2.22 Maintenance of Traffic

2.22.1 General

The Design-Builder shall perform all Work necessary to meet the requirements associated with Maintenance of Traffic (MOT), including providing for the safe and efficient movement of people, goods, and services through and around the Project, while minimizing adverse impacts to residents, commuters, and businesses.

The Design-Builder shall prepare a Transportation Management Plan (TMP), including temporary traffic control, Transportation System Management and Operations, and Public Information strategies, and shall conduct all on-site activities relating to traffic maintenance in accordance with this Section.

The Design-Builder shall be responsible for coordinating with other projects within the vicinity of the Project, at a minimum, scheduling of lane closures, detours, ramp closures, temporary alignments, and staging of construction activity. Construction activities shall be scheduled to minimize the number of required closures and to maximize the opportunities available to perform Work during closures required by other projects. The Design-Builder shall coordinate and schedule activities to minimize impact on other projects.

Refer to Section 2.01, *General Information,* for projects anticipated to be under construction at the same time as the Project. The Design-Builder shall coordinate with Local Agencies and Utility companies to identify other projects scheduled for construction during the duration of the Project.

2.22.2 Mandatory Standards

The following is a list of Mandatory Standards that shall be followed for all design and construction related to this Section as referenced in Section 2.02, *Mandatory Standards*.

1. Required Project Specifications (Appendix B)
2. General Special Provisions (Appendix B)
3. Standard Specifications M 41-10 (Appendix B)
4. WSDOT *Design Manual* M 22-01 (Appendix D)
5. WSDOT *Olympic Region Pavement Marking Policy* (Appendix T)
6. WSDOT *Olympic Region Signing Policy* (Appendix T)
7. Standard Plans M 21-01 (Appendix D)
8. WSDOT *Traffic Manual* M 51-02 (Appendix D)

9. *Washington State Modifications to the Manual on Uniform Traffic Control Devices* (WAC 468-95) (Appendix D)
10. WSDOT *Materials Manual* M 46-01 (Appendix D)
11. WSDOT *Construction Manual* M 41-01 (Appendix D)
12. WSDOT *Entire Sign Fabrication Manual Combined* (Appendix D)
13. WSDOT *Plans Preparation Manual* M 22-31 (Appendix D)
14. WSDOT *Maintenance Manual* M 51-01 (Appendix D)
15. WSDOT *Plan Sheet Library – Work Zone Traffic Control* (Appendix D)*
16. WSDOT *Secretary's Executive Order E 1060 Speed Limit Reduction in Work Zone* (Appendix T)*
17. WSDOT *Secretary's Executive Order E 1001 Work Zone Safety and Mobility* (Appendix T)
18. *FHWA Manual on Uniform Traffic Control Devices for Streets and Highways* (Appendix D)
19. *AASHTO Manual for Assessing Safety Hardware* (MASH 16)
20. *NCHRP Report 350: Devices in Work Zones*
21. *AASHTO A Policy on Design Standards - Interstate System*
22. *AASHTO A Policy on Geometric Design of Highways and Streets*
23. *AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals*
24. *AASHTO Roadside Design Guide*
25. *Transportation Research Board Highway Capacity Manual*
26. *ITE Traffic Control Devices Handbook*
27. *FHWA Traffic Control Systems Handbook*
28. *FHWA Traffic Monitoring Guide*
29. *FHWA Developing and Implementing Transportation Management Plans for Work Zones*
30. *ITE Traffic Engineering Handbook*
31. *ITE Manual of Transportation Engineering Studies*
32. *ATSSA Quality Guidelines for Work Zone Traffic Control Devices*
33. *U.S. Access Board ADA Accessibility Guideline*
34. *FHWA Final Rule on Work Zone Safety and Mobility* (23 CFR Part 630 Subpart J)

*The Standard Plans contained in these Mandatory Standards shall be made Site-specific if used for Traffic Control Plans (TCPs). The Plan Sheet Library is located at this link:

https://wsdot.wa.gov/engineering-standards/all-manuals-and-standards/plan-sheet-library/work-zone-typical-traffic-control-plans-tcp

2.22.2.1 Conformance to Established Standards

Traffic control plans (TCPs), signs, and all traffic control devices and procedures furnished or provided shall conform to the standards established in the latest WSDOT adopted edition (in accordance with WAC 468-95) of the *FHWA Manual on Uniform Traffic Control Devices for Streets and Highways*, published by the U.S. Department of Transportation. Flagging shall also be in accordance with WAC 296-155-305 and pedestrian traffic control shall also be in accordance with the WSDOT *Design Manual.* Judgment of the quality of devices furnished will be based upon *ATSSA Quality Guidelines for Work Zone Traffic Control Devices* published by the American Traffic Safety Services Association. The condition of signs and traffic control devices shall be new or "acceptable" as defined in the *ATSSA Quality Guidelines for Work Zone Traffic Control Devices* and will be accepted based on a visual inspection by the Traffic Control Supervisor (TCS). WSDOT may also identify devices that are unacceptable based on the *ATSSA Quality Guidelines for Work Zone Traffic Control Devices*. The WSDOT Engineer's decision on the condition of a sign or traffic control device will be final. The Design-Builder shall remove and replace a sign or traffic control device determined to be unacceptable within 12 hours of notification.

In addition to the standards of the *FHWA Manual on Uniform Traffic Control Devices for Streets and Highways* described above, WSDOT enforces crashworthiness requirements for most work zone devices. The *MASH 16* has superseded the *NCHRP Report 350* as the established requirements for crash testing. Traffic control devices, as defined by Chapter 6F of the *FHWA Manual on Uniform Traffic Control Devices for Streets and Highways* and Chapter 1010 of the WSDOT *Design Manual*, that are manufactured after December 31, 2019, shall be compliant with the *MASH 16* crash test requirements, as determined by WSDOT, except as follows:

1. In situations where a *MASH 16* compliant traffic control device does not exist and there are no available traffic control devices that were manufactured on or before December 31, 2019, then a traffic control device manufactured after December 31, 2019, that is compliant with either *NCHRP 350* or the 2009 edition of the *AASHTO Manual for Assessing Safety Hardware (MASH 09)* is allowed for use with approval of the WSDOT Engineer.

2. Temporary traffic control devices that were manufactured on or before December 31, 2019 and were successfully tested to *NCHRP 350* or *MASH 09* may continue to be used on WSDOT projects throughout their normal service life.

3. Small and lightweight channelizing and delineating devices, including cones, tubular markers, flexible delineator posts, and plastic drums, shall meet the requirements of either *NCHRP 350*, *MASH 09*, or *MASH 16* as determined by the manufacturer of the device.

4. A determination of crashworthiness for acceptance of trailer-mounted devices such as arrow displays, temporary traffic signals, area lighting supports, and portable changeable message signs is currently not required.

2.22.3 Performance Requirements

2.22.3.1 General

The Design-Builder shall prepare a TMP including a Traffic Incident Management Plan (TIMP) to be approved by the WSDOT Engineer and establish a MOT task force prior to construction activity that may impact traffic. The WSDOT Engineer may permit shoulder closures for activities such as surveying or environmental and other design-related Work prior to approval of the TMP, provided the Design-Builder prepares TCPs in accordance with the requirements of this Section. The Design-Builder shall make changes to the TMP when the personnel or conditions of the original TMP or TIMP change. TCPs that are within the jurisdiction of the City of Puyallup, City of Sumner, Pierce County, Pierce Transit, Puyallup Tribe of Indians, BNSF Railway Company, or other affected agencies and stakeholders will require approval from the affected Local Agency.

2.22.3.2 Transportation Management Plan

The Design-Builder shall develop a TMP that includes the items from the *Transportation Management Plan Checklist* (Appendix T), and the following items:

1. Descriptions of traffic staging, including conceptual TCPs, to accommodate construction staging
2. Descriptions of the requirements for temporary roadways
3. Procedures to identify and incorporate the needs of transit operators, Utility Owners, schools, and business owners in the Project corridor
4. Procedures for obtaining concurrence of stakeholders and implementing road and lane closures
5. Processes for developing and obtaining agreement among stakeholders for switching procedures
6. Procedures to identify and incorporate the needs of Local Agencies affected by the Work
7. Procedures to identify and incorporate the needs of Environmental Justice (EJ) and Limited English Proficiency (LEP) populations affected by the Work and in coordination with the Communications Plan in accordance with Section 2.09, Communications.

