEW**

Item	Action/who, what, when, where
Process developed for recording the meeting	
All agenda items reviewed	
Report of review results developed	
Appeals and Resolution process implemented for all unresolved items on which an impasse occurred	
Summary report given to WSDOT Project Development Management	

• **REVIEW NOTES:**

DESIGN CHECKLIST: CIVIL (Project Name)

Reviewer: _____ Organization: _____ Discipline: _____ Sheet _____ of _____

Package: _____ Contract No.: _____ Date ____ / ____ / ____

I have reviewed the (drawings/specifications/calculations) for items checked on the following list. The items checked were found (generally acceptable/generally deficient/acceptable with exceptions) for the level of detail and completeness required of this submittals. I recommend this submittal be (accepted/reworked).

SUBMITTALS STATUS: 30% 60% 90% 100%

CIVIL	NOT CH'D	OK?		NOTES	REQUIRED			
		Y	N		30%	60%	90%	100%
STANDARD CIVIL ABBREVIATIONS, SYMBOLS & NOTES								
1. Abbreviations								
2. Legend & Symbols.								
3. Construction Notes.								
4. General Notes.								
STREET ALIGNMENT DATA								
5. Stationing, Distances, Bearings and Coordinates								
STREET PLAN AND PROFILE								
6. North arrow and scale on drawing								
7. Coordination with all mainline, siding, and spur track alignments								
8. Existing Flow Line elevations								
9. Crown and Flow Line plan and profile alignment data (and does every horizontal alignment have a vertical alignment and vice versa)								
10. Verify curb limits match curb profile limits								
11. Grades, grade breaks and vertical curve data								
12. Street alignment and curve data								
13. Join Existing station, offset (horizontal)								
14. Join Existing Curb and Gutter data (horizontal)								
15. Begin & End Sawcut data (horizontal)								
16. Begin & End Sidewalk data (horizontal)								
17. Required curb cuts for ADA and driveways								
18. Construction Notes labels								

Design to Construction Transition Project Turn-Over Plan

Information Needed at Turn Over to Construction

This plan is useful to coordinate your project's transition from design to construction. Use this as applicable to project scope and complexity.

1. Survey

- **End areas (cut & fill):** Should include plots of each station analyzed or developed during earthwork computer runs and be in a format that a contractor can understand. This information will be made available to bidders upon request and should be organized in a logical format.
- **Staking data:** Should be detailed enough to allow survey crews to do slope staking, set clearing limits, and set subgrade and surfacing hubs. Should correlate with the end areas.
- **Horizontal/Vertical control:** A list should be provided that includes vertical and horizontal control datums, scale factors (to get from Project Datum to State Plane coordinates), temporary benchmark locations, GPS monuments, other monuments used, and basis of survey data (ground survey vs. aerial photogrammetry). Include copies of traverses and backup notes from the Survey Crew field books.
- **Monumentation/Control information:** Include backup notes from the Survey Crew.

2. Design Backup

- **Index:** For all backup material.
- **Backup calculations for quantities:** This should be a bound book arranged in the same order as the Summary of Quantities. Tabs are recommended for the major sections of work like Preparation, Grading, Drainage, and so on. There should be at least one calculation sheet for every item in the project. The calculation sheets for the individual items should include any assumptions about how the quantity or price was determined as well as details about special locations or situations that would be pertinent to the inspector.
- **Geotech shrink/swell assumptions:** Include assumptions for amount of material lost due to clearing; adjustments made to embankment, excavation, and borrow quantities due to shrink or swell; and the weight-to-volume conversion factors used. Should be included as part of the earthwork backup calculations.
- **Design decisions and constraints:** What decisions and constraints should the Construction Office be aware of? For instance, if a future contract is dependent on a profile or alignment being constructed in this project, it should be noted. Other issues to consider might be weather sensitivity of embankment material, order of work constraints, contractor staging areas, and public acceptance of or opposition to the project.

