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Complied 2015 Meeting Minutes

(September – December)

for the

WSDOT/AGC/ACEC Design-Build Committee

Meetings

WSDOT/AGC/ACEC
DESIGN-BUILD TEAM MEETING
Agenda

December 3, 2015
1:00 pm to 4:00 pm
WSDOT Corson Ave Office, Conf. Rm. 119/201
6431 Corson Avenue South, Seattle, WA
No Teleconference line requested

Co-Chairs Scotty Ireland and Paul Mayo

AGENDA ITEMS:

1. Sign-In Sheet / Introductions (1:00 pm – 1:40 pm) Scotty / Paul / Richard

A. Safety Briefing

Scotty and Paul provided the typical safety briefing to the Team and guests.

B. Review and update Sign-In Sheet

Sign-in sheet attached

C. Introduction of new & existing members, SME's and other Guests

Scotty, Paul and Richard noted that there have been several transitions with regards to members recently. They're summarized as follows:

AGC - Jon Harris is no longer with PCL. He will be replaced by Ankur Talwar (PCL District Manger). Ryan Olson represented PCL for the meeting and Ankur will join the Team at the beginning of the New Year;

WSDOT – Ed Barry has transitioned from HQ Project Development to NWR where he will serve as a liaison with Sound Transit. Ed will continue serving on the Team based on his new role, which will include supporting DB and GCCM projects. HQ Project Development will backfill his position before the end of 2015 and that person will likely represent that group in future meetings;

ACEC – Eric Crowe has transitioned from AECOM to Jacobs. Despite this, he will continue serving on the Team as an ACEC Design Manager Representative.

ACTION ITEM: *Paul, Scotty and Richard will continue to provide updates on member status as they occur.*

D. Review Team Charter

Collectively, the Team reviewed the Team Charter (that was revised and adopted at the beginning of 2015) for applicability. General discussions took place with regards to minor revisions associated with the roles and responsibilities of Team Members. There were specific discussions as it applied to member attendance and participation. The Team agreed that for the benefit of the Team, it would be appropriate to strengthen the emphasis on these topics and incorporate specific language into the Charter to establish the minimum expectations of a 75 percent attendance over the course of the year. Unless there are extenuating circumstances, Team Members who miss more than two meetings over the course of the year may be asked to resign to allow an opportunity for other representatives who can commit to participating on a more consistent basis.

ACTION ITEM: *Scotty will provide an updated Charter for Team Member endorsement at the January 14, 2016 meeting.*

E. Assess 2015 accomplishments

Scotty, Paul and Richard provided a brief summary of the topics addressed by the Team and accomplishments of since January 2015, acknowledging the collaborative efforts by Team Members and Subject Matter Experts (outside of the Team). There was significant energy expended by all contributing to furthering the development of WSDOT's DB technical requirements. Although not present, the Team specifically recognized Teresa Eckard's efforts in coordinating everyone's contributions throughout the year. All agreed that the Team would not have been able to accomplish as much without her commitment and support.

No further action required.

2. Review Previous Meeting Minutes (1:40 pm – 1:45 pm) Scotty

The October 22nd DRAFT meeting minutes were posted to TheHub on 11/9/2015. No comments were received, and they were finalized and posted to the website on 11/18/2015. Meeting minutes are located at:

http://www.wsdot.wa.gov/Business/Construction/MeetingMinutes.htm

There were no additional comments to the meeting minutes and they were accepted.

No further action required.

3. Old Business (1:45 pm – 2:00 pm)

A. Chapter 2 Section draft template review status and update (see updated spreadsheet) (10 Min) Scotty

Scotty provided a briefing to the Team of the status of the Chapter 2 technical requirements. Based on the work of the Team, the State Construction Office authorities and FHWA representatives will begin reviewing the Final Drafts that were coordinated through the Team. Scotty noted that this will take time due to limited resources within those organizations, but reminded the Team that WSDOT will be using the Final Drafts as baseline templates for upcoming DB Projects.

ACTION ITEM: *Scotty said that WSDOT will provide a status update of WSDOT DB contract template efforts at the next meeting.*

B. GCCM Task Force status update (5 Min) Scotty / Paul

Scotty and Paul provided a briefing to the Team noting that WSDOT, AGC and ACEC will form a (small) GCCM Task Force that will be focused on evaluating current legislation related to GCCM with the intent on developing recommendations for proposed legislation that would provide WSDOT legislative authority to use GCCM with the support of industry. The Team will consist of approximately 9-10 members and be led by Mark Gaines (WSDOT) and Geoff Owen (Kiewit Infrastructure). The Team will form after the beginning of the New Year. DB Team members interested in serving on the Task Force should contact their respective organizational leads by the end of the year.

ACTION ITEM: *Scotty said that WSDOT will provide a status update of GCCM Task Force efforts at the next meeting.*

4. New Business (2:00 pm – 3:30pm)

A. 2016 WSDOT / AGC / ACEC DB Committee Goals and Topics (90 Minutes) Scotty / Paul / Richard

Discuss member proposed 2016 topics and goals

Establish and prioritize 2016 goals

The Team spent most of the meeting collectively discussing solicited topics and goals for the upcoming year. Scotty had compiled ten goals and 25 topics proposed by members prior to the meeting. There were common themes present between topics. General consensus was there needs to be a focus on: establishing more consistency in the development and administration of DB projects; monitor the results of WSDOT implementation of its Project Delivery Method Selection Guidance policy; and complete and monitor the effectiveness the DB Technical (aka Chapter 2) and General Terms (aka Chapter 1) template documents. It was noted that with the 2016 primary focus shifting from a DB contract documents to DB practice and implementation, there will need to be more preparation for future meetings by Team Members prior to meetings. Team members present acknowledged that responsibility. Paul volunteered to take the lead to compile the feedback from the Team to establish the DRAFT 2016 Meeting Topic Schedule. The meeting schedule will be presented for endorsement at the first meeting of the year (January 14, 2016).

ACTION ITEM: *The Team Leads will present the DRAFT 2016 Meeting Topic Schedule for endorsement at the first meeting of the year (January 14, 2016).*

5. Review and Expand Action Items (3:30 pm – 3:45 pm) All

TERESA TO COMPILE FROM ABOVE TOPICS

6. Future Meetings (3:45 pm – 4:00 pm) All

2016 Meeting Dates:

February 25, 2016
April 7, 2016
May 26, 2016
June 30, 2016
September 1, 2016
October 13, 2016
December 1, 2016

2016 Meeting Location: Kent Maintenance Facility Conference Room (reserved for all DB Sub-committee meetings in 2016). The facility address is:

26620 68th Ave S
Kent, WA 98032

Any planned changes to the programed meeting dates or location will occur at least one week prior to the meeting.

Conference Call-In: Consistency in representation is important to the Team's success. If a member is not able to attend, a conference call line will be made available for the meeting if requested in advance.

Washington State Department of Transportation | AGC Associated General Contractors of Washington | ACEC Washington

WSDOT/AGC/ACEC
Design-Build Committee Meeting
Team Member Sign In

Type	Member	Organization	Phone	E-mail	Attendee Initials
O	Adams, Bob[2]	Atkinson Constr.	425-255-7551	bob.adams@atkn.com	
WSDOT	TBD	WSDOT-HQ DN	464-1217		
WSDOT	Barry, Ed	WSDOT-NWR	206-~~805-2924~~	barryed@wsdot.wa.gov	
AGC	Bednarczyk, Marek	Graham Constr.	206-729-8844	marekb@grahamus.com	MB
WSDOT	Boutwell, Jami	WSDOT-NWR 405	425-456-8504	boutwej@wsdot.wa.gov	
WSDOT	Brown, Chris	WSDOT-AWV	206-805-5435	BrownCD@wsdot.wa.gov	
ACEC	Campbell, Dan	GeoEngineers	425-861-6094	dcampbell@geoengineers.com	
O	Christopher, Chris[2]	WSDOT-HQ CN	360-705-7821	christc@wsdot.wa.gov	
WSDOT	Clarke, Brenden	WSDOT - OR	360-357-2606	clarkeb@wsdot.wa.gov	
ACEC	Crowe, Eric	~~AECOM~~ JACOBS	425-208-9083	Eric.crowe@~~aecom~~JACOBS.com	
WSDOT	Eckard, Teresa	WSDOT-HQ CN	360-705-7908	eckardt@wsdot.wa.gov	
FHWA	TBD	FHWA			
AGC		PCL	(206)437-7242		
WSDOT	Hodgson, Lisa	WSDOT-NWR 405	~~425-420-9984~~	hodgsol@wsdot.wa.gov	
WSDOT	Ireland, Scotty[1]	WSDOT-HQ CN	360-705-7468	irelans@wsdot.wa.gov	
WSDOT	Jepperson, Omar	WSDOT-NWR 405	425-456-8610	jepperO@wsdot.wa.gov	
AGC	Larson, Phil	Atkinson	425-508-6718	phil.larson@atkn.com	
AGC	Mayo, Paul[1]	Flatiron Corp	425-508-7713	pmayo@flatironcorp.com	
WSDOT	McNabb, Gil	WSDOT-NWR 405	425-456-8643	mcnabbg@wsdot.wa.gov	
WSDOT	Mizuhata, Julia	WSDOT-NWR 520	425-576-7059	MizuhaJ@wsdot.wa.gov	
ACEC	Ostfeld, Eric	Parsons	206-643-4269	Eric.ostfeld@parsons.com	
ACEC	Patterson, Richard[3]	Bucklund & Taylor	206-321-6655	rdpn@b-t.com	
AGC	Pindras, Greg	Max J. Kuney	509-535-0651	gregp@maxkuney.com	
AGC	Prouty, Jim	Granite Construction	425-551-3100	Jim.prouty@gcinc.com	J.a.P.
ACEC	Rohila, Manish	Rohila Consulting	425-246-1749	manish@rohilaconsulting.com	
AGC	Vanderwood, Jerry	AGC Chief Lobbyist	206.284.0061	jvanderwood@agcwa.com	
AGC	Young, Frank	Kiewit	206-295-8735	frank.young@kiewit.com	
ACEC	BEN UPSALL	GEO ENGINEERS	206-919-4806	BUPSALL@GEOENGINEERS.com	BMU

1 WSDOT / AGC DB Subcommittee Co-chairs
2 WSDOT/AGC Co-lead
3 ACEC Lead

Guests – Please print clearly

Attendee	Organization	Phone	E-mail
Ryan Olson	PCL	206-793-8116	Rdolson@pcl.com
Marcus Leavitt	Parsons	775-400-7117	Marcus.leavitt@parsons.com

Team Charter

WSDOT/AGC/ACEC Design-Build Committee

Team Mission

- **Vision** – A nationally recognized Design-Build Program that consistently delivers quality projects through positive coordination with Design-Builders, executed through competitive contracts that appropriately allocate risk, promote innovation and collaboration that ultimately benefits the citizens of Washington.
- **Mission –** Founded on strong WSDOT and Design-Builder relationships, further develop and maintain WSDOT's Design-Build Program based on the values of collaboration, innovation and continuous improvement that result in industry best practices.
- **Purpose** – To serve as a resource for establishing Design-Build policy, procedures and process improvement.

Team Goals

- **Seek Continuous Improvement** to WSDOT's Design-Build Program.
- **Develop and Maintain Excellent Communications** on WSDOT's Design-Build Program between WSDOT, AGC, ACEC and other interested parties.
- **Improve Understanding** of the value of Design-Build project delivery.
- **Encourage New Participants** in Design-Build project delivery from the design and construction industry.

Team Organization and Responsibilities

- **Membership** – Representatives include WSDOT HQ Design and Construction and project teams, the construction industry and the consulting engineer industry. Reference the attached membership table which will be updated at the start of each year.
- **Co-Chair Roles and Responsibilities:**
  - Co-Chair: Scotty Ireland, WSDOT
  - Co-Chair: Paul Mayo, Flatiron West, Inc.
  - **Shared Responsibilities**:
    - Provide leadership to the Team;
    - Lead the meetings;
    - Facilitate resolution of issues;
    - Oversee changes in membership;
    - Oversee changes in the Charter;
    - Identify Annual Goals;
    - Meet responsibilities as a Team member.
- **Team Member Roles and Responsibilities**:
  - WSDOT will consider team's recommendations and either incorporate it into the Design-Build program or give feedback on why recommendations are not incorporated, in full or in part.
  - All Team members agree to:
    - Provide specific expertise in Design-Build project delivery;
    - Review documents and comment promptly;
    - Attend all meetings possible and prepare appropriately;
    - Complete all necessary assignments prior to each meeting;

        - Relay information to their groups (if any) after each meeting and gather information/feedback from their groups as practicable before each meeting;
        - Maintain a focus on solutions that benefit the mission and goals of the team as a whole.
- **Staff Resources**: On specific issues subject matter experts will be made available to review and discuss ideas with the team.
- **Core Values**
    - Accountability;
    - Innovation;
    - Professionalism;
    - Transparency;
    - Respectfulness;
    - Integrity.

Operating Guidelines

- **Communications**
    - Team members will receive and accept meeting requests through Outlook;
    - Draft Agendas will be prepared and distributed by WSDOT and will be sent out approximately one week prior to the meeting;
    - Draft meeting minutes will be prepared and distributed by WSDOT and will be sent out for comment approximately two week after the meeting;
    - Meeting minutes will be finalized and posted by WSDOT ~~at least~~approximately one week before the next meeting at:
      http://www.wsdot.wa.gov/Business/Construction/MeetingMinutes.htm
    - An Action Item List will be included with the meeting minutes;
    - A conference call-in will be available from WSDOT if requested in advance. Team members are encouraged to attend the meetings in person;
    - WSDOT will provide hardcopies of the agenda at the meetings.
- **Meeting Times**: Approximately ~~E~~every 6 weeks. 1:00- 4:00 pm
- **Conduct of Meetings**
    - Informed Member Alternates are acceptable and encouraged if a Team member cannot attend;
    - All cell phones will be turned off during the meetings;
    - Meetings will end with a clear understanding of expectations and action items;
    - Meetings are expected to be approximately three hours;
    - WSDOT will keep the meeting minutes. Comments from individual members will generally not be attributed and a verbatim record of the meeting will not be prepared.
- **Meeting Ground Rules**
    - Be honest and open during meetings;
    - Encourage a diversity of opinions on all topics;
    - Give everyone the opportunity for equal participation;
    - Be open to new approaches and listen to new ideas;
    - Use team time effectively; move on after reasonable discussion of issues;
    - Use this group as a safe forum to bring up issues related to DB.

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WSDOT/AGC/ACEC Design-Build Team Membership
January, 2015

Type	Member	Organization	Phone	E-mail
O	Adams, Bob[2]	Atkinson Constr.	425-255-7551	bob.adams@atkn.com
WSDOT	Barry, Ed	WSDOT-HQ DN	206-805-2924	barryed@wsdot.wa.gov
AGC	Bednarczyk, Marek	Graham Constr.	206-729-8844	marekb@grahamus.com
WSDOT	Boutwell, Jami	WSDOT-NWR 405	425-456-8504	boutwej@wsdot.wa.gov
ACEC	Campbell, Dan	GeoEngineers	425-861-6094	dcampbell@geoengineers.com
O	Carpenter, Jeff[2]	WSDOT-HQ CN	360-705-7821	carpenj@wsdot.wa.gov
AGC	Christian, Janiece	PCL	425-456-8504	jchristian@pcl.com
WSDOT	Clarke, Brenden	WSDOT - OR	360-357-2606	clarkeb@wsdot.wa.gov
ACEC	Crowe, Eric	AECOM	425-208-9083	Eric.crowe@aecom.com
WSDOT	Eckard, Teresa	WSDOT-HQ CN	360-705-7908	eckardt@wsdot.wa.gov
FHWA	Ellis, Sue	FHWA	360-753-9554	susan.wllis@dot.gov
WSDOT	Hodgson, Lisa	WSDOT-NWR 405	425-420-9984	hodgsol@wsdot.wa.gov
WSDOT	Ireland, Scotty[1]	WSDOT-HQ CN	360-705-7468	irelans@wsdot.wa.gov
WSDOT	Jepperson, Omar	WSDOT-NWR 405	425-456-8610	jepperO@wsdot.wa.gov
AGC	Larson, Phil	Atkinson	425-508-6718	phil.larson@atkn.com
AGC	Mayo, Paul[1]	Flatiron Corp	425-508-7713	pmayo@flatironcorp.com
WSDOT	McNabb, Gil	WSDOT-NWR 405	425-456-8643	mcnabbg@wsdot.wa.gov
WSDOT	Mizuhata, Julia	WSDOT-NWR 520	425-576-7059	MizuhaJ@wsdot.wa.gov
WSDOT	Nielsen, Brian	WSDOT-NWR AWV	206-805-5426	nielseb@wsdot.wa.gov
ACEC	Ostfeld, Eric	Parsons	206-643-4269	Eric.ostfeld@parsons.com
ACEC	Patterson, Richard[3]	Bucklund & Taylor	206-321-6655	rdpn@b-t.com
AGC	Pindras, Greg	Max J. Kuney	509-535-0651	gregp@maxkuney.com
AGC	Vanderwood, Jerry	AGC Chief Lobbyist	206-284-0061	jvanderwood@agcwa.com
AGC	Young, Frank	Kiewit	206-295-8735	frank.young@kiewit.com

1 WSDOT / AGC DB Subcommittee Co-chairs
2 WSDOT/AGC Co-lead
3 ACEC Lead

2016 Proposed DB Goals and Topics

Line Item	Goal / Topic	Lead	Subject	Description	Comments
1	Goal	Brenden Clarke	DB Contract Admin Improvements	Work with industry to improve contract administration of DB projects	
2	Goal	Dan Campbell	ACEC Representation	To have ACEC fully represented at each meeting. I feel the A/E community, primarily myself, have missed way too many meetings.	
3	Goal	Eric Crowe	Consistent DB Administration	Establish guidelines as to how DB project are administered. We have done a good job of reviewing chapter 2 and I feel we have a very good document moving forward, however the benefits of this work will only be realized if there is some consistencies in the way they are administered.	
4	Goal	Eric Ostfeld	RFP Improvements	Identify areas where there are opportunities for improvement and develop a pure performance specification requiring proponents to propose out of the box solutions.	
5	Goal	Jim Prouty	Outreach	For Washington, jointly participate in a DBIA conference in 2016, (small team of presenters). This would allow us to present a topic collaboratively, and interact with other state agencies to enhance our Team Charter Goals; Seek Continuous Improvement, Develop and Maintain Excellent Communication, and Improve Understanding. It's good to see and hear what is going on across the nation as it relates to alternative project delivery and attending a DBIA conference together can be a way to do that.	
6	Goal	Julia Mizuhata	Consistent DB Administration	To see an updated Design-Build Process guidance manual published. I see this as not just a need for the Regions in the State that are just beginning to develop Design-Build projects.	
7	Goal	Marek Bednarczyk	Quality Management	Establish the minimum requirements for Quality Control Staff on a Design Build Project. Third Party requirement or In-house. This is a huge variable that could result in higher costs, unbalanced bids, less QA/QC, and the potential for a lower level of QC resulting in a poor finished product.	
8	Goal	Marek Bednarczyk	Document Control Standardization	Work with WSDOT and agree to a document control platform that can be used across all Design Build projects. WSDOT administered with a WSDOT Document Control Plan. Goal to simplify and standardize documentation and communication.	
9	Goal	Marek Bednarczyk	DB Selection Process	To have a fair and unbiased contractor selection process for Design Builds.	
10	Goal	Scotty Ireland	Small Project Design-Builder Procurement Process	With recent legislation and the implementation of WSDOT's PDMSG, develop a modified procurement process that is scalable for small design-build projects (<$10M upset amount, possibly <$25M). Eric Ostfeld had previously brought a similar topic forward, and considering there will be an increase in probability of smaller projects being brought forward, I think we need to take it to the next step and at least develop the framework for a proposed modified process. This proposed goal is consistent with the Team Charter's Mission and Goals.	

2016 Proposed DB Goals and Topics

Line Item	Goal / Topic	Lead	Subject	Description	Comments
1	Topic	Brenden Clarke	Project Goal Assessments	I suggest we discuss Project Goals and evaluation criteria for SOQ's and Proposals to get feedback from industry to see if there are concerns or challenges with the goals WSDOT has been using, or suggestions for improvements.	
2	Topic	Brenden Clarke	DB Personnel Consistency	With the number of D-B projects on the horizon, perhaps we should discuss how to manage the issue of Key Personnel when a D-B team is planning on submitting on more than one project with overlapping evaluation schedules. We touched on this during the last meeting, but it might be worth re-visiting.	
3	Topic	Brenden Clarke	NCR / NCI Data	Perhaps it would be worthwhile to discuss NCR/NCI's. How is WSDOT doing, how can WSDOT be more consistent? How is industry doing to resolve NCR's, and is it clear what WSDOT's expectations are? Concerns from OER's perspective?	
4	Topic	Dan Campbell	Owner Consistency	How to develop a consistently strong/experience owner D/B leads across the regions that may implement D/B.	
5	Topic	Eric Crowe	WSDOT Oversight Staff	Selection of oversight staff that are suited for DB – DB projects are different than traditional project and require a different level of thinking	
6	Topic	Eric Crowe	Technical dispute resolution	Clearly defined issue escalation process – when should technical disagreements be escalated an to who	
7	Topic	Eric Crowe	Review Process and Expectations	Ground rules for the generation of comments – ideally if you are making comments you should be a team member that knows the history of the project	
8	Topic	Eric Crowe	Review Process and Expectations	"Approval Process" – Approval of the project is not until construction is complete, does this mean that "reviewed" design documents can be "re looked" at after they are released for construction?	
9	Topic	Eric Crowe	Concept Plans	Completion and Accuracy of Conceptual Plans – Conceptual plans need to be "conceptually correct"	
10	Topic	Eric Crowe	Concept Plans	Amount and completion of upfront documentation –e.g.. Should preliminary channelization plans be developed and approved (this may be a way to add some ownership to the conceptual plans)	

2016 Proposed DB Goals and Topics

Line Item	Goal / Topic	Lead	Subject	Description	Comments
11	Topic	Eric Ostfeld	Innovation	Innovation in my opinion is the true value proposition of D-B project delivery. Standardizing the D-B process and templates is key to meeting Owner expectations and streamlining design-build as a wide spread method for project delivery. Having the ATC process as a tool is instrumental in continuing to allow innovation. However, I'd be interested in seeing if there are additional tools that that could be considered or general guiding principles that could be adopted and codified to allow greater opportunities for innovation. Opportunities for innovation will vary significantly based on individual project needs and constraints. Potentially there is project criteria that could be developed to trigger implementation of additional innovation tools.	
12	Topic	Jim Prouty	2.25.8 HOT MIX ASPHALT MIX DESIGN AND ASPHALT CONCRETE PLANT	Current RFP requirements: HMA Mixing Plant - The plants used by the Design-Builder for the production of HMA shall conform to all of the requirements of the Standard Specifications. The Construction QA Manager shall inspect the HMA plants and document that they meet all requirements. HMA supplier provides QC for mix provided. Design Builder provides the "street", QC, inspection to ensure adherence to laydown temperatures, depth, width, location, etc. WSDOT retains QA, QV for relative density and job mix compliance. The Construction QA Manager is most likely not qualified to determine if an HMA plant is in compliance or not. The above statement can result in an unnecessary NCI/R for resolution. Propose to strike this language.	
13	Topic	Jim Prouty	2.25.8 HOT MIX ASPHALT MIX DESIGN AND ASPHALT CONCRETE PLANT	HMA mix design structural section; Typically WSDOT will specify ½" PG 64-22 for all layers of the HMA section in the basic configuration or Section 2.7; Pavement. For the base lifts, a 1" HMA Lift would be more cost effective to produce and provide higher strength and durability. There seems to be resistance from WSDOT to consider using anything other than the more expensive ½" HMA in the base lifts. Past Design Build Projects indicate the answer to revising the base lift section is no? Can some reasoning be provided or would WSDOT be open to this concept?	

2016 Proposed DB Goals and Topics

Line Item	Goal / Topic	Lead	Subject	Description	Comments
14	Topic	Jim Prouty	Section 2.20.3.2 Pavement Marking Performance Requirements	Second paragraph: The Design-Builder shall test the retro reflective performance of newly applied pavement markings after 12 hours, but within 21 Calendar Days, of the marking application. Installation of permanent pavement markings is the same for Bid Build and Design Build contracts. For Bid Build Projects, the above testing process, (after 12 hrs., but within 21 Calendar Days), is not consistently performed. Why is this language in Design Build Contracts? Specified time frame requires an unnecessary MOT impact by having to take a lane(s) just to obtain readings from the striping. Consider revising testing process to allow reading to be obtained the same shift the striping is installed, (Blow loose glass beads off with compressed air / leaf blower?)	
15	Topic	Jim Prouty	Section 2.11 Roadway	10-22-15 Meeting Topic 4.B.2. Section 2.11 Roadway; Pre-Bid Barrier / Guardrail inventory I agree with Erick Crowes Statement that determining if the Barrier / Guardrail meets current standards can be a costly item and tough to quantify during the pursuit phase. For reasons discussed in the meeting, it may be difficult or impossible to obtain without taking lanes so it can be appropriately inventoried. In addition to this, there is no variance in the design manual or supplied from the manufactures for Type 31 Guardrail. Type 31 means 31”; No plus / minus. From a craftsmanship perspective there needs to be a variance to account for sag / vertical curves and irregularities in the finished surface. Installing guardrail to line and grade is common practice. From previous experience, with no variance in height, it puts QA in a difficult position to accept the guardrail as installed. All stakeholders can look at the installed guardrail and agree that the line and grade looks correct, but when you put the tape measure to it, you may be an inch off. Action: Develop a plus / minus for Type 31 Guardrail. Pursue this with the guardrail contractors / suppliers to develop written guidance.	
16	Topic	Julia Mizuhata	PDMSG	Provide an update on how (well) the process is working following its application on upcoming projects. Any challenges encountered? Changes that might have had to be made to process?	
17	Topic	Marek Bednarczyk	Project Closeout Process	Identify and implement best practices for project closeout	
18	Topic	Marek Bednarczyk	Small Project Design-Builder Selection Process	Develop an alternative means for selection of Contractors for small DB Projects	
19	Topic	Paul Mayo	2.6 Geotechnical	With the significant changes to this chapter (including design parameters, field explorations requirements, special inspection and field verifications) being implemented on a couple of recent projects, evaluate the effectiveness of the changes and assess opportunities for improvement.	

2016 Proposed DB Goals and Topics

Line Item	Goal / Topic	Lead	Subject	Description	Comments
20	Topic	Paul Mayo	2.5 Survey and Mapping	Project electronic files are provided in Appendix A2 and Right of Way Plans are provided on .pdf files in Appendix R1 and project electronic files are provided in appendix A1. This is a disconnect as the DB doesn't use .pdf files for design and requires additional work. Is there a way to provide the electronic ROW plans.	
21	Topic	Paul Mayo	DB Training	WSDOT has talked about developing DB training for its staff. Many Contractor and Design firms have specific training to prepare their staff for DB projects. Is there the opportunity to collect best practices from industry partners to help WSDOT in this effort?	
22	Topic	Phil Larson	Joint Training	If we see DB used more we will need to find a way to train the Prime Contractors, Subcontractors, Designers, and WSDOT staff on how DB contracts are administered and the new risk profile which each party takes for the contract. This could tie-in to DBE outreach and training.	
23	Topic	Phil Larson	Marketing	We need to find a consistent message to market which projects fit DB best.	
24	Topic	Scotty Ireland	Small Project DB Quality Assurance	Considering the increased probability of smaller DB projects, what is industry's perspective of the most effective QA implementation for DB on projects with an upset amount less than <$10M (no preference, self-performed, EOR representative, independent third party, Contracting Agency performed) and why?	
25	Topic	Scotty Ireland	Partnering	The ability for Teams to collaborate and "partner" can be a significant factor in the success of a project. Partnering is a broad term and has multiple meanings to different people. There is formal partnering that can be required by the RFP and typically happens at the beginning of the projects with Project Managers and Executives. There's informal partnering that occurs daily on projects as a standard practice of good leaders and managers. Discuss the Team's perspective on the effectiveness of partnering and establish a list of partnering "best practices" that's supported by WSDOT and the DB community. Ultimately, these would become standard practice for WSDOT's DB Program. Things to consider: what types of projects should require formal partnering to be implemented; what types of partnering practices work best (meetings, surveys, after hour "workshops"); who should be involved with partnering and when should it occur (NTP; Beginning of design; beginning of construction); how often should partnering sessions be scheduled on a project; how do you make partnering scalable to the size of the project.	

Washington State Department of Transportation

AGC Associated General Contractors of Washington

ACEC Washington

WSDOT/AGC/ACEC
DESIGN-BUILD TEAM MEETING
Draft Meeting Minutes

October 22, 2015
1:00 pm to 4:00 pm
WSDOT Corson Ave Office, Conf. Rm. 119/201
6431 Corson Avenue South, Seattle, WA
No Teleconference line requested

Co-Chairs Scotty Ireland and Paul Mayo

AGENDA ITEMS:

1. **Sign-In Sheet/Open the meeting / Introductions** (1:00pm – 1:10pm) Scotty/Paul
   - A. Safety Briefing
   - B. Review and Update Sign-In Sheet
   - C. Introduction of new members, SME's and other Guests
     1. New Members – Jim Prouty
        – Chris Brown
        SME's – Eric Wolin

Attendees:

Adams, Bob	Atkinson Constr.
Barry, Ed	WSDOT-HQ DN
Bednarczyk, Marek	Graham Constr.
Boutwell, Jami	WSDOT-NWR 405
Clarke, Brenden	WSDOT - OR
Crowe, Eric	AECOM
Eckard, Teresa	WSDOT-HQ CN
Harris, Jon	PCL
Ireland, Scotty	WSDOT-HQ CN
Larson, Phil	Atkinson
Mayo, Paul	Flatiron Corp
McNabb, Gil	WSDOT-NWR 405
Mizuhata, Julia	WSDOT-NWR 520
Ostfeld, Eric	Parsons
Patterson, Richard	Bucklund & Taylor
Pindras, Greg	Max J. Kuney
Jim Prouty	Granite Construction
Rohila, Manish	Rohila Consulting
Young, Frank	Kiewit
Guests	
Wolin, Eric	WSDOT – HQ Environmental

Scotty briefly reviewed the evacuation plan and bathroom locations. Check sign-in sheet to make sure your information is current. Everyone briefly introduced themselves. Scotty introduced the new members and SME's. Hub access for Jim P and Chris B is needed.

2. **Review Previous Meeting Minutes** (1:10pm – 1:15pm) Scotty

   The September 10th DRAFT meeting minutes will be posted to TheHub on 11/5/2015. If no comments are received, they will be finalized and posted to the website on 11/13/2015. Meeting minutes are located at:

   http://www.wsdot.wa.gov/Business/Construction/MeetingMinutes.htm

MM will be posted on the Hub for review.

3. Old Business (1:15pm – 1:35pm)

A. Chapter 2 Section draft template review update (see updated spreadsheet) (10 Min) Teresa

Teresa reviewed the current status of the DB contract document sections reviewed by this committee in 2015. All should be posted (or re-posted) for a two week period on TheHub for a final review in November. The final draft of all of the sections but 2.8 and 2.11 are expected to be completed in November. HQ Construction review of the contract language will start in December and following resolution of all changes by HQ Construction, the FHWA will review the documents for approval.

There were a handful of sections that were not a priority for review by this committee or the DB Work Group. Those will be posted on TheHub and the DB WG SharePoint site for comments in November, with the final drafts expected the end of December.

The DB Work Group (some WSDOT committee members are also members of the work group) had a session where they reviewed the proposed changes to the technical sections proposed by this committee. There were very few recommended changes. The consensus was by the work group was that the section were greatly improved and should save time and $$ for both WSDOT and the DBer moving forward. Teresa thanked the committee members for all of their hard work and expressed appreciation for the input of the SME's provided by AGC, ACEC and WSDOT for our process.

B. Project Delivery Method Selection Guidance Briefing (10 Min) Scotty

http://www.wsdot.wa.gov/Projects/delivery/designbuild/PDMSG.htm

Scotty discussed the PDMSG – input from group last meeting, PDMSG and appendix A posted, appendices still being developed.

PDMSG letter is being implemented this week (probably) to utilize the PDMSG to determine the PDM for projects.

Teresa doing workshop for SR 520 West Approach Bridge South (WABS) and Portage Bay, it was asked if consultants were involved in the process, and the answer is yes, consultants hired to assist with preliminary design and contract document development are part of the process. The ASCE and ASDE are also part of the process as well as a facilitator (Teresa in this test case)

Scotty discussed the upcoming kick off meeting with JTC (tomorrow) on how WSDOT is developing DB and PDMSG. Consultant (Hill International) is preparing an overview of DB, DB Best Practices, and will evaluate WSDOTS current practices with DB delivery, Proposed improvements to maximize value, efficiencies, are risk properly assigned, work with staff, legislative concerns/changes, etc. Study has started with final draft due Sept 1, 2016.

Bob Adams –the JTC study is an offshoot of Connecting Washington Bill, wanted to have reforms in place, which required this study to make recommendations to improve WSDOT's DB project delivery. Input of industry through this committee demonstrates what works; report will provide suggestions for improvements.

4. New Business (1:35pm – 3:25pm)

A. GCCM Task Force (5 Min) Scotty/Bob

Reform VII – WSDOT is developing using GCCM for heavy civil- will use CPARB process for next couple years before pursuing new legislation. Task force was put together to support the development of this for WSDOT. Legislation not needed right away, but CPARB process is available, wait and see how Sound Transit and Colman Dock project works. A subcommittee from this group will become the GCCM Task Force to identify BPs for GCCM for WSDOT. Consider proposing GCCM legislation in 2017 for WSDOT. What is the process for GCCM approval? Mark Gaines and Jeff Owen will lead the Task Force. If members of the committee (AGC and ACEC) have interest in participating, let Bob Adams know. WSDOT members should go to Mark Gaines. Size probably 10 members or less on Task Force. The leaders have experience with GCCM.

B. Chapter 2 Technical Review Comments

1. Section 2.8 Environmental (30 Min) Teresa/SME's

Eric Wolin discussed the issues associated with 2.8 that he and Dan Campbell (not available today) decided on. Section **2.8.4.1 third paragraph** – Dan C felt that the Preliminary Design submittal is not a good trigger as there may be multiple "Preliminary Design submittals". Resolution was to call out the "first" submittal.

There was some additional discussion about the DBer using the WSDOT maintenance environmental permits to perform all vegetation and pest maintenance within the project limits. Eric is still coordinating with HQ maintenance, so this item is pending.

See the attached draft section 2.8 for detailed markups and revisions.

2. Section 2.11 Roadway (30 Min) Teresa/SME's

Discussion on

2.11.3.3 Roadside Barrier Selection- information on barriers limited at RFP time, DBer tasked with determining during proposal – is there a better way? There was discussion where WSDOT talked about their takeoffs, but info may be dated by time of proposal, AGC and ACEC folks would like to see a survey or baseline, maybe use telemetry. Ed wanted to discuss with a PE doing procurement (Omar) before making a decision.

Also what should be standard language in the template – when may guardrails be used? Discussion on possibilities – the type of barrier is a fill in so would be project specific. WSDOT will not relax safety requirements.

3.10 Pedestrian Facilities – may want to assess ADA requirements on or near structures. There was lengthy discussion about identifying ADA requirements. New method is to "box" in area where ADA must be evaluated and modified to meet requirements by DBer and RFP doc is better with the "box". Ed Barry will discuss with a PE on if it is feasible to provide more info at the RFP stage and/or is WSDOT wants to indicate ADA improvements on or near structures.

See attached draft section 2.11 for detailed markups and revisions.

C. Upset Price and Best Value (20 Min) Eric Crowe

Eric Crowe discussed the potential issue of Best Value where proposal price cannot be over the upset price. If you add value through ATC, etc. may need to back off from items that could potentially put you over the upset price.

Points for performance verses price – the balance of points versus the cost to gain the price. Upset price was top down and engineer's estimate was bottom up. There is a benefit in having an upset price, but need to make sure there is room between the Eng Est and upset amount for innovation.

How does WSDOT establish the Upset amount – often the total budget for the contract is used as the upset amount. Teresa commented that other agencies use a "Walk away" amount. i.e. what percentage of the budget would be allowed before WSDOT would not execute the project.

Recently, with market changes, WSDOT estimates have been substantially under the proposal prices, leaving no range of value between the true Engineer's Estimate and Upset amount.

The current chapter one template language modified the language so the upset amount is an option rather than a requirement on all jobs. Some projects will not have an upset amount (emergency projects, schedule critical projects, etc.)

Committee supports the use of upset amount in general on most projects, however, it is critical that there is sufficient range between the Engineer's estimate and the upset amount to allow ATC's that would enhance the "best value" of the project.

D. DB Co-located Facility Security (20 Min) Omar Jepperson

Jami – issue was posted on TheHub, theft on projects, etc. Trying to find language to put in the RFP that isn't too prescriptive, one of the comments was to have the DBers insurance cover WSDOT assets at the collocated project site, other was Brenden's job is a specific location where he would have project specific requirements.

Paul commented that if a high risk area is chosen because of price, the savings are passed on to WSDOT in the proposal.

Comment was DBer's insurance would be pricey

Why would the DB'er not provide security for the site?

What are the minimum basic requirements needed for the template?

Class B (real estate terms) normal risk area- does this provide the description needed in the spec?

Make sure the sq footage is reasonable

Jami will provide Omar with the discussion points and there may be follow-up on this item.

E. Upcoming DB Projects (5) Scotty

405/167 DC out for RFQ;

I5/SR 16 HOV Connector; RFQ Posted on Nov 2nd

Post upcoming DB projects (estimated) on our website when schedule is updated in Nov/Dec. It could change significantly due to the application of the PDMSG processes.

5. Future Meeting Highlights (3:25pm – 3:35pm)

A. 2016 WSDOT/AGC/ACEC DB Committee Goals — Scotty/Paul

There is a Committee Leads meeting on Nov 2nd – this is for all of the WSDOT/AGC/ACEC committee leads
Requesting goals for 2016 – to be reviewed at the next meeting in Dec.
In the next 7 days, email proposed goals and topics to Paul, Richard, Scotty and Teresa.
Every member will provide at least one goal and topic.
(Teresa will send out a requesting email)

6. Review and Expand Action Items (3:35pm – 3:45pm) — All

Teresa - Post upcoming DB project sched to web before Dec meeting
Teresa email for 1 goal and topic from each committee member
Teresa - Follow up with 2.8 and 2.11 with SME's
Teresa – send out meeting requests for 2016
Paul – send info on Prequalifications of DBers before Dec 3rd meeting to Scotty and Teresa
All – Provide 1 goal and 1 topic for 2016

7. Future Meetings (3:45pm – 4:00pm) — All

Teresa discussed meetings and locations in 2016 per the following. She showed pictures of the meeting space – much less crowded and has good heating/cooling/ventilation. Group agreed to meet in 2016 per the proposed dates and location. Teresa will send out the meeting requests and location info prior to the Dec 3rd meeting.

Location: Through the end of 2015, we will be meeting at the Corson Ave Project Office, **Conference Room 119/121**
The address is:
6431 Corson Avenue South
Seattle, WA 98108

Future 2015 meeting dates:
December 3, 2015 - Conference Room 119/121

Potential 2016 Location: In 2016, we propose meeting at the WSDOT Kent Maintenance Facility Conference Room.
The address is:
26620 68th Ave S
Kent, WA 98032
The Kent Maintenance Facility Conference Room is currently reserved for all of the proposed meeting times for 2016.

Potential 2016 Meeting Dates:
January 14, 2016
February 25, 2016
April 7, 2016
May 26, 2016
June 30, 2016
September 1, 2016
October 13, 2016
December 1, 2016

Any planned changes to the programed meeting dates or location will occur at least one week prior to the meeting.

Conference Call-In: Consistency in representation is important to the Team's success. If a member is not able to attend, a conference call line will be made available for the meeting if requested in advance.

Draft WSDOT/AGC/ACEC Design-Build Committee 2015 Section Review Status

RFP Chapter 2 Sections	Subject Matter Experts	Status of template revisions	Notes/Comments
2.13 Bridges and Structures	WSDOT – Rich Zeldenrust ACEC - Rich Patterson	• **DB BDM Changes – part of BDM agreed to (9/16)** • **DB Work Group Review and Comments (10/6)** • Finalize Comments (11/5) • Re-Post final version (11/6) • Final Draft (11/20)	The DB BDM references were changes – instead of a stand-alone document, it will be a chapter in the BDM. All sections were reviewed by the DB Work Group in Sept.
2.6 Geotechnical	WSDOT - Jim Cuthbertson /Jim Struthers; ACEC – Dan Campbell AGC - Phil Larson	• **DB BDM Changes – part of BDM agreed to (9/16)** • **Other Geo changes (10/5)** • **DB Work Group Review and Comments (10/6)** • Finalize Comments (11/5) • Re-Post final version (11/6) • Final Draft (11/20)	
2.22 Maintenance of Traffic (MOT)	WSDOT - Bonnie Nau ACEC – Manish Rohila AGC - Mannie Barnes	• **DB Work Group Review and Comments (10/6)** • Finalize Comments (11/5) • Re-Post final version (11/6) • Final Draft (11/20)	
2.10 Utilities and Relocation Agreements and GT1-07(17)	WSDOT John, Collins, Pete Townsend and Ahmer Nizam ACEC –Eric Ostfeld AGC - Paul Mayo	• **Changes incorporated into 2.10 and 1-07.17 w/o final AG notes** • **DB Work Group Review and Comments (10/6)** • Finalize Comments (11/5) • Re-Post final version (11/6) • Final Draft (11/20)	Waiting on AG office final comments Will proceed with draft while additional comments pending.
2.12 Project Documentation	WSDOT – Ed Barry ACEC – Eric Ostfeld AGG - Chris Williams	• **Revised section from WSDOT SME's (9/14)** • **DB Work Group Review and Comments (10/6)** • Finalize Comments (11/5) • Re-Post final version (11/6) • Final Draft (11/20)	
2.28 Quality Management Plan (QMP)	WSDOT - Randy Mawdsley; ACEC – Eric Ostfeld AGC - Jeremy Mason	• **SR 520 LL changes (9/15)** • **DB Work Group Review and Comments (10/6)** • Finalize Comments (11/5) • Re-Post final version (11/6) • Final Draft (11/20)	
2.18 Intelligent Transportation Systems	WSDOT - Greg Leege; ACEC – Bart Cima AGC – Mike Woeck	• **Revised section from WSDOT SME's (9/14)** • **DB Work Group Review and Comments (10/6)** • Finalize Comments (11/5) • Re-Post final version (11/6) • Final Draft (11/20)	
2.29 Maintenance During Construction	WSDOT – Mark Renshaw; ACEC – Manish Rohila AGC – Mannie Barnes	• **DB Work Group Review and Comments (10/6)** • Changes from HQ Maint on Envir Permits (10/30) • Finalize Comments (11/5) • Re-Post final version (11/6) • Final Draft (11/20)	
2.8 Environmental	WSDOT – Eric Wolin ACEC – Dan Campbell AGC - Mike Shaw	• **DB Work Group Review and Comments (10/6)** • **Review section prior to Oct 22nd** • **SME's Lync on Oct 14th** • Comments discussed at Oct 22nd meeting • Revised Redlines from WDOT SME's (11/4) • SME resolution Lync meeting on (11/9) (include HQ Const) • Revised section from WSDOT SME's (11/24) • Post final version (12/15) • Final Draft 12/30/2015	
2.11 Roadway	WSDOT –Ed Barry ACEC – Eric Crowe AGC – Phil Larson	• **DB Work Group Review and Comments (10/6)** • **Review section prior to Oct 22nd** • **SME's Lync on Oct 19th** • Comments discussed at Oct 22nd meeting • Revised Redlines from WDOT SME's (11/4) • SME resolution Lync meeting on (11/9) (include HQ Const) • Revised section from WSDOT SME's (11/24) • Post final version (12/15) • Final Draft 12/30	

2.8 ENVIRONMENTAL

2.8.1 GENERAL

The Design-Builder shall conduct all Work necessary to deliver the Project while protecting and enhancing ~~enhancing~~ the environment. Elements of the Work shall include, but are not limited to, the following:

- Avoiding impacts to the community and to the environmental, historic, archaeological, and cultural resources beyond those already approved by the regulatory agencies. If new impacts are unavoidable, the Design-Builder shall make every effort to minimize the unavoidable impacts. ***New, unavoidable temporary and permanent impacts shall be mitigated in accordance with current jurisdictional land use codes and the *Wetland and Stream Mitigation Report* (Appendix E).****
- Fostering good relationships with Federal, State, and Local Agencies, tribes, and local stakeholders by ensuring that the commitments WSDOT has made are reflected in the Project's final design and are fulfilled during construction. The Design-Builder shall accomplish this by meeting or exceeding all environmental requirements and commitments listed in the Contract, permits, environmental documents, and regulatory agency concurrence letters.
- Complying with all Federal, State, and local laws, regulations, and ordinances (collectively referred to in this Section as "regulations") and not receiving any permit violations.
- Provide supporting documents and information to assist in the preparation of WSDOT lead permit applications. Collaboratively prepare or assist in WSDOT permit modifications resulting from D-B design changes or requests, and secure all other required permits.

2.8.2 MANDATORY STANDARDS

The following is a list of Mandatory Standards that shall be followed for all design and construction related to this Section. They are listed in hierarchical order, where the Mandatory Standards listed higher in the list shall take precedence over those listed below them. If a Mandatory Standard contains a reference to another document that is not listed below and states that the referenced document shall be used, the referenced document shall also be considered to be a Mandatory Standard with the same hierarchal precedence as the source publication. This is not a comprehensive list; other applicable standards may be required to complete the design and construction. If the Design-Builder becomes aware of any ambiguities or conflicts relating in any way to the Mandatory Standards, the Design-Builder shall immediately notify the WSDOT Engineer.

If the requirements of a Mandatory Standard, programmatic agreement, or permit issued for the Project conflict, then the provisions within the project-specific permit shall take precedence.

- Special Provisions (Appendix B).
- *Amendments to the Standard Specifications* (Appendix B).
- Standard Specifications (Appendix B).

Comment [DC1]: Shouldn't this be protecting the environment?

Response - One of the WDOT goals is to leave the environment better than we found it at the end of a project so No Change

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Comment [jlb2]: 10/7/15, 4:58 PM, Eric Wolin says: Recommend making the entire sentence red font because it is project specific.

Comment [ET3]: Use if applicable

Comment [jlb4]: 10/5/15, 4:54 PM, Eric Wolin says: Add a fourth bullet: Provide supporting documents and information to assist in the preparation of WSDOT lead permit applications. Collaboratively prepare or assist in WSDOT permit modifications resulting from D-B design changes or requests, and secure all other required permits. (This comment came from Dave Davies in the Olympic Region. I agree with his suggestion.)

Response – See Markup

- Standard Plans (Appendix D).
- *WSDOT Environmental Manual* (M31-11) (Appendix D).
- *WSDOT Highway Runoff Manual* (M31-16) (Appendix D).
- *WSDOT Temporary Erosion and Sediment Control Manual* (M3109) (Appendix D).
- *WSDOT Design Manual* (M22-01) (DM) (Appendix D).
- *WSDOT Construction Manual* (M41-01) (Appendix D).

2.8.2.1 INTERAGENCY AGREEMENTS AND MEMORANDA

WSDOT has entered into several interagency agreements with Federal and State agencies and Local Agencies which provide guidance and clarification for meeting regulatory requirements. The Design-Builder shall comply with the Implementing Agreements, Memoranda of Understanding or Agreement, and Instructional Letters included in Appendix E.

This Section has been intentionally omitted.

2.8.3 ENVIRONMENTAL PERSONNEL, COMMUNICATIONS, AND TRAINING

2.8.3.1 KEY PERSONNEL

2.8.3.1.1 Environmental Compliance Manager

~~The~~The Design-Builder shall identify a single point of contact for all environmental issues. This role, identified as the Environmental Compliance Manager (ECM) shall be responsible for the overall environmental compliance for the Project, and shall function as principal technical advisor and coordinator for environmental issues. The Environmental Compliance Plan (ECP) shall identify all critical roles, responsibilities, and authorities of the ECM.

The ECM shall be assigned to the Project and be available on-Site full-time to provide assistance and oversight through ~~Substantial~~Project Physical- Completion, including environmental close-out. If the Design-Builder replaces the ECM, the Design-Builder shall provide an equally or more qualified replacement, contingent upon approval from the WSDOT Engineer. If during the course of the Contract, WSDOT finds that the ECM is not ensuring full environmental compliance with all permits, provisions, policies, and commitments; then WSDOT may require replacement of the ECM in accordance with Section 1-05 of the General Provisions.

The ECM shall have at least ***5*** years of experience managing environmental design and construction compliance issues on projects. Within those ***5*** years, ***3*** years shall be specific to linear *** and aquatic or marine-related *** transportation ~~projects~~projects and ***2*** years shall be in the Pacific Northwest region. The ECM shall have knowledge of the environmental regulations and permits relevant to the Project. The ECM is required to be a current Certified Erosion and Sediment Control Lead (CESCL), as recognized by the Washington State Department of Ecology (WSDOE). The Design-Builder shall provide a copy of the course certificate or other material verifying completion of the certification course ~~at the time of~~ as part of the Environmental Compliance Plan submittal ~~Proposal submission~~.

Comment [jlb5]: Option 1 – use if applicable, otherwise delete. Revise as needed to fit project. Eric agrees with this recommendation.

Comment [jlb6]: Option 2 - use if applicable, otherwise delete. Eric agrees with this recommendation.

Comment [jlb7]: 10/5/15, 12:14 PM, Eric Wolin says: Begin this sentence with "The Design-Builder shall identify a single point of contact for all environmental issues. This role, identified as…" (This comment came from Dave Davies in the Olympic Region. I agree with his suggestion.)

Response – See Markup

Comment [jlb8]: 10/5/15, 12:12 PM, Eric Wolin says: Insert, "assigned to the Project and" between the words "be" and "available". (This comment came from Dave Davies in the Olympic Region. I agree with his suggestion.)

Response – See Markup

Comment [ET9]: Note to Author-If Environmental Risks are minimal, full time availability may not be necessary. Confirm change with HQ Environmental Services Office.

Comment [jlb10]: 10/5/15, 12:16 PM, Eric Wolin says: Delete "Substantial" and insert "Project Physical". (This comment came from Dave Davies in the Olympic Region. I agree with his suggestion.)

Response - See Markup

Comment [jlb11]: 10/5/15, 12:21 PM, Eric Wolin says: Insert the following phrase after the word "Completion": ", including environmental

Comment [ET12]: Include this language if the projects includes aquatic or marine related work

Comment [jlb13]: 10/5/15, 12:24 PM, Eric Wolin says: Add the words, "and aquatic or marine-related" between the words "linear" and "transportation". (This comment came from Dave

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Comment [DC14]: I disagree with further defining the experience to include specific "aquatic or marine related" as the linear transportation corridor is inclusive. If the RFP is for a non-

Comment [DC15]: It seems overkill to have this required at the proposal submission. If this is listed as key position, it should be included in the SOQ. **Agree see Markup**

Comment [jlb16]: Why is this requirement listed here in chapter 2? If we truly want it at proposal submission, shouldn't it be in the ITP? See Comment KC12 below and my response.

Comment [CL17]: This information is available on line and I usually verify it if I don't know the person. See Comment KC12 below and my response.

Comment [KC18]: DB Group Comment: This information is not needed at the time of proposal submission as this person is not part of the key personnel. Suggest talking to SME to find out the

The ECM shall also be responsible for the following:

- Integrating with the design team during plan preparation and advising how to avoid and minimize adverse effects to the natural environment and communities through design and construction means and methods.
- Reviewing engineering plans to ensure the Project's design accurately reflects environmental commitments and Contract requirements.
- Developing Design-Builder submittals necessary to obtain environmental permits. Acting as a point of contact for the WSDOT permitting team, to provide schedule details, quantities and other information as required.
- Coordinating with Design-Builder engineers early to ensure they are aware of environmental commitments, and reviewing plans to ensure they are consistent with environmental commitments and permit requirements.
- Ensuring and providing documentation that the Work complies with all environmental commitments agreed to in the environmental documents, permits, agreements, and approvals of the Project.
- Attend environmental coordination meetings with regulatory agencies, as required for permit compliance, modifications, or additional permit approvals.
- Facilitating Environmental Task Force Meetings to coordinate with WSDOT's Environmental Manager and his or her staff regarding critical permitting and compliance issues.
- Conduct environmental awareness training~~training~~.
- Acting as a liaison to WSDOT, the design team, and the construction personnel (e.g., submitting reports, discussing changes to the Project, communicating compliance issues, and discussing non-compliant events).
- Attending pre-activity meetings.
- Maintaining the authority and means to bring the Project into compliance or stop Work if the Project is in violation of an environmental regulation permit condition or commitment.
- Overseeing preparation and implementation of the TESC Plan, SPCC Plan, and Water Quality Monitoring Plan.
- Ensuring Environmentally Sensitive Areas beyond those authorized by permit, are not impacted as a result of the Work.
- Developing or providing direct supervision to individuals assigned to prepare and implement the plans described in this Section.
- Attending field visits by regulatory agencies.
- Preparing and implementing a monitoring plan to ensure erosion, sedimentation and spill control devices, and best management practices (BMPs) are effective and maintained.
- Providing internal QA reviews and documentation that the Work complies with all environmental commitments agreed to in the environmental documents, permits, agreements, and approvals of the Project.

Comment [jlb19]: 10/5/15, 12:29 PM, Eric Wolin says: Add new bullet after Line 40: Developing Design-Builder submittals necessary to obtain environmental permits. Acting as a point of contact for the WSDOT permitting team, to provide schedule details, quantities, etc. (This comment came from Dave Davies in the Olympic Region. I agree with his suggestion.)
Response - See Markup

Comment [jlb20]: 10/5/15, 12:31 PM, Eric Wolin says: Add new bullet: Coordinating with Design-Builder engineers early to ensure they are aware of environmental commitments, and reviewing plans to ensure they are consistent with environmental commitments and permit requirements. (This comment came from Dave Davies in the Olympic Region. I agree with his suggestion.)
Response – See Markup

Comment [jlb21]: 10/5/15, 12:31 PM, Eric Wolin says: Add new bullet: Facilitating weekly Environmental Task Force Meetings to coordinate with WSDOT's Environmental Manager and his or her staff regarding critical permitting and compliance issues. (This comment came from Dave Davies in the Olympic Region. I agree with his suggestion.)
Response - See Dan C. Comment below – Agreed - See Markups

Comment [DC22]: Suggest adopting the above comment but deleting the "weekly" adjective and just leave it as Environmental Task Force meetings.

Comment [jlb23]: 10/5/15, 12:41 PM, Eric Wolin says: Insert the words "permit condition," between the existing words "regulation" and "or". (This comment came from Dave Davies in the Olympic Region. I agree with his suggestion.)
Response – See Markup

- Identifying when ~~when~~ a non-compliant event is occurring or has occurred and immediately contacting the WSDOT Engineer per the communications protocol. Prepare Draft ECAP Incident Reports for WSDOT's review within two (2) days of identifying the non-compliance, and Final ECAP Incident Reports in coordination with WSDOT's ECM within seven (7) days of the incident.
- Conducting field inspections as needed to ensure that environmental compliance measures and BMPs are meeting environmental requirements.
- Conducting a weekly walk-through prior to the environmental task force meeting to inspect BMP effectiveness and maintenance. WSDOT shall be invited to attend the walk-through.

2.8.3.1.2 Environmental Compliance Inspector

The Environmental Compliance Inspector (ECI) shall assist and report to the ECM. The ECI will be responsible for field inspections and other environmental duties as directed by the ECM. The ECI shall inspect all environmental related field Work at the direction of the ECM. The ECI shall be assigned to the job full-time through Project Physical ~~Substantial~~ Completion. The ECI shall have a valid CESCL within 6 months of starting and shall have a minimum of ***4 years of environmental compliance experience, or have a bachelor's degree in a civil engineering or an environmental related field.

The ECI shall be responsible for producing Daily Environmental Inspection Reports (DEIRs). A DEIR will be produced for each day of field Work and shall include a minimum of three photos of environmental compliance activities ((representative of the overall working being completed that day ~~a balance of good and bad practices)~~ and a narrative (a minimum of three paragraphs) ~~(a minimum of three paragraphs~~) explaining the results of the day's environmental compliance field inspection. If Work occurs on a night shift, ~~at least one photo and one paragraph~~similar reporting shall be included to describe night Work. All photos shall be date and time stamped. The DEIRs will be reviewed by the ECM and then posted or e-mailed to a distribution list as determined by the WSDOT engineer within three field work days of each daily inspection. If field Work has occurred during any single 24-hour period, then a DEIR shall be produced for that period of Work. If no Work has occurred, no DEIR need be produced for that period. Photos and content of the DEIRs shall be submitted to the WSDOT Engineer for Review and Comment.***

This Section has been intentionally omitted.

2.8.3.2 Environmental Communications Protocol

As part of the ECP, the ECM shall develop, document, and implement an Environmental Communications Protocol. The Environmental Communications Protocol shall include:

- Organizational charts that identify the Design-Builder's ECM and other personnel who will be assisting the ECM to ensure compliance during design and construction with all permit conditions, performance standards, and environmental commitments.
- A description of the process to be used for non-compliance reporting including a list of WSDOT, Design-Builder and regulatory agency personnel that would be contacted in the event of a spill, inadvertent discovery, or non-compliance event~~event~~.

Comment [jlb24]: 10/5/15, 12:45 PM, Eric Wolin says: Insert the following new bullet point: Providing internal QA reviews and documentation that the Work complies with all environmental commitments agreed to in the environmental documents, permits, agreements, and approvals of the Project. The ECM shall ensure that environmental elements of the Work are included in the Design-Builders Quality Management Plan (QMP) and Quality Process. (This comment came from Dave Davies in the Olympic Region. I agree with his suggestion.)
Response below

Comment [DC25]: I suggest deleting the last sentence in the comment above

OK – see Markup – last sentence deleted.

Comment [jlb26]: 10/5/15, 12:46 PM, Eric Wolin says: insert the word "immediately" after the existing word "and". (This comment came from Dave Davies in the Olympic Region. I agree with his suggestion.)
Response – See Markup

Comment [jlb27]: 10/5/15, 12:48 PM, Eric Wolin says: Add the following sentence after the existing sentence that ends with the word "protocol.": Prepare Draft ECAP Incident Reports for WSDOT's review within two (2) days of identifying the non-compliance, and Final ECAP Incident Reports in coordination with WSDOT's ECM within seven (7) days of the incident. (This comment came from Dave Davies in the Olympic Region. I agree with his suggestion.)
Response – See Markup

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Comment [jlb28]: 10/5/15, 12:49 PM, Eric Wolin says: Delete the word "Substantial" and replace with "Project Physical" (This comment came from Dave Davies in the Olympic Region. I agree with his suggestion.)

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Comment [DC29]: Overly prescriptive. Recommend deleting.

Comment [DC30]: Suggest deleting "at least one photo and one paragraph" and instead say "similar reporting"

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Comment [ET31]: Option 1 – Use in most cases, but if the project scope does not justify this positi

Comment [ET32]: Option 2 – use if approval to delete Option 1 is received.

Comment [DC33]: Instead of the comment noted below suggest the first sentence of Section 2.8.3.2 include the following inserted after Environmenta

Comment [jlb34]: 10/5/15, 12:51 PM, Eric Wolin says: Add a third bullet after Line 17 that states the following: The Design-Builder shall

- The Design-Builder shall ensure the environmental communications protocol is consistent with WSDOT's ECAP. The protocol shall discuss the roles and communication procedures that will be used for internal and external communications, and communications with WSDOT

2.8.3.3 ENVIRONMENTAL TASK FORCE MEETINGS

The Design-Builder's ECM shall organize and implement weekly meetings during design and construction to ensure that the Project design meets the Project environmental commitments, and to identify which construction elements such as locations, Work activities, weather conditions, and times of day present the greatest risk to the environment. The requirement to meet weekly may be waived by the WSDOT Engineer based upon Project needs and risk. In addition, the ECM shall review temporary erosion and sediment control BMPs at these meetings to avoid and minimize risk. WSDOT shall be invited to attend these meetings. The ECM shall use the *Commitments List* (Appendix C) and the construction schedules to identify environmental Contract requirements pertaining to upcoming Work activities. The ECM shall verify that environmental commitments are implemented in daily Work activities.

2.8.3.4 KICK-OFF MEETING

The Design-Builder shall include environmental on the agenda for the Project kick-off meeting (refer to Section 2.1). During the kick-off meeting, the Design-Builder shall discuss the status of environmental submittals, including its environmental training program, to demonstrate how the environmental Contract requirements are being fulfilled.

2.8.3.5 ENVIRONMENTAL PROTECTION TRAINING

The Design-Builder shall develop and implement an environmental protection training program for the Design-Builder's design and construction staff, quality assurance personnel, subcontractors, and vendors. The Design-Builder shall be responsible for all Work, including subcontracted and supplied Work, and associated personnel should their Work practices lead to a negative effect on the environment or result in a non-compliant event or permit violation. Therefore, the Design-Builder's training program shall orient employees, subcontractors, and all other parties brought onto the Project to complete Work in support of the Project to the following activities prior to the start of Work:

- Permit conditions, performance standards, environmental Contract requirements, and environmental regulations related to the Project;
- The overall importance of environmental issues;
- The specific environmental sensitivities of the Project;
- Keeping high pH and turbid water from reaching storm drains and surface water;
- Recognizing high-visibility fencing and its purpose;
- Erosion and sediment control procedures and certification;
- Proper handling and disposal of concrete and waste products;
- Environmental compliance monitoring and reporting procedures~~procedures~~. This must include WSDOT's Environmental Compliance Assurance Procedure (ECAP), and recognizing ECAP "triggers;
- Noise requirements;

Comment [DC35]: The comment below is redundant with criteria already listed.
Response - Disagree because the criteria listed here are things the Design-Builder's training program must cover.

Comment [jlb36]: 10/5/15, 12:55 PM, Eric Wolin says: Add the following language to the existing bullet: This must include WSDOT's Environmental Compliance Assurance Procedure (ECAP), and recognizing ECAP "triggers." (This comment came from Dave Davies in the Olympic Region. I agree with his suggestion.)
Response – See Markup

- Spill prevention, spill containment, location of SPCC Plan, and location of spill response kits;
- Management of known or suspected contamination;
- Plan and procedures for management of unanticipated historic or archaeological discoveries; and
- Emergency response procedures.

The Design-Builder's ECM shall notify the WSDOT Engineer of environmental training sessions and invite WSDOT to participate.

The Design-Builder Shall ensure staff are trained to sample stormwater in compliance with the NPDES Construction Stormwater General Permit, project-specific permit conditions, performance standards, and environmental commitments. This training shall include a field visit with WSDOT environmental staff prior to construction to establish sample locations and to review monitoring and reporting procedures.

~~The Design-Builder shall provide training to ensure water quality is in compliance with the *WSDOT Highway Runoff Manual*, project-specific permit conditions, performance standards, and environmental commitments. This training shall include a field visit with WSDOT environmental staff prior to construction to establish monitoring sites and to review monitoring and reporting procedures~~.

2.8.4 ENVIRONMENTAL PLANS AND STRATEGIES

2.8.4.1 ENVIRONMENTAL COMPLIANCE PLAN (ECP)

The Design-Builder shall prepare and implement an ECP that identifies roles and responsibilities of ~~an~~ the ECM, procedures for environmental compliance, procedures to identify and correct non-compliant events, and procedures for emergency response. WSDOT's goal is to ensure environmental compliance with no permit violations.

In order to facilitate preliminary field investigation in support of design and early construction, WSDOT will accept an Interim Environmental Compliance Plan (IECP) specific to the proposed early construction Work. The IECP shall include all applicable information for construction in the locations where early Work will occur. The information provided in the IECP shall be incorporated into the Draft and Final ECP when submitted to WSDOT in accordance with this Section. To fulfill the ECP requirements for proposed early Work, the Design-Builder shall submit an IECP to the WSDOT Engineer for review and approval 14 calendar days prior to early construction. The IECP shall include a Temporary Erosion and Sediment Control (TESC) Plan; all permits and modifications to existing permits needed to complete the Work; a Spill Prevention, Control, and Countermeasures (SPCC) Plan; a Fugitive Dust Control Plan; an Unanticipated Discovery Plan; and any reference documents.

The Design-Builder shall provide WSDOT with a complete Draft ECP prior to or with ~~the~~ first Preliminary Design Submittal. ~~Submittal.~~ The ECM shall be responsible for preparing and submitting the Draft ECP. WSDOT will Review and Comment on the Draft ECP in accordance with Section 2.28. The Design-Builder shall provide the WSDOT Engineer with the Final ECP ten Calendar Days prior to the commencement of any construction activities not otherwise identified within the IECP for Review and Comment. The Design-Builder shall resolve all comments before the ECP may be "Released For Construction." The Design-Builder shall stamp and sign the ECP "Released for

Comment [DC37]: This paragraph doesn't make sense to me. The training doesn't ensure the water quality is in compliance. It seems more accurate to say something along the lines that staff will be trained to monitor water quality as a means to ensure…..**I agree. Recommend changing the first sentence to read, "The Design-Builder shall ensure staff are trained to sample stormwater in compliance with the NPDES Construction Stormwater General Permit,…"**
Response – See Markups

Comment [jlb38]: 10/7/15, 5:02 PM, Eric Wolin says: Highway Runoff Manual should be changed to "NPDES Construction Stormwater General Permit".

Comment [jlb39]: 10/5/15, 12:57 PM, Eric Wolin says: Delete "an" and replace with "the". (This comment came from Dave Davies in the Olympic Region. I agree with his suggestion.)
Response – See Markup

Comment [KC40]: DB Group comment: suggest adding this timeline so it builds in some review time. Eric agrees with this suggestion.
Response – See Markup

Comment [DC41]: I think a different trigger mechanism other than Preliminary Design Submittal may be appropriate because often there isn't one preliminary design submittal but instead several preliminary submittals that cover isolated aspects of the project.

Response - Recommend discussing this comment with the Design Build Group to get their input.

Comment [ET42]: Note to author- check requirements of Env. Permit

Construction". The ECP shall be consistent with all other requirements of the Quality Management Plan (QMP).

The ECP shall consist of two parts:

- Part I: Environmental Personnel, Communications, and Training
- Part II: Environmental Plans and Strategies

The Final ECP shall be stored in a format easily accessible by WSDOT. A hard copy of the ECP shall be maintained by the ECM at the Design-Builder's construction office or on-Site at the Project. The ECP shall be updated throughout the Project to reflect changes resulting from permit modifications, project design, field conditions or staffing.~~in the field and with staff~~.

2.8.4.2 TEMPORARY EROSION AND SEDIMENT CONTROL (TESC) PLAN

The Design-Builder shall prepare and implement a TESC Plan that describes measures to minimize erosion during construction activities. The Design-Builder shall identify a certified TESC Lead who shall develop, implement, inspect, and update the TESC Plan.

The TESC Lead shall complete a Construction Site Erosion and Sediment Control Lead (CESCL) certification course offered by a CESCL certification agency or shall be current as a Certified Professional in Erosion and Sediment Control (CPESC). A listing of CESCL certification courses can be found at:
http://www.ecy.wa.gov/programs/wq/stormwater/cescl.html

~~A TESC plan template, which provides information on how to create an effective TESC plan, is available online for non-WSDOT TESC plan designers at the WSDOT Erosion Control Program website:~~
~~www.wsdot.wa.gov/Environment/WaterQuality/ErosionControl.htm~~

The TESC Plan (narrative and plan sheets) shall be prepared and implemented in accordance with the *WSDOT Temporary Erosion and Sediment Control Manual* and Division 8 of the Standard Specifications. The TESC Plan shall address how off-site stormwater will be intercepted and piped through or around the Project Site. The Design-Builder's TESC Plan shall accommodate all Project-specific permit conditions, performance standards, and environmental commitments.

The Design-Builder shall submit a TESC Plan that addresses early construction elements as a part of the Preliminary Design Submittal. Updated TESC Plans, including narrative and plan sheets, shall be submitted as part of the Final Design Submittal described in Section 2.28. Construction shall not proceed on any element of Work until the relevant TESC Plans, including narratives, are stamped "Released for Construction" as described in Section 2.28.

The TESC design shall be prepared under the direction of a Professional Engineer licensed under Title 18 RCW and shall carry the Professional Engineer's stamp.

The temporary drainage facility design shall consider traffic safety during construction including, but not limited to, consideration of gutter flow spread along the roadway shoulder. Gutter flow spread for temporary drainage facility design shall meet the *WSDOT Hydraulics Manual* requirements that apply to the permanent facility.

Comment [jlb43]: 10/5/15, 1:02 PM, Eric Wolin says: Replace "in the field and with staff" with the following language: "resulting from permit modifications, project design, field conditions, and/or staffing." (This comment came from Dave Davies in the Olympic Region. I agree with his suggestion.)
Response – See Markups

Comment [jlb44]: Verify link. Eric verified that the link works as of 10/13/15.

Comment [jlb45]: Verify link. This link works but the web page no longer has a TESC Plan template so I recommend we delete the paragraph (see comment below).

Comment [jlb46]: 10/7/15, 5:04 PM, Eric Wolin says: Recommend deleting this paragraph because the web page listed no longer has a TESC Plan Template.
Response – See Markups – Jami?

2.8.4.2.1 High Visibility Construction Fencing Requirements

Within the Project limits (including staging areas, borrow sources, and other sites developed or used to support the construction of the Project), all Environmentally Sensitive Areas and their buffers that are not permitted for impact shall be fenced with high visibility construction fencing (HVF) or high visibility silt fence (HVSF) prior to commencing construction activities, including geotechnical borings, equipment staging, materials storage and parking of workers' vehicles. The Design-Builder shall identify the sensitive areas to be protected in the plan sheets. The Design-Builder shall install and maintain HVF/HVSF and ensure protection of the sensitive areas in accordance with Sections 8-01.3(1) and 9-14.5(8) of the Standard Specifications. If the Project will be constructed in stages, the HVF/HVSF and other markings described below shall be completely installed before construction on that stage begins.