8. Processes for signing transitions during construction from one stage to the next, and from interim to permanent signing. See Section 2.19, Signing for coordination of the required ballbank study related to curve warning signs and additional requirements.

9. Procedures to utilize smart work zone devices, as described in this Section, for extended lane, ramp and road closures, trucks entering roadways or other traffic impacts related to construction activities, to improve user information and decision options, and to improve safety for motorists and workers in the Project corridor. Devices include, but are not limited to, Smart Work Zone System (SWZS), Queue Warning System (QWS), remote communications PCMS boards, real-time traffic flow detection, and real-time monitoring.

10. Procedures to utilize SWZS, as described in this Section, when directed by the WSDOT Engineer if Traffic Analysis indicates a traffic queue will exceed a 3 mile delay to motorists as part of an approved TCP

11. Procedures to utilize a QWS, as described in this Section, when directed by the WSDOT Engineer if Traffic Analysis indicates a traffic delay exceeds 1 mile, a traffic queue will exceed typical advance signing as part of an approved TCP, or traffic delay exceeds 15 minutes or more in delay.

12. Procedures to identify and incorporate the needs of emergency service providers, law enforcement entities, Commercial Vehicle Services, and other related corridor users. The Design-Builder shall also include procedures to ensure all information required by these agencies to protect the public is made available.

13. Procedures for providing job Site access point for emergency service provider and law enforcement entities

14. Provisions for incident and emergency response

15. Processes to identify, produce, and receive acceptance for designs of temporary traffic signals

16. Methods and frequency of inspection and maintenance of all traffic control throughout the Project limits, including response times to correct, modify, or implement changes to pavement marking, signing, temporary lane configurations, and changes in Temporary Concrete Barrier (TCB) configurations.

17. Descriptions of contact methods, personnel available, and response times for conditions requiring attention during off-hours. Include a Communications Plan to Olympic Region Traffic Management Center (ORTMC), Olympic Region Traffic Office, and field offices.

18. Identification of measurable limits for the repair and replacement of traffic control devices, including pavement markings. Pavement markings shall be refreshed, at a minimum, twice per calendar year.

19. Processes to maintain the operation and performance of existing WSDOT Intelligent Transportation Systems (ITS)

20. Processes to determine the need for revised traffic signal timings, and if revisions are required, detail the procedures for the development, approval, implementation, testing, and maintenance of all affected signals
21. Provisions to maintain existing access to all properties within the Project limits for the duration of the Project, except as provided by other Sections
22. Procedures to modify existing access within Project limits
23. Provisions to provide continuous access to established truck routes, Hazardous Material routes, transit routes, and school bus routes
24. Procedures to modify the plans as needed to adapt to current Project circumstances
25. Procedures to determine detour routes, and for obtaining acceptance from all stakeholders for all proposed detour routes. The Design-Builder shall identify special needs for emergency service providers, transit service, and truck routes.
26. Procedures to communicate MOT information to the WSDOT's Communications Team, and to notify the public of MOT issues in accordance with Section 2.09, Communications
27. Procedures to accommodate adjacent projects' TCPs and strategies, if applicable
28. Procedures to modify the TCPs when the staging schedule of the Project or adjacent Projects changes
29. Identify haul routes

2.22.3.3 Traffic Incident Management Plan

During construction, MOT will become increasingly sensitive to incidents such as equipment malfunctions, traffic crashes, inclement weather, and special events. The Design-Builder shall prepare and implement a formal TIMP to address how these incidents shall be managed.

2.22.3.3.1 General

The TIMP shall identify methods for immediate incident detection and verification, response, Site management, clearance, and motorist information. The TIMP shall include procedures for interaction with the ORTMC, City of Puyallup, City of Sumner, Pierce County, Pierce Transit, Puyallup Tribe of Indians, BNSF Railway Company, Washington State Patrol (WSP), and other affected agencies and stakeholders. In addition, if Local Agencies along the Project corridor have adopted incident management guidelines, the Design-Builder shall be responsible for coordinating with local policies and procedures.

The TIMP shall reflect proposed construction staging. The Design-Builder shall modify and implement the TIMP in conjunction with planned special events. The TIMP shall include specific time limits for the detection, verification, and classification of incidents, as well as for the dissemination of information about

the incidents. The TIMP shall provide a mechanism to review and capture lessons learned from incidents.

The Design-Builder shall coordinate the TIMP development and updates with WSDOT.

The TIMP shall identify and provide for the incorporation of design elements to aid incident management, including turn-around for emergency vehicles, emergency access points, incident investigation sites, and signing to help motorists report the location of incidents in the Project.

2.22.3.3.2 Incident Response Team

Immediately upon detection, the Design-Builder shall notify the ORTMC of vehicles blocking traffic lanes, disabled vehicles on shoulders, or debris on the roadway that may present a traffic hazard to the public or cause traffic to deviate from normal traffic pattern. The Design-Builder will not be required to provide additional Incident Response Team equipment or personnel; however, the Design-Builder shall make materials and equipment available that are on-site as requested by the WSDOT Engineer, WSDOT Incident Response Team, or WSP. Removal of animal carcasses on the roadway shall be in accordance with Section 2.29, *Maintenance During Construction*.

2.22.3.3.3 Drop Sites

The Design-Builder shall identify a minimum of two drop sites within the vicinity of the Project where disabled vehicles can be safely towed off the freeway and motorists can be assisted. A phone and shelter shall be available at the drop sites for motorists to use. The drop sites may be retail establishments, such as a hotel, airport, gas station, or repair shop, and shall be located within 1 mile of the Project limits.

2.22.3.3.4 Temporary Emergency Turn-Outs

Temporary emergency turn-outs shall be provided on segments where shoulder widths are less than 8 feet for sections longer than 4,000 feet in length. The minimum emergency turn-out width shall be 14 feet from the edge line for a minimum of 150 feet in length, not including transitions. The approach transitions shall be made at 15:1 (Length: Width) or greater. The departure transitions shall be made at 25:1 or greater. The emergency turn-outs shall have a paved surface and shall not be subject to ponding or other weather-related conditions that could render them ineffective. Emergency turn-outs shall be located on the right side of the travel lanes. Advance signing shall be provided 0.25 miles in advance of the approach transition, and an R8-7 “Emergency Stopping Only” sign shall be installed adjacent to the emergency turn-out.

2.22.3.3.5 Emergency Vehicle and Law Enforcement Access

The Design-Builder shall provide coordination with local and regional emergency service providers, law enforcement entities, and other related corridor users

including timely communication of Lane Closure Plans, Detour Plans, and other Project elements that may affect the appropriate delivery of time-sensitive services. Emergency vehicle and law enforcement access shall be maintained through all closures.

2.22.3.3.6 Maintain Camera Surveillance

Refer to Section 2.18, *Intelligent Transportation Systems*, for maintenance requirements of the Closed-Circuit Television system during construction.

2.22.3.3.7 Variable Message Signs

Refer to Section 2.18, *Intelligent Transportation Systems*, for maintenance requirements of the existing Variable Message Sign (VMS).

Existing VMS approaching the Project may be used, with the WSDOT Engineer's concurrence, to provide motorists with incident and construction-related information prior to entering the Work zone. VMS shall not be used in lieu of Portable Changeable Message Signs (PCMS) as the primary messaging tool. The Design-Builder shall coordinate with the ORTMC to provide timely, accurate information regarding planned closures, and updated traffic and construction information. The ORTMC will then coordinate with the Northwest Region Transportation Management Center (NWRTMC).

The Design-Builder shall also provide PCMS to provide information to motorists, in accordance with this Section.

2.22.3.3.8 Highway Advisory Radio

A portable Highway Advisory Radio (HAR) may be provided and operated by the WSDOT Engineer. The Design-Builder shall provide and maintain signing for a portable HAR when requested by the WSDOT Engineer.

The Design-Builder shall coordinate with the ORTMC to provide timely, accurate information regarding planned closures, and updated traffic and construction information. The ORTMC will then coordinate with the NWRTMC.