- **Approved deviations & project/corridor analysis:** Copies of the actual letter approving the deviation, project analysis, or corridor analysis should be included to help explain the reasoning behind the deviation. These letters should come directly from the Design File for Approval.
- **Hydraulics/Drainage information:** Include all assumptions and limitations; describe the reasoning behind inlet locations and pipe designs; and note which locations could be changed and which could not. Reference discussions with Maintenance about structure type, pond location, or access points. Include a copy of the Hydraulics Report.
- **Clarify work zone traffic control/workforce estimates:** Describe the WZTC philosophy. As backup, describe the impact to the public and what your expectations are, expected durations for detours, and the work effort required to accomplish the work within the time allowed. Also, include how the subject project will be impacted by adjacent and associated projects and how WZTC will have to be coordinated with those other projects. Include assumptions about traffic control hours and number of flaggers and patrollers used.
- **Geotechnical information (report):** Include a copy of all Geotechnical Reports for walls and bridges. Some projects will have a copy of the Geotechnical Report printed and available for the bidders. A copy should be sent to the Construction Office for its use.
- **Package of as-builts used (and verified) and right of way files:** Provide half-size copies of the as-builts and right of way plans used in the design process. Include an index so the Construction Office can understand which as-builts were used and what they were used for.
- **Detailed assumptions for construction CPM schedule (working days):** Include limitations on concurrent work activities; limitations from weather; and how the CPM could be impacted by adjacent projects, production rates assumed for work activities, and durations of shutdowns for critical items.
- **Graphics and design visualization information (aerials).**
- **Heads-up regarding controversies in the field:** Provide a list of issues that the Construction Office may have to deal with (adjacent residences and businesses, political considerations, and so on) and names and phone numbers of a contact person for each issue.
- **Specific work item information for inspectors:** Provide any detailed information not covered in the plan set that would simplify or assist the inspection effort (detailed stations for items, assumptions, and so on).
- **Traffic counts:** Include the sheets from the Plan for Approval with traffic volumes. If possible, include information about who developed the traffic information and how they arrived at the numbers.
- **Management of utility relocation:** One person from the Design Office should be designated to manage utility relocations. A description should be provided of how utilities were located (as-builts; potholing; and so on), and backup information for each utility should be included.

3. Concise Electronic Information With Indices

- **Detailed survey information:** See Survey above.
- **Archived InRoads data:** This should include end areas and both the existing and proposed DTMs. Only final alignments and channelization should be included; preliminary alignments and points are not needed and should not be included.
- **Only one set of electronic information:** For all electronic information, only include the final project configuration. Do not include any early iterations as they only serve to confuse those who are unfamiliar with the project.
- **“Storybook” on electronic files:** This should be written by the designer who created the electronic file (the Survey Crew describes survey data, the designers describe the Caice files, and so on).
- **CADD files.**

4. Agreements, Commitments, and Issues

- **Agreements and commitments by WSDOT:** Include an indexed list of all the agreements created for the project, including utility relocation, service (power, phone, water), participants (local agency, developer), and on-call consultant(s) for construction support (if consultants were used during design).
- **RES commitments:** Include a list of all landowners and contacts in the area and a list of agreed-to conditions.
- **Summary of environmental permit conditions/commitments:** Environmental permits and conditions that must be adhered to during construction should be made part of the special provisions. The backup documents for those conditions (usually a copy of the actual permit) should be included in the file.
- **Other permit conditions/commitments:** Include a list of other commitments if not specified in the contract documents, such as local agency conditions (work hours, zoning rules, and so on).
- **Internal contact list:** Include a list of names and phone numbers of persons involved in the design of the project. A single point of contact should be identified, usually the Design Team Leader.
- **Construction permits and easements:** Include a list of all construction permits and easements acquired for the project.
- **Utility status/contact:** This should be coordinated with the “Management of Utility Relocation” item.

Support Needed From the Design and Construction Offices

The Design and Construction offices should be responsible for the following support between the offices:

1. Prior to Construction

(a) More careful review of plans:

- Provide a set of plans for review at 30%, 60%, and 90% to the Construction Office.
- Consider allowing more time for the review process.
- Consider notifying the Construction Office in advance of the review so that an inspector can be available during the review time.

(b) How do we ensure that WZTC and staged construction plans will work?

- Allow time for adequate review by the Construction Office.
- Meetings between the Design and Construction offices are desirable as well.

2. Within the Design Office

(a) Work out support between the Design and Construction offices before a project is advertised to provide one or more of the following:

- Designer/design support during construction (Design Technical Advisor).
- Responsible/knowledgeable designer available during construction.
- Lead designer transfer to the Construction Office during construction.
- Designers available for redesign.
- Criteria for using design support.
- Design support during construction should be a higher priority.
- Design support for addenda (involving Construction, as directed).

3. Within the Construction Office

(a) Work out support between the Design and Construction offices before ad to provide one or more of the following:

- Lead inspector to work in the Design Office prior to ad to learn about the project.
- Determine the need for on-call agreements with any consultants who participated in the design.
- Provide feedback to the Design Office during construction.

4. Post-Construction

(a) In some cases, the Design office may benefit by receiving as-built plans from Construction. An example might be contiguous projects within a corridor where construction changes will impact ongoing design. The Construction Office should provide as-builts to the Design Office as appropriate.