No other Work shall be performed by the Design-Builder until the WSDOT Engineer has had an opportunity to verify the installation of HVF/HVSF. Installation of HVF/HVSF is identified as a Hold Point in accordance with Section 2.28. Throughout the life of the Project, the Design-Builder shall preserve and protect the sensitive area, acting immediately to repair or restore any HVF/HVSF that has been damaged or removed.

WSDOT maintenance activities may occur behind HVF. The Design-Builder shall be responsible for granting permission to WSDOT maintenance to access these areas.

2.8.4.2.2 Best Management Practices

The Design-Builder shall select, install, inspect, maintain, and remove all erosion and sediment control BMPs in accordance with the requirements described in Section 8-01 of the Standard Specifications, the *WSDOT Temporary Erosion Control and Sediment Control Manual*, and the *Commitments List* (Appendix C). The Design-Builder shall not use experimental BMPs unless they have been approved by the WSDOT Engineer prior to their use (e.g., chemically enhanced sand filtration systems).

2.8.4.3 Spill Prevention, Control, and Countermeasures (SPCC) Plan

The Design-Builder shall prepare a project-specific SPCC Plan that will be used for the duration of the Project. The SPCC Plan shall contain all necessary information for managing accidental hazardous material spills and unanticipated discoveries of prior contamination, and it shall be in accordance with the SPCC Plan Requirements provided in Appendix E and shall include all information required in the current version of the SPCC Plan Template available at the WSDOT Hazardous Materials Program website: www.wsdot.wa.gov/Environment/HazMat/SpillPrevention.htm

The Design-Builder shall submit the Plan to the WSDOT Engineer as part of the ECP in accordance with the requirements described in this Section. No on-Site construction activities, including placing materials or equipment in staging or storage areas, may commence until WSDOT has had the opportunity to Review and Comment on the SPCC Plan for the Project.

2.8.4.4 Fugitive Dust Control

Fugitive dust shall be controlled by the Design-Builder in accordance with the *WSDOT Environmental Manual* and project-specific commitments. Fugitive dust is defined as dust that obscures vision for more than 5 seconds, or remains airborne for more than 30 seconds.

Comment [jlb47]: 10/7/15, 5:05 PM, Eric Wolin says: Need to reference Appendix E and include the SPCC Plan Requirements that we developed for Design-Build in the Appendices since we cannot reference Division 1 of the Standard Specs.
Response – See Markups and note to author

Comment [ET48]: Note to Author - Make sure that the SOCC Plan Requirements are provided in Appendix E

2.8.4.5 WATER QUALITY MONITORING PLAN

The Design-Builder shall prepare a Water Quality Monitoring and Protection- Plan (WQMPP), and submit it to the WSDOT Engineer for approval. The Water Quality Monitoring Plan shall include all of the monitoring and reporting conditions outlined in the Section 401 Water Quality Certification that WSDOT has obtained. The Design-Builder shall submit the plan for Review and Comment 45 Calendar Days ~~45 Calendar Days~~ prior to beginning construction.

2.8.4.6 UNANTICIPATED DISCOVERY PLAN

No known historic or Historic, archaeological, or cultural sites have been identified within the Right-of-Way as described in the Cultural Resources Sections of the environmental documents prepared for the Project. WSDOT has prepared an *Unanticipated Discovery Plan* (Appendix E) pursuant to Section 106 of the National Historic Preservation Act and the Statewide Section 106 Programmatic Agreement. The *Unanticipated Discovery Plan* (Appendix E) shall be adopted by the Design-Builder and incorporated as part of the Design-Builder's ECP, prior to the start of construction.

2.8.5 ENVIRONMENTAL COMMITMENTS

WSDOT made commitments in the National Environmental Policy Act (NEPA)/State Environmental Policy Act (SEPA) environmental documents, permits, National Historic Preservation Act (Section 106), and Endangered Species Act (ESA) Biological Assessment documents which contain a number of specific design and construction criteria.

Conditions and performance standards from the permits, NEPA/SEPA documentation, the National Historic Preservation Act (Section 106), and ESA documentation have been consolidated into the *Commitments List* (Appendix C). These commitments have been tailored to better define compliance roles and responsibilities for the Project. WSDOT tracks commitments to ensure fulfillment throughout the various stages of Project delivery. The Design-Builder shall fulfill and report on the implementation of these commitments. The commitments included in the *Commitments List* (Appendix C) shall be incorporated into this Project.

The Design-Builder shall implement the commitments included in the *Commitments List* (Appendix C). A list of the permits obtained and additional permits required for the Project is provided in this Section. The principal environmental documents for the Project are incorporated into this RFP as Appendices E and P. The Design-Builder shall be responsible for incorporating these commitments in the design submittals and the Released for Construction (RFC) Documents.

The *Commitment List* (Appendix C) is thought to hold all environmental commitments. The Design-Builder shall review all permits, the NEPA/SEPA documentation, and all other pertinent documents to ensure all commitments are captured. The Design-Builder shall track and maintain a commitments database during the Project, and ensure fulfillment through various phases of Project delivery. The original permitting documents supersede the WSDOT supplied *Commitment List* (Appendix C). The Design-Builder shall add new commitments, and/ or modify the Commitment List as appropriate resulting from permit modifications or approvals obtained by WSDOT or the Design-Builder, and they shall be incorporated into this Project.

Comment [jlb49]: 10/5/15, 1:06 PM, Eric Wolin says: Insert "and Protection" between the existing words "Monitoring" and "Plan". The acronym is "WQMPP" if this section is intended to relate to "in-water work" pursuant to 401 WQ Certification. Make this section all red because it should be considered on a project-by-project basis. (This comment came from Dave Davies in the Olympic Region. I agree with his suggestion.)
Response –For Discussion – Eric Wolin recommends making the heading for Section 2.8.4.5 plural such as "Water Quality Monitoring Plans" because there are two different types of water quality monitoring that may be required depending on the permits triggered by the project. Suggest creating two subsections. One subsection would be titled "Monitoring Plan for In-Water Work" and would have the following two options:
Option 1 – Use for projects where WSDOT has obtained an Individual 401 Water Quality Certification from Ecology and the permit includes a WQMPP submittal requirement.
Option 2 – Use for projects that that obtained a Letter of Verification (LOV) from Ecology.
The second subsection would be titled "Plan for Sampling to Comply with the NPDES Construction Stormwater General Permit".
If the group agrees on this approach then I will agree to write up draft language for each of the sections and options proposed above

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Comment [DC50]: Does this need to be a 45 day requirement. Can it be 14 days and/or RFC'd prior to commencing construction?
Response – No Change. It needs to be at least 45 days because WSDOT has to get Ecology's approval of the plan before in-water work can begin.

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Comment [ET51]: Use if applicable

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Comment [jlb52]: Option 1, use if applicable, otherwise delete. I agree with this recommendation.

Comment [jlb53]: Option 2, use if applicable, otherwise delete. I agree with this recommendation.

Comment [CL54]: Use in projects where NEPA compliance is conducted (federal nexus). Otherwise, delete references to NEPA. Most of the time our projects have a federal nexus and the way this is worded it could work for either situation so I recommend keeping the language as is.
Response – No change

Comment [jlb55]: 10/5/15, 1:19 PM, Eric Wolin says: Insert the following requirement after the sentence ending with the word "captured." The Design-Builder shall track and maintain a commitments database during the Project, and ens…

Comment [jlb56]: 10/5/15, 1:20 PM, Eric Wolin says: Add the following requirement: The D-B shall add new commitments, and/ or modify the Commitment List as appropriate resulting from permit modifications or approvals obtained by …

2.8.5.1 NEPA/SEPA DOCUMENTATION

NEPA Documentation (Appendix E) has been prepared by WSDOT to address the scope, impacts, and mitigation for the Project. In addition, WSDOT has issued ***SEPA Documentation*** (Appendix E).

The Design-Builder shall not design or construct the Project in such a way that causes impacts to the environment or surrounding communities beyond those identified in the environmental documentation and authorized by permit. If the Design-Builder designs or constructs the Project in such a way that causes different impacts to the environment or surrounding communities, additional NEPA and SEPA documentation may be required. If required, the Design-Builder shall be responsible for preparing any additional environmental documentation to support WSDOT's NEPA/ SEPA compliance or documentation process. In addition, the Design-Builder shall pay all costs and accept all responsibility for any schedule delays associated with securing the additional environmental approvals.

If required, the environmental documentation shall follow the *WSDOT Environmental Manual* and 23 CFR 771. WSDOT will coordinate with all applicable agencies as part of any environmental documentation process. Final determination regarding the necessity of environmental documentation shall be made by WSDOT and the Federal Highway Administration (FHWA).

All environmental documentation shall be subject to written approval by WSDOT and FHWA.

2.8.5.2 PERMITS AND APPROVALS

2.8.5.2.1 Permit Acquisition

WSDOT has obtained the following permits and approvals:

- ***Section 404, Nationwide Permit (NWP) 23 – U.S Army Corps of Engineers.
- Section 401, Water Quality Certification – WSDOE.
- Hydraulic Project Approval – Washington Department of Fish and Wildlife (WDFW).
- Flood Control Zone Permit, City of Auburn.***

The Design-Builder shall acquire the following permits and approvals (if necessary) and comply with all associated environmental requirements:

- ***Section 402 NPDES Construction Stormwater General Permit – WSDOE.
- Noise Variance or Noise Exemptions – King County, Pierce County, and the Cities of Algona, Pacific, and Auburn.
- Notice of Intent for geotechnical borings – WSDOE.
- Notice of Intent for installing, modifying, or removing piezometers – WSDOE.
- Notice of Intent for installing, modifying, or decommissioning wells – WSDOE.
- Request for Chemical Treatment Form (if necessary) – WSDOE.*
- Administrative Order for Chemical Treatment (if necessary) – WSDOE.*

Comment [jlb57]: 10/5/15, 1:23 PM, Eric Wolin says: After the word, documentation" add the following phrase "to support WSDOT's NEPA/ SEPA compliance or documentation process." (This comment came from Dave Davies in the Olympic Region. I agree with his suggestion.)
Response – See Markup

Comment [jlb58]: Note to author: Insert project-specific permits that WSDOT will provide. I agree with this guidance.

*Note: The use of water quality chemical treatment BMPs, including chitosan enhanced sand filtration, requires approval from WSDOE. The Design-Builder shall submit a Request for Chemical Treatment Form to WSDOE for approval before a discharge from a chemical treatment system can occur.***

2.8.5.2.2 Permit Compliance, Modifications, and Additional Approvals

The Design-Builder shall follow the requirements of all permits and commitments referenced in this Section, Appendix C, Appendix P, and any other permits that are obtained for the Project. ~~***The Design-Builder is advised that a Section 404 NWP permit with specific conditions has been obtained by WSDOT.***~~ The Design-Builder shall provide the WSDOT Engineer with timely notice of its intent to propose an alternative construction method or a design change that is inconsistent with a particular permit, environmental requirement, or commitment. WSDOT will work with the Design-Builder and will bring final detailed proposals provided by the Design-Builder to the regulatory agencies for permit modifications, to obtain modified permits, and to re-initiate ESA consultation as required. The Design-Builder shall be responsible for preparing any additional environmental documentation needed to secure the additional environmental approvals required for implementation of the Design-Builder's proposals.

All costs, delays, or both that result from the discovery of a previously unknown environmentally sensitive resource (i.e., streams, wetlands, jurisdictional ditches, and archaeological resources) due to any Alternative Technical Concept, alternative construction method, or design change shall be the Design-Builder's responsibility, in accordance with Section 1-04 of the General Provisions. To secure permit modifications or additional permits or approvals, the Design-Builder's ECM shall, upon request, attend environmental coordination meetings between WSDOT, the regulatory agencies, and other entities that may have an approval role.

The Design-Builder is advised that there are Environmentally Sensitive Areas throughout the Project limits that shall not be disturbed by construction activity unless specifically authorized by permits.

The Design-Builder is advised that there may be cultural resources existing within the Project limits. If the design changes from the Conceptual Plans, the Design-Builder shall provide the WSDOT Engineer 14 Calendar Days to review the revised plans. After reviewing the plans, WSDOT will determine if additional Cultural Resource investigations are required. All risk for schedule delay shall be borne by the Design-Builder. The need for and the delay time associated with cultural resources investigations goes up considerably with Work that is in close proximity to streams, and within undisturbed native soils.

2.8.5.3 IMPACT AREA LINE

The Impact Area Line was established to limit access to the area needed to construct each element of the Project. The portions of the Impact Area Line that cut through Environmentally Sensitive Areas are elements of the Basic Configuration.

Unless otherwise indicated in the Contract, Work shall not occur outside of the Impact Area Line except for landscaping, ROW fence repair, and control of noxious weeds in compliance with local and state-wide noxious regulations.

Comment [jlb59]: Note to author: insert project specific permits that the DB shall acquire. I agree with this guidance.

Comment [jlb60]: Note to author: project specific. See comment below.

Comment [jlb61]: 10/7/15, 5:12 PM, Eric Wolin says: Recommend removing this red fill-in language because we already identify the permits WSDOT has obtained in Section 2.8.5.2.1.

Comment [jlb62]: Optional, use if applicable, otherwise delete. I agree with this recommendation.

Comment [jlb63]: 9/29/15, 11:31 PM, Manish Rohila says: Please be cognizant of the impact area line in those areas where there is zero roadwork but ITS installation is required. For example, thesea areas show the impact line at the edge of existing pavement. If there is a sign/illuminaiton being installed then the conduit for the electrical/ITS work will be installed outside the edge of pavement....while the RFP will not have captured this in their quantification of the impact areas.

Comment [jlb64]: 10/7/15, 5:21 PM, Eric Wolin says: It is critical that WSDOT project teams developing and obtaining environmental approvals for the Design-Build project consider potential impacts that the ITS installation will have. Any areas where soil disturbance will occur should be reviewed and evaluated to make sure they do not impact sensitive areas or historic/cultural resoources. The impact area line should be adjusted to encompass areas where ITS work will occur.

Comment [jlb65]: New language, needs to be coordinated and in alignment with 2.29.

Response – (covers 64, 65 and 66) Clarification pending agreement from HQ Maint. and additional input on weed control in aquatic areas – Eric Wolin recommends contacting Ray Willard for input. Will follow up and finalize before final posting of section.

Comment [KC66]: DB Group comment: This should be discussed with SME to determine if there are other activities that should be included – for instance, taking care of downed trees…Depending on the location, we may not be allowed to remove downed trees if the area where it landed is not permitted for impacts. For example, if it falls near a stream, wetland, buffer, or in a critical habitat area.

Comment [jlb67]: 9/29/15, 11:26 PM, Manish Rohila says: What about those situations where there is no ROW fence and fencing is required per 2.11.3.5. Typically the impact area line does not extend to the limits of the fence and the RFP requires the DB to install the fence to the limited access line (except in areas of streams).

Comment [jlb68]: 10/7/15, 5:28 PM, Eric Wolin says: The impact area line should include any areas where permanent fencing is required per 2.11.3.5. The impacts associated with fence construction and installation need to be analyzed and to avoid an unpermitted impact to a sensitive area.

2.8.5.4 ENVIRONMENTALLY SENSITIVE AREAS

WSDOT prepared a *Wetland and Stream Assessment Report* (Appendix E) to support environmental documentation for the Project. This report includes wetland delineations, characterizations, ratings, and functional assessments, as well as an assessment of all streams within the Project vicinity.

The Design-Builder shall conduct an independent verification prior to the installation of HVF to confirm that all sensitive areas have been identified. The Design-Builder shall submit a sensitive area verification confirmation letter to WSDOT stating its concurrence with the previously-identified Environmentally Sensitive Areas. If the Design-Builder disagrees with WSDOT's findings, the letter shall identify the location of all new sensitive areas and all existing Environmentally Sensitive Areas in question. The Design-Builder shall install HVF around all sensitive areas identified through the process.

The Design-Builder shall install HVF as shown in the RFC documents around all Environmentally Sensitive Areas that are not permitted for impact.

All impacts, including impacts associated with ITS conduit, cabinets, sign bridges, etc., shall be accounted for in the total area impacts, and evaluated against the permits for impact. If an impact is not permitted, the Design-Builder shall obtain a permit modification.

2.8.5.4.1 Wetlands

WSDOT has determined that construction of the Project will result in permanent and temporary impacts to wetlands or wetland buffers. Temporary impacts to ~~wetlands~~ wetlands or wetland buffers shall be restored by the Design-Builder in accordance with the Permits.

Wetland impacts are not anticipated.

2.8.5.4.2 Streams

WSDOT has determined that construction of the Project will cause unavoidable impacts to streams and their buffers. All Work in and around streams shall be conducted within the parameters of the Hydraulic Project Approval (HPA) and all other permits.

Streams were not identified in the immediate Project area.

2.8.5.4.3 Jurisdictional Ditches

The Section 404 Nationwide Permit that WSDOT obtained for this Project is limited to a total of ***0.5 acres of combined impacts to wetlands, streams, jurisdictional ditches, and other waters of the U.S. The Design-Builder shall install HVF around jurisdictional ditches identified through the permitting process that have not been permitted for permanent impact.***

WSDOT has not identified any jurisdictional ditches that would be impacted by the Project.

2.8.5.4.4 Additional Impacts

If the Design-Builder proposes changes that have the potential to result in impacts that are not permitted, the Design-Builder shall conduct field investigations to assess impacts to Environmentally Sensitive Areas and to determine if additional and previously unidentified

Comment [jlb69]: Project specific appendix. I agree with this recommendation.

Comment [jlb70]: Optional, use if applicable, otherwise delete. I agree with this recommendation.

Comment [jlb71]: Optional Language – use if you are not confident in WSDOT's permitted delineation or if you think the project footprint has changed since WSDOT's permitted delineation has occured, otherwise delete.

Comment [jlb72]: Option 1, use if applicable, otherwise delete. I agree with this recommendation. We should modify the language to include wetland buffers as well.
Response – See Markups

Comment [jlb73]: Option 2, use if applicable, otherwise delete. I agree with this recommendation.

Comment [jlb74]: Option 1, use if applicable, otherwise delete.

Comment [jlb75]: Option 2, use if applicable, otherwise delete.

Comment [jlb76]: Fill-in.

Comment [jlb77]: Option 1, use if WSDOT identified jurisdictional ditches, otherwise delete. This paragraph describes more than impacts to jurisdictional ditches. Need to move the language in lines 30 – 32 to another section.

Comment [jlb78]: Option 2, use if WSDOT didn't identify any jurisdictional ditches, otherwise delete. I agree with this recommendation.

sensitive areas are present. If known or previously unidentified sensitive areas are present and would be impacted by the proposed change, or if previously unidentified sensitive areas are present that would be impacted by the Conceptual Plans, the Design-Builder shall provide WSDOT with all information necessary to obtain a permit modification. This information should include an assessment of all sensitive area impacts based on the footprint of the final Project design. The Design-Builder shall not impact these sensitive areas without written authorization from the WSDOT Engineer. Authorization will not be provided until WSDOT has received modified permits from permitting agencies. The Design-Builder shall strive to include all additional impacts to Environmentally Sensitive Areas in a single submittal.

If the Design-Builder plans to work outside the Impact Area Line or outside permitted impacts due to an Alternative Technical Concept or design change, the Design-Builder shall conduct a field investigation to determine if sensitive areas are present. If a sensitive area exists, the Design-Builder shall work with WSDOT to determine if it has been delineated and permitted for impacts. If not, all costs and schedule delays associated with having to obtain permit modifications or additional mitigation shall be the responsibility of the Design-Builder.

2.8.5.4.5 Mitigation

The Design-Builder shall reference the exhibits in the ***_Wetland and Stream Mitigation Report_*** (Appendix E) to prepare design submittals for the mitigation sites in accordance with Sections 2.15, 2.27, and 2.28, the *WSDOT Plans Preparation Manual*, the *WSDOT Highway Runoff Manual*, and the QMP. The Design-Builder shall ensure all permit conditions and environmental commitments are met. Refer to the *Commitments List* (Appendix C) and permits included in Appendix P. The Design-Builder shall ensure that the mitigation goals, objectives, and performance criteria as outlined in the ***_Wetland and Stream Mitigation Report_*** (Appendix E) are achieved up to the end of the fifth year following initial planting.

2.8.5.5 NOISE

Construction Noise

The Design-Builder shall implement mitigation measures for temporary noise impacts associated with construction activities in accordance with the local noise regulations. ***The Design-Builder shall obtain a nighttime noise variance or exemption from the Cities of Algona, Pacific, and Auburn; and King County, and shall comply with all noise variance/exemption conditions.***

The Design-Builder shall be aware that the process to obtain noise variances/exemptions can be lengthy, and should plan to submit the nighttime noise variance/exemption applications as soon as practicable. WSDOT will be available as a resource if the Design-Builder requests assistance during the variance approval process. Copies of all noise variances shall be provided to the WSDOT Engineer.

Noise Walls

If the Design-Builder adjusts the proposed noise wall or roadway by more than 10 feet horizontally, or the proposed roadway by more than 2 feet vertically, the Design-Builder shall prepare, and submit for Review and Comment, a Supplemental Noise Analysis Report. The Supplemental Noise Analysis Report shall confirm that the future noise levels with the noise wall at the proposed new location are equal or better than the noise levels at all the receivers in the most current noise model with the noise wall location and top of wall

Comment [jlb79]: Reason for not using the capitalized defined term:
The definition for Environmentally Sensitive Area is linked to what is shown in the Conceptual Plans, therefore should not be used to describe sensitive areas not shown on the Conceptual Plans.

Comment [CL80]: Caps v. lower case use here is confusing to the reader. See Jami's explanation above.

Comment [jlb81]: Project specific appendix

Comment [jlb82]: Project specific appendix

Comment [jlb83]: Optional, use if applicable, otherwise delete.

elevations depicted in ****SR 167 SB HOT Lane Noise Analysis**** (Appendix E). The Design-Builder's Supplemental Noise Analysis Report shall comply with the *WSDOT Traffic Noise Policy and Procedures* (Appendix E), and be consistent with FHWA guidelines and the methodology used by WSDOT in preparation of the *** **NEPA/SEPA documentation** ~~DCE~~***. If the Design-Builder makes a change from the Basic Configuration that may potentially impact noise modeling results, the Design-Builder shall analyze the proposed change for impacts to noise in the Supplemental Noise Analysis Report.

Noise walls shall not be modeled with absorptive properties to reduce the proposed noise wall dimensions depicted in the Basic Configuration. Any additional noise analysis required by this Section shall not model the noise walls with absorptive properties. However, absorptive materials may be considered in application to provide additional noise benefits.

The Design-Builder shall submit the Supplemental Noise Analysis Report to the WSDOT Engineer for Review and Comment. The Design-Builder shall submit the Traffic Noise Model (TNM) files with the Supplemental Noise Analysis Report. The TNM files shall contain line of sight analysis.

The Design-Builder shall provide methods for achieving the decibel reduction targets, as outlined in the Supplemental Noise Analysis Report. These methods may include noise walls. The Design-Builder shall work with the WSDOT Engineer to communicate these methods to the public. This communication shall be done in accordance with Section 2.9. Prior to finalizing the noise wall design, the Design-Builder shall prepare schematics of the noise walls for review with adjacent property owners. If requested by WSDOT, the Design-Builder shall attend a meeting with adjacent property owners to discuss the noise walls. Noise walls shall be completed, including panel erection and application of pigmented sealer, within nine months of the start of any clearing and grubbing that is within 50 feet of the noise wall alignment and includes any trees greater than 4 inches DBH.

If noise walls are to be removed and re-built, the new wall shall be completed within 6 months after the existing wall is removed.

2.8.5.6 THREATENED AND ENDANGERED SPECIES

If the Design-Builder modifies design or construction activities from those described in the ****ESA Biological Assessment**** (Appendix E), ESA consultation may have to be re-initiated. If this occurs, the Design-Builder shall work through WSDOT to provide the necessary information required for re-initiation of ESA consultation. WSDOT will take the lead in coordinating with NOAA Fisheries and USFWS. If ESA consultation needs to be re-initiated due to changes made by the Design-Builder, all cost and schedule impacts shall be the Design-Builder's responsibility.

The ****ESA Biological Assessment**** (Appendix E) contains a number of performance standards. Performance standards have been included in the *Commitments List* (Appendix C). The Design-Builder shall fulfill and report on the implementation of performance standards and environmental commitments in the Environmental Commitments Close Out Report described in this Section.

2.8.5.7 HAZARDOUS MATERIALS

No known or suspected contamination has been identified within the Right-of-Way.

Comment [jlb84]: Project specific appendix

Comment [jlb85]: Project specific

Comment [CL86]: The NEPA level of documentation formerly known as a DCE no longer exists.

Response – See Markups – Teresa will check language in this section with Jim Laughlin since he is the SME when it comes to noise.

Comment [jlb87]: Project specific appendix

Comment [jlb88]: Project specific appendix

Comment [jlb89]: Option 1, use if applicable, otherwise delete.

Known contamination has been identified within the Right-of-Way. Known or suspected contamination shall be addressed in the Released for Construction Documents.

***Prior to construction, the Design-Builder shall have performed a thorough hazardous materials survey including, but not limited to, asbestos-containing materials/lead based paint (ACM/LBP) completed by a certified Asbestos Hazard Emergency Response Act inspector on all structures that will be demolished. The Design-Builder shall be responsible for filing a Notice of Intent with the Puget Sound Clean Air Agency prior to asbestos abatement or demolition of any structures. The Design-Builder shall ensure notification is received by the Washington State Department of Labor and Industries no later than 14 Calendar Days prior to the asbestos removal start date. The Design-Builder shall inspect, remove, and dispose of all hazardous materials including, but not limited to, ACM/LBP identified in the survey. This effort will not be considered a Differing Site Condition in accordance with Section 1-04 of the General Provisions.

Prior to commencing asbestos-related Work, the Design-Builder shall provide the WSDOT Engineer with copies of approvals and notifications that have been given and/or obtained from the required Local Agency. The Design-Builder shall designate a Washington State Certified Asbestos Supervisor to personally supervise the asbestos removal and to ensure that the handling and removal of asbestos is accomplished by certified workers, pursuant to Washington State Department of Labor and Industries Standards.***

***All costs for remediation of the known contamination identified in *Phase II Environmental Site Assessment – Puget Western Property* (Appendix E) and *Soil Sampling and Testing – Powell Property* (Appendix E) shall be included in the Design-Builder's Proposal.

Two Underground Storage Tanks (USTs) have been identified within the Project area at the former Holmes Electric property located at 1422 Raymond Avenue S.W. Additional information regarding the USTs can be found in the *I-405, Tukwila to Renton Improvement Project (I-5 to SR 169 Phase 2) Hazardous Materials Technical Memorandum* (Appendix E). The Design-Builder shall remove these USTs in accordance with Chapter 173-360 WAC. The Design-Builder shall notify WSDOE at least 30 Calendar Days prior to beginning tank removal. This written notification shall be submitted on a 30-Day Notice Form. All costs to remove the UST, document the removal, and comply with applicable Federal and State regulations for USTs shall be included in the Design-Builder's lump sum bid.

The Design-Builder shall process the soils at the Holmes Electric property in accordance with the recommendations in the *Holmes Electric Property Chemical Analytical Results* (Appendix E).***

***A 20,000 gallon Underground Storage Tank (UST) has been identified within the Project area at Overlake Hospital Medical Center (OHMC). A closure in-place occurred and the appropriate notifications and documentation were sent to Ecology and are included in the *Overlake Hospital Underground Storage Tank (20,000) Documentation* (Appendix E) The Design-Builder shall remove this UST in accordance with State UST regulations, Chapter 173-360 WAC. The Design-Builder shall notify WSDOE at least 30 Calendar Days prior to beginning tank removal. This written notification shall be submitted on the *Ecology 30-Day Notice Form for Underground Storage Tank Removal* (Appendix E). All costs to remove the UST, document the removal, and comply with applicable UST State and Federal regulations shall be included in the Design-Builder's lump sum bid.

Comment [jlb90]: Option 2, , use if applicable, otherwise delete. Include description of know contamination (see examples below).

Comment [jlb91]: Example.

Source: I-405, I-5 to SR 169 Stage 2 Widening Design-Build Project, 2008

Comment [jlb92]: Example.

Source: I-405, I-5 to SR 169 Stage 2 Widening Design-Build Project, 2008

A 30,000 gallon UST has also been identified within the Project area at OHMC. It has been removed and documentation has been provided in the *Overlake Hospital Underground Storage Tank (30,000) Documentation* (Appendix E).***

If the Design-Builder encounters an unknown underground storage tank (UST) within the Right-of-Way, the Design-Builder shall decommission and remove the UST. This effort may be considered a Differing Site Condition in accordance with Section 1-04 of the General Provisions. If a UST is encountered, WSDOT and the Design-Builder shall follow all applicable rules and regulations associated with UST removal activities.

The Design-Builder shall dispose of construction waste material such as concrete or other harmful materials at approved sites in accordance with Sections 2-01, 2-02, and 2-03 of the Standard Specifications. The Design-Builder shall ensure that the Site is properly contained during construction so that contaminants do not migrate off-Site and so that the health and safety of all on-Site personnel are protected during Work at the Site.

If unknown contamination is discovered during construction, the Design-Builder shall notify the WSDOT Engineer immediately and shall follow the SPCC Plan, as well as all appropriate regulations.

Refer to Section 2.24 for building or structure demolition. Retrofitting and widening of Bridge 167/112W will require a lead and asbestos good faith survey by an AHERA certified personnel and conducted in accordance with the Puget Sound Clean Air Agency in King and Pierce County.

Comment [jlb93]: An example of UST language.

Source: I-405/NE 8th St to SR 520 Braided Ramps – Interchange Improvement Project, 2009

Comment [jlb94]: Project specific, use if applicable, otherwise delete.

2.8.5.8 HISTORIC, ARCHAEOLOGICAL, AND CULTURAL PRESERVATION

Any historic, archaeological, or cultural objects encountered by the Design-Builder shall not be further disturbed in accordance with Section 1-07 of the General Provisions and the *Unanticipated Discovery Plan* (Appendix E).

If the Design-Builder elects to propose a change that would impact areas not previously analyzed; ~~including geotechnical borings~~, ITS conduit, junction box foundations, camera poles, drainage elements, and additional subsurface investigation; consultation with the Department of Archaeology and Historic Preservation, consulting parties, FHWA, and affected and interested tribes may be necessary. WSDOT reserves the right to take up to 14 Calendar Days to notify the Design-Builder if additional concurrence for the proposed design change is required with other entities; and to complete field investigations. If this consultation is necessary, the Design-Builder shall plan on at least six months of delay for re-consultation. It is unlikely this additional Work and coordination will be necessary for Work within roadway fill. It is more likely to be required when working near streams and within undisturbed native layers of soil. If additional investigations and coordination are needed as a result of changes made by the Design-Builder, all cost and schedule impacts shall be the Design-Builder's responsibility.

Comment [DC95]: Can delete the reference to geotechnical borings since it is redundant with "additional subsurface investigation" **I agree with this suggestion.**
Response – See Markups

2.8.6 CONSTRUCTION REQUIREMENTS

2.8.6.1 DISPOSAL OF SURPLUS MATERIAL

All surplus excavation or other materials shall be disposed of outside the Project limits or reused in a manner that does not impact sensitive resources such as wellhead protection zones, surface water bodies, parks, and child-use areas. Disposing of soils of any kind directly to a topsoil manufacturer is prohibited.

Additionally, surplus material or other material shall not be disposed of or reused in Environmentally Sensitive Areas shown in the Conceptual Plans, or in any areas determined by the WSDOT Engineer to be Environmentally Sensitive Areas. All trucking tickets or other means of tracking where the material was disposed of shall be provided to the WSDOT Engineer.

2.8.6.2 ENVIRONMENTAL COMPLIANCE, MONITORING, AND REPORTING

The Design-Builder, through rigorous monitoring and inspections, shall ensure that all regulations, approvals, and environmental performance specifications are being fulfilled. This includes inspecting all on-Site erosion and sediment control BMPs in accordance with the NPDES Construction Stormwater General Permit requirements and ensuring the SPCC plan is being implemented in accordance with this Section.

A WSDOT archaeologist or their designee shall be present for ground disturbing activities at the following locations:

- ***Site C;
- Culvert 73a (unnamed tributary to the Milwaukee ditch);
- Culverts 65 and 95 (Jovita Creek); and***
- Other sites identified in an ATC or by the WSDOT Engineer as needing archaeological monitoring.

The Design-Builder shall notify the WSDOT Engineer at least 24 hours before each ground disturbing activity is started at these locations.

2.8.6.2.1 Water Quality Monitoring

This Section has been intentionally omitted.

2.8.6.2.2 Post-Construction Monitoring

Within seven Calendar Days of Substantial Completion, the ECM shall conduct final monitoring inspections to assess and document compliance with permitting requirements and other environmental commitments provided to the Design-Builder in the *Commitments List* (Appendix C). Inspections shall address the successes, failures, and remedial actions for site restoration and compensatory mitigation sites.

2.8.6.2.3 Environmental Commitment Close Out Report

The Design-Builder shall prepare an Environmental Commitment Close Out Report to summarize overall compliance with permit conditions, performance standards, and environmental commitments. At a minimum, the Design-Builder's Environmental Commitment Close Out Report shall include the following:

- Fulfillment descriptions completed for all permit conditions, performance standards, and environmental commitments;
- The fulfillment description shall be detailed and specific enough to clearly describe and document how each individual commitment was met (e.g., by specific action, plan submittal, activity completion, and/ or design, construction, operational milestone completion). The description will include a date when each commitment was fulfilled;

Comment [jlb96]: Project specific, revise to fit project.

Comment [jlb97]: 10/5/15, 1:30 PM, Eric Wolin says: This section should be red font since it depends on the permits associated with the project. The requiements would align with the monitoring requirements for the relevant permits or commitments. (This comment was subimtted by Dave Davies. I recommend incorporating it.)

Comment [jlb98]: Jami says: on that same note, there should be optional template language (or example language) inserted for when it is applicable to the project

Response – Agree similar to response to Comment 50 – Section 2.8.4.5. Eric will provide new language.

Comment [jlb99]: 10/5/15, 1:32 PM, Eric Wolin says: Add the following: The fulfillment description shall be detailed and specific enough to clearly describe and document how each individual commitment was met (e.g., by specific action, plan submittal, activity completion, and/ or design, construction, operational milestone completion). The description will include a date when each commitment was fulfilled. (This comment was subimtted by Dave Davies. I recommend incorporating it.)
Response – See Markup

- Commitments the Design-Builder was unable to fulfill, and why;
- Significant compliance deficiencies or incidents that may have occurred during the life of the Project and the corrective actions taken; and
- Future requirements for maintaining permanent BMPs, such as cleaning detention ponds.

The Environmental Commitment Close Out Report shall be submitted for review and Approval by the WSDOT Engineer within 21 Calendar Days of Substantial Completion. Preparation of the Environmental Commitment Close Out Report shall be consistent with all other requirements of the Quality. The Design-Builder may submit the Environmental Commitment Close Out Report in stages as discrete elements of Work are completed (e.g., at completion of wetland and stream mitigation sites).

Comment [jlb100]: 10/5/15, 1:36 PM, Eric Wolin says: Insert the phrase "and Approval by the WSDOT Engineer" after the existing word "review": Also add the following statement: Preparation of the Environmental Commitment Close Out Report shall be consistent with all other requirements of the Quality. (This comment was subimtted by Dave Davies. I recommend incorporating it.)
Response – See Markups

2.8.6.3 AIR QUALITY

The Design-Builder shall comply with all rules of local air pollution authorities. If there are none, air quality rules of WSDOE shall govern the work.

2.8.7 SUBMITTALS

The Design-Builder shall submit the following documents to the WSDOT Engineer as required by this RFP and the permits obtained for the Project. The submittals shall include, but are not limited to, the following:

- Interim Environmental Compliance Plan (IECP);
- Environmental Compliance Plan (ECP);
- Asbestos Containing Materials/Lead Based Paint (ACM/LBP) Surveys;
- Copies of approvals and notifications pertaining to asbestos removal and demolition-related Work;
- Supplemental Noise Analysis Report (if necessary);
- Noise Variance or Exemption (if necessary);
- Environmental Commitments Close-Out Report;
- Various Construction Monitoring Reports as required in the permits;
- Final wetland, stream, and buffer mitigation plans;
- Final wetland, stream, and buffer mitigation As-Built Plans;
- Work plans for stream bypass and fish exclusion and handling, where necessary;
- Water Quality Monitoring and Protection Plan as required by the 401 permit; and
- Dump tickets for any and all soils and materials removed as excess or waste from the Site.
- Copies of permits for all offsite disposal facilities to be utilized.
- Health and Safety Plan
- Soil Management Plan
- Construction log for noise

Comment [jlb101]: 10/5/15, 1:37 PM, Eric Wolin says: Insert the words "and Protection" between the existing words "Monitoring" and "Plan". (This comment was subimtted by Dave Davies. I recommend incorporating it.)
Response – See Markups

Comment [jlb102]: 10/5/15, 1:38 PM, Eric Wolin says: Add the following submittals:
- Copies of permits for all offsite disposal facilities to be utilized.
- Health and Safety Plan
- Soil Management Plan
- Construction log for noise
- Site Log Book
- Discharge Monitoring Reports (DMRs)
- ECAP Incident Reports through the duration of the Project

(This comment was subimtted by Dave Davies. I recommend incorporating it.)
Response – See Markups

- Site Log Book
- Discharge Monitoring Reports (DMRs)
- ECAP Incident Reports through the duration of the Project

End of Section

2.11 ROADWAY

2.11.1 GENERAL

The Design-Builder shall conduct all Work necessary to complete the roadway design and grading elements for the Project.

2.11.2 MANDATORY STANDARDS

The following is a list of Mandatory Standards that shall be followed for all design and construction related to this Section. They are listed in hierarchical order, where the Mandatory Standards listed higher in the list shall take precedence over those listed below them. If a Mandatory Standard contains a reference to another document that is not listed below and states that the referenced document shall be used, the referenced document shall also be considered to be a Mandatory Standard with the same hierarchal precedence as the source publication. This is not a comprehensive list; other applicable standards may be required to complete the design and construction. If the Design-Builder becomes aware of any ambiguities or conflicts relating in any way to the Mandatory Standards, the Design-Builder shall immediately notify the WSDOT Engineer.

- Special Provisions (Appendix B).
- *Amendments to the Standard Specifications* (Appendix B).
- Standard Specifications (Appendix B).
- *WSDOT Design Manual* (M22-01) (Appendix D).
- Standard Plans (Appendix D).
- *Project Delivery Memo 14-01 ET 31 and ET Plus Guardrail Terminal Moratorium* (Appendix D).
- *WSDOT Plans Preparation Manual* (M22-31) (Appendix D).
- *WSDOT Local Agency Guidelines* (M36-63) (Appendix D)
- *WSDOT Traffic Manual* (M 51-02) (Appendix D).
- *Washington State Modifications to the Manual on Uniform Traffic Control Devices* (WAC 468-95) (Appendix D).
- *FHWA Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD), 2009 Edition with Revisions 1 & 2 dated May 2012 (Appendix D).
- *Mitigation and Roadside Restoration Design Criteria* (Appendix L).
- *AASHTO A Policy on Design Standards – Interstate System.*
- *AASHTO A Policy on Geometric Design of Highway and Streets.*
- *AASHTO Guide for High Occupancy (HOV) Facilities.*
- *AASHTO Roadside Design Guide.*
- *US Access Board ADA Accessibility Guidelines for Buildings and Facilities* (ADAAG).
- *AASHTO Guide for the Development of Bicycle Facilities.*

Comment [ET1]: John Romero

General Item – Gore design. It has been my experience seeing consultant design work for the WB Nalley Valley HOV and NB I-5 HOV, that none of the gores for these two projects were designed in accordance with 1360.06(5) Off-Connections, particularly items (b) thru (f). Never seem to get the grades right or the reserve area designed correctly. This led us change things during the construction (WB Nalley Valley) and have late deviations (NB I-5 HOV) prior to finalizing PS&E package. Is this something that needs to be addressed in the template, or does this fall with the reviewer of their design?

Response - Incorporate this as part LL for procedures and Manuals

Comment [ET2]: John Romero
Page 1, line 19 – With a new Design Manual revision coming up, how will this template deal with the elimination of the design matrices?
Response - Eliminate all references to design matrices and reference the appropriate chapters in the new design manual (due by end of Nov)

Comment [jlb3]: Note to author: as of July 2015, this is the version adopted by WSDOT. Verify

- *AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities.*
- *U.S. Access Board Revised Draft Guidelines for Accessible Public Rights-of-Way*, November 2005 (Appendix D).
- *FHWA Flexibility in Highway Design* (Appendix L).

2.11.3 DESIGN REQUIREMENTS

The Design-Builder may propose revisions to the roadway design and grading shown in the Conceptual Plans. The Design-Builder shall consult Sections 1-04 and 1-08 of the General Provisions for the cost and schedule responsibilities when such changes require modifications to the Basic Configuration or to the Project permits.

2.11.3.1 DESIGN CRITERIA

- ***SR 167 is classified as an Urban Principal Arterial route, Design Class P-1, with full access control within the Project limits. SR 167 is part of the National Highway System (NHS).
- The Project shall be designed to meet the full design level. Refer to Section 2.12 for Pre-Approved Design Variances.
- The design speed for SR 167 mainline shall be 70 mph.
- The design vehicle shall be WB-67.
- Where the HOT Lane is adjacent to the GP lane, the width shall be 14 feet except from MP 11.99 to MP 12.88 and from MP 16.33 to MP 18.24, where the width shall be 13 feet. Where the HOT Lane is on a separate alignment, the width shall be in accordance with the *WSDOT Design Manual*.
- In widening and overlay areas, superelevation rates and transition lengths shall match the existing superelevation rates and transition lengths. Existing superelevation rates and transition lengths shall be evaluated to confirm that they meet current WSDOT standards. An existing condition that does not meet the requirements of the *WSDOT Design Manual* shall be modified to meet the current WSDOT standards. See Section 2.12 for Pre-Approved Design Variances.
- Widening of the SR 167 roadway towards the median might impact the existing configuration of the median crossovers within the Project limits. Impacted median crossovers shall be relocated in accordance with the *WSDOT Design Manual*. Pre-approved new median crossover locations are included in the *Design Approval* (Appendix O).
- The shared use path along north side of 8th Street E shall be a 10-foot wide cement concrete sidewalk with a 5-foot wide (excluding the curb) buffer strip between the path and the roadway.
- The width of the cement concrete sidewalk on the south side of 8th Street E and both sides of Ellingson Road, except under the bridge, shall be 6 feet (excluding the curb). The width of the cement concrete sidewalk on both sides of Ellingson Road under the bridge shall be 5 feet (excluding the curb).
- The HOV bypass lane shall be located on the left side of the metered lane(s) with the exception of the eastbound 15th Street SW to southbound SR 167 on-ramp (FS Line), where it may be located on the right.***

Comment [jlb4]: Note to author: as of July 2015, this is the version adopted by WSDOT. Verify

Comment [ET5]: John Romero
Page 2, line 14 – With a new Design Manual revision coming up, how will full design level be identified?

Response - Part of project specific fill in –should not be referencing full design level anywhere in RFP. May reference a BOD if exists.

Comment [jlb6]: 9/29/15, 10:59 PM, Manish Rohila says: First sentence states that "shall" match existing superelevation rates and transition lengths for widening/overlay areas. Last sentence states that an existing condition that does not meet the WSDOT DM requirements, shall be modified to meet. By default, widening a roadway will always result in increasing the super transition length. So which is it….update or match existing?

Response - Agree, but not part of template – share issue back to 405 group as a LL

Comment [jlb7]: 9/29/15, 11:20 PM, Manish Rohila says: This also conflicts with the requirements noted in 2.11.4.6 which allows those elements that do NOT meet the requirements to stay.

Response - Agree, but not part of template – share issue back to 405 group as a LL

Comment [jlb8]: Note to author: project specific – add/revise/delete as necessary.

2.11.3.2 CORRIDOR ANALYSIS

The ***Corridor Analysis Mainline Design Speed Report*** (Appendix O) documents the considerations used in setting the mainline design speed for ***I-405*** and shall be used to clarify design guidelines for use in the Project.

2.11.3.3 ROADSIDE BARRIER SELECTION

All traffic barriers incorporated into the Project shall be in accordance with the *WSDOT Design Manual*, the *Project Delivery Memo 14-01 ET 31 and ET Plus Guardrail Terminal Moratorium*, and the Standard Plans; shall be ***single-slope concrete type barrier; and shall have a minimum exposed height of 42 inches (high performance barrier), unless they are on a city street or otherwise specified in the RFP. All concrete barriers shall be constructed in accordance with the ***I-405 Urban Design Criteria*** (Appendix L). Replaced concrete barrier shall match the height and shape of the existing abutting concrete barrier to remain, if the replacement length of concrete barrier is less than 400 feet measured continuously through all foundations (signs, poles, gantries, etc.). Existing barrier that does not meet current standards shall be replaced. All removed precast barrier shall be delivered to a disposal site designated by WSDOT Maintenance ***Area 4 (Kent)*******.

Existing guardrail shall be evaluated for need and shall be relocated or removed as required in accordance with the *WSDOT Design Manual*. Existing guardrail that meets current WSDOT standards may be left in place.

Each approach end of concrete barrier shall be treated with an impact attenuator ***type REACT 350***.

If concrete barriers are constructed back-to-back and the space between is 8 feet or less, the space shall be capped in accordance with the Standard Plans.

Concrete barriers shall be installed to mitigate clear-zone hazards associated with retaining walls.

2.11.3.3.1 Walls and Barriers Along Right-of-Way

Where there is a retaining wall or a noise wall along the Right-of-Way within 12 feet of vehicle access such as parking, driveways, or streets, the Design-Builder shall provide a concrete barrier to prevent vehicles from going over the top of the wall, to protect the wall from damage, and to redirect errant vehicles.

Where the top of a concrete barrier is below the top of a retaining wall or noise wall, the concrete barrier shall be placed as close to the wall as possible, and any gaps between the concrete barrier and wall shall be filled with concrete to the top of the concrete barrier. Where the top of the concrete barrier is above the top of a retaining wall or noise wall, the concrete barrier shall be cast integral with the wall, constructed on a moment slab, or offset a minimum of 2 feet from any part of the wall, coping, or cap.

Where the top of the concrete barrier and wall are less than 6 feet above the ground on the community side of the wall, then Right-of-Way fencing shall also be provided. The fencing shall be mounted to the top of the concrete barrier or wall, whichever is taller, in a manner that prevents trash, leaves, or other debris from collecting between the fencing and the concrete barrier or wall.

Comment [jlb9]: Note to author: project specific appendix.

Comment [jlb10]: Note to author: project specific fill-in

Comment [jlb11]: Note to author: project specific appendix.

Comment [jlb12]: Note to author: insert maintenance area.

Comment [jlb13]: Note to author: project specific language, revise to fit project.

Comment [jlb14]: 9/25/15, 8:01 AM, Eric Crowe says: I understand that the above texit is project specific, however similar requirements have been used on previous projects. On very large projects, where existing barrier and guardrail height need to be evaluated for replacement, this is a big ticket item. Evaulating this during the proposal can be time intesive and expensive. Suggest that the evaluation of existing barrier be included, but a set amount of barrier replacement is included in the bids so that there is a level playing field for this element. WSDOT would need to have some idea as to the extents of this work for cost estimating purposes.

Response - Discuss in meeting- Information limited on barriers at RFP – Dbers tasked with determining during proposal – is there some way to improve this?

Comment [SH15]: This part of the section is more project specific. For example, there are NJ-Shape 32", F-Shape 32" barriers, why does it "say only Single-Slope"?
Response - Agree – project specific

Comment [jlb16]: Consider adding template language for other options. For example, there are NJ-Shape 32" and F-Shape 32" barriers.

Response - NO – keep project specific language for this item

Comment [jlb17]: Note to author: project specific

Comment [jlb18]: 9/29/15, 11:06 PM, Manish Rohila says: Project specific or an attenuator at every instance? Most new projects require concrete barrier in lieu of guardrail. There are instances where there are quite a few +/-100' runs of barrier to protect sign foundations (10 for example on I-405 BTL) where non-flared guardrail terminals were more cost effective.
Response - Discuss – Barriers verses Guardrails- what is standard language for template? When might guardrails be used?

Comment [jlb19]: 9/25/15, 7:27 AM, Eric Crowe says: There may be instances where guardrail may be appropriate? I would assume that this means fill walls but cut walls would be clear zone hazard and a depending on how far away from the mainline, guardrail may be appropriate.

Comment [jlb20]: 9/29/15, 10:54 PM, Manish Rohila says: Especially considering those situations where there is an existing ditch between mainline edge of pavement and the face of the wall. I don't believe there is HP barrier with built in scuppers.

2.11.3.4 IMPACT ATTENUATORS

All impact attenuators shall be ***REACT350*** and shall be designed in accordance with the *WSDOT Design Manual*.

If the Design-Builder determines that the system referenced above does not meet the design requirements for the proposed application, the Design-Builder shall submit an Impact Attenuator Technical Memorandum for WSDOT review and acceptance.

2.11.3.5 FENCING

The Design-Builder shall construct fence along the limited access line, except across streams (wetlands or sensitive areas??), as shown in the ***Existing Limited Access Fence Design Decision Paper included in the*** *Design Approval* (Appendix O) and in accordance with the *WSDOT Design Manual* and the Standard Plans. Existing fencing along the limited access line that is disturbed or displaced by construction shall be repaired by the Design-Builder in accordance with the *WSDOT Design Manual* and the Standard Plans.

Where noise walls are placed less than 8 feet from a limited access line, the fence shall be attached to the ends of the noise wall.

Fall protection ~~fencing~~ shall be provided in accordance with the *WSDOT Design Manual*.

2.11.3.6 SIDE SLOPES

Side slopes shall be in accordance with Chapter 1230 of the *WSDOT Design Manual*. For cut slopes and fill slopes behind traffic barrier protecting fixed objects, the Design-Builder shall submit a technical memorandum in accordance with Section 2.12 to provide the written justification discussed in Section 1230.06 of the *WSDOT Design Manual*. The Design-Builder shall submit a Design Variance in accordance with Section 2.12 for all other side slopes not meeting the requirements of the *WSDOT Design Manual*. The technical memorandum shall be submitted to the WSDOT Engineer for Review and Comment prior to construction.

Side slopes shall be summarized in a side slope table on the construction drawings that shall identify the alignment, station range, and the side slope applied.

2.11.3.7 MAINTENANCE ACCESS

Access requirements for facilities constructed by the Project are addressed in the applicable Sections of these Technical Requirements. All existing maintenance access roads shall remain in place unless impacted by construction of permanent Work. Temporarily impacted maintenance access roads shall be restored to their original condition. Existing maintenance access roads are shown in the Conceptual Plans.

This Section is intentionally omitted.

2.11.3.8 BREAK IN LIMITED ACCESS

There shall be no new breaks in limited access.

There shall be a break in limited access at northbound SR 167 MP 26.08 for petroleum pipeline maintenance access.

Comment [jlb21]: Note to author: project specific.

Comment [jlb22]: 9/29/15, 11:10 PM, Manish Rohila says: What about wetlands? Is the intent to place fencing across/through them to meet the limited access requriement noted in this section?

Response - Teresa will check with Eric Wolin on whether wetlands not fenced and Ed Barry will check with the access group

Comment [jlb23]: Note to author: project specific document to be included in the design approval appendix.

Comment [SH24]: Please check. I believe the DM have been revised on use of fencing for fall protection for pedestrian facilities. Now, I believe it is required to use railings and hand rails for pedestrian facilities.

Response - Agree as marked.

Comment [KC25]: DB Group comment: Suggest putting this in a different section just for Fall Protection as that can involve more than just fencing.

Response - Agree – create a new 2.11.3.6 for Fall Protection

Comment [jlb26]: 9/25/15, 7:39 AM, Eric Crowe says: suggest adding all site specific slope limitations here rather than adding them in various sections of the document. For example If 2:1 slopes are the steepest slopes allowed for maintenance, include the requirement here

Response - Note to Author –Put all side slopes here – only this section. Coordinate all side slope requirements with all authors – reference this section in other sections.

Comment [jlb27]: Option 1 – use if applicable, otherwise delete.

Comment [jlb28]: Option 2 – use if applicable, otherwise delete.

Comment [DC29]: Option 1 – use if no new breaks in limited access.

Comment [DC30]: Option 2 – project specific, revise as needed to fit the project.

2.11.3.9 CHANNELIZATION DESIGN

With respect to the number of lanes and storage lengths at intersections and ramps, the configurations provided in the ***Conceptual Plans*** shall be the minimum, unless otherwise specified. The Design-Builder may propose reductions in these characteristics of the design in accordance with Section 2.21. WSDOT's determination to accept or reject such proposals will be in its sole discretion and such determinations are not subject to the disputes process otherwise provided under the Contract.

2.11.3.10 PEDESTRIAN FACILITIES

All existing pedestrian facilities impacted by the Project, including, but not limited, to sidewalks, curb ramps, accessible routes, bridges, ~~and~~ driveways, and crossings, shall be evaluated to confirm that they meet the requirements of the *WSDOT Design Manual*. Existing pedestrian facilities that do not meet the requirements of the *WSDOT Design Manual* shall be modified to meet current WSDOT standards to the maximum extent feasible.

***The delineated pedestrian facilities impact zones are located at the following interchanges:

- SR 167 and 8th Street E;
- SR 167 and Ellingson Road; and
- SR 167 and 15th Street SW.***

Within the pedestrian facilities impact zone, existing crosswalk pavement marking that is not incorporated into the new pedestrian route shall be removed. Removal of pavement marking shall be in accordance with Section 2.22.

2.11.3.11 NOISE WALLS

The noise wall on northbound SR 167 from STA LM' 435+35 to STA LM' 452+00, shall be constructed at least 18 feet from the future edge of pavement. The future edge of pavement is the eastern edge of pavement of northbound SR 167 in the Future Channelization Plan. The area between the future edge of pavement and the noise wall is reserved for a future water quality treatment facility (refer to Section 2.14). This reserved area shall be graded to slope down to the face of the noise wall. The slope (H:V) from the future edge of pavement to the face of the noise wall shall not be steeper than 4:1 or flatter than 10:1.

A noise wall shall be constructed entirely within the Right-of-Way along the I-405 limited access line at the location shown in the Conceptual Plans.

This Section has been intentionally omitted.

2.11.3.12 ~~SHOULDER~~ RUMBLE STRIPS

Type 1 shoulder rumble strips shall be constructed on the right and left shoulders of southbound SR 167.

This Section has been intentionally omitted.

Comment [jlb31]: Note to author: project specific info – this may be in another appendix (ie. Design Approval, channelization plan/PFA, etc.).

Comment [jlb32]: 9/25/15, 7:46 AM, Eric Crowe says: This section has the potential to add significant cost to the design efforts on the project. It would be better if the evaluation was part of the scope but the recommendations for design and construction were part of a force account item. There are too many varialbles associated with these types of fixes especially in non typical areas such as bridge etc. to be able to adequately price during the proposal stage. Otherwise specifiy exactly what the scope needs to be.

Response - Discussion - No change in general – note to author – may want to assess WSDOT evaluation of ADA compliance on or near structures

Comment [jlb33]: 10/7/15, 1:27 PM, Phil Larson says: If a FA item does not work consider a dollar amount for the proposal. This would make this the same for all bidders. ATC would not count to the dollar amount.
Response - See above

Comment [SH34]: There are more that driveway crossings, I think deleting the "driveway" will cover all crossings.
Response - Agree with markup

Comment [KC35]: DB Group comment: edited per our suggestion.

Comment [jlb36]: Note to author: project-specific

Comment [jlb37]: Option 1 – use/revise to fit project, otherwise delete

Comment [jlb38]: Option 2 – use/revise to fit project, otherwise delete

Comment [jlb39]: Option 3 – use if there are no noise walls, otherwise delete

Comment [SH40]: How about making it more generic just "Rumble Strips".

Comment [KC41]: DB Group comment: Agreed, use just "Rumble Strips".

Response - OK – see Markup

Comment [jlb42]: Option 1 - use/revise to fit project, otherwise delete

Comment [jlb43]: Option 2 – use if there are no noise walls, otherwise delete

2.11.3.13 ROADWAY EMBANKMENTS

The Design-Builder shall remove abandoned existing manmade materials such as, but not limited to, foundations, bridges, box culverts, and other drainage structures in accordance with Section 2-02 of the Standard Specifications.

An earthen berm shall be constructed along northbound I-405 as shown in the Conceptual Plans. The slope shall be 2H:1V or flatter. The top shall have a minimum width of 5 feet. The minimum top of berm elevation shall be as shown in the Conceptual Plans. The earthen berm shall be constructed in accordance with the roadway embankment requirements of the Standard Specifications.

Comment [jlb44]: Optional – revise/delete to fit project

2.11.4 SUBMITTALS

2.11.4.1 DESIGN PARAMETER TABLE

The Design-Builder shall develop design parameter tables that include all of the design criteria shown in the design parameter tables included in the *Design Approval* (Appendix O). The Design-Builder shall verify the information provided and update the design parameter tables to reflect the current design at the time of each submittal. The design parameter tables shall be checked according to the Quality Management Plan, and shall be submitted as part of the Project Development Approval Package and Channelization Plan for review.

2.11.4.2 ROADSIDE BARRIER TECHNICAL MEMORANDUM

The Design-Builder shall prepare and submit a technical memorandum to the WSDOT Engineer for Review and Comment providing justification for need or removal of all existing and proposed roadside barrier. The technical memorandum shall include the following:

- Description of the roadside hazard including dimensions, station, off-set, and narrative description;
- Barrier length of need calculation;
- Plan layout of barrier including beginning and ending stations, off-set, terminal type, and barrier type; and
- Narrative documenting justification for the need or removal of roadside barrier, and the terminal type selection.

2.11.4.3 IMPACT ATTENUATOR TECHNICAL MEMORANDUM

The Design-Builder shall prepare and submit a technical memorandum to the WSDOT Engineer for review and acceptance when using a system other than the ***REACT350***. The technical memorandum shall include the following:

Comment [jlb45]: Note to author: project specific.

- Attenuator location;
- Proposed substitution, including justification describing the attributes of the proposed attenuator that make it the best product for the intended application; and
- Specific design rationale describing why one of the systems referenced above is not applicable.

Acceptance will be at WSDOT's sole discretion.

The design and written justification shall be revised based on comments received during WSDOT reviews.

2.11.4.4 CLEAR ZONE INVENTORY

The Clear Zone Inventory shall be completed prior to the start of construction and updated to reflect all changes from the Project. The Clear Zone Inventory shall be prepared using the *Clear Zone Inventory Form* (Appendix O) and Chapter 1600 of the *WSDOT Design Manual*. The Clear Zone Inventory shall be included within the Design Documentation Package.

2.11.4.5 PEDESTRIAN FACILITIES TECHNICAL SUMMARY

For all existing pedestrian facilities described in this Section, the Design-Builder shall prepare and submit a technical summary to WSDOT for Review and Comment, which outlines the pre-Project compliance conditions of all pedestrian facilities. The technical summary shall include the location of each facility; the facility type (e.g., sidewalk, sidewalk ramp, pedestrian access route, bridge, crossing, etc.)(only for facilities that are NOT being replaced or modified); the pre-Project status (meets/does not meet criteria); mitigation required; photos; drawings; and worksheets similar to the ones provided in the *Maximum Extent Feasible Template* (Appendix O).

2.11.4.6 SUPERELEVATION TECHNICAL MEMORANDUM

***As shown in the *WSDOT Design Manual*, an "F" (full design) is in the matrix cell for the "horizontal alignment" design element. Superelevation (rate and transitions) falls under this design element.

The Design-Builder shall prepare and submit a technical memorandum to WSDOT for Review and Comment. The technical memorandum shall include the following:

- An evaluation of the superelevation rate and superelevation transitions for all horizontal curves on the Project, including the existing/proposed and required superelevation rate, length, and position relative to the beginning or end of the horizontal curve.***

***As shown in the *Project Specific Matrix* (Appendix O), for widening/restriping areas of mainline, ramps, and collector distributors, a "DE" (design exception) is in the matrix cell for the "cross slope lane" design element. Superelevation (rate and transitions) falls under this design element. An existing condition that does not meet or exceed the requirements in the *WSDOT Design Manual* may remain in place. As noted on the matrix, the crown point is not permitted in the wheel track. The definition of wheel track for this Project shall be the area located between 2 and 4 feet from the edges of the lanes. This definition shall apply to lane widths from 11 to 12 feet.

The Design-Builder shall prepare and submit a technical memorandum to WSDOT for Review and Comment. The technical memorandum shall include the following:

- An evaluation of the superelevation rate and superelevation transitions for all horizontal curves on the Project, including the existing/proposed and required superelevation rate, length, and position relative to the beginning or end of the horizontal curve;

Comment [jlb46]: 9/29/15, 11:17 PM, Manish Rohila says: What is the purpose of the "pre-project status"? This a time consuming effort that requires detailed drawings of items that do NOT meet the ADA requirements. If they do not meet, then they are required to be replaced....so why document what it was that didn't meet?

Response - Detail needed only if not replaced or not modified.

Comment [KC47]: DB Group comment: This section may be eliminated based on new ADA guidance. Suggest coordinating with SME for confirmation.

Response - No change in ADA that would allow deletion of this section

Comment [ET48]: John Romero
Page 7, Section 2.11.4.6, line 18 and 27 – Mentions "F" and "DE" in the matrix. Again, with the new Design Manual revision coming up, how will this template deal with the elimination of the design matrices?
Response - Should not refer to design levels or matrices in the document

Comment [jlb49]: Option 1 – Example #1.

Comment [ET50]: John Romero
Page 7, Section 2.11.4.6, line 18 and 27 – Mentions "F" and "DE" in the matrix. Again, with the new Design Manual revision coming up, how will this template deal with the elimination of the design matrices?
Response - Should not refer to design levels or matrices in the document

- A list of superelevation rate and superelevation transition design exceptions in the format needed by WSDOT for entry into the WSDOT Design Variance Inventory System;
- The design exceptions shall be numbered, and the numbered design exceptions are required to be noted on the channelization plan sheets (refer to the Channelization Plan for Approval Package in Section 2.12); and
- A list of locations where the existing roadway crown point is in a proposed wheel track and required to be corrected by the Design-Builder.***

This Section has been intentionally omitted.

End of Section

Comment [jlb51]: Option 1 – Example #2.

Comment [jlb52]: Option 2 – use if there are no noise walls, otherwise delete

Washington State Department of Transportation

AGC Associated General Contractors of Washington

ACEC Washington

WSDOT/AGC/ACEC
DESIGN-BUILD TEAM MEETING
Meeting Minutes

September 10, 2015
1:00 pm to 4:00 pm
WSDOT Corson Ave Office, Conf. Rm. 119/201
6431 Corson Avenue South, Seattle, WA
No Teleconference line requested

Co-Chairs Scotty Ireland and Paul Mayo

AGENDA ITEMS:

1. **Sign-In Sheet/Open the meeting / Introductions** (10 Min) Scotty/Paull
   - A. Safety Briefing
   - B. Review and Update Sign-In Sheet
   - C. Introduction of SME's and other Guests

Attendees:			
Adams, Bob[2]	Atkinson Constr.	425-255-7551	bob.adams@atkn.com
Barry, Ed	WSDOT-HQ DN	206-805-2924	barryed@wsdot.wa.gov
Bednarczyk, Marek	Graham Constr.	206-729-8844	marekb@grahamus.com
Boutwell, Jami	WSDOT-NWR 405	425-456-8504	boutwej@wsdot.wa.gov
Christopher, Chris[2]	WSDOT-HQ CN	360-705-7821	christc@wsdot.wa.gov
Clarke, Brenden	WSDOT - OR	360-357-2606	clarkeb@wsdot.wa.gov
Crowe, Eric	AECOM	425-208-9083	Eric.crowe@aecom.com
Eckard, Teresa	WSDOT-HQ CN	360-705-7908	eckardt@wsdot.wa.gov
Harris, Jon	PCL	425-394-4231	jharris@pcl.com
Hodgson, Lisa	WSDOT-NWR 405	425-420-9984	hodgsol@wsdot.wa.gov
Ireland, Scotty[1]	WSDOT-HQ CN	360-705-7468	irelans@wsdot.wa.gov
Larson, Phil	Atkinson	425-508-6718	phil.larson@atkn.com
Mayo, Paul[1]	Flatiron Corp	425-508-7713	pmayo@flatironcorp.com
McNabb, Gil	WSDOT-NWR 405	425-456-8643	mcnabbg@wsdot.wa.gov
Mizuhata, Julia	WSDOT-NWR 520	425-576-7059	MizuhaJ@wsdot.wa.gov
Ostfeld, Eric	Parsons	206-643-4269	Eric.ostfeld@parsons.com
Rohila, Manish	Rohila Consulting	425-246-1749	manish@rohilaconsulting.com
Guests			
Jim Prouty	Granite Construction	425-551-3100	Jim.prouty@gcinc.com
Bart Cima	IBI Group	206-521-9091	bcina@ibigroup.com
Mark Renshaw	WSDOT	425-739-3733	Mark.renshaw@wsdot.wa.gov
Chris Thomas- Dial-in	WSDOT	206-440-4466	thomacp@wsdot.wa.gov

2. **Review Previous Meeting Minutes** (5 Min) Scotty

   The July 9th DRAFT meeting minutes were distributed to the Team on 7/22/2015. No comments were received and they were finalized and posted to the website on 8/20/2015. Meeting minutes are located at:

   http://www.wsdot.wa.gov/Business/Construction/MeetingMinutes.htm

The previous meeting minutes were distribution and posting were discussed. No comments

3. Old Business (10 Min)

A. Chapter 2 Section draft template review update (see updated spreadsheet) — Teresa

Teresa reviewed the current status of the template reviews. See the updated spreadsheet attached to the meeting minutes, file name WSDOT-AGC-ACEC DB Committee chapter 2 Sections status Rev.docx

4. New Business (120 Min)

A. Project Delivery Method Selection Guidance Comment Discussion (30 Min) — Scotty/Bob/Richard

1. Use a dollar limit ($25 Million or more or less?) as an indicator if DB (or GCCM) is more likely (larger projects) or DBB is more likely (smaller projects). PDMSG team agreed that larger projects are more likely to be alternate delivery rather than DBB. Will add to guidance as a heuristic rule – not part of the process but an indicator that alternate delivery is more likely over $25 Million.
2. Ability to change the final PDM will be included in the guidance with an approval process similar to an exception based on comments from AGC and ACEC.
3. Bob Adams felt that DBB was the automatic default and suggested that DB be the default. The PDMSG agrees that there are holdovers from the old selection process (where DBB was the default unless DB was actively pursued) and will remove the implication of DBB as the default PDM, but the goal of an unbiased approach precludes establishing any default PDM.
4. Legislative language added to the executive summary
5. Concerns that ratings in matrix are skewed toward DBB (WSDOT staff comments were they are skewed toward DB). Paul Mayo to provide input on ratings.
6. Comments on ratings may be because the goals are not as clear as they could be (due to input from multiple reviewers). Teresa will clarify the goals in the matrix that seem confusing.
7. Schedule to implement PDMSG and training – expect to have one more executive review and expect to finalize before end of the year. Bob Adams discussed the JTC study and the importance of the selection process as a topic in the study. Completion of PDMSG is important to the process. Committee has a RFP out for a consultant to run the study – about 2 weeks to selection. Start the end of Oct. Will file a report by the end of next year. AGC/ACEC/WSDOT/Local 17/Industry DB experts will be on the committee. Chris C. said that he will try to get the committee to focus on an unbiased approach to select the best contracting method. Bob said that he thinks the committee is starting with thinking WSDOT is having errors in their contracts and DB is the answer.

B. Chapter 2 Technical Review Comments

1. Section 2.18 Intelligent Transportation Systems (30 Min) — Teresa/SME's

1. Issuance of the Intelligent Transportation Systems Design Requirements (this is a NW region document but is being used by other regions with their modifications)
2. Design-Builder responsibility to meet all roadway viewing requirements for CCTV installation (Section 2.18.4.4) There is a problem with the number of cameras shown on the preliminary drawings with what is actually needed to meet the requirements. Either don't provide a camera layout or go farther with the design. Discussion on providing more information on existing system (SIMS). Discussion on reference drawings verses WSDOT warrantying the info(Paul referenced the drainage drawings). Follow up with SME – note to author to not provide a camera layout.
3. Check landscaping(future), roadway and drainage specs for conflicts with ITS requirements.
4. Follow up with SME's with final comments and markups attached to meeting minutes.

2. Section 2.29 Maintenance During Construction (30 Min) — Teresa/SME's

1. 2.29.3.1 DBer performing weed control in sensitive areas - Teresa discussed this issue. Eric Wolin is researching the permits and use of permits by DBers. What reporting and references are needed in the RFP? Need to follow through with HQ and Regional Maint. to insure that there are no gaps or issues with how we are moving forward with this section. This item is pending confirmation from HQ Maint on the use of the permits. Also discussed mosquito control – using the WSDOT maint permit where applicable.
2. Coordinate changes with 2.8 Environmental section
3. Follow up with SME's with final comments and markups attached to meeting minutes.

C. A pre-qualification list for DB teams on Small Projects (20 Min) — Eric Ostfeld

As potential projects for DB become smaller, it becomes more difficult to put a detailed proposal together (cost and time). Prequalify DBers for smaller projects; select a list from the prequalification list to submit proposals.

Discussion on the need to select qualified firms to provide a proposal, streamline proposal requirements and timeline, how are we sure that the best qualified firm will be selected? On smaller projects will this be an issue?

Paul has an example of this approach in S. Carolina project specific– prequalify with an SOQ with specific technical approach and then decision is based on price. He will provide info to WSDOT.

Eric was suggesting prequalify a number of DBers, select the ones that can do the work, find out interest and request proposals for those interested.

Discussed on whether this is a legal process for Construction services – check this with AG's office

Discussion focused on the intent – streamline the process to save $$ and time for both WSDOT and Proposers.

Streamline the proposal and RFQ or a blended document?

Reduce requirements for smaller jobs

Does this open up opportunities for firms who have not previously done a DB job with WSDOT?

Are we still getting the most qualified firm?