2.22.3.3.9 Design-Builder Response Time

The TCS, with the Design-Builder, shall coordinate the resources and equipment necessary to respond to emergency situations. The resources shall be on-site within 45 minutes of notification of an emergency situation. The TCS and Design-Builder shall ensure the support staff is of sufficient size and has the equipment and materials necessary to respond to issues affecting traffic flow, such as displaced pre-cast concrete traffic barrier, pothole repair, water on the roadway, closing lanes, ramps, setting up detours, and other issues that have the potential of affecting safety of the motoring public.

2.22.3.4 This section is intentionally omitted

2.22.3.5 Maintenance of Traffic Task Force Meetings

The Design-Builder shall establish and chair a MOT task force, which shall include Design-Builder personnel, the WSDOT Engineer, and other WSDOT personnel; the City of Puyallup and other stakeholders identified in the TIMP as needed for coordination, permits and reviews; and other agencies that are affected by the TCPs.

The MOT task force will serve as an advisory committee to the Design-Builder. The Design-Builder shall consider all recommendations and input provided by the task force; however, final design and implementation remain the responsibility of the Design-Builder.

The Design-Builder shall schedule and chair MOT task force meetings twice each month from Notice to Proceed 1 (NTP1) to Substantial Completion. The meeting schedule and frequency of meetings may be adjusted upon agreement by the MOT task force members.

The purpose of the meetings shall be to achieve the following:

1. Further refine and develop the TCPs and MOT strategies
2. Review the Design-Builder's MOT details
3. Disseminate Project MOT information to task force meeting attendees
4. Obtain MOT input from task force meeting attendees
5. Develop, refine, and review the TIMP and its implementation
6. Review the TCS log
7. Identify the need for improvements based on traffic control implemented previously
8. Discuss comments/complaints about traffic control from the WSDOT Engineer and the public, and determine how they will be addressed
9. Discuss Work zone related crashes and identify appropriate revisions to traffic control to prevent future crashes
10. Identify potential haul routes to the task force meeting attendees
11. Other regional traffic-related topics of importance
12. Review the Look-Ahead Schedule
13. Review MOT traffic operations and discuss signal timing and phasing improvements to the traffic signal systems during all construction stages

The Design-Builder shall prepare the agenda, meeting minutes, exhibits, and Design Plans required for the meetings, and shall invite representatives from adjacent projects to the meetings.

2.22.4 Design and Construction Requirements

2.22.4.1 Work Zone Traffic Engineering Manager

The Work Zone Traffic Engineering Manager (WTEM) shall be responsible for ensuring that the design of all elements related to construction staging, Work zone safety, and Work zone traffic control are completed and all applicable design requirements are met. The WTEM shall be on-site once a week for the duration of the construction staging and TCP development unless otherwise approved by the WSDOT Engineer. The WTEM shall also be available for approval of modifications to the staging or TCP through Substantial Completion. The WTEM shall be a Professional Engineer.

The WTEM shall have at least 5 years of recent temporary traffic control design, traffic engineering experience, or both, on complex, urban interstate projects in design, construction, or both. The WTEM shall understand the concepts of traffic modeling and have experience designing construction staging, Work zone safety, and Work zone traffic control.

The WTEM shall be responsible for the following design elements including, at a minimum:

1. Detours
2. Stage construction plans and TCPs
3. Temporary Plans for signals, Intelligent Transportation Systems (ITS), lighting, signing, and pavement markings

2.22.4.2 Traffic Control Plans

The Design-Builder shall prepare documentation to justify all proposed road closures, detour routes, and reductions in lane storage at traffic signals or ramp meters. Traffic Analysis shall follow Section 2.21, *Traffic Operations*. The documentation shall be submitted to the WSDOT Engineer for Review and Comments with the proposed TCPs.

The Design-Builder shall use the procedures in the TMP to develop detailed Site-specific TCPs that provide for all construction stages and identify opportunities to expedite construction throughout the course of the Project. The TCPs shall be prepared under the direction of the Design-Builder's WTEM.

All construction signs, flaggers, and other traffic control devices shall be shown on the TCPs, except for emergency situations. The TCPs shall show locations of all required advance warning signs, and a safe, protected location for the flagging station. If flagging is to be performed during hours of darkness, TCPs shall require illumination for the flagging station in accordance with this Section.

The TCPs shall show the necessary construction signs, flaggers, uniformed police officers, and other control devices required to support the Work. The Design-Builder shall be responsible for submitting proposed TCPs to the WSDOT

Engineer for Review and Comment; releasing the drawings for construction; and providing copies of the TCPs to the TCS.

Where indicated in the RFC TCP, the Design-Builder shall install temporary sign overlay panels which cover portions of existing signs. Unless otherwise indicated in the RFC TCP or allowed by the WSDOT Engineer, all Work shall be accomplished while the existing sign is in place. Sheet metal screws shall be used to attach overlay panels to existing aluminum signs. All overlay panels shall have a minimum of 4 screws and screws shall be installed at 24-inch on centers. The Design-Builder shall remove temporary sign overlay panels when the closure is no longer active. Rivet holes shall be plugged with aluminum blind rivets painted the same color as the sign background. Materials damaged by the Design-Builder shall be replaced at no expense to WSDOT.

TCPs shall include, at a minimum, the following items:

1. Complete plan sheets and details for all stages of construction. This shall include construction sequencing plans that show the overall approach to Project staging.
2. Identify on the plan sheet the intended use and expected duration of the plan. If the plan is intended for use during a specific work shift, show the allowable closure hours on that plan.
3. The appropriate details when temporary construction of traffic signals, detour routes, bridges, retaining structures, drainage, and other miscellaneous construction is required to maintain traffic.
4. Roadway plan sheets showing all existing traffic control devices that will be retained, relocated, or removed; and all temporary traffic control devices that will be installed, retained, relocated, or removed.
5. The spacing, size, color (legend and background, if applicable), and quantity of all traffic control devices.
6. Work areas including ingress and egress for construction vehicles.
7. Roadway plan sheets with the location of each sign so it can be easily read in relation to the roadway and other traffic control devices. A small-scale layout of each sign shall be shown on the corresponding roadway plan sheet where the sign is to be placed.
8. Provisions for using temporary barriers and attenuators to satisfy clear zone requirements, and to protect the traveling public and the Design-Builder's personnel, including lateral displacement distance behind barrier.
9. Temporary lighting, signalization, and ITS details, as required.
10. Temporary drainage plan and profile sheets showing all existing drainage that will be retained, relocated, or removed; and all temporary drainage facilities that will be installed, retained, relocated, or removed in accordance with Section 2.14, *Stormwater*.

11. Detour plans shall be provided for all closures, including pedestrian and bicycle routes, unless the WSDOT Engineer approves otherwise. Detour plans for freeway, roadway, and ramp closures shall be route-specific unless the WSDOT Engineer approves otherwise. Sign location and spacing shall be per the *Washington State Modifications to the Manual on Uniform Traffic Control Devices* (WAC 468-95) (Appendix D).

    a) Route-specific signage modifies the M4-9 series signage to 48 by 48 inch on roadways 45 miles per hour (mph) or higher, and 36 by 36 inch on roadways 40 mph or lower, including the appropriate shield or the roadway descriptions in text; cardinal directions; and an arrow of appropriate orientation of the following sizes:

        (1) 12-inch Interstate, U.S. Highway, or Washington State shield for 48 by 48-inch signs; 9-inch shields for 36 by 36-inch signs. For roadways without shields, maximize roadway description text size to fit.

        (2) Cardinal directions shall be 8C/6C for 48 by 48-inch signs; 6C/5C for 36 by 36-inch signs (where the first letter is larger)

        (3) "DETOUR" text shall be 8D for 48 by 48-inch signs; 6D for 36 by 36-inch signs

        (4) 22.5 by 3.7 inch for left, left ahead, right ahead, and right arrows for 48 by 48-inch signs; 13.5 by 2.75 inch for 36 by 36-inch signs

        (5) 13.5 by 5.5 inch for upper-left, straight, and upper-right arrows for 48 by 48-inch signs; 12 by 5.5 inches for 36 by 36-inch

12. Layouts showing the locations of ground-mounted and overhead signs, special sign details, clear zones, and structural and foundation requirements.