Region		Project Name				
SR, I, US	MP Limits	L Number	Contract Number	PS&E Number	PIN Number	Federal Aid Number
Reviewers						
REVIEW ITEMS			Yes	No⁽¹⁾	N/A	REMARKS
A. GENERAL						
1. Does PS&E title substantially agree with project title in Capital Projects Reporting System (CIPP) so PS&E can readily be identified by its title in the program, and is title identical throughout the contract documents?			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. Are all executed agreements and permits, referenced in the project file?			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3. Were all permits and agreements executed?			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4. Is the Headquarters OEO Office minority/training goals letter in the project file?			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5. Is copy of executed Work Order Authorization in the project file, and was it executed on or prior to advertisement date?			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6. Is paths and trails (P&T) determination documented in the project file with backup computations? Was this information turned into Headquarters Program Management?			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7. Is one ad copy of the plans, specifications, and all addenda in the PS&E file?			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
8. Does project file include R/W certification?			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9. Does project file include backup data showing how unit bid prices were determined for lump sum items, estimated items, or other bid items that have little or no historical cost data?			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

(1) Explain in remarks column or in attachment
8/13/2019

REVIEW ITEMS	Yes	No ⁽¹⁾	N/A	REMARKS
10. Is justification to use state forces or state supplied materials documented in the project file? Is memorandum with justification and estimate approved by proper authority per Design Manual Figure 330-4 and Plans Preparation Manual 420.01(5) & (11), 750.25 and Figure 7-1?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
11. Does state force work comply with the \$50,000 limitation (effective July 1, 2005, sixty thousand dollars) when state force labor is included, as governed by RCW 47.28.030 and 47.28.035? Were the guidelines of "per project" in RCW 47.28.035 followed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
12. Is there project file documentation supporting use of and rates for incentive pay and does file document that Headquarters Construction Office was consulted prior to establishing rates?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13. Is the project file documentation supporting use of and rates for nonstandard liquidated damages, and does file document that Headquarters Transportation Data Office and Construction Office was consulted prior to establishing rates?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14. Does addenda format and plan shading comply with addendum preparation guidelines per the Plans Preparation Manual 440.01 and Appendix 5.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
15. Are addenda changes clearly identified and consistent with proposal, plans, wage rate, or other attachments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
16. Are addendum changes significant enough to warrant the addendum?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
17. Is the memorandum of justification for use of a proprietary item approved by the proper authority per the Design Manual Figure 330-4 and Plans Preparation Manual 420.01(10) & 750.16?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
18. Is there documentation justifying the use of state mandatory waste sites, and/or mandatory material sources? Has this justification been approved by the proper authority per the Design Manual Figure 330-4, and the Plans Preparation Manual 420.01(11), 740.03?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

(1) Explain in remarks column or in attachment
8/13/2019

REVIEW ITEMS	Yes	No ⁽¹⁾	N/A	REMARKS
Additional general review comments (use attachments if additional space is necessary):				
B. PLANS				
1. Are the plans clear, readable, and of good quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. Are the applicable plans and the special provisions properly prepared with a signed and dated seal per the Plans Preparation Manual 420.01 & 450.01?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3. Are landscape, bridge or structure, and consultant plans signed, dated and sealed as applicable per the Plans Preparation Manual 450.01?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4. Are the test borings located on the plans?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5. Are construction easements shown on the Plans? Are the stations and distances from centerline shown as required?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Reviewer's additional plan review items follow (use attachments if additional space is necessary):				
C. CONTRACT PROVISIONS				
1. Does the estimate include the appropriate sales tax? Does the estimate have the proper engineering percentage?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

(1) Explain in remarks column or in attachment
8/13/2019

REVIEW ITEMS	Yes	No ⁽¹⁾	N/A	REMARKS
2. Are description of work and material requirements addressed adequately to ensure proper construction of all work with nonstandard pay items?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3. Are there proper measurement and payment statements for all nonstandard items, and do they agree with the Proposal?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4. Is lump sum payment only used where extent of work is not likely to change, and can bidder determine the amount of work involved with these items?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5. Do the special provisions contain the correct DBE/MWBE training goals?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6. Is Log of Test Boring provided for projects involving construction of bridges and other structures?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7. Are "Required Contract Provisions Federal Aid Construction Contract" provisions included for federally funded projects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
8. Federal and/or state prevailing minimum hourly wage rates included?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9. Are Railroad Protective Liability forms included for projects requiring railroad insurance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10. If project includes alternate bids, does proposal provide for a base bid total and totals for each bid alternate, and do the special provisions state what award is to be based on?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
11. Are Forest Service Provisions included for projects that require work within or adjacent to national forest reservations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
12. Do the special provisions include the proper DBE/MWBE forms?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13. Is there a copy of Non-Collusion Affidavit and Certification for federal aid Contracts page in over \$100,000 for Federally Funded Projects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14. Is there a copy of proposal signature page and Subcontractor List page?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