Comment was that it may be possible to screen 10 teams if team member experience is in the evaluation

Comment that innovation needs to be part of the process (don't eliminate the ATC's)

Possible contacts for smaller project process – DBIA, Paul-S. Carolina, Michigan

Teresa shared that a streamlined procurement process for smaller DB projects has been discussed. She also put a slide on the screen that describes the current approved 1-step process by WSDOT – this has only been used on one project and is not necessarily that streamlined. (slide is attached to meeting minutes)

Paul has an example of this approach in S. Carolina project specific– prequalify with an SOQ with specific technical approach and then decision is based on price. He will provide info to WSDOT.

D. DB Contract Document format (10 Min) — Scotty

Scotty requested feedback on the future formatting of DB Contract Documents. The intent is to create "Template" language that is the same in every project. "Optional or Fill in" language that is preapproved (like GSP's) but is only used if applicable, and then project specific language. Do members want the types of info differentiated?

Response was Black Bar in margin – shows there has been a change,

current DBB – shows changed or added in language with six *'s. How do we show the change for options (three options, and author picks one) will figure out how to trigger the black bar.

Added item:

E. **Upcoming WSDOT DB Projects –** Scotty discussed that we are collecting information from all of the regions on what upcoming DB projects are planned to start next six years. Will have a rough list for next meeting on these projects.

5. Future Meeting Highlights (10 Min)

A. Upset Price and Best Value — Eric Crowe
B. 2016 WSDOT/AGC/ACEC DB Committee Goals — Scotty/Paul
C. DB Co-located Facility Security — Omar Jepperson

Discussed Upset Price and Best Value with Eric Crow for October meeting.

Goals are to be the topic in December. Meeting locations/requests for 2016 will be worked out in the next few weeks.

Annual meeting and leads will be schedule by Chris C. and Bob Adams.

DB Co-located Facility Security will be schedule for the October meeting.

6. Review and Expand Action Items (10 Min) All

Paul – S. Carolina info
Teresa - ITS info concept – Follow up with SME
All - Upcoming review of Roadways and Environmental sections due by 10/7.
Paul - Replace the SME for 2.8 Environmental Section
Teresa – PDMSG Review Out
Teresa – Follow up with SME 's on 2.29 and 2.18
Chris Thomas – send ITS design guidelines to put on TheHub
Teresa – post One step DB procurement slides on TheHub

7. Future Meetings: All

Location: We will be meeting at the Corson Ave Project Office, **Conference Room 119/121**
The address is:
6431 Corson Avenue South
Seattle, WA 98108

Future meeting dates:
October 22, 2015 - **Conference Room 119/121**
December 3, 2015 - **Conference Room 119/121**

Any planned changes to the programed meeting dates will occur at least one week prior to the meeting.

Conference Call-In: Consistency in representation is important to the Team's success. If a member is not able to attend, a conference call line will be made available for the meeting if requested in advance.

Draft WSDOT/AGC/ACEC Design-Build Committee 2015 Section Review Status

RFP Chapter 2 Sections	Subject Matter Experts / Discussion Lead	Status of template revisions (**Bold test has been completed,** other text is future tasks and estimated dates)	Notes/Comments
2.13 Bridges and Structures	WSDOT – Rich Zeldenrust ACEC - Rich Patterson	• **Review section prior to March 5** • **Comments discussed at March 5th meeting – not all comments discussed** • **Lync Meeting with Rich and HQ Construction (Mark Gaines) 5/14** • **Resolution of comments and incorporation of DB BDM in section by Rich and Mark - 6/26 conflicts with some changes** • **Mark Gaines/ Rich Lync meeting on final revisions (7/14)** • **Mark G/HQ Const OK of changes 7/21** • **SME resolution Meeting (7/28)** • **Meeting on DB BDM and effect on 2.13 (9/3/15)** • Finalize Comments (9/15) • Post final version (9/15) • Finalize changes after (9/29)	An additional SME resolution meeting was added and additional resolution of comments is in progress.
2.6 Geotechnical	WSDOT - Jim Cuthbertson /Jim Struthers; ACEC – Dan Campbell AGC - Phil Larson	• **Review section prior to April 16th** • **Comments discussed at April 16th meeting** • **SME resolution Lync meeting on 4/30** • **Revised section from Jim C.** • **HQ Construction Comments** • **Resolution of HQ Construction Comments Lync Meeting 6/2** • **Final Comments from Jim Cuthbertson 6/15** • **Revisions from TFE per Jim's notes** • **HQ Construction OK 7/6** • **Post final version (7/7)** • **Finalize changes after 7/21** • Revise to incorporate change to DB BDM (9/15)	
2.22 Maintenance of Traffic (MOT)	WSDOT - Bonnie Nau ACEC – Manish Rohila AGC - Mannie Barnes	• **Review section prior to May 28th** • **Comments discussed at May 28th meeting** • **Revised Redlines from Bonnie (7/22)** • **SME resolution Lync meeting on (8/6)** • **Revised section from Bonnie (8/10)** • Post final version (9/15) • Finalize changes after 9/8)	
2.10 Utilities and Relocation Agreements and GT1-07(17)	WSDOT John, Collins, Pete Townsend and Ahmer Nizam ACEC –Eric Ostfeld AGC - Paul Mayo	• **Review section prior to May 28th** • **Comments discussed at May 28th meeting** • **Lync Meeting with John/Ahmed (7/8)** • **Revised Redlines from John/Ahmed (7/14)** • **SME resolution Lync meeting on (7/21) (include HQ Const)** • **Revised section from John/Ahmed (7/30)** • **AG Office Review (9/1)** • **Meet with AG Office (9/1)** • **AG office research (9/15)** • Post final version (9/30) • Finalize changes after 10/15)	
2.12 Project Documentation	WSDOT – Ed Barry ACEC – Eric Ostfeld AGG - Chris Williams	• **Review section prior to July 9th** • **SME's Lync on July 6th** • **Comments discussed at July 9th meeting** • **Revised Redlines from WDOT SME's (7/23)** • **SME resolution Lync meeting on (7/22) (include HQ Const)** • Revised section from WSDOT SME's (9/14) • Post final version (9/21) • Finalize changes after 10/5)	

Draft WSDOT/AGC/ACEC Design-Build Committee 2015 Section Review Status

2.28 Quality Management Plan (QMP)	WSDOT - Randy Mawdsley; ACEC – Eric Ostfeld AGC - Jeremy Mason	• **Review section prior to July 9th** • **SME's Lync on July 6th** • **Comments discussed at July 9th meeting** • **Revised Redlines from WDOT SME's (7/23)** • **SME resolution Lync meeting on (7/28) (include HQ Const)** • **Revised input from HQ Design (8/12)** • **Revised section from WSDOT SME's (9/1)** • **SR 520 LL changes (9/4)** • Post final version (9/14) Finalize changes after 9/29	
2.18 Intelligent Transportation Systems	WSDOT - Greg Leege; ACEC – Bart Cima AGC – Mike Woeck	• **Review section prior to Sept 10th** • **SME's Lync on Sept 8th** • Comments discussed at Sept 10th meeting • Revised Redlines from WDOT SME's (9/23) • SME resolution Lync meeting on (9/29) (include HQ Const) • Revised section from WSDOT SME's (9/14) • Post final version (10/8) • Finalize changes after 10/22	
2.29 Maintenance During Construction	WSDOT – Mark Renshaw; ACEC – Manish Rohila AGC – Mannie Barnes	• **Review section prior to Sept 10th** • **SME's Lync on Sept 2nd** • Comments discussed at Sept 10th meeting • Revised Redlines from WDOT SME's (9/23) • SME resolution Lync meeting on (9/29) (include HQ Const) • Revised section from WSDOT SME's (9/14) • Post final version (10/8) • Finalize changes after 10/22	
2.8 Environmental	WSDOT – Eric Wolin ACEC – Dan Campbell AGC - Mike Shaw	• Review section prior to Oct 22nd • SME's Lync on Oct 14th • Comments discussed at Oct 22nd meeting • Revised Redlines from WDOT SME's (11/4) • SME resolution Lync meeting on (11/9) (include HQ Const) • Revised section from WSDOT SME's (11/24) • Post final version (12/15) • Finalize changes after 12/30	
2.11 Roadway	WSDOT –Ed Barry ACEC – Eric Crowe AGC – Phil Larson	• Review section prior to Oct 22nd • SME's Lync on Oct 14th • Comments discussed at Oct 22nd meeting • Revised Redlines from WDOT SME's (11/4) • SME resolution Lync meeting on (11/9) (include HQ Const) • Revised section from WSDOT SME's (11/24) • Post final version (12/15) • Finalize changes after 12/30	

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

Draft Project Delivery Method Selection Guidance

8/17/2015

State Construction Division

Contents

Executive Summary

In alignment with Reform IV, this formal guidance was developed to aid WSDOT staff in evaluating projects for the most appropriate Project Delivery Method (PDM) based on each project's attributes, opportunities and risks that result in the most cost effective and best value project delivery.

A State Construction Office led focus group established the following goals for the development of this guidance:

1. Establish a systematic approach that can be consistently applied throughout WSDOT,
2. Establish how and when a project should be assessed,
3. Develop the PDM Selection Process to be scalable for all projects,
4. Design the PDM Selection Process to provide the documentation for PDM approval,
5. Clearly identify all levels of approval or endorsement in the process.

Historically, Design-Bid-Build (DBB) has been the default PDM for all WSDOT projects unless an Alternative PDM was specifically pursued. WSDOT is legislatively pre-approved to use Design-Build (DB) as a PDM with internal approval required from the WSDOT Chief Engineer. The use of General Contractor/Construction Manager (GCCM) as a PDM requires approval from the Chief Engineer and the Capital Projects Advisory review Board (CPARB), Project Review Board (PRB) subcommittee.

This new formal guidance, the Project Delivery Method Selection Guidance (PDMSG), can be applied to all projects to determine the optimal PDM. The PDMSG currently evaluates three methods; DBB, DB, and GCCM. The optimal PDM determination shall be endorsed and/or approved through the Region and Engineering and Regional Operations authorities. Until legislation is changed, when GCCM is determined to be the most appropriate PDM, subsequent approval will need to be pursued from the CPARB PRB subcommittee.

The PDMSG development team evaluated selection processes of other DOT's and agencies in US and Canada. The Project Delivery Selection Matrix from University of Colorado, Boulder and Colorado DOT was selected as a foundation for developing WSDOT's PDMSG. The guidance was tailored to incorporate WSDOT's policies and values while retaining the fundamental principles applicable to all transportation projects. Some of key elements in the PDMSG include the following:

- All projects are evaluated in two steps
    - The Probable PDM is determined during the Project Definition Phase

Comment [ET1]: Bob Adams says:
Overall comment:
This document assumes DBB as the default PDM, unless criteria show otherwise. With the recent revisions in SB5997 that encourages DB, it seem that the default should be DB, unless WSDOT choses to assume the risks associated with DBB.

Discussed using $ limit such as $30 Million to assume likely DB (or GCCM) vrs DBB –

Resolution- incorporate a $ limit into the checklist

Comment [ET2]: Strongly encouraged

Richard also commented on added more of the legislative language into the executive summary.

Resolution: add more of the legislative language

Also go through an make sure that the existing process is not impacting the wording and processes.- focus on the new, unbiased process.

Comment [ET3]: Revise this section to make sure it is clear that this is the current process, not the proposed process.

- The Final PDM is determined by the Design PEO by validating, updating or revising the Probable PDM (at 10% to 30% Design)

- A Selection Checklist is used to quickly identify projects that are limited to using DBB as the PDM,
- A Selection Matrix (if needed as a second step) is used to determine the Probable PDM or validate/update the determination for the Final PDM, with a Workshop being utilized for larger projects,
- The work to determine the Probable PDM and the Final PDM is scalable to the size and complexity of the project,
- The PDMSG is integrated with the existing project development process.

After evaluation of the methods used by the transportation industry and other entities, a fundamental basis for using a PDM selection process emerged. No single PDM is optimal for every project. Using a systematic process to determine the most appropriate PDM, based on project attributes, opportunities and risks will result in the most cost effective and best value project delivery.

Comment [ET4]: Bob Adams says:
Executive summary, page 2:
The Design PEO may have an inherent conflict of interest when making the final determination of whether or not to give up the design responsibility to the contractor. Ths should be a business decision on the part of WSDOT, not solely a design decision

Resolution- No Change - the process has several checks and balances on the PEO for bias, also PEO needs to buy into the method at this stage, needs to be actively engaged.

Introduction

This guidance document provides a systematic approach for selecting the optimal PDM for WSDOT projects. It provides the definitions, background, tools and processes to accomplish the following tasks and deliverables:

- Assist WSDOT staff to choose the best PDM for each project.
- Document the selection decision and approval process.

The previous PDM selection process was automatically DBB unless approval to use the DB and GCCM contracting methods was pursued.

This document provides progressive levels of tools to evaluate the best PDB for every project, with each tool scalable to the appropriate level of effort for the type and size of the project.

This PDMSG is integrated with the existing project development processes as outlined in the WSDOT Design Manual (M22-01), including the Project Deliverables Expectation Matrix (Section 305.04(1)(b)). It also coordinates with the CRA-CVEP workshops as described in the Project Risk Management Guide. Ultimately, the PDM determination will be integrated into the Design Document Package contained in the Project File.

This document has also used the University of Boulder, Colorado, Project Delivery Selection Matrix located at: http://www.colorado.edu/tcm/project-delivery-selection-matrix, as a starting point in developing this WSDOT guidance. Much of the data, background and some of the process documents are derived from the University of Boulder, Colorado, Project Delivery Selection Matrix, although this guidance has been further developed to meet the goals, values, policies and procedures of WSDOT.

This guidance has been developed by a team with representation from the Construction Division, the Development Division, the Capital Development Program Management Office, the NW Region and Olympic Region. Additionally, this document has contributions from the WSDOT/AGC/ACEC Design-Build Committee, the Design-Build Work Group and numerous other key WSDOT staff.

This is a living document and periodic updates are anticipated to incorporated continual improvement to this guidance and process through lessons learned and changes in WSDOT policies and procedures.

The PDMSG Team that provided the majority of the time and effort to produce this guidance include Scotty Ireland, Mark Gaines, Ed Barry, Matt Neely, Omar Jepperson, John Wynands and Teresa Eckard.

CHAPTER 1. Project Delivery Method Selection Background

1.1 Definitions

In addition to terms defined in the WSDOT Design Manual, the following are references defined for use with this guidance.

1.1.1 *Project Delivery Method (PDM):*

The Project Delivery Method is the process by which a transportation project is comprehensively designed and constructed from project definition to closeout. The different Project Delivery Methods are distinguished by the manner in which contracts between WSDOT, designers and contractors are formed and the technical relationships that evolve between each party inside those contracts. Currently, WSDOT primarily uses two types of Project Delivery Methods and is pursuing the use of a third; Design-Bid-Build (DBB), Design-Build (DB) and General Contractor/ Construction Manager (GCCM). The Project Delivery Method determines when the parties become engaged and influences ownership and impact of changes on project cost. No single Project Delivery Method is ideal for all projects. Each project must be examined individually to determine how it aligns with the attributes of each available Project Delivery Method.

1.1.2 *Design-Bid-Build (DBB):*

Design-Bid-Build is the traditional Project Delivery Method in which WSDOT designs, or retains a designer to furnish complete design services, and then advertises and awards a separate construction contract based on the designer's completed construction documents. In DBB, WSDOT has control over the entire process and is responsible for the details of design during construction and as a result, is responsible for the cost of any errors or omissions encountered in construction. In DBB, selection of the contractor is based solely on price with award of the contract based on the Low Bid.

Comment [HL5]: Should this be capitalized. When I see capitals I look for a defined term somewhere. Possibly this is a defined term within another manual?

Response – I have to think about this one – It does represent a defined term in the contract docs

1.1.3 *Design-Build (DB):*

Design-Build is a Project Delivery Method in which WSDOT procures both design and construction services in the same contract from a single, legal entity referred to as the Design-Builder. WSDOT typically uses a two-phase selection process where Design-Builders are shortlisted based on qualifications in the first phase and then selected based on price and approach in the second phase. The DB project delivery method allows the phases of design and construction to overlap. The Design-Builder becomes involved early in project development, at approximately the 15% to 30% design level, offering opportunities for innovation and improved constructability, and confirming project costs early. The Design-Builder controls the details of design and is typically responsible for the cost of any design errors or omissions encountered during construction. Per RCW 47.20.785,

WSDOT can use the Design-Build project delivery method for projects that cost $2 Million and over and are approved by the Chief Engineer.

Comment [HL6]: Executive Summary page 1 includes the approval by Chief Engineer.

Response – no change – this is the existing policy and procedure- not the new proposed procedure for approval.

1.1.4 *General Contractor /Construction Manager (GCCM):*

General Contractor/Construction Manager is a PDM in which WSDOT contracts separately with a contractor as a Construction Manager and either performs design or contracts with an engineering firm to provide a design. The Construction Manager is selected early in the project development phase (10% to 30% Design) to provide design and constructability input. WSDOT retains control of the design of the project and is typically responsible for design errors and omissions during construction on GCCM projects. As the design nears completion, WSDOT and the Construction Manager work to negotiate a Maximum Allowable Construction Cost (MACC) for the project. Upon successful negotiation of the MACC, the Construction Manager becomes the General Contractor and works at-risk for the final cost and construction schedule. The early contractor input associated with GCCM delivery is especially suited for projects that are technically complex, require complicated phasing and staging, or require operability of the facility (such as a ferry terminal) during construction. WSDOT must get approval from the Capital Project Advisory Review Board (CPARB), Project Review Board (PRB) subcommittee, before using the GCCM project delivery method.

1.1.5 *Alternative Project Delivery Method*

An Alternative Project Delivery Method refers to any PDM other than traditional DBB. In this guidance, it generally refers to DB and GCCM.

1.1.6 *Probable Project Delivery Method (Probable PDM):*

The Probable PDM is a temporary determination that is used for project planning until it can be validated or updated by the Project Office assigned to the project. Probable PDM selection occurs at the project definition or "Scoping Phase" (per Design Manual, Section 300.05(1)), and is determined by using the Selection Checklist and/or the Selection Matrix. The Probable PDM assists with the programing and assignment of the project and is a required deliverable within the Project Definition Package. Projects assigned pre-design funding may delay determining the Probable PDM if more information from the pre-design phase is needed to select the best PDM.

1.1.7 *Final Project Delivery Method (Final PDM):*

Final PDM is the PDM determination submitted for approval to use as the delivery method for the project early in the project design process. Final PDM selection is recommended at the Project Planning and Endorsement stage of the project (approximately 10% design). The Project Engineer/Engineering Manager will validate the Probable PDM by verifying or updating the backup

and Probable PDM Selection Checklist/Matrix to determine the Final PDM. If additional work is required due to project size or difficulty coming to a determination, a Selection Matrix Workshop will be utilized to determine the Final PDM.

1.1.8 *Project Goals*

Project Goals are an observable and measurable end result having one or more objectives to be achieved as part of the project. Typically, Project Goals are the highest priority end results necessary for a successfully delivered project. Do not confuse the Project Goals with the goals established as criteria in the RFP during the selection process for a Design-Build project. There may be overlap, but the purpose and focus of the two types of goals are not necessarily identical. As stated, Project Goals are associated with the end results necessary for a successfully delivered project, RFP goals are established as scoring criteria for the RFP process used in DB project delivery procurement. . There may be overlap, but the focus of the goals is different~~There may be overlap, but the focus of the goals is different~~. Project Goals are evaluated with numerical scores.~~scores.~~

1.1.9 *Project Constraints*

Project Constraints are end results that **must**~~**must**~~ be achieved as part of the project. They can often be confused with Project Goals that have a high priority. ~~They can often be confused with Project Goals that have a high priority.~~ Project Constraints are evaluated using pass/fail ratings.

1.1.10 *Weights*

Weights are a way to apply relative importance to Project Goals as part of the evaluation process in the Selection Matrix. Project Constraints are not weighted because they are Pass/Fail.

1.1.11 *Ratings*

Ratings are provided in the Selection Matrix and show the relative value of each Project Delivery Method in achieving the associated Project Goal. Modifications to the Project Goals or new Project Goals require that the associated ratings be adjusted or created. Appendix A.6, Contract Attribute Comparison Spreadsheet, provides data on the pros and cons of each potential project delivery method as it relates to project attributes and Project Goals.

1.1.12 *Neutral Goals*

The Selection Matrix is a form of decision matrix that evaluates the ability to meet Project Goals with each of the possible Project Delivery Methods. A neutral goal is a Project Goal that has the same rating for each proposed PDM. The Selection Matrix shows several potentially neutral goals. These goals would be automatically removed from the scoring, unless modifications to the Project Goal require a shift in the "neutral" rating. Likewise, any Project Goal added to the Selection Matrix that

Comment [M7]: May want to delete this sentence. Two sentences earlier, almost the same thing is stated.

Resolution – will review and revise as needed.

Comment [HL8]: Suggest reviewing for repetitive language. Seems like we say the same thing twice.

Resolution – will review and revise as needed.

Comment [HL9]: Suggest using the word "shall". That is typically well known in WSDOT to mean you have to do this no matter what.

Resolution – No Change - In this case, Must is typically used when differentiating goals from constraints. Shall is more directive as in contract doc's

Comment [M10]: May want to delete?

Resolution – will review and revise as needed.

the team determines has the same rating for each PDM, would be neutral and therefore not included in the scoring.

1.2 Value of Project Delivery Method Selection

After evaluation of the methods used by the transportation industry and other entities, a fundamental basis for using a Project Delivery Method Selection process emerged. No single PDM is optimal for every project, therefore each project should be evaluated to determine the best PDM. Emergency projects would be exempt from this process unless the project team determines that this guidance and process would facilitate the project.

Some of the benefits associated with selecting the right PDM for WSDOT projects include:

- Achieving the Best Price or Best Value for the project,
- Achieving critical schedule requirements for the project including key milestones,
- Achieving the best quality and best scope within the limitations of cost, schedule and other project limits,
- Aligning the Design and Construction Office with the PDM to utilize existing WSDOT resources and staff as effectively as possible,
- Aligning the attributes of the project with the PDM to best meet the Project Goals,
- Utilize the characteristics of the PDM to effectively mitigate or respond to project risks.

Early identification of the PDM enhances these benefits. While evaluating project delivery methods utilized nation-wide and WSDOT project development guidance, it became clear that the benefits associated with selecting a PDM were reduced or negated if the PDM was not identified early in the design process.

The benefits of early identification of PDM include:

- The Project Management Plan (PMP) needs will vary based on the PDM selected. Early selection maximizes the benefits of having a solid PMP.
- Early selection allows effective early design decisions that affect final costs.
- Early selection facilitates selecting the project office staff and early determination of design effort/resource loading, scheduling and budgeting.
- Early selection facilitates incorporation of PDM risk allocation into the cost estimate.
- Scoping estimates will be more accurate by allowing the team to estimate using factors appropriate to the PDM. For example, GCCM will include costs for an independent cost estimator, construction management, WSDOT management and on-call designer in the PE phase.~~phase.~~

1.3 Potential Bias

The processes in this guidance need to be followed without bias. There is no PDM that fits every project. Potential bias for or against a method should be considered or discussed briefly and put aside.

Comment [ET11]: Value of delivery method selection, page 8:
There is a good write up of the pros and cons of the various PDM's in the FTA guidelines that would benefit this section. See http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_131.pdf

Resolution- will review the info and incorporate additional pro's and con's as applicable

Comment [HL12]: Please confirm that Reform IV supports this statement.

Resolution – will check with Reform and with PDMSG team on this

Per PDMSG meeting – no change

Comment [ET13]: Bob Adams says:
Value of early identification, Section 1.2, page 8.
If minimize impacts is the primary goal of the delivery method selection, then the timing is of little importance.

Response-No change - the benefits of early identification of PDM are listed. The goal is to maximize the benefits of using alternative delivery and not to waste $$ and time. However, it does not mean that alternate delivery may still have an overall benefit, even if identified late and we will outline a process to incorporate a late change in the PDM if it can be justified.

Comment [M14]: Just a thought. Most of this is common sense, and WSDOT already has a history of selecting the project delivery method early in project development. Could consider shortening this to one or two sentences and eliminating the bullets. Also, since this relates to "timing" more than "value", you may want to change the heading of this section to "Value and Timing of Project Delivery Method Selection".

Resolution – will review and revise as needed.

If a workshop is part of the process, the assistance of a facilitator is strongly encouraged. A facilitator, familiar with the process and Selection Matrix but independent of the project, can help effectively manage the workshop and allow the Project Engineer/Engineering Manager the opportunity to fully participate. A facilitator can help keep bias under control and balance the participation of the team in the workshop so that an individual, with a strong opinion and a loud voice, does not dominate the results.

1.4 Project Delivery Method Determination When a Project is on Hold

If a project is on hold for a substantial time (i.e. no work proceeding) after the Probable or Final PDM is determined, it would be prudent for the Project Engineer/Project Office to check the viability of the PDM once the project recommences. If two years or more have elapsed without work on the project, a new evaluation of the Probable PDM and/or Final PDM is required when the project proceeds.

1.5 Project Delivery Method Selection Process Requirements

Table 1.1 Determining Probable Project Delivery Method

Estimated Project Cost	Required Process
• Less than $2 Million	Part 1 of Selection Checklist
• Equal to or greater than $2 Million but less than $25 Million, or • ~~Less than $25 Million, or~~ • Part 1 of Checklist does not determine a Probable PDM	Part 1, 2 and 3 of Selection Checklist
• $25 Million or greater, or • Parts 2 and 3 of the Checklist do not determine a Probable PDM	Selection Matrix

Table 1.2 Determining Final Project Delivery Method

Estimated Project Cost	Required Process
• Less than $2 Million	Validate or Revise Part 1 of Selection Checklist
• Equal to or greater than $2 Million but less than $~~Less than~~ $25 Million, or • Validation/Revision of Part 1 of Checklist does not determine a Final PDM	Validate, Revise or Complete Part 1, 2 and 3 of Selection Checklist
• $25 Million or greater but less than $100 Million~~Million or greater~~, or • Validation/Revision of Parts 2 and 3 of the Checklist does not determine a Final PDM	Validate, Revise or Complete Selection Matrix
• $100 Million or more, or • Validation/Revision of the Selection Matrix does not determine a Final PDM	Selection Matrix Workshop

Comment [ET15]:
Mark Gaines
Suggest moving Table 1.1 information to the Chapter "Determination of Probably PDM" and Table 1.2 to "Determination of Final PDM". Section 1.5 seems a little out of place here.

Also, I just noticed that this is already included in Appendix A2. Do we even need it here?

Resolution – think this needs to be upfront – I added to appendices per a comment from Beta test group – but it is not optimal to have same table in two places. I may add a reference and or link to appendix in place of the table.

Thoughts?

CHAPTER 2. ~~Phases of~~Timing for Project Delivery Method

Selection~~Selection~~

2.1 Overview

2.1.1 *Determining the Probable PDM - Selection Checklist and Selection Matrix*

The Scope, Budget, Schedule and Risks developed for the Project Definition Package are to be used to determine the Probable PDM at the end of the project definition and scoping phase and are a deliverable in the "Deliverables Expectation Matrix" under "Project Definition". Part 1 of the Selection Checklist allows quick identification of DBB projects, Part 2 allows quick identification of the Probable PDM or possible delivery options, and Part 3 confirms that the RCW requirements for an Alternative PDM are being met. If the Selection Checklist does not determine a Probable PDM or if the project is $25 Million or over, the Selection Matrix shall be used to provide the Probable PDM. The Selection Matrix process uses a decision matrix with Project Goals rated against each PDM. If the result is indeterminate, the Probable PDM can be determined later when more project information is available, although this should be a rare occurrence. Projects which are large and complex that are assigned pre-design funding may fall into this category and delay determining the Probable PDM until some or all of the pre-design work is complete. The results of the Checklist and/or Matrix should be included with the Project Summary documentation. Validation or revision of the Probable PDM will be performed later in the project development as part of the Final PDM determination.

2.1.2 *Determining the Final PDM – Validation/Revision Process/Selection Matrix*

Workshop:~~***Workshop:***~~

The project scope, budget, schedule, goals and risk analysis further developed after the project scoping will be used, in conjunction with the original scoping document to determine the Final PDM. It is recommended that the Final PDM be developed as a deliverable in the "Project Planning and Endorsement" phase as shown in the "Deliverables Expectation Matrix", but will be determined no later than the "Geometric Review" phase or approximately 30% Design. In determining the Final PDM, the project design team will verify the current project information, identify significant changes, review the Probable PDM Checklist and/or the Probable PDM Selection Matrix, and validate or revise the documentation to confirm or revise the PDM. If the project team considers the determination to be clearly supported by the validated or revised documentation, and the project is less than $100 Million, then the Selection Matrix Workshop is not necessary.

Comment [M16]: This section addresses both probably and final PDM determination. Suggest pulling the Probable PDM information out of here and moving it to "Determination of Probably PDM", and suggest pulling the Final PDM information out of here and moving it to the "Determination of Final PDM" chapter. This would eliminate Chapter 2. I think it would be cleaner to get all the Probable and Final information is separate Chapters.

Resolution – I discussed reorganizing the document with Mark and agree that this may help the reader understand the processes better – will review and revise to incorporate

Comment [HL17]: Note: this is the only place within the document that these terms are capitalized. Suggest putting as lower case or change this throughout the document for consistency.

Resolution – Agree - will review and revise as needed.

Comment [ET18]: Bob Adams says: 2.1.2 page 11, last paragraph. replace "shall" with "should"

Response – In this case, this is a procedural "shall" but will check to see if this should be changed in other areas of the document

Comment [M19]: This is wording is a little complicated. Simplify? Delete this portion?

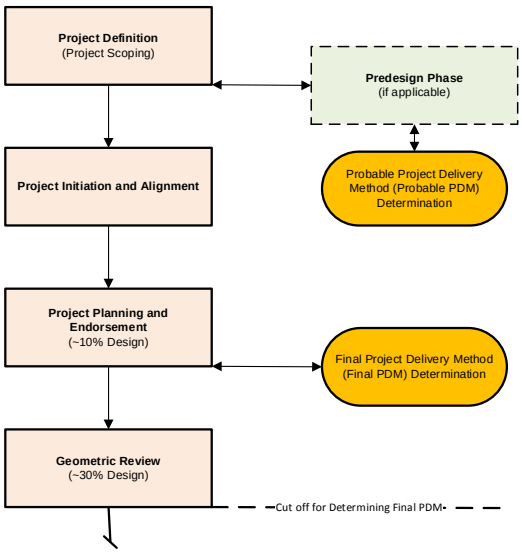
Resolution – will review and revise as needed.

Comment [ET20]: Bob Adams says: 2.1.2, page 11. A hard stop at 30% Design is too rigid. there should be flexibility to consider DB after 30%.
Response - Add a paragraph about changes to a project that may require a change to the PDM after 30%

For projects $25 Million or over, the Final PDM shall be determined before the required Cost Risk Assessment (CRA) Workshop. All projects $100 Million or over will go through the Final PDM Selection Matrix Workshop before the required Cost Estimate Validation Process (CEVP) Workshop. The Final PDM should be determined **at least one month prior** to a CRA or CEVP Workshop to allow sufficient time to incorporate the PDM into the project documents required prior to these Workshops. Because the CRA or CEVP process could modify or change the PDM in a few rare cases, the Project Engineer/Project Office should briefly defer seeking approval for the ~~f~~Final PDM until after the CRA/CEVP Workshops.

As previously stated, the Final PDM should be determined at approximately 10% design (as described in the "Deliverables Expectation Matrix" referenced in the Design Manual, 3.0504(1)(b)), but no later than 30% design. Developing project information can be one cause for the determination of the Final PDM to be later than the 10% design stage. Delaying until after 30% design to determine the Final PDM will impact the benefits gained using GCCM or DB, and may adversely impact the cost and schedule of a project if the PDM changes. Determination of the Final PDM and the CRA/CEVP Workshops should be identified as milestones in the Project Management Plan (PMP) to ensure that the processes are coordinated and not unnecessarily delayed.

Figure 2.1 Determination of Probable and Final PDM ~~and PDM~~ as part of Project Development Phases Flowchart



Comment [ET21]: says:
2.1.2, page 12, second paragraph. Again, the wording of 30% Design limit is too strong

This is a procedural limit - are adding a process for late changes to the PDM

Comment [ET22]: Bob Adams says:
2.1.2, page 12, graphic foot note. 30% should not be a cut-off for Determining Final PDM

Same as above

CHAPTER 3. Determination of the Probable PDM

3.1 Participation

The Probable PDM will be determined based on the information provided by the staff assigned to the Project Definition. It is recommended to have Region representatives that will be responsible for the design and construction of the Project participate in the assessment, if possible regional staff responsible for this phase of project development may elect to require this coordination at their discretion). ~~(regional staff responsible for this phase of project development may elect to require this coordination at their discretion).~~

The following staff members are expected to participate in this process:

- Project Engineer/Project Design Lead or Program Management staff assigned the Project Definition of the project.
- Regional Project Development Engineer's Representative(s) assigned the Project Definition of the project.
- Contract Administration Project Office will consult as appropriate.

Once a Probable PDM is selected, participation by the following staff members may occur:

- Regional Administrator.
- Assistant State Design Engineer.
- Assistant State Construction Engineer.~~.~~

3.2 Tasks Prior to Determining the Probable PDM

Determining a PDM is based on the project's attributes. The following tasks will need to be performed prior to determining the Probable PDM:

1. Read the Project Delivery Method Selection Guidance.
2. Complete the training for the Selection Checklist and/or Selection Matrix.
3. Develop Project Definition Summary Package, including or expanded as follows:
    a. Project Description and attributes such as scope, schedule and budget (reference the Project Description Worksheet as an additional tool).
    b. Project Goals and Project Constraints.
    c. Contract Attribute Comparison Spreadsheet – review the pros and cons of the three project delivery methods as they relate to different project attributes.
    d. Preliminary Risk Assessment (reference the Risk Assessment Guidance in Appendix A as an additional resource).
4. Review the Project Definition documentation and any additional information developed (scope, schedule, preliminary drawings, goals, risks and constraints).

Comment [M23]: As a general comment on Chapters 3 and 4, I think it would be helpful to review what information should be included here and what should be put in Appendices C and D. It seems like we have a lot of information in this document that could easily be moved to the Appendices.

Resolution – Agree – level of info may be too detailed, will review and revise

Comment [M24]: May consider deleting this. I don't know that it adds value.

Resolution – will review and revise as needed.

Comment [HL25]: Please note often in the design phase the project office that will administer the construction project is unknown.

Resolution - Will add a note in the guidance to address this.

Comment [M26]: Should review to see if we want a list of staff included here, or if this would be better in the appendices.

Resolution – will review and revise as needed.

5. If applicable, review the information from the pre-design phase.

3.3 Probable PDM Determination Process Flow Narrative

The process is shown in the outline below and in Figure 3.1. It consists of individual steps followed in sequential order and follows, in general, milestones defined in the Deliverables Expectation Matrix (Appendix A.1).

The purpose of the Selection Checklist is to provide an initial tool to quickly evaluate projects using a series of questions. The first part of the Checklist will quickly screen out obvious DBB projects. Parts 2 and 3 have more detailed questions and the RCW requirements for using an Alternative PDM. The Selection Checklist will determine the Probable Project Delivery Method in Parts 1, 2 or 3; reduce the options for Probable PDM before utilizing the Selection Matrix; or identify all three methods as options for Probable PDM for the Selection Matrix process.

3.3.1 *Probable PDM Determination- Selection Checklist Process*

I. Project Definition Package (and pre-design phase information, if applicable),

   A. Project attributes including scope, schedule, and budget.

   B. Identify Project Goals.

   C. Determine and review Project Constraints.

   D. Identify project risks.~~risks.~~

II. Selection Checklist Part 1 - DBB Screening,

III. Selection Checklist Part 2 - Detail Questions,

IV. If more focus is needed to determine the Probable PDM, questions associated with the Project Goals or Project Constraints can be added,

V. Selection Checklist Part 3 - RCW Requirements.

VI. If the Selection Checklist did not determine a Probable PDM, the project cost is $25 Million or more or if the Project Engineer determines that additional evaluation would be beneficial to the project, then go to Subsection 3.3.2, Step V.~~Step V~~.

3.3.2 *Probable PDM Determination– Selection Matrix*

The Selection Matrix is used to determine the Probable PDM if the project cost is $25 Million or more or if the Checklist did not determine the Probable PDM. ~~PDM.~~ Utilizing a decision matrix format, the Selection Matrix has general Project Goals with ratings assigned to each goal for each possible PDM that typically affects the PDM selection per the transportation industry and WSDOT. The user will identify the general

Comment [M27]: Should review to see if we want task lists like this here, or if it would be better to put this in the appendices.

Resolution – will review and revise as needed.

Comment [M28]: The Selection Checklist make no mention of the Project Definition Package. If we are going to list it here, it seems like it would also be mentioned in Appendix C.
Resolution – will review and revise as needed.

Comment [M29]: Do you mean VI?

Resolution - VII

Comment [M30]: Should this just be deleted? We would want the user to start reading at the top of 3.3.2.
Resolution – will review and revise as needed.

Comment [M31]: This is basically a repeat of the sentence directly above, however it doesn't discuss the situation where the Project Engineer determines that additional evaluation would be beneficial. Probably need to add this or delete this sentence entirely.

Resolution – will review and revise as needed.

goals provided that apply to their project, refine or add goals if needed (with associated adjusted or new ratings), apply weights to the Project Goals in accordance with their relative importance, and multiply ratings with weights for scores to be total for each possible PDM. If there are any Project Constraints, they may initially be identified as high priority Project Goals. Rather than having a Weight with relative importance related to the others goals, they are a requirement of the project and will be evaluated as a pass/fail against each possible PDM.

After a Probable PDM is identified, it will be evaluated against the project risks to ensure that it is a viable option, resulting in a determination of the Probable PDM.

VII. Selection Matrix.

A. Identify Project Goals in the matrix.

a. Cross out any of the provided Goals that do not apply to the project or are minor or PDM selection neutral.

b. Clarify the language of the provided Project Goals that apply to your project.

c. Review and adjust the rating for each Project Goal, if needed, and provide justification.

d. Add Project Goals if needed and provide rating for each possible PDM.

B. Identify Project Constraints, if any, including Project Goals that are really Project Constraints and evaluate possible methods as pass/fail.

C. Cross out columns for PDM's that fail Constraints, and do not consider those further in your evaluation.

D. Assign Weights for Project Goals, score and total scores for possible PDM's.

E. If there is a clear choice of PDM, then:

a. Perform an initial risk assessment for the Probable PDM.

F. If there is not a clear choice of Probable PDM, then:

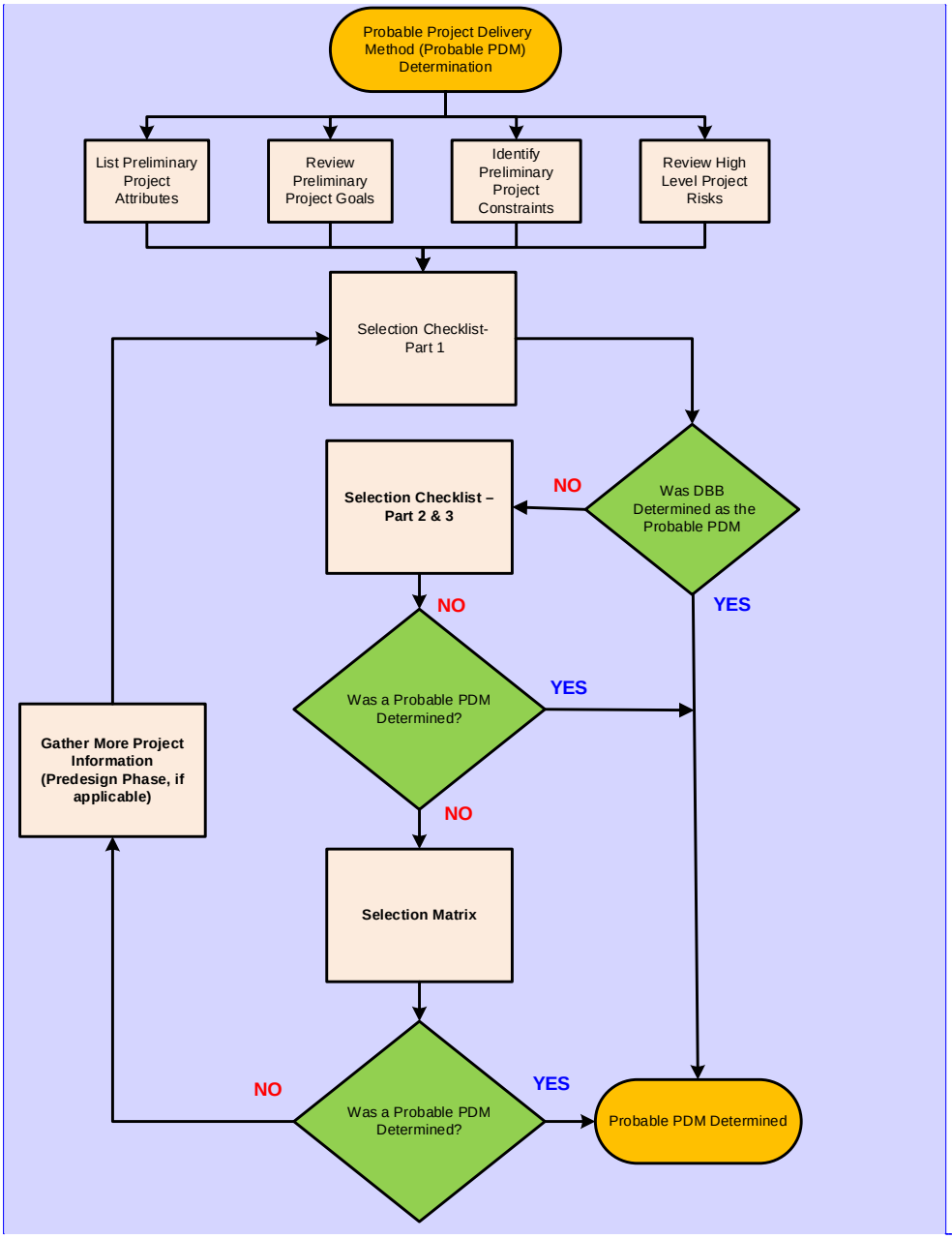
a. Perform an initial risk assessment on all remaining PDM's.

VIII. If there is still no clear Probable PDM, redo the Probable PDM Selection Checklist/Selection Matrix when additional project information is available. Large and complex projects may have pre-design funding. Determine Probable PDM utilizing the information developed in the pre-design phase, if a applicable.

Comment [M32]: Why does this section have numbering that is continued from the checklist (starts at VI)? This is a stand-alone process, so it seems like the numbering of the steps would start at 1.

Resolution – will review and revise as needed.

Figure 3.1 Probable PDM Determination Flowchart



Comment [ET33]: Bob Adams says: Figure 3.1 Flowchart. This chart assumes DBB as the default Probable PDM. Why not assume DB as the default, as encouraged by the legislature?

Response – Bob proposed using a $ limit to assume DBB or Alternate delivery early on – plan to incorporate into the process, suggested $25 to 30 Million limit

Comment [ET34]: Lisa Hodgson
In looking at Page 15, item E. and F. it would seem a box needs to be added "Perform an Initial Risk Assessment" between "Was DBB Determined as the Probably PDM" and "Probable PDM Determined" and again "Perform an Initial Risk Assessment" between "Was a Probably PDM Determined?" and "Probable PDM Determined".

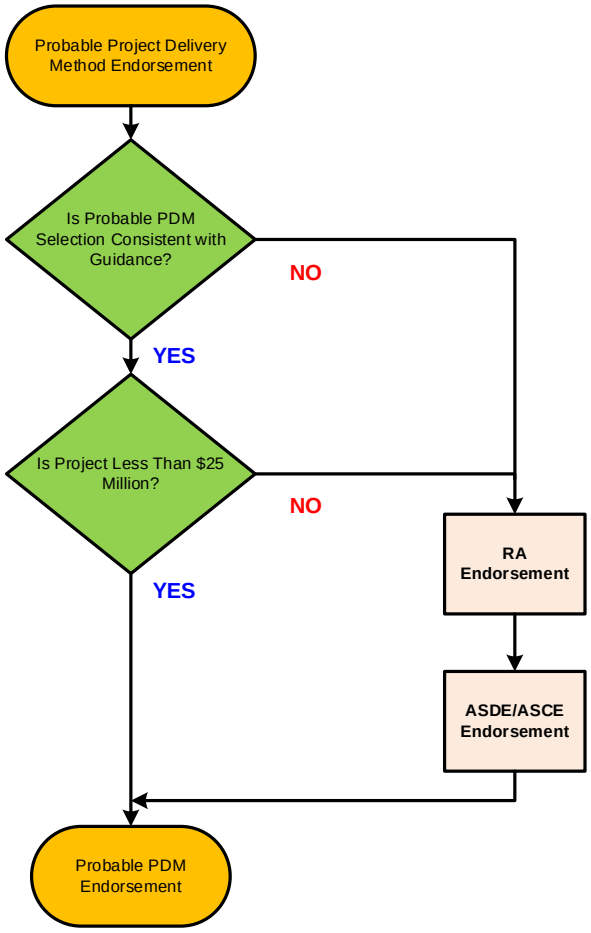
Resolution – will review and revise as needed.

3.4 Probable PDM Endorsement Process

I. Regional Administrator (RA) recommends and endorses Probable PDM if an exception to the guidance is requested or project budget is $25 Million or more.

II. Assistant State Design Engineer (ASDE) and Assistant State Construction Engineer (ASCE) review and endorse ~~A~~RA recommendation of the Probable PDM if an exception to the guidance for Probable PDM is requested or the project budget is $25 Million or more.

Figure 3.2 Probable Project Delivery Method Endorsement Flowchart



CHAPTER 4. Determination of the Final PDM

4.1 Participation

The Final PDM will be determined by the Project Engineer assigned to the design and/or construction of the project. The following staff members are expected to participate in this process:

4.1.1 *Final PDM Validation/Revision Process*

- Project Engineer/Project Design Lead assigned to the design/construction of the project (this may be different offices).
- Project Office/staff assigned to design and construct of the project, as appropriate.

4.1.2 *Final PDM Selection Matrix Workshop* ($100 Million or greater)

- Project Engineer/Project Design Lead assigned the design/construction of the project (this may be different offices.)
- Project Office/staff assigned to design and construct the project, as appropriate.
- Assistant State Design Engineer.
- Assistant State Construction Engineer.
- Facilitator - facilitators for the Selection Matrix Workshop will be trained for each region and may be shared between regions.

4.1.3 Final *Project Delivery Method Approval/Endorsement*

Once a Final PDM is selected, the following additional participation will occur:

- Regional Administrator.

Once a Final PDM is selected, the following additional participation may occur:

- Assistant State Design Engineer.
- Assistant State Construction Engineer.
- Chief Engineer
- CPARB PRB Sub Committee

4.2 Tasks Prior to PDM Validation/Revision Process/Selection Matrix Workshop

1. Read this Project Delivery Method Selection Guidance.
2. Complete the training for the Selection Checklist, Selection Matrix and/or Selection Matrix Workshop

Comment [ET35]: Bob Adams says: 4.1, page 18. Assigning the responsibility to determine the PDM to the Project Engineer assigned to the design may not result in the best business decision for the department.

Per earlier comment
Resolution- No Change - the process has several checks and balances on the PEO for bias, also PEO needs to buy into the method at this stage, needs to be actively engaged.

Comment [HL36]: Please note often in the design phase the project office that will construction project is unknown.

Resolution – will reference this in guidance

Comment [HL37]: Please note often in the design phase the project office that will construction project is unknown.

Resolution – will reference this in guidance

Comment [HL38]: How does Table 1.2 roll into this section? Should there be a section titles CRA/CEVP Workshop added? Seems like we need to address defer final approval till after the CRA/CEVP Workshop in accordance with P. 12.
Resolution – will review and revise as needed.

Comment [HL39]: Per page 1 Executive Summary this is required for GCCM

Resolution – Agree will review to make sure other elements not left out.

3. Review project information and identify changes (scope, schedule, preliminary drawings, gGoals, risks and constraints).
4. Complete the Project Description - refine and revise as needed.
5. Identify Project Goals and Constraints - refine and revise as needed.
6. Identify risks or Review Risk Assessment (if applicable) - refine and revise as needed.
7. Review information associated with any related or expanded tasks for an upcoming CRA or CEVP process.

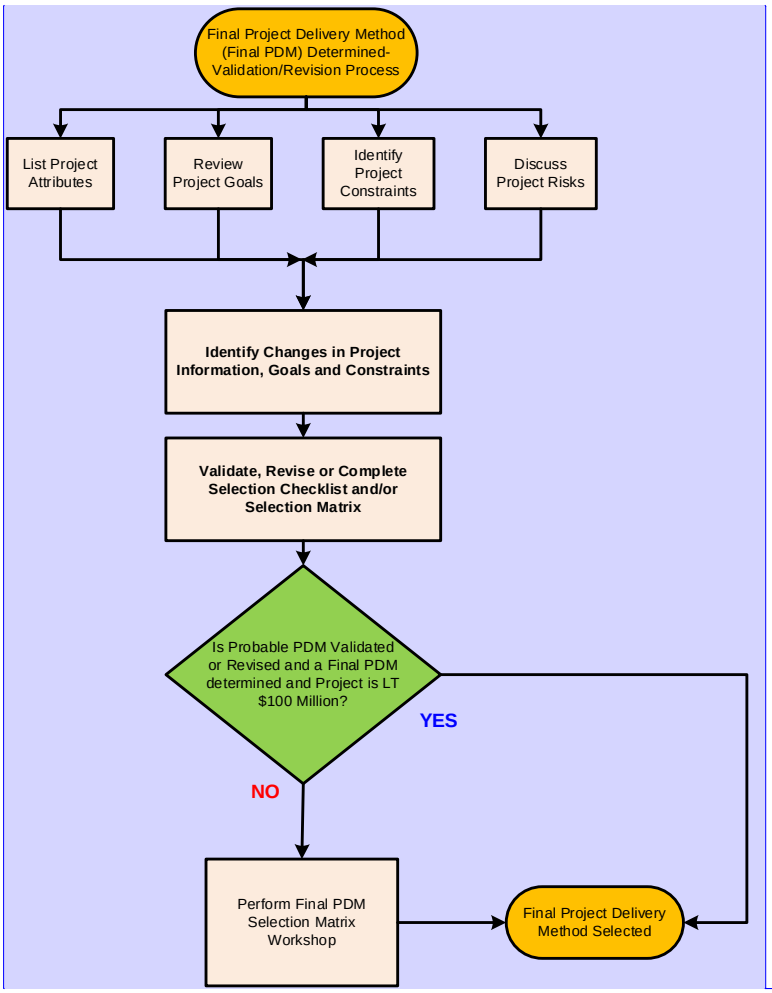
4.3 Final PDM Determination – Process Flow Narrative

The process is shown in the outline below and in Figure 4.1. It consists of individual steps followed in sequential order and follows, in general, milestones outlined in the Deliverables Expectation Matrix (Appendix A.1).

4.4 Final PDM Determination - Validation/Revision Process

I. Identify any changes in Project information (scope, schedule, budget, goals, etc.).
II. Revise the original Selection Checklist and/or Selection Matrix with additional information and changes, if any.
III. If any of the follow are true, Perform the Selection Matrix Workshop
    1. There is no clear choice.
    2. The Probable PDM was not validated, and the revised Selection Checklist and/or Selection. Matrix does not clearly indicate a Final PDM.
    3. The project cost is $100 Million or ~~over~~more.
    4. The Project Engineer chooses to perform the Selection Workshop.

Figure 4.1 Final PDM Determination - Validation/Revision Process Flowchart



Comment [ET40]: Lisa Hodgson: Green triangle has "LT" – think this was supposed to be "Less Than"? **Resolution – Yes - will review and revise as needed.**

4.5 Final PDM Determination - Selection Matrix Workshop

I. Assemble Workshop Team/Pre-work.

II. Identify Project Goals.

   a. Goals associated with the following are included in the Matrix:

      1. Schedule.
      2. Cost/Funding.
      3. Standards.
      4. Function (Complexity & Innovation).

III. Identify Project Constraints and eliminate Project Delivery Methods that fail.

IV. Review Goal ratings, determine Weights and score matrix.

V. If the completed matrix indicates there is a clear choice of Final PDM, then perform an initial risk assessment for the selected PDM.

VI. If there is not a clear choice of Final PDM, then perform an initial risk assessment on all remaining Project Delivery Methods.

VII. If there is a clear choice of Final PDM, perform a pass/fail analysis of risks or goals associated with the following secondary factors to ensure that they are not relevant to the Selection.

   1. WSDOT staff experience/availability.
   2. Competition and contractor experience.

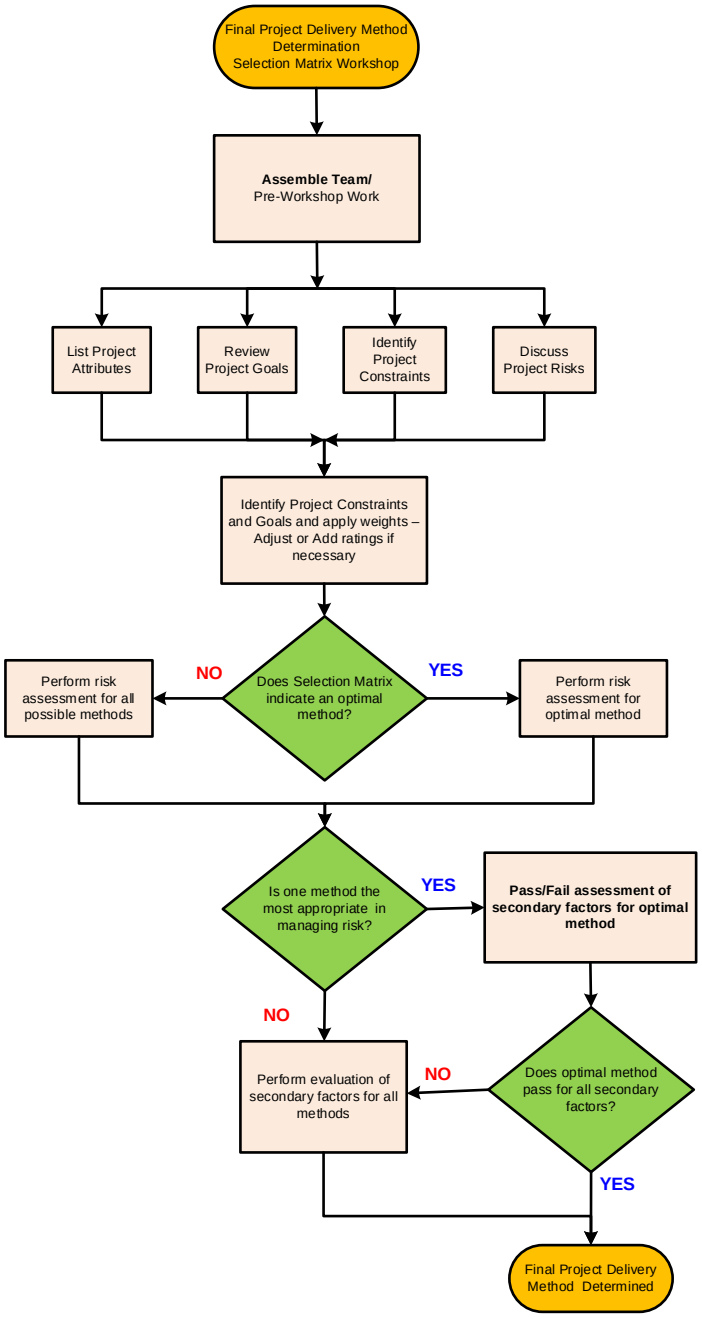
VIII. If the previous steps do not result in a clear determination of the Final PDM then perform a more rigorous evaluation of all goals and risks against the three potential methods of delivery (DBB, DB and GCCM).

   a. Are Project Goals clearly defined and weighed appropriately?

Comment [HL41]: Seems like there should be something that follows this statement, i.e., if answer is Yes, then do this and No, then do something else??

Resolution – will review and revise as needed.

Figure 4.2 Final PDM Determination - Selection Matrix Workshop Flowchart



4.6 Final Project Delivery Method (Final PDM) Approval Process

I. If the Project is less than $100 Million and complies with the guidance; then the Regional Administrator reviews and approves the Final PDM.

II. If the Project cost is $100 Million or more; then

A. The Regional Administrator endorses the Final PDM and recommends approval to HQ; and

B. The Assistant State Design Engineer and Assistant State Construction Engineer endorse the Final PDM.

III. If an exception to the guidance is requested for the Final PDM; then

A. The Regional Administrator reviews and recommends the Final PDM to HQ;

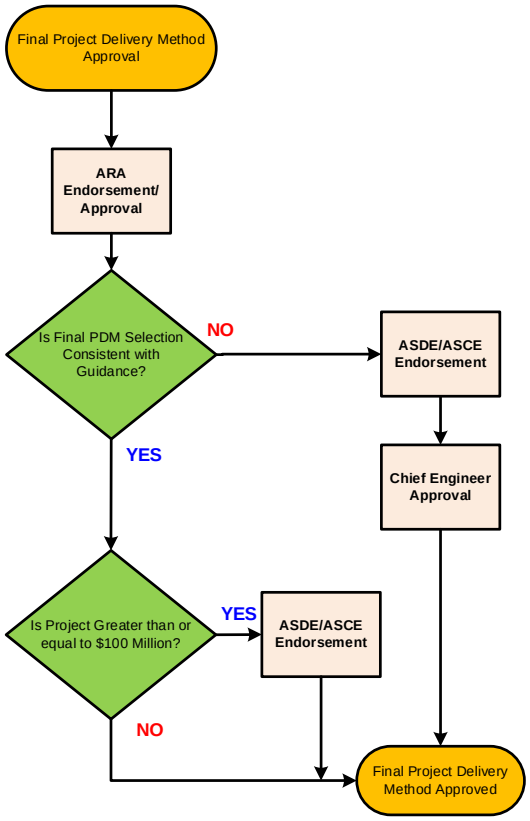
B. The Assistant State Design Engineer and Assistant State Construction Engineer review and endorse the Final PDM; and

C. The Chief Engineer reviews and approves the Final PDM.

Comment [HL42]: Per Executive Summary, Page 1, I read that to say regardless of the dollar amount, if the Final PDM is Design-Build it requires approval from the Chief Engineer and if GCCM then requires approval of Chief Engineer and CPARB PRB Sub Committee. If that is correct, then this section needs to be updated to reflect this.

Response - This was referring to the current policy, not the proposed approval process I will review the language in the executive summary and clarify.

Figure 4.3 Final PDM Approval Flowchart



Appendix A Worksheets and Forms

The following forms are included to facilitate this process.

A.1 Project Deliverables Expectation Matrix - Reference WSDOT Design Manual, 305.04(1)(b)

A.2 Tables of Project Delivery Method Selection Process Requirements by Project Cost

Tables are provided that show what level of the process is required based on Project Cost.

A.3 Project Delivery Method - Selection Checklist

Fill out the appropriate sections of the Selection Checklist to determine the Probable PDM or verify/revise for the Final PDM. Goals and Constraints may be used in Step 2 to refine the focus to determine the Probable PDM.

A.4 Project Delivery Method - Selection Matrix

Determine which of the provided Project Goals are applicable. Identify if any are Project Constraints (Pass/Fail). These are instrumental first steps of the process that will guide the selection of the Probable PDM. Weigh each goal based on its relative importance to the project, score each goal by possible PDM and total the scores with the highest score indicating the PDM. Check the selected PDM against risks and secondary factors. Provide assumptions and backup as required.

Project Delivery Method - Selection Matrix Workshop

Utilizing the Selection Matrix in a workshop setting, determine the Final PDM. Typically the workshop would utilize a facilitator and the team would evaluate the project attributes in more detail. Modify or create goals in the workshop. Identify if any are project constraints (Pass/Fail). Review and assign or modify ratings as needed. Weigh each goal based on relative importance to the project, score and total scores. Check the selected Final PDM against risks and secondary factors. Provide assumptions and backup as required.

A.5 Project Delivery Description Worksheet*

Provide information on the project. This includes size, type, funding, risks, complexities, etc. All information should be developed for the specific project. Document any assumptions, if necessary.

A.6 Contract Attribute Comparison Spreadsheet

This spreadsheet provides the project team with direction concerning typical Project Delivery Method pro's and con's associated with project attributes. This spreadsheet includes general information and is not intended to be all-inclusive. Use the spreadsheet as a supplement to determining specific pro's and con's related to your project's goals and attributes and the evaluation of rankings for the selection matrix, and assistance with evaluating risks.

Appendix A Worksheets and Forms

*A.7 Risk Assessment Guidance **

This guidance section provides the project team with additional assistance for evaluation of the risk factor including: Typical Transportation Project Risks; a General Project Risks Checklist; and a simplified qualitative risk analysis spreadsheet that can be used to record and evaluate risks relating to the PDM early in the project or for smaller or less complex projects. The WSDOT Qualitative Risk Analysis process and spreadsheets are referenced as links at the beginning of Appendix A.7.

*Note: Use of these tools is optional and they are provided to facilitate the organization of information at the discretion of the Project Engineer. The Project Engineer/Project Office would typically use the Project Definition Package and the PMP as the primary backup for the processes, workshops and required documentation. If pre-design funding is provided for the project, this additional information may be necessary to determine the Probable PDM.