13. Drawings on how to fabricate signs not detailed in the WSDOT *Entire Sign Fabrication Manual Combined* showing dimensions, background color, and legend.

14. Methods for covering, partially covering, or modifying signs when not applicable to the current phase of construction.

15. Methods for covering, partially covering, or modifying signals when needed for the current phase of construction.

16. Striping, crosswalks, intersection details, and traffic delineators.

17. Type and location of all pavement markings to be installed, removed, or renewed for each stage of construction, and locations of the final pavement markings.

18. Cross-sections covering each significant change in configuration including, at a minimum, reduction in lane or shoulder widths; reduction or increase in number of lanes; and changes of lateral barrier placement or type. Cross-sections shall show lane configuration (including direction of travel) and widths, shoulder widths, lateral buffer distance behind barrier, Work areas,

and pavement marking type. Cross-sections shall identify locations of vertical drop-offs or fixed objects adjacent to the roadway and how they will be protected. Cross-sections shall include the station limits the section applies to. Cross-sections shall be provided covering the entire length of the segment included in the TCPs.

19. Typical sections shall identify direction of travel, lane widths, lane type (general purpose, shoulder, HOV, turn lane, etc.), and number of lanes.

20. Access and control of bicyclists and pedestrians including persons with disabilities in accordance with the Americans with Disabilities Act of 1990 (ADA) through the traffic control zones. An approved alternate route shall be provided prior to any impacts to a pedestrian path or bicycle route. A pedestrian alternative route shall be provided for North Levee Road, North Levee Road Loop and Milwaukee Avenue East prior to any Work impacting pedestrian accessibility, and shall meet the same requirements for a pedestrian path. See section 2.22.4.4.5 for additional details.

21. TCPs shall show how access to transit stops will be maintained and include Transit Agency approval of relocated stops with the TCP submittal.

22. Detail modifications to the TCPs to address wintertime conditions or periods of suspended Work.

23. A switching procedure for each traffic control stage change identified in the TCPs. The switching procedure shall include information jointly determined by the Design-Builder and the WSDOT Engineer, sufficient to facilitate discussion of each traffic control stage change in the MOT task force meetings.

24. The TCPs shall be complete. Typical traffic control configurations such as those found in the *FHWA Manual on Uniform Traffic Control Devices for Streets and Highways* may be used to assist in developing the TCPs. Only Site-specific TCPs that have been Released for Construction (RFC) shall be used by the Design-Builder. Typical plans are not acceptable unless incorporated as details into the TCPs.

The Design-Builder shall maintain an updated log for the approved TCPs in the document control system. The log shall be available for WSDOT to review at all times.

2.22.4.2.1 Design Vehicle

The design vehicle for the Project shall be a WB-67 for all State Routes. The design vehicle and vehicle accommodations (see the WSDOT *Design Manual*, Chapter 1310) for temporary facilities, including intersections, freeway mainline, freeway ramps, and local roads on the Project shall conform to the requirements listed in Appendix O. The Design-Builder shall verify the vehicle classifications meet the appropriate design vehicle for each Traffic Control Plan. Provisions for oversized vehicles shall be coordinated with the WSDOT Engineer when detours or limited vertical clearance are required by the TCPs.

2.22.4.3 Allowable Closures

This Section lists the allowable lane closure hours for the Project. Restrictions for roadway segments not listed in this Section require the WSDOT Engineer approval. No lane closures shall occur outside of the hours specified within this Section, unless approved in advance and in writing by the WSDOT Engineer. The Design-Builder shall notify the public in advance of closures. All required traffic analyses shall follow Section 2.21, *Traffic Operations*.

No temporary lane closures or restrictions, including set-up and removal of traffic control devices, will be allowed except during the hours permitted by this Section. In addition, no Work that restricts or interferes with traffic will be allowed from noon on the day preceding through noon on the day following a holiday or holiday weekend. Holidays that occur on Friday, Saturday, Sunday, or Monday are considered a holiday weekend. January 1, the third Monday of January, the third Monday of February, Memorial Day, June 19, July 4, Labor Day, November 11, Thanksgiving Day, the day after Thanksgiving, and Christmas Day shall be considered holidays. When these holidays fall on a Sunday, the following Monday shall be considered a holiday. When these holidays fall on a Saturday, the preceding Friday shall be considered a holiday.

The Design-Builder shall coordinate Work activities with other local events in the area, so that the events will not be impacted. In addition, road, ramp, and lane closures will not be allowed during the following events:

1. Unless otherwise approved by the WSDOT Engineer, no lane restrictions or closures will be allowed on SR 161, SR 167, SR 410, SR 512, or Local Agency streets during the Washington State Spring Fair and the Washington State Fall Fair in Puyallup, Washington
2. The Design-Builder shall also identify major events, such as a sporting event or a combination of events, with an anticipated combined attendance over 15,000 at venues within the greater Tacoma, Fife, Milton, Edgewood, Federal Way, Auburn, Sumner and Puyallup areas, or 25,000 at venues within the greater Puget Sound Region and shall adjust closure times to minimize the impact to traffic in accordance with Section 2.09, *Communications*. No traffic restrictions shall be implemented between 2 hours prior to and 2 hours after the end of events having a significant impact on traffic volumes.
3. Additional limitations may be placed on traffic restrictions such as lane closures, ramp closures, and detours during the holiday period from November 15 of each year through January 2 of the following year. No shifts to traffic patterns of lane configurations, city street closures, or extended lane, ramp or road closures shall be made during the holiday period unless approved by the WSDOT Engineer.
4. During WSDOT or Local Agency Snow and Ice Operations for snowplowing and application of deicing agents or abrasives for public travel

lanes during winter weather months, generally November through March, in accordance with Section 2.29, *Maintenance During Construction*.

The Design-Builder shall accommodate the passage of superloads (as defined by the WSDOT Commercial Vehicle Services), wide loads, and other permit loads through the temporary traffic control area by making exceptions to the allowable lane closures. In addition, the Design-Builder shall coordinate with adjacent concurrent projects to provide continuity in the lane configurations.

WSDOT reserves the right to not approve traffic restrictions and freeway closures.

Liquidated damages will be assessed for failure to complete Work and open all lanes and ramps to traffic by the specified times, in accordance with Section 1-08 of the *General Provisions*.

2.22.4.3.1 Lane Closures

The Design-Builder shall maintain the existing configuration, including the existing number of lanes in each direction, at all times outside of the allowable closures described in this Section, except as allowed in this Section or with prior written approval by the WSDOT Engineer.

2.22.4.3.1.1 SR 167/SR 161 Lane Closure on North Meridian, North of River Road

The Design-Builder will be allowed to implement lane closures in accordance with the following table. Exceptions outside of these hours may be allowed with prior written approval by the WSDOT Engineer.

SR 167/SR 161 – Lane Closure on North Meridian, North of River Road								
Allowable Closure Times Shown in 24-Hour Format	**Mon. Night to Tue. Morning Tue. Night to Wed. Morning Wed. Night to Thu. Morning Thu. Night to Fri. Morning**		**Fri. Night to Sat. Morning**		**Sat. Night to Sun. Morning**		**Sun. Night to Mon. Morning**	
	From	**To**	**From**	**To**	**From**	**To**	**From**	**To**
Northbound (Increasing) Minimum 1 Lane Open	21:00	05:00	21:00	09:00	21:00	09:00	19:00	05:00
Southbound (Decreasing) Minimum 1 Lane Open	21:00	05:00	21:00	09:00	21:00	09:00	19:00	05:00

2.22.4.3.1.2 SR 167, MP 5.27 to 7.15 – Lane Closure between North Meridian and SR 410

The Design-Builder will be allowed to implement lane closures in accordance with the following table. Exceptions outside of these hours may be allowed with prior written approval by the WSDOT Engineer. If the Lane Closure is adjacent to an Auxiliary Lane, the affected ramp shall be closed concurrently and the allowable hours for the ramp closure shall apply.