(1) Explain in remarks column or in attachment
8/13/2019

REVIEW ITEMS	Yes	No ⁽¹⁾	N/A	REMARKS
15. Is a copy of the geotech report available for the bidders to purchase?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Reviewer's additional contract provisions review items follow (use attachments if additional space is necessary):				
D. ESTIMATE				
1. Is the final copy of the engineer's estimate in the file?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. Does the estimate have proper improvement code and other pertinent data? Does the estimate note when it is a federal aid project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3. Has the Lump Sum Breakdown for Superstructure and/or Lump Sum Breakdown for Roadway Deck been placed in EBASE and forwarded to Headquarters Project Development Branch? (This applies only to federal aid projects over \$500,000. This dollar amount is the sum of the work done contractor amount and sales tax. It is used to prepare the quarterly federal FHWA-45 form report)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Reviewer's additional contract provisions review items follow (use attachments if additional space is necessary):				

(1) Explain in remarks column or in attachment
8/13/2019

DESIGN CHECKLIST: UTILITIES

Reviewer/Checker: _____ Organization: _____ Discipline: _____ Sheet _____ of _____
 Contract: _____ Project No.: _____ Date ____ / ____ / ____

I have reviewed the (drawings/specifications/calculations) for items checked on the following list. The items checked were found (generally acceptable/generally deficient/acceptable with exceptions) for the level of detail and completeness required of this submittals. I recommend this submittal be (accepted/reworked).

SUBMITTAL STATUS: 30% 60% 90% 100%

UTILITIES DRAWINGS	OK?			REMARK
	YES	NO*	N/A	
Reminder: Do also ALL DRAWINGS Checklist and attach.				
1. Compare location of feature with documentation provided.				
2. Check pothole and field investigation data.				
3. Check easement locations.				
4. Check utility crossing #'s, owners and sizes.				
5. Check to see that existing and relocated utilities are clearly delineated.				
6. Check clearances or right-of-way lines for adherence to standards.				
7. Check for cautionary notes at hazardous utilities (e.g. gas).				
8. Verify that clearances at critical points account for correct cover, encasement allowance, wall and lining thicknesses, etc.				
9. Check that facilities to be extended in the future are terminated in a re-accessible location.				
10. Verify pipe size, type, and class against design calculations.				
11. Check for sign-off and approval from appropriate utility agencies.				
12. Check for adequate references to standard drawings.				
13. Verify that lines can be isolated for later testing and extension.				
14. Verify that corrosion protection measures are included if specified in the design.				
15. Check that utility lines can be staked from field monuments and information given on plans.				

*Explain in REMARKS column or in attachment

DESIGN CHECKLIST: UTILITIES

Reviewer/Checker: _____ Organization: _____ Discipline: _____ Sheet _____ of _____
 Contract: _____ Project No.: _____ Date ____/____/____

I have reviewed the (drawings/specifications/calculations) for items checked on the following list. The items checked were found (generally acceptable/generally deficient/acceptable with exceptions) for the level of detail and completeness required of this submittals. I recommend this submittal be (accepted/reworked).

SUBMITTAL STATUS: 30% 60% 90% 100%

UTILITIES DRAWINGS	OK?			REMARK
	YES	NO*	N/A	
16. Check for consideration of construction sequence where required.				
17. Verify manhole and valve cover elevations where subsequent raising or lowering may be required.				
18. Check that Design criteria was used.				
19. See that utilities continuous between adjacent projects.				
20. Check that repair and maintenance access provided.				
21. Check that temporary works clearly indicated.				
22. Check that provisions for protection during construction clearly indicated.				
23. Check that thrust blocking will not be disturbed by construction or maintenance of other nearby underground facilities.				
24. Check ventilation and blow-off scheme.				
25. Check that calls for appurtenances (valves, bends, etc.) agree with schematic depiction.				

*Explain in REMARKS column or in attachment

APPENDIX B
Various Quality Checklists

Olympic Region

PS&E Review Checklist – Alignment & R/W

Before a PS&E element is reviewed, make sure the expectations of what will be checked are understood. The expectation is that the following WILL be checked before the review is considered complete.