A.1 Deliverable Expectation Matrix

	Project Definition and Summary (PE.PS.08)	Project Initiation and Alignment	Project Planning and Endorsement (10%)	Geometric Review (30%)	General Plans Review (60%)	Preliminary Contract Review (90%)	Final Contract Review (100%)	Contract Ad and Award	Project Close Out and Archiving
Milestone Purpose	Documents the project purpose, type, strategy, phase durations, budget, and recommended ad date.	Provides basis to charter project team and begins development of the PMP. (PE.PM.03.12)	Documents the key project criteria, assumptions, and deliverable format.	Documents design criteria and major design decisions. (PE.PD.42)	Design of major project elements completed, review for constructability and conformance with standards (PE.PD.75)	On small projects, this may be combined with the Final Contract Review. (PE.PD.80) On major projects, this is an added constructability review. (PE.PD.75) This is intended to be a near-final review. Items missing from design should be minor and should be documented to reviewers.	PS&E documents are reviewed by the Region (typically 10 weeks). At end of this review, Contract Plans are Ad Ready. (PE.PD.80)	Submittal of all final deliverables for owner acceptance. (PE.PD.90)	Archive and forward all required project records and files.
Decisions Frozen and Milestones Completed (Overview)		Expected level of effort Authorized budget Deliverable list (PE.PM.03.12)	Milestone dates set Study framework set Study criteria set Assumptions defined Design criteria set (PE.PD.42)	Design concept fixed Design features defined NEPA/SEPA approval obtained (PE.EV.11.60) Type size and location of all structures fixed (PE.BR) Footprint set Approval to begin ROW acquisition process (RW.PA) Approval of geometric design Design Concurrence/ Approval (PE.PD.42)	All key project elements and features that drive the project outcome and costs are defined. Type, size and location of key elements and features fixed. Geometric Review comments resolved and documented.	The deliverables are substantially complete Review and acceptance of design detail of key elements and features (PE.PD.75) Permits Obtained. All environmental permits are approved, verified, and accepted for inclusion into the plans (PE.EV.29) General Plans Review comments resolved & documented. (PE.PD.80)	The deliverables are complete. All review comments adjudicated. Plans and specifications stamped and sealed at end. ROW Certification (PE.PD.90.03) Final Project Approval (PE.PD.80)	Owner accepts design Approval to advertise ROW is clear (PE.PD.90)	PS&E documents boxed w/original plans & sent to Archive. (PE.PD.90.14) Electronic CAD and CAE files and supporting project documentation transmitted to the WSDOT Project Manager. (PE.PD.90.15)
Preliminary Engineering									
Design/PS&E Elements									
Project Management (PE.PM)	Project Definition completed. (PE.PS.08) Environmental Review Summary completed. (PE.PS.08.03) Design Decisions Summary completed. (PE.PS.08.02)	Project definition (description) completed (PE.PS.08) Team assignments made Team identification completed Roles & responsibilities established Measures of success identified Major Milestones established Boundaries of project identified Operating guidelines established Lessons Learned Review	Project Management Plan completed, including: Baseline schedule Budget Risk assessment Communication plan Change management plan QA/QC plan Endorsement (PE.PM.03)					Construction Project Management Plan completed (CN.03.PM.03)	Lessons Learned captured and reported Evaluation of team/ consultant performance completed (CN.03.PM.03)
Project Delivery Method Selection	Determine Probable PDM (May be deferred to pre-design phase if applicable)		Recommended: Determine Final PDM	Required: Determine Final PDM					

A.1 Deliverable Expectation Matrix

	Project Definition and Summary (PE.PS.08)	Project Initiation and Alignment	Project Planning and Scoping (10%)	Geometric Review (30%)	General Plans Review (60%)	Preliminary Contract Review (90%)	Final Contract Review (100%)	Contract Ad and Award (PE.PD.90)	Project Close Out and Archiving
Environmental Review, Permitting, and Documentation (PE.EV)	Environmental Review Summary completed (PE.PS.08.03) (Determine type of environmental documentation needed)	Verify Environmental Documentation and permits needed (PE.EV) Agreement on Area of Potential Affect for Section 106 and Action Area for ESA work (PE.EV.02)	Environmental Documentation and permits coordinated with agencies (PE.EV)	Agency and public coordination conducted (PE.PM.05) Complete determination if utility relocations will be included in WSDOT documents and permits (PE.PD.38) Permits needed verified and begin submitting applications (PE.EV.21 & PE.PD.70) Discipline studies, reports, and predecessor information completed (PE.EV.10) NEPA/SEPA approval (PE.EV.11)	All environmental permit applications submitted (PE.EV.21) Permits conditions coordinated with the design team and incorporated into the plans	All environmental permits approved, verified, and accepted for inclusion into the plans (PE.EV) All environmental special provisions approved and included in the PS&E plan set (PE.PD.50)	Environmental Commitment File completed (PE.EV.31)	Environmental Preconstruction Meeting (if applicable)	
Intersection, Channelization or Interchange Plans (PE.PD.20)	Channelization and intersection issues and deficiencies identified		Intersection improvement recommendations endorsed	Deviations and design exceptions submitted and approved (PE.PD.42) Channelization and Intersection Plans approved (PE.PD.42) Signal Permits completed (if required) Confirm phasing and pocket lengths with traffic operations		Approved Channelization Plan verified for consistency with plans and specifications (PE.PD.20.05)			
Estimates	Preliminary cost estimate developed for Project Definition (PE.PS.01)	Budget assumptions communicated	Determine if project needs Value Engineering (PE.PD.10) or Cost Risk Assessment/Cost Estimating Validation Process (PE.PD.04)	Cost estimate updated Right of Way Project Funding Estimate completed	Cost estimate updated Pay groups and pay items determined (PE.PD.65)	Cost estimate completed including below the line items Summary of quantities completed Item prices determined Lump sum cost detail completed (PE.PD.65)	Construction estimate finalized (PE.PD.65)		

A.1 Deliverable Expectation Matrix

	Project Definition	Project Initiation and Alignment	Project Planning and Scoping (10%)	Geometric Review (30%)	General Plans Review (60%)	Preliminary Contract Review (90%)	Final Contract Review (100%)	Contract Ad and Award	Project Close Out and Archiving
Roadway Geometrics and Plans (PE.PD.20)	Project limits identified Affected alignments identified New versus existing alignment determined Lane/shoulder widths determined Design matrix identified Design speed defined Preliminary design criteria established (PE.PS)		Design criteria/ parameters approved Preliminary footprint designed	Typical roadway section(s) completed, identifying station to station roadway geometrics, surfacing type & depth, slope information, guardrail, vertical cut locations, and construction notes Deviations & design exceptions approved (PE.PD.42.30 and .50) Mainline and major horizontal, & vertical alignments, and superelevations designed Design Approval obtained (PE.PD.42.10)	All horizontal & vertical alignments & superelevations completed DDP updated as required (PE.PD.42)	All geometric plans completed (alignment, profiles, roadway sections, interchange contours, site preparation, road approach plans, etc.) Design compared to endorsed design criteria/ parameters (PE.PD.50)			
Hydraulics & Water Quality (PE.PD.22) (also see Temporary Erosion and Sediment Control (TESC)) (PE.PD.50.65)	Design criteria identified Drainage Deficiencies identified in accordance with Maintenance and Regional Hydraulics Storm water Management requirements identified Water quality requirements identified Retrofit Cost-Effectiveness and Feasibility (RCEF) Phase 1 Analysis (PE.PS)	Deficiencies confirmed with Maintenance	Hydraulic and Water Quality issues identified Deficiencies confirmed with Project/Design Team Storm water Management and Report Requirements and type documented Sensitive Area Documentation completed (Water Resource Inventory). Stormwater Management Strategy endorsed (PE.EV.10)	TS&L of drainage facilities determined Preliminary Hydraulic Report completed, including: o Documentation of deficiencies o Existing basins and flows for anticipated TDAs o Identification of Minimum Requirements from Highway Runoff Manual (HRM). Storm Water Report submitted to region for review and approval Hydraulic Report Submitted Preliminary Stormwater Management options to identify Right of Way needs completed (PE.PD.22)	Retrofit Cost- Effectiveness and Feasibility (RCEF) Phase 2 Analysis Hydraulic Report approved (PE.PD.22.05)	Approved Hydraulic Report 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			
Illumination Also refer to "Expectation for Illumination Reviews" matrix.			Decision on design standards, equipment, etc. completed	Refer to Deliverables in the Illumination Matrix "Permitting Submittal Review" Warrant Analysis completed	Refer to Deliverables in the Illumination Matrix "Intermediate PS&E Submittal Review"	Refer to Deliverables in the Illumination Matrix "PS&E Pre-Submittal Review"	Refer to Deliverables in the Illumination Matrix "Final PS&E Submittal Review"		

A.1 Deliverable Expectation Matrix

	Project Definition	Project Initiation and Alignment	Project Planning and Scoping (10%)	Geometric Review (30%)	General Plans Review (60%)	Preliminary Contract Review (90%)	Final Contract Review (100%)	Contract Ad and Award	Project Close Out and Archiving
ITS Also refer to "Expectation for ITS Reviews" matrix.			ITS design methodology for review completed Type, size, and location completed Decision made on design standards, equipment	Refer to Deliverables in the ITS Matrix "Permitting Submittal Review" Soils analysis request for special design CCTV or ramp-meter foundations submitted Preliminary Signal Plan submitted to HQ Traffic for approval	Refer to Deliverables in the ITS Matrix "Intermediate PS&E Submittal Review"	Refer to Deliverables in the ITS Matrix "PS&E Pre-Submittal Review"	Refer to Deliverables in the ITS Matrix "Final PS&E Submittal Review"		
Right of Way (RW) (PE.PD.28 & RW)	Requirements for Right of Way documented (PE.PS)	Preliminary Right of Way needs identified	Title reports ordered (PE.PD.28.10)	Right of Way plan completed and approved (PE.PD.28.14) ROW Appraisals completed (RW.PA) Relocation Plan completed (RW.PA.60) Right of Way Project Funding Estimate prepared Right of Entry for project investigations obtained (PE.PD.28.12)	ROW appraisal reviews completed and offers made ROW acquisition and Relocation initiated (RW.PA)	Right of Way negotiations completed	Right of Way relocations completed (RW.PA.09)	Right of Way certified (PE.PD.90.10)	
Roadside Restoration (PE.PD.32)	Roadside Restoration Worksheet completed – define impacts and estimate restoration to meet Roadside Classification Plan requirements Complete determination if Roadside Restoration will be included in construction contract or in a separate contract.	Scope of work for mitigation and roadside restoration efforts defined Need for coordination of visual elements in project identified Determine if Visual Quality Assessment is required for Environmental Document	Visual Quality Analysis developed (PE.EV.10.17) Complete verification of roadside impacts, scope and estimate for restoration of roadside Wetland areas delineated for survey	Site Analysis completed Functional Analysis completed Conceptual Design completed Conceptual Irrigation/planting Plan completed Preliminary Plant Palette completed. Mitigation Site Selection completed. Evaluation of TS&L of Structures and Walls and determine treatment for visual aspects completed	Preliminary irrigation layout completed Necessary agreements identified (water, electric, maintenance) Coordination completed with Architect to detail treatment of visual elements completed Final Conceptual Plans, Grading and Planting plans for Mitigation report completed Coordination completed with Environmental and Biology for Mitigation Report Development	Landscape Architect stamps plans for roadside restoration, environmental mitigation, irrigation and contour plans Recommend preferred option to accomplish required plant establishment beyond 1st year	Commitment file transmitted to construction PE		

A.1 Deliverable Expectation Matrix

	Project Definition	Project Initiation and Alignment	Project Planning and Endorsement (10%)	Geometric Review (30%)	General Plans Review (60%)	Preliminary Contract Review (90%)	Final Contract Review (100%)	Contract Ad and Award	Project Close Out and Archiving
Roadside Safety (PE.PD.20.08)		IHSDM - (Interactive Highway Safety Design Model) utilized, if applicable	Accident & crash history reviewed Conflicting traffic movements (diverging, merging, weaving, crossing) identified Pedestrian & bicycle needs identified Non-standard barrier identified Access review completed (PE.PD.14)	Fall restraint requirements identified Complete coordination of proposed removal of significant vegetation with Landscape Architect Clear Zone Inventory & Evaluation completed (PE.PD.06.05) Utility conflicts identified (PE.PD. 06.20.06 and PE.PD.38) Geometric mitigations, e.g., shoulder widening, incorporated into design Geometric Check completed – Intersections, horizontal, vertical sight distances	Hazard Mitigation completed– i.e. barrier length of need, fixed objects, attenuator design, drainage structures ADA requirements completed	Quantity Tabulation completed		Utility relocation coordination completed	
Signals (PE.PD.36) Also refer to "Expectation for Signal Reviews " matrix.			Signal design methodology completed	Refer to Deliverables in the Signals Matrix "Permitting Submittal Review" Signal permit submitted to WSDOT. (PE.PD.36.04)	Refer to Deliverables in the Signals Matrix "Intermediate PS&E Submittal Review"	Refer to Deliverables in the Signals Matrix "PS&E Pre-Submittal Review"	Refer to Deliverables in the Signals Matrix "Final PS&E Submittal Review"		
Signing (PE.PD.36.01)				Sign layout completed, including overhead signs Existing signs to reuse, and relocate determined Existing sign inventory completed (include associated electrical items for sign lighting or flashing signs) Potential conflicts between light standards and signal poles with signs identified	Visual standards for corridor coordinated with Landscape Architect (PE.PD32, PE.EV.10.17) Signing plans, notes, sign specifications completed Conflicts with illumination and/or signal features, drainage or utilities identified Coordination with luminaries on structures or walls identified and mounting/foundation details completed Requests for sign structure submitted to HQ Bridge and Structures (PE.BR.02.03) Service load and line loss calculations completed Utility Agreement and Utility Relocation Requests submitted (PE.PD.38.04)	Signing detail sheets completed			

A.1 Deliverable Expectation Matrix

	Project Definition	Project Initiation and Alignment	Project Planning and Endorsement (10%)	Geometric Review (30%)	General Plans Review (60%)	Preliminary Contract Review (90%)	Final Contract Review (100%)	Contract Ad and Award	Project Close Out and Archiving
Soils & Paving (PE.PD.16 and PE.PD.18)	Scoping Level Surfacing (Pavement Design) Report completed, including: o WSPMS/Historical Data/Maintenance Input o Projected Traffic Type/Usage o Existing Conditions/Primary Deterioration	Project soils investigations defined Scoping Level Pavement Design reviewed Onsite field investigation scheduled (schedule and initiate no sooner than 1 year prior to construction) Topographic survey requested Region materials resurfacing report requested	Soils investigation initiated Field and Core Investigation completed Draft Pavement Design Report completed Borings coordinated with signals, high mast & sign structures, and ITS CCTV poles	Soils and Geotechnical Report completed (PE.PD.16 and PE.PD.18) Pavement Resurfacing Report completed Draft Surfacing Report (PE.PD.16.20) (Pavement Design Report) completed and approved by Region, (forwarded to State Materials Lab for concurrence) Foundation Design checked as requested by Design PEO for signals/illumination Complete assessment and initiation of on-site field testing as required. (Forward to State Material's Lab if required)	Draft Surfacing Report (Pavement Design Report) completed (PE.PD.16.20) Final Pavement Design Document stamped by Region and forwarded to State Material's Lab for signed concurrence Foundation Design for signals/illumination completed Rec Plan completed	Final Pavement Design Document with Region stamp and State Material's Lab signed concurrence to Region for Plan Review All permits and environmental requirements completed Materials Source Report completed and submitted to State Material's Lab	Boring logs submitted	Geotechnical Report compiled for contractor review Geotechnical Report & cross-sections posted on website Pavement Repair quantities and locations reviewed with Construction PEO for verification of field accuracy	
Specifications (PE.PD.60)					Specifications run list completed Specialty groups specifications and special provisions completed Pay groups and pay items determined	Prepare summary of quantities Determine item prices All special provisions submitted for review and approval	Approved Specifications included in PS&E		
Structures (Bridges, Retaining Walls, Noise Walls, high mast lighting, sign structures) (PE.BR and PE.PD.18) Also refer to "Expectation for Structural Reviews" matrix.		Scope for TS&L Determined Structural Input on Environmental Documentation and Permits Provided	Structural Participation in Agency Coordination Provided	Refer to Deliverables in the Structural Matrix "Intermediate PS&E Submittal Review" Complete TS&L (Preliminary Bridge Plan, PE.BR.02.02) Bridge and Wall Site Date Completed for Preferred Structural Alternative (PE.BR.01) Structural Permitting Submittal Review Completed (includes constructability review for viable construction method, sequence, and schedule)	Refer to Deliverables in the Structural Matrix "PS&E Pre-submittal Review"	Refer to Deliverables in the Structural Matrix "Final PS&E Review"	Refer to Deliverables in the Structural Matrix "Ad Copy"		

A.1 Deliverable Expectation Matrix

	Project Definition	Project Initiation and Alignment	Project Planning and Endorsement (10%)	Geometric Review (30%)	General Plans Review (60%)	Preliminary Contract Review (90%)	Final Contract Review (100%)	Contract Ad and Award	Project Close Out and Archiving
Survey & Mapping (PE.PD.06)		Project survey requirements finalized, including areas that may be outside roadway corridor improvements.	Project survey control completed Cadastral survey performed Topographic Survey performed	Design level mapping completed Record of Survey completed and filed (PE.PD.28.07) Right of Way plan completed and approved (PE.PD.28.14) Relocation plan completed (RW.PA.09)	Mapping of new roadway features completed Field review of proposed features completed	DNR Permits to Destroy Monuments obtained (PE.PD.28.09)	Preliminary construction staking data completed		
Temporary Erosion and Sediment Control (TESC) (PE.PD.50.14)				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	
Traffic Analysis (PE.PD.34)			Traffic Impact Analysis (TIA) scope established	Accident Analysis completed Traffic Operational Analysis completed	Assumptions and conclusions in Traffic Analysis verified for consistency with design				
Utilities (PE.PD.38)	Utilities within the project limits notified Washington Utilities Transportation Commission (WUTC) permit application for railroad crossings submitted	Potential utility relocations identified Responsibility for costs established	Utility As-Builts requested Railroad (RR) issues identified (PE.PD.26) Relocation cost responsibility defined Franchise and permit documentation collected Utility relocation strategy for project established	Utility Plan with as-built information completed and transmitted to Utilities (PE.PD.38.02) Preliminary Utility conflicts identified Utility Object Relocation Record (UORR) sent to utilities Project Overview Meeting held with Utility Owners Subsurface Utility Engineering (SUE) Quality Level C & D completed Determination of need for SUE Quality Level A & B Relocation plans and schedule requested from utilities Franchise and permit process initiated Cost recovery accounts initiated Utility property rights verified Railroad standard Construction Maintenance Agreement (CMA) obtained (PE.PD.26.06	Utility conflicts confirmed and relocation letters sent to utilities Utility relocation meeting held Utility Relocation Plans and schedules obtained and approved (PE.PD.38.03) Utility and railroad agreements completed (PE.PD.38.04), (PE.PD.26.06) Utility permits and franchises obtained Finalize utility agreements (costs responsibility estimate complete) (PE.PD.38.04), (PE.PD.26.06)	Utility Relocation Plan information and specifications Incorporated in PS&E Letters of Understanding issued to utilities requiring relocation Utility, service, and railroad agreements completed (PE.PD.38.04), (PE.PD.26.06) Utility relocation and schedule monitored and coordination completed Construction Maintenance Agreement completed		Utility relocation work completed	

A.1 Deliverable Expectation Matrix

	Project Definition	Project Initiation and Alignment	Project Planning and Endorsement (10%)	Geometric Review (30%)	General Plans Review (60%)	Preliminary Contract Review (90%)	Final Contract Review (100%)	Contract Ad and Award	Project Close Out and Archiving
Public Involvement Plan (PE.PM.05)		Define Stakeholders List	Public Involvement Plan completed (PE.PM.05.01)						
Work Zone Traffic Control (PE.PD.40)		Basic traffic control strategies and alternatives completed	Traffic control strategy completed	Preliminary traffic control layouts completed	Traffic control plans showing Construction Sequence and staging completed (PE.PD.40.04)	Final traffic control plans completed (PE.PD.40.04) Final detour plans completed PE.PD.40.05)	Traffic Control Plans Completed (PE.PD.40.04) and associated Specials approved		

A.2 Tables of PDMS Process Requirements

Table 1.1 Determining Probable Project Delivery Method

Estimated Project Cost	Required Process
• Less than $2 Million	Part 1 of Selection Checklist
• Less than $25 Million, or • Part 1 of Checklist does not determine a Probable PDM	Part 1, 2 and 3 of Selection Checklist
• $25 Million or greater, or • Parts 2 and 3 of the Checklist do not determine a Probable PDM	Selection Matrix

Comment [ET43]: Update table – put a link here instead???

Table 1.2 Determining Final Project Delivery Method

Estimated Project Cost	Required Process
• Less than $2 Million	Validate or Revise Part 1 of Selection Checklist
• Less than $25 Million, or • Validation/Revision of Part 1 of Checklist does not determine a Final PDM	Validate, Revise or Complete Part 1, 2 and 3 of Selection Checklist
• $25 Million or greater, or • Validation/Revision of Parts 2 and 3 of the Checklist does not determine a Final PDM	Validate, Revise or Complete Selection Matrix
• $100 Million or more, or • Validation/Revision of the Selection Matrix does not determine a Final PDM	Selection Matrix Workshop

A.3 Project Delivery Method Selection Checklist

Project Name		☐ **Probable PDM** **Date**_____ ☐ **Final PDM** **Date**_____	
Project Status	☐ Definition ☐ Initiation & Alignment ☐ Planning & Endorsement (~10% Design) ☐ Geometric Review (~30% Design)		
PART IA (SEE APPENDIX C)		DBB Only	DBB, DB or GCCM
Level of Design	A. Is the design over 30% complete and DBB was used as the PDM to this point?	☐ Yes	☐ No
Cost	B. Is the Project Estimate $2 Million or less	☐ Yes	☐ No
	Note: RCW does not allow use of DB for a project less than $2 Million		
ANY **Yes** answers above indicate Design-Bid-Build as the Project Delivery Method			
Part IA: Probable Project Delivery Method Recommendation ☐ DBB Only ☐ DBB, DB or GCCM (Go to Part IB) ☐ Exception (Go to Part IB) If DBB Only is selected, skip Parts II and III and go to Part IV **Part IA: Final Project Delivery Method Recommendation** ☐ DBB Only ☐ DBB, DB or GCCM (Go to Part IB) ☐ Exception (Go to Part IB) If DBB Only is selected, skip Part II and III and go to Part V			
PART IB (SEE APPENDIX C)		DBB or DB	DBB, DB or GCCM
Cost	C. Is the Project Estimate $10 Million or less?	☐ Yes	☐ No
	Note: Would not typically use GCCM for a project at $10 Million or less.		
A **Yes** answer above indicate GCCM is not a viable Project Delivery Method			
Part IB: Probable Project Delivery Method Recommendation ☐ DBB or DB Only (Go to Part II) and cross out GCCM as a Viable Option ☐ DBB, DB or GCCM (Go to Part II) **Part IB: Final Project Delivery Method Recommendation** ☐ DBB or DB Only (Go to Part II) and cross out GCCM as a Viable Option ☐ DBB, DB or GCCM (Go to Part II)			

PART II SEE APPENDIX C FOR GUIDANCE ON FILLING OUT THIS CHECKLIST				IS QUESTION RELATED TO A GOAL OR CONSTRAINT?
Schedule	A. Are there 3rd party agreements with local government or agencies that require a full design before execution? (Does it impact a significant portion of the project?)	**DBB/GCCM** ☐ Yes	**DB** ☐ No	**Goal** ☐ **Const** ☐
	Justification:			
	B. Are there long lead, lengthy environmental permits or ROW issues that would delay start of Construction? (Does it impact a significant portion of the project?)	**DBB/GCCM** ☐ Yes	**DB** ☐ No	**Goal** ☐ **Const** ☐
	Justification:			
	C. Is early obligation of funds necessary? (Such as a deadline to obligate grant funding)	**DB** ☐ Yes	**DBB/GCCM** ☐ No	**Goal** ☐ **Const** ☐
	Justification:			

Comment [ET44]: Phil Larson says:
Why should the level of design over 30% be a reason only use DBB?

Resolution: we are considering removing this from the Checklist- this is assuming our old process and only affects the interim projects until this process is fully in place.

A.3 Project Delivery Method Selection Checklist

	D. Is there time to prepare 100% design?	**DBB/GCCM** ☐ Yes	**DB** ☐ No	**Goal** ☐ **Const** ☐
	Justification:			
	E. Is there a need to compress the schedule?	**DB** ☐ Yes	**DBB/GCCM** ☐ No	**Goal** ☐ **Const** ☐
	Justification:			
	F. Is the Project Schedule impacted by funding limits (such as the Biennium)?	**DBB/GCCM** ☐ Yes	**DB/DBB/GCCM** ☐ No	**Goal** ☐ **Const** ☐
	Justification:			
Complexity and Innovation	G. Are there significant risks that could be better managed by others than WSDOT?	**DB** ☐ Yes	**DBB/GCCM** ☐ No	**Goal** ☐ **Const** ☐
	Justification:			
	H. Does the project involve specialty engineering or high-tech designs or have other opportunities for innovation?	**DB/GCCM** ☐ Yes	**DBB** ☐ No	**Goal** ☐ **Const** ☐
	Justification:			
	I. Does the project require complex phasing and staging with the possibility of high impacts to the public?	**DB/GCCM** ☐ Yes	**DBB** ☐ No	**Goal** ☐ **Const** ☐
	Justification:			
	J. Does an existing road or facility need to remain in service? (no options for detour or an alternate facility available) (Does it impact a significant portion of the project?)	**DB/GCCM** ☐ Yes	**DBB** ☐ No	**Goal** ☐ **Const** ☐
	Justification:			
	K. Is WSDOT willing to give up control of design and/or construction on this project?	**DB** ☐ Yes	**DBB/GCCM** ☐ No	**Goal** ☐ **Const** ☐
	Justification:			
Cost/ Funding	L. Is early certainty of the total project cost important? (Increased certainty of total cost early in the project needed due to funding or project constraints)	**DB** ☐ Yes	**DBB/GCCM** ☐ No	**Goal** ☐ **Const** ☐
	Justification:			

The following PDM Options are indicated from the responses to the questions in Part II (Constraints and Goals)

☐ **DBB** ☐ **DB** ☐ **GCCM**

Exceptions	(Optional) Describe Exception to the guidance provided by the questions in Part II:

Comment [ET45]: Phil Larson says:
F. We have had funding impacts on past DB.

Resolution: No change - Past DB projects were not approved unless all funding in place. Then language was added to contracts affected by biennium funding which has since had to be modified. Projects of moderate size affected by the biennium or other funding limits impact the ability to use DB.

Comment [ET46]: Phil Larson says:
WSDOT still has "control". The control comes from the RFP.

Resolution – No change – the control of the design decisions rests with the EOR who work for the Design-Builder, not the Owner on a DB project. The owner controls the design and is responsible for design errors on DBB and GCCM.

A.3 Project Delivery Method Selection Checklist

	Provide Justification for the Exception:		
PART III: RCW REQUIREMENTS TO USE DESIGN-BUILD OR GENERAL CONTRACTOR/CONSTRUCTION MANAGER			
Design-Build **RCW 47.20.785**	**1. Is the preliminary Engineer's Estimate between $2 Million or over?**	☐ **Yes**	☐ **No**
	If the answer to 1 is yes, continue with questions 1a through 1d. If no, Design-Build is not a viable option.		
	1a. Are construction activities highly specialized?	☐ Yes	☐ No
	1b. Is a DB approach critical in developing the construction methodology?	☐ Yes	☐ No
	1c. Does the project provide opportunity for greater innovation and efficiencies between the designer and builder?	☐ Yes	☐ No
	1d. Would use of DB result in significant reduction to the overall project schedule or critical milestones?	☐ Yes	☐ No
	If yes was selected for any of questions 1a through 1d, Design-Build is a viable PDM option.		
GCCM **RCW 39.10.340**	**2. Will CPARB approval to use GCCM be requested?**	☐ **Yes**	☐ **No**
	If the answer to 2 is yes, continue with questions 2a through 2e. If no, General Contractor/ Construction Manager is not a viable option.		
	2a: Does the project involve complex scheduling, phasing or coordination?	☐ Yes	☐ No
	2b: Does the project involve construction at an occupied facility which must continue to operate during construction?	☐ Yes	☐ No
	2c: Is involvement of General Contractor/Construction Manager input during design critical to project success?	☐ Yes	☐ No
	2d: Does the project encompass a complex or technical work environment?	☐ Yes	☐ No
	2e: Does the project require specialized work on a building that has historic significance?	☐ Yes	☐ No
	If yes was selected for any of questions 2a through 2e, General Contractor/Construction Manager is a viable PDM option.		

A.3 Project Delivery Method Selection Checklist

PART IV: PROBABLE PROJECT DELIVERY METHOD
☐ **A Probable Delivery Method has been determined** ☐ DBB ☐ DB ☐ GCCM
☐ **More than one Viable Options have been determined and the Selection Matrix will be completed** ☐ DBB ☐ DB ☐ GCCM

Preparer Name and Title:	**Authorizing Name and Title:**
Preparer Signature:	**Authorizing Signature:**
State Construction Office Endorsement	**ASCE Signature:**
State Design Office Endorsement	**ASDE Signature:**

PART V: FINAL PROJECT DELIVERY METHOD
☐ **A Final Project Delivery Method has been determined through validation or revision of this Checklist** ☐ DBB ☐ DB ☐ GCCM
☐ **More than one Viable Options have been determined and the Selection Matrix and/or Workshop will be completed** ☐ DBB ☐ DB ☐ GCCM

Preparer Name and Title:	**Authorizing Name and Title:**
Preparer Signature:	**Authorizing Signature:**
State Construction Office endorsement	**ASCE Signature:**
State Design Office endorsement	**ASDE Signature:**

Attach Project Information, assumptions and additional justification to Form.

A.4 Selection Matrix

Project Name_____ _____ Determining Probable PDM Date:_____

_____ Determining Final PDM Date:_____

Pass/Fail Constraints	Project Goals	Weight	Design-Bid-Build		Design-Build		General Contractor/ Construction Manager	
			Rating	Score	Rating	Score	Rating	Score
	Schedule							
	Minimize project delivery time		2		5		3	
	Meet a specific critical Milestone or Completion date		2		5		4	
	Utilize (federal) funding by a certain date		3		5		3	
	Effectively manage weather, environmental and/or other construction windows		3		5		4	
	Minimize impacts to schedule due to funding limitations (such as the biennium)		5		2		5	
	Cost/Funding							
	Minimize project cost (typically considered neutral)		3		3		3	
	Complete the project on budget (typically considered neutral)		3		3		3	
	Maximize the project scope and improvements within the budget		2		4		4	
	Project cost must not exceed a specific amount		3		3		5	
	Determine the total project cost as early as possible in the schedule		2		5		3	

Comment [ET47]: Phil Larson says: Why give DB only a 3 here. We have an upset amount with most projects and then a BAFO.

Response – ratings for this item included the owner control of design and a negotiated not to exceed number on the construction for GCCM and was based on industry pro's and con's related to the different contracting method. I will run this through the committee again to see if the group is open to an adjustment.

A.4 Selection Matrix

Project Name:_____ Probable PDM or Final PDM (circle one) Date:_____

Pass/Fail Constraints	Project Goals	Weight	Design-Bid-Build		Design-Build		General Contractor/ Construction Manager	
			Rating	Score	Rating	Score	Rating	Score
	Standards							
	Meet or exceed project quality/scope requirements - utilizing opportunities for innovation		3		5		4	
	Provide high quality design and construction utilizing design **constraints and Standards and Owner Control**		5		2		4	
	Provide an aesthetically pleasing project through Owner Control		5		3		5	
	WSDOT controls specific project elements (such as significant right of way or environmental impacts)		5		3		5	
	Function							
	Maximize the life cycle performance of the project (assume maintenance and operations is not part of DB)		5		2		5	
	Maximize capacity and mobility of improvements		3		5		5	
	Minimize impacts to the public and/or local businesses during construction		2		5		5	
	Incorporate opportunities for innovation and efficiencies to meet specific requirements		2		5		4	
	Avoid or minimize impacts to environmentally sensitive areas through risk transfer		3		5		5	

Attach Project Information, Assumptions and additional Justification to Form.

Comment [ET48]: Phil Larson says: Once again the RFP gives the owner control over the standards. For DB at WSDOT the design manual is followed along with the other standard WSDOT uses to complete all designs. Why should DB only get a 2 here.

Response – I will try to clarify the wat his goal is written, the ratings are based on the contractual relationships between the owner and the EOR – in DB, WSDOT does not contract with the EOR and does not control the design decisions.

Comment [ET49]: Phil Larson says: DB have it follow the aesthetics in the RFP. How is this different from DBB or GCCM?

Response- Aesthetics are very difficult to define in a performance contract document like an RFP. Again, the owner control of the design decisions allow the owner to guide the minute choices associated with something like aesthetics.

Comment [ET50]: Phil Larson says: WSDOT has control over this in the RFP and BC.

Response – I think this goal can be written more clearly – Minimize the operations and maintenance costs of the project – DB minimizes the capital cost as the expense of operational and maintenance costs unless this is hardwired into the RFP – which defeats the purpose of DB. If operations and maintenance of the improvement are added to the DB contract, then the capital cost verses operations and maintenance are balanced. WSDOT does not currently do this type of DB so it is not considered in the rating

Comment [ET51]: Phil Larson says: Currently if we have an ATC it is reviewed by maintenance. Manitenance and operations are part of DB.

See response above

A.5 Project Description Worksheet

The following items should be considered in describing the specific project. This form is optional and may be used to summarize the project attributes. Other project information such as the Project Definition Package and PMP is the source information and should be attached. Make sure to identify assumptions.

Project Attributes
Project Name and Status (level of Design):
Location:
Project Goals:
Estimated Budget:
Estimated Project Schedule:
Required Project Completion or Milestone Dates (if applicable):
Source(s) of Project Funding:
Project Corridor:
Major Features of Work – pavement, bridge, sound barriers, etc.:
Major Schedule Milestones:
Major Project Stakeholders:
Assumptions:
Major Obstacles with Right of Way, Utilities, and/or Environmental Approvals:
Major Obstacles during Construction Phase:
Preliminary Risks Identified:
Safety Issues:
Construction Requirements:

A.6 Contract Attribute Comparison Spreadsheet

ITEM	DESIGN-BID-BUILD (DBB)	DESIGN-BUILD (DB)	GENERAL CONTRACTOR / CONSTRUCTION MANAGER (GC/CM)
PROCUREMENT			
Requirements	DBB provides for a path to execute public work through a competitive process resulting in award to the lowest cost bidder.	DB project delivery may be used by WSDOT on projects over $10 million. For projects between $2-10M DB may be used with the approval of CPARB. In both cases, they must meet the criteria in RCW. May be used if: 1) efficiency between design and build teams are realized 2) savings in delivery time in necessary 3) specialized team is required	GCCM process may be used by WSDOT on projects generally over $10 million with the approval of CPARB. May be used if: 1) complex scheduling or phasing 2) facility is occupied and continue to operate during construction 3) GCCM input in design is critical to project success 4) complex or technical work environment 5) Is there specialized work on a building with historic significance.
RCW	RCW 39.80 & 39.04	RCW 47.20.785	RCW 39.10
Procurement of Contract	Design-Bid-Build is the traditional Project Delivery Method in which WSDOT designs, or retains a designer to furnish complete design services, and then advertises and awards a separate construction contract based on the designer's completed construction documents. In DBB, WSDOT has control over the entire process and is responsible for the details of design during construction and as a result, is responsible for the cost of any errors or omissions encountered in construction. In DBB, selection of the Contractor is based solely on price with award of the contract based on Apparent Low Bid.	Design-Build is a Project Delivery Method in which WSDOT procures both design and construction services in the same contract from a single, legal entity referred to as the Design-Builder. At WSDOT, the method typically uses a two-phase selection process where Design-Builders are shortlisted based on qualifications in the first phase and then selected based on price and approach in the second phase. This Project Delivery Method allows the phases of design and construction to overlap. The Design-Builder becomes involved early in project development, at approximately the 15% to 30% design level, offering opportunities for innovation and improved constructability, and confirming project costs early. The Design-Builder controls the details of design and is typically responsible for the cost of any design errors or omissions encountered in construction. Per RCW 47.20.785, WSDOT can use Design-Build project delivery for projects over $10 Million. For projects between $2 and $10 Million, WSDOT must get approval from the Capital Project Advisory Review Board to use Design-Build project delivery.	General Contractor/Construction Manager is a Project Delivery Method in which WSDOT contracts separately with a Contractor as a Construction Manager and either performs design or contracts with an engineering firm to provide a design. The Construction Manager is selected early in the project development phase (10% to 30% Design) to provide design and constructability input. WSDOT retains control of the design of the project and is typically responsible for design errors and omissions during construction on GCCM projects. As the design nears completion, WSDOT and the Construction Manager work to negotiate a Maximum Allowable Construction Cost (MACC) for the project. Upon successful negotiation of the MACC, the Construction Manager becomes the General Contractor and works at-risk for the final cost and construction schedule. The early Contractor input associated with GCCM delivery is especially suited for projects that are technically complex, require complicated phasing and staging, or require operability of the facility (such as a ferry terminal) during construction. WSDOT must get approval from the Capital Project Advisory Review Board before using GCCM project delivery.
COST			
Pro's	☐ Competitive bidding provides a low cost bid for construction to a fully defined scope of work ☐ Increase certainty about cost estimates for Construction because project fully designed before bidding ☐ Construction costs and/or unit prices are contractually set before construction begins	☐ Contractor input into design should moderate cost ☐ Design-Builder collaboration and ATCs can provide a cost-efficient response to Project Goals ☐ Costs are contractually set early in design process with design-build proposal ☐ Allows a variable scope bid to match a fixed budget ☐ Potential lower average cost growth ☐ Funding can be obligated in a very short timeframe ☐ Potential for fewer cost change orders as the Design-Builder is responsible for design errors and the associated costs	☐ WSDOT/designer/contractor collaboration to reduce project risk can result in lowest project costs ☐ Early contractor involvement can result in cost savings through VE and constructability ☐ Cost will be known earlier when compared to DBB ☐ Integrated design/construction process can provide a cost efficient strategies to Project Goals ☐ Can provide a cost efficient response to the Project Goals
Con's	☐ Cost accuracy is limited until design is completed ☐ Construction costs are not locked in until design is 100% complete ☐ Cost reductions due to contractor innovation and constructability is difficult to obtain ☐ More potential of cost change orders due to WSDOT design responsibility (WSDOT responsible for design errors)	☐ Risks related to design-build, lump sum cost without 100% design complete, can impact final cost due to unknowns at the time of the RFP	☐ Non-competitive negotiated MACC introduces price risk ☐ Difficulty in MACC negotiation introduces some risk that MACC will not be successfully executed requiring aborting the GCCM process ☐ Paying for contractors involvement in the design phase may increase total cost ☐ More potential of cost change orders due to WSDOT design responsibility (WSDOT responsible for design errors)

A.6 Contract Attribute Comparison Spreadsheet

ITEM	DESIGN / BID / BUILD (DBB)	DESIGN / BUILD (DB)	GENERAL CONTRACTOR / CONSTRUCTION MANAGER (GC/CM)
Level of Design			
Pro's	☐ 100% design by WSDOT or WSDOT selected consultants ☐ WSDOT has complete control over the design (can be beneficial when there is one specific solution for a project) ☐ Project scope can be developed/changed during the design without change orders☐ The scope of the project is well defined through complete plans and contract documents ☐ Well-known process to the industry	☐ Design advanced by the WSDOT to level necessary to precisely define the contract requirements and properly allocate risk ☐ Does not require much design to be completed before awarding project to the Design-Builder (between ~ 10% - 30% complete) ☐ Contractor involvement in early design, which improves constructability and innovation ☐ Plans do not have to be as detailed because the Design-Builder is bought into the project early in the process and will accept design responsibility	☐ Can utilize a lower level of design prior to selecting a contractor then collaboratively advance design with WSDOT, designer and contractor ☐ Contractor involvement in early design improves constructability ☐ WSDOT controls design ☐ Design can be used for DBB if the price is not successfully negotiated ☐ Design can be responsive to risk minimization
Con's	☐ WSDOT design errors can result in a higher number of change orders, claims, etc. ☐ Minimizes competitive innovation opportunities ☐ Can reduce the level of constructability since the contractor has no input into the project until after the design is complete	☐ Must have very clear definitions and requirements in the RFP because it is the basis for the contract ☐ If design is too far advanced it will limit the advantages of design-build ☐ Potential for lacking or missing scope definition if RFP not carefully developed ☐ Over utilizing performance specifications to enhance innovation can risk quality through reduced technical requirements ☐ Less WSDOT control over the design ☐ Can reduce WSDOT design consistency statewide.	☐ Teaming and communicating concerning design can cause disputes ☐ Three party process can slow progression of design ☐ If design is too far advanced it will limit the advantages of GCCM or could require design backtracking
SCHEDULE			
Pro's	☐ Schedule can be more predictable and more manageable with a complete design ☐ Milestones can be easier to define with a complete design ☐ Projects can more easily be “shelved” with a complete design ☐ Shortest procurement period (Bid period is typically shorter than the RFQ/RFP processes) ☐ Elements of design can be advanced prior to permitting, construction, etc. ☐ Time to communicate/discuss design with stakeholders	☐ Potential to accelerate schedule through parallel design-build process ☐ Shifting schedule risk to DB team ☐ Obligates construction funds more quickly ☐ Industry input into design and schedule ☐ Fewer chances for disputes between WSDOT and Design-Builders ☐ More efficient procurement of long-lead items ☐ Ability to start construction before entire design, ROW, etc. is complete (i.e., phased design) ☐ Allows innovation in resource loading and scheduling by DB team ☐ Schedule delays due to design error the responsibility of the Design-Builder	☐ Ability to start construction before entire design, ROW, etc. is complete (i.e., phased design) ☐ More efficient procurement of long-lead items ☐ Early identification and resolution of design and construction issues (e.g., utility, ROW, and earthwork) ☐ Can provide a shorter procurement schedule than DB ☐ Team involvement for schedule optimization ☐ Continuous constructability review and VE ☐ Maintenance of Traffic improves with contractor inputs ☐ Contractor input for phasing, constructability and traffic control may reduce overall schedule
Con's	☐ Requires time to perform a linear design-bid-construction process ☐ Design and construction schedules can be unrealistic due to lack industry input ☐ WSDOT is responsible for design errors which can lead to change orders and schedule delays ☐ Low bid selection may lead to potential delays and other adverse outcomes.	☐ Request for proposal development and procurement can be intensive ☐ Undefined events or conditions found after procurement, but during design can impact schedule and cost ☐ Time required to define technical requirements and expectations through RFP development can be intensive ☐ Time required to gain acceptance of quality program ☐ Requires WSDOT and stakeholder commitments to an expeditious review of design	☐ Potential for not reaching MACC and substantially delaying schedule ☐ MACC negotiation can delay the schedule ☐ Designer-contractor-WSDOT disagreements can add delays ☐ Strong WSDOT management is required to control schedule ☐ WSDOT is responsible for design errors which can lead to change orders and schedule delays

A.6 Contract Attribute Comparison Spreadsheet

ITEM	DESIGN / BID / BUILD (DBB)	DESIGN / BUILD (DB)	GENERAL CONTRACTOR / CONSTRUCTION MANAGER (GC/CM)
Project Complexity and Innovation			
Pro's	☐ WSDOT can have more control of design of complex projects ☐ WSDOT and consultant expertise can select innovation independently of contractor abilities ☐ Opportunities for value engineering studies during design, more time for design solutions ☐ Aids in consistency and maintainability ☐ Full control in selection of design expertise ☐ Complex design can be resolved and competitively bid	☐ Designer and contractor collaborate to optimize means and methods and enhance innovation ☐ Opportunity for innovation through draft RFP, best value and ATC processes ☐ Can use best-value procurement to select Design-Builder with best qualifications ☐ Constructability and VE inherent in process ☐ Early team integration ☐ Sole point of responsibility for design and construction	☐ Highly innovative process through three party collaboration ☐ Allows for WSDOT control of a designer/contractor process for developing innovative solutions ☐ Allows for an independent selection of the best qualified designer and best qualified contractor ☐ VE inherent in process and enhanced constructability ☐ Risk of innovation can be better defined and minimized and allocated ☐ Can take to market for bidding as contingency if MACC negotiations fail
Con's	☐ Innovations can add cost or time and restrain contractor's benefits ☐ No contractor input to optimize costs ☐ Limited flexibility for integrated design and construction solutions (limited to constructability) ☐ Difficult to assess construction time and cost due to innovation	☐ Requires desired solutions to complex designs to be well defined through technical requirements (difficult to do) ☐ Qualitative designs are difficult to define (example. aesthetics) ☐ Risk of time or cost constraints on designer inhibiting innovation ☐ Some design solutions might be too innovative or unacceptable ☐ Quality assurance for innovative processes are difficult to define in RFP	☐ Process depends on designer/CM relationship ☐ No contractual relationship between designer/CM ☐ Innovations can add cost or time ☐ Scope additions can be difficult to manage ☐ Preconstruction services fees for contractor involvement ☐ Cost competitiveness – single source negotiated MACC
Staff Experience and Availability			
Pro's	☐ WSDOT, contractors and consultants have high level of experience with the traditional system ☐ Designers can be more interchangeable between projects ☐ Smaller number of technical staff required through use of consultant designer	☐ Less WSDOT staff required due to the sole source nature of DB ☐ Opportunity to grow WSDOT staff by learning a new process	☐ WSDOT can improve efficiencies by having more project managers on staff rather than specialized experts ☐ Smaller number of technical staff required through use of consultant designer
Con's	☐ Can require a high level of WSDOT staffing of technical resources ☐ Staff's responsibilities are spread out over a longer design period ☐ Can require staff to have full breadth of technical expertise	☐ Limitation of availability of staff with skills, knowledge and personality to manage DB projects ☐ Existing staff may need additional training to address their changing roles ☐ Need to "mass" WSDOT management and technical resources at critical points in process (i.e., RFP development, design reviews, etc.)	☐ Strong committed WSDOT project management is important to success ☐ Limitation of availability of staff with skills, knowledge and personality to manage GCCM projects ☐ Existing staff may need additional training to address their changing roles ☐ WSDOT must learn how to negotiate MACC projects

A.6 Contract Attribute Comparison Spreadsheet

ITEM	DESIGN / BID / BUILD (DBB)	DESIGN / BUILD (DB)	GENERAL CONTRACTOR / CONSTRUCTION MANAGER (GC/CM)
Level of Oversight and Control			
Pro's	☐ Full WSDOT control over a linear design and construction process ☐ Oversight roles are well understood ☐ Contract documents are typically completed in a single package before construction begins ☐ Multiple checking points through three linear phases: design-bid-build ☐ Maximum control over design	☐ A single entity responsible for project design and construction ☐ Allows overlap between design and construction ☐ Getting input from construction to enhance constructability and innovation ☐ Overall project planning and scheduling is established by one entity	☐ Preconstruction services are provided by the construction manager ☐ Getting input from construction to enhance constructability and innovation ☐ Provides WSDOT control over an integrated design/construction process
Con's	☐ Requires a high-level of oversight ☐ Increased likelihood of claims due to WSDOT design responsibility ☐ Limited control over an integrated design/construction process	☐ Can require high level of design oversight ☐ Can require high level of quality assurance oversight ☐ Limitation on staff with DB oversight experience ☐ Less WSDOT control over design ☐ Control over design relies on proper development of technical requirements	☐ WSDOT must have experienced staff to oversee the GCCM ☐ Higher level of cost oversight required
Competition and Contractor Experience			
Pro's	☐ Promotes high level of competition in the marketplace ☐ Opens construction to all reasonably qualified bidders ☐ Transparency and fairness ☐ Reduced chance of corruption and collusion ☐ Contractors are familiar with DBB process	☐ Allows for a balance of qualifications and cost in Design-Builder procurement ☐ Two-phase process can promote strong teaming to obtain “Best Value” ☐ Increased opportunity for innovation possibilities due to the diverse project team	☐ Allows for qualifications based contractor procurement ☐ WSDOT has control over an independent selection of best qualified contractor ☐ Contractor is part of the project team early on, creating a project “team” ☐ Increased opportunity for innovation due to the diversity of the project team
Con's	☐Risks associated with selecting the low bid (the best contractor is not necessary selected) ☐No contractor input into the process ☐Limited ability to select contractor based on qualifications	☐ Need for DB qualifications can limit competition ☐ May be lack of competition with past experience with the Project Delivery Method and WSDOT (although this is not the current experience on NWR projects) ☐ Issues with the DB team selected for the project can impact communications and collaboration ☐ The gap between WSDOT experience and contractor experience with Project Delivery Method can create conflict	☐ Currently there is not a large pool of contractors with experience in GCCM, which will reduce the competition and availability ☐ Working with only one contractor to develop MACC can limit price competition ☐ Requires a strong project manager from the WSDOT ☐ A common point of failure is Teamwork and communication between WSDOT, the designer and the Contractor, which is critical to project success

A.7 Risk Assessment Guidance for PDM Selection

For assistance evaluating preliminary risks, utilize the link below to WSDOT Risk Assessment webpage.

http://www.wsdot.wa.gov/Projects/ProjectMgmt/RiskAssessment/and select the "Project Risk Management Guide".

It is recommended that the qualitative risk analysis is utilized for evaluating the risks associated with the project and procurement method.

Additionally, a simplified Qualitative risk analysis is attached to facilitate identification of risks in the early stages of the project and for small or less complex projects.

Much of the following information came from University of Boulder, Colorado, Project Delivery Selection Matrix with revisions to conform to WSDOT policy and procedures.

Three documents are provided in this appendix to assist in an initial risk assessment relative to the selection of the Project Delivery Method:

- Typical Transportation Project Risks
- General Project Risks Checklist
- Simplified Qualitative Risk Analysis

It is important to recognize that the initial risk assessment is only to ensure the selected PDM can properly address the project risks. A more detailed level of risk assessment, as described in the WSDOT Project Risk Management Guide, should be performed concurrently with the development of the procurement documents to ensure that project risks are properly allocated, managed, and minimized through the procurement and implementation of the project.

A.7 Risk Assessment Guidance for PDM Selection

Typical Transportation Project Risks

Following is a list of project risks that are frequently encountered on transportation projects and a discussion on how the risks are resolved through the different Project Delivery Methods.

1) Site Conditions and Investigations

DESIGN-BID-BUILD

Site condition risks are generally best identified and mitigated during the design process prior to procurement to minimize the potential for change orders and claims when the schedule allows.

DESIGN-BUILD

Certain site condition responsibilities can be allocated to the Design-Builder provided they are well defined and associated third party approval processes are well defined. Caution should be used as unreasonable allocation of site condition risk will result in high contingencies during procurement. WSDOT should perform site investigations in advance of procurement to define conditions and avoid duplication of effort by proposers. At a minimum, WSDOT should perform the following investigations:

1) Basic design surveys;
2) Hazardous materials investigations to characterize the nature of soil and groundwater contamination, if any;
3) Geotechnical baseline report to allow Design-Builders to perform proposal design without extensive additional geotechnical investigations.

GCCM

WSDOT, the designer, and the contractor can collectively assess site condition risks, identify the need to perform site investigations in order to reduce risks, and properly allocate risk prior to determining the MACC.

2) Utilities

DESIGN-BID-BUILD

Utility risks are best allocated to WSDOT, and mostly addressed prior to procurement to minimize potential for claims when the schedule allows.

DESIGN-BUILD

Utilities responsibilities need to be clearly defined in contract requirements, and appropriately allocated to both Design-Builder and WSDOT.

A.7 Risk Assessment Guidance for PDM Selection

GCCM

Can utilize a lower level of design prior to contracting and joint collaboration of WSDOT, designer, and contractor in the further development of the design.

3) Railroads (if applicable)

DESIGN-BID-BUILD

Railroad risks are best resolved prior to procurement and relocation designs included in the project requirements when the schedule allows.

DESIGN-BUILD

Railroad coordination and schedule risks should be well understood to be properly allocated and are often best assumed by WSDOT. Railroad design risks can be allocated to the designer if well defined. Best to obtain an agreement with railroad defining responsibilities prior to procurement

GCCM

Railroad impacts and processes can be resolved collaboratively by WSDOT, designer, and contractor. A lengthy resolution process can delay the MACC negotiations.

5) Environmental

Meeting environmental document commitments and requirements, noise, historic, wetlands, endangered species, etc.

DESIGN-BID-BUILD

Risk is best mitigated through design prior to procurement when the schedule allows.

DESIGN-BUILD

Certain environmental approvals and processes that can be fully defined can be allocated to the Design-Builder. Agreements or MOUs with approval agencies prior to procurement is best to minimize risks.

GCCM

Environmental risks and responsibilities can be collectively identified, minimized, and allocated by WSDOT, the designer, and the contractor prior to determining the MACC

6) Third Party Involvement

Timeliness and impact of third party involvement (funding partners, adjacent municipalities, adjacent property owners, project stakeholders, FHWA, Utilities).

A.7 Risk Assessment Guidance for PDM Selection

DESIGN-BID-BUILD

Third party risk is best mitigated through the design process prior to procurement to minimize potential for change orders and claims when the schedule allows.

DESIGN-BUILD

Third party approvals and processes that can be fully defined can be allocated to the Design-Builder. Agreements or MOUs with approval agencies prior to procurement is best to minimize risks.

GCCM

Third party approvals can be resolved collaboratively by WSDOT, designer, and contractor.

A.7 Risk Assessment Guidance for PDM Selection

General Project Risk Checklist (Items to consider when assessing risk) from University of Boulder, Colorado, Project Delivery Selection Matrix

Environmental Risks	External Risks
☐ Delay in review of environmental documentation ☐ Challenge in appropriate environmental documentation ☐ Defined and non-defined hazardous waste ☐ Environmental regulation changes ☐ Environmental impact statement (EIS) required ☐ NEPA/ 404 Merger Process required ☐ Environmental analysis on new alignments required	☐Stakeholders request late changes ☐Influential stakeholders request additional needs to serve their own commercial purposes ☐Local communities pose objections ☐Community relations ☐Conformance with regulations/guidelines/ design criteria ☐Intergovernmental agreements and jurisdiction
Third-Party Risks	**Geotechnical and Hazmat Risks**
☐ Unforeseen delays due to utility owner and third-party ☐ Encounter unexpected utilities during construction ☐ Cost sharing with utilities not as planned ☐ Utility integration with project not as planned ☐ Third-party delays during construction ☐ Coordination with other projects ☐ Coordination with other government agencies	☐Unexpected geotechnical issues ☐Surveys late and/or in error ☐Hazardous waste site analysis incomplete or in error ☐Inadequate geotechnical investigations ☐Adverse groundwater conditions ☐Other general geotechnical risks
Right-of-Way/ Real Estate Risks	**Design Risks**
☐ Railroad involvement ☐ Objections to ROW appraisal take more time and/or money ☐ Excessive relocation or demolition ☐ Acquisition ROW problems ☐ Difficult or additional condemnation ☐ Accelerating pace of development in project corridor ☐ Additional ROW purchase due to alignment change	☐ Design is incomplete/ Design exceptions ☐ Scope definition is poor or incomplete ☐ Project purpose and need are poorly defined ☐ Communication breakdown with project team ☐ Pressure to delivery project on an accelerated schedule ☐ Constructability of design issues ☐ Project complexity - scope, schedule, objectives, cost, and deliverables - are not clearly understood
Organizational Risks	**Construction Risks**
☐ Inexperienced staff assigned ☐ Losing critical staff at crucial point of the project ☐ Functional units not available or overloaded ☐ No control over staff priorities ☐ Lack of coordination/ communication ☐ Local WSDOT issues ☐ Internal red tape causes delay getting approvals, decisions ☐ Too many projects/ new priority project inserted into program	☐ Pressure to deliver project on an accelerated schedule. ☐ Inaccurate contract time estimates ☐ Construction QC/QA issues ☐ Unclear contract documents ☐ Problem with construction sequencing/ staging/ phasing ☐ Maintenance of Traffic/ Work Zone Traffic Control

A.7 Risk Assessment Guidance for PDM Selection

Assessment of Risk Project Delivery Selection Opportunities/Obstacles Checklist

DESIGN-BID-BUILD	
Opportunities	**Obstacles**
☐ Risks managed separately through design, bid, build is expected to be easier ☐ Risk allocation is most widely understood/used ☐ Opportunity to avoid or mitigate risk through complete design ☐ Risks related to environmental, railroads, & third party involvement are best resolved before procurement ☐ Utilities and ROW best allocated to WSDOT and mostly addressed prior to procurement to minimize potential for claim ☐ Project can be shelved while resolving risks	☐ WSDOT accepts risks associated with project complexity (the inability of designer to be all-knowing about construction) and project unknowns ☐ Low-bid related risks ☐ Potential for misplaced risk through prescriptive specifications ☐ Innovative risk allocation is difficult to obtain ☐ Limited industry input in contract risk allocation ☐ Change order risks can be greater ☐ Contractor may avoid risks
DESIGN-BUILD	
Opportunities	**Obstacles**
☐ Performance specifications can allow for alternative risk allocations to the Design-Builder ☐ Risk-reward structure can be better defined ☐ Innovative opportunities to allocate risks to different parties (e.g., schedule, means and methods, phasing) ☐ Opportunity for industry review of risk allocation (draft RFP, ATC processes) ☐ Avoid low-bid risk in procurement ☐ Contractor will help identify risks related to environmental, railroads, ROW, and utilities ☐ Designers and contractors can work toward innovative solutions to, or avoidance of, unknowns	☐ Need a detailed project scope, description etc., for the RFP to get accurate/comprehensive responses to the RFP (Increased RFP costs may limit bidders) ☐ Limited time to resolve risks ☐ Additional risks allocated to designers for errors and omissions, claims for change orders ☐ Unknowns and associated risks need to be carefully allocated through a well-defined scope and contract ☐ Risks associated with agreements when design is not completed ☐ Poorly defined risks are expensive ☐ Contractor may avoid risks or drive consultant to decrease cost at risk to quality
GCCM	
Opportunities	**Obstacles**
☐ Contractor can have a better understanding of the unknown conditions as design progresses ☐ Innovative opportunities to allocate risks to different parties (e.g., schedule, means and methods, phasing) ☐ Opportunities to manage costs risks through GCCM involvement ☐ Contractor will help identify and manage risk ☐ WSDOT still has considerable involvement with third parties to deal with risks ☐ Avoids low-bid risk in procurement ☐ More flexibility and innovation available to deal with unknowns early in design process	☐ Lack of motivation to manage small quantity costs ☐ Increase costs for non-proposal items ☐ Disagreement among Designer-Contractor-WSDOT can put the process at risk ☐ If MACC cannot be reached, additional low-bid risks appear ☐ Limited to risk capabilities of GCCM ☐ Designer-contractor-WSDOT disagreements can add delays ☐ Strong WSDOT management is required to negotiate/optimize risks ☐ Discovery of unknown conditions can drive up MACC, which can be compounded in phased construction

A.7 Risk Assessment Guidance for PDM Selection

Simplified Qualitative Risk Analysis for preliminary evaluation of risk for PDM Selection Project Name: _____ Date:_____					
Identify Risks	What are possible Causes?	Probability (L-M-H)	Seriousness (L-M-H)	Possible Preventative Action	Possible Mitigating Action (If it happens anyway)

Background

Before you can fill out the Selection Checklist, you must develop the Project Definition Package far enough to have a firm grasp of the project attributes including the scope, schedule and budget. You will also need to identify the Project Goals and determine Project Constraints. Finally, project risks will need to be identified.

The Project Definition Package may be used directly or the Project Engineer may choose to summarize the information on the Project Description Form provided in Attachment A.

Project Limitations/Decisions – Even during the Definition of a Project, some decisions and project limitations may have already been established. Identify and document these decisions to keeps them visible during the project development and the identification of the Project Goals and Constraints.

Project Goals – If you have worked on a WSDOT Design-Build Project, you may be familiar with the goals generated as part of the Design-Builder selection process in the RFQ and ITP. These goals are currently developed and provided in the letter requesting approval to use DB instead of DBB. These goals can be contract centric and may be emphasized due to the contracting method already selected. The Engineer must first establish the overall Project Goals to provide the evaluation criteria for the decision making processes associated with the Probable PDM selection, and then later develop the RFP/ITP goals specific to the contract procurement process, if needed.

Project Goals

Step 1 - Identification Process

A quick way to establish Project Goals is to picture your project as complete with a celebration in process. What goals should be accomplished as part of the project for the project to be considered as success?

Typical Projects Goals may include:

- Schedule Goals
    - Minimize Project Schedule
    - Complete on Schedule
    - Achieve Specific Milestones
    - Incorporate other project schedules
    - Utilize funding by a certain date
    - Seasonal issues
    - Project closeout issues
- Cost Goals
    - Minimize Project Cost

    - Complete Project within budget
    - Maximize the Scope and improvements within the budget
    - Project must not exceed a specific amount
    - Minimal changes will be accepted (limited Contingency)
    - Minimize Operations and Maintenance Costs
    - Utilize Staff effectively
    - Sufficient competition to insure a competitive price
- Standards
    - Meet or exceed quality/scope requirements utilizing innovation
    - High quality scope of work utilizing design constraints and standards
    - Aesthetics
    - Proscriptive Standards required to be used
    - Meet all regulatory requirements
    - Meet the standards required by other agencies and 3rd party agreements
    - WSDOT control of significant ROW impacts
    - WSDOT control of significant environmental impacts
    -
- Functional
    - Maximize the Life Cycle Performance
    - Maximize capacity and/or mobility of improvements
    - Incorporate future planned improvements
    - Avoid or Minimize impacts to the traveling public
    - Seek opportunities for innovation
    - Avoid or minimize impacts to the environment
    - Maintain operations of a facility during construction
    - Maintain Safety during construction

Step 2 - Remove Neutral Goals

Once you have identified Project Goals, remove any goals that are neutral. These would be goals that have the same relative ability to be met regardless of the PDM, so the rating is identical for each PDM. Neutral Goals do not have an impact on the contracting method selection decision.

Step 3 - Prioritize Project Goals

The Project Engineer may use a zero to 5 score, or High, Medium and Low, or whatever method suits them to prioritize the Project Goals. (Utilizing zero to 5 will allow the Project Engineer to use the priority scores as a starting point for Goal Weights if they use the Selection Matrix).

Start by picking out the goal considered the highest priority and assign it a “5” or “H”. Now evaluate each Goal by comparing it with the starting, highest Goal. Has it the same importance? Is a little more important than the first Goal? Assign and adjust the priority and continue with the highest priority Goal, until all Project Goals are ranked. The Engineer may end up with 4 or 5 higher priority Project Goals,

although more complex projects may have more. Break the Project Goals into two groups, Primary and Secondary. The Engineer will typically focus on Primary Project Goals in this process, unless the result is indeterminate, and then the Secondary Project Goals may assist in making a decision on the Probable PDM.

Step 4 – Identify Project Constraints

Next evaluate the Highest Priority Project Goals ("5" or "H" Goals) to determine if any are constraints. Constraints differ from Project Goals in that they MUST be accomplished for project success. If there are any Project Constraints, they are typically initially identified as a high level goal. Evaluate the "5's" or any "H" level Project Goals to see if they are a constraint. Project decisions and limitations identified in the project information can assist with establishing Constraints verses Project Goals.

Identifying Constraints can be difficult. If the Engineer is unsure they should leave it as a high priority Goal. If it is really a Constraint, they will be able to double check this later in the process. Avoid the temptation to make every high priority Goal into a Constraint.

End of Appendix B

2.18 INTELLIGENT TRANSPORTATION SYSTEMS

2.18.1 GENERAL

The Design-Builder shall conduct all Work necessary to meet the requirements for Intelligent Transportation Systems (ITS) in accordance with this RFP and shall keep the existing ITS functioning throughout construction of the Project.

The Design-Builder shall maintain electrical power to all ITS devices during construction. The Design-Builder shall maintain communications between all ITS devices and the traffic management center (TMC) during construction.

The Design-Builder shall design, furnish, and install complete ITS including, but not limited to, the following elements:

- ***Communication conduit system.
  - Two 4-inch mainline conduits (each with 4-inch innerducts) and lateral conduits for fiber optic cables to ITS devices.
- Communication cables and interfaces.
  - Fiber optic mainline and distribution cables. Preterminated patch panels and ancillary equipment for fiber splicing, as required.
- Closed circuit television (CCTV) system.
  - Cameras and camera control cabinets.
- Traffic data accumulation and ramp metering system (ES).
- Ramp meters, data stations, and traffic detection loops.
- Highway Advisory Radio (HAR) System.
  - HAR transmitter , HAR sign, and control cabinets.
- Environmental Sensor Station (ESS).
- Interconnect to traffic signal controllers.
- Variable message signs (VMS).
- Signs, structures, and control cabinets.
- Associated video, voice, and data distribution and transmission equipment; and communication equipment in ITS, traffic signal, and ***toll cabinets***.
- Transformer cabinet, junction boxes, pull boxes, cable vaults, conduit, and any ancillary equipment required to create a fully-functioning and operable ITS as defined by the Mandatory Standards.
- System and equipment testing as required.
- Foundations, property restoration, and incidental Work.
- Toll Equipment:
  - Toll rate signs (TRS) and cabinets.
  - Roadside toll collection cabinets.

Comment [jlb1]: **Aug 25, 2015 12:24 PM Vernon Klingman says:**
Hi, there. The template often references the WSDOT NW Region ITS Current Practices Supplement and the WSDOT NW Region ITS Design Requirements. Would you like me to review these documents as well? I'm curious if they address some things. The template mentions separating networks for ITS elements (pg 19). Do the supplements address how the networks are to be separated? This can be done with Ethernet switches, fiber optic distribution or both. Also, the WSDOT has sometimes wanted spare devices, but the contractor has not felt obligated to provide them as they have not been required for a functioning system. Do the supplements address this issue? Lastly, the template mentions replacing all existing cameras within the project limits with new cameras. The new cameras are IP, so they must now be located much closer to the cabinets due to the distance limitations of Ethernet communication. This means that replacing cameras could likely involve a major overhaul of the existing ITS network. It could require the replacement and or addition of not only cameras but also poles and cabinets. It may be a good idea to highlight this issue somehow in the ...

Comment [jlb2]: **Aug 31, 2015 1:54 PM Chris Thomas says:**
The ITS documents you are referring to have been replaced with a new one; the Intelligent Transportation Systems Design Requirements. This document is being used statewide, but is owned by the Northwest Region (me). It is for use with all design, not just DB projects. We should talk abou ...

Comment [jlb3]: **Sep 1, 2015 9:15 AM Vernon Klingman says:**
Yes, Cohu and I have discussed the extender. I think that would be an excellent idea.

Comment [jlb4]: **Aug 21, 2015 3:43 PM Phil Larson says:**
When you look at 2.18 ITS without the project infromation there is not much to comment on. It is the information added for each project which causes challenges on the project.

No Change

Comment [jlb5]: **Aug 21, 2015 4:50 PM Bart Cima says:**
The ITS Current Practices Supplement and the ITS Design Guide should be incorporated into the ITS Special Provisions.

ITS Design Requirements takes the place of these two documents- change on page 3

Comment [jlb6]: **Aug 31, 2015 9:17 AM Chris Thomas says:**
Already commented on this

Comment [jlb7]: **Aug 31, 2015 9:43 AM Chris Thomas says:**
Other Items: Toll Equipment: • Toll rate signs (TRS) and cabinets • Roadside toll collection cabinets • Uninterruptible power supply (UPS) for TRS • Gantries and ancillary equipment for Toll Lanes • ITS communication and conduit infrastructure to support Express Toll Lanes ...

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- Uninterruptible power supply (UPS) for TRS.
- Gantries and ancillary equipment for Toll Lanes.
- ITS communication and conduit infrastructure to support Express Toll Lanes.

- ~~New VMS are not required for this Project.~~ ***

2.18.1.1 FORWARD COMPATIBILITY

***The Design-Builder shall design the following ITS elements to be Forward Compatible in accordance with the General Provisions:

- Communication conduit system,
- Cabinets,
- Digital message signs,
- Cameras and Camera Poles,~~.~~
- Communication cables and interfaces, and
- TRS structures.***

- ***This Section has been intentionally omitted.***

2.18.1.2 ITS TASK FORCE

Refer to Section 2.16.

2.18.1.3 TESTING OF EXISTING EQUIPMENT

To ensure that all existing equipment is in proper working order, the Design-Builder may request a meeting on-Site with WSDOT and the agency with current maintenance responsibility, prior to the performance of any Work at the Site. At the time of this meeting, all cabinet components and operations may be tested by the Design-Builder. The Design-Builder shall be responsible for requesting, coordinating, and conducting the on-Site meeting, and for providing all labor, materials, test equipment, and test documentation. All testing shall be non-destructive. If the Design-Builder begins Work without arranging this pre-testing, WSDOT will assume that all cabinet components and operations were in proper working order prior to the performance of any Work, and the Design-Builder shall be responsible for ensuring that all cabinet components and operations are in proper working order during and upon the completion of the Work. If no pre-testing is completed, any equipment that is not functioning upon completion of the Work will be assumed to have been in proper working order as of the date of Notice to Proceed, and shall be replaced at the Design-Builder's expense. The Design-Builder shall submit the results of all pre-tests in writing to the WSDOT Engineer.

2.18.1.4 COORDINATION WITH ADJOINING PROJECTS

The Design-Builder shall obtain the ITS design plans for adjacent projects and determine the coordination requirements for continuous functioning of the ITS equipment for the Project. This shall include coordination with the WSDOT ITS Engineer. The Design-

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Comment [ET9]: Use what is applicable

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Comment [jlb8]: Aug 31, 2015 9:31 AM Chris Thomas says:
this conflics with line 25. delete this line. This section is going to be edited for each project, but it shouldnt have a conflict in the template.
Change per markup

Comment [jlb10]: Aug 21, 2015 4:07 PM Bart Cima says:
In past procurements, this item has been an area of potentical confusion. Efforts should be made to clearly define what is desired with a balance towards not adding cost and complexity to the project

Comment [jlb11]: Aug 31, 2015 6:12 AM Chris Thomas says:
There were some issues in the early RFPs with this. The last few contracts had issues because they waved all or part of the requirements from this section and then tried to take it back later after realizing that they still needed it.

Comment [jlb12]: Aug 31, 2015 9:35 AM Chris Thomas says:
Resolution – Revise per markups

Comment [jlb13]: Use if applicable - Insert forward compatible elements and insure that what the desired outcome is clearly defined.

Comment [jlb14]: Optional Language - Use if forward compatibility applies to project, otherwise delete.

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Comment [jlb15]: Optional Language - Use if forward compatibility does not apply to project, otherwise delete.

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Comment [jlb16]: Aug 21, 2015 4:16 PM Bart Cima says:
For ITS, this is more than adjoining projects, the new ITS infrastrcture needs to connect with existing ITS infrastructure in adjecent roadway segments. WSDOT should also facilitate coordination with adjoining projects.

Comment [jlb17]: Aug 31, 2015 6:14 AM Chris Thomas says:
Sounds good. Is there a suggested change for this section?

Change per Markup

Builder shall also adjust the design and construction schedule to coordinate the installation of the required components, while continuously maintaining the ITS. Refer to Section 2.1.

2.18.2 MANDATORY STANDARDS

The following is a list of Mandatory Standards that shall be followed for all design and construction related to this Section. They are listed in hierarchical order, where the Mandatory Standards listed higher in the list shall take precedence over those listed below them. If a Mandatory Standard contains a reference to another document that is not listed below and states that the referenced document shall be used, the referenced document shall also be considered to be a Mandatory Standard with the same hierarchal precedence as the source publication. This is not a comprehensive list; other applicable standards may be required to complete the design and construction. If the Design-Builder becomes aware of any ambiguities or conflicts relating in any way to the Mandatory Standards, the Design-Builder shall immediately notify the WSDOT Engineer.

- Special Provisions (Appendix B).
- ****WSDOT Northwest Region ITS Special Provisions* (Appendix B).***
- *Amendments to the Standard Specifications* (Appendix B).
- Standard Specifications (Appendix B).
- *WSDOT Design Manual* (M22-01) (Appendix D).
- ****WSDOT Northwest Region ITS Details* (Appendix T).***
- Standard Plans (M21-01) (Appendix D).
- *WSDOT Traffic Manual* (M51-02) (Appendix D).
- *Washington State Modifications to the Manual on Uniform Traffic Control Devices* (WAC 468-95) (Appendix D).
- *WSDOT Materials Manual* (M46-01) (Appendix D).
- *WSDOT Construction Manual* (M41-01) (Appendix D).
- ****WSDOT Northwest Region Illumination and Signal Details* (Appendix T).***
- ~~****WSDOT Northwest Region ITS Current Practices Supplement* (Appendix T).***~~
- ~~****WSDOT Northwest Region ITS Design Guide* (Appendix T).***~~****WSDOT Intelligent Transportation System Design Requirements* (Appendix T).***
- ****WSDOT ITS Device Naming Scheme* (Appendix T).***
- *NFPA 70: National Electrical Code* (NEC).
- *AASHTO A Policy on Geometric Design of Highways and Streets*.
- *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals*, 5th Edition, 2009.
- *FHWA Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD), 2009 Edition with Revisions 1 & 2 dated May 2012 (Appendix D).
- *AASHTO Roadside Design Guide*.

Comment [jlb18]: Region-specific appendix

Comment [jlb19]: Region-specific appendix

Comment [jlb20]: Region-specific appendix

Comment [jlb21]: Region-specific appendix

Comment [jlb22]: **Aug 21, 2015 4:18 PM Bart Cima says:**
The current practices should be viewed as guidelines, as opposed to standards or requirements. They are written as a design guide, not technical requirements. It would be best if WSDOT were to incorporate what is desired into the requirements.

Comment [jlb23]: **Aug 31, 2015 6:16 AM Chris Thomas says:**
This document has been replaced. The new document is being used as the statewide Design Manual for ITS and it IS requirements, not guidelines.

Comment [jlb24]: Region-specific appendix

Comment [jlb25]: **Aug 31, 2015 6:21 AM Chris Thomas says:**
Delete both the ITS Current Practices and the ITS Design Guide. Replace them with "Intelligent Transportation Systems Design requirements".

Change per Markup

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Comment [jlb26]: Region-specific appendix

Comment [jlb27]: As of july 2015, this is the edition that is adopted by WSDOT. Verify.

Comment [jlb28]: As of july 2015, this is the edition that is adopted by WSDOT. Verify.

- *US DOT National ITS Architecture*.

2.18.3 WSDOT PERSONNEL

The Design-Builder shall coordinate the Work with the WSDOT Engineer. The Design-Builder shall coordinate ITS Work with the following WSDOT staff:

- WSDOT ITS Engineer, and
- WSDOT Electrical Inspector.

2.18.3.1 WSDOT ITS ENGINEER

The WSDOT ITS Engineer will perform the following:

- Review the certification of test device calibration (to ANSI specified guidelines);
- Review and make recommendations for acceptance to the Design-Builder of the required documentation including specifications, shop drawings, and all measured and recorded values for the system and for each cabinet;
- Review splice vault, CCTV, cabinet, and communication hub locations once surveyed and staked in the field;
- Oversee connections to the existing ITS communication network;
- Review plans and component submittal packages and assist the design team; and
- Make recommendations to the Design-Builder for the acceptance of ITS ***and Toll Infrastructure*** based on the submittal and other documentation packages.

2.18.3.2 WSDOT ELECTRICAL INSPECTOR

The Department of Labor and Industries has authority over all electrical installations within the State of Washington. WSDOT has been granted authority over all electrical installations within the rights-of-way of State highways, provided WSDOT maintains and enforces an equal, higher, or better standard of construction, materials, devices, appliances, and equipment than is required by State law. It is the role of the WSDOT Electrical Inspector to ensure that all electrical installations meet the requirements of the National Electric Code, and all applicable State laws and provisions.

The WSDOT Electrical Inspector will perform the following:

- Act as a resource for the ITS design team;
- Assist with ITS plan reviews;
- Perform periodic inspections during construction;
- Witness required ITS ***and Toll Infrastructure*** field tests (as desired); and
- Inspect and approve all ITS***, Toll Infrastructure,*** and electrical installations in accordance with this RFP.

The Local Agency will perform the final electrical inspection and acceptance of ITS elements within the Local Agency's right-of-way.

WSDOT will designate a WSDOT Electrical Inspector. The Design-Builder shall contact WSDOT to arrange for electrical inspection.

Comment [jlb29]: **Aug 21, 2015 4:19 PM Bart Cima says:**
This project should be compliant with the regional ITS architecture also.

Comment [jlb30]: **Aug 31, 2015 6:22 AM Chris Thomas says:**
That is covered with the documents listed above.

Changed per Markup

Comment [jlb31]: Note for DB Manual: these people should be identified early on and communicated to the CN office. Typically will be regional staff.

Comment [jlb32]: **Aug 31, 2015 4:21 PM Bart Cima says:**
Throughout the project, a regional ITS engineer who will ultimately be responsible for the operations and maintenance of the ITS should be involved in all ITS task force meetings and design reviews.- **add as a note to the Engineer and add to Manual**

Comment [ET33]: Note to Author: A regional ITS engineer who will ultimately be responsible for the operations and maintenance of the ITS should be involved in all ITS task force meetings and design reviews.

Comment [jlb34]: **Aug 31, 2015 6:24 AM Chris Thomas says:**
They are. That is the ITS Implementation Engineer. They report directly to the ITS Engineer and go to all of the traffic task force meetings.
This role is assigned to an ITS Engineer for each project

Comment [jlb35]: **Aug 21, 2015 4:23 PM Bart Cima says:**
Consider adding other ITS elements required to this review.

Comment [jlb36]: **Aug 31, 2015 6:26 AM Chris Thomas says:**
No Change Field review is not needed for other items.

Comment [jlb37]: Optional - include on projects with tolling, otherwise delete.

Comment [jlb38]: Optional - include on projects with tolling, otherwise delete.

2.18.4 DESIGN AND CONSTRUCTION REQUIREMENTS

2.18.4.1 GENERAL REQUIREMENTS

The ITS shall provide for ***fiber optic communications, real-time National Television System Committee CCTV surveillance, data collection, VMS, ramp metering, HAR, ESS~~,~~ ATM***, and all associated traffic control devices.