SR 167, MP 5.27 to 7.15 – Lane Closure between North Meridian and SR 410								
Allowable Closure Times Shown in 24-Hour Format	**Mon. Night to Tue. Morning Tue. Night to Wed. Morning Wed. Night to Thu. Morning Thu. Night to Fri. Morning**		**Fri. Night to Sat. Morning**		**Sat. Night to Sun. Morning**		**Sun. Night to Mon. Morning**	
	From	**To**	**From**	**To**	**From**	**To**	**From**	**To**
Northbound (Increasing) Minimum 1 Lane Open	23:00	05:00	23:00	08:00	23:00	09:00	23:00	05:00
Southbound (Decreasing) Minimum 1 Lane Open	20:30	05:00	21:00	09:00	20:00	09:00	20:00	05:00

2.22.4.3.1.3 SR 410, MP 8.84 to 10.00 - Lane Closure

The Design-Builder will be allowed to implement lane closures in accordance with the following table. Exceptions outside of these hours may be allowed with prior written approval by the WSDOT Engineer. If the Lane Closure is adjacent to an Auxiliary Lane, the affected ramp shall be closed concurrently and the allowable hours for the ramp closure shall apply.

SR 410, MP 8.84 to 10.00 - Lane Closure								
Allowable Closure Times Shown in 24-Hour Format	**Mon. Night to Tue. Morning Tue. Night to Wed. Morning Wed. Night to Thu. Morning Thu. Night to Fri. Morning**		**Fri. Night to Sat. Morning**		**Sat. Night to Sun. Morning**		**Sun. Night to Mon. Morning**	
	From	**To**	**From**	**To**	**From**	**To**	**From**	**To**
Eastbound (Increasing) Minimum 1 Lane Open	20:00	05:00	20:00	07:00	20:00	08:00	19:00	05:00
Westbound (Decreasing) Minimum 1 Lane Open	20:00	04:00	20:00	07:00	21:00	08:00	19:00	04:00

2.22.4.3.1.4 SR 512, MP 10.97 to 12.06 - Lane Closure

The Design-Builder will be allowed to implement lane closures in accordance with the following table. Exceptions outside of these hours may be allowed with prior written approval by the WSDOT Engineer. If the Lane Closure is adjacent to an Auxiliary Lane, the affected ramp shall be closed concurrently and the allowable hours for the ramp closure shall apply.

SR 512, MP 10.97 to 12.06 - Lane Closure								
Allowable Closure Times Shown in 24-Hour Format	**Mon. Night to Tue. Morning Tue. Night to Wed. Morning Wed. Night to Thu. Morning Thu. Night to Fri. Morning**		**Fri. Night to Sat. Morning**		**Sat. Night to Sun. Morning**		**Sun. Night to Mon. Morning**	
	From	**To**	**From**	**To**	**From**	**To**	**From**	**To**
Eastbound (Increasing) Minimum 1 Lane Open	22:00	04:00	22:00	7:00	22:00	09:00	22:00	04:00

Westbound (Decreasing) Minimum 1 Lane Open	22:00	06:00	23:00	7:00	22:00	09:00	21:00	06:00

Refer to Section 2.23 *Railroad* for all closures related to Work within BNSF Railway Company Right of Way at the SR 512 Puyallup River Bridge.

2.22.4.3.2 Full Freeway, Highway, and Roadway Closures

The Design-Builder will be allowed full road closures during the setting of girders over a mainline section, during the setting of sign bridges, during traffic pattern switches, or as otherwise permitted in accordance with this Section, upon written notification to the WSDOT Engineer and upon prior written approval by the WSDOT Engineer and all Local Agencies impacted by the detour routes.

Adjacent auxiliary lanes or ramp closures required as part of a full roadway closure will be counted as a single closure toward the most restrictive closure. The Design-Builder shall maintain the existing number of lanes in each direction at all times, except as allowed in this Section or with prior written approval by the WSDOT Engineer. The Design-Builder shall not implement the road closures below concurrently with other road closures which are part of the detour or used as an alternate route for the closure, unless otherwise approved in writing by the WSDOT Engineer. Consecutive ramps shall not be closed concurrently, unless otherwise approved in writing by the WSDOT Engineer. Both directions of a route shall not be closed concurrently if not specifically allowed in this section, unless otherwise approved in writing by the WSDOT Engineer. Closure of a local road is prohibited concurrently with a planned closure of other local roads implemented within 3 miles of the Project Limits, unless otherwise approved in writing by the WSDOT Engineer.

The Design-Builder shall provide written notification to the WSDOT Engineer and the affected Local Agencies of all planned closures, including the date and time of the closure, the Work activities scheduled for Work preceding the full closure, and the applicable traffic control, at least 60 Calendar Days in advance of the full freeways, highways, and roadways closure. A traffic analysis shall be conducted for all full freeway mainline closures as described in Section 2.21, *Traffic Operations*, and shall be provided to WSDOT and the affected agencies as part of this notification.

The Design-Builder shall submit the scheduled closure to the WSDOT Engineer for Review and Comment at least 14 Calendar Days prior to the date on which the closure is scheduled. WSDOT will provide a response acknowledging the closure request within 2 business days. All freeway, highway, and roadway closures not confirmed as scheduled shall be canceled.

Detour routes shall be provided by the Design-Builder for all freeway, highway, and roadway closures. Detours shall be approved by impacted Local Agencies a minimum of 30 Calendar Days prior to implementing the closure. The Design-Builder shall coordinate the closure with nearby projects and WSDOT Maintenance activities to ensure no conflicting Work activities are planned, including ramp or roadway closures that have conflicting or overlapping detours.

Roadway closures, detours, and alternate routes will be analyzed by WSDOT for disproportionate impacts to EJ and LEP communities in accordance with Section 2.08, *Environmental*. If an EJ or LEP community is identified along a proposed route and will be disproportionately impacted, appropriate mitigation shall be coordinated between WSDOT Communications and the Design-Builder. When additional changes are made to the route, it shall be evaluated to determine if the detour adds congestion, noise or creates safety issues for adjacent residences and businesses and if it adds considerably longer distance to access residences/businesses that may affect low income and minority populations. WSDOT will work with Local Agencies and conduct public outreach as necessary, to ensure that the proposed route will not have a disproportionately high and adverse effect on EJ or LEP populations.

Communications about roadway closures, detours, and alternate routes shall include appropriate accommodations for identified EJ and LEP populations and businesses and shall be included in the Communications Plan in accordance with Section 2.09, *Communications*.

A submittal that does not conform to the Contract Time limits, is incomplete, unintelligible, or includes inaccurate information, will be returned to the Design-Builder for correction. The Design-Builder will be notified promptly of a disapproved closure or a closure that will require coordination with other parties, including EJ and LEP populations, as a condition of approval.

All detours shall be in place, including all advance-signing, prior to closure of the freeways, highways, and roadways.

Full closure of the freeways and highways shall require WSP enforcement as part of the traffic control strategy and use of WSP be reflected on the TCPs.

Advance notification, public notification, and signing requirements shall be in accordance with this Section and Section 2.09, *Communications*.

The Design-Builder shall provide the WSDOT Engineer with a Contingency Plan for re-opening closed freeways, highways, and roadways to public traffic in the event of equipment breakdown, shortage of materials, lack of production of materials, or other production failure; or when it becomes necessary to re-open the closure for use by public traffic. The Design-Builder shall furnish an hour-by-hour schedule of all Work activities to be performed during the full freeways, highways, and roadways closure, including the Work activities scheduled for Work preceding the full closure. The Contingency Plan and its acceptance by the WSDOT Engineer shall not relieve the Design-Builder from the liquidated damages as specified in this Section and Section 1-08.9 of the *General Provisions*.

2.22.4.3.2.1 SR 167/SR 161 Road Closure on North Meridian, between River Road and Valley Avenue

BETTERMENT

~~The Design-Builder will be allowed to implement up to 16 road closures in accordance with the following table for setting girders, setting sign bridges and~~

~~switching traffic patterns. Exceptions outside of these hours may be allowed with prior written approval by the WSDOT Engineer.~~ The Design-Builder committed to zero road closures on North Meridian, between River Road and Valley Ave.