	<u>Date/Initial</u>
Alignments "tied down" (to mons, or Northing and Easting Given for alignment points)	_____
Bearings shown for all tangent sections of alignments	_____
Every RofW line angle point has a sta./offset call-out (check them)	_____
Align./R/W sheets should show cut/fill lines (clear-grub lines are on Site Prep)	_____
cut/fill lines are ALL within R/W (flag those that are not for discussion with designer)	_____
Align vs. Roadway sections – slope treatment matches; <ul style="list-style-type: none">• Go thru roadway sections, for each section, if a fill slope is shown, verify there is a corresponding fill line on the align sheets. If a ditch section is shown, verify there is a corresponding cut line.	_____ _____
Temporary Construction Easements (TCE's)	_____

Reviewer Comments:

Olympic Region

PS&E Review Checklist –All Plan Sheets

Before a PS&E element is reviewed, make sure the expectations of what will be checked are understood. The expectation is that the following WILL be checked before the review is considered complete.

	<u>Date/Initial</u>
“Begin/end project” and “begin/end construction” match vicinity map	_____
Check all references (“see sht., see detail, match line sht. X, etc.) - <u>Correct</u> sheet name, or detail name referenced - <u>Exact</u> sheet name, or detail name referenced - If bid item referenced, <u>Exact</u> bid item name used (per sum. Of qty.)	_____
Legends are complete & consistent - ALL items that occur on all sheets show on the legend	_____
Text size & font type consistent through the plan set - look for anything that sticks out/looks different than rest	_____
All standard plan references are correct and reference appropriate plan	_____
EXACT bid item names used /match summary of quantities	_____
All Title Block items are correct (PE, project title, Region Administrator, job number, etc.)	_____
Verify all Q-tab sheets match plan sheet callouts (stations, offsets, bid items, etc.) <ul style="list-style-type: none">• Verify Q-tab callouts with Q-tab general notes for consistency.• Use standard plans for verification on general notes.• Q-tabs and plan sheets must be used in conjunction with each other to verify required information	_____

Reviewer Comments:

Olympic Region

PS&E Review Checklist –EU & EUD

Before a PS&E element is reviewed, make sure the expectations of what will be checked are understood. The expectation is that the following **WILL** be checked before the review is considered complete.

Date/Initial

“Begin/end project” and “begin/end construction” match vicinity map _____

Check all references (“see sht., see detail, match line sht. X, etc.”) _____

- Correct sheet name, or detail name referenced
- Exact sheet name, or detail name referenced
- If bid item referenced, Exact bid item name used (per sum. Of qty.)

All Title Block items are correct (PE, project title, Region Administrator, job number, etc.) _____

Reviewer Comments:

Olympic Region

PS&E Review Checklist – Pavement Marking

Before a PS&E element is reviewed, make sure the expectations of what will be checked are understood. The expectation is that the following WILL be checked before the review is considered complete.

Date/Initial

Follow each stripe, highlight it as you check that it shows
Up in the Q-tab stationing. Highlight the Q-tab also for verification. _____

Verify station callouts and offsets at all begin/end tapers. _____

- Label either the pavement widths on the graphics
-OR- label pavements widths on the leader with the
station/offset callouts. Do not label both.

All widths are labeled at each sheet match line. _____

Verify all Q-tab sheets match plan sheet callouts (stations,
offsets, bid items, etc.) _____

- Verify Q-tab callouts with Q-tab general notes
for consistency.
- Use standard plans for verification on general
notes.
- Q-tabs and plan sheets must be used in
conjunction with each other to verify required
information

Label all line types on each sheet. _____

Reviewer Comments:

Olympic Region

PS&E Review Checklist – Paving Plan

Before a PS&E element is reviewed, make sure the expectations of what will be checked are understood. The expectation is that the following WILL be checked before the review is considered complete.

	<u>Date/Initial</u>
Pavement width provided matches that shown in Pavement Marking Plan	_____
GR runs, lengths divisible by 12.5' std. section length?	_____
Precast Single slope barrier comes in 20' std. sections (does length account for this?)	_____
Every radius return/curb return, if it is curved, is a radius Shown, or can one be determined	_____
Paving vs. Roadway sections: key stations and widths match: Every width shown in paving plan matches RS, if shown there Key stations match exactly Attach highlighted backup, showing it has been checked	_____
Verify all Q-tab sheets match plan sheet callouts (stations, offsets, bid items, etc.) <ul style="list-style-type: none">• Verify Q-tab callouts with Q-tab general notes for consistency.• Use standard plans for verification on general notes.• Q-tabs and plan sheets must be used in conjunction with each other to verify required information	_____

Reviewer Comments:

OLYMPIC REGION

Preliminary Bridge Plan Checklist

Before a preliminary bridge plan is reviewed, the expectations of what will be reviewed is understood to include the following. Before the review is considered complete this information WILL be checked.