The Design-Builder shall provide a complete, operational, and maintainable ITS and components. The ITS and its components shall be compatible with the existing system ***and the Toll System***. The Design-Builder shall furnish, install, and maintain all electrical power service and communications necessary for the ITS system ***and the Toll System***. The Design-Builder shall label all new and existing ITS devices using naming and numbering conventions in accordance with the ****WSDOT ITS Device Naming Scheme****. The Design-Builder shall provide an ITS that meets the following requirements:

- ***Expandability;***
- Cabinet layouts in accordance with ~~the ***WSDOT Northwest Region ITS Current Practice Supplement*** and~~ the ***WSDOT Northwest Region ITS Details***;
- Protection from voltage surges and lightning;
- Weather-resistant components capable of operating in rain, snow, and wind conditions, and in temperature and humidity ranges encountered in the Project area;
- Hazard-free ITS components mounted along the side of the road outside of the clear zone or in protected areas; and
- If ITS components are mounted in the clear zone, they shall be constructed and protected in accordance with the *WSDOT Design Manual*.

The Design-Builder shall use stainless steel mounting hardware such as bolts, nuts, washers, and external hinges on vaults, cabinets, shelters, junction boxes, and other outdoor ITS devices. The Design-Builder shall use only components designed for ten or more years of industrial use.

The Design-Builder shall round and smooth sharp corners and edges on all ITS ***and Toll Infrastructure*** components that the Design-Builder furnishes and installs.

All material, equipment, and components furnished by the Design-Builder shall be new (within 12 months from the date of manufacture), of the latest design and manufacture, in an operable condition at the time of delivery and installation, and compatible with the existing system.

The Design-Builder shall not install cameras or HAR transmitters on sign bridges.~~The Design-Builder shall not mount ITS equipment on sign structures, with the exception of HAR signs and VMS.~~

The Design-Builder shall install all cabinets so that they are easily accessible to maintenance personnel from the roadway. The Design-Builder shall locate the ITS elements so that the need for future relocation is eliminated based on Forward Compatiibility requirements, if any~~.~~.

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Comment [ET39]: Use items that are applicable to the project scope

Comment [jlb40]: Aug 21, 2015 4:26 PM Bart Cima says:
Other ITS elements specific to the project should also be included or deleted frm this list (e.g., LCS, SDMS, etc.)

Comment [jlb41]: Aug 31, 2015 7:00 AM Chris Thomas says:
this is true for projects with ATM, shoulder running, or Tolling, however this isn't a project RFP, it is a template.
See Markup – add ATM

Comment [jlb42]: Optional - include on projects with tolling, otherwise delete.

Comment [jlb43]: Optional - include on projects with tolling, otherwise delete.

Comment [jlb44]: Region-specific appendix

Comment [jlb45]: What does this mean???

Comment [jlb46]: Aug 21, 2015 4:27 PM Bart Cima says:
This should be detailed and defined for each project.

Comment [ET47]: Use if applicable and detail and define for the project

Comment [jlb48]: Aug 31, 2015 9:19 AM Chris Thomas says:

Comment [jlb49]: Region-specific appendix

Comment [jlb50]: Region-specific appendix

Comment [jlb51]: Aug 21, 2015 4:29 PM Bart Cima says:

Comment [jlb52]: Aug 31, 2015 7:02 AM Chris Thomas says:

Comment [ET53]: Note to Author – verify that the regional ITS details are current.

Comment [jlb54]: Aug 21, 2015 4:31 PM Bart Cima says:

Comment [jlb55]: Aug 31, 2015 7:04 AM Chris Thomas says:

Comment [jlb56]: Optional - include on projects with tolling, otherwise delete.

Comment [jlb57]: Aug 21, 2015 4:33 PM Bart Cima says:

Comment [jlb58]: Aug 31, 2015 7:10 AM Chris Thomas says:

Comment [jlb59]: Aug 21, 2015 4:35 PM Bart Cima says:

Comment [jlb60]: Aug 31, 2015 7:12 AM Chris Thomas says:

Comment [jlb61]: Aug 21, 2015 4:35 PM Bart Cima says:

Comment [jlb62]: Aug 31, 2015 7:12 AM Chris Thomas says:

The Design-Builder shall design and construct a temporary ITS that provides for continuous operation of all existing ITS components during construction. The temporary ITS shall be prepared on separate plan sheets than that of the permanent ITS Plans.

Temporary vehicle detection shall be required if construction activities cause the center of the existing loop location to deviate more than 1 foot from the center of the travel lane.

The Design-Builder shall label each ITS device cabinet and transformer cabinet in accordance with the ****WSDOT Northwest Region ITS Special Provisions and the ~~-~~ITS Device Naming Scheme~~-~~****.

At the preliminary design level, the Design-Builder shall design the ITS as a whole before installation of any individual field component. The Design-Builder shall notify WSDOT a minimum of seven Calendar Days in advance of staking locations for ITS devices for Review and Comment, as well as making final connections of the newly-installed or temporary ITS components to the existing system.

Existing ITS cabinets within the Project limits shall be replaced as required by ****WSDOT ~~Northwest Region~~ Intelligent Transportation System Design Requirements~~-ITS Current Practices Supplement~~****.

See Section 2.16 for electrical service, salvage, and Utility locate specifications.

2.18.4.2 VEHICLE DETECTION

The Design-Builder shall provide permanent vehicle detection which measures vehicular volume and lane occupancy on the highway. The Design-Builder shall place permanent mainline detection in accordance with the ****-WSDOT Intellegent Transportation Ssystems Design Requirements-~~WSDOT Northwest Region ITS Current Practices Supplement~~****. The Design-Builder shall place permanent detection in all ramps, all auxiliary lanes, and all mainline lanes. ****Mainline and speed detection loops shall not be placed within 100 feet of Toll Gantries, or in areas with heavy weaving or merging traffic.****

The Design-Builder shall maintain and re-establish operation of all loops outside the Project limits if they connect to a controller cabinet within the Project limits.

The Design-Builder shall include a maximum of 32 detector inputs per cabinet.

Where existing loops will be reused and routed into a new data station or ramp meter cabinet, the Design-Builder shall ensure that all existing loops are connected to the new cabinet location. To achieve this, the Design-Builder shall comply with this RFP and the following requirements:

- No splices will be allowed in the detector lead-ins (2C(SH) cables). In the event that existing cables are too short, the Design-Builder shall replace the lead-in cables.
- Existing loops shall be tested in accordance with the Standard Specifications and the ****WSDOT Northwest Region ITS Special Provisions****, and shall be replaced if they fail the induction loop test.

2.18.4.2.1 Permanent Vehicle Detection

The Design-Builder shall install induction loop detectors for permanent detection in accordance with this Section.

In areas where new pavement will be constructed, the Design-Builder shall install the loops in the pavement base prior to the final lift of the pavement surfacing, unless otherwise

Comment [jlb63]: Aug 21, 2015 4:41 PM Bart Cima says:
This requirement can add a significant amount of cost to the project. Alternative approaches to providing a similar performance should be considered on a project specific basis.

Comment [jlb64]: Aug 31, 2015 7:16 AM Chris Thomas says:
Are you suggesting that WSDOT doesn't manage traffic through construction areas? These devices are needed for traffic incident management. Any upfront cost for ITS is quickly regained by reduction in delay.

No change - see ITS design requirements for what is allowed, proposed changes in ATC's are possible

Comment [jlb65]: Region-specific appendix

Comment [jlb66]: Aug 21, 2015 4:38 PM Bart Cima says:
Should this be the ITS Device Naming Scheme?

Comment [jlb67]: Aug 31, 2015 7:16 AM Chris Thomas says:
Yes
Resolution – Per markup

Comment [jlb68]: Region-specific appendix

Comment [jlb69]: Aug 21, 2015 4:42 PM Bart Cima says:
The department needs to identify which cabinets and equipment need to be replaced on a project by project basis. This should be included in the requirements.

Comment [jlb70]: Aug 31, 2015 7:20 AM Chris Thomas says:
The original RFPs had lists like you are talking about for everything (not just ITS). WSDOT missed items on those lists and it cost the state a lot of money to add them into the contract later. This fixed that issue.
No change

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Comment [jlb71]: Region-specific appendix

Comment [jlb72]: Aug 21, 2015 4:46 PM Bart Cima says:
The use of the current practices supplement should be converted to special provisions to provide additional clarity.

Comment [jlb73]: Aug 31, 2015 6:08 AM Chris Thomas says:
The ITS Current Practices were a stepping stone on the way to a design manual for ITS. There is very little information on ITS in the Design Manual sin…

Comment [jlb74]: Optional, use or revise to fit project.

Comment [jlb75]: Region-specific appendix

Comment [jlb76]: Aug 21, 2015 4:48 PM Bart Cima says: …

Comment [jlb77]: Aug 31, 2015 7:23 AM Chris Thomas says: …

approved by the WSDOT Engineer. The Design-Builder shall coordinate installation of detector loops with the base and paving operations.

All lanes, ramps, and special use facilities within the Project limits shall have fully functioning induction loop detectors upon Physical Completion. All broken loops and all loops that do not pass the testing requirements shall be replaced regardless of their operational status at Notice to Proceed.

2.18.4.2.2 Temporary Vehicle Detection

Temporary detection shall be in accordance with the ****WSDOT ~~Northwest Region~~ Intelligent Transportation System Design Requirements ~~ITS Current Practices Supplement~~****.

2.18.4.2.3 Loop Detectors

The Design-Builder shall furnish and install R1, R2, and WR induction loop detectors in accordance with these Technical Requirements, the ****WSDOT Northwest Region ITS Details****, and the ****WSDOT ~~Northwest Region~~ Intelligent Transportation System Design Requirements ~~ITS Current Practices Supplement~~****.

2.18.4.3 RAMP METERING/DATA STATIONS

The Design-Builder shall furnish and install new data stations and cabinets in accordance with the ****WSDOT ~~Northwest Region~~ Intelligent Transportation System Design Requirements ~~ITS Current Practices Supplement~~****.

The Design-Builder shall furnish and install all equipment necessary to create a fully-functioning and operable ramp metering and data station system. ***All new ramp meters and data stations shall be fully operational prior to Toll Infrastructure Completion. See Section 2.26 for additional information.***

The Design-Builder shall furnish and install ramp meter poles and associated signal heads, advanced warning signs and flashers, cabling, junction boxes, pull boxes, cable vaults and foundations, and signing to accommodate the change in roadway geometry.

The Design-Builder shall furnish and install new cabinets and foundations, and make the ramp meters fully-functioning and operable.

The Design-Builder shall install new ramp meters at the following locations:

- ***Ellingson Road to southbound SR 167 on-ramp.
- Ellingson Road to northbound SR 167 on-ramp.
- 8th Street E to southbound SR 167 on-ramp.
- 8th Street E to northbound SR 167 on-ramp.***

The Design-Builder shall rebuild existing ramp meters in accordance with the ****WSDOT Intellegent Transportation System Design Requirements and the WSDOT Northwest Region ITS Details ~~WSDOT Northwest Region ITS Current Practices Supplement~~**** at the following locations:

- ***Eastbound 15th Street SW to southbound SR 167 on-ramp.
- Westbound 15th Street SW to southbound SR 167 on-ramp.***

The Design-Builder shall install new data stations at the following locations:

Comment [jlb78]: Region-specific appendix

Comment [jlb79]: **Aug 21, 2015 4:49 PM Bart Cima says:**
The current practices supplement should be part of the special provisions.

Comment [jlb80]: **Aug 31, 2015 7:23 AM Chris Thomas says:**
Already commented on this issue.

Comment [jlb81]: Region-specific appendix

Comment [jlb82]: Region-specific appendix

Comment [jlb83]: Region-specific appendix

Comment [jlb84]: **Aug 21, 2015 4:51 PM Bart Cima says:**
Please incorporate the current practices supplement into the special provisions.

Comment [jlb85]: **Aug 31, 2015 7:24 AM Chris Thomas says:**
Already responded

Comment [jlb86]: **Aug 31, 2015 7:24 AM Chris Thomas says:**
see previous response.

Comment [jlb87]: **Aug 31, 2015 7:24 AM Chris Thomas says:**
Okay, one more clarification: The details and the specs tell construction what to build. This document tells the designer, on design build and design-bid-build projects, where to design items. This info does not belong in specs.

Comment [jlb88]: Optional - include on projects with an interim milestone for toll completion, otherwise delete.

Comment [jlb89]: Insert project-specific locations

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Comment [jlb90]: Region-specific appendix

Comment [jlb91]: **Aug 21, 2015 4:53 PM Bart Cima says:**
The term "rebuild" does not provide clear guidance. The current practices supplement should be incorporated into the special provisions.

Comment [jlb92]: **Aug 31, 2015 7:27 AM Chris Thomas says:**
"rebuild" is followed by "in accordance with", which defines the expectation. However, there should be a reference to the ITS details as well.
change per markups

Comment [jlb93]: Insert project-specific locations

- ***SR 167 southbound at approximately STA LM' 359+50.
- SR 167 southbound at approximately STA LM' 381+50.
- SR 167 southbound at approximately STA LM' 444+00.***

Comment [jlb94]: Insert project-specific locations

Comment [jlb95]: Optional – use if applicable

2.18.4.3.1 Ramp Meter Advance Warning Sign

Ramp meter advance warning signs shall include the proper advance signing with flashing beacons. The Design-Builder shall install the ramp meter flasher poles in accordance with the Standard Plans, the *WSDOT Intellegent Transportation System Design Requirements* and the *** ~~*the WSDOT Northwest Region ITS Special Provisions ~~*~~WSDOT Northwest Region ITS Current Practices Supplement~~***. Refer to Section 2.19 for signing requirements.

Comment [jlb96]: Region-specific appendix

Comment [jlb97]: Aug 21, 2015 4:54 PM Bart Cima says:
"... in accordance with the Standard Plans and the WSDOT Northwest Region ITS Special Provisions."

Comment [jlb98]: Aug 31, 2015 7:30 AM Chris Thomas says:
yea, this is covered by a lot of stuff, the standard plans, the special provisions, and the new ITS Design Requirements. I'm not sure why we keep referenceing the same documents throughout. Change per markup

2.18.4.3.2 Ramp Meter Signal Foundation

The Design-Builder shall furnish and install the pole base and the pole shaft for the ramp meter signal poles and advance warning sign poles. Refer to Section 2.6 for geotechnical requirements.

2.18.4.3.3 Grounding

The Design-Builder shall perform grounding in accordance with the ***WSDOT *Northwest Region ITS Special Provisions****.

Comment [jlb99]: Region-specific appendix

2.18.4.3.4 Ramp Meter Pole

The ramp meter pole shall be in accordance with the ***WSDOT ~~*Northwest Region *~~Intelligent Transportation System Design Requirements~~ *ITS Current Practices Supplement*~~***. Refer to Section 2.17 for signal standard requirements.

Comment [jlb100]: Region-specific appendix

Comment [jlb101]: Aug 21, 2015 4:54 PM Bart Cima says:
The current practices supplement should be incorporated into the special provisions.

Comment [jlb102]: Aug 31, 2015 7:38 AM Chris Thomas says:
Already commented. Change per markup

2.18.4.3.5 Signal Head Assembly

The Design-Builder shall install powder-coated cast aluminum background shields with reinforced edges on the upper heads. The Design-Builder shall not install a background shield on the lower heads.

The Design-Builder shall install metal reinforcement plates for the top and bottom of all installed polycarbonate signal heads to improve the structural stability of the signal head mounting bracket.

2.18.4.3.6 Control Cable and Connections

The Design-Builder shall install general purpose ramp meter signal and flasher control cables rated for 600 volts. The Design-Builder shall comply with the IMSA specifications for the control cables.

2.18.4.3.7 Ramp Meter Signing

The Design-Builder shall provide all necessary ramp meter signing in accordance with these Technical Requirements, the ***WSDOT ~~*Northwest Region *~~Intelligent Transportation System Design Requirements ~~*ITS Design Guide*~~***, the ***~~*WSDOT Northwest Region ITS Current Practices Supplement*~~***, and the *WSDOT Design Manual*.

Comment [jlb103]: Region-specific appendix

Comment [jlb104]: Region-specific appendix

Comment [jlb105]: Aug 21, 2015 4:55 PM Bart Cima says:
The current practices supplement should be incorporated into the special provisions.

Comment [jlb106]: Aug 31, 2015 7:39 AM Chris Thomas says:
Already commented. Change per markup

2.18.4.4 CLOSED CIRCUIT TELEVISION SYSTEM

The Design-Builder shall furnish and install a CCTV system in accordance with the ***WSDOT ~~Northwest Region~~ Intelligent Transportation System Design Requirements ~~ITS Current Practices Supplement~~***. The system shall include CCTV cameras, camera cables, camera control cabinets, video transmitters, video receivers, Ethernet switches, AC/DC adaptors, camera poles, foundations, and all other accessories and components to make the cameras fully-functioning and operable. The Design-Builder shall also furnish all equipment necessary to install the components, and connections to create a fully-functioning and operable system.

The Design-Builder shall ensure that all accessories and components are fully compatible with the existing ITS equipment.

The Design-Builder shall replace all existing cameras within the Project limits with new CCTV cameras.

Existing CCTV cameras removed within the Project limits shall be salvaged and delivered to WSDOT.

CCTV cameras installed within the Project limits shall meet the following requirements:

- At interchanges, cameras shall be located to provide a full view of the intersecting arterial and ramps; and
- All pavement surfaces within the limited access and within the Project limits shall be completely visible by CCTV cameras.
- The view of all paved surfaces outside of the project limits shall be maximized provided that all camera equipment required to do so stays within the project limits.
- Existing views of pavement surfaces within or outside the Project limits shall not be degraded. Any paved surfaces that were visible by CCTV prior to the contract shall be preserved.
- ~~Existing pavement surfaces outside the Project limits shall be visible by CCTV cameras to the extent these pavement surfaces were visible by existing CCTV cameras prior to the Project construction. However, camera views of the existing pavement surfaces outside the Project limits shall be improved, if it is possible to do so with the CCTV cameras installed on this Project.~~

No trees shall be removed to obtain the required visibility for new or existing cameras.

The Design-Builder shall consult with WSDOT on the placement of CCTV hardware. Camera views, accessibility, and maintainability are issues of concern. The Design-Builder shall inspect the ~~camera~~ view for all proposed camera locations from a bucket truck, unmanned aerial vehicle or three dimensional modeling and provide video and still images of that view to WSDOT for Review and Comment during the design process.

2.18.4.4.1 CCTV Camera Pole

Refer to Section 2.13 and the ***WSDOT Northwest Region ITS Details*** for structural and foundation requirements.

Comment [jlb107]: Region-specific appendix

Comment [jlb108]: **Aug 21, 2015 4:56 PM**
Bart Cima says:
The current practices supplement should be incorporated into the special provisions.

Comment [jlb109]: **Aug 31, 2015 7:39 AM**
Chris Thomas says:
Change per markup

Comment [jlb110]: **Aug 21, 2015 5:03 PM**
Bart Cima says:
Recent experience has shown the difficulty in meeting this requirement. Certain requirements limit the ability to meet this, including: 50' mounting height restriction, the need for maintenance pull outs, and restrictions on the use of non-compliant cameras.

Comment [jlb111]: **Aug 31, 2015 7:42 AM**
Chris Thomas says:
The only issue has been that the DB is surprised when they need more cameras than are shown on the conceptual plans. There hasn't been any issue actually meeting the requirement and the requirement does allow for shorter poles, but they do need approval. More effort is needed on the conceptual plans.
Add Note to Author

Comment [ET112]: Note to Author – work with the Region TMC to try to make the conceptual plans reflect as close as possible the actual number of cameras needed.

Comment [jlb113]: **Aug 21, 2015 5:03 PM**
Bart Cima says:
WSDOT should provide information regarding existing camera coverage and any known gaps.

Comment [jlb114]: **Aug 31, 2015 7:43 AM**
Chris Thomas says:
We are back to the comment about WSDOT making lists on earlier projects. All it did was cost the sta ...

Comment [jlb115]: **Aug 21, 2015 5:05 PM**
Bart Cima says: ...

Comment [jlb116]: **Aug 31, 2015 7:45 AM**
Chris Thomas says: ...

Comment [jlb117]: Optional language: use on projects in areas where we do not want to lose screening trees. Revise or delete for are ...

Comment [jlb118]: **Aug 31, 2015 7:48 AM**
Chris Thomas says: ...

Comment [jlb119]: **Sep 1, 2015 3:10 PM Jami Boutwell says:** ...

Comment [jlb120]: **Aug 21, 2015 5:06 PM**
Bart Cima says: ...

Comment [jlb121]: **Aug 31, 2015 7:50 AM**
Chris Thomas says: ...

Comment [jlb122]: **Aug 21, 2015 6:04 PM**
Bart Cima says: ...

Comment [jlb123]: **Aug 31, 2015 7:51 AM**
Chris Thomas says: ...

Comment [jlb124]: **Region-specific appendix**

Camera poles shall be installed in accordance with the ***WSDOT ~~Northwest Region~~ Intelligent Transportation System Design Requirements ~~ITS Current Practices Supplement~~***.

2.18.4.4.2 CCTV Control Cabinet

The Design-Builder shall furnish and install the CCTV control cabinets and shall provide all necessary tools and equipment to connect the cabinets to the cameras, electrical source, and communications system.

2.18.4.4.3 Access to CCTV

The Design-Builder shall provide access in accordance with the ***WSDOT Northwest Region ITS Design Requirements***. Maintenance vehicles, such as bucket trucks, shall have the ability to back up adjacent to the CCTV structure for maintenance of the CCTV and shall have adequate access onto and off of the roadway.

2.18.4.5 VMS

The Design-Builder shall furnish and install VMS at approximately the following location:

- ***SR 167 northbound STA E167 11080+00;***

The Design-Builder shall furnish, install, and test the VMS structures, foundations, power, software, local control panel assembly, and all other ancillary equipment and components, to create a fully-functioning and operable VMS system.

The Design-Builder shall position the signs to achieve the optimum sight line and maximum visibility for the vehicles approaching the sign. The minimum visibility requirement shall be 1,000 feet. The Design-Builder shall consider the sign-viewing angle for the VMS location and install the VMS in accordance with manufacturer's recommendations and these Technical Requirements.

WSDOT TMC personnel will remotely operate the messages on the signs.

The Design-Builder shall design the support structure in accordance with the requirements of the ***I-405 Urban Design Criteria***. The Design-Builder shall mount the VMS to the support structure. The new VMS shall not be mounted on or supported by roadway bridges.

The Design-Builder shall furnish and install the VMS, VMS controller cabinets and accessories in accordance with this Section and as required to make the VMSs fully-functioning and operable. Installation shall be in accordance with these Technical Requirements and the ***WSDOT ~~Northwest Region~~ Intelligent Transportation System Design Requirements ~~ITS Design Guide~~*** ~~and the ***WSDOT Northwest Region ITS Current Practices Supplement~~***. The Design-Builder shall notify WSDOT when installation and testing of the VMS hardware is complete, so that WSDOT can verify VMS operations.

The Design-Builder shall supply all equipment and personnel needed to load, transport, and unload the VMS. The Design-Builder shall provide power to each VMS within ten Calendar Days of delivery of the VMS, or house the VMS in a controlled atmosphere facility.

Refer to Section 2.13 for additional VMS requirements and to Section 2.26 for TRS requirements.

Comment [jlb125]: Aug 21, 2015 5:07 PM
Bart Cima says:
The current practices supplement should be incorporated into the special provisions.

Comment [jlb126]: Aug 31, 2015 7:51 AM
Chris Thomas says:
Already commented **Change per markup**

Comment [jlb127]: Region-specific appendix

Comment [jlb128]: Aug 21, 2015 5:09 PM
Bart Cima says:
Consideration should be given on a project by project specific basis, particularly for urban environments where noise walls, ATM structures, limited right of way are prevalent.

Comment [jlb129]: Aug 31, 2015 7:54 AM
Chris Thomas says:
Consideration to build cameras that cannot be accessed or maintained? This covers access for maintenance, the desire to keep them out of reach of vandals, and the need to have them located high enough to see over traffic.
No Change

Comment [jlb130]: Region-specific appendix

Comment [jlb131]: Insert project-specific locations

Comment [jlb132]: Aug 21, 2015 5:10 PM
Bart Cima says:
Consideration should be given on a project by project basis, particularly for urban environments where conditions may not be conducive to providing 1000'

Comment [jlb133]: Aug 31, 2015 7:58 AM
Chris Thomas says:
In special circumstances, WSDOT can back off of this requirement. RFPs are not written based on the worst case scenario. That would be like saying "build a traffic signal to LOS F, but make it better than LOS F if you can". The DB isn't going to spend a bunch of money to give you a signal that runs at LOS B.
No Change

Comment [jlb134]: Region-specific appendix

Comment [jlb135]: Region-specific appendix

Comment [jlb136]: Region-specific appendix

Comment [jlb137]: Aug 21, 2015 5:11 PM
Bart Cima says:
The current practices supplement should be incorporated into the special provisions.

Comment [jlb138]: Aug 31, 2015 7:58 AM
Chris Thomas says:
Already commented **Change per markup**

2.18.4.5.1 Access to VMS

The Design-Builder shall provide access in accordance with the ***WSDOT Northwest Region ITS Design Requirements***. Maintenance vehicles, such as bucket trucks, shall have the ability to park adjacent to the VMS structure for repairs to the VMS and shall have adequate access onto and off of the freeway.

2.18.4.5.2 Maintaining VMS During Construction

The VMS are used to inform drivers of incidents prior to, within, and beyond the Project limits. Existing or new VMS shall remain operational at all times. If an existing VMS is removed, a temporary VMS shall be installed and operational before removing the existing VMS. Temporary VMS shall meet the technical requirements for new VMS systems.

2.18.4.6 HIGHWAY ADVISORY RADIO (HAR)

Both HAR signs shall display, and the HAR Transmitters shall broadcast at a frequency determined by WSDOT and provided to the Design-Builder.

2.18.4.6.1 Highway Advisory Radio Sign (HARS)

The Design-Builder shall design and construct new HARS and control cabinets at the following locations:

- ***SR 167 southbound at STA LM' 440+00.***

The Design-Builder shall furnish, install, and test a fully-functioning and operable HARS and associated equipment in accordance with the ***WSDOT Northwest Region ITS Special Provisions*** and the ***WSDOT Northwest Region ITS Details***. The Design-Builder shall furnish, install, and test warning beacons, controllers, controller cabinets, and 800 MHz radio connection (800 MHz connection for the future northbound sign only) including all electrical and communications components necessary to connect with the ITS.

The Design-Builder shall position the warning beacons to achieve the optimum sight line and maximum visibility for the vehicles approaching the sign. All new HARS shall be overhead-mounted only.

2.18.4.6.2 Highway Advisory Radio Transmitter (HART)

The Design-Builder shall design and construct new HART and control cabinets on ***SR 167 within 400 feet of STA LM' 367+50.***

The Design-Builder shall furnish, install, and test a fully-functioning and operable HART and associated equipment in accordance with the ***WSDOT Northwest Region ITS Special Provisions*** and the ***WSDOT Northwest Region ITS Details***.

2.18.4.7 ENVIRONMENTAL SENSOR STATION (ESS)

The Design-Builder shall design and construct new ESS ***on SR 167 northbound at approximately STA LM' 716+80***.

The Design-Builder shall furnish, install, and test a fully-functioning and operable ESS and associated equipment in accordance with the ***WSDOT Northwest Region ITS Special Provisions*** and the ***WSDOT Northwest Region ITS Details***.

Comment [jlb139]: Aug 21, 2015 5:12 PM
Bart Cima says:
This requirement should be reconsidered in light of the increasing use of ATM.

Comment [jlb140]: Aug 31, 2015 7:59 AM
Chris Thomas says:
ATM does not change the maintenance requirements of VMSs. ATM is maintained very differently.
No Change

Comment [jlb141]: Region-specific appendix

Comment [jlb142]: Aug 21, 2015 5:13 PM
Bart Cima says:
The department should consider discontinuing the use of HAR as a means of communicating with drivers.

Comment [jlb143]: Aug 31, 2015 8:00 AM
Chris Thomas says:
I don't disagree, but that needs to be delt with outside of this document. HAR is a part of the ITS for now.
No Change

Comment [jlb144]: Insert project-specific locations

Comment [jlb145]: Region-specific appendix

Comment [jlb146]: Region-specific appendix

Comment [jlb147]: Insert project-specific location

Comment [jlb148]: Region-specific appendix

Comment [jlb149]: Region-specific appendix

Comment [jlb150]: Insert project-specific location

Comment [jlb151]: Region-specific appendix

Comment [jlb152]: Region-specific appendix

2.18.4.8 COMMUNICATION CONDUIT SYSTEM

The Design-Builder shall design and construct a complete conduit system, including all associated conduit, cables, junction boxes, pull boxes, cable vaults, and accessories in accordance with these Technical Requirements, the ***WSDOT Northwest Region ITS Details***, and the ***WSDOT ~~Northwest Region~~ Intelligent Transportation System Design Requirements ~~ITS Current Practices Supplement~~***.

The Design-Builder shall design and install mainline conduits along SR 167 at the following locations:

- ***From STA LM' 317+11.50 to the existing cable vault at approximately STA LM' 520+00, and
- From the existing cable vault at approximately STA LM' 523+70 to the existing cable vault at approximately STA LM' 625+90.***

The mainline conduit shall consist of two 4-inch conduits with each conduit containing four 1.12-inch factory silicon-lined and smooth-walled innerducts. The Design-Builder shall install all communications cables within the conduit system. Direct-buried or exposed cables will not be permitted. Innerduct conduit shall only be used for fiber optic distribution and transmission cables.

The Design-Builder shall install mainline conduit systems with consideration to access, maintainability, and Forward Compatiblity on the freeway side of noise walls and Right-of-Way fences. The Design-Builder shall minimize the number of transverse crossings of the freeway.

The ITS conduit and pull box system shall be separated from lighting conduits and traffic signal conduits, although a shared trench, shared power service, and shared cabinet pads may be used. The two 4-inch conduits installed for the fiber optic communication system shall be backfilled with control density fill or clean granular material and detectable orange warning tape shall be placed above the conduits. All conduits trenched under pavement and backfilled with clean granular material shall be compacted in accordance with Method C of the Standard Specifications. The paving shall be replaced with paving materials that match existing pavement. A trace wire shall be included with all conduits installed for fiber optic cable. When communication cable is installed as part of a new system, the communication cable shall be kept separate from all other wiring.

The Design-Builder shall furnish and install conduit and cabling to interconnect all traffic signal controller cabinets within Project limits and WSDOT limited access. At each interchange the interconnect conduit system shall connect each WSDOT signal controller cabinet together with one 2-inch diameter conduit between cable vaults adjacent to each signal controller cabinet. The signal controller cabinet nearest an ITS camera cabinet shall be connected to the camera cabinet with one 2-inch diameter conduit and the interconnect fiber. If there is not a camera cabinet within the interchange, the signal interconnect shall be connected to the nearest ITS cabinet containing the distribution fiber.

Refer to Section 2.16 for additional requirements.

The Design-Builder shall immediately cap all open ends of installed conduit until cables are installed.

Standard bell ends shall be installed on all conduit ends by the Design-Builder to prevent damage to the installed cable.

Comment [jlb153]: Region-specific appendix

Comment [jlb154]: Region-specific appendix

Comment [jlb155]: Aug 21, 2015 5:14 PM
Bart Cima says:
The current practices supplement should be incorporated into the special provisions.

Comment [jlb156]: Aug 31, 2015 8:01 AM
Chris Thomas says:
Already commented. **Change per markup**

Comment [jlb157]: Insert project-specific locations

Comment [jlb158]: Aug 21, 2015 5:17 PM
Bart Cima says:
Consideration should be given to allow the colocation of other ITS cables in this conduit.

Comment [jlb159]: Aug 31, 2015 8:04 AM
Chris Thomas says:
Absolutely not. Fiber is a long-haul communications medium and the communication conduit system is continuous for very long runs. If you take a 50 mile conduit run and put some other cable in it, you have just broken a 50 mile run into something shorter and much less valuable for WSDOT.
No Change

With open trench installations of conduit under pavement, the Design-Builder shall place the conduit a minimum of 3 feet below finished grade. All other conduit place dunderground shall be placed a minimum of 24 inches below the finished grade. Open trench installation of conduit across roadways will not be allowed.

The Design-Builder shall install warning tape and locate wire in accordance with these Technical Requirements and the ****WSDOT Northwest Region ITS Details****.

Conduit under pavement shall be installed in accordance with Section 2.16.

2.18.4.8.1 Existing Conduit Systems

The Design-Builder shall not use existing communication conduit system (3-inch or 4-inch with innerduct). All existing conduit with innderduct shall be replaced with new conduit meeting the Mandatory Standards.

The Design-Builder may use all other existing conduit systems if the exsting conduit systems meet all design requirements stated in these Technical Requirements and the Mandatory Standards.

Existing conduit systems consist of stick PVC, stick polyethylene, continuous polyethylene, or rigid steel conduit. Where existing conduit is replaced, abandoned, or is otherwise not acceptable, the Design-Builder shall furnish and install new conduit. The Design-Builder shall not relocate or use salvaged conduit.

When installing fiber optic cable in existing conduits through existing junction boxes, the Design-Builder shall check the cable route to ensure that there is a smooth transition between exit and entrance elevations, and that the horizontal angle of the conduit is not so sharp as to cause damage to the cable as it is being pulled through the existing conduit. If the Design-Builder encounters sharp bends which violate the fiber optic cable bending radius limitations, the Design-Builder shall install new conduit to provide a smooth transition.

The Design-Builder shall clean the existing conduit of debris prior to pulling fiber optic or copper cable through it in accordance with Section 8-20 of the Standard Specifications and these Technical Requirements.

2.18.4.8.2 Conduit on Structures

Conduit installed on structures shall be rigid galvanized steel (RGS) conduit. Where the mainline communication conduit system is routed across bridge structures, the Design-Builder shall design, furnish, and install a structural hanger system and accompanying conduit sweeps and joints to convey conduit under the bridge structure. Conduits mounted under bridge structures shall be located between girders or within a box girder. Refer to Section 2.13 for requirements for new utiltily attachments to existing bridges.

Where conduits transition from the ground to a structure, the Design-Builder shall furnish and install conduit expansion and deflection fittings. Conduits routed across bridges shall be higher than the ground, associated pullboxes, cable vaults, and junction boxes to facilitate drainage of the conduit system.

The Design-Builder shall furnish and install conduit expansion fittings.

2.18.4.8.3 Junction Boxes, Pull Boxes, and Cable Vaults

The Design-Builder shall place junction boxes, pull boxes, and cable vaults in accordance with these Technical Requirements, the ****WSDOT Northwest Region ITS Details****, and

Comment [jlb160]: Region-specific appendix

Comment [jlb161]: Aug 21, 2015 5:20 PM
Bart Cima says:
The department should direct the design builder to either use or replace the existing conduit on a project by project basis.

Comment [jlb162]: Aug 31, 2015 8:36 AM
Chris Thomas says:
That is where WSDOT started. There were a lot of change orders. This was the result.
No change

Comment [jlb163]: Region-specific appendix

the ***WSDOT ~~Northwest Region~~ Intelligent Transportation System Design Requirements ~~ITS Current Practices Supplement~~***.

Pull boxes shall be used for intermediate pull points where cable vaults are not needed. No splices will be allowed in pull boxes.

The Design-Builder shall place a cable vault in the mainline conduit system at the south end of the Project, at the same station as the southernmost camera cabinet (in addition to the cable vault adjacent to this camera cabinet). This cable vault will be used for the future mainline cable splice to the south and shall be located where it will be accessible with a truck and trailer.

The Design-Builder shall clean all pull boxes and cable vaults of dirt and debris prior to Substantial Completion.

The Design-Builder shall include a drainage system, grounding provisions, enclosure hanger bracket assembly, and a ground rod marker in the construction of a fiber optic splice vault.

Drainage systems for pull boxes and vaults shall be designed and constructed in accordance with the ***WSDOT ~~Northwest Region~~ Intellegent Transportation System Design Rerquirements***.

Refer to Section 2.16 for additional requirements for junction boxes, pull boxes, and cable vaults.

2.18.4.9 COMMUNICATION CABLES AND INTERFACES

The Design-Builder shall provide a complete communication cable and interface system to all ITS, signal, TRS, and roadside toll cabinets along ***SR 167*** within the Project limits using new SMFO cable. The existing communication cable and interface system includes the following:

- ***Mainline SMFO cable (48-strand);
- Mainline SMFO cable (96-strand);
- Distribution SMFO cable (36-strand);
- Distribution SMFO cable (48-strand);
- Twisted pair copper cable (25 pf);
- Communication end equipment; and
- Splice vaults, splice closures, and fiber optic connection components.***

Specifications for communication cable and testing requirements are described in these Technical Requirements.

The Design-Builder shall perform the following:

- Ensure the existing communications are functional at all times during the construction period;
- Design and construct a fully-functioning and operable communications network to serve the ITS***, Toll Infrastructure,*** and signal, components within the Project; and

Comment [jlb164]: Region-specific appendix

Comment [jlb165]: Aug 21, 2015 5:21 PM
Bart Cima says:
The current practices supplement should be incorporated into the special provisions.

Comment [jlb166]: Aug 31, 2015 8:36 Am
Chris Thomas says:
Already commented. **Change per markup**

Comment [jlb167]: Optional forward comnpatibility language – use if applicable, otherwise delete.

Comment [jlb168]: Region-specific appendix

Comment [jlb169]: Aug 21, 2015 5:25 PM
Bart Cima says:
This should be included in the ITS standard details.

Comment [jlb170]: Aug 31, 2015 8:38 AM
Chris Thomas says:
"how to build it" is now in the details. the "when to build it" is covered in the ITS Design requirements.
Change per markup

Comment [jlb171]: Insert route(s)

Comment [jlb172]: Insert project-specific elements.

Comment [jlb173]: Optional - include on projects with tolling, otherwise delete.

- Propose solutions to achieve design objectives based on WSDOT functional, technical, operational, and maintenance requirements.

The Design-Builder shall furnish and install communication gear in all new and existing ***ITS, signal, TRS, and roadside toll cabinets*** within the Project limits in accordance with the ***WSDOT ~~Northwest Region~~ Intelligent Transportation System Design Requirements ~~ITS Current Practices Supplement~~***.

The Design-Builder shall not substitute, apply any part, or attach any piece of equipment contrary to the manufacturer's recommendations and standard practices.

The Design-Builder shall not use leased telephone lines, microwave, or wireless communications for permanent or temporary communications systems.

All locations containing identical equipment shall be configured and wired in an identical manner, including internal wiring and harnesses, wiring color codes, labeling terminal block positions, termination strips, power service configuration, and panel and equipment mounting and locations.

2.18.4.9.1 Fiber Optic Cable

The Design-Builder shall furnish, install, test, and maintain the following SMFO cable for mainline distribution and signal interconnect:

- ***New continuous 48-strand SMFO mainline cable between the existing cable vault at approximately SR 167 STA LM' 625+90 and the southernmost camera cabinet near the 8th Street E interchange. The new mainline cable shall be fully spliced to the existing mainline cable in the median cable vault at SR 167 STA LM' 625+90 and shall be fully spliced to its own preterminated patch panel in the southernmost camera cabinet near the 8th Street E interchange.
- New 36-strand SMFO distribution cable between existing data station cabinet (167es01628) at approximately SR 167 STA LM' 625+90 to the southernmost ITS cabinet (near the 8th Street E interchange) connecting all devices in between. New distribution cable shall also be added wherever the existing cable is impacted north of 167es01628.
- New 12-strand SMFO interconnect cable between all signal cabinets within limited access at each interchange within the Project limits, with the exception of the northbound and southbound 8th Street E interchange signals interconnect described in Section 2.17.
- The signal cabinet nearest a camera cabinet shall be connected to that camera cabinet's preterminated patch panel with a 12-strand SMFO. If there is not a camera cabinet within the interchange, the signal interconnect shall be connected to the nearest ITS cabinet containing the distribution fiber.***

North of the existing camera cabinet 167vc01321, the Design-Builder may utilize existing 36-strand SMFO distribution cable.

The Design-Builder shall splice the ***36-strand*** SMFO distribution cable to the preterminated patch panel stub cable for all ***ITS devices, signal, TRS, and roadside toll cabinets*** in accordance with the ***WSDOT Intelligent Transportation System Design Requirements ~~WSDOT NWR ITS Current Practices Supplement~~***.

When fiber optic mainline cable parallels overhead electrical transmission lines, the Design-Builder shall locate the fiber optic cable as far from the transmission lines as

Comment [jlb174]: Revise elements to fit project.

Comment [jlb175]: Region-specific appendix

Comment [jlb176]: Bart Cima
The current practices supplement should be incorporated into the special provisions.

Comment [jlb177]: Chris Thomas
Already commented. **Change per markup**

Comment [jlb178]: Aug 21, 2015 5:29 PM
Bart Cima says:
The department should reconsider the use of these communications systems.

Comment [jlb179]: Aug 31, 2015 8:39 AM
Chris Thomas says:
we do on a regular basis, but it is not our standard for the time being.
Resolution – no change at this time

Comment [jlb180]: Insert project-specific elements

Comment [jlb181]: Revise/delete to fit project

Comment [jlb182]: Project-specific

Comment [jlb183]: Revise elements to fit project

Comment [jlb184]: Region-specific appendix

Comment [jlb185]: Bart Cima
The current practices supplement should be incorporated into the special provisions

Comment [jlb186]: Chris Thomas
Already commented. **Change per markup**

possible. The Design-Builder shall not place the fiber optic cable within 3 feet of a ditch or culvert clean-out areas. The Design-Builder shall design a temporary fiber optic cable system to maintain continuous communication of all ITS components throughout construction.

All fiber optic cable shall be designed and routed through pull boxes and cable vaults. The Design-Builder shall remove all existing cables that are no longer needed to operate the ITS.

Splices in distribution cable shall be performed inside cable vaults placed adjacent to ITS cabinets. The splices shall connect the distribution fiber to ITS cabinets with pre-terminated patch panel.

The Design-Builder shall replace each fiber optic cable that is nicked, severed, or otherwise rendered unusable due to Work performed as part of the Contract. Spliced fiber optic cable shall be replaced with new, unspliced cable, unless otherwise provided for in this RFP. Liquidated Damages may apply in accordance with Section 1-08 of the General Provisions. The Design-Builder shall notify the WSDOT Engineer immediately after cable damage is discovered.

The Design-Builder shall exercise caution and excavate manually using hand-held tools when exposing an existing fiber optic cable. The Design-Builder shall report all nicks or abrasions to WSDOT prior to replacement. The Design-Builder shall not exceed the bending radius while handling and re-routing the cable.

The Design-Builder shall use lubricants during cable-pulling operations, in accordance with the ****WSDOT Northwest Region ITS Special Provisions***. In the event a cable is severed or otherwise rendered not usable because of Work performed as part of the Contract, the Design-Builder shall perform the following activities:

Comment [jlb187]: Region-specific appendix

- Use fusion splices to make the initial emergency repair to fiber optic cable.
- Install the splices in existing splice vaults. The fusion splices shall meet the requirements of these Technical Requirements.
- Install new cable between existing terminations or splices to replace the damaged cable.
- Install new cable between existing terminations or splices for nicks or abrasions on cable caused by the Design-Builder.

2.18.4.9.1.1 *Fiber Optic Cable Installation*

The Design-Builder shall install cable in accordance with the ****WSDOT Northwest Region ITS Special Provisions*** for pulling requirements.

Comment [jlb188]: Region-specific appendix

2.18.4.9.1.2 *Fiber Optic Cable Identification Requirements*

The Design-Builder shall identify all fiber optic cable at all terminals, and whenever the cable is entering or leaving a vault, junction box, housing, or enclosure using permanent plastic, yellow-colored labels fastened securely to the cables in accordance with the ****WSDOT Northwest Region ITS Special Provisions***.

Comment [jlb189]: Region-specific appendix

The surface of the outer jackets shall be printed with the manufacturer's identification, date of manufacture, and part number.

2.18.4.9.1.3 *Fiber Optic Connection Components*

Fiber optic connection components may be required to connect cable installed to the ITS communications network for the Project. The Design-Builder shall follow the requirements of the ***WSDOT Northwest Region ITS Special Provisions***.

Comment [jlb190]: Region-specific appendix

2.18.4.9.1.4 *Indoor Patch Cords*

The Design-Builder shall supply all patch cords in accordance with this RFP. The patch cords shall have less than 2 feet of slack at all locations.

2.18.4.9.1.4.1 *LC-UPC Fiber Connectors*

The Design-Builder shall use factory-installed LC-UPC connectors with yellow or blue boots for single-mode fibers and shall follow these requirements:

- LC-UPC connector loss shall be less than 0.3 dB; maximum reflectance value shall be -55 dB;
- Connector ratings shall be from -22 degrees Fahrenheit to 140 degrees Fahrenheit for operation; and from -40 degrees Fahrenheit to 140 degrees Fahrenheit for storage;
- Connectors shall have protective caps;
- Connectors shall be secured to the aramid fibers surrounding the individual optic fibers;
- Connector bodies shall be of one-piece construction, have metallic coupling nuts and bodies, and zirconia ceramic ferrules; and
- Boots shall be glued in place to prevent spinning.

2.18.4.9.1.5 *Patch Panel Components*

The Design-Builder shall furnish and install new pre-terminated patch panels to replace the fiber distribution panels at the following locations:

- All ***ITS, TRS, and roadside toll cabinets*** within the Project limits; and
- ***The existing fiber terminal cabinet FTC-305 (to be known as 167ft01440) at approximately SR 167 STA LM' 528+00.***

Comment [jlb191]: Revise elements to fit project.

Comment [jlb192]: Project-specific language

Refer to these Technical Requirements and the ***WSDOT Northwest Region ITS Special Provisions*** for patch panel component requirements.

Comment [jlb193]: Region-specific appendix

2.18.4.9.1.6 *Outdoor Fiber Splice Closure*

The Design-Builder shall provide an outdoor fiber splice closure, which includes an outer enclosure and plastic splice trays. The temperature rating for the splice closure shall be -22 degrees Fahrenheit to 140 degrees Fahrenheit.

The Design-Builder shall install sufficient desiccant (packaged silica) in the enclosure to reduce possible damage from moisture, in accordance with the manufacturer's recommendations.

2.18.4.9.1.6.1 *Outer Enclosure*

The Design-Builder shall provide an outer enclosure, which meets the following requirements:

- Protects splices from damage;
- Is composed of salt corrosion-resistant material and compatible materials not supporting galvanic cell action;
- Is re-enterable;
- Permits splicing without circuit disruption;
- Has a grounding lug (ground all fiber optic cable shields); and
- Has cable (trunk and pigtail) strain relief and is compatible with the inner enclosure, splice trays, and cables.

2.18.4.9.1.6.2 *Splice Tray*

The Design-Builder shall provide a plastic splice tray (inner enclosure), which meets the following requirements:

- Allows entry to individual fibers;
- Is stackable;
- Holds 12 splices and 24 fibers;
- Does not violate the bare fiber bend radius; and
- Has room for identification of the splice on the cover.

The Design-Builder shall mount all splices on the splice tray. Polyethylene tubes shall protect the fibers, and ethylene vinyl acetate sleeves with stainless steel rods shall protect the splices. Vinyl markers shall identify each fiber in the enclosure.

2.18.4.9.1.7 ***Fiber Optic Cable Splicing***

The Design-Builder shall splice fiber optic cable as specified in these Technical Requirements.

The Design-Builder shall fusion-splice the fiber optic cable only. Cable splices will be allowed if approved by WSDOT; only at the location specified; and only when there are no practical alternatives. Splices shall be made in cable vaults using splice closures approved by WSDOT.

The Design-Builder shall follow the fiber optic cable manufacturer's methods, recommendations, materials, and techniques for splicing.

The Design-Builder's splicing equipment shall be in good working order, properly calibrated, and meet all industry standards and safety regulations. The cable preparation, closure installation, and splicing shall be accomplished in accordance with industry standards.

To minimize mechanical stress and splicing locations, cables shall be trained into final position observing minimum bending radii of the cable of not less than 20 times the diameter of the cable, or as specified in the manufacturer's requirements, whichever is greater.

Comment [jlb194]: Aug 21, 2015 5:33 PM
Bart Cima says:
Consider revising the wording to "... in accordance with manufacturer specifications"

Comment [jlb195]: Aug 31, 2015 8:45 AM
Chris Thomas says:
The manufacturers of what? The cable manufacturer does not tell them how to strip, clever, dress, or splice a cable. The enclosure documentation is minimal too. There is no documentation for what you are requesting.
No Change

Cleanliness and freedom from contamination shall be strictly observed with respect to splicing materials and joint construction. Upon completion of the splicing operation, the Design-Builder shall deposit all waste material in suitable containers, remove it from the job site, and dispose of it in accordance with State and Federal laws.

2.18.4.9.1.8 *Wireless Communications*

The Design-Builder shall not use wireless communications between field devices and communication nodes.

Comment [jlb196]: Bart Cima
The department should give consideration to the use of wireless communications on a project by project basis.

Comment [jlb197]: Chris Thomas
Already commented on this
Resolution - No change

2.18.4.9.1.9 *Twisted Pair Media*

Twisted pair media (in addition to the SMFO system) is required for the Project's permanent communications system. All devices within the Project limits and as specified shall be connected to the fiber optic communications system.

Existing ITS devices on ***I-405 north of the Project limits*** currently connected to twisted pair media shall remain connected to twisted pair media. No splices in the twisted pair media are allowed. If the Design-Builder cuts or damages the twisted pair media, the Design-Builder shall replace the entire length of the twisted pair media from the location of the existing copper terminal cabinet to the ***Tukwila HUB***.

Comment [jlb198]: Insert location

Comment [jlb199]: Insert location

2.18.4.10 ELECTRIC, ELECTRONIC, VIDEO, AND TELEPHONE CABLES

Electric, electronic, video, and telephone cables may exist within the Project limits and may be impacted by construction activities and require replacement. The Design-Builder shall exercise caution when working near existing cables. When exposing existing cables, the Design-Builder shall excavate manually using only hand-held tools.

Industry-accepted lubricants used during cable pulling operations shall be compatible with cable insulation materials and shall not degrade the cable insulation. The Design-Builder shall stock splice kits meeting the technical requirements to repair any cable damaged by construction activities.

For cable damaged by Work performed as part of the Contract, the Design-Builder shall install new cable between existing terminations or splices.

The Design-Builder shall seal all nicks or abrasions, caused when exposing a cable by hand-digging, with rubber splicing tape. The Design-Builder shall seal a nick penetrating the cable jacket to the underlying material with a cast epoxy kit using 3M Scotchcast kits and 3M Scotch #23 rubberized splicing tape that have met the requirements for cable jacket repair, or by using an equivalent approved by WSDOT.

All cables connecting equipment such as VMS, CCTV cameras, and cabinets shall conform to the equipment manufacturer's specifications, the ****WSDOT Northwest Region ITS Special Provisions****, and the Standard Specifications.

Comment [jlb200]: Region-specific appendix

2.18.4.10.1 Electric and Electronic Cable

The Design-Builder shall not splice electric or electronic cables without the WSDOT Electrical Inspector's approval. The Design-Builder shall use one-piece cables between termination points for power, communications control, and RF cables.

When using crimp-on connectors, the Design-Builder shall install the insulation of electrical cables deep enough into the lug so that the insulation acts as a strain relief.

The Design-Builder shall maintain the electrical continuity of the cable shields. The Design-Builder shall ground all cable shields entering cabinets and splice closures in accordance with the Special Provisions. The Design-Builder shall comply with Section 3.3 of the USDA RUS Splicing Standard PC-2 for shield bonding. The Design-Builder shall use bonding connectors complying with RUS standard PE-33 (Cable Shield Connectors).

2.18.4.10.2 Video/Control Cable and Accessories for CCTV Camera

The Design-Builder shall furnish and install CCTV control cable and all other necessary cables and accessories in accordance with these Technical Requirements and the manufacturer's specifications, to make the CCTV cameras operational.

2.18.4.10.3 Grounding

The Design-Builder shall install a grounding system and protection devices that are suitable for the specific installation and equipment being supplied, in accordance with these Technical Requirements, Section 8-20 of the Standard Specifications, and Standard Plan J-60.05-00.

2.18.4.10.4 Control Cabinets

The Design-Builder shall furnish and install the control cabinets, and make them functional.

The Design-Builder shall ensure that the existing control cabinets are operational at all times, outside of the allowable working hours identified in this Section.

The Design-Builder shall use industry-standard fiber management practices and techniques in all control cabinets.

The Design-Builder shall supply all equipment needed to load, transport, and unload the cabinet.

The Design-Builder shall install the control cabinet, which includes mounting and sealing the cabinet on its foundation, terminating the power cables, grounding the cabinet, and terminating the communications cables, signal cables, control cables, and loop lead-ins.

2.18.4.11 VIDEO, VOICE, AND DATA DISTRIBUTION AND TRANSMISSION SYSTEM

The Design Builder shall furnish and install all of the necessary fiber optic distribution and transmission system equipment to provide a fully-functioning ITS, including the following:

- ***Three*** distinct fiber optic networks along the corridor for communication between each field device and the ITS hub(s): ***one for ITS (ES, VMS, HAR, signal, etc.), one for CCTV, and one for tolling***;
- Fiber optic communications between the ITS hub(s) and the ***TMC in Shoreline, Washington***; and
- New communications equipment provided in all ITS cabinets in accordance with the ****WSDOT ~~Northwest Region~~ Intelligent Transportation System Design Requirements ~~ITS Current Practices Supplement~~****.

The Design-Builder shall ensure that all ITS components and devices are connected to the hub and the TMC and are fully-functional in accordance with this Section. All material and equipment shall be compatible with the existing ITS.

Comment [jlb201]: Fill-in Project specific

Comment [jlb202]: Project specific – description should coincide with fill-in at beginning of bullet.

Comment [jlb203]: Aug 21, 2015 5:39 PM
Bart Cima says:
Consideration should be given to allow for logical network design.

Comment [jlb204]: Aug 31, 2015 8:52 AM
Chris Thomas says:
No, the networks have to match what is outside of each discrete project. Otherwise, the devices will not talk to each other.
No Change

Comment [jlb205]: Insert project/region-specific information

Comment [jlb206]: Bart Cima
The current practices supplement should be incorporated into the special provisions.

Comment [jlb207]: Chris Thomas
Already commented **Change per markup**

Comment [jlb208]: Region-specific appendix

Existing and new ITS devices shall be connected to the new single mode fiber optic system.

In addition to the items being installed in the hubs for communication with field equipment, the Design-Builder shall furnish and install the following in the hub:

*****Kent Hub (SR 167 at SR 516):**

- Three RS900 Ethernet switches for the ITS, CCTV, and tolling networks.***

All existing hubs shall remain fully-operational at all times.

2.18.4.12 ITS HUBS

No new hubs are required.~~.~~

A new hub shall be installed at STA XXX+XX and shall be in accordance with the *WSDOT Northwest Region ITS Special Provisions* ~~(Appendix B)~~ for Concrete Universal Enclosures (CUE).

~~2.18.4.12~~2.18.4.13 MAINTAINING ITS DURING CONSTRUCTION

Existing ITS elements, including CCTV cameras, ramp meters, VMS, HAR, and data stations, shall remain operational during construction of the Project, except during the allowable working hours on the ITS. Prior to the installation of new equipment, the Design-Builder shall provide temporary equipment for locations where the existing equipment will be removed, unless otherwise permitted in this RFP.

~~2.18.4.12.1~~2.18.4.13.1 Allowable Working Hours on the ITS

All ITS, whether inside or outside of the Project limits, shall not be taken out of operation by the Design-Builder, and shall remain operational during all phases of construction.

The Design-Builder shall work on active ITS elements from ***~~9~~ p.m. to 4 a.m. only***.

Unless otherwise specified in this RFP, the Design-Builder shall contact WSDOT a minimum of seven Calendar Days prior to performing any Work on existing and active ITS devices and 30 Calendar Days in advance of performing any Work on the hub. The Design-Builder shall perform all Work in a manner ensuring the integrity and proper performance of all ITS components.

Liquidated damages will be assessed for unplanned ITS disruptions. Refer to Section 1-08 of the General Provisions.

~~2.18.4.12.2~~2.18.4.13.2 Maintaining Ramp Metering During Construction

Existing ramp meter equipment shall remain operational until a new or temporary ramp meter is installed.

When any in-place ramp meter is to be off-line due to construction during any time in which the ramp meter is normally in operation, the Design-Builder shall install a temporary ramp meter. Temporary ramp meters shall meet all ramp meter design requirements in accordance with the ****WSDOT* ~~*Northwest Region*~~ *Intelligent Transportation System Design Requirements* ~~*ITS Current Practices Supplement*~~***; be compatible with the

Comment [jlb209]: Insert project-specific locations

Comment [jlb210]: Aug 31, 2015 2:46 PM Chris Thomas says:
need another heading and section for ITS HUBs: 2.18.X.X COMMUNICATION HUBS
No new hubs are required. -or- **A new hub shall be installed at STA XXX+XX and shall be in accordance with the WSDOT Northwest Region ITS Special Provisions (Appendix B) for Concrete Universal Enclosures (CUE).**
Change per markup

Formatted: Heading 4

Comment [ET211]: Option 1- use if applicable, otherwise delete and use Option 2

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Formatted: Font: Italic, Font color: Red

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Comment [ET212]: Option 2 – Use if applicable, otherwise delete and use Option 1

Formatted: Font color: Red

Formatted: Font color: Red

Comment [jlb213]: Aug 21, 2015 5:41 PM Bart Cima says:
Consideration should be given on a project to project basis to determine which ITS elements should be maintained and to provide acceptable functionality.

Comment [jlb214]: Aug 31, 2015 8:53 AM Chris Thomas says:
Consideration has been given to this. The ITS is to be kept whole. Managing traffic through construction has been determined to be a high priority.
No Change

Comment [jlb215]: work with region traffic to set times.

Comment [jlb216]: Region-specific appendix

Comment [jlb217]: Bart Cima
The current practices supplement should be incorporated into the special provisions.

Comment [jlb218]: Chris Thomas
Already commented **Change per markup**

existing system; communicate in real-time with the TMC; and include all associated signing, detection, and pavement marking for ramp meter operations.

~~2.18.4.12.3~~2.18.4.13.3 Maintaining Camera Surveillance During Construction

The existing cameras shall remain operational or temporary cameras shall be installed.When an existing camera needs to be off-line due to construction for greater than the allowable working hours on the ITS, the Design-Builder shall install a temporary camera. The temporary camera shall be installed and operational prior to taking the existing camera off-line. Temporary cameras shall be compatible with the existing system; and shall have the same functionality and coverage as the existing system.

The Design-Builder shall maintain power and fiber optic connections to all cameras during construction.

~~2.18.4.13~~2.18.4.14 ITS TESTING

The Design-Builder shall follow all testing requirements in accordance with the ****WSDOT Northwest Region ITS Special Provisions***.

The Design-Builder shall coordinate ITS testing with the WSDOT Engineer. Prior to any testing, the Design-Builder shall provide 30 Calendar Days notice to the WSDOT Engineer.

The Design-Builder shall have current training and certification on all testing equipment used. The Design-Builder shall provide documentary evidence that the instruments used for testing have been calibrated in accordance with the instrument manufacturer's specifications within the last 12 months. The Design-Builder shall have all testing equipment calibrated annually for the duration of the Contract. Measurements recorded during the tests shall be supplied to WSDOT.

The Design-Builder shall have in its possession a certification of test device calibration in accordance with the American National Standards Institute (ANSI) guidelines. The testing device shall measure electrical and insulation characteristics of power and signal control cables, and calibration documentation of optical cable test equipment. ANSI guidelines call for annual calibration of test equipment.

Depending on the construction schedule, highway ITS components may be installed, made operational, and relocated at a later time. Highway ITS components shall undergo all series of tests when relocated.

The Design-Builder shall incorporate all testing into the Baseline Contract Schedule and Monthly Contract Schedule Updates for submittal to WSDOT. The Design-Builder shall provide a schedule for all testing so that WSDOT may observe the testing. Times and locations for all tests shall be provided to WSDOT a minimum of seven Calendar Days in advance of any test.

The Design-Builder shall perform the required testing for temporary and permanent ITS systems in accordance with the Mandatory Standards and these Techncial Requirements. The Design-Builder shall develop all ITS ***and Toll Infrastructure*** testing procedures and pass/fail requirements and ~~.~~ shall submit all test procedures and pass/fail requirements, manufacturer's certification of compliances, and equipment documentation to WSDOT for Review and Comment and resolve all WSDOT comments a minimum of 14 Calendar Days prior to any testing. Testing procedures and requirements must be accepted by WSDOT prior to any testing. WSDOT may observe any tests and will audit test results. The Design Builder shall submit test reports upon completion of each test in accordance with this

Comment [jlb219]: Aug 21, 2015 5:43 PM
Bart Cima says:
Consideration should be given on a project by project basis to determine the coverage that is acceptable during construction.

Comment [jlb220]: Aug 31, 2015 8:54 AM
Chris Thomas says:
camera coverage is at the top of the list for things to be maintained.
No Change

Comment [jlb221]: Region-specific appendix

Comment [AM222]: Suggest adding the following after the second sentence…, "The Design-Builder shall incorporate all testing into the Baseline Contract Schedule and Monthly Contract Schedule Updates for submittal to WSDOT." **NOTE:** Language is now incorporated into the template.

Comment [jlb223]: Use in projects with tolling, otherwise delete.

Comment [AM224]: Suggest adding the following language after the first sentence if not already included in the Region Special Provisions…, "The Design-Builder shall also perform the required testing for temporary and permanenet ITS systems.in accordance with the Mandatory Standards and these Technical Requirements and shall submit them all to WSDOT for review and comment by WSDOT a minimum of 14 days prior to any testing." **NOTE:** Language is now incorporated into the template.

Comment [AM225]: Suggest adding the following language after the second sentence if not already included in the Region Special Provisions…, "The Design-Builder shall submit test reports upon completion of each test in accordance with this Section and Section 2.28." **NOTE:** Language is now incorporated into the template.

Comment [AM226]: Suggest adding this language…, "The Design-Builder shall notify WSDOT when all ITS requirements have been met in accordance with the Contract, including training, documentation, testing and field installations. WSDOT will perform the final inspection and acceptance of ITS systems after verifying the proper operation of all ITS components at Physical Completion of the Project." **NOTE:** Language is now incorporated into the template.

section and Section 2.28. The Design-Builder shall notify WSDOT when all ITS requirements have been met in accordance with the Contract, including training, documentation, testing and field installations.

WSDOT will perform the final inspection and acceptance of ITS sytems after verifying the proper operation of all ITS components at Physical Completion of the Project.

Refer to Section 2.26 for additional Toll Infrastructure testing procedures and requirements.

Comment [jlb227]: Use in projects with tolling, otherwise delete.

~~2.18.4.13.1~~2.18.4.14.1 Fiber Optic Splicing and Testing Plan

The Design-Builder shall submit a Fiber Optic Splicing and Testing Plan to WSDOT for Review and Comment prior to beginning Work on the ITS. The Fiber Optic Splicing and Testing Plan shall be in MS Word format and shall include the following:

- Location of all proposed fiber optic splices, including what is being spliced;
- Location of all temporary fiber optic splices;
- Scheduled date of splices and testing;
- Tests to be performed;
- Equipment to be used for the testing;
- Calibration results of testing equipment; and
- List of Project contacts (including phone numbers) for the Design-Builder and WSDOT staff.

The Fiber Optic Splicing and Testing Plan shall be submitted with each final plan submittal that includes ITS Work. The Fiber Optic Splicing and Testing Plan shall be updated with each design change affecting testing type and location.

Comment [jlb228]: Aug 21, 2015 5:45 PM
Bart Cima says:
The Fiber Optic Splicing and Testing Plan should be submitted prior to the ITS work (i.e., not during design phases)..

~~2.18.4.13.2~~2.18.4.14.2 Power and Control Cable Testing

The Design-Builder shall test power and control cables according to the requirements of Section 8-20 of the Standard Specifications and these Technical Requirements.

Comment [jlb229]: Aug 31, 2015 8:56 AM
Chris Thomas says:
This is a construction item, not a design item. the designer cannot tell you all of this informaiton such as the equipment to be used for testing, or the dates.

No change

~~2.18.4.13.3~~2.18.4.14.3 Component, Test, and Project Documentation

The Design-Builder shall prepare and submit component, test, and Project documentation. The test documentation shall include completed forms and electronic documentation. Two sets of component and test documentation shall be submitted directly to WSDOT for acceptance.

The Design-Builder shall notify WSDOT when all ITS requirements have been met. WSDOT will accept the ITS after verifying the proper operation of all components.

~~2.18.4.13.3.1~~2.18.4.14.3.1 *Fiber Optic Cable Test Documentation*

The Design-Builder shall submit fiber optic cable test documentation (including calibration and certification of the fiber optic cable test equipment), as part of the component documentation; and any testing documentation required in accordance with these Technical Requirements and the ****WSDOT Northwest Region ITS Special Provisions****.

Comment [jlb230]: Region-specific appendix

The Design-Builder shall use WSDOT's file naming convention in accordance with ****WSDOT ITS Device Naming Scheme**** for all test files.

Comment [jlb231]: Region-specific appendix

The Design-Builder shall provide a test summary describing the final measurements that are out of range; any approved changes in specified methods; and actual dates of tests performed by both power meter and optical time domain reflectometer. The Design-Builder shall take corrective actions on portions of the fiber determined to be out of range in accordance with the ****WSDOT Northwest Region ITS Special Provisions****.

Upon completion of the Project, the Design-Builder shall provide WSDOT with ~~two copies~~an electronic copy of the manufacturer's reel test documentation.

Comment [jlb232]: Region-specific appendix

Comment [jlb233]: Aug 21, 2015 5:47 PM
Bart Cima says:
Consider changing this to an electronic submission.

Comment [jlb234]: Aug 31, 2015 8:57 AM
Chris Thomas says:
Agreed. Please change to electronic. **Change per markup**

2.18.5 MAINTENANCE AND OPERATION OF ITS COMPONENTS

The Design-Builder shall provide maintenance of all existing and new highway ITS components impacted as part of the Project until Physical Completion or unless otherwise noted.

Upon Notice to Proceed of the Contract, the Design-Builder shall be responsible for all highway ITS and communications components that the Design-Builder performs Work on, including those components already in place. The Design-Builder shall maintain the components through Physical Completion.

Maintenance and operation includes the response to faults. The three categories of faults – urgent, priority, and minor – are described as follows:

- Urgent – Any fault that causes a total failure, disruption, safety impact, or system-wide disruption of the communications links and equipment; and ramp metering or CCTV facilities. The response time for urgent faults of ITS components shall be less than two hours. The repair time for urgent faults of ITS components shall be less than four hours.
- Priority – Any fault that causes a failure or disruption of an operator workstation, local control unit for VMS, or the VMS itself. The response time shall be noon of the next Calendar Day. The repair time shall be less than four hours.
- Minor – Any other fault. The response time shall be midnight of the next Calendar Day. The repair time shall be less than four hours.

The Design-Builder shall provide a plan for maintenance of existing and new ITS components within the Project limits. The plan shall include the following:

- Details of the proposed preventive maintenance program, including frequency, for each highway ITS component.
- A general description of the proposed emergency maintenance and operation response program for each highway ITS component. This description shall include the categories of faults and how the faults will be detected.
- Maintenance and operation activities.

The Design-Builder shall replace, not repair, hardware or equipment if any of the following occurs:

- The Design-Builder has attempted to repair the hardware or equipment on at least one previous occasion and there has been a subsequent failure;
- The repair activities interfere with the movement of traffic; or
- WSDOT decides that replacement is necessary in the interest of public safety.

The Design-Builder shall maintain a log documenting maintenance activities and all repairs performed on ITS equipment. The maintenance log shall be made available to WSDOT upon request.

During construction, the Design-Builder shall identify local vendors for repair parts for all ITS components, so that the parts can be obtained within four hours. The Design-Builder shall provide a list of vendors to WSDOT within 60 Calendar Days of execution of the Contract.

2.18.5.1 MAINTENANCE AND OPERATIONS PLAN

The Design-Builder shall submit to WSDOT for Review and Comment a written plan for providing maintenance and operation of ITS components furnished and installed by the Design-Builder, a minimum of 21 Calendar Days prior to performing Work on any portion of the ITS.

2.18.5.2 MAINTENANCE ACCESS REQUIREMENTS

All ITS devices shall be designed and constructed so that they are accessible and maintainable using current maintenance methods and materials.

At all new CCTV, VMS, HART, ramp meter, data station, and ESS installations, the Design-Builder shall design and construct shoulder widening or off-shoulder access to accommodate a maintenance vehicle in accordance with the ****WSDOT* ~~*Northwest Region Intelligent Transportation System Design Requirements ITS Current Practices Supplement*~~***. The parking surface outside of the roadway shoulder shall be pervious, and shall not have a slope greater than 6 percent in any direction.

Type 2 maintenance pullouts located on roadways with a posted speed of 35 mph or less shall have a 15:1 entrance taper and a 35:1 exit taper. All other characteristics of Type 2 maintenance pullouts shall be in accordance with ***~~Section 1.7.2 of~~ the WSDOT ~~*Northwest Region*~~ *Intelligent Transportation System Design Requirements* ~~*ITS Current Practices Supplement*~~***.

The Design-Builder shall design and construct a 3-foot level work zone clear of obstacles on all sides of new ITS installations.

For ESS and HART, maintenance vehicles shall have the ability to park adjacent to the ESS/HART and shall have adequate access onto and off of the freeway.

Refer to Section 2.29 for additional maintenance requirements.

2.18.5.3 ITS TRAINING

This Section has been intentionally omitted.

2.18.6 SUBMITTALS

Refer to Sections 2.12 and 2.28 for additional requirements.

2.18.6.1 ITS PRELIMINARY DESIGN SUBMITTAL

The ITS Preliminary Plans, Fiber Optic System Test, and other test plans described in this Section shall be submitted to WSDOT for Review and Comment as part of the Preliminary Design Submittal described in Section 2.28.

Comment [jlb235]: Region-specific appendix

Comment [jlb236]: Bart Cima:
The current practices supplement should be incorporated into the special provisions.

Comment [jlb237]: Chris Thomas:
Already commented **Change per markup**

Comment [jlb238]: Aug 21, 2015 5:49 PM Bart Cima says:
Consideration should be given on a project by project basis, particularly for urban environments with limited right of way.