SR 167/SR 161 – Road Closure on North Meridian, between River Road and Valley Avenue								
Allowable Closure Times Shown in 24-Hour Format	**Mon. Night to Tue. Morning Tue. Night to Wed. Morning Wed. Night to Thu. Morning Thu. Night to Fri. Morning**		**Fri. Night to Sat. Morning**		**Sat. Night to Sun. Morning**		**Sun. Night to Mon. Morning**	
	From	**To**	**From**	**To**	**From**	**To**	**From**	**To**
Road Closure and Detour	22:00	04:00	23:00	6:00	23:00	08:00	22:00	04:00

The Design-Builder shall maintain access to all roads and driveways not directly impacted by the closure, unless otherwise approved in writing by the WSDOT Engineer.

The Design-Builder ~~will be allowed to implement no more than two~~ committed to 1 extended weekend road closure related to the construction of the new DDI in accordance with the following table.

SR 167/SR 161 – Extended Weekend Road Closure on North Meridian, between River Road and Valley Avenue for Work Related to the DDI Traffic Pattern Switch		
Allowable Closure Times Shown in 24-Hour Format	**Friday Night to Monday Morning**	
	From	**To**
Extended Weekend Road Closure and Detour	22:00	04:00

No other lane, ramp or road closures will be allowed concurrently, except those directly related to the above extended weekend road closure and detour, or with prior written approval by the WSDOT Engineer.

The Design-Builder has committed to hosting an open house ahead of the extended weekend road closure.

2.22.4.3.2.2 SR 167, MP 5.27 to 7.15 – Road Closure between North Meridian and SR 410

The Design-Builder committed to 0 closures ~~will be allowed to implement up to ten road closures in accordance with the following table.~~ Northbound and Southbound shall not be closed concurrently, except during girder placement at Milwaukee Avenue East, or with prior written approval by the WSDOT Engineer. Exceptions outside of these hours may be allowed with prior written approval by the WSDOT Engineer.

SR 167, MP 5.27 to 7.15 – Road Closure between North Meridian and SR 410								
Allowable Closure Times Shown in 24-Hour Format	Mon. Night to Tue. Morning Tue. Night to Wed. Morning Wed. Night to Thu. Morning Thu. Night to Fri. Morning		Fri. Night to Sat. Morning		Sat. Night to Sun. Morning		Sun. Night to Mon. Morning	
	From	To	From	To	From	To	From	To
Northbound (Increasing) Road Closure and Detour	23:00	05:00	23:00	07:00	23:00	08:00	22:00	05:00
Southbound (Decreasing) Road Closure and Detour	22:00	04:00	23:00	07:00	23:00	08:00	22:00	04:00

2.22.4.3.2.3 SR 410, MP 8.84 to 10.00 – Road Closure

The Design-Builder will be allowed to implement no more than two Roadway closures in accordance with the following table. Eastbound and westbound will be allowed to be closed concurrently to set the sign bridge as shown in the Conceptual Signing Plan. Exceptions outside of these hours may be allowed with prior written approval by the WSDOT Engineer.

SR 410, MP 8.84 to 10.00 - Road Closure								
Allowable Closure Times Shown in 24-Hour Format	Mon. Night to Tue. Morning Tue. Night to Wed. Morning Wed. Night to Thu. Morning Thu. Night to Fri. Morning		Fri. Night to Sat. Morning		Sat. Night to Sun. Morning		Sun. Night to Mon. Morning	
	From	To	From	To	From	To	From	To
Road Closure and Detour	22:00	04:00	23:00	6:00	23:00	08:00	22:00	04:00

2.22.4.3.2.4 SR 512, MP 10.97 to 12.06 - Road Closure

The Design-Builder will be allowed to implement no more than four road closures to set sign bridges in accordance with the following table. Eastbound and westbound shall not be closed concurrently, unless otherwise approved in writing by the WSDOT Engineer. Exceptions outside of these hours may be allowed with prior written approval by the WSDOT Engineer.

SR 512, MP 10.97 to 12.06 - Road Closure								
Allowable Closure Times Shown in 24-Hour Format	Mon. Night to Tue. Morning Tue. Night to Wed. Morning Wed. Night to Thu. Morning Thu. Night to Fri. Morning		Fri. Night to Sat. Morning		Sat. Night to Sun. Morning		Sun. Night to Mon. Morning	
	From	To	From	To	From	To	From	To
Road Closure and Detour	22:00	04:00	23:00	6:00	23:00	08:00	22:00	04:00

2.22.4.3.3 Entrance and Exit Ramp Closures

The Design-Builder will be allowed to close ramps during the hours listed in the table below and in accordance with this Section. The Design-Builder shall

maintain the existing ramp configurations at all times outside of the allowable closures described in this Section, unless otherwise permitted in this Section. Refer to Section 1-08 of the *General Provisions* for liquidated damages associated with failure to fully re-open ramps by the opening time given in the table below. If two or more ramps within the Project limits are planned to be closed concurrently, and the closed ramps have overlapping detours, the Design-Builder shall conduct an analysis of the detour routes in accordance with Section 2.21, *Traffic Operations*, and submit it to the WSDOT Engineer. If overlapping detours are determined to be unacceptable by the WSDOT Engineer, then only one ramp closure will be allowed. Closure durations shall be reduced based on the results of this analysis. Consecutive ramp closures will not be allowed, except where specifically allowed in this Section or with prior written approval by the WSDOT Engineer.

2.22.4.3.3.1 SR 167 Ramp Closure to or from SR 512; SR 167 Ramp Closure to or from SR 410; SR 410 Ramp Closure to or from Traffic Avenue/Main Street; SR 512 Ramp Closure to or from East Pioneer

The Design-Builder will be allowed to implement no more than 20 full ramp closures as allowed in this section, unless otherwise approved in writing by the WSDOT Engineer.

SR 167 Ramp Closure to or from SR 512; SR 167 Ramp Closure to or from SR 410; SR 410 Ramp Closure to or from Traffic Avenue/Main Street; SR 512 Ramp Closure to or from East Pioneer								
Allowable Closure Times Shown in 24-Hour Format	**Mon. Night to Tue. Morning Tue. Night to Wed. Morning Wed. Night to Thu. Morning Thu. Night to Fri. Morning**		**Fri. Night to Sat. Morning**		**Sat. Night to Sun. Morning**		**Sun. Night to Mon. Morning**	
	From	**To**	**From**	**To**	**From**	**To**	**From**	**To**
SR 167 Increasing Full Off-Ramp or On-Ramp Closure and Detour	22:00	04:00	23:00	06:00	23:00	08:00	22:00	04:00
SR 167 Decreasing Full Off-Ramp or On-Ramp Closure and Detour	22:00	04:00	23:00	06:00	23:00	08:00	22:00	04:00
SR 410 Increasing Full Ramp Closure and Detour	22:00	04:00	23:00	06:00	23:00	08:00	22:00	04:00
SR 410 Decreasing Full On-Ramp Closure and Detour and Right Lane Closure on mainline	22:00	04:00	23:00	06:00	23:00	08:00	22:00	04:00
SR 512 Increasing Full East Pioneer On-Ramp Closure and Detour and Right Lane Closure on mainline	21:00	05:00	21:00	08:00	21:00	09:00	21:00	05:00

SR 167 Ramp Closure to or from SR 512; SR 167 Ramp Closure to or from SR 410; SR 410 Ramp Closure to or from Traffic Avenue/Main Street; SR 512 Ramp Closure to or from East Pioneer								
Allowable Closure Times Shown in 24-Hour Format	**Mon. Night to Tue. Morning Tue. Night to Wed. Morning Wed. Night to Thu. Morning Thu. Night to Fri. Morning**		**Fri. Night to Sat. Morning**		**Sat. Night to Sun. Morning**		**Sun. Night to Mon. Morning**	
	From	**To**	**From**	**To**	**From**	**To**	**From**	**To**
SR 512 Decreasing Full East Pioneer On-Ramp Closure and Detour and Right Lane Closure on mainline	21:00	06:00	21:00	08:00	21:00	09:00	21:00	06:00

The Design-Builder will be allowed to implement one extended weekend ramp closure for reconstructing the SR 167 northbound off-ramp to SR 512 westbound in accordance with the following table.

Extended Weekend Ramp Closure for reconstructing SR 167 NB off-ramp to SR 512 WB		
Allowable Closure Times Shown in 24-Hour Format	**Friday Night to Monday Morning**	
	From	**To**
Extended Weekend Ramp Closure and Detour	21:00	04:00

The Design-Builder will be allowed to implement one extended weekend ramp closure for reconstructing the SR 512 eastbound on-ramp from East Pioneer in accordance with the following table.