Plan	Date/Initial
Roadway widths shown match Pavement Marking Plan	_____
All other (off-bridge) roads shown: channelization exactly Matches pavement marking plan	_____
Proposed Alignment matches PS&E Alignment sheets	_____
• Bearings	_____
• PC, PT etc. sta./offsets	_____
• Equations	_____
Profile, grade & pivot point matches Roadway Sections	_____
Barrier type & connection type matches Paving Plan	_____
Retaining walls shown match PS&E	_____
• Existing matches Site Prep	_____
• Proposed matches Wall sheets	_____
Utilities	_____
• All shown as existing will be there (accounts for known relocations prior to ad)	_____
• Missing any?	_____
• All proposed utilities shown?	_____
Contours shown look reasonable	_____
Profiles	
Intermediate elevations calc correctly	_____
Back of Pavement seat sta. matches roadway sections	_____
Proposed profile matches geometry on Roadway Profiles Sheets	_____
• Gradients	_____
• VC (gradient in, gradient out, length)	_____
• Elevations	_____
Vertical Clearance	
• Min. VC points shown are at correct location	_____
• For locations VC is within 1' of the min., verify it	_____

Reviewers Comments:

Olympic Region

PS&E Review Checklist – InRoads

***INDEPENDENT** spot-checks that InRoads modeling matches the contract. The expectation is that the following **WILL** be checked before the review is considered complete.*

	<u>Date/Initial</u>
Spot check, for each road, at each major width, matches paving	_____
Review horizontal and vertical alignment descriptions from InRoads report. Do the InRoads reports match the PS&E callouts?	_____
Proposed x-slopes match roadway sections (check major runs)	_____
Check that grades for the project profiles match the roadway profile sheets and are verifiable thru hand calculations. (BVC, EVC, etc.)	_____
Pick a few inlets, 1 or 2 on each road, perhaps, and get the cross Section, and see that the elevation works	_____
Pavement width provided matches that modeled in InRoads	_____
Barrier and G/R locations match those modeled in InRoads	_____
Wall profiles need to be checked against InRoads surfaces once those surfaces have reached a "final" form. The profiles are sensitive to changes in surfaces and those kind of changes are not always communicated.	_____

Reviewer Comments:

Olympic Region

PS&E Review Checklist – All Contract Q-TABS

Before a PS&E element is reviewed, make sure the expectations of what will be checked are understood. The expectation is that the following WILL be checked before the review is considered complete.

	<u>Date/Initial</u>
Order of items matches Summary of Quantities	_____
Rounding applied per Plans Prep. Manual	_____
General Notes refer to correct standard plan	_____
General Notes "see detail" or "see sheet" references all correct	_____
Quantity looks roughly correct Either quickly scale it, or if it's the only item on the q-tab code, the Stationing should generally result in arithmetic that comes close to Matching the length given, considering rounding, offsets, etc. Just meant to be a quick check.	_____
No duplicate numbers, per sheet	_____
General notes look consistent for all the same bid items	_____
Locations looks correct For Example:	
• On Site Prep Q-Tabs – Verify the "removing guardrail" is in the right location.	_____
• On Pavement Marking Q-Tabs – Verify the begin and end sta. for paint lines	_____
• On Paving Q-Tabs – Verify the extruded curb is in the right location	_____

Reviewer Comments:

Olympic Region

PS&E Review Checklist – Roadway Sections

Before a PS&E element is reviewed, make sure the expectations of what will be checked are understood. The expectation is that the following **WILL** be checked before the review is considered complete.

	<u>Date/Initial</u>
Surfacing depths match approved surfacing report <i>(for fish passage projects look in the Materials folder under Design. Preliminary material reports can be found within project scoping folders)</i>	_____
Widths shown match those modeled in inroads	_____
Side slopes shown match those modeled in inroads	_____
"Varies" dimensions have a min. and max. given, if appropriate.	_____
Key stations match Paving Plan	_____
Widths match Paving Plans exactly	_____
No missing depths or material type call-outs	_____
Overlay only areas have corresponding Roadway Sections	_____
Stationing shown <u>exactly</u> matches bridge sheets	_____
2' deflection area accounted for behind barrier – where appropriate.	_____

Reviewer Comments:

Olympic Region

PS&E Review Checklist –Site Preparation Details

Before a PS&E element is reviewed, make sure the expectations of what will be checked are understood. The expectation is that the following WILL be checked before the review is considered complete.