Comment [jlb239]: Aug 31, 2015 8:58 AM Chris Thomas says:
It is, but again, the contract does not list requirements for the worst case scenario. That would put WSDOT in a very bad position.
No change

Comment [jlb240]: Region-specific appendix

Comment [jlb241]: Bart Cima:
The current practices supplement should be incorporated into the special provisions.

Delete Reference to section 1.7.2

Comment [jlb242]: Chris Thomas:
Already commented **Change per markup**

Comment [jlb243]: Aug 21, 2015 5:52 PM Bart Cima says:
Consideration should be given to clarify access requirements for specific ITS equipment.

Comment [jlb244]: Aug 31, 2015 9:00 AM Chris Thomas says:
What are you getting at? at some locations it is okay to have no room to work on the cabinet? 3 feet of work area is required by L&I.
No Change

Comment [jlb245]: Aug 21, 2015 5:54 PM Bart Cima says:
Testing plans should be part of later submittals.

Comment [jlb246]: Aug 31, 2015 9:01 AM Chris Thomas says:
agreed. test plans need to come in the construction phase.

The ITS Preliminary Plans Submittal shall include the devices described in this Section, in addition to the following:

- Title block, north arrow, and scale bar.
- Legend of symbols.
- Existing ITS features and Utilities.
- ~~Locations of all proposed ITS devices with labels.~~
- ***Toll Infrastructure.***
- Proposed channelization.
- Proposed fiber optic cable/conduit location plan.
- Cabinet locations.

2.18.6.2 ITS FINAL DESIGN SUBMITTAL

The Design-Builder shall provide an ITS Final Design Submittal in accordance with Section 2.28 that addresses the comments received from the ITS Preliminary Design Submittal review, and any issues raised during the ITS task force meetings.

The ITS Final Design Plans shall be submitted in a single, complete package and include the following:

- All items from the ITS Preliminary Plans.
- All ITS details in accordance with the ****WSDOT Northwest Region ITS Details****.
- All ITS labels.
- Temporary ITS plan.
- Pull box, cable vault, and junction box locations and details.
- Communication schematics network diagram (including IP settings). ~~and f~~
- Fiber distribution diagrams with patch panel layout details.
- Fiber optic splice details.
- Loop termination schedule.
- ~~Panel service details.~~
- Transformer/breaker schedule.
- ~~Power service locations.~~
- ~~Power distribution schematic.~~
- Cabinet foundation details.
- Fiber termination cabinet details.
- ~~VMS support structure and foundation details.~~
- CCTV camera pole structure details.
- Foundation details for CCTV camera poles.

Comment [jlb247]: Aug 21, 2015 5:53 PM
Bart Cima says:
Consider removing the requirement to provide labels at the preliminary design stage.

Comment [jlb248]: Aug 31, 2015 9:09 AM
Chris Thomas says:
agreed. they are always wrong at this stage anyhow.

Comment [jlb249]: Use in projects with tolling, otherwise delete.

Comment [jlb250]: Region-specific appendix

Comment [jlb251]: Aug 21, 2015 5:55 PM
Bart Cima says:
Temporary ITS plans should be submitted during construction, based on construction phasing.

Comment [jlb252]: Aug 31, 2015 9:11 AM
Chris Thomas says:
No, they are designed along with the construction staging.
No Change

Comment [jlb253]: Aug 21, 2015 5:58 PM
Bart Cima says:
Cable vault and pull box drainage details should be included in the ITS standard details.

Comment [jlb254]: Aug 31, 2015 9:17 AM
Chris Thomas says:
There is now a detail for the drain in the ITS details.
No Change

Comment [jlb255]: Aug 31, 2015 4:40 PM
Chris Thomas says:
break this into two statements: • . Communication Schematics Network Diagram (including IP addresses) • . Fiber distribution diagrams with patch panel layout details **Change per markup**

Comment [jlb256]: Aug 21, 2015 5:56 PM
Bart Cima says:
Power service details and schematics should be included in the electrical design submittal.

Comment [jlb257]: Aug 31, 2015 9:12 AM
Chris Thomas says:
agreed, but the Transformer/breaker schedule stays in the ITS submittal. It is reviewed by the ITS group, not the electrical group. **Change per markup**

Comment [jlb258]: Aug 21, 2015 5:57 PM
Bart Cima says:
VMS support structure and foundation details should be part of the structural design submittal.

Comment [jlb259]: Aug 31, 2015 9:13 AM
Chris Thomas says:
Agreed

Response – deleted – make sure is part of structural design submittal- TFE confirmed in 2.13.

- ***Toll Infrastructure.***
- Details for non-standard elements.
- Wire notes (including identification of new and existing conductors and cable) and construction notes.
- Calculations to support transformer sizing and transformer over current protection devices.
- Conduit fill and junction box capacity calculations.
- ~~Service load calculations.~~

The Design-Builder shall submit a Fiber Optic Splicing and Testing Plan ~~with each Final Design Submittal that includes~~prior to the ITS Work.

2.18.6.3 RELEASED FOR CONSTRUCTION ITS PLANS

Refer to Sections 2.12 and 2.28 for submittal and review requirements.

2.18.6.4 OTHER SUBMITTALS

The Design-Builder shall submit testing and software documentation, test samples and operating software (including firmware) to the WSDOT Engineer upon completion of each test as specified in these Technical Requirements.

The Design-Builder shall submit the following items upon Physical Completion of the Project

- Component, test procedures, test report and other Project documentation (including NTCIP documentation)~~, and Project documentation~~;
- Fiber optic cable test documentation;
- Maintenance and Operations Plan; and
- Product manuals.

The Design-Builder shall provide WSDOT with the x, y, and z GPS coordinates of the newly installed ITS components including, but not limited to, the following elements:

- CCTV Systems, VMS, RWIS, HAR signs, and HART;
- Ramp metering systems;
- Data stations systems;
- Communication conduit systems;
- Communication cable and interface systems;
- Video, Voice, and Data Distribution and Transmission Systems;
- Communication hubs;
- Permanent traffic recorder stations;
- Environmental sensor stations;
- Loop detectors;
- Control cabinets;

Comment [jlb260]: Use in projects with tolling, otherwise delete.

Comment [jlb261]: Aug 21, 2015 5:59 PM
Bart Cima says:
line 30 and 33 - Transforming sizing, transformer over current protection devices, and service load calculations should be part of the electrical design submission

Comment [jlb262]: Aug 31, 2015 9:13 AM
Chris Thomas says:
Agreed with the Service load calculations, but the other 2 stay here. They are reviewed and normally designed by the ITS group. **Change per markup**

Comment [jlb263]: Aug 21, 2015 6:00 PM
Bart Cima says:
The Fiber Optic Splicing and Testing Plan should be submitted prior to the ITS work.

Comment [jlb264]: Aug 31, 2015 9:13 AM
Chris Thomas says:
Agreed
Resoltuion – Per Markup

Comment [AM265]: Suggest adding new language as follows just ahead of the first bullet point item…, "The Design-Builder shall submit testing and software documentation, test samples and operating software (including firmware) to the WSDOT Engineer upon completion of each test as specified in these Technical Requirements.The Design-Builder shall submit the following items upon Physical Completion of the Project:" **NOTE:** Language is now incorporated into the template.

Formatted: Indent: Left: 0", Hanging: 0.45", No bullets or numbering

Comment [AM266]: Suggest re-writing the first bullet item as follows…, "All Component, test procedures and test report documentation (including NTCIP documentation);" **NOTE:** Language is now incorporated into the template.

- All junction and pull boxes, and cable vaults;
- Mainline fiber optic cable (every 50 feet);
- Fiber optic splices vaults; and
- Stand-alone electric service pads.

The Design-Builder shall also provide WSDOT with the x, y, and z GPS coordinates of existing components when they are connected to the new components. GPS coordinates shall be submitted in CDROM or DVD format and include ITS devices and x, y, and z GPS coordinates for each device.

End of Section

Washington State Department Of Transportation

Intelligent Transportation Systems

Design requirements

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Contents

8 Communications

9 ITS for roundabouts

1 General requirements

1.1 ITS plan submittals

1.1.1 Content and organization

The goal of any ITS designer is to assemble a comprehensive set of plans that includes a thorough and purpose-built ITS network that will optimize roadway operations. A good design results in a complete, fully-functional and maintainable ITS network.

ITS plans must include all the information necessary for a complete review of the work being performed. They must also include all the information required for construction or installation, and for documentation of the completed work for future reference.

1.1.1.1 ITS plans shall contain each of the following if relevant to the project (e.g. patch panel layout details are not relevant if there are no patch panels on the project):

- Title block, north arrow and scale bar;
- Legend of symbols;
- Existing ITS features and utilities, including device ID;
- Existing and new loop names;
- Proposed channelization;
- Temporary ITS plans, ITS details, construction notes and wire notes;
- Permanent ITS plans, ITS details, construction notes and wire notes;
- Toll infrastructure;
- Fiber optic splice details;
- Patch panel layout details;
- Communication schematic, including all equipment and IP address information, and fiber assignment numbers (see **Figure 1-1: Example communication schematic**);
- One-line fiber distribution diagram (see **Figure 1-2: Example one-line diagram and patch panel layout**);
- Hub details including elevation views of the new and existing equipment installed in the racks;
- Detail sheets for loops, cabinets, CCTV, etc.;
- Details for all non-standard installations and elements;
- All other information needed or required elsewhere to properly document the work being done.

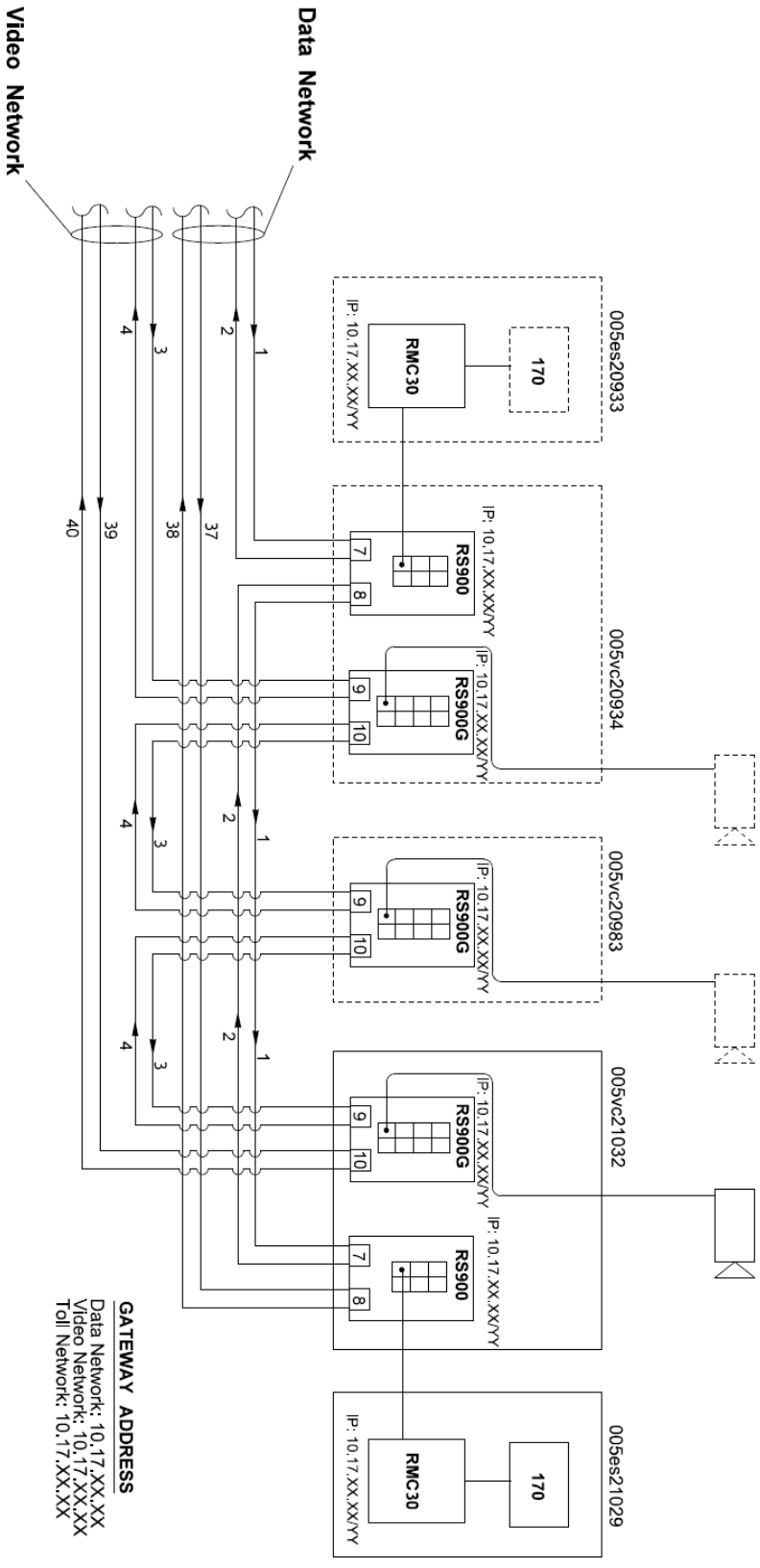


Figure 1-1: Example communication schematic

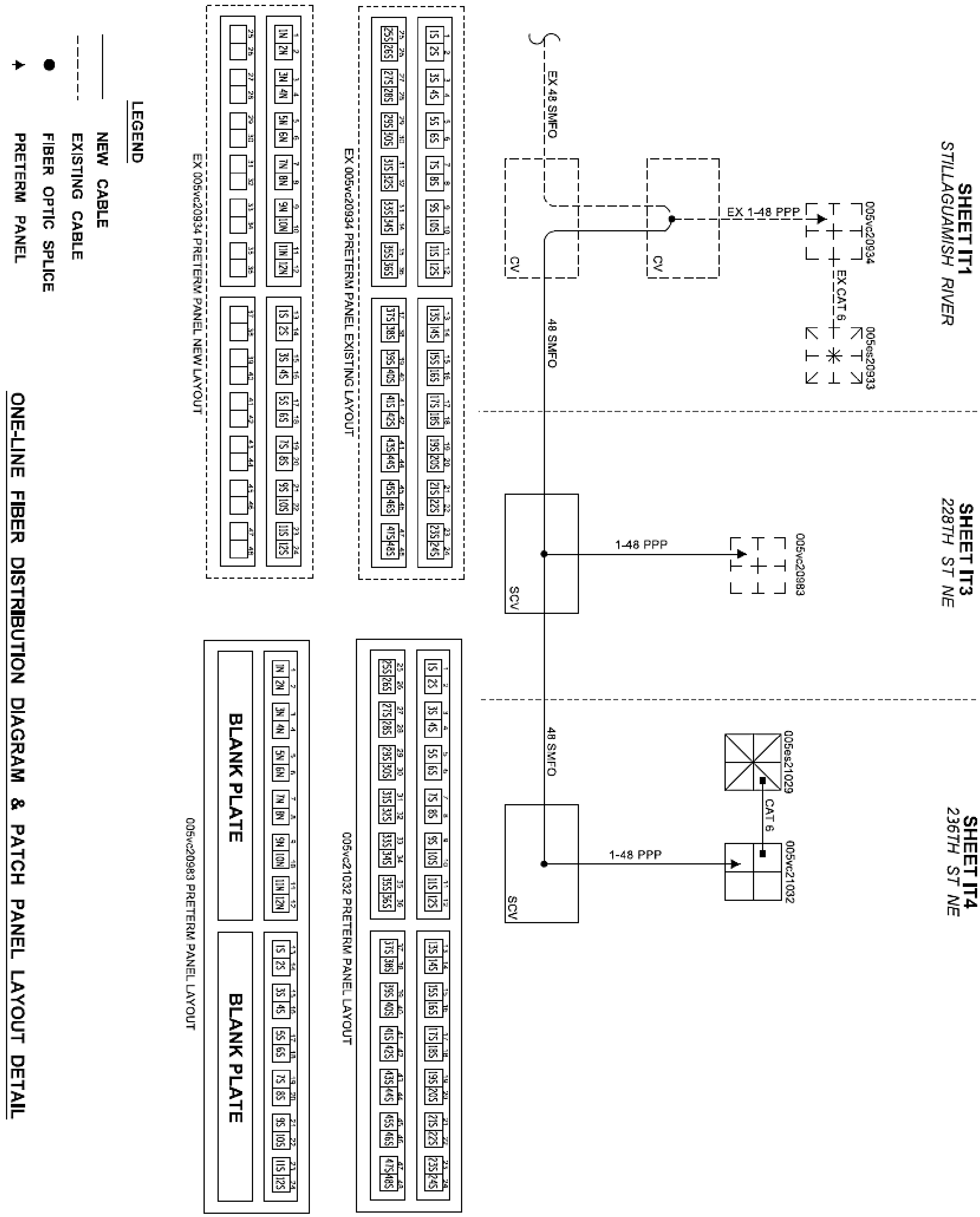


Figure 1-2: Example one-line diagram and patch panel layout

1.1.1.2 Wire notes, construction notes and the ITS legend shall be on separate sheets from the plan sheets.

1.1.1.3 Temporary ITS plans, construction notes and wire notes shall be on separate plan sheets from the permanent plan sheets.

1.1.1.4 All new and existing ITS and spare conduits shall be shown on detail sheets

1.1.1.5 All conduits shown on a detail shall be identified with wire notes on both the detail sheet and the plan sheet

1.1.1.6 Tolling detail sheets shall be separate from ITS plan and detail sheets.

1.1.1.7 The tolling plan shall be shown on the ITS plan sheets.

1.1.1.8 All non-ITS work shall be on separate plan sheets.

1.2 Device naming

1.2.1 Naming scheme

ITS devices must be named using a consistent system in order to reduce confusion and improve device management. Inconsistent naming will introduce inaccuracies when communicating within the agency or with contractors, which will lead to maintenance and construction errors.

The name consists of 3 concatenated fields:

- A 3-digit roadway number with zeroes prepended to the beginning of the number for roadway numbers with fewer than 3 digits (e.g. 005, 090, 405);
- A 2-character device type code as shown in Table 1-1;
- A 5-digit milepost at which the device itself is located, reflecting the nearest 1/100th mile with the decimal point removed (i.e. 165.37 becomes 16537).

For example, a variable message sign on I-90 at milepost 11.19 will be named 090vm01119.

Note that the 5-digit milepost used in the device name reflects the location of the device itself, not the location of its corresponding cabinet. For a camera, the milepost represents the location of the camera. For a data station or ramp meter, the milepost represents the location of the mainline loops. If the mainline loops for each location are not aligned at the same location, the average milepost between the separate locations is used instead. For a VMS or HARS cabinet, the milepost for the sign is used. For a transformer cabinet, the location of the transformer cabinet itself is used.

Device names must also be unique and cannot be duplicated. In situations where multiple devices of the same type are placed at the same milepost, such as lane control signs for an ATM installation, the milepost of the device name may be adjusted by 1/100th mile to create a unique name. The milepost stated within the device name must increase from right to left when facing the direction of increasing milepost. The device closest to the median, or the device to the right of the median if they are equidistant, will use the actual milepost for its device name.

1.2.1.1 The device name shall consist of 3 concatenated fields: (1) roadway number, (2) type code and (3) milepost.

1.2.1.2 The roadway number within the device name shall contain 3 digits. Zeroes are prepended to the beginning of the roadway number for roadways numbers with fewer than 3 digits.

1.2.1.3 The type code within the device name shall be 2 characters, following the naming scheme shown in **Table 1-1: Type codes.**

1.2.1.4 The milepost within the device name shall contain 5 digits, reflecting the location of the ITS device itself, not its cabinet unless the mileposts are the same, to the nearest 1/100th mile with the decimal point removed. Zeroes are prepended to the beginning of the milepost to meet the 5-digit requirement if necessary.

Device	Type Code	Device	Type Code
ATM Corridor	ac	Microwave Repeater	mr
Call Box	cb	Neon Sign	ns
communication HuB	hb	earthQuake Detector	qd
Changeable Message sign	cm	earthQuake Processor	qp
Closure Signal	cs	Reversible Controller	rc
closed circuit Video Camera	vc	toll Rate sign	rs
Drum Sign	ds	Seismic gate Controller	sc
Ramp Meter / Data Station	es	Security Device	sd
Toll Facility	fc	variable Speed Limit sign	sl
Flashing Beacon	fb	Tag Reader	tr
Fiber optic Terminal cabinet	ft	Terminal Cabinet	tc
Gate Controller	gc	TolL controller	tl
ATM Gantry	gn	Toll triP	tp
HAR Sign	hs	Traffic Signal	ts
HAR Transmitter	ht	Travel Time sign	tt
Illumination Control	ic	Transformer	xf
Information Side-Mount & Speed sign	is	Variable Message sign	vm
Lane Control sign	lc	Weather Station	ws
License plate Reader	lr	weigh station	
Movable Gate	mg		

Table 1-1: Type codes

1.2.1.5 Each device shall receive a unique device name, even if they are the same type of device at the same location.

1.2.1.6 If multiple devices of the same type are installed at the same milepost, the milepost within the device name shall be adjusted by 1/100th mile to satisfy the name uniqueness requirement. The milepost stated within the device shall increase from right to left across the entire roadway, when facing the direction of increasing milepost.

1.2.1.7 If multiple devices of the same type are installed at the same milepost, the device closest to the median, or the device to the right of the median if they are equidistant, shall use the actual milepost within its device name. See **Figure 1-3: Example lane control sign names on a fictional highway** for graphical explanation.

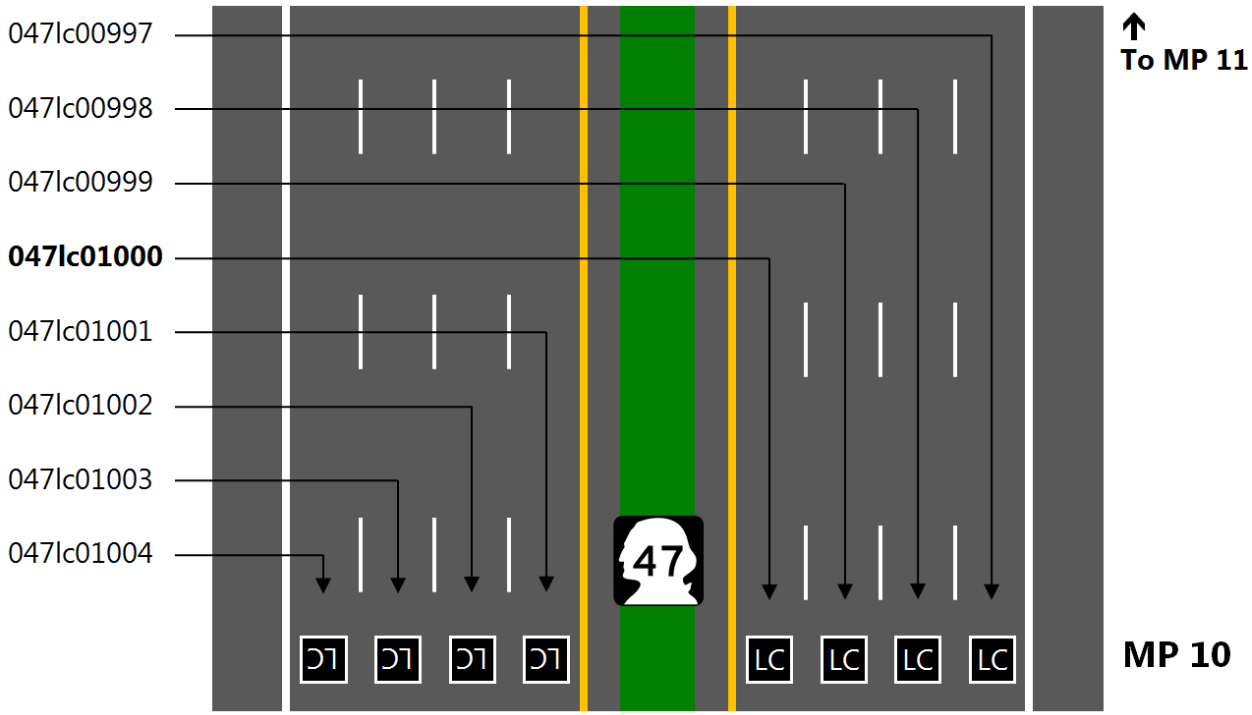


Figure 1-3: Example lane control sign names on a state highway 47

1.3 Existing ITS devices

1.3.1 Operations during construction

Whenever work is performed on an existing ITS device, the existing device will most likely experience operational impacts. These devices and the impacts to the devices must be stated clearly in the special provisions. Examples of these situations are included below:

- If the grinding process during a paving project will impact induction loops embedded in the pavement, a disruption specification must state the maximum duration of time that the loops can remain out of normal operations. This must be limited to the amount of time actually required to perform the work (typically 1 to 5 days).
- If power is interrupted to a device, it should only occur when the device is least needed. This may be in the middle of the day, but it is usually in the middle of the night. It may be acceptable to keep a device out of operations for an extended period of time if impacts are minimal or if alternatives are unrealistic, but there must be a clearly-stated limit in the special provisions.

Specifications regarding temporary ITS equipment and disruptions to existing devices are often the most difficult to write. These specifications explain to the contractor the work they must perform prior to an impact, the work to be performed during the impact/cutover and/or the maximum allowed duration of impact to the system. It is crucial to consider all aspects of the cutover and to verify that the work can be accomplished in the allotted time. Complex projects may have disruption specifications that are several pages long. Some examples of disruption specifications are included below.

ITS Loops
The Contractor shall have 3 consecutive calendar days to install and make functional all new loops from the time that existing loops are ground, damaged or otherwise disrupted by construction activities.

The Contractor shall not disrupt more than 3 mainline loop installations at any given time. A mainline loop installation is defined as a set of count and speed loops installed in all lanes at a single location and tied to a single cabinet.

Failure to meet the 3 day deadline will result in the assessment of liquidated damages in accordance with the subsection **Liquidated Damages** of the Special Provision **PROSECUTION AND PROGRESS**.

005es18252 Temporary Ramp Meter
The Contractor shall install and make operational a temporary ramp meter system for the existing ramp meter 005es18252 as shown in the plans within 5 calendar days after the traffic shift on the W-S ramp. The temporary ramp meter shall remain operational until 005es18236 and all associated loops are operational and connected to the WSDOT TMC in Shoreline.

Failure to install the temporary ramp meter as outlined above will result in the assessment of liquidated damages in accordance with the subsection **Liquidated Damages** of the Special Provision **PROSECUTION AND PROGRESS**.

Video and Data Communication Cutover

The contractor shall have one weekend between the hours of 8 PM Friday and 4 AM Monday to cutover the video and data communication system. Work to be completed before the cutover includes splicing and terminating a new 36 SMFO between the Everett HUB and 005vc18726. On the cutover weekend the contractor shall connect the fiber optic facility as to allow video and data communication to 005vc18726, 005vc18748, 005vc18797, and 005vc18848. Lateral data communication shall also be established to 005es18726, 005vm18726, 005es18739, 005es18789, 005es18846, and 005es18847. Work to be completed prior to the cutover weekend shall include:

- The new 005vc18748 shall be installed in accordance with the plans.
- The 36 SMFO cable, all distribution cables, all SMFO electronics, and all patch panels shall be installed and connected between the Everett HUB and 005vc18726 as shown in the plans.
- Install and connect the RS-900 Ethernet switch in the Everett HUB.
- Program all Ethernet devices as shown in the plans and test the data network for connectivity.

The following work shall occur on the cutover weekend:

- Connect the Ethernet devices to all 170 and VMS controllers.
- Connect the camera feed and control to the fiber optic transmitter.

Failure to meet the 4 AM Monday deadline will result in the assessment of liquidated damages in accordance with the subsection **Liquidated Damages** of the Special Provision **PROSECUTION AND PROGRESS**.

Mainline Communication Cutover

The contractor shall have one weekend between the hours of 8 PM Friday and 4 AM Monday to cutover the mainline communication cable. The following work items shall be completed before the cutover weekend:

- Install 1-60 SMFO cable between the Everett HUB and the cable vault at STA LRC 819+20.
- Splice the 1-60 SMFO to the pre-terminated patch panel in the Everett HUB.

The work shall occur in the following order:

1. Cut the existing 1-60 SMFO cable in the cable vault at STA LRC 819+20.
2. Splice the new 1-60 SMFO cable from the Everett HUB to the existing 1-60 SMFO mainline communication cable.
3. Remove the disconnected 1-60 SMFO cable between the Everett HUB and the cable vault at STA LRC 819+20.

Failure to meet the 4 AM Monday deadline will result in the assessment of liquidated damages in accordance with the subsection **Liquidated Damages** of the Special Provision **PROSECUTION AND PROGRESS**.

1.3.1.1 Any device or component that will be impacted shall be stated in the special provisions, including the expected duration of impact.

1.3.1.2 All existing ITS devices shall be kept operational during the project unless the existing device has already been replaced with a new one that has been inspected and made fully operational by WSDOT.

1.3.1.3 Once a new device has replaced an existing ITS device and has been inspected by WSDOT, the new device shall be kept operational.

1.3.1.4 Devices that are damaged by construction activities that are not specifically designated for replacement or removal in the plans or the RFP shall be restored to new condition or replaced by the Contractor in accordance with WSDOT standards.

1.4 Conduit

1.4.1 General

1.4.1.1 Conduits between cabinets on a shared foundation shall not go through any junction boxes.

1.4.2 Size

1.4.2.1 The minimum size of conduits for Intelligent Transportation Systems (ITS) shall be 2″ in diameter. However, a smaller conduit may be used at Type 1 pole foundations, for loop lead-in conduits and for power conduits between cabinets and transformers.

1.4.3 Spare conduits

1.4.3.1 A minimum of one spare 2″ conduit is required at each roadway crossing.

1.4.3.2 A minimum of one spare 2″ conduit is required through VMS structure foundations.

1.4.3.3 A minimum of one spare 2″ conduit is required between each transformer cabinet and its nearest junction box.

1.4.3.4 A minimum of one spare 2″ conduit is required between each device cabinet and its nearest junction box with the following additional requirements:

- ES cabinets require two 2″ or one 3″ spare conduit(s);
- Foundations installed for future cabinets require three 2″ conduits or two 3″ conduits, in addition to one 2″ conduit to the adjacent ITS cabinet with the patch panel and one 1.5″ conduit to the transformer.

1.5 Junction boxes

1.5.1 Type

1.5.1.1 Any existing type 3 junction box shall be replaced with a heavy-duty type 6 junction box if located in pavement or a type 8 junction box if not located in the pavement.

1.5.1.2 If an existing junction box is located in the paved shoulder, it shall be replaced with a heavy duty junction box.

1.5.2 Removal of unused junction boxes

1.5.2.1 Any ITS junction boxes that are not part of the permanent ITS network when the project is complete shall be removed.

1.5.3 Location

1.5.3.1 All existing junction boxes that are in, or are within 3 feet of, the existing or proposed travelled way shall be moved to a location outside of the pavement whenever possible. If relocating outside the pavement is not possible, the junction boxes shall be moved to a location 3 feet or more outside of the travelled way and replaced with a heavy-duty junction box (type 4, 5 or 6) or a pull box with a heavy lid.

1.5.3.2 Any junction boxes not located in the pavement shall not be heavy duty junction boxes.

1.6 Vaults (pull boxes and cable vaults)

1.6.1 Location

1.6.1.1 A cable vault shall be located adjacent to all device cabinet foundations.

1.6.1.2 All existing vaults that are in, or are within 3 feet of, the existing or proposed travelled way shall be moved to a location outside of the pavement whenever possible. If relocating outside the pavement is not possible, the cable vaults and pull boxes shall be moved to a location where the nearest edge of the vault is 3 feet or more outside of the travelled way.

1.6.1.3 Any pull box or cable vault that is not located in the pavement shall be supplied with a standard-duty lid.

1.6.1.4 Any pull box or cable vault that is located in the pavement shall be supplied with a heavy-duty lid.

1.6.1.5 The top of all vaults connected directly to a cabinet foundation shall have the same elevation as, or a lower elevation than, the cabinet foundation.

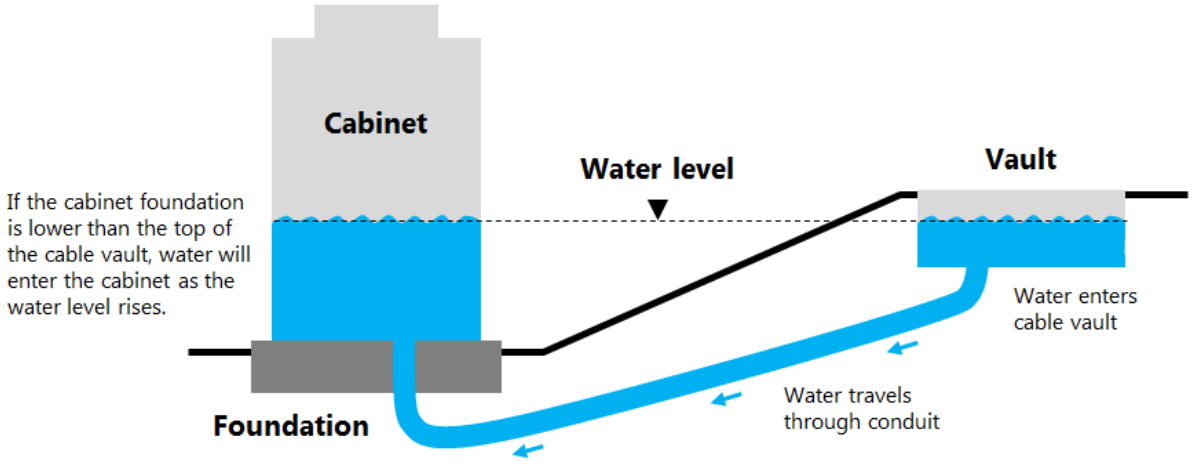


Figure 1-4: Cabinet foundation height requirements in relation to vaults

1.6.1.6 New and existing cable vaults and pull boxes shall not be located in a traveled lane under any circumstances.

1.6.1.7 Unless approved by WSDOT, new and existing cable vaults and pull boxes shall be located outside of the pavement. If approved for use in the paved shoulder, the following requirements shall be met:

- The cable vaults and pull boxes shall be equipped with heavy-duty lid if located in the shoulder;
- The nearest edge shall be no less than 3 feet from the edge stripe.

1.6.2 Removal of unused vaults

1.6.2.1 Any vaults that are not part of the permanent ITS network when the project is complete shall be removed.

1.6.2.2 Abandoned conduits shall be removed from all vaults and the resulting hole shall be grouted to match the surrounding surfaces.

1.7 Cabling

1.7.1 Installation

1.7.1.1 Cables supplying power to cabinets shall only share conduits and junction boxes with other power or illumination circuits.

1.7.1.2 Cabling shall not use cabinets as a raceway or junction box. If a cable is not intended for use in a cabinet, it shall not be installed into or through that cabinet.

1.7.2 Slack

1.7.2.1 All vaults must contain a minimum of 50 feet of slack for each fiber optic cable. In some situations, more slack may be required.

1.7.2.2 50 feet of slack shall be provided for each direction of every cable entering a splice closure.

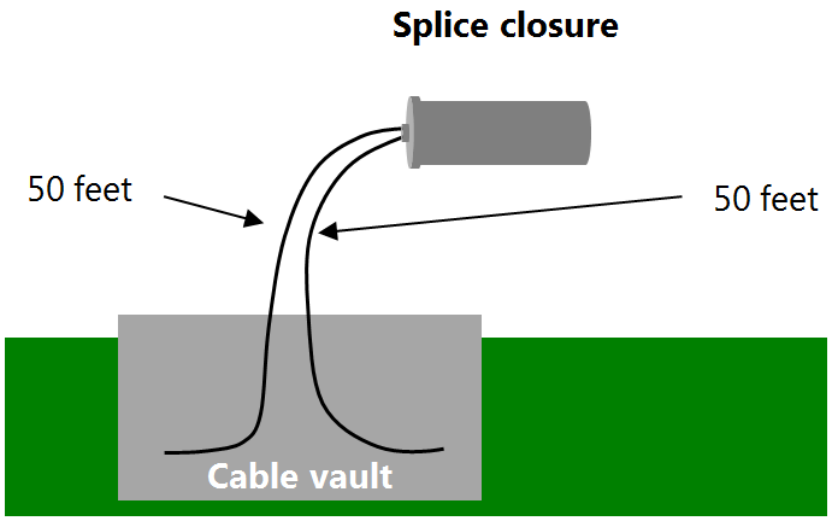


Figure 1-5: Splice closure and cable slack

1.7.2.3 Sufficient slack shall be added to reach the locations of any devices that are being installed within 2 years of contract completion and where the total extra slack does not exceed 600 feet.

1.7.3 Removal of unused cabling

1.7.3.1 Any cables in ITS conduits that are not part of the permanent ITS network when the project is complete shall be removed.

1.8 Cabinets

1.8.1 Location

1.8.1.1 Cabinets shall be located where they are accessible from WSDOT roadways.

1.8.1.2 Cabinets shall be no closer than 8 feet from the face of nearby guardrails. This is to accommodate the deformable nature of guardrails upon impact. If the cabinets are placed too close to the guardrail, it is likely that they, or the personnel working with the cabinets, will be struck as a result of guardrail deflection, as shown in the adjacent photo. This particular incident damaged variable speed and lane control cabinets, resulting in over a month of outage and substantial replacement costs.

Figure 1-6: Cabinet damage due to guardrail deflection

1.8.1.3 Cabinets shall be no closer than 5 feet from the face of a non-rigid concrete barrier.

1.8.1.4 Sufficient length of barrier shall be provided to protect both the cabinets and the work area around the cabinets according to the design manual.

1.8.1.5 The elevation of the top of a cabinet foundation shall not be lower than the top of any adjacent junction box or vault connected to the foundation with conduit. This is to prevent water from draining from the junction box into the cabinet.

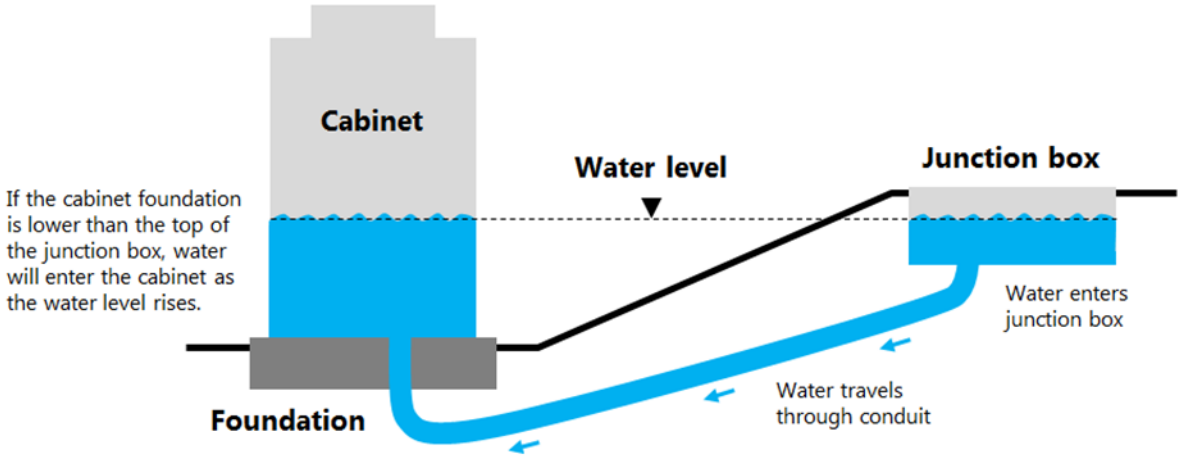


Figure 1-7: Cabinet foundation height requirements in relation to junction boxes

1.8.1.6 Cabinets shall not be placed behind any structural or noise/sound walls. This is to facilitate maintenance access.

1.8.1.7 ITS devices shall not share the same cabinet with any other systems unless the cabinet is a WSDOT-standard multi-use cabinet specifically designed for that purpose (i.e. 332D with CCTV). This includes, but is not limited to, signals, illumination, irrigation, etc.

1.8.1.8 ES cabinets shall not be used to house equipment for any other system, including other ITS systems. This is to prevent crowding, as cabinets are very full. Adding additional equipment will block access to other cabinet components.

1.8.2 Removal of unused cabinets

1.8.2.1 Any cabinets that are not part of the permanent ITS network when the project is complete shall be removed.

1.8.3 Cabinets on slopes

1.8.3.1 For slopes uphill from the roadway the foundation shall be cut into the hillside according to the ITS detail for sloped foundations.

1.8.3.2 For slopes downhill from the roadway equal to or flatter than 4:1, the foundation shall be cut into the hillside according to the ITS detail for sloped foundations.

1.8.3.3 For slopes downhill from the roadway, steeper than 4:1, the following features are required:

- A retaining wall shall be built and a platform constructed between the roadway and the retaining wall to support the ITS cabinet foundation;
- The ITS cabinet foundation shall be at the same elevation as the roadway;
- A fence shall be provided around the perimeter of the raised platform according to Standard Plan L-20.10-02;
- The distance between the fence and the sides of the cabinet shall be no less than 3 feet;
- The distance between the fence and either door of the cabinet shall be no less than 5 feet.

1.8.4 Existing cabinets

1.8.4.1 Existing cabinets within the project limits shall be replaced if any of the following conditions are met:

- The cabinet is designated for replacement in the contract documents;
- The cabinet is more than 10 years old before physical completion of the contract;
- The cabinet does not meet current NWR ITS specifications;
- The cabinet is damaged.

1.8.4.2 Existing cabinet foundations within the project limits shall be replaced if a new cabinet is being installed and the existing foundation does not meet all design requirements for a new foundation, including conduit requirements.

1.8.5 Power

Each ITS cabinet shall be on its own circuit, with its own circuit breaker and power cables from either the transformer or the service cabinet feeding it.

1.9 Cabinet foundations

1.9.1 Removal of unused foundations

1.9.1.1 Any foundations that are not part of the permanent ITS network when the project is complete shall be removed.

1.9.1.2 Cabinets shall use the same foundation as other nearby cabinets when possible.

1.10 Type 1 maintenance pullout (pickup truck access)

1.10.1 Characteristics

1.10.1.1 Type 1 maintenance pullouts shall have these minimum characteristics:

- 8-foot wide, 80-foot long paved shoulder;
- 5:1 entrance taper;
- 30:1 exit taper.

1.10.2 Location

1.10.2.1 Type 1 maintenance pullouts are required next to all cabinet and hub locations.

1.11 Type 2 maintenance pullout (bucket truck access)

1.11.1 Characteristics

1.11.1.1 For pullouts next to camera poles, a minimum of 20 feet of the pullout shall be located both upstream and downstream of the camera pole.

1.11.1.2 For pullouts next to structures with a VMS, a minimum of 35 feet of the pullout shall be upstream of the structure.

1.11.1.3 Type 2 maintenance pullouts shall have these minimum characteristics:

- 14-foot wide,50 foot long paved shoulder;
- 35:1 entrance taper;
- 70:1 exit taper.

1.11.2 Location

1.11.2.1 Type 2 maintenance pullouts shall be provided next to all camera poles.

1.11.2.2 Type 2 maintenance pullouts shall be provided next to all structures with a walk-in VMS.

1.12 Maintenance access roads

1.12.1 Characteristics

1.12.1.1 Maintenance access roads shall have these minimum characteristics:

- The access road shall be provided to the nearest WSDOT roadway shoulder;
- The road shall be a minimum of 14 feet wide;
- The road shall be constructed according to the detail in **Figure 1-8: Maintenance access road**;
- A 10′ wide x 15′ long generator parking pad shall be provided adjacent to the hub transfer switch and connected to the access road.

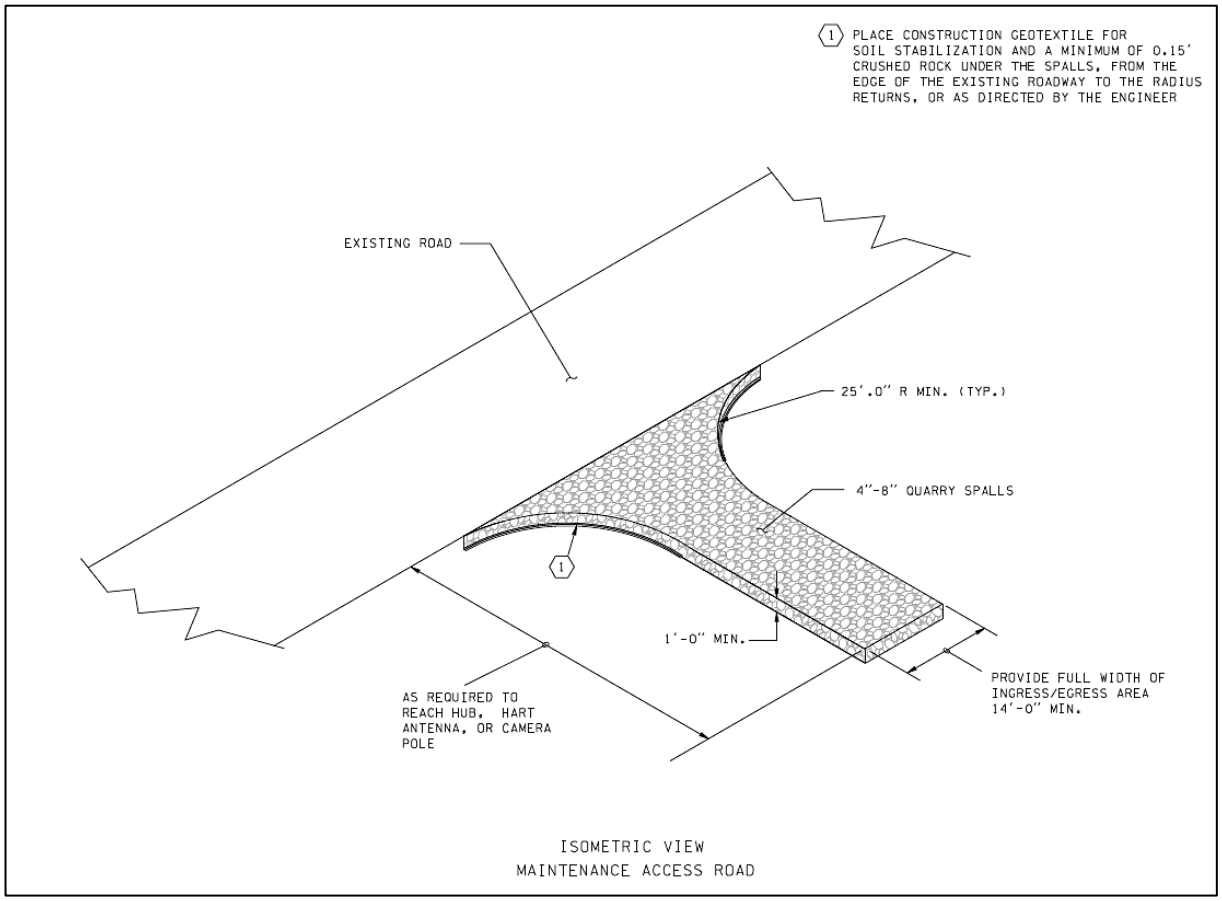


Figure 1-8: Maintenance access road

1.12.2 Location

1.12.2.1 Maintenance access roads are required at the following locations:

- Communication hubs;
- HAR Transmitters;

- Camera locations that are not adjacent to the roadway (see camera pole location requirements). In this case, the maintenance access road shall be built within 10 feet of the camera pole and shall be reachable by the bucket truck described in the camera pole section.

1.13 Work outside of the project limits

1.13.1 Cabling

Some projects may require a connection to the existing ITS infrastructure that is outside of the project limits. This is acceptable as long as there is an existing conduit path between the new and existing systems. As long as no soil is being disturbed, installation and termination of cables under these conditions are considered normal maintenance work and can be done outside of the project limits. Whenever working outside of the project limits, the designer should always communicate to the project office the type of work being performed.

1.13.2 Hardware

Most projects that include installation of equipment in the field will require head-end equipment to be installed in a hub and/or at the traffic management center (TMC). This work is almost always performed outside of project limits. This is acceptable, as this type of work is considered normal maintenance and can be performed by the Contractor regardless of the project limits. Another solution, if approved by the NWR ITS Engineer, is to list the required hub and TMC equipment in the special provisions supplied to WSDOT. WSDOT would then receive the equipment from the contractor and perform the final installation of the equipment. Note that hub and TMC equipment are a crucial part of the design and without them, the field devices that they serve will not function.

1.14 Special designs

All new installations must be fully designed. In most cases, existing specifications and details have already been standardized and will be available for use. However, they may not work for every installation due to unique situations. If a unique installation is required, the designer will need to create specifications or details for the installation. Examples of this type of work are listed below:

- If a cabinet is designed with the installation of non-standard items, an elevation view of the cabinet showing the rack mounting units (RMU) being used is required. This allows reviewers to comment on the integrity of the installation, such as the fit and the ability to allow airflow through the cabinet.
- An elevation view of conduit installed on structures is required to show conduit routing. It does not need to show all expansion and deflection fittings since those are covered in the specifications. However, it does need to show all conduits bends and NEMA boxes. There is a maximum number of bends allowed between boxes and there are minimum bend radius requirements for conduits carrying fiber optic cables. These details must be provided as they are important for design review and verification of construction.
- Some installations require specialty items such as pole or bridge mounted cabinets, or cameras mounted to bridge structures. These items are not standardized and will require additional details to show how they are to be constructed.

Note that standard ITS installations are not always the right solution. Designers should always consider the purpose and the intended use of the device. For example, a standardized design may be based on the posted speed of a roadway. However, if the device is intended for use during peak period, it may be more effective to deviate from standardized designs and use the operating speed instead of the posted speed.

1.14.1 Specifications and approval

1.14.1.1 All site-specific designs shall be accompanied by corresponding details and specifications that show all work required to be performed.

1.14.1.2 Some sites may require special designs, but all special designs require approval from the ITS Engineer.

2 CCTV

2.1 Overview

CCTV is used by the traffic management center (TMC) to visually monitor conditions on the highway network.

CCTV infrastructure provides time and cost savings during incident management by reducing the need to dispatch personnel to confirm every reported incident. For example, operators in the TMC can use CCTV feeds to determine whether an incident is severe enough to warrant emergency personnel response, allowing for prioritization.

CCTV can also be used to improve response times by confirming the location of an incident, which would otherwise be difficult due to the often imprecise reports from drivers. Operators can coordinate with emergency response personnel to determine the quickest way to access an incident.

Operations and maintenance activities also benefit from CCTV as they can be used to monitor equipment performance. CCTV is often used to determine the integrity of VMS displays, ramp metering operations, loop detection count accuracy and construction progress. For example, TMC operators visually confirm that ramp metering systems operating correctly and not causing excessive queuing onto local streets. Operators will also use CCTV to verify the readability of VMS displays, ensuring that there are no broken pixels within the text.

This document provides guidelines that regulate the performance requirements of Northwest Region CCTV systems.

2.2 CCTV Coverage

2.2.1 Coverage and spacing

In order to provide needed effectiveness, CCTV coverage needs to include the travelled lanes and shoulders of all roadways, including ramps. Ideally, nominal spacing between camera sites would be 0.5 miles, based on the optimal viewing distance of camera optics under ideal conditions. However, due to roadway geometry, roadside equipment, trees or structural obstructions, the distance may have to be reduced to provide the necessary coverage.

Good coverage	Poor coverage (trees, overpasses and signs)
	

Figure 2-1: CCTV coverage quality

In locations of special interest, such as tunnels or sections of roadway with hard shoulder running, the nominal spacing should be reduced to provide greater redundancy to support additional operations, such as fire suppression systems or hard shoulder monitoring.

2.2.1.1 Cameras shall be located to provide 100% coverage of all travel lanes and shoulders. This is necessary for incident management.

2.2.1.2 Cameras shall provide an axonometric view of the roadway. A view along the plane of the roadway is not acceptable and is not considered as full coverage. The axonometric view is required to actively manage traffic, where operators must determine which lanes are impacted by an incident. This is important for incident management and reporting.

2.2.1.3 At interchanges, cameras shall provide 100% coverage of all ramps. The view should be optimized, if possible, for merging and weaving segments since there is a greater chance of collisions in these areas.

2.2.1.4 Maximum coverage shall be obtained using the least number of cameras possible. Additional assets result in higher maintenance costs for WSDOT.

2.2.1.5 In a project area, existing cameras that no longer provide 100% coverage of all freeway lanes and ramps shall be removed. New cameras shall be placed where full coverage can be attained, or additional cameras shall be provided to provide 100% coverage.

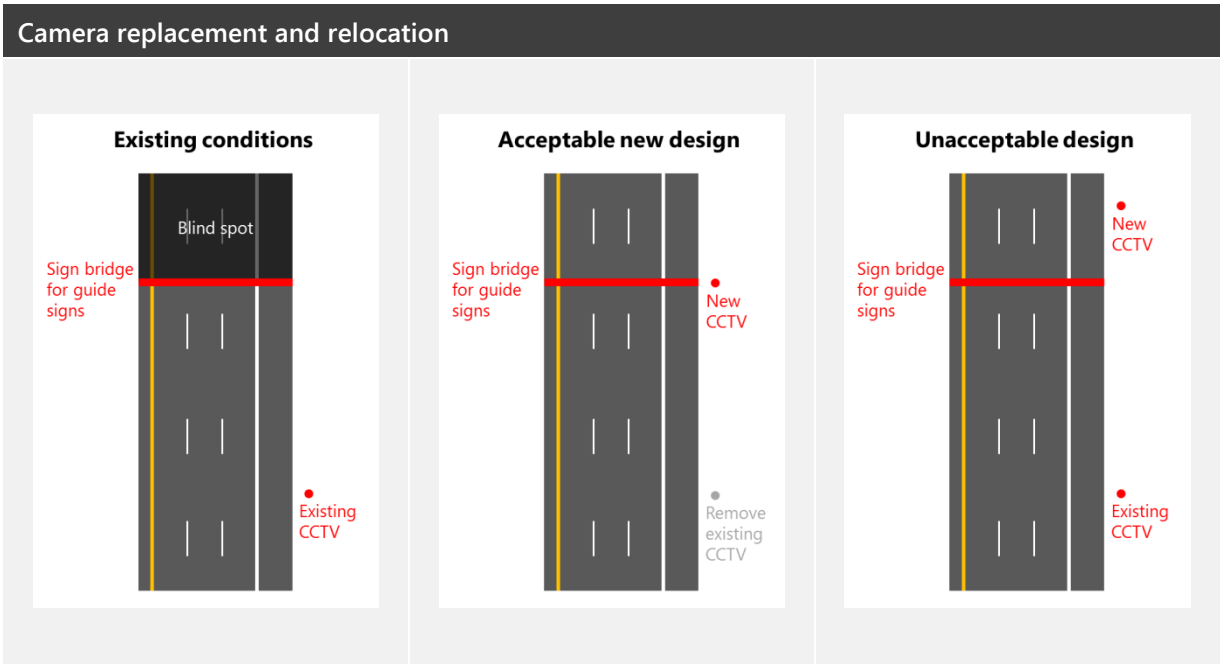


Figure 2-2: CCTV placement near guide signs

2.2.1.6 When determining sites for camera installation, the designer shall consider whether existing or future-planned traffic signs, gantries and bridges could obstruct the camera's coverage of the area.

Sign bridge obstruction (diagram example and real-life example)

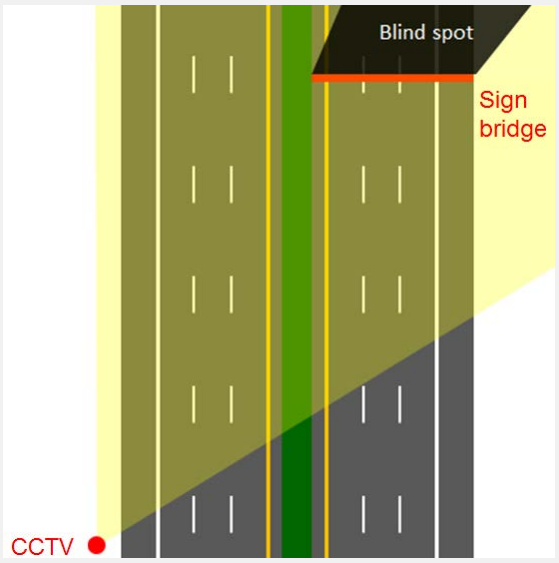


Figure 2-3: Sign bridge obstruction

2.2.1.7 The designer shall consider roadway geometry (horizontal and vertical curves) when determining camera placement

2.2.1.8 The maximum longitudinal distance between consecutive cameras on a corridor is 4500 feet. This is an operational consideration that limits the distance that a camera can cover by itself to no more than 2250 feet in each direction. Even under normal weather, it is difficult to discern conditions at distances beyond 2250 feet.

2.2.2 Vegetation

CCTV coverage can be affected by the growth of vegetation along the roadway. This poses an operational challenge, since plant growth over time results in significant blind spots and reduces roadway coverage. The designer must consider the future growth of vegetation when choosing the location of the camera. This should be done by coordinating with the landscape architect to ensure that plant growth will not obstruct the camera view. This may be achieved by readjusting the location of the camera, adding additional cameras or by using low-growing plants.

Poor coverage due to vegetation growth

Figure 2-4: Poor coverage due to vegetation growth

2.2.2.1 The designer shall consider whether future growth of vegetation may obstruct the camera's coverage of the area, especially when designing outside of summer months.

2.2.2.2 Cameras shall be placed where vegetation growth will not interfere with camera views.

2.2.2.3 Vegetation shall be selected to avoid interference with camera views.

2.2.2.4 If it is impractical to relocate cameras or modify vegetation to achieve full coverage, additional cameras shall be installed to ensure full coverage.

2.2.3 Other viewing considerations

In addition to the coverage considerations mentioned in the previous section, there are other factors that may influence the quality of CCTV coverage and its ability to meet operational requirements. Cameras are often located adjacent to other roadside equipment and under varying environmental conditions. Great consideration must be given to reduce any negative effects of the local surroundings that may impact the coverage quality.

2.2.3.1 Personnel shall be able to see the camera from its respective control cabinet. This is a maintenance consideration which allows the cabinet user to visually confirm the camera's performance without the need for additional personnel or equipment.

2.2.3.2 For on-ramps with ramp meters, cameras shall provide the front view of at least one signal head per metered lane. The signal head indicators shall be visible without obstruction and under both daytime and nighttime lighting conditions. This is important for ramp metering operations since operators must verify that ramp meters are performing normally and safely.

2.2.3.3 Cameras shall provide the front view of HAR sign beacons and be capable of clearly seeing both beacons without obstruction and under both daytime and nighttime lighting conditions. This reduces maintenance dispatches and costs since operators can remotely verify equipment performance.

2.2.3.4 Cameras shall provide the front view of VMS, SMS, LCS, TRS, tunnel closure signs and signals, and be capable of clearly seeing the display pixels under daylight and nighttime conditions. This is required for operators to verify the messages or aspects being displayed. Operators will also use the cameras to visually confirm and accurately report problems to maintenance regarding failed pixels and modules.

2.2.3.5 For VMS, SMS, LCS and TRS displays, the designer must consider the LED cone of vision (i.e. viewing angles). The camera shall also be no more than 2000 feet upstream of the sign display, but no closer than the minimum distance required to clearly see the pixels under daylight conditions.

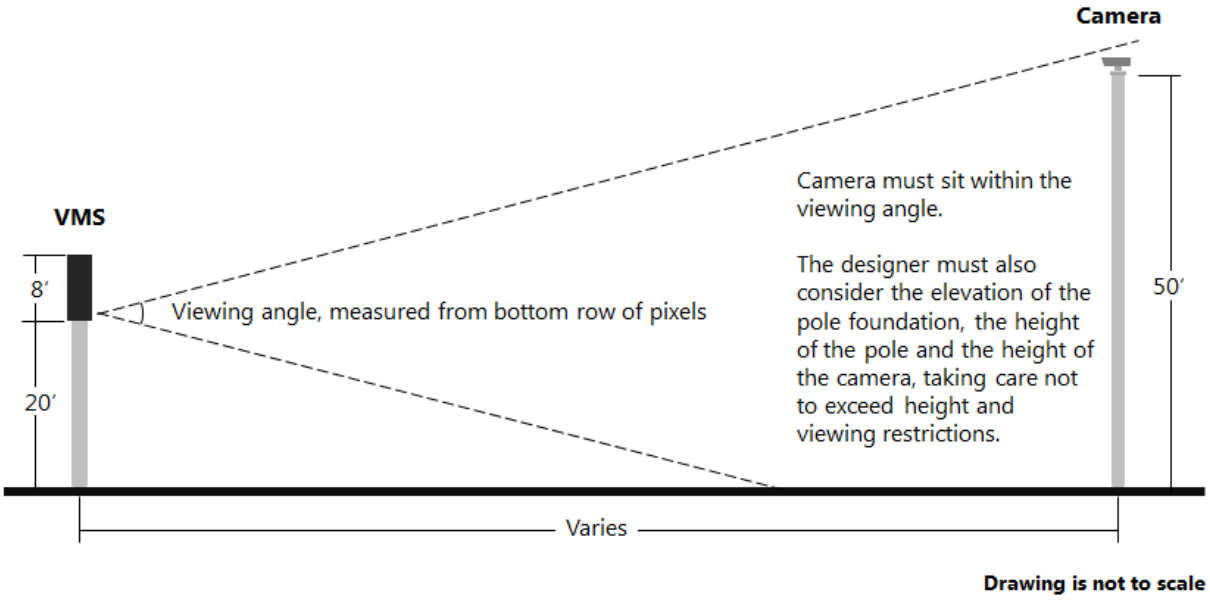


Figure 2-5: CCTV camera must sit within the viewing angle

2.2.3.6 For arterial locations, cameras shall provide a clear view of the intersection and the accompanying queuing at the intersection on all approaches.

2.2.3.7 At freeway interchanges, cameras shall provide a full view of ramps and signalized intersections.

2.2.3.8 Cameras shall be located so that the brightness of road lighting, including luminaire or tunnel lighting, will not close the camera's automatic iris and affect image quality.

2.2.3.9 Cameras providing coverage for short tunnels or lids shall be located at the downstream end directly at the physical openings of each tunnel. This is to prevent lighting conditions during the day from closing the camera's automatic iris and affecting image quality. Operationally, this allows operators to view what is happening at the tunnel entrance during all lighting conditions.

Poor placement: Camera iris closed by light from the tunnel portal, darkening the overall image


Figure 2-6: Lighting effects on CCTV iris

2.2.3.10 The designer shall consider the effects of locations that are susceptible to strong oscillations, such as on bridges or at locations with frequent gusting winds. Strong oscillations will render a camera unusable by operators. It will also damage hardware and reduce the camera's reliability, resulting in increased maintenance costs. Camera poles have been designed to be very rigid to minimize oscillations.

2.2.3.11 Cameras shall not be mounted on sign bridges, luminaire poles or other supports that are more vulnerable to oscillations than a camera pole.

No vibration	Vibration
	

Figure 2-7: Vibration effects on CCTV image

2.3 Infrastructure

2.3.1 Camera

2.3.1.1 Cameras shall be capable of pan, tilt and zoom (PTZ) functions.

2.3.1.2 Existing cameras and control cables within the project limits shall be replaced if any of the following conditions are met:

- If it is required by contract documents;
- If the existing camera is more than 10 years old before physical completion of the contract;
- If the camera model is not current with the Northwest Region ITS specifications. **Note:** Replacing existing cameras that transmit NTSC video and RS-422 data with IP cameras may cause significant impacts to the existing CCTV network. Such replacement may require additional cameras, poles and cabinets to satisfy viewing requirements due to the distance limitations of Ethernet communication.

2.3.1.3 If the camera is replaced, the camera control cable shall also be replaced.

2.3.2 Camera pole

2.3.2.1 For freeway applications, a camera shall not be mounted on anything other than a WSDOT-approved camera pole.

2.3.2.2 If the camera pole is located more than 100 feet from the cabinet, a junction box for a conduit containing the camera control cable shall be located at the base of the camera pole.

2.3.2.3 The camera pole shall not be located more than 10 feet from the edge of the pavement (maintenance pullout). Poles located further than 10 feet from the edge of the pavement shall be provided with a maintenance access road.

2.3.2.4 Camera poles shall be 50 feet tall unless approved by the NWR ITS Engineer. This is to maintain a standard pole height that is adequately tall to provide a good viewing angle above traffic.

2.3.2.5 Alternative camera pole heights between 10 and 65 feet can be considered by the designer if there are no other ways to achieve a necessary view, or if it is needed to reduce inventory in the field. It is desirable to avoid 65 foot poles when possible in the northwest region because there are a very limited number of trucks with a telescopic mast that will reach that height. Most bucket trucks in the northwest region are limited to a 52 foot vertical reach. All pole designs deviating from the standard 50-foot pole require approval from the NWR ITS Engineer.

2.3.2.6 The camera cable shall not exceed 300 feet. This is because current camera models stream video over an Ethernet cable, and current Ethernet cable standards allow for a maximum cable length of 100 meters (approximately 300 feet). Installations that require longer cables shall have approval from the NWR ITS Engineer. Additional equipment and an intermediate pole-mounted cabinet will be required for these locations if no suitable alternative can be found.

2.3.2.7 If a longer camera cable is approved, the distance between the camera cabinet and camera pole shall not exceed 600 feet under any condition.

2.3.2.8 For cameras mounted on or near bridges that cross the mainline, their supporting pole shall be mounted on the bridge or 10-15 feet away from the bridge. The 10 feet requirement is a maintenance consideration that allows enough room for side and underside access of the bridge with a UBIT (under bridge inspection truck).

2.3.2.9 Unless special approval has been granted by the WSDOT ITS Engineer, the camera mounted on the pole shall be reachable by a vehicle with a telescopic mast capable of extending 52 ft vertically and 36 ft horizontally, shown on the next page.

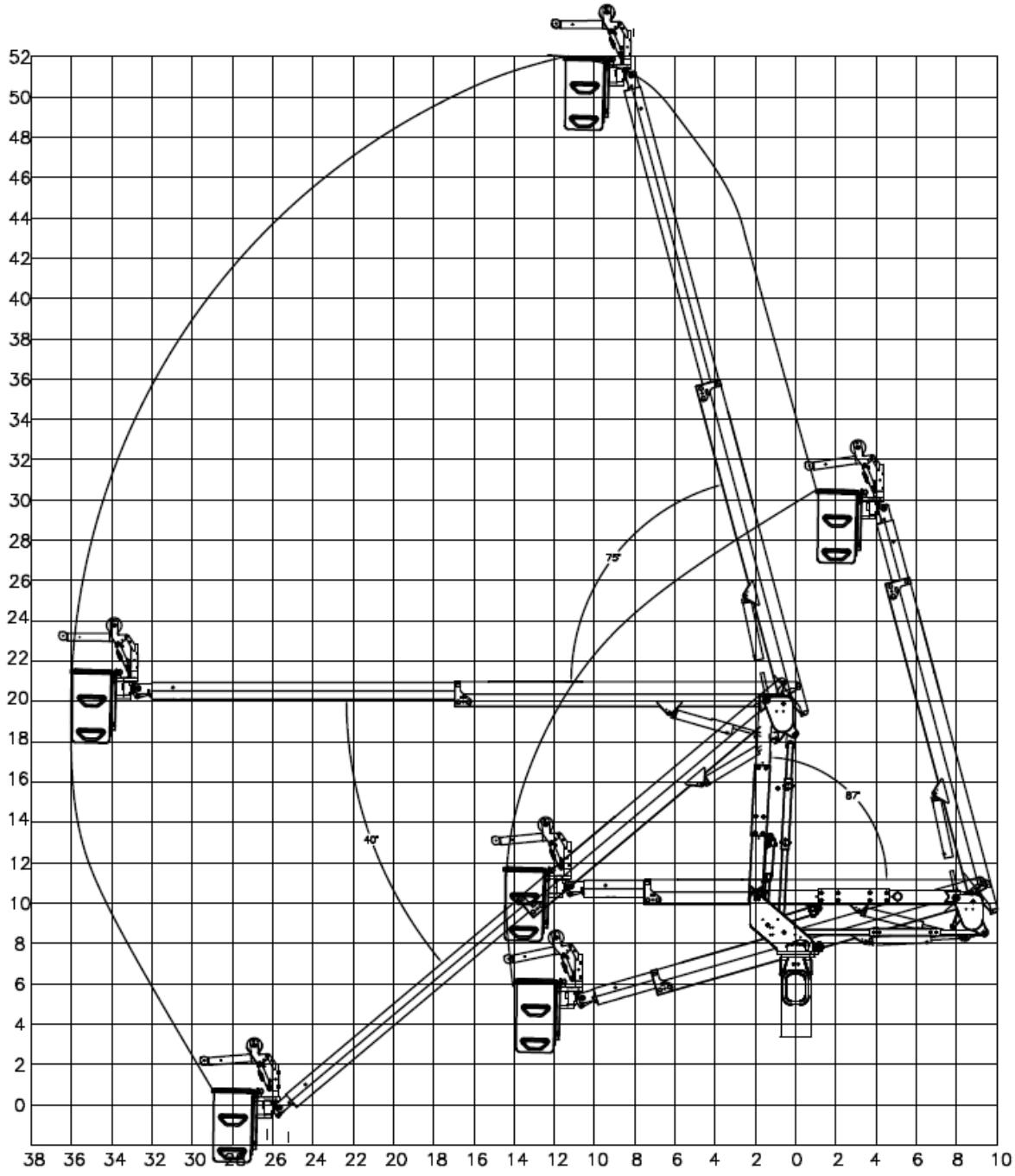


Figure 2-8: Vehicle with a telescopic mast

2.4 Camera cabinet

2.4.1 Placement

2.4.1.1 Camera cabinets shall be located on the outside shoulder (the right-hand side shoulder in the direction of travel of a roadway).

2.4.1.2 Camera cabinets shall be placed adjacent to the camera pole whenever possible.

2.4.1.3 Camera cabinets shall use the same foundation as other nearby cabinets when possible.

2.4.1.4 One camera cabinet may be used by multiple cameras on the same roadway, provided that the distance criteria between the camera and the cabinet are satisfied. A maximum of 4 cameras may be installed in a single cabinet, assuming all other design criteria are satisfied.

3 Loop detection

3.1 Overview

Loop detection is used to monitor traffic flow by measuring vehicle presence, allowing the roadway operator to derive speed, occupancy and volume data for traffic management and analysis purposes.