Extended Weekend Ramp Closure for reconstructing SR 512 EB on-ramp to SR 512 WB		
Allowable Closure Times Shown in 24-Hour Format	**Friday Night to Monday Morning**	
	From	**To**
Extended Weekend Ramp Closure and Detour	21:00	04:00

The Design-Builder will be allowed to implement one extended weekend ramp closure for reconstructing the SR 512 westbound on-ramp from East Pioneer in accordance with the following table.

Extended Weekend Ramp Closure for reconstructing SR 512 WB on-ramp from East Pioneer		
Allowable Closure Times Shown in 24-Hour Format	**Friday Night to Monday Morning**	
	From	**To**
Extended Weekend Ramp Closure and Detour	21:00	04:00

The Design-Builder will be allowed to close ramps upon written notification to WSDOT and upon prior approval by the WSDOT Engineer and all affected Local Agencies, provided that the requirements for ramp access are satisfied, and provided that the closure is shown on an RFC TCP. Consecutive off-ramps or consecutive on-ramps shall not be closed concurrently unless approved by the WSDOT Engineer.

The Design-Builder shall provide a written ramp closure schedule to the WSDOT Engineer at least 14 Calendar Days in advance of a ramp closure. The schedule shall show the locations and times of all ramp closures and the allowable closure time limits specified in the Contract. A schedule that does not conform to the Contract Time limits, is incomplete, unintelligible, or includes inaccurate information, will be returned to the Design-Builder for correction. The Design-Builder will be notified promptly of disapproved closures or closures that will require coordination with other parties as a condition of approval. Requests for ramp closures made less than 14 Calendar Days in advance will not be approved.

The Design-Builder shall confirm all scheduled closures with the WSDOT Engineer at least 7 Calendar Days prior to the date on which the ramp closure is scheduled. All ramp closures not confirmed by the Design-Builder as scheduled shall be canceled. Confirmed ramp closures that are canceled for unsuitable weather may be rescheduled for the next allowable day.

The Design-Builder shall provide detour routes for ramp closures and all roadway closures. Detours shall be approved by impacted Local Agencies a minimum of 14 Calendar Days prior to implementing the closure. All detours shall be in place, including all signing, prior to closure of the ramp. If more than one ramp or roadway will be closed at the same time, all detour routes shall be shown on the same plan.

The Design-Builder shall coordinate ramp closures with nearby projects in accordance with Section 2.01, *General Information*, to ensure consecutive ramps or off-ramps are not closed simultaneously or result in conflicting or overlapping detours.

The Design-Builder shall complete all ramp Work within the specified allowable closure times prior to opening the ramps to traffic.

2.22.4.3.4 Allowable Shoulder Closures

Shoulder closures will be permitted during the allowable lane closure hours. In addition, temporary shoulder closures will be permitted in accordance with the RFC TCP as follows:

Allowable Shoulder Closures		
Allowable Closure Times Shown in 24-Hour Format	**Monday to Friday**	
	From	**To**
SR 161/North Meridian SR 167 Northbound SR 167 Southbound SR 512 Eastbound SR 512 Westbound SR 410 Eastbound SR 410 Westbound	09:00	15:00

Shoulders that are adjacent to a closed lane shall be closed.

2.22.4.3.5 Local Road Lane Closures

Lane closures for local roads as shown in the following table require permit approval through the Local Agency. RFC TCPs shall not be approved without Local Agency written approval.

Single Lane Closure, Minimum 1 Lane Open in Each Direction								
Allowable Closure Times Shown in 24-Hour Format	**Mon. Night to Tue. Morning Tue. Night to Wed. Morning Wed. Night to Thu. Morning Thu. Night to Fri. Morning**		**Fri. Night to Sat. Morning**		**Sat. Night to Sun. Morning**		**Sun. Night to Mon. Morning**	
	From	**To**	**From**	**To**	**From**	**To**	**From**	**To**
North Meridian (south of 5th Avenue NW/NE)	20:00	06:00	21:00	07:00	21:00	09:00	20:00	06:00
North Levee Road	20:00	06:00	21:00	07:00	21:00	09:00	20:00	06:00
Valley Avenue NE or NW	20:00	06:00	21:00	07:00	21:00	09:00	20:00	06:00
East Main Avenue/Traffic Avenue	20:00	06:00	21:00	07:00	21:00	09:00	20:00	06:00
East Pioneer	20:00	06:00	21:00	07:00	21:00	09:00	20:00	06:00
East or West Stewart Avenue	20:00	06:00	21:00	07:00	21:00	09:00	20:00	06:00

2.22.4.3.6 Local Road Closure

Road closures for local roads as shown in the following table require permit approval through the Local Agency. RFC TCPs shall not be approved without Local Agency written approval.

Local Road Closure								
Allowable Closure Times Shown in 24-Hour Format	**Mon. Night to Tue. Morning Tue. Night to Wed. Morning Wed. Night to Thu. Morning Thu. Night to Fri. Morning**		**Fri. Night to Sat. Morning**		**Sat. Night to Sun. Morning**		**Sun. Night to Mon. Morning**	
	From	**To**	**From**	**To**	**From**	**To**	**From**	**To**
North Meridian (south of 5th Avenue NW/NE)	22:00	05:00	22:00	07:00	22:00	09:00	22:00	05:00
East Main Avenue/Traffic Avenue	22:00	05:00	22:00	07:00	22:00	09:00	22:00	05:00
East or West Stewart Avenue	22:00	05:00	22:00	07:00	22:00	09:00	22:00	05:00
North Levee Road Loop	22:00	05:00	22:00	07:00	22:00	09:00	22:00	05:00
Milwaukee Avenue East	21:00	05:00	21:00	07:00	21:00	09:00	21:00	05:00
4th Street NE	21:00	05:00	21:00	07:00	21:00	09:00	21:00	05:00

Closure of a local road is prohibited concurrently with a planned closure of other local roads implemented within 3 miles of the Project Limits, unless otherwise approved in writing by the WSDOT Engineer. The Design-Builder will be allowed to implement no more than two extended weekend right lane closures on

North Meridian, in coordination with the North Levee Road Loop closures noted in the table below, for reconstructing and widening the SR 167 Northbound Puyallup River Bridge sidewalk related to the shared-use path.

Extended Weekend Road Closure for Reconstructing North Levee Road Loop		
Allowable Closure Times Shown in 24-Hour Format	**Friday Night to Monday Morning**	
	From	**To**
Extended Weekend Full Loop Closure and Detour	21:00	04:00

2.22.4.3.7 Railroad Flagging

See Section 2.23, *Railroad*, for railroad related requirements.

2.22.4.3.8 Flagging Alternating Traffic

Flagging for local roads as shown in the following table require permit approval through the Local Agency. RFC TCPs shall not be approved without Local Agency written approval.

Flagging Alternating Traffic								
Allowable Closure Times Shown in 24-Hour Format	**Mon. Night to Tue. Morning Tue. Night to Wed. Morning Wed. Night to Thu. Morning Thu. Night to Fri. Morning**		**Fri. Night to Sat. Morning**		**Sat. Night to Sun. Morning**		**Sun. Night to Mon. Morning**	
	From	**To**	**From**	**To**	**From**	**To**	**From**	**To**
Flagging within 300 feet of the intersection with North Meridian and Valley Avenue	24:00	04:00	24:00	05:00	24:00	06:00	22:00	04:00
Flagging within 300 feet of the intersection with North Meridian and River Road	24:00	04:00	24:00	05:00	24:00	06:00	22:00	04:00
North Levee Road Loop	21:00	06:00	21:00	08:00	21:00	10:00	21:00	06:00
Milwaukee Avenue East	20:00	06:00	20:00	08:00	20:00	10:00	20:00	06:00
Flagging at intersection with 4th Street NE under North Meridian, vicinity of Riverwalk Trail	20:00	06:00	20:00	08:00	20:00	10:00	20:00	06:00

2.22.4.3.9 Rolling Slowdown

Rolling Slowdown						
Allowable Closure Times Shown in 24-Hour Format	Mon. Night to Tue. Morning Tue. Night to Wed. Morning Wed. Night to Thu. Morning Thu. Night to Fri. Morning Sun. Night to Mon. Morning		Fri. Night to Sat. Morning		Sat. Night to Sun. Morning	
	From	To	From	To	From	To
Rolling Slowdown	23:00	04:00	23:59	06:00	23:59	06:00

Rolling Slowdown shall not exceed 15 minutes and shall not be used for setting sign bridges or girders. See additional requirements in this Section.