Date/Initial

Check all references ("see sht., see detail, match line sht. X, etc.) _____
- Correct sheet name, or detail name referenced
- Exact sheet name, or detail name referenced
- If bid item referenced, Exact bid item name used (per sum. Of qty.)

EXACT bid item names used /match sum. Of quantities _____

All Title Block items are correct (PE, project title, Region Administrator, job number, etc.) _____

Verify all Q-tab sheets match plan sheet callouts (stations, offsets, bid items, etc.) _____
• Verify Q-tab callouts with Q-tab general notes for consistency.
• Use standard plans for verification on general notes.
• Q-tabs and plan sheets must be used in conjunction with each other to verify required information

Reviewer Comments:

Olympic Region

PS&E Review Checklist – Special Provisions

Before a PS&E element is reviewed, make sure the expectations of what will be checked are understood. The expectation is that the following WILL be checked before the review is considered complete.

	<u>Date/Initial</u>
Non-standard bid items have measurement and pay statements	_____
Measurement and pay statement bid item names EXACTLY match sum. Of quantities	_____
Appropriate GSPs for bid items	_____
Special provision order is correct	_____
Correctly converted from old to new system	_____
Description of work spec matches the Ebase description of work	_____

Reviewer Comments:

Olympic Region

Design Coordination Review (DCR) checklist - Staging

Meant to find possible major construction challenges, by doing an independent look at things that we have seen experienced on projects in the past...CONCEPTUALLY, this assumes that – for nine stages- there could be different footprints/effected areas for the different stages. If footprints don't differ between stages, there is likely nothing to check.

Date/Initial

Conflicts with existing utilities – check all stages

- temp paving footprint vs. exist. utilities _____
- check cut fill lines for all stage vs. existing utilities _____

Conflicts with permanent features built then “staged-over” – check all stages

- Temp paving limits sit on top of anything it shouldn't ? _____
- Cut fill lines for any stage outside permanent cut fills? _____
 - o If so, do an electronic DCR using this footprint _____

Conflicts with drainage features installed then staged over

- Determine what stage proposed drainage features can Be installed at the earlier, and check all subsequent stages, Considering whether their footprint will go over the proposed Features _____

Conflicts with existing drainage features – any stage

- For existing features that remain: go thru staging and make Sure no footprint for any stage goes over the feature _____
- For existing features that are to be removed :determine the Earliest stage that the feature can be removed/taken out of service, THEN look at staging drainage design, and make sure the replacement system can go in place in the same or next stage. _____

Reviewer Comments:

Olympic Region

Wall: _____

PS&E Review Checklist – Retaining Wall Plan & Profile

The expectation is that this review packet will include copies of the below, highlighted where checked.

	<u>Date/Initial</u>
If contours are shown, verify they represent the terrain That will be there when wall is done (existing if not doing Additional grading in the area, proposed contours if grading Will be done at wall location	_____
Print the roadway profile if the wall is adjacent to a roadway Verify the elevation shown on the roadway profile “works” with The elevation shown on the retaining wall profile sheet	_____
Identify and print out key InRoads cross sections Check that the elev. Shown on the InRoads cross sections matches The elevation shown on the roadway profile and wall profile	_____
If the wall ties into another wall, check that the stationing matches	_____
Verify underdrains are accounted for, and drain to a logical location	_____
Make copies of highlighted major recommendations from the geotech Report, and verify that they have been included. Attach it to this Documentation packet (special provisions will be checked separately, This is just recommendations that affect plan & profile sheets)	_____

FOR THE TECHNICAL REVIEW OF THE FOLLOWING WILL BE NEEDED:

- Wall Plan, Profile & detail sheets
- Paving plan, with approx. wall location drawn in
- Roadway profile for adjacent road
- Key InRoads cross sections
- Align. Sheet (if wall has a curve in it)
- Highlighted geotech report with major recommendations

Reviewer Comments:

APPENDIX C
Quality Assurance Procedures

Document Checking Steps

Step 1. Prepare

Designer prepares document package, fills out and affixes a Document Checking Coversheet

Step 2. Check the work

Check the document for the following information against supporting affixed documentation:

- Facts, Figures, Tables, Callouts, Data
- Document meets standards (DM, PPM, SS, Region Processes, etc.)
- Follows this standard checking color convention:
 - **yellow highlight** - checked & is OK.
 - **green** – incorrect or should be deleted.
 - **red** – corrections and/or additions.
 - **black** - for notes. Circle as needed for clarity.

Step 3. Backcheck by Others

This step to be inserted as directed by PE, APE or Supervisor.
After backcheck is completed, document is returned to Designer.