Many ITS devices and traffic management strategies, such as congestion monitoring, ramp metering, queue protection and HOT lanes, require loop detection. The associated performance assessments of these devices and strategies also require data collected from loop detectors.

Therefore, it is vital that loop detectors be designed with high reliability, generally a combination of maximum uptime, minimum time spent on maintenance and high-quality data collection.

This document provides guidance to achieve the desired characteristics of loop detection systems.

3.2 Coverage

3.2.1 Mainline

3.2.1.1 Between interchange mainline loops, mainline data stations shall be equally spaced every 0.5 mile (2640 feet). If there are conflicts or other criteria that needs to be satisfied that prevents this requirement from being met, the location of a single set of loops may be adjusted by up to 300 feet in either direction.

3.2.1.2 At all locations, 2-loop speed traps shall be installed in all mainline lanes, specialty use lanes and shoulders intended for hard-shoulder running facilities (for transit or otherwise) within the project limits.

3.2.1.3 Loops shall be installed in all on- and off-ramp lanes with the following requirements:

- Loops installed on off-ramps shall be located downstream of, and within 150 feet of, the physical separation of the roadway from the ramp, i.e. gore nose or just downstream of a barrier;
- Loops installed on non-metered on-ramps shall be upstream of, and within 150 feet of, the physical separation of the roadway from the ramp, i.e. gore nose;
- Loops shall be installed at the beginning and at the end of any ramp that connects one freeway to another freeway. The upstream loop shall be labelled as an off-ramp loop for the roadway that the ramp is separating from, and the downstream loop shall be labelled as an on-ramp loop for the roadway that the ramp is joining. These loops will generally be connected to different cabinets.
- Loops installed on all on- and off-ramps shall be Type WR loops.

3.3 Placement considerations

3.3.1 Location for data reliability

Loop detector data quality is heavily influenced by the physical placement of the loop detector. Certain locations of the roadway may not yield data that is useful for traffic management or performance assessment purposes and, in some cases, may negatively affect the performance of ITS systems.

For example, if a set of loops are placed in an area with higher than normal weaving volumes, there will be a greater chance of "double-counting" as vehicles straddle the lane lines. As a result, a queue protection system relying on those loops may be given data inputs that overstate the severity of congestion in that area.

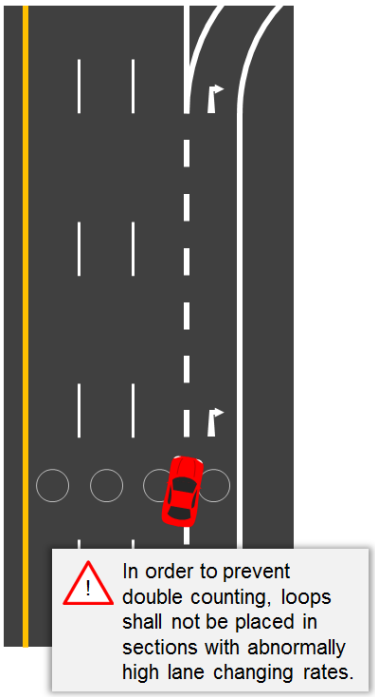


Figure 3-1: Loop placement

3.3.1.1 Mainline loops shall not be located in the following areas:

- In locations where the roadway is tapering outwards to add a lane;
- In locations where a lane is being merged into the remaining lanes;
- In areas with a higher than normal rate of weaving and lane changes;
- In areas with high volumes of merging or diverging traffic.

3.3.1.2 Mainline loops shall be located downstream of and within 100 feet of the gore nose or physical separation of off-ramps.

3.3.1.3 Mainline loops shall be located upstream of and within 100 feet of the gore nose or physical separation of on-ramps.

3.3.2 Additional considerations for Active Traffic Management

3.3.2.1 Loop-based speed detection shall be provided between all ATM installations adhering to one of the following options:

- Option 1: A single location of speed loop-based detection centered (±300 feet) between two ATM installations (greater than 1000 feet from either ATM installation).
- Option 2: Two locations of speed loop-based detection between two ATM installations (both greater than 500 feet from their nearest ATM installation).

3.3.2.2 Where neither option 1 nor option 2 are attainable and where all other data station loop spacing requirements are satisfied, install a supplemental Wavetronix speed detector midway between ATM installations (± 300 ft). This option does not replace the need for loop-based mainline detection.

3.4 Loop naming

3.4.1 Naming scheme

Operators and maintenance personnel often need to identify specific loops for analysis or maintenance purposes. In order to reduce confusion and the need for memorization, loop naming must follow a specific and consistent order. This loop naming scheme was developed so that the loop name effectively describes to the user the loop's location in the roadway along with its purpose. The naming scheme is especially valuable as the number and types of loops in the system has grown rapidly in the past few years and will only continue to expand.

3.4.1.1 Loop names shall be 7-characters and shall use the following scheme:

Character 1 Roadway Class	**Character 2** RoadwayType	**Character 3** Direction	**Character 4** Lane Class	**Character 5** Lane Type	**Character 6** Device type	**Character 7** Lane #
_ (Gen. Purp.)	M (Mainline)	S (Southbound)	_ (Shared; thru)	_ (Mainline)	_ (Not S, T, R)	1
A (Auxiliary)	C (Collector dist.)	N (Northbound)	R (Right)	A (Adv. queue)	S (Speed loop)	2
M (Used for Meter Rate)	R (Reversible)	E (Eastbound)	L (Left)	D (Demand)	T (Speed trap)	3
D (Duplicate)	A (Arterial)	W (Westbound)	H (HOV; HOT)	I (Inter. Queue)	R (Meter rate)	4
O (Off system)	X (Cross street)		B (Bus Only)	O (On-ramp)	C (Coupled speed)	5
T (Toll/tag reader)			Y (Bicycle Only)	P (Passage)		6
0-9 (Border Wait)			V (Metered HOV)	Q (Queue)		7
			W (Metered HOV on shoulder)	X (Exit)		8
			Z (HOV on shoulder)	M (Merge)		9

Table 3-1: Loop naming scheme

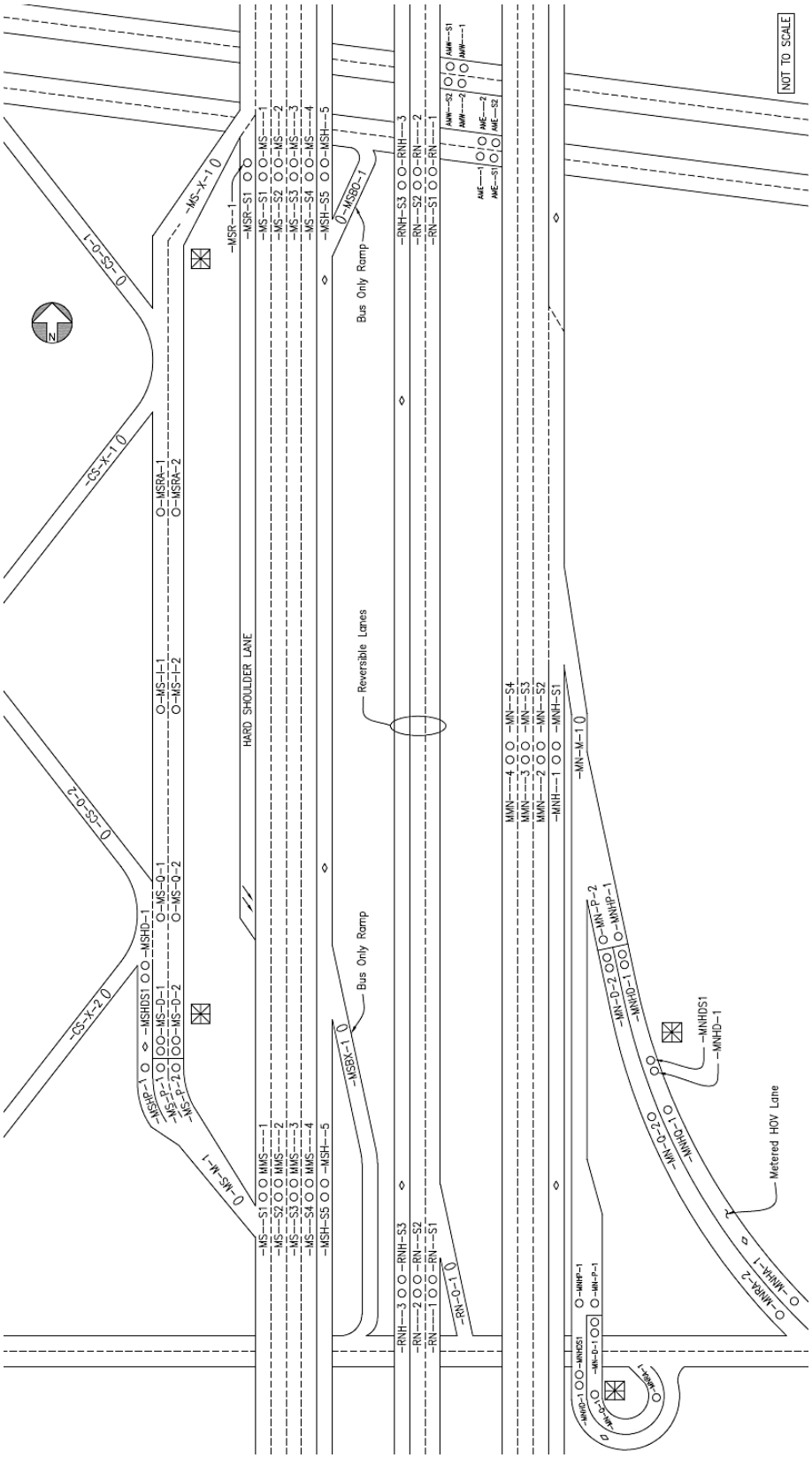


Figure 3-2: Loop naming scheme Installation

3.4.2 Maintenance and constructability requirements

The physical reliability of loop detection systems is dependent on the installation methods. Loop detection systems are easily impacted by external factors, such as loop location and pavement integrity. In the event that a loop detector does fail, it must be repaired quickly to minimize downtime, but with minimal impact to traffic flow.

On the other hand, data quality can be influenced by static or non-static interference to the loop detection zone, causing errors in traffic management equipment or performance assessments. As a result, great care must be given to minimize interferences to loop detection equipment in order to maintain high data quality.

3.4.2.1 In multilane configurations, mainline loop tails for loops in the same direction of travel shall be installed such that half (± 1 lane) are routed to junction boxes on opposite shoulders of the same direction of travel. This is to avoid the need for full roadway closures when maintaining loop detection equipment.

3.4.2.2 Sawcuts for mainline loop tails shall not be cut across ramp lanes.

3.4.2.3 Mainline loops shall be aligned so they are directly adjacent to each other.

3.4.2.4 In cement concrete pavement, loops shall be located in the center of the lane and no less than 3 feet from transverse panel joints. This is to reduce the chance of loop damage from pavement deformation or failure, since concrete panels are weaker near the joints.

3.4.2.5 In asphalt pavement, loops shall be located in the center of the lane.

3.4.2.6 Loops more than 400 feet away from the cabinet shall have more than 4 turns (refer to ITS loop details).

3.4.2.7 Loop splices shall not be contained in a pull box or cable vault. These boxes often contain water due to their large size and depth. Loop splices shall be contained in a:

- Standard junction box;
- Barrier junction box;
- NEMA junction box.

3.5 Cabinet

3.5.1 Location

Maintenance activities require both access to the contents of data station cabinets and visual confirmation of traffic conditions at the site of the vehicle detectors, often concurrently. Therefore, it is beneficial to place the cabinet so that the user facing the front of the cabinet will also be facing the location of the loops. This allows the user to visually observe field conditions while working with cabinet hardware, a configuration that will require just one maintenance person to perform basic maintenance duties rather than two (one for cabinet work and the other for visual confirmation).

3.5.1.1 Data station cabinets shall be located within 100 feet of the mainline loops, along the station.

3.6 Equipment

3.6.1 Lane width impacts

3.6.1.1 Wide loops (Type WR) shall be installed in all lanes wider than 12 feet. This is to improve detection of vehicles that may not be centered in the lane.

3.7 Loop termination

3.7.1 Loop termination schedule

3.7.1.1 The designer shall coordinate with the NWR ITS Engineer to create the correct loop termination schedule, as the loops must be connected to their cabinets in a specific order.

4 Ramp metering

4.1 Overview

Ramp meters use part-time signals to regulate the inflow of traffic from on-ramps onto the mainline by temporarily storing vehicles and then releasing them at a determined rate. The purpose is to prevent or delay traffic flow breakdown on the mainline by:

- Preventing or delaying the mainline from operating beyond stable conditions;
- Improving merge conditions by dispersing platoons of merging traffic.

The prevention or delay of traffic flow breakdown can lead to:

- Less congestion;
- Improved traffic flow on the mainline;
- Greater throughput during peak periods;
- Reduced travel time fluctuation (more reliable travel times);
- Reduction in primary and secondary collisions.

This document contains guidelines that will assist in the design of ramp metering and data collection systems. The design guidelines presented in the documents are intended to ensure that ramp metering systems and their related components meet the requirements necessary for consistent, effective and reliable operations.

4.2 Coverage

4.2.1 Coverage area

4.2.1.1 All on-ramps within Seattle metropolitan area shall have a ramp meter installed.

4.2.1.2 On-ramps outside of the Seattle metropolitan area shall have a ramp meter installed when the sum of the volume in the right lane of the mainline and the volume of the on-ramp equals or exceeds 1700 vph during the peak hour in the year when operation begins.

4.2.1.3 Ramp meters shall be designed as a system. If a roadway has 3 on-ramps in close proximity with the upstream-most and downstream-most on-ramps qualifying for a ramp meter, the remaining on-ramp shall also be equipped with a ramp meter. This is to discourage diversions from metered ramps onto adjacent non-metered ramps.

4.3 Stop line location

4.3.1 Minimum stop line distance to merge

Acceleration distance and ramp meter storage capacity is determined by the placement of the stop line along the ramp. The *minimum* stop line distance to merge regulates the minimum length that must be provided for a vehicle to accelerate to highway speeds. Several factors can influence this minimum length, including the gradient of the ramp, the composition of on-ramp traffic and the traffic flow characteristics on the mainline.

4.3.1.1 The stop line distance to merge shall be as long as possible, without exceeding the maximum stop line to merge distance detailed in **section 4.3.2** and without compromising storage area on the ramp.

4.3.1.2 The designer shall consider gradients of the merge area.

4.3.1.3 The designer shall consider any speed characteristics of the ramp and mainline (e.g. 50 mph limits).

4.3.1.4 The designer shall consider flow breakdown characteristics.

4.3.1.5 The designer shall consider that:

- Uphill gradients reduce acceleration and require longer acceleration distances; and
- Downhill gradients aid acceleration and require shorter acceleration distances.

4.3.1.6 The designer shall consider the horizontal curvature of the ramp and determine whether increasing the stop line distance to merge will provide a benefit for drivers, since drivers may not use the extra distance for acceleration while traversing a sharp horizontal curve.

4.3.1.7 On loop ramps, the ramp meter shall be placed as close to the downstream end as possible. This is to maximize storage capacity and provide adequate sight distance to the ramp meter signal. Placing the ramp meter further back will reduce the sight distance due to the ramp curvature while providing little benefit for acceleration, as drivers are unlikely to use the extra distance for acceleration due to the tight horizontal curve of the ramp. See **Figure 4-1: RM location on ramps**.

4.3.1.8 A deviation from standards may be needed to reduce acceleration distance in order to increase storage, or additional metered lanes may need to be added.

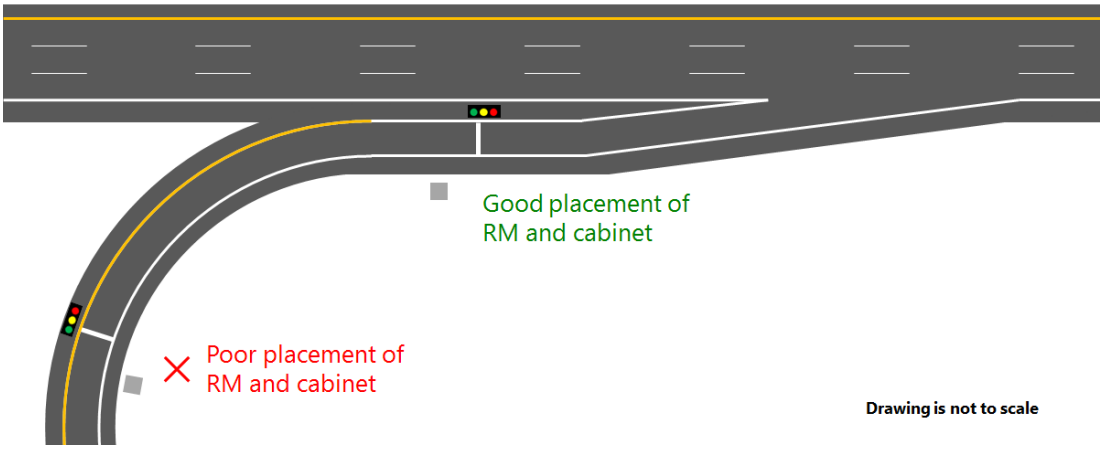


Figure 4-1: RM location on ramps with sharp horizontal curves

4.3.2 Maximum stop line distance to merge

Acceleration distance and ramp meter storage capacity is determined by the placement of the stop line along the ramp. The *maximum* stop line distance to merge regulates the maximum allowable length for acceleration. This is an important consideration for ramp metering, especially in the case of extremely long ramps.

Even if there is adequate space, it is not always beneficial to increase the acceleration distance to the maximum possible length. This is because a longer acceleration distance, combined with high release rates, may allow individual vehicles to catch up to the vehicle ahead of them upon leaving the ramp meter stop line, thus redeveloping into undesirably large platoons. This behavior reduces the effectiveness of ramp metering and should be minimized by carefully evaluating the maximum distance between the stop line and the merge.

This consideration becomes even more crucial when traffic composition for the on-ramp contains a high percentage of heavy vehicles.

4.3.2.1 Designers shall ensure that the acceleration distance from the stop line is short enough to prevent vehicles released at separate intervals from being able to regroup before merging.

4.3.3 Storage capacity

Storage for ramp meter operations needs to be sufficiently large to accommodate vehicles as they wait for the ramp meter. The storage capacity should be sufficient to prevent ramp meter queues from extending beyond the entrance of the ramp and into adjacent local roads, especially at signalized intersections and arterials where through traffic is impeded by ramp overflow. Storage overflow can impede traffic on the local arterial. It is a highly-politicized topic and can cause conflicts of interest between stakeholders.

The storage capacity is determined primarily by the location of the stop line and the upstream terminus of the ramp. In addition to typical factors such as heavy vehicle composition and roadway gradient, factors that must be considered for storage requirements include:

- Ramp demand: A high hourly flow will generally require larger storage areas in order to accommodate queued traffic;
- Distribution of ramp demand: If the upstream terminus of the ramp is served by a busy signalized intersection (e.g. arterial crossing) or a roundabout, there may be large platoons of vehicles entering the ramp storage at short intervals. In such cases, the ramp may quickly fill up, only to be insufficient to store the next platoon. In this situation, a larger storage area should be provided;
- Ramp metering algorithm: WSDOT uses a fuzzy-logic-based algorithm for ramp metering. The algorithm responds to real-time traffic conditions and adjusts rates to match demand. More congestion on the mainline will result in a lower ramp metering rate. On the other hand, more queuing on the on-ramp will result in a faster ramp metering rate. The algorithm will attempt to balance the two situations.

4.3.3.1 If traffic modeling is being performed for a project, storage for ramp meters shall be capable of accommodating forecasted demand for 20 years from the day when operation begins, assuming a ramp metering rate of 12 vehicles per minute per lane. Storage on any ramp shall not be less than 450 feet per lane.

4.3.3.2 HOV volume shall not be subtracted from the peak hour volume when calculating ramp storage. Ramp meter rates are adjusted to subtract HOV volume from the number of vehicles processed by the meter each minute. The result is that the storage needed remains the same as if the HOV traffic had waited in the queue.

4.3.3.3 If traffic modeling and forecasting is not being used, the designer shall use the following table to determine the minimum length of storage, which shall not be less than 450 feet per lane.

Peak hour volume	Metered Lanes		
	1	2	3
200	450 ft	-	-
300	450 ft	-	-
400	525 ft	-	-
500	600 ft	-	-
600	700 ft	-	-
601	-	900 ft	-
700	-	900 ft	-
800	-	900 ft	-
900	-	900 ft	-
1000	-	1050 ft	-
1100	-	1200 ft	-
1200	-	1400 ft	-
1201	-	-	1350 ft
1300	-	-	1350 ft
1400	-	-	1350 ft
1500	-	-	1350 ft
1600	-	-	1350 ft
1700	-	-	1575 ft
1800	-	-	1800 ft
1900	-	-	2050 ft
2000	-	-	2300 ft
2100	-	-	2550 ft
2200	-	-	2800 ft
2300	-	-	3050 ft
2400	-	-	3300 ft
2500	-	-	3550 ft
2600	-	-	3800 ft
2700	-	-	4000 ft

All storage values shown are a total for all lanes. The storage in each lane does not need to be divided equally.

4.3.3.4 Modelling shall be used for ramps with volumes over 2,000 vph to determine the necessary storage capacity.

4.3.4 Number of metered lanes

It is often not feasible to increase storage capacity by lengthening the on-ramp. In such cases, storage capacity can be increased by adding lanes.

4.3.4.1 A minimum of 1 metered lane shall be provided when the current peak hour volume is below 600 vehicles per hour.

4.3.4.2 A minimum of 2 metered lanes shall be provided when the current peak hour volume is between 600 and 1,200 vehicles per hour.

4.3.4.3 A minimum of 3 metered lanes shall be provided when the current peak hour volume is over 1,200 vehicles per hour.

4.3.4.4 Storage for all metered lanes shall extend as far up the ramp as possible, but at a minimum, all lanes shall extend at least 150 feet upstream of the queue loops.

4.3.4.5 An HOV bypass lane shall be provided whenever possible and shall adhere to the following:

- For ramps without existing HOV facilities (arterial HOV lane, bus stop, etc.), the HOV bypass lane shall be located to the left side of the metered lane(s) whenever possible;
- For ramps with existing HOV facilities (arterial HOV lane, bus stop, etc.), the HOV bypass lane shall be located on the same side as the existing HOV facility.

4.3.5 Using the shoulder as storage

An alternative to constructing full-time metered lanes is to use the full-depth hard shoulder instead. In this situation, the shoulder is used as a metered lane when the ramp meter is in operation. It remains a shoulder when the ramp meter is off. This alternative reduces the amount of pavement and right-of-way needed for the ramp, but requires approval from the NWR ITS Engineer in addition to approval of the associated deviations as part of the channelization plan process. This option may be suitable for low-cost improvement projects where existing roadway widths permit the use of hard shoulder usage. Minor widening may be needed to accommodate additional shy distance to the physical edge of the roadway for queuing traffic. In some cases, the physical edge of the roadway may also need extra shy distance to the barrier (refer to WSDOT Design Manual Chapter 1610).

4.3.5.1 All shoulder ramp meter installations shall receive approval from the NWR ITS Engineer.

4.4 Cabinets

4.4.1 Cabinet type

Ramp meters and data station equipment are standardized and designed to be mostly interchangeable. The resulting economies of scale simplify the system while reducing costs associated with procurement, manufacturing, installation and maintenance. For example, in the event that a ramp meter cabinet becomes inoperable, a data station cabinet can be used as a replacement within a very short turn-around time if no other spares are available.

4.4.1.1 Ramp meters and data stations shall use the same type of cabinet with the same contents.

4.4.2 Additional cabinet placement considerations for ramp metering

Maintenance activities require both access to the contents of ramp meter cabinets and visual confirmation of ramp meter operations, often concurrently. Therefore, it is beneficial to place the cabinet so that the signal heads are visible from the cabinet, a configuration that will require just one maintenance person to perform basic maintenance duties rather than two (one for cabinet work and the other for visual confirmation).

4.4.2.1 A ramp meter cabinet shall be located where the faces of the signal heads are visible from the cabinet.

4.4.2.2 A ramp meter cabinet shall be located so it is accessible from the ramp.

4.4.2.3 A ramp meter cabinet shall be provided for each physically-separated on-ramp being metered. Note that cabinets are capable of controlling a ramp with a maximum of 3 adjacent lanes. They are not capable of controlling 4 or more metered lanes.

4.5 Loop detection requirements

4.5.1 Installation

4.5.1.1 At a ramp meter, the maximum detector lead-in length for mainline loops and stop line loops (demand and passage) is 500 feet. The maximum detector lead-in length for all other loops is 800 feet.

4.5.2 Coverage

4.5.2.1 The following loops shall be installed on all ramps equipped with ramp metering (see diagram on following page):

- Demand loop: Located as shown on the ITS details. The demand loop is used to detect the presence of a vehicle at the stop line waiting for a green indication.
- Passage loop: Located as shown on the ITS details. The passage loop is used to detect a vehicle crossing the stop line during the green indication.
- Queue loop: For ramps with less than 1000 feet of storage, the queue loop shall be located midway between the stop line and the advance queue loop (a minimum of 300 feet from the stop line). The primary use of the queue loop is to detect a short queue of vehicles and adjust the ramp metering rate accordingly.
- Intermediate queue loop: For ramps with 1000 feet of storage or more, the intermediate queue loop shall be located upstream of the queue loop and downstream of the advance queue loop.

  For ramps with more than 1000 feet of storage, the queue and intermediate loops shall split the distance evenly between the demand loop and the advance queue loop, except where the distance between the demand loop and the queue loop would be less than 500 feet. In latter case, the queue loop shall be located at 500 ft and the intermediate queue loop shall be located midway between the queue loop and the advance queue loop.
- Advance queue loop: Located approximately 100 feet downstream from the entrance of the ramp. The advance queue loop is used to detect very long vehicle queues that are already (or in the process of) causing queue spillovers onto adjacent local streets. The maximum distance from the stop line shall be 1400 feet.
- Merge loop: Located 200 feet upstream from the painted gore point. The merge loop is used to detect secondary queuing and may decrease the meter rate if necessary. Merge detectors shall use Type WR loops.
- HOV passage loop: Located in the HOV bypass lane. The HOV passage loop shall be aligned with the passage loop(s) across the ramp roadway, perpendicular to the direction of travel.
- HOV demand loop: Located in the HOV bypass lane, 300 feet upstream of the stop line of the adjacent metered lane.
- HOV demand speed loop: Located 17 feet (center to center) downstream from the HOV demand loop.

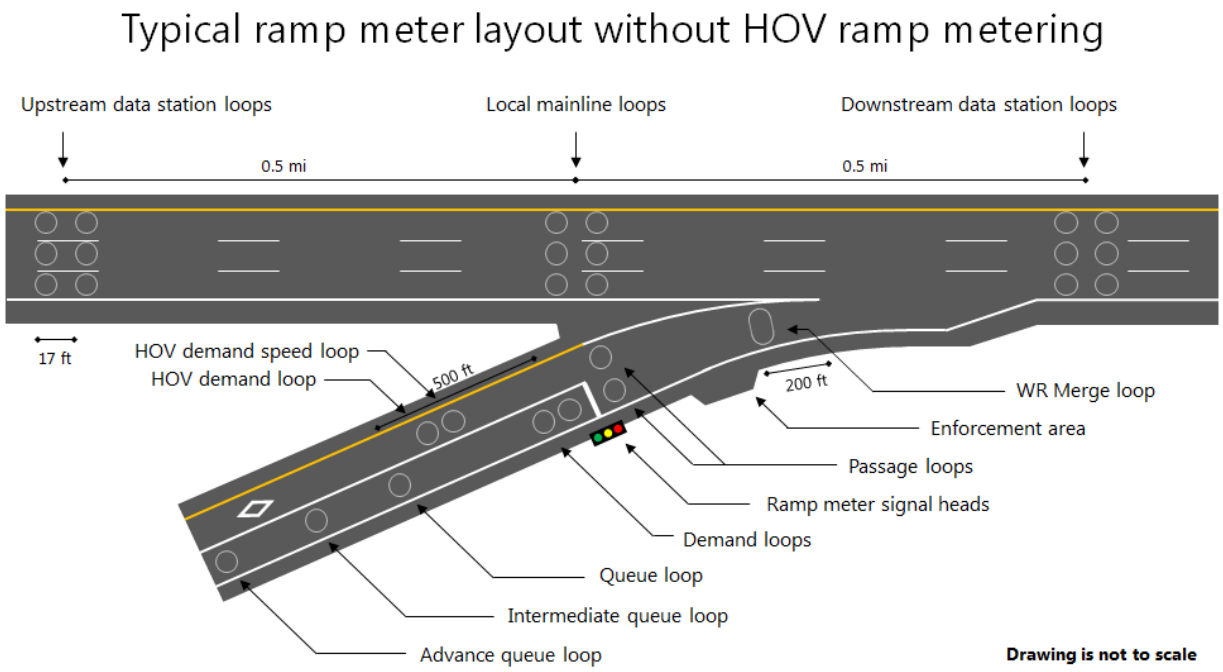


Figure 4-2: Typical ramp meter layout without HOV ramp metering

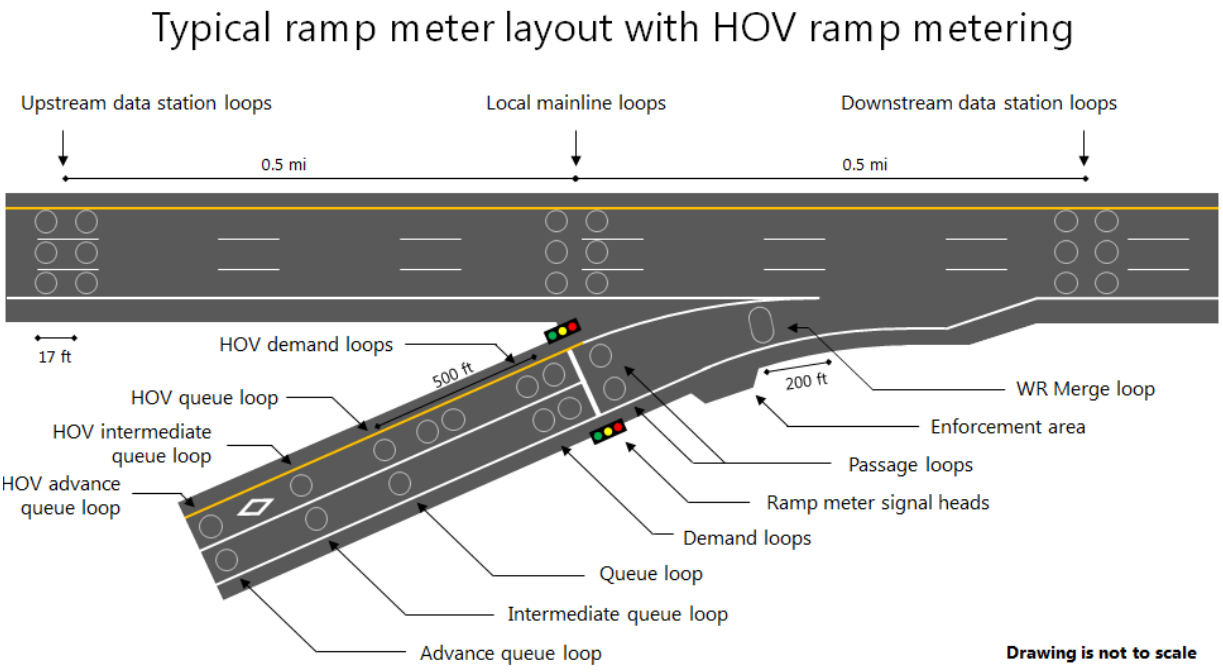


Figure 4-3: Typical ramp meter layout with HOV ramp metering

4.6 Ramp meter signal pole

4.6.1 Location

4.6.1.1 The stop line and ramp meter signal standards shall be installed on a tangent, or mostly tangent, section of roadway. The minimum length of the tangent section is 300 feet. This requirement may be omitted only if there are conflicts or other criteria that make it impossible to satisfy this requirement.

4.6.1.2 The ramp meter signal standard shall be visible to drivers as they approach the signal for a minimum of 300 feet.

4.6.2 Ramp Meter Signal Standard (Type 1 Ramp Meter Pole)

4.6.2.1 The Ramp Meter Signal Standard may only be used for single lane ramp meters.

4.6.2.2 The Ramp Meter Signal Standard shall be located no more than 8 feet from the edge stripe. If the pole must be further than 8 feet, an overhead Ramp Meter Signal Standard shall be installed.

4.6.2.3 Ramp Meter Signal Standards placed closer than 5 feet from the edge stripe shall be behind or on top of a barrier.

4.6.2.4 The Ramp Meter Signal Standard shall be located adjacent to the lane that it is metering.

4.6.2.5 The Ramp Meter Signal Standard shall be located on the left side of the ramp whenever feasible and when there is no HOV bypass on the left.

4.6.2.6 The Ramp Meter Signal Standard shall include signing in accordance with the Standard Plans and the detail in **Figure 4-4: On-ramp with Type 1 Ramp Meter Pole** and **Figure 4-6: Signing for ramp meters**.

4.6.3 Overhead Ramp Meter Signal Standard (Type 2 Ramp Meter Pole)

4.6.3.1 The Overhead Ramp Meter Signal Standard may be used for ramp meters with 1 lane and shall be used for all ramp meters with 2 or 3 lanes.

4.6.3.2 The mast arm shall not span the HOV bypass lane unless the HOV lane is metered. However, the mast arm shall be designed to allow for a metered HOV lane in the future.

4.6.3.3 The Overhead Ramp Meter Signal Standard shall have signing in accordance with the Standard Plans and the detail in **Figure 4-5: On-ramp with Type 2 Ramp Meter Pole** and **Figure 4-6: Signing for ramp meters**.

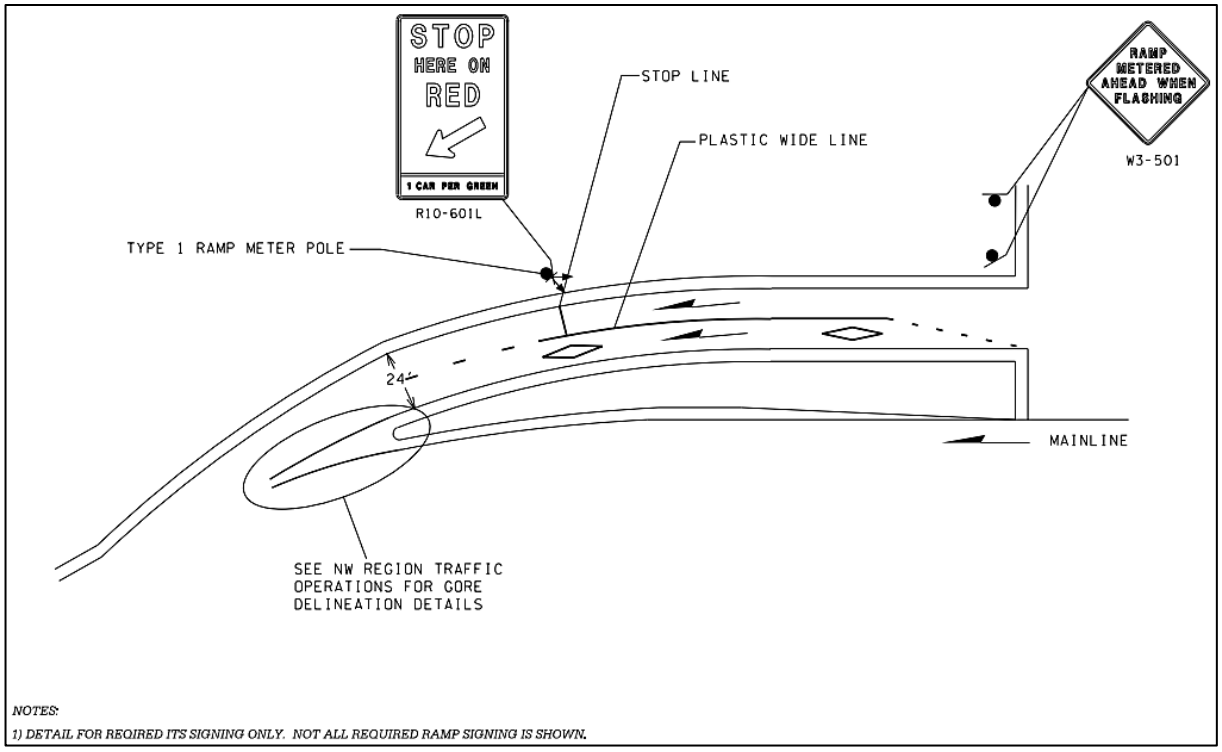


Figure 4-4: On-ramp with Type 1 Ramp Meter Pole

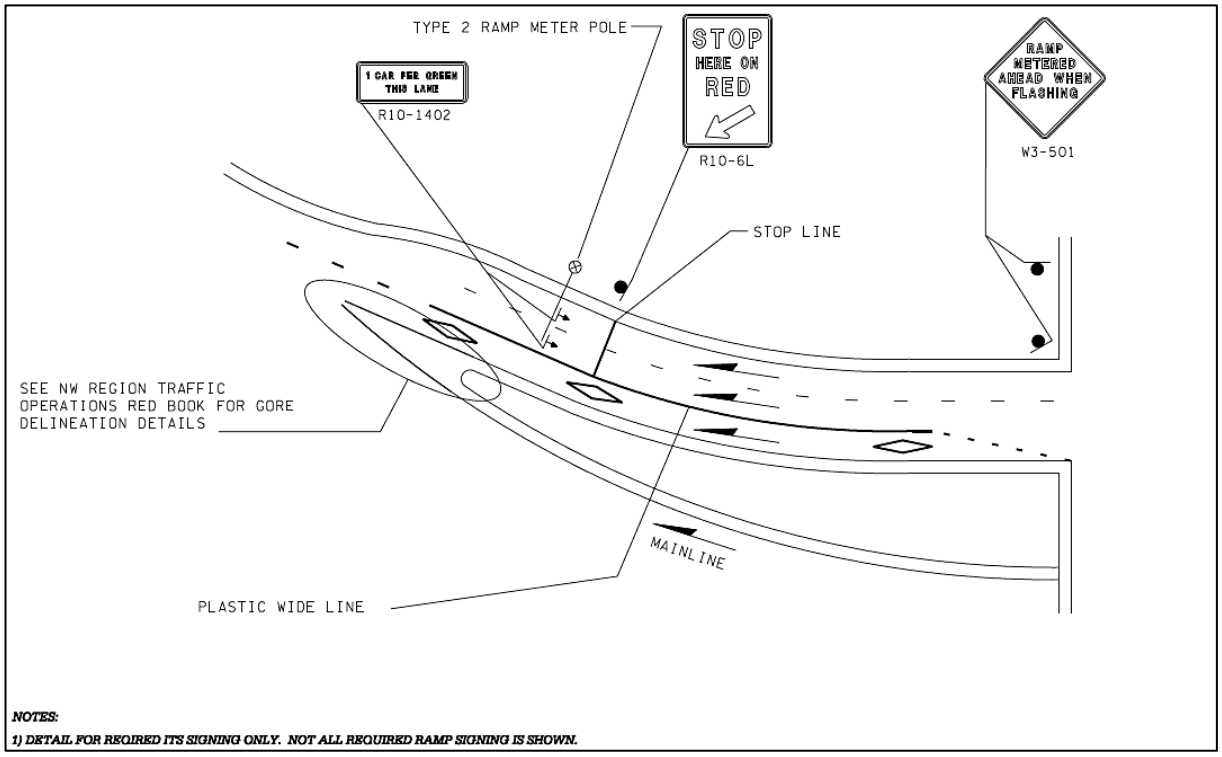


Figure 4-5: On-ramp with Type 2 Ramp Meter Pole

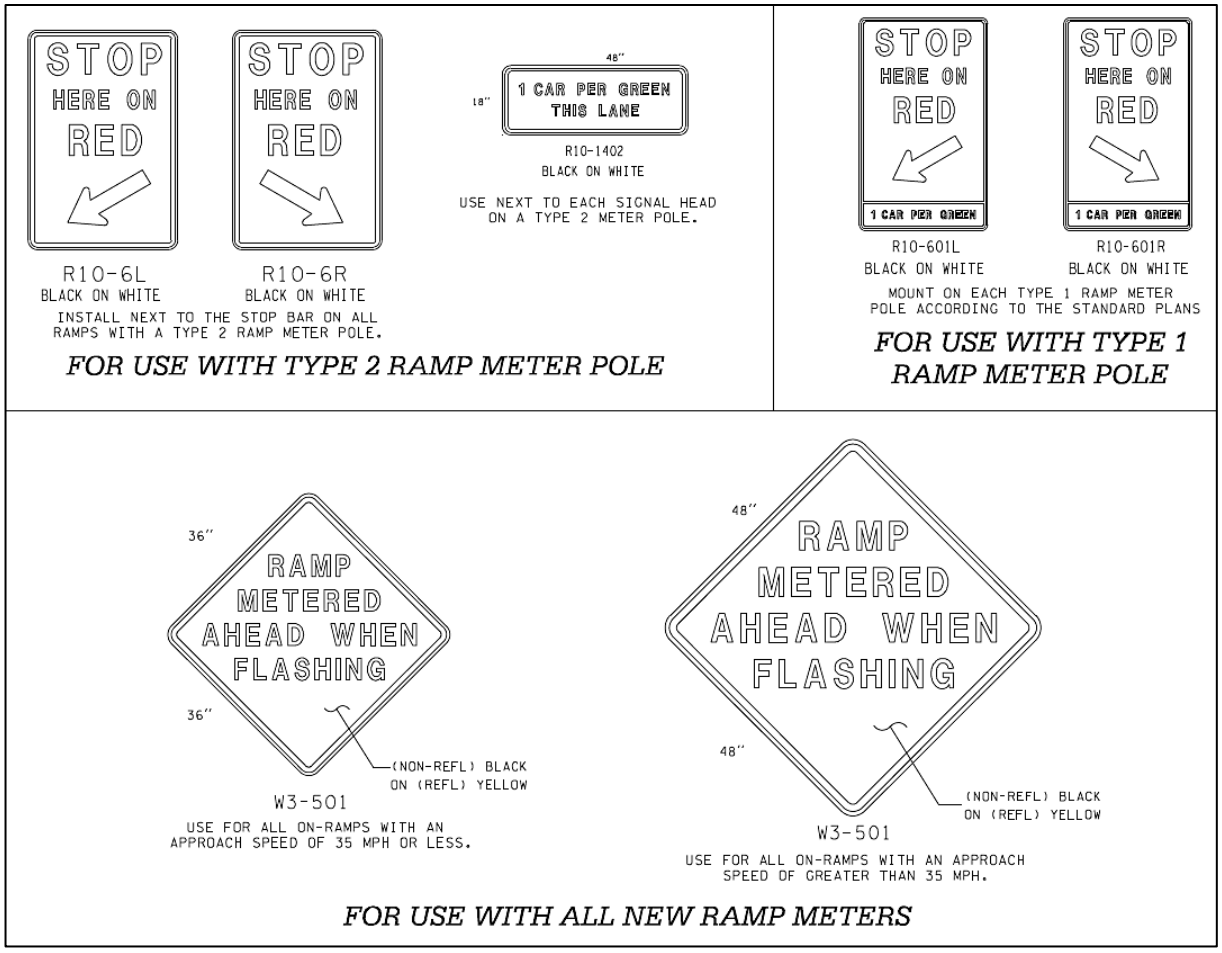


Figure 4-6: Signing for ramp meters

4.7 Advance Warning Sign and Beacon (AWS)

4.7.1 Placement

Advance Warning Signs and Beacons (AWS) are used to notify drivers about ramp meter operations. There are several benefits for doing so. Operationally, AWS can deter drivers from using the ramp altogether, especially drivers who intend on using the highway for short-distance trips. They can also encourage them to take alternate routes. However, in order to act as a deterrent, the AWS must be visible before drivers commit to entering the ramp.

4.7.1.1 Each approach shall contain a clear view of an AWS before drivers commit to the ramp. This may require that each approach contain its own AWS. However, the number of AWS signs can be reduced as long as each approach has a clear view of an AWS sign and its beacon.

4.7.1.2 A mid-ramp AWS shall be provided on ramps longer than 1500 feet, located 700 to 1100 feet upstream of the stop line.

4.7.2 Sign details

4.7.2.1 All AWS signs shall have black text on a yellow background.

4.7.2.2 A 3’ x 3’ sign shall be used for ramps with a signed approach speed less than or equal to 35 mph.

4.7.2.3 A 4’ x 4’ sign shall be used for ramps with a signed approach speed greater than 35 mph.

4.7.2.4 The AWS shall be designed and constructed in accordance with the Standard Plans and/or ITS details.

4.8 Other requirements

4.8.1 Emergency vehicles

4.8.1.1 Ramps shall include preemption for emergency vehicles where all lanes are metered and where a shoulder at least 10 feet wide is not present, or is metered. The preemption sensor shall be placed either on the upstream terminus of the metered shoulder or on the signal mast arm for overhead mast arms.

4.8.2 HOV bypass

4.8.2.1 An HOV bypass lane shall be provided whenever possible on metered ramps.

4.8.2.2 The HOV bypass shall be metered when the current volume is over 250 vph during the peak hour, or when it is projected to be over 400 vph in the 20-year forecast.

5 Variable Message Signs

5.1 Overview

Variable message signs (VMS) are traffic control devices designed to display a variety of messages viewable by passing drivers. VMS allow operators in the Traffic Management Center to communicate with drivers quickly, reliably and effectively. They assist in TMC operations and aid in incident management, congestion management and operational efficiency.

VMS displays provide regulatory, warning and guidance information related to traffic control. The content of a VMS display should assist drivers in making decisions. Operational, road condition and driver safety messages are also acceptable messages.

Examples of VMS messages include collision information, delay information, travel times, advance roadwork notification and dynamic rerouting guidance.

In order for VMS infrastructure to maintain their operational effectiveness and reliability, many factors have to be considered in the design process, including spacing of the signs and maintainability. This document provides the design requirements for effective VMS infrastructure.

5.2 Standalone variable message sign

5.2.1 Location

Variable Message Signs (VMS) are most effective when they are used with relevance to time and location. In other words, the information being displayed must be geographically relevant and be applicable within a short amount of time after it is seen.

For example, a VMS 2-3 miles from an incident scene can provide useful information to drivers, such as lane closure information, as the time between visual recognition of the VMS message and the incident scene is very short. In contrast, information provided on a VMS 10 miles from an incident scene may become outdated once the driver has reached the incident scene. It is also likely that the driver may not retain the information provided by the VMS.

As a result, it is good practice to locate variable message signs at set intervals along a freeway corridor. This will allow operators to choose the most contextually relevant VMS and improve the effectiveness of the information being displayed.

Another consideration is the importance of VMS infrastructure during strategic diversion of traffic flow. Strategic diversions are used to reroute traffic onto alternate routes in the event that the primary route is unsuitable for use. Clarity of routing guidance can be improved by allowing drivers to read the diversion message twice before reaching the decision point.

An example application of a strategic diversion is shown below for traffic between Seattle and Redmond.

In all cases, variable message signs must be placed in areas that allow for adequate reading time. At 60 mph, a tangent sight distance of 800 provides about 9 seconds of reading time.

Example VMS deployment

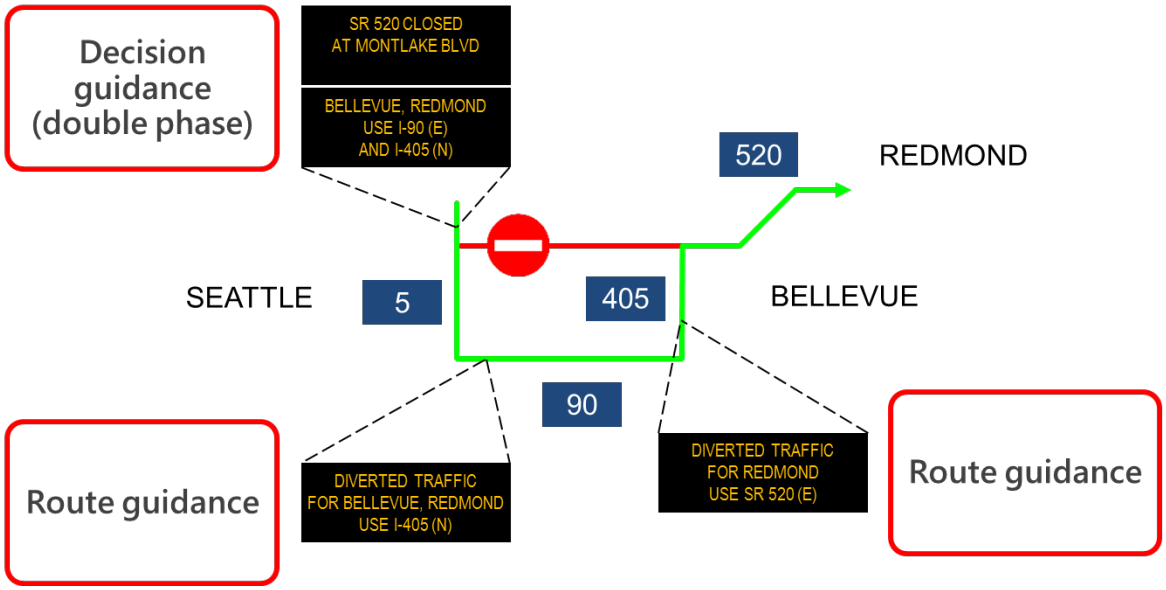


Figure 5-1: Example VMS deployment for strategic diversions

5.2.1.1 A VMS sign shall be provided every 3-4 miles along a corridor

5.2.1.2 A VMS sign shall be provided upstream of a major decision point (e.g. freeway to freeway interchanges, any interchange with access to an alternate route, etc.). The VMS sign shall allow enough time for drivers to safely navigate to the exit of the interchange from the far lane. When determining the distance from the interchange, it should be assumed that drivers will not make the decision to exit until they have reached the location of the sign.

5.2.1.3 The location shall provide a minimum tangent sight distance of 800 feet. This is to provide adequate time for drivers to read the VMS display.

5.2.1.4 Locations with a high percentage of weaving, or adjacent to on or off ramps, should be avoided whenever possible. Driver attention to the messages on a VMS is reduced when they are actively changing lanes or merging onto the highway.

5.2.2 Mounting

5.2.2.1 A VMS sign shall be centered over the directional roadway for roadways with 3 or more lanes in the same direction of travel.

5.2.2.2 A VMS sign may be shoulder-mounted on a "T structure" for directional roadways with 2 or fewer lanes in the same direction of travel.

5.2.2.3 The bottom of any part of the VMS housing over the roadway, including lanes and paved shoulders, shall be a minimum of 20 feet and a maximum of 25 feet above the roadway.

5.2.2.4 If the VMS is mounted above the unpaved shoulder, the bottom of the VMS housing shall be a minimum of 20 feet above a roadway profile line projected from the road surface and a minimum of 10 feet above the highest immediate ground surface.

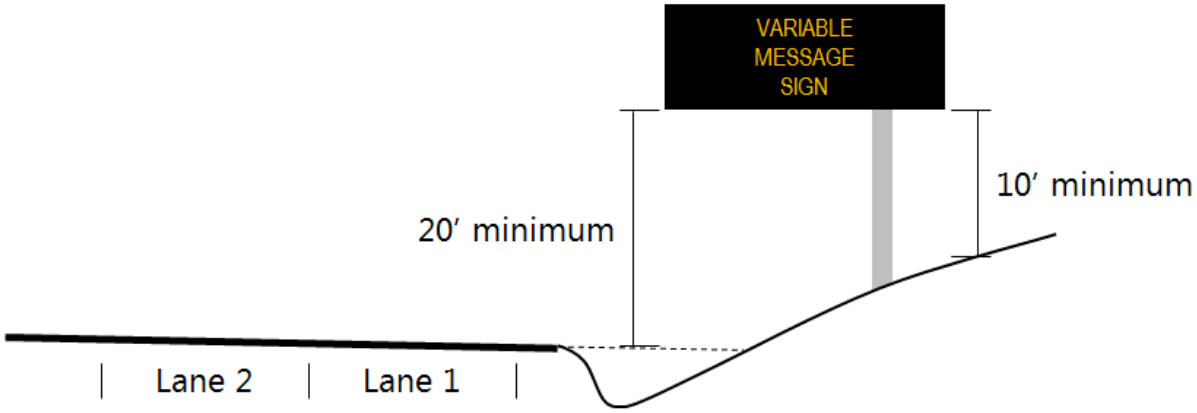


Figure 5-2: VMS over unpaved shoulder

5.2.2.5 Maintenance walkways (catwalk) are required in accordance with the standard plans. The 5-ft catwalk noted in the Standard Plans as optional is required for all walk-in VMS installations.

5.2.2.6 The maintenance walkway shall extend to the fog line on the side of the road with the maintenance pullout.

5.2.3 Cabinet

5.2.3.1 The VMS shall utilize a ground-mounted 334-style cabinet.

5.2.3.2 The sign controller shall be located in the ground-mounted cabinet.

5.2.3.3 The cabinet shall be located on the same side of the road as the maintenance pullout.

5.2.3.4 The cabinet shall be located adjacent to the VMS structure or within 150 feet upstream of the VMS structure.

5.2.4 Standalone VMS specification

5.2.4.1 The VMS legend shall be full-matrix amber LED, capable of displaying 3 lines of text.

5.2.4.2 The character set shall be capable of displaying characters from 20 (hex) to 7E (hex), inclusive, of the ASCII character set.

5.2.4.3 Each line shall contain at least 18 characters.

5.2.4.4 For freeway applications, the character height shall be 18 inches.

5.2.4.5 For arterial applications, the character height shall be 12 inches.

5.3 Active Traffic Management sites

5.3.1 Installation location

Active traffic management (ATM) systems are used to support traffic control techniques such as queue protection and speed harmonization. ATM equipment is often mounted on sign bridges, but can also be supported by bridge structures or other appropriate structures along the roadway. In the following sections, an ATM site is designated as an "ATM installation" or an "ATM site", regardless of the type of support being used.

Similar to variable message signs, active traffic management installations must be placed at set intervals to maintain contextual relevance. However, ATM signs provide traffic control information typically beginning only a mile upstream of an incident. Due to the tactical requirements of ATM systems, the installation intervals must be even shorter (nominally 0.5 miles) than those of VMS sites to provide necessary information in a timely manner.

The shorter spacing between ATM sites allows for better continuity of information as the driver passes from one site to another. Although inter-visibility of ATM installations is ideal for lane-control purposes, it is not practical in many areas due to signage crowding and roadway geometry.

However, it is necessary that lane-specific signs, i.e. lane control signs, appear to the driver to be in the correct lane when navigating roadway curves. This requirement is regulated by the minimum time that the sign must appear, from the driver's perspective, in the correct lane along a horizontal curve. Failure to adhere to this requirement may lead drivers to incorrectly interpret lane-control information.

At interchanges, ATM can provide junction warning/control capabilities, where drivers are directed out of the right lane to provide more room for merging traffic. However, this is only possible if the installation is located upstream of an on-ramp.

5.3.1.1 Installations shall have 0.5 mile nominal spacing; however more frequent spacing may be necessary to accommodate densely spaced urban interchanges.

5.3.1.2 Installations shall not be located anywhere within a horizontal curve where the LCS appears, from the driver's perspective, to be in the correct lane for less than 6 seconds at the posted speed. This is to prevent drivers from misidentifying the lane control sign that corresponds to their lane as they navigate the curve. See **Figure 5-3: Sight distance requirements for lane control signs**.

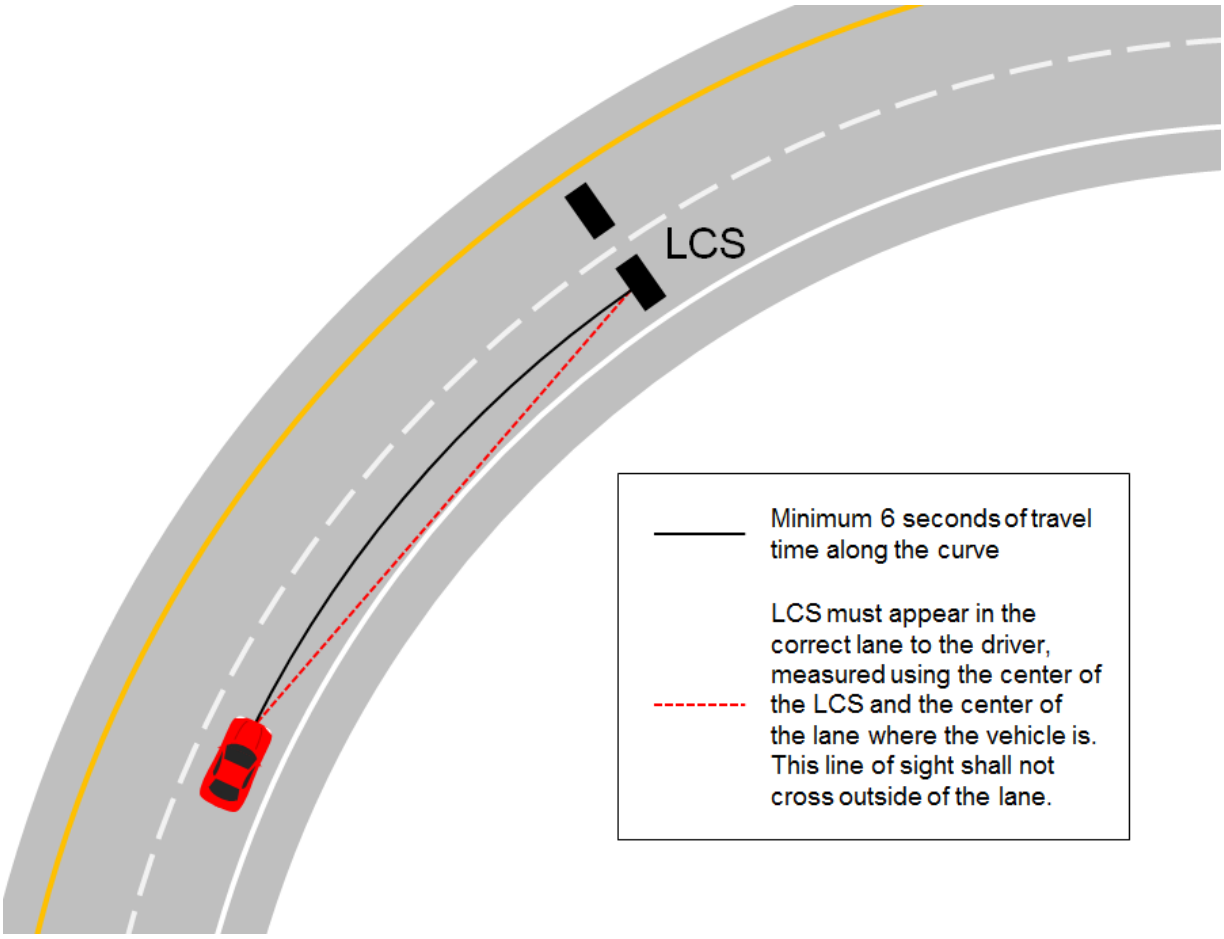


Figure 5-3: Sight distance requirements for lane control signs

5.3.1.3 Installations shall be a minimum of 800 feet upstream of an exit ramp.

5.3.1.4 Installations shall not be located within 300 feet of an on-ramp merge area, defined as the area between the tip of the gore point and the end of the merge taper.

5.3.1.5 Installations are allowed downstream of an exit ramp as long as other restrictions are met.

5.3.2 Lane control signs (LCS)

Lane control signs are used to communicate lane-specific traffic control information. Each lane is provided with its own LCS. These signs are used to display the following:

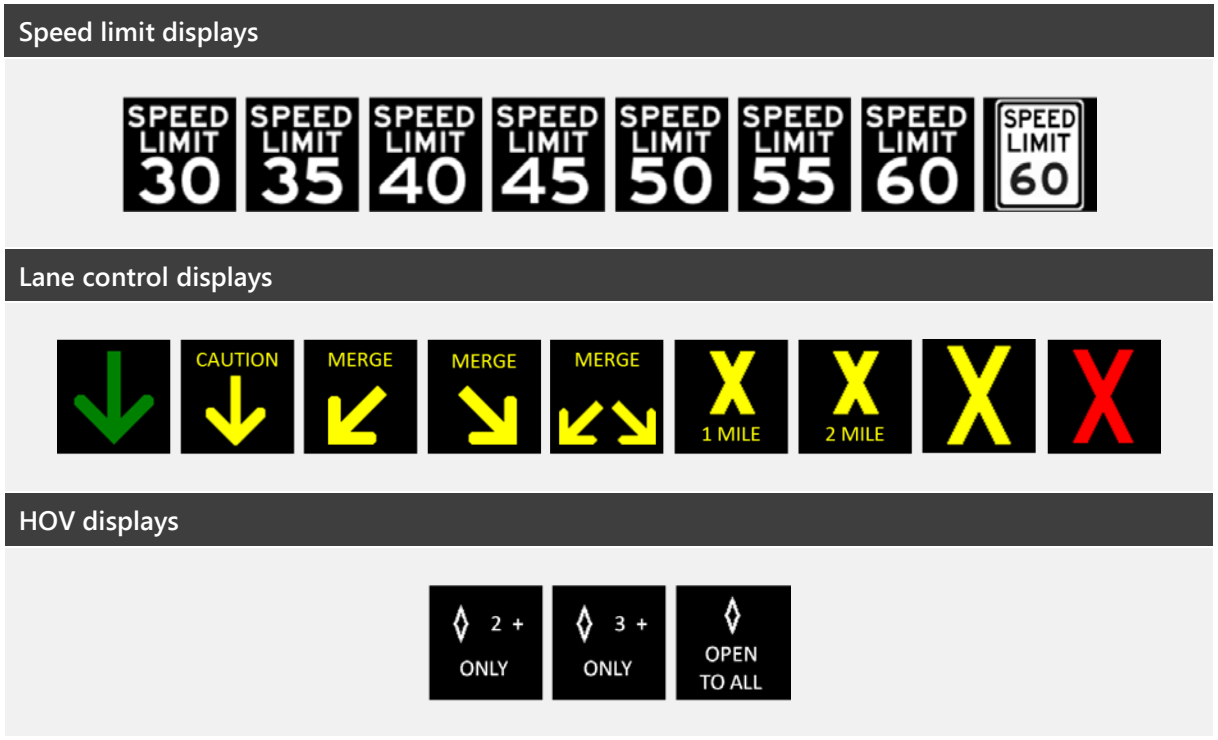


Figure 5-4: LCS displays

5.3.2.1 One LCS shall be centered over each mainline lane.

5.3.3 Lane control sign specification

5.3.3.1 The LCS display shall be full-matrix full-color LED.

5.3.3.2 The LCS display shall have a viewable area of 5'x5', be high resolution and capable of displaying all messages shown above.

5.3.3.3 The LCS display shall be capable of displaying at least 6, 12-inch tall characters per line.

5.3.3.4 The LCS display shall be capable of displaying 2 lines of 9-inch tall characters with 1 line of 18-inch characters, or 4 lines of 9-inch tall characters.

5.3.4 Side-mounted signs (SMS)

Side-mounted signs provide supplementary information when LCS messages are deployed. They show messages that would otherwise be displayed on a full-size VMS, such as “Slow Traffic Ahead” and “Reduced Speed Zone”. When no messages are deployed on the LCSs, the default speed limit is shown on SMS.

5.3.4.1 SMS shall be on every other ATM installation, alternating with VMS. Installations containing a VMS shall not contain an SMS.

5.3.4.2 SMS shall be installed in the median and on the right-hand side shoulder.

5.3.4.3 The horizontal distance between an SMS and the nearest mainline edge stripe shall be no more than 20 feet.

5.3.4.4 The top of each SMS should be mounted at the same elevation as the bottom of the LCS at the same ATM installation.

5.3.4.5 An additional SMS shall be provided when an ATM installation is upstream of an on-ramp, as shown by **Figure 5-5: Additional SMS for on-ramp**. The extra sign is needed to provide speed and incident information to ramp traffic that would otherwise not see the information displayed on the ATM installation.

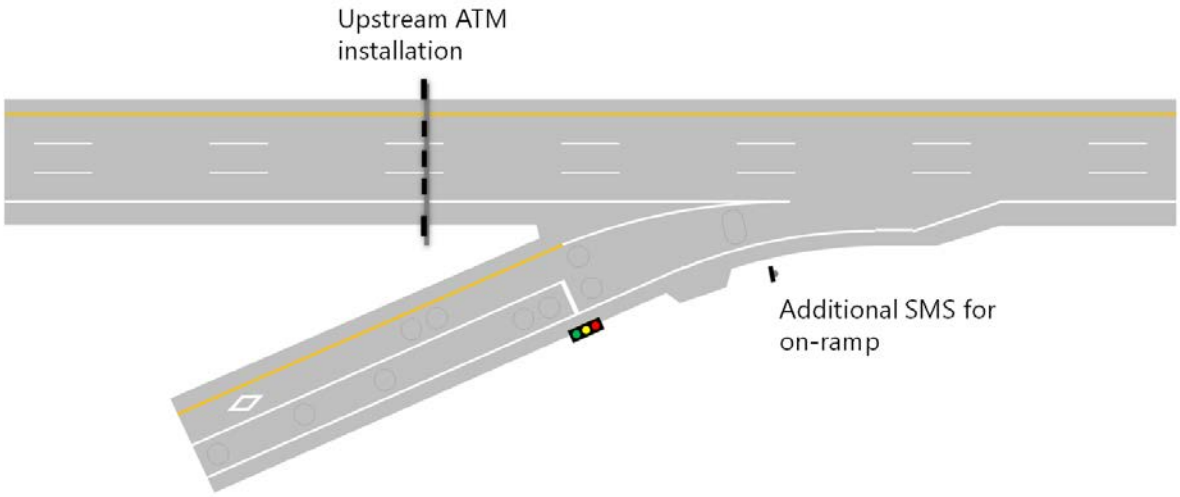


Figure 5-5: Additional SMS for on-ramp

5.3.5 Side-mounted sign specification

5.3.5.1 The SMS display shall be full-matrix full-color LED.

5.3.5.2 The SMS display shall have a viewable area of 6’x6’, be high resolution and capable of displaying 4 lines of text with 8 characters on each line.

5.3.5.3 The SMS display shall be capable of displaying at least 8, 12-inch characters per line.

5.3.5.4 The SMS display shall be capable of displaying 4 lines of 12-inch characters.

5.3.6 ATM Variable Message Signs (VMS)

ATM installations often contain a VMS to provide additional information to drivers. They are used for supplementary messages such as those regarding incidents, congestion and roadwork. Example messages include "Slow Traffic Ahead" and "RIGHT LANE CLOSED". Normally, a full-size VMS is used in an ATM installation. However, a smaller VMS may be used if the full-size VMS is not feasible.

5.3.6.1 VMS shall be provided on the first (most upstream) ATM installation of a corridor.

5.3.6.2 A small VMS shall not be installed unless a full-size VMS cannot be accommodated.

5.3.6.3 A VMS shall be provided at installations where the distance to the nearest upstream ATM site is more than 2 miles.

5.3.6.4 A VMS shall be provided on every other ATM installation, alternating with SMS. Installations containing SMS shall not contain a VMS.

5.3.6.5 At an installation, the VMS shall be mounted on the same structure as the adjacent LCS.

5.3.6.6 At an installation, the horizontal distance between the VMS and the nearest LCS shall be no more than 5 feet.

5.3.6.7 At an installation, the VMS may be located above the LCS (this will require structural design).

5.3.7 ATM full-size VMS specification

5.3.7.1 The VMS legend shall be full-matrix amber LED, capable of displaying 3 lines of text.

5.3.7.2 For signs with fixed character width, each line shall contain 18 characters.

5.3.7.3 For signs with variable character width, each line shall contain at least 21 characters.

5.3.7.4 The character set shall be capable of displaying characters from 20 hex to 7E hex, inclusive, of the ASCII character set.

5.3.7.5 The character height shall be 18 inches.

5.3.7.6 The sign shall be capable of displaying graphics, symbols and any font set.

5.3.8 ATM small VMS specification

5.3.8.1 The VMS legend shall be full-matrix amber LED, capable of displaying 3 lines of text.

5.3.8.2 For signs with fixed character width, each line shall contain 14 characters.

5.3.8.3 For signs with variable character width, each line shall contain at least 14 characters.

5.3.8.4 The character set shall be capable of displaying characters from 20 hex to 7E hex, inclusive, of the ASCII character set.

5.3.8.5 The character height shall be 18 inches.

5.3.8.6 The sign shall be capable of displaying graphics, symbols and any font set.

6 Other ITS devices

6.1 HAR

6.1.1 General

6.1.1.1 The radio frequency stated on the HAR sign shall match the broadcast frequency of the associated HAR transmitter.

6.1.2 HAR sign (HARS) location

6.1.2.1 HAR signs shall be located 1 to 2 miles in advance of the corresponding HAR transmitter. For HAR transmitters located within an interchange, this distance shall be measured from the beginning of the furthest exit ramp of the interchange.

6.1.2.2 HAR signs shall be mounted on a sign structure over the freeway lanes if the roadway contains 3 or more lanes in the same direction of travel.

6.1.2.3 If the roadway contains fewer than 3 lanes in the same direction of travel, HAR signs may be mounted on the shoulder.

6.1.3 HAR transmitter (HART) location

6.1.3.1 The transmitter shall be placed in or near major interchanges.

6.1.3.2 The transmitter shall be placed on a hill or at a location with open space surrounding the transmitter in order to ensure high transmission quality.

6.1.4 Cabinet

6.1.4.1 HAR signs and transmitters shall utilize a ground-mounted 334-style cabinet.

6.1.4.2 The cabinet shall be located where a person performing work from the cabinet (facing the display panel) can see the face of the HAR sign and beacons.

6.2 Environmental Sensor Station (ESS)

Environmental sensor stations are used to measure, report and forecast road-related weather conditions. The information is especially valuable in the winter and allows WSDOT maintenance personnel to make timely winter maintenance decisions, such as proactive snow and ice control. The information is also provided to the public as traveler information. The ESS is also known as a "weather station" or "RWIS".