2.22.4.4 Traffic Operations During Construction

The Design-Builder shall notify the ORTMC, at (253) 538-3300, 10 minutes in advance of setting up and removing all lane, shoulder, and roadway closures. If a lane closure extends into King County, the Design-Builder shall notify the ORTMC 15 minutes in advance of setting up and removing all lane, shoulder, and roadway closures, and the ORTMC will coordinate with the NWRTMC.

The Design-Builder shall use protective vehicles with warning beacons and transportable attenuators (TAs) for protection of Work zones on roadways with a posted speed limit equal to or greater than 45 mph.

2.22.4.4.1 Mainline During Construction

Existing shoulders can be used as traveled lane or Work zone truck access in accordance with Section 2.07, *Pavement*.

There may be existing facilities in the existing roadway shoulder which may not be adequate for traveled lane or Work zone truck access operations. These may include, at a minimum, drainage structures, junction boxes, cable and drainage vaults, Utility appurtenances, manholes, pull boxes, and the lids for these facilities. Prior to using an existing shoulder as all or part of the Traveled Way, the Design-Builder shall inspect all existing facilities within the roadway shoulder which may be used as traveled lane or Work zone truck access and remediate existing facilities within the roadway shoulder which are not adequate to support sustained traffic. All damaged facilities shall be replaced at the Design-Builder's expense.

Mainline and Auxiliary Lanes shall be a minimum of 11 feet and shall not exceed 14 feet wide unless otherwise approved on RFC TCPs.

When shoulders are less than 5 feet wide, construction signs shall be barrier-mounted or placed behind the barrier at an elevated height to ensure visibility from a height of 3 feet from the roadway surface.

Tripod-mounted signs are allowed when shoulders are greater than 5 feet wide and the minimums described in this Section can be maintained.

The Design-Builder shall not clip construction signs. When placement of a sign would result in the edge of a sign within 2 feet of the Traveled Way, the Design-Builder may implement one of the following strategies:

1. Use a sign smaller than the typical 48 by 48-inch size (roughly 67 inches wide diagonally).
2. Omit the sign and provide additional advance warning at other locations.
3. Design special rectangular signs to convey the same message but with a reduced width.

A 2-foot minimum clearance is required between the nearest edge of signs and the edge of the traveled way.

The desired shoulder width is between 8 and 10 feet. When shoulders are greater than 10 feet wide and longer than 500 feet, the Design-Builder shall place drums at 80-foot spacing, 10 feet from the edge line, supplemented by a minimum of two transverse devices at 500-foot spacing.

The Design-Builder shall provide an 8-foot right shoulder/distress lane, when feasible. Each shoulder shall be a minimum of 2 feet wide and shall be paved. Wider shoulders may be required to accommodate the necessary sight distance or to provide the width necessary for the placement of required signing.

The Design-Builder shall design temporary construction or widening to withstand the anticipated traffic volumes and loadings during the applicable stage of the Project.

Mainline general purpose lanes in the same direction of travel shall not be split or separated.

2.22.4.4.1.1 Design Criteria

The design speed for temporary conditions shall not be less than the legally posted speed limit. All mainline shifting tapers and lane closure tapers shall be in conformance with standards provided in the latest version of the *FHWA Manual on Uniform Traffic Control Devices for Streets and Highways*. All mainline shifting tapers and lane closure tapers shall use a minimum taper rate in accordance with *FHWA Manual on Uniform Traffic Control Devices for Streets and Highways* requirements.

2.22.4.4.1.2 Temporary Lane Closures

The Design-Builder shall provide written notification to the WSDOT Engineer and all affected Local Agencies a minimum of 7 Calendar Days prior to each closure. Each lane closure shall have one sequential arrow board per closed lane, as part of the traffic control layout. No closures shall be scheduled until the TCPs are RFC.

For lane closures longer than 500 feet, the Design-Builder shall use a minimum of two transverse devices in the closed lane at 500-foot spacing.

2.22.4.4.1.3 Law Enforcement

Law enforcement shall be provided for rolling slowdowns, full freeway closures, and to control intersections when traffic signals are temporarily turned off. Law enforcement for the Work zone shall be provided by the Design-Builder and shall be included in the Proposal Price. Law enforcement, as part of the traffic control strategy and use of Law enforcement, shall be reflected on the TCPs. Local Agency Law enforcement shall have first right of refusal on local streets. WSP shall be used on all State Highways, unless otherwise approved in writing by the WSDOT Engineer. The Design-Builder is responsible for arranging all law enforcement needs.

2.22.4.4.1.4 Sequential Arrow Displays

Each vehicle used to place, maintain, or remove components of a traffic control system on multi-lane highways shall be equipped with a sequential arrow display that shall be in operation when the vehicle is in use. Vehicles equipped with sequential arrow displays not involved in placing, maintaining, or removing components when operated within a stationary-type lane closure shall display only the four-corner flash caution mode. The operator of the vehicle shall control the arrow display while the vehicle is in motion. Sequential arrow displays used in moving lane closures shall be truck-mounted. This requirement applies to all vehicles placing, maintaining, and removing traffic control devices, including concrete barrier trailers and "cherry pickers".

2.22.4.4.1.5 Advance Signing

The Design-Builder shall furnish and install six G24-501 (modified) signs with the Project hotline phone number within the Project limits, to be placed under the G20-2A END ROAD WORK sign: one each in the westbound directions of SR 512 and SR 410, one in the northbound direction of SR 167, one in the southbound direction of SR 167, one in the southbound direction of SR 161, and one in the northbound direction of North Meridian.

The Design-Builder shall supply the Project identification signs. The Design-Builder shall be responsible for coordination, transportation, and installation of the sign, including supplying the posts for the sign and placards with the Project amount and Design-Builder's name. Refer to the *Project Identification Sign Detail* (Appendix W). These signs shall be located a minimum of 800 feet away from guide signs and motorist information signs.

The Design-Builder is responsible for locating the Project identification signs near the beginning of Project limits. Project identification signs shall be installed in the southbound direction of SR 167, eastbound direction of SR 410, eastbound direction of SR 512, southbound direction of SR 161, northbound direction of North Meridian, and eastbound North Levee Road.

The Design-Builder shall supply the Bipartisan Infrastructure Law sign. The Design-Builder shall be responsible for coordination, transportation, and installation of the sign, including supplying posts for the sign and placards with

the WDSOT logo and USDOT logo. Refer to the *Bipartisan Infrastructure Law Sign Detail* (Appendix W). This sign shall be located a minimum of 800 feet away from guide signs and motorist information signs.

The Design-Builder is responsible for locating the Bipartisan Infrastructure Law signs, one in the southbound direction of SR 167 and one in the southbound direction of SR 161, a minimum of 500 feet upstream of the Project identification sign, but no more than 1/2 mile ahead. This sign shall not include the Design-Builder's name or logo.

The Advance Signing shall be installed within 30 Calendar Days of the date the Contract is executed, and prior to all other construction activity on the Project. The signs shall remain in place until Physical Completion. Coordination with nearby projects may be required for placement of the signs.

If it is necessary to relocate advance signing, the Design-Builder shall be responsible for relocation.

2.22.4.4.2 Ramps During Construction

2.22.4.4.2.1 Design Criteria

The Design-Builder shall provide acceleration and deceleration lanes to ensure vehicles are within 10 mph of the mainline speed at the point they must merge or diverge from mainline lanes. Exit speeds shall be posted for all ramps. For ramps where the design speed during construction is reduced from existing conditions, black on orange construction signs shall be used for the exit speed signs.

The number of lanes and lane configurations shall equal or exceed the existing configuration. Adequate storage for queuing and throughput volumes at traffic signals and ramp meters shall be maintained. Ramp meters shall not operate with two vehicles per green indication