- Makes all annotations in **Blue**.
- ✓ - agrees with Checker.
- **Stet** – Means “let it stand.” Backchecker disagrees with Checker. If so, must resolve these issues with Checker before proceeding.

Step 5. Correct

- Either the Designer or another person capable of making the changes.
- **Blue circle/highlighter** indicates “this change has been made”.
- Prints clean, revised sheet & provides with marked up document to Designer.

Step 6. Verify

- The Designer or another qualified team member, but not the person who made the corrections.
- Checks work to verify changes made according to markups.
- **Green circle/highlighter** indicates “verified”.
- Attaches checked/verified plan to previous versions.

PD-#/ Milestone #/ Name of Deliverable
Quality Review Check

WIN / PIN

SR #

Project name –

MP ###.## to MP ###.##

Month Day, Year

CHECK PRINT.

No. _____ Date: _____

Assembled By: _____

Cross-check with calcs or backup:

_____ Date: _____

Checked: _____ Date: _____

Backchecked: _____ Date: _____

Corrected: _____ Date: _____

Verified: _____ Date: _____

Washington State Department of Transportation

Olympia Project Office Name

Designed By:
Designer Name

Red and Green Plan Set Review Process

Purpose:

To keep one master copy of current plan set and status of work being done to plan set at all times.

General Info:

The red and green notebook(s) for each project will be set up and maintained by the CAD Operators for each Team. Any sheets placed in or removed from these books must be tracked using the check out sheet system for that project's notebook. These books can be checked out but only for short term use. Archive book(s) for each project will be set up and maintained by the CAD Operators for each Team. PDFs of completed sheets are available under each

Process:

Responsible Party	Step	Action
Designer	1.	CHECK OUT sheets for review or markup. Please initial your changes (Initial the "Check Print" location on the Project QC Cover Sheet, if during QC process).
	2.	CHECK IN sheets, place markups in book, and tab with RED STICKIES (This will flag CAD support there are revisions to be done).
Technician	3.	CHECK OUT sheets and performs revisions per markups and/or "Task Description".
	4.	CHECK IN sheets, place completed sheets in book, tab with GREEN STICKIES (This will flag the designer that there are completed markups which need verification). Place folded markups behind the corresponding sheets.
Designer	5.	Review new sheets. If additional changes are needed choose a. or b. below: a. For minor revisions, return sheets to original Technician for completion. b. For major revisions, place sheets in the book with red tabs and repeat process above.
	6.	Verify the changes are complete using the Document Checking Procedures sheet; remove GREEN STICKIES from the completed sheets.
	7.	Initial reviewed items on the mark ups (initials are on Check Print stamp if during QC process), remove RED STICKIES, and place the checked items in the Archival Bins/Binders.

Copies:

Sheets may be copied out of the book without **CHECK IN/OUT** requirements, BUT all **COPIES** must be identified as a copy. "**RED AND GREENS**" must NEVER be done on copied sheets. Doing so could result in multiple versions floating around the office causing confusion. Therefore, the only official sheets, are those either in the book or are currently checked out per the above procedure.

Red and Green procedure for tracking sheets.

1	ONLY SHEETS CHECKED OUT OR SHEETS IN THESE BOOKS APPLY TO THE MP PROJECT.
2	Fill out the attached "checkout Sheet" form when taking a sheet to work on.
3	When returning a sheet to the book, fill out the "Checkout Sheet".
4	Place a red tab on each sheet that has been "red and greened".
5	The CADD Operator is responsible for checking the book for red tabs, red signifies work for the CADD person to do.
6	Once the CADD operator has applied the red and green mark-ups to the sheet, fold and paperclip the mark-up to the back of the new updated sheet and place a green tab on the new sheet. This signifies the changes have been made and it is ready for review.
7	It is then the design engineers responsibility to check the book for green tabs and review CADD's work.
8	Once the mark-up has been reviewed by the designer, remove the original marked up sheet, place the date and your initials on the sheet, write the word "file" on the sheet, and give to the CADD operator to be filed for project records.
9	If there is a non-standard detail or sheet, (i.e., hand drawn 8.5 X 11, notes, or a new sheet), place the paperwork in the proper sequence in the book and place a yellowtab on the top of the page in order for the CADD operator to add the sheet to the plan set.
10	Persons who check out a sheet are responsible for that sheet. Do not loose the sheet, you are responsible for that sheet. If the sheet is not in the book or checked out, it does not exist.
11	If a sheet is to be removed completely, write "sheet deleted" on the sheet, write sheet deleted on the sign in/out sheet, and place initials and date on the sheet. Give to the CADD operator to file for the project records.