6.2.1 Location

6.2.1.1 The location of the ESS shall be determined by the NWR Area Maintenance Supervisor.

6.2.1.2 The pavement sensor shall be in the outside lane, 4 feet from the edge stripe.

6.2.2 Cabinet

6.2.2.1 The ESS shall utilize a ground-mounted 334-style cabinet.

7 Temporary ITS

7.1 Overview

During construction work, it may be necessary to temporarily relocate or modify ITS equipment in the field to maintain operations. The designer must keep in mind that effective ITS operation is crucial to the efficiency of the WSDOT roadway network. Traffic management is ultimately dependent on equipment that is available, functional and reliable. Any degradation to ITS equipment may have system-wide consequences. For example, a ramp meter site using faulty traffic data may become a traffic flow bottle-neck for an entire corridor, while failed CCTV equipment may reduce emergency response times.

Therefore, it is important that ITS equipment remain reliably functional throughout the construction process and, if necessary, temporary ITS equipment be used to maintain high levels of operation.

7.2 General

7.2.1 Operations

7.2.1.1 The designer shall consider the impacts of the construction process on ITS devices, power, communication and other conduit/wiring systems of ITS devices. The designer shall design a temporary system as a substitute if the original system will be impacted.

7.2.1.2 ITS devices shall remain operational at all times, unless specified otherwise by the contract documents.

7.2.1.3 The designer shall exercise caution to avoid unintentionally damaging ITS devices during the construction process, especially when grading, saw cutting, grinding, excavating, performing drainage work, shifting lanes, etc. The designer should coordinate with those from other disciplines to flag items on the plan sheets that must be avoided. This may include a note to avoid saw cutting loops or digging into conduits.

7.3 Communication systems

7.3.1 Exposure to traffic

7.3.1.1 Temporary lane striping shall not route traffic over existing junction boxes or vaults without approval from a WSDOT structural engineer.

7.3.1.2 Junction boxes and vault lids that will be exposed to traffic shall be replaced with heavy-duty boxes before exposure to traffic.

7.4 CCTV

7.4.1 Coverage during construction

7.4.1.1 Cameras shall remain operational during construction.

7.4.1.2 Cameras to be impacted by construction activities shall be replaced, before work begins, by temporary cameras or permanent cameras in new locations.

7.4.1.3 Cameras that remain in operation shall provide 100 percent coverage on all freeways and ramps throughout the life of the project.

7.5 Ramp meters

7.5.1 Operations

7.5.1.1 Ramp meters shall remain operational during construction

7.5.1.2 The designer may relocate signal heads and provide temporary detectors if needed to accommodate the construction process.

7.5.1.3 Advance warning signs and beacons shall remain visible and operational.

7.5.1.4 All signing for ramp meters shall remain visible to motorists during construction and meet WSDOT signing standards.

7.6 Temporary vehicle detection

7.6.1 Type and location

7.6.1.1 Temporary detection shall be provided for all mainline lanes and all ramps during construction if the original equipment is removed from service or can no longer function reliably.

7.6.1.2 Temporary detection on the mainline, off-ramps and non-metered on-ramps shall be within 200 feet of the original equipment they are substituting. They shall also meet the requirements for loop spacing.

7.6.1.3 Sites equipped with ramp meter systems which require temporary detection shall use embedded induction loops in accordance with the ITS details.

7.6.1.4 Temporary detection shall be calibrated to provide comparable availability, detection quality (within 5%) and reliability as the device it is substituting.

8 Communications

8.1 Overview

The communications network provides the backbone for all Intelligent Transportation Systems (ITS) operations. It is the crucial link that connects not only the ITS devices in the field, but also the traffic management systems and software.

WSDOT relies on Intelligent Transportation Systems to provide the necessary traffic management strategies, and in turn depends heavily on the communications network. The availability, reliability and efficiency of the communications network influence the effectiveness of traffic management strategies. For example, a slow network may delay the timeliness of updating traffic control messages on variable message signs and lane control signs, affecting the credibility of the information displayed. Repeated over time, this may erode the public's trust in WSDOT's ability to provide timely and accurate information to road users.

An unreliable network may cause communications outages that bring ITS devices offline for entire corridors at a time. This may affect operations such as ramp metering, which will have to rely on time-of-day settings rather than real-time data. Since time-of-day settings are static, they cannot reflect actual traffic conditions and may cause the ramp meter to release vehicles at inefficient rates.

To maintain a high standard of design, this document provides the requirements and guidelines necessary for ensuring that WSDOT's communications network is available, functional and reliable.

8.2 Communication hub

8.2.1 Description

A communications hub is a facility in the field that handles ITS devices and communications equipment for an area. There are 13 hubs in the WSDOT network as of this writing, providing services such as video transmission, video distribution, data transmission and data distribution. New hubs should be considered in projects that expand the footprint of the existing ITS network.

8.2.2 Location

8.2.2.1 The location of the hub shall be determined by the NWR ITS Engineer. Generally, a hub is provided at major freeway-to-freeway interchanges and also every 10-15 miles along a corridor.

8.2.3 Existing communication hubs

8.2.3.1 Existing communications hubs within the project limits shall be replaced if any of the following conditions are met:

- Identified for replacement in the contract documents;
- The communications hub is more than 20 years old before physical completion of the contract.

8.2.4 Exterior treatment

8.2.4.1 The area around the hub shall be prepared and fenced in accordance with the NWR ITS details.

8.3 Conduit

8.3.1 Location

8.3.1.1 Mainline conduits shall stay on the same longitudinal alignment as long as possible (1 mile minimum). By maintaining a longitudinal alignment, cable installation can be simplified. The total length of the cable can also be shortened, as less cabling is used to travel across the roadway. Most importantly, this increases design consistency and predictability during road construction, which will reduce the chance of unintentional impacts and aids in future locating of buried conduit.

8.3.1.2 If installed near noise walls or row fences, the mainline conduits shall be located on the freeway side of any noise walls or right-of-way fences. This improves access and avoids special access arrangements that may delay repairs.

8.3.1.3 Mainline conduits shall be located to accommodate future roadway widening projects.

8.3.1.4 All raceways in the mainline conduits shall be continuous from HUB to HUB (or end to end).

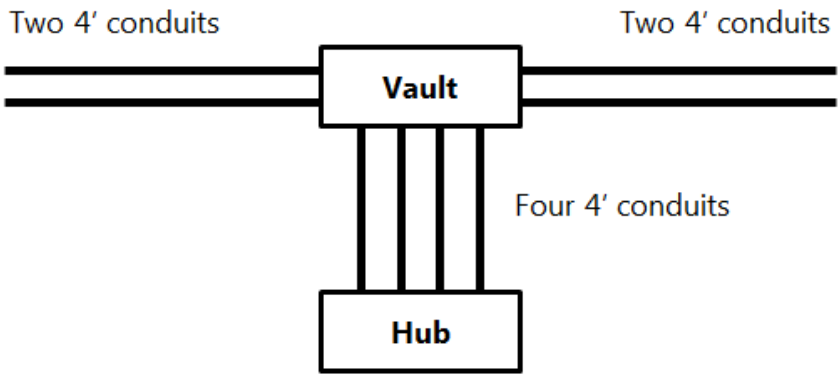


Figure 8-1: Raceways

8.3.1.5 If conduits containing fiber optic cables are attached to a bridge, these conduits shall be installed at a higher elevation than the top of the pull boxes or cable vaults at both ends of the crossing. This is to prevent water from being trapped in the conduits. Trapped water in the winter may freeze, expand and damage the fiber optic cables in the conduit, resulting in costly repairs and lengthy network outages.

8.3.1.6 If conduits containing fiber optic cables are attached to a bridge, the pull boxes or cable vaults at both ends of the crossing shall contain drains.

8.3.1.7 Any exposed conduits containing fiber optic cables shall be designed with these minimum characteristics:

- A pull box or cable vault shall be located within 50 feet of both ends of the exposed conduit;
- The exposed conduit shall be at a higher elevation than the top of the pull box or cable vault at either end;
- The pull box or cable vault at both ends of the exposed conduit shall include a 2-inch screened drain.

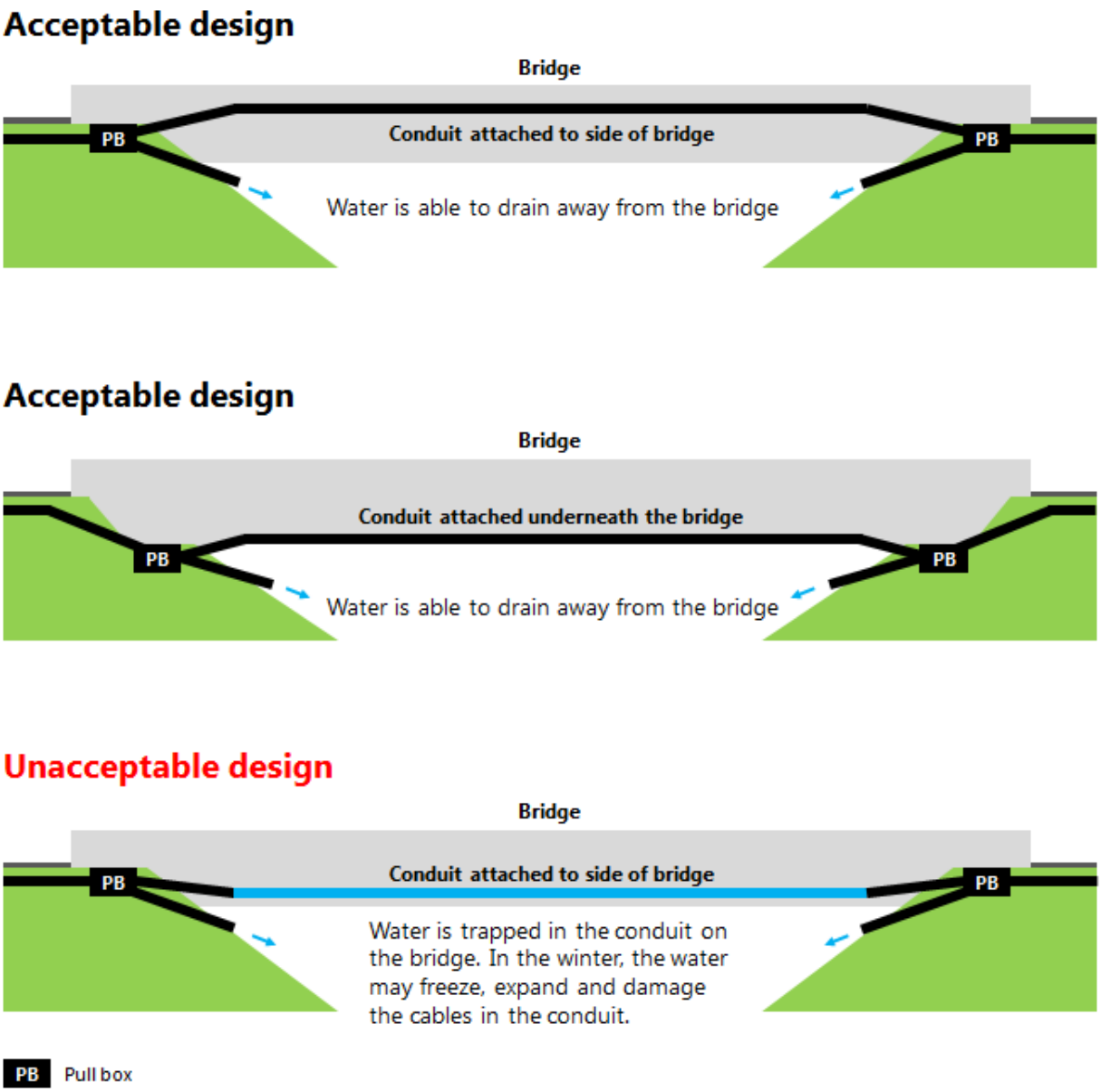


Figure 8-2: Drainage considerations for conduits on bridges

8.3.2 Size

8.3.2.1 Along freeways, the mainline conduit system shall consist of two 4-inch conduits. Each 4-inch conduit shall contain 4 innerducts.

8.3.2.2 Along non-freeway roadways, the mainline conduit system shall consist of two 2-inch conduits or larger.

8.3.3 Contents of conduits

8.3.3.1 Conduits with innerducts shall only contain mainline and distribution communication cables.

8.3.3.2 Systems with more than one mainline conduit shall have the mainline fiber and the distribution fiber located in separate conduits (outerduct).

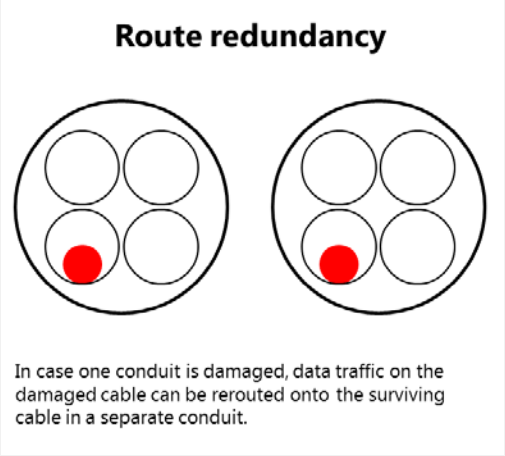
Example wiring schedule with route redundancy				
Conduit	**Duct**	**Cable**	**Comments**	**Diagram**
4″	A	96 SMFO	Mainline SMFO	
	B	Empty	-	
	C	Empty	-	
	D	Empty	-	
4″	A	48 SMFO	Distribution SMFO	
	B	Empty	-	
	C	Empty	-	
	D	Empty	-	

Figure 8-3: Redundant wiring schedule

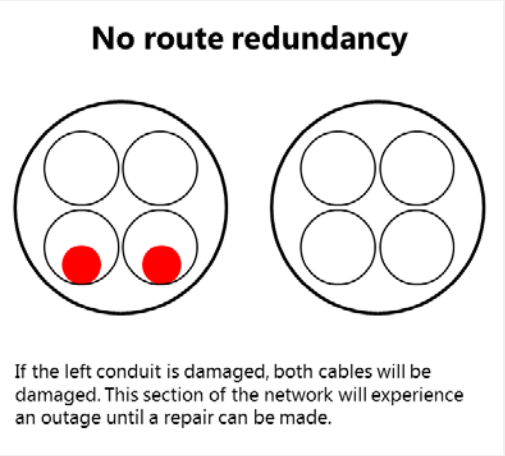
Example wiring schedule without route redundancy				
Conduit	**Duct**	**Cable**	**Comments**	**Diagram**
4″	A	96 SMFO	Mainline SMFO	
	B	48 SMFO	Distribution SMFO	
	C	Empty	-	
	D	Empty	-	
4″	A	Empty	-	
	B	Empty	-	
	C	Empty	-	
	D	Empty	-	

Figure 8-4: Non-redundant wiring schedule

8.3.4 Existing infrastructure

8.3.4.1 When modifying existing mainline conduit, or when the existing mainline conduit will be impacted, any conduit that does not meet current NWR ITS standards (material, size, inner-duct quantity, etc.) shall be replaced with new conduit between pull boxes/cable vaults.

8.3.4.2 Conduit repair kits of any kind shall not be used, as most repair kits are not capable of reliably withstanding conditions experienced during roadway applications.

8.3.4.3 If a roadway is modified so that an existing conduit ends up located under a travel lane, the existing conduit shall be replaced (from existing vault to existing vault) in a location outside of the paved area (or under the new shoulder if no other location is feasible).

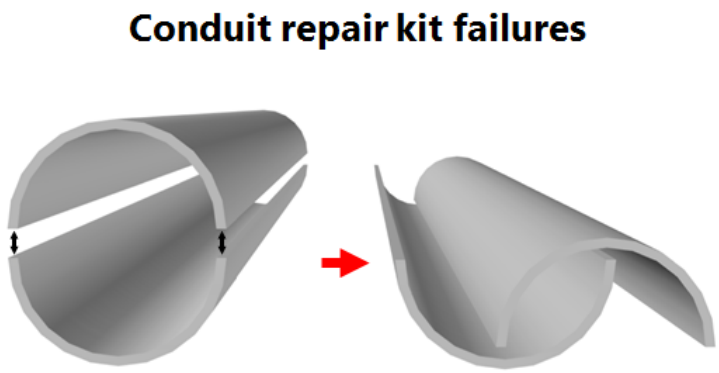


Figure 8-5: Conduit repair kit failures

8.3.5 Crossings

8.3.5.1 Any conduit crossing used to carry the distribution cable between the mainline conduit system and an ITS cabinet shall not be more than 500 feet from that ITS cabinet.

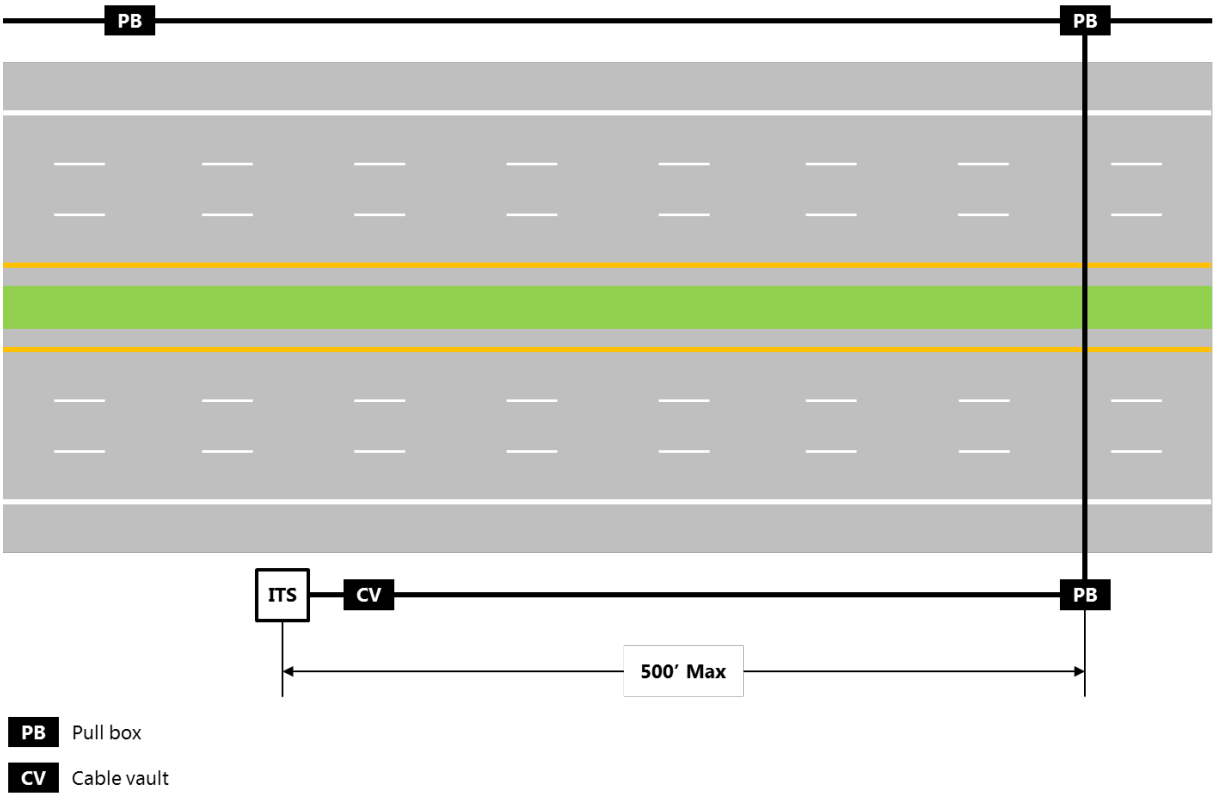


Figure 8-6: Conduit crossings

8.4 Vaults

8.4.1 General requirements

8.4.1.1 Cable vaults and pull boxes that are part of the mainline conduit system shall only contain the mainline and distribution communication cables, except where directly connected to ITS device cabinets.

8.4.2 Cable vaults

8.4.2.1 Cable vaults are required at the following locations:

- Any underground fiber optic splice location, including known future splice locations;
- All new and existing communication hubs;
- All new and existing ITS, tolling and signal cabinet locations;
- Every mile along the mainline conduit run.

8.4.2.2 A screened 2-inch drain pipe shall be provided between all cable vaults and any drainage ditch, swale or pond within 100 feet (see ITS detail).

8.4.3 Pull boxes

8.4.3.1 Pull boxes shall be located along fiber optic conduit runs with no more than 1000 foot spacing.

8.4.3.2 Pull boxes shall be located at both ends of crossings, borings and bridges.

8.4.3.3 No junction box smaller than a pull box shall be used in any conduit run containing fiber optic cable(s).

8.4.3.4 A screened, 2-inch drain pipe shall be provided between all pull boxes and any drainage ditch, swale or pond within 100 feet.

8.5 Mainline cabling

8.5.1 Description

8.5.1.1 The mainline cable is defined as the longitudinal fiber optic cable running along the corridor between communication hubs in the mainline communication conduit system.

8.5.2 General requirements

8.5.2.1 Splices are allowed every 13,000 to 18,000 feet in locations determined by the NWR ITS engineer. For maintenance reasons, it is important that splice locations are accessible with a truck and a splicing trailer.

8.5.2.2 If the existing mainline cable will be impacted, the cable shall be replaced between existing splices (no new splices shall be added).

8.5.2.3 The cable strand count shall be determined by the NWR ITS Engineer. The cable is typically a 48 to 96 count single-mode cable.

8.5.3 Cable termination

8.5.3.1 Pre-terminated (preterm) patch panels meeting the current WSDOT specifications shall be installed at all locations with a mainline cable interface.

8.5.3.2 The preterm cable shall be spliced to the mainline cable in a cable vault or optical cable entrance facility (OCEF) located no more than 100 feet from the cabinet or hub containing the preterm panel.

8.5.3.3 There shall be one pre-terminated patch panel for each optical cable installed in a hub or fiber terminal cabinet (FTC).

8.5.3.4 The mainline and the distribution cables shall be spliced to separate pre-terminated patch panels where both are terminated in a single cabinet.

8.5.3.5 There shall be one fiber optic splice closure per fiber optic stub cable.

8.5.3.6 If the mainline cable ends at a location other than the hub, the cable shall be spliced to a pre-terminated patch panel installed in the ITS cabinet (not ES cabinet) nearest the physical end of the project.

8.6 Distribution cabling

8.6.1 Description

8.6.1.1 The distribution cable, also known as "mainline distribution", is defined as the fiber optic cable that connects the roadside ITS and tolling cabinets to the nearest hub.

8.6.2 General requirements

8.6.2.1 Distribution cabling shall use the mainline communication conduit system for all longitudinal runs along the corridor.

8.6.2.2 If an existing distribution cable will be impacted by the project, the cable shall be replaced between devices currently served by the cable.

8.6.2.3 The cable strand count shall be determined by the NWR ITS Engineer. The cable is typically a 36 to 48 count single-mode cable.

8.6.3 Strand usage

8.6.3.1 The first 12 strands in both directions are terminated at all ITS cabinets served by the cable.

8.6.3.2 Unique strands in both directions shall be terminated at each tolling cabinet and the toll rate sign cabinet. The strand numbers and quantity shall be determined by the NWR ITS Engineer.

8.6.3.3 Additional strands in both directions shall be terminated for agency interface. The strand numbers, quantity and location shall be determined by the NWR ITS Engineer.

8.6.3.4 Additional strands in both directions shall be terminated for network redundancy. The strand numbers, quantity and location shall be determined by the NWR ITS Engineer.

8.6.4 Route architecture

8.6.4.1 The distribution cable shall connect to all ITS cabinets and intersection signal cabinets.

8.6.4.2 The distribution cable shall be routed to cabinets in order of the milepost of the cabinet location (not the device ID).

8.6.4.3 When ITS cabinets are grouped on a shared foundation, the distribution cable shall connect to only one of the cabinets in the following order of importance:

1. Fiber Optic Terminal Cabinet (FTC)
2. ATM cabinet
3. CCTV cabinet
4. HARS cabinet
5. VMS cabinet
6. Other ITS cabinet
7. ES Cabinet
8. UPS cabinet (334-style)
9. Intersection signal cabinet

8.6.4.4 Tolling cabinets shall have their own connection to the distribution cable, independent of any connection to adjacent ITS cabinets.

8.6.4.5 Cabinets that share a foundation and do not contain a patch panel shall each have an OSP CAT 6 cable routed through the conduits in the foundation to the cabinet containing the patch panel. In this case, the Ethernet switch(es) shall be installed in the cabinet with the patch panel.

8.6.5 Cable termination

The following requirements are to ensure maximum uptime of the network. By separating certain cables and panels, they can be taken offline for maintenance without impacting other parts of the network.

8.6.5.1 Pre-terminated (preterm) patch panels meeting the current WSDOT specifications shall be installed in all locations with a distribution cable interface.

8.6.5.2 There shall be a maximum of one pre-terminated patch panel in each cabinet except where an outside agency's fiber is terminated in a WSDOT cabinet. In that case, there shall be two pre-terminated panels.

8.6.5.3 There shall be one pre-terminated patch panel for each optical cable installed in a hub or building/facility. The exception is when both cables are on the same roadway, in which case distribution cables may be combined into one panel (i.e. I-5 northbound and southbound distribution cables may be spliced to the same panel).

8.6.5.4 The pre-terminated cable shall be spliced to the distribution cables in a cable vault or optical cable entrance facility (OCEF) located no more than 100 feet from the cabinet or hub containing the pre-terminated panel.

OCEF rack	OCEF fiber optic splices
	

Figure 8-7: Optical cable entrance facility (OCEF)

8.6.5.5 There shall be one fiber optic closure per pre-terminated stub cable except where the pre-terminated patch panels for a tolling cabinet and an ITS cabinet are spliced in the same cable vault. In this case, there shall be no more than two pre-terminated stub cables connected to one fiber optic closure; one for ITS and one for tolling.

8.7 Lateral cabling

8.7.1 Description

Lateral cabling is defined as a fiber optic cable spur between one ITS cabinet served by the distribution cable and one non-ITS cabinet, or between one ITS cabinet served by the distribution cable and one signal cabinet.

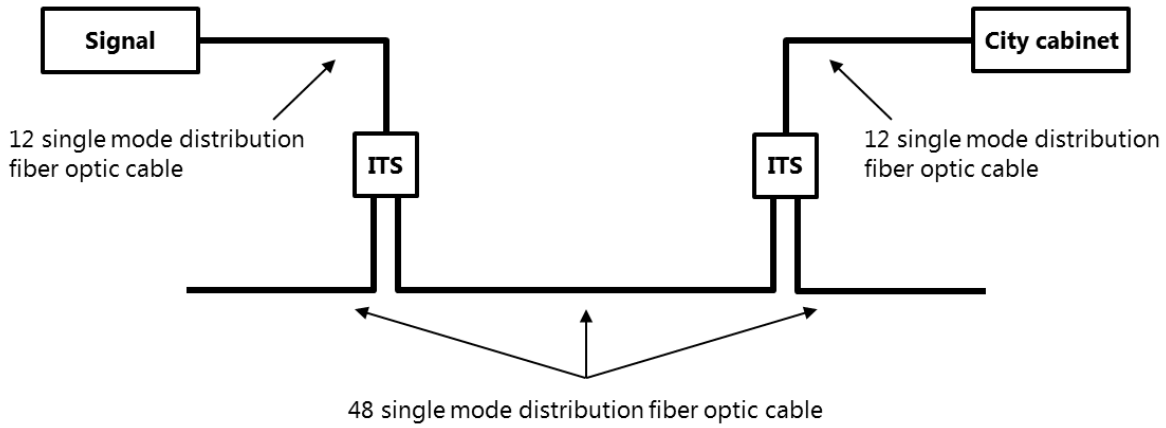


Figure 8-8: Lateral cabling

8.7.2 General requirements

8.7.2.1 Lateral cabling may be used to connect non-ITS devices or signal cabinets located within 750 feet of an ITS cabinet served by the distribution cable when approved by the NWR ITS Engineer.

8.7.2.2 Any device cabinet served by the distribution cable shall utilize no more than 1 lateral cable.

8.7.2.3 Any non-ITS cabinet or signal cabinet shall utilize no more than 2 lateral cables.

8.7.2.4 The lateral cable is typically a 12 count single-mode cable.

8.7.3 Cable termination

8.7.3.1 Pre-terminated (preterm) patch panels meeting the current WSDOT specifications shall be installed in all locations with a lateral cable interface.

8.7.3.2 There shall be a maximum of one pre-terminated patch panel in each cabinet except where an outside agency's fiber is terminated in a WSDOT cabinet. In that case, there shall be two pre-terminated panels; one for WSDOT and one for the outside agency.

8.7.3.3 Lateral fiber cables shall be spliced to a pre-terminated patch panel. The pre-terminated patch panel shall be combined with all other lateral fibers and interconnect fibers going to that location. If room allows, it shall also be combined with the distribution cable.

8.7.3.4 The pre-terminated stub shall be spliced to the lateral cables in a cable vault or optical cable entrance facility (OCEF) located no more than 100 feet from the cabinet or hub containing the pre-terminated panel.

8.7.3.5 There shall be one fiber optic closure per pre-terminated stub cable.

8.8 Interconnect cabling

8.8.1 Description

8.8.1.1 The interconnect cable is defined as a distribution-style fiber optic cable connecting signal cabinets and other ITS devices along an arterial state highway.

8.8.2 General

8.8.2.1 Interconnect cables shall meet the same design requirements as fiber optic distribution cables.

8.8.3 Cable termination

8.8.3.1 Pre-terminated (preterm) patch panels meeting the current WSDOT specifications shall be installed at all locations where there is an interconnect cable interface.

8.8.3.2 There shall be a maximum of one pre-terminated patch panel in each cabinet except where an outside agency's fiber is terminated in a WSDOT cabinet. In that case, there shall be two pre-terminated panels.

8.8.3.3 Interconnect fiber cables shall be spliced to a pre-terminated patch panel. The pre-terminated patch panel shall be combined with all other interconnect fibers and lateral fibers going to that location. If room allows, it shall also be combined with a distribution cable.

8.8.3.4 The pre-terminated stub shall be spliced to the interconnect cables in a cable vault or optical cable entrance facility (OCEF) located no more than 100 feet from the cabinet or hub containing the pre-terminated panel.

8.8.3.5 There shall be one fiber optic closure per pre-terminated stub cable.

8.9 Fiber optic patch cords

8.9.1 General requirements

8.9.1.1 Patch cords contained within a patch panel shall be no more than 1 foot longer than required to make the connection.

8.9.1.2 Patch cords between two patch panels shall be no more than 1 foot longer than required to make the connection.

8.9.1.3 Patch cords between a patch panel and a device shall not be more than 2 feet longer than required to make the connection.

8.9.1.4 Patch cords between a patch panel and a device shall be contained inside of a 1/2" to 5/8" yellow split loom.

8.9.1.5 Boots shall be glued to the patch cord jacket to prevent spinning or from being pulled off under normal use.

8.10 Other requirements for cabling

8.10.1 General requirements

8.10.1.1 Communication cables shall not occupy the same conduits or junction boxes as power conductors.

8.10.1.2 A single splice closure shall contain no more than one pre-terminated stub unless approved by the NWR ITS Engineer.

8.10.1.3 Mainline cable splices and distribution cable splices shall not occur in the same splice closure.

8.10.1.4 Only 48-port and larger pre-terminated panels shall be installed in any hub.

8.10.1.5 Pre-terminated patch panels shall be used for all fiber optic terminations in all locations. Distribution panels and directly connectorized fibers are not allowed.

8.10.1.6 Mechanical splices or fiber optic strands shall not be used.

8.11 Communications Equipment

8.11.1 Roadside cabinets

At a minimum, the listed communication equipment and accessories (including all mounting hardware and cabling to provide a fully functional system) shall be installed in each of the following types of cabinets (both new and existing).

A standalone cabinet is defined as a cabinet that (1) does not share a common foundation with another ITS cabinet and (2) is not located within 300 feet of another ITS cabinet.

8.11.1.1 At each ES cabinet, the following shall be installed:

- One RuggedCom RMC30 terminal server;
- One RuggedCom RS900 switch located in the cabinet with the pre-terminated panel;
- If the cabinet is standalone, a RuggedCom RS910 may replace both the RS900 and RMC30.

8.11.1.2 At each HARS cabinet, the following shall be installed:

- One RuggedCom RMC30 terminal server;
- One RuggedCom RS900 switch located in the cabinet with the pre-terminated panel;
- If the cabinet is standalone, a RuggedCom RS910 may replace both the RS900 and RMC30.

8.11.1.3 At each ATM cabinet, the following shall be installed:

- One RuggedCom RS900 switch for up to 5 Ethernet connections;
- One RuggedCom RSG2300 switche for 6 or more Ethernet connections;

8.11.1.4 At each PTR cabinet, the following shall be installed:

- One RuggedCom RS900 switch;
- One Moxa 5210T Terminal Server.

8.11.1.5 At each VMS and TRS cabinet, the following shall be installed:

- One RuggedCom RS900 switch.

8.11.1.6 At each traffic signal cabinet, the following shall be installed:

- One RuggedCom RS900 switch (Note: If the signal cabinet is utilizing a lateral cable, the RS900 in the ITS cabinet nearest to the signal cabinet shall contain 3 optical ports).

8.11.1.7 At each HAR transmitter cabinet, the following shall be installed:

- One RuggedCom RS900 switch;
- One Quintum 2-channel FXS VoIP device.

8.11.1.8 At each ESS (weather station) cabinet, the following shall be installed:

- One RuggedCom RS900 switch.

8.11.1.9 At each CCTV cabinet, or any cabinet with a camera connected to it, the following shall be installed:

- One RuggedCom RS900G switch.

8.11.2 Communication hubs

At a minimum, each hub (both new and existing) shall receive the following communication equipment and accessories (including all mounting hardware and cabling to provide a fully functional system):

8.11.2.1 Data system

- One 19-inch wide Ethernet switch mounting bracket (see ITS details) for every 5 switches, or part thereof;
- One RuggedCom RS900 switch for each network (ITS, Tolling, etc.) in each direction of all state highways served by the hub;
- One RuggedCom RS900G switch for the camera network in each direction of all state highways served by the hub.

8.11.3 Traffic management center

At a minimum, traffic management centers (TMC) shall receive all equipment necessary to support the new field equipment, the existing equipment required to remain and communication hub equipment (including all mounting hardware and cabling to provide a fully functional system).

8.11.3.1 TMC equipment shall include, but is not limited to:

- Ethernet switches for ITS and camera networks
- 24-channel FXO VoIP device
- Video decoders
- Video encoders
- Any other office-side equipment needed for a complete system

9 ITS for roundabouts

9.1 CCTV

9.1.1 Location

9.1.1.1 A pan-, tilt- and zoom-capable camera shall be located approximately 400-600 feet from the center of the roundabout along the State Highway. The camera view shall show all movements within the roundabout without having to pan the camera. The camera view shall also maximize views of all lanes entering or exiting the roundabout.

9.2 Loop detection

9.2.1 Data station

9.2.1.1 A data station shall be provided near the roundabout.

9.2.2 Loops on entering lanes

9.2.2.1 Loops shall be provided on all lanes entering the roundabout. They shall be located upstream of the roundabout (before entering the roundabout).

9.2.2.2 Loops shall be located approximately halfway between the beginning of the multilane section and the yield line, but downstream from the beginning of the splitter island.

9.2.2.3 Loops shall be upstream of any crosswalks.

9.2.2.4 For short splitter islands, loops shall be located near the beginning of the island. For long splitter islands, loops shall be located near the midpoint of the island.

9.2.3 Loops on exit lanes

9.2.3.1 Loops shall be provided on all lanes exiting the roundabout. They shall be located downstream of the roundabout (after exiting the roundabout).

9.2.3.2 Loops shall be located approximately halfway between the roundabout and the lane reduction (where applicable), but upstream of the end of the splitter island.

9.2.3.3 Loops shall be downstream of any crosswalks.

9.2.3.4 For short splitter islands, loops shall be located near the end of the island. For long splitter island, loops shall be located near the midpoint of the island.

9.3 Communication

9.3.1 Connection to WSDOT network

9.3.1.1 A communication link that includes conduit(s) and fiber optic cables to the nearest existing WSDOT fiber optic network shall be provided. If this is not possible, a leased broadband drop shall be used instead.

9.3.1.2 All other necessary communication hardware required for a fully-functional system shall be provided.

9.4 ITS configuration

9.4.1 Naming and location

9.4.1.1 Loop detection and CCTV shall be placed in accordance with the detail shown in **Figure 9-1: Loop naming scheme for roundabouts.**

9.4.1.2 Loop naming shall follow the scheme shown in **Figure 9-1: Loop naming scheme for roundabouts**.

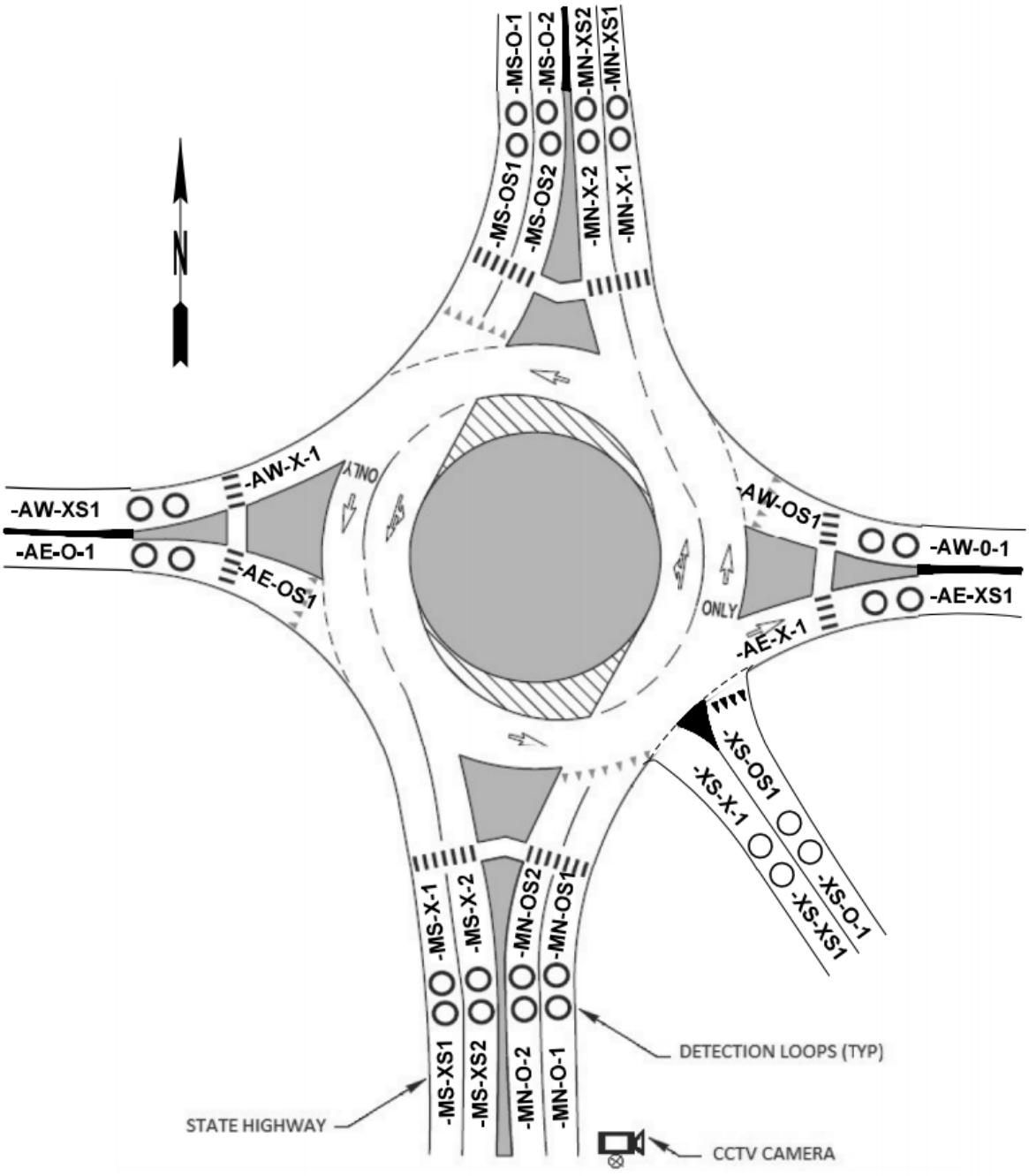


Figure 9-1: Loop naming scheme for roundabouts

2.29 MAINTENANCE DURING CONSTRUCTION

2.29.1 GENERAL

The Design-Builder shall conduct all Work necessary to meet the maintenance requirements described in this Section. Elements of Work shall include operation, maintenance, and repair of the existing facilities; and facilities constructed under the Contract beginning at the earlier of the following two milestones: 45 Calendar Days after Notice to Proceed or 7 Calendar Days prior to installation of any high visibility fence, silt fence or other BMPs; and ending on the day of Physical Completion.

The Design-Builder shall perform maintenance during construction in a safe, reasonable, and prudent manner, and shall employ good business practices and appropriate management ~~techniques. The~~techniques. The Design-Builder shall furnish all labor, materials, equipment, and necessary services, such as highway safety controls, in connection with maintenance during construction. Refer to the *WSDOT's ~~M51-01 Mm~~aintenance Mm~~a~~nual* ~~(Appendix D)~~ for maintenance standards of items listed as the Des~~o~~ig~~m~~n-Builder's responsibility. When referencing the *WSDOT Maintenance Manual*, all references to "should" or "may" shall be interpreted as "shall" unless approved by the WSDOT Engineer.

For the purpose of maintenance during construction, the Project limits are defined as all Right-of-Way, including any easements that may be necessary to construct the Project, that are located within the following areas:

Project Maintenance Limits

- ***Within the SR 167 Right-of-Way from MP 10.48 to MP 18.24.
- Within the limited access lines along the interchanges at 8th Street E, Ellingson Road, 15th Street SW, 15th Street NW, and S 277th St.
- The SR 18 interchange maintenance area limits are shown in the *Maintenance Limit for the SR 18 Interchange* (Appendix Q).***

The Design-Builder shall provide maintenance, inspections, and repairs required on an "as needed" basis throughout the duration of the Contract in accordance with the *WSDOT Maintenance Manual*. If WSDOT determines that the Design-Builder has failed to provide adequate routine maintenance, emergency and operational response, or inspections and repairs, WSDOT will issue a verbal notification of the failure to the Design-Builder.

WSDOT will follow the verbal notification with a written notification to commence and continue correction of the failure. Failure by the Design-Builder to correct the stated deficiency within 24 hours of the verbal notification may result in WSDOT performing the Work without prejudice to other remedies WSDOT may have. In such case, WSDOT will deduct the cost of correcting such deficiencies from payments then or thereafter due to the Design-Builder. If payments then or thereafter due are not sufficient to cover the cost of correcting the deficiencies, the Design-Builder shall pay the difference to WSDOT upon demand.

2.29.2 MANDATORY STANDARDS

The following is a list of Mandatory Standards that shall be followed for all design and construction related to this Section. They are listed in hierarchical order, where the Mandatory Standards listed higher in the list shall take precedence over those listed below

Comment [jlb1]: **Aug 21, 2015 5:46 PM Eric Ostfeld says:**
prudent, good business practice type language is hard to quantify. Suggest removing to simplify document.

Mark- do not want to remove language. Is there some standard we can reference? WSDOT Maintenance Manual? Add to reference documents?

Mark to revise language – be specific on what sections in manual you want to use as the standard.

Refer to the WSDOT's M51-01 maintenance manual, appendix D for maintenance standards of items listed as DB's responsibility

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Comment [JO2]: Are these standards written in contract language?
See Markups to convert to contract language

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Comment [jlb3]: Note to Author: Project-specific appendix.

Comment [jlb4]: Note to Author: Insert project maintenance limits (may be different than the project limits).

them. If a Mandatory Standard contains a reference to another document that is not listed below and states that the referenced document shall be used, the referenced document shall also be considered to be a Mandatory Standard with the same hierarchal precedence as the source publication. This is not a comprehensive list; other applicable standards may be required to complete the design and construction. If the Design-Builder becomes aware of any ambiguities or conflicts relating in any way to the Mandatory Standards, the Design-Builder shall immediately notify the WSDOT Engineer.

- Special Provisions (Appendix B).
- *Amendments to the Standard Specifications* (Appendix B).
- Standard Specifications (Appendix B).
- *WSDOT Maintenance Manual* (M51-01) (Appendix D).
- *WSDOT Roadside Manual* (M25-30) (Appendix D).
- ~~***~~*~~WSDOT~~* NWR *~~Integrated~~* *WSDOT* *Roadside Vegetation Management Plans* (Appendix D).~~***~~
- *WSDOT Right-of-Way Manual* (M26-01) (Appendix D).

2.29.3 MAINTENANCE OF THE RIGHT-OF-WAY

2.29.3.1 GENERAL

The Design-Builder shall maintain the roadside vegetation outside the limits of vegetation disturbed by the Design-Builder's operations and outside the sensitive area boundaries. The Work includes nuisance vegetation control, noxious weed control, tree and brush control, and turf and grass care. Refer to Section 2.15 for roadside restoration requirements.

2.29.3.2 NUISANCE VEGETATION CONTROL

The Design-Builder shall control knotweed, scotchbroom, and blackberry within the Project limits. The Design-Builder shall treat all nuisance vegetation to ensure it is dead prior to removal. Scotchbroom shall be removed prior to blooming. Once knotweed has been treated, dead knotweed stems shall be removed from Project limits. The Design-Builder shall control all Alder, Cottonwood, and Willow within new stormwater facilities during the plant establishment period. The Design-Builder shall maintain all stormwater treatment facility access routes in a vegetation-free state. The nuisance vegetation control shall occur for the life of the Contract, including the plant establishment period.

2.29.3.3 NOXIOUS WEED CONTROL

The Design-Builder shall allow WSDOT, ***the King County Weed Board, and the Pierce County Weed Board*** personnel access to any part of the Right-of-Way within the Project limits to identify and control noxious weeds with herbicides. Areas with weed infestations will be identified by WSDOT, ***the King County Weed Board, or the Pierce County Weed Board***, and reported to the Design-Builder through verbal and written notice of the location, plant type, and required compliance date. Weed control shall be accomplished by the Design-Builder.

Notices to comply typically allow up to 10 Calendar Days to complete the activity. The performance measure for control is 100 percent. Herbicides used within the Project limits

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Comment [jlb5]: Note to Author: Region-specific documents can be found at: http://www.wsdot.wa.gov/Maintenance/Roadside/mgmt_plans.htm

Comment [jlb6]: Aug 20, 2015 3:26 PM Jami Boutwell says:
Lessons Learned from SR167 HOT Lanes, WSDOT's intent was to have DB perform weed control, including in sensitive areas, however the contract does not allow the DB to work in sensitive areas. Suggest revising this language to reflect that maintenance for activities that extend beyond the DB's High Vis fence shall be in compliance with the Permits. If no specific permit conditions apply, then we need to include criteria/guidance as to what is/isn't allowed. This issues affects Sections 2.8, 2.15, & 2.29.

Teresa - This is more of an environmental "permit" condition issue – discuss with Eric Wolin before next meeting.

Eric is researching if maint permit can be assigned to DBer – will discuss this item in meeting.
Resolution – No change at this time – The intent will change to "All areas inside the project boundary will be maintained by the DBer, and refer to the WSDOT maint environmental permit in some cases." No change until ability to use maint permit is confirmed. (Eric Wolin is working on this, proposing final language and coordinating change in 2.8)

Comment [jlb7]: Note to Author: Project/region specific.

Comment [jlb8]: Note to Author: Project/region specific

shall be applied at recommended label rates to the target vegetation, and only during weather conditions that will allow use of the control agent. The Design-Builder shall use an herbicide at legal rates and as recommended by the herbicide manufacturer for the target vegetation, and shall ensure that a person who is licensed to apply herbicide performs the Work. A copy of the application record shall be submitted to WSDOT.

The Design-Builder shall provide WSDOT with access to the area the herbicide will be applied, and shall ensure that all materials, equipment, and personnel are outside of the area when the herbicide is applied.

If the Design-Builder decides to remove noxious weeds by hand, the Design-Builder shall remove the root of the plant, and dispose of it in a container. The Design-Builder shall dispose of the plant and the container in a refuse disposal, and shall complete the activity within the time limit specified on the notice to comply. If the Design-Builder fails to respond to a notice to comply, the Design-Builder shall pay all fines assessed, including subcontractor, administrative overhead, personnel, material, equipment, and excess penalties. ***The King County Weed Board and the Pierce County Weed Board*** reserve the right to control weeds in an area identified as out of compliance by any means they choose, and at any time of day they deem appropriate.

Delays to the Design-Builder for the application of herbicide by WSDOT, ***the King County Weed Board, the Pierce County Weed Board***, or other parties shall not be reason for an extension of time or additional compensation, including claims of differing site conditions. Refer to the *Roadside Vegetation Management Plans*~~Integrated Vegetation Management Plan (IVA) in Appendix D~~.

2.29.3.4 TREE AND BRUSH CONTROL

The Design-Builder shall remove or trim all trees or brush that obscure roadway signs or cause a reduction in sight distance. The Design-Builder shall remove trees that are identified as hazards or dangers within the Project limits, roadway, or structures adjacent to or within the Right-of-Way. WSDOT will identify and notify the Design-Builder of trees and brush that fall within this criteria. The Design-Builder shall remove danger/hazard trees within 24 hours of verbal or written notification from WSDOT. The Design-Builder shall remove downed trees that have fallen and are within 30 feet of the edge of paved shoulder of an active travel lane, or that may be a safety concern for public travel.

2.29.3.5 TURF AND GRASS CARE

The Design-Builder shall mow existing turf or grasses from the edge of pavement to a point 16 feet from the edge. When the average grass height reaches 30 inches, the grass or turf shall be mowed to a height between 6 inches and 12 inches. The Design-Builder shall not scalp the ground within sensitive areas. Mowing will not be required on slopes steeper than 2:1.

2.29.3.6 HEALTH HAZARDS

The Project area is occupied by transients, birds, bats, and rodents; and will contain biological and associated physical hazards. The areas under the ends of the bridges within the Project are most impacted by these hazards. Other areas may also be impacted.

Transients

The Project area includes materials and waste that pose a physical, biological safety, and health hazard, such as waste associated with transients and drug users. Materials and waste

Comment [jlb9]: Note to Author: Project/region specific

Comment [jlb10]: Aug 21, 2015 3:39 PM Phil Larson says:
This item should be FA.

[**NOTE from Jami**: it wasn't clear what language this comment applied to, so I applied it to the entire paragraph that the comment was closest to.]

Mark - Use The Integrated Vegetation Management Plan – includes typical noxious weed maps- include as a reference?

Add language that refers to Appendix "D" for the IVM plan specific to the maintenance area within the region that the work is taking place.

Resolution - See Markups

Comment [jlb11]: Note to Author: Project/region specific

Comment [SH12]: There were an interest or discussion from NWR Landscape office to add this section to 2.15 (Landscape). Just a note so that you can check into it.

No change at this time

may include, but are not limited to, hypodermic needles, food, garbage, clothing, bedding, broken glass, human and animal excrement, drug paraphernalia, makeshift dwellings, and other hazards. The Project area may also be occupied by violent and dangerous individuals.

In the event transients are encountered within the Project limits and are hampering Work or causing unsafe work conditions, the Design-Builder shall notify the responsible enforcement agency (Washington State Patrol, local law enforcement agency, community service patrol), who will assist the Design-Builder with removing the transients. The Design-Builder shall schedule a place, date, and time to meet the enforcement agencies, so that the enforcement agencies can escort the transients from the Project limits.

The Design-Builder shall ensure that the public, including persons who may be non-English speaking or those who may not be able to recognize potential safety and health hazards within the Project area, are not harmed by the Design-Builder's activities.

The Design-Builder shall follow the instructions in the *Illegal Encampments within State Right-of-Way* (Appendix R). All costs to remove the transients and cleanup the Site within the Project limits shall be included in the Contract Price.

Health and Safety Requirements

The Design-Builder shall coordinate with WSDOT to provide and maintain a safe and healthy Project area for WSDOT's and the Design-Builder's personnel as described in this section and in accordance with applicable laws and this RFP.

Construction Requirements

The Design-Builder shall be responsible for the sanitation measures required to provide and maintain a safe and healthy Project area for the duration of the Project, in accordance with applicable laws and this RFP. The Design-Builder shall develop and maintain a plan for mitigation of health hazards at the Project Site. The plan shall be available at WSDOT's request.

Site Maintenance for Biological and Physical Hazards

Prior to commencement of the construction Work, the Design-Builder shall perform an initial cleanup of the Project area, including all preparatory Work required to make the Project area sanitary and safe in accordance with applicable laws and the health hazards plan, and to address all biological and physical hazards present. Necessary training of personnel, on-Site and off-Site preparations, and safety equipment shall be provided by the Design-Builder to complete the initial cleanup and disposal of the biological and physical hazards.

Public Notification

The Design-Builder shall furnish and install informational signs approved by WSDOT 3 Calendar Days prior to performing hazardous activities within the Project area known to be occupied by transients. Hazardous activities include, but are not limited to, cleaning, clearing brush, overhead activities, excavating, or operating other heavy equipment. The Design-Builder shall conduct a visual reconnaissance of the area at least 3 Calendar Days in advance to determine the type of cleanup and removal effort needed. The signs shall include dates and locations of the activity and state that trespassing is not authorized. The signs shall be visible from each apparent access route into the Work area. Each sign shall be weather resistant and post mounted; be written in both English and Spanish; state "No Trespassing"; and include the dates and location of the Work. Signs shall be maintained in

Comment [jlb13]: Aug 20, 2015 2:18 PM Frank Young says:
Suggest the use of a provisional sum or Force Account.

Comment [ET14]: Note to Author – If work location is downtown Seattle, Tacoma or Spokane, this could have a larger cost impact on the project. Consider using Force Account if this effort will be extensive and ongoing. Also verify if there are specific local agency requirements the Project will be subjected to. As an example, the City of Seattle has strict policies related to homeless encampments.

Comment [jlb15]: Aug 21, 2015 5:51 PM Eric Ostfeld says:
Agree with Frank on the FA.

No change

Add note to author – if work location is downtown Seattle, Tacoma or Spokane – this could have a larger cost impact on the project. Consider how to better define or provide an allocation.

Comment [jlb16]: Aug 21, 2015 5:52 PM Eric Ostfeld says:
What does "healthy" mean? No doughnuts? Reference to OSHA or L&I standards may be more tangible.

Resolution – revise per markup – following paragraphs describe requirements more specifically.

Comment [jlb17]: Aug 21, 2015 5:55 PM Eric Ostfeld says:
should be some level of confidence that the site hasn't changed since bid. For example, a tent city moves in after bid submission... how does D-B'er account for that in the price?

See response to comment 14- add note to Author for certain areas

Comment [ET18]: Note to Author – If work location is downtown Seattle, Tacoma or Spokane, this could have a larger cost impact on the project. Consider using Force Account if this effort will be extensive and ongoing. Also verify if there are specific local agency requirements the Project will be subjected to.

legible condition until the hazardous Work at the Work area is physically completed, at which time the signs shall be removed from the Project.

The Design-Builder shall provide notification to homeless service organizations, homeless advocacy groups, shelters, and free health clinics. WSDOT will provide contact information and flyer templates for the Design-Builder's use. The Design-Builder's flyer shall contain the information included in the flyer templates. The Design-Builder shall submit the flyer and general plans to WSDOT for Review and Comment at least 14 Calendar Days prior to commencing the hazardous activities.

The Design-Builder shall distribute the approved flyers by mail or hand delivery 7 Calendar Days prior to commencing activities within areas known to be occupied by transients.

Periodic Site Maintenance

If the Project area becomes unsanitary or unsafe due to biological and physical hazards after the Design-Builder prepares the Site for the first phase of construction activities, the Design-Builder shall perform additional Site maintenance and take additional measures as needed to protect the public, and WSDOT's and the Design-Builder's personnel. The nature and frequency of the Site maintenance activities shall be included in the health hazards plan. Periodic maintenance of the Project area may include the use of signs, fencing, lighting, law enforcement, or security.

2.29.4 MAINTENANCE OF ROADWAYS

2.29.4.1 GENERAL

The Design-Builder shall complete all components of the Work to allow for unrestricted traffic access to lanes and shoulders in accordance with Section 2.22.

2.29.4.2 ROADWAY SWEEPING

The Design-Builder shall maintain all paved areas within the Project limits to prevent the accumulation of dirt and gravel. The Design-Builder shall periodically and when directed by WSDOT, perform street sweeping or other best management practices to remove debris from the roadway and shoulders.

The Design-Builder shall take care to prevent spillage on haul routes. If spillage occurs, the Design-Builder shall remove it and clean the area within one hour of the spillage being observed or verbal notification from WSDOT. Tracking of dirt and gravel from the Work zone is prohibited.

2.29.4.3 EXISTING PAVEMENT

The Design-Builder shall maintain all existing pavement including pothole repair. Any pothole greater than a total of 36 cubic inches in volume or 3 inches in depth shall be repaired within 24 hours of being observed by the Design-Builder or notified by WSDOT. If the pothole is causing traffic to slow or deviate from normal traffic patterns, the Design-Builder shall perform pothole repair within one hour of being observed by the Design-Builder or notified by WSDOT. Temporary pothole repairs will be allowed if weather conditions will not allow for permanent repairs, or if traffic conditions dictate that permanent repairs are scheduled for another time to reduce impacts. Materials used for temporary pothole repairs shall be pre-approved by WSDOT. All temporary pavement repairs shall be inspected by the Design-Builder at least once every business day or more

often if the temporary repair shows any signs of failure. If the temporary repair shows signs of imminent failure, the repair shall be reinforced within one hour of being observed by the Design-Builder, or notification from WSDOT.

Permanent pothole repair shall be performed in accordance with Section 2.7. Materials used for permanent pothole repair shall be of the same type and depth as the adjacent pavement. For pavement maintenance activities that require closures, the Design-Builder shall submit a traffic control plan meeting the requirements of Section 2.22.

2.29.4.4 PAVEMENT MARKINGS

The Design-Builder shall maintain existing and new pavement with painted, plastic, or raised pavement markings. WSDOT will notify the Design-Builder when existing markings require refreshing. Paint for temporary pavement markings shall be in accordance with Section 9-34 of the Standard Specifications. The Design-Builder shall anticipate that, at a minimum, existing markings will need to be refreshed once per calendar year. Refer to Chapter 8 of the *WSDOT Maintenance Manual* ~~in (Aappendix "D")~~ for additional pavement marking requirements. ~~When referencing the *WSDOT Maintenance Manual*, all references to "should" or "may" shall be interpreted as "shall" unless approved by the WSDOT Engineer.~~

All costs to maintain, install, move, or remove permanent or temporary pavement markings, lines, or raised pavement markings that are considered part of the Work, are the responsibility of the Design-Builder.

2.29.4.5 TRAFFIC CONTROL DEVICES

Refer to Section 2.22.

2.29.4.6 GUARDRAIL, CONCRETE BARRIER, AND ATTENUATORS

The Design-Builder shall replace or repair all guardrail, concrete barrier, and attenuators that become damaged by the public or by the Design-Builder's operations. Attenuators that are damaged and must be replaced shall meet current National Cooperative Highway Research Program and WSDOT standards. All parts used to repair a damaged attenuator shall be direct replacement parts as required by the manufacturer. Payment for damaged guardrail, concrete barrier, or attenuators qualifying for relief under Section 1-07 of the General Provisions shall be in accordance with Section 1-09 of the General Provisions, except for temporary devices installed by the Design-Builder.

2.29.4.7 TRAFFIC SYSTEM SIGNS

The Design-Builder shall be responsible for maintenance of existing permanent signs. Maintenance of existing permanent signs includes cleaning, repairing, and replacing damaged signs and posts. Cleaning will only be required when directed by WSDOT. Payment for maintenance of existing permanent signs shall be in accordance with Section 1-09 of the General Provisions.

Payment for repairing permanent signs qualifying for relief under Section 1-07 of the General Provisions shall be in accordance with Section 1-09 of the General Provisions. Repair of damage caused by the Design-Builder's operations shall be at the Design-Builder's expense.

Comment [jlb20]: Aug 21, 2015 6:01 PM Eric Ostfeld says:
what is WSDOT using to determine when the pavement markings have to be replaced? If D-B'er can assume replacement at least once per year, what can they assume for "at most"?

Mark, provide revised language - Use the requirements for permanent striping for refreshing temp striping.

Refer to Chapter 8 of the Maintenance Manual in appendix "D" for pavement marking requirements.

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Comment [JO19]: Verify that these requirements are written in contract language.

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Comment [JLB21]: This is duplicative – already stated in 2.29.1
Resolution – see markups

2.29.4.8 STORMWATER MANAGEMENT

The Design-Builder shall maintain and provide adequate stormwater management on the Project until Physical Completion. Maintenance shall include cleaning and repair of riprap, cribbing, ditches, channels, culverts, cross-drains, drainage structures, and gutters.

2.29.4.9 ACCESS TO PUBLIC FACILITIES

The Design-Builder shall maintain uninterrupted access to all public facilities affected by the Project. Access shall mean providing a clear and easily understood route into and out of existing public and private facilities and businesses. The Design-Builder shall provide all necessary signing to convey that the route to the facilities and businesses is open to traffic. WSDOT will determine whether the signing is adequate. The Design-Builder shall provide access for all types of vehicles, including delivery trucks.

2.29.4.10 PROTECTION OF DRAINAGE STRUCTURES AND JUNCTION BOXES

The Design-Builder shall verify that all existing and new drainage structures, utility boxes, and junction boxes that are located within 2 feet of temporary or permanent travel lanes have sufficient strength to safely carry highway traffic loads without failing. Structures or boxes that do not have sufficient strength shall be reinforced, protected, or both prior to opening the travel lanes to traffic.

2.29.4.11 ANIMAL CARCASSES

Comment [jlb22]: Aug 20, 2015 2:25 PM
Frank Young says:
Suggest that WSDOT maintains this responsibility. They have the experience and resources to perform this task.

No change- Maintenance does not want to work within the project limits.

Animal carcasses that present a traffic hazard, such as damaging vehicles, blocking a lane, or causing traffic to slow below the posted speed limit, shall be removed from the travel lanes by the Design-Builder within one hour of observation by the Design-Builder or notification from WSDOT. The carcass shall be removed from the Project limits and disposed of by proper means at an approved location. Failure to remove the carcass within one hour will result in WSDOT correcting such deficiencies. In such case, WSDOT shall deduct from payments then or thereafter due, the cost of correcting such deficiencies. If payments then or thereafter due are not sufficient to cover the cost of correcting the deficiencies, the Design-Builder shall pay the difference to WSDOT upon demand.

2.29.5 SNOW AND ICE OPERATIONS

2.29.5.1 PUBLIC TRAVEL WAY

WSDOT or the Local Agency will perform snowplowing and application of deicing agents and/or abrasives for public travel lanes. The snowplowing will be done as part of the normal course of plowing the public roadways within and in the vicinity of the Project. Snow or ice will not be removed from the public travel lanes to facilitate the Work or construction.

When plowing within the Project limits, WSDOT or the Local Agency will take no special measures to protect materials, traffic control devices, or equipment the Design-Builder has stored or stockpiled on shoulders or within the Project limits. The Design-Builder shall maintain any channelization devices that may be displaced or damaged by snowplowing operations and application of deicer or abrasives.

Snow, ice, abrasives, or other debris (such as car parts and tire chains) that are plowed or migrate from the public traffic lanes or shoulders into the Work area will not be removed

by WSDOT or the Local Agency. Any removal of this material within the Project limits shall be at the Design-Builder's expense.

Comment [jlb23]: Aug 21, 2015 6:07 PM Eric Ostfeld says:
difficult to price this risk. If snow/ice is unlikely (most low elevation western Washington) WSDOT would be better to assume risk for this rather than have D-B'er price it.

No Change- hasn't been an issue on projects per SME's

2.29.5.2 WORK ZONE

The Design-Builder shall perform any snow and ice removal for the Design-Builder's operations within the Work area. The Design-Builder shall not allow any snow and ice removal from its operations to be placed within the public traffic lanes.

2.29.6 ELECTRICAL

2.29.6.1 SIGNALS

2.29.6.1.1 Existing Signals

Refer to Section 2.17.

2.29.6.2 INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

Refer to Section 2.18.

2.29.6.3 LUMINAIRES

The Design-Builder shall maintain and operate all lighting systems in accordance with the requirements of Section 2.16. Maintenance and operation includes, but is not limited to, the following:

- Replacement of lamps, as required;
- Replacement or repair of any damaged equipment or underground cables;
- Maintenance concerning a public safety issue (including exposed wires and knockdowns), within one hour of notification from WSDOT; and
- Routine maintenance and other maintenance that does not affect the public safety, within 24 hours of notification from WSDOT.

Payment for repairing damaged permanent luminaires qualifying for relief under Section 1-07 of the General Provisions shall be in accordance with Section 1-09 of the General Provisions.

2.29.6.4 TOLL INFRASTRUCTURE

~~***~~Refer to Section 2.26.~~***~~

~~***This Section is intentionally omitted.***~~

2.29.7 HAZARDOUS SPILLS RESPONSE

2.29.7.1 PUBLIC TRAVEL WAY

Cleanup of hazardous spills by third parties within the public traffic lanes and shoulders will be coordinated by WSDOT, the Washington State Department of Ecology, and/or other Local Agencies. The Design-Builder shall allow access to the Project area for spill response. The Design-Builder shall make personnel and equipment available to respond to all emergencies, except when such emergencies are life threatening to the personnel.

In the event the hazardous spill is caused by the Design-Builder's equipment, operations, or Work, the Design-Builder shall be responsible for cleanup under the direction of WSDOT and the Washington State Department of Ecology. All costs for cleanup including all costs incurred by the Design-Builder, WSDOT, the Washington State Department of Ecology, other resource agencies, and contractors required to mitigate the hazard shall be borne by the Design-Builder.

2.29.7.2 WORK ZONE

Any hazardous spills within the Work area and outside of the public travel lanes shall be the responsibility of the Design-Builder. The Work shall be performed in accordance with the Spill Prevention, Control, and Countermeasures Plan described in Section 2.8.

2.29.8 STRUCTURES

2.29.8.1 EXISTING BRIDGES

The Design-Builder shall maintain drainage structures on and off the bridges within the Project. Free draining of water through any drainage structure shall be maintained.

2.29.9 EMERGENCY RESPONSE

2.29.9.1 COOPERATION

The Design-Builder shall cooperate with law enforcement and other emergency response agencies in response to accidents, fires, spills, or other emergencies in any area affected by the Project, including the Project area and public traffic lanes. The Design-Builder shall cooperate in all WSDOT investigations of accidents and other incidents within the Project area. Refer to Section 2.9 for additional communication requirements regarding emergency response.

Comment [jlb24]: Aug 21, 2015 6:07 PM Eric Ostfeld says:
what does cooperate mean? Is it different than what everyone is legally required to do anyway?

No Change

2.29.9.2 EMERGENCY ACCESS

The Design-Builder shall work with emergency service providers to address their concerns about emergency access to and through the Project. This may include installing gates to allow emergency personnel to access the Project area. Refer to Section 2.22 for additional Maintenance of Traffic requirements.

The Design-Builder shall allow WSDOT Maintenance and all affected Local Agencies access to the Project Site to respond to urgent safety concerns.

2.29.9.3 NOTIFICATION

The Design-Builder shall notify WSDOT, the Washington State Patrol, and all emergency service providers in the affected area in writing of any access closures at the construction Site. Notification shall include the names and telephone numbers (business, residence, and cellular) of Project personnel to contact in case of emergencies. This contact list shall be updated as necessary. Refer to Section 2.9 for additional communication requirements.

2.29.9.4 USE OF DESIGN-BUILDER RESOURCES

The Design-Builder shall make personnel and equipment available to respond to all emergencies, except when the emergency is life-threatening to the personnel. Refer to Section 2.22 for additional Maintenance of Traffic requirements.

2.29.10 MAINTENANCE OF PROPERTY

2.29.10.1 GENERAL

The Design-Builder shall preserve public and private property at all times in accordance with Section 1-07 of the General Provisions.

The Design-Builder shall witness or reference land monument and property marker locations by a Land Surveyor licensed in the State of Washington, before moving, disturbing, or damaging any property. Refer to Section 2.5 for additional requirements regarding monumentation and surveying.

2.29.10.2 RESTORATION OF PROPERTY AND LANDSCAPE

The Design-Builder shall restore, at its own cost, property and landscaping that is damaged in the course of construction to a condition similar, equal, or better to that existing prior to the occurrence of damage by repairing, replacing in kind, rebuilding, replanting, or compensating the property owner.

2.29.10.3 TEMPORARY FENCING

The Design-Builder shall be required to furnish and install temporary chain link security fencing in order to contain animals and people, prior to removal of any existing sound barrier or Right-of-Way fencing within the Project limits.

2.29.11 MAINTENANCE OF AESTHETIC TREATMENT

2.29.11.1 GENERAL

The Design-Builder shall monitor the appearance of the aesthetic treatments on walls or bridges for any defects, flaws, or vandalism until Physical Completion. The Design-Builder shall note and bring to WSDOT's attention defects, flaws, and vandalism.

Defects and flaws shall be corrected in accordance with Section 1-05 of the General Provisions.

The Design-Builder shall be responsible for cleaning up and restoring property impacted by vandalism until Physical Completion.

The use of paint or permanent marking of any type on permanent barrier, railing, and walls will not be allowed except as required by the Contract.

2.29.12 SUBMITTALS

2.29.12.1 HERBICIDE APPLICATION

A copy of the application record of herbicide for noxious weed removal shall be submitted to WSDOT within 2 Calendar Days of herbicide application.

End of Section

One Step Method (for expedited projects)

- No RFQ, RFP Only
- No Short List or Stipend, unless short list created for emergency project
- Must evaluate all responsive proposals
- Good competition, but a lot of work for both owner and submitters
- Possibly a good method for smaller, simpler projects

One Step Method

- Very difficult to differentiate between teams on a simple project. Many will be capable and will want to propose. Hard to pick just three.
- Well suited for straightforward, simple projects. E.g. bridge replacement, pavers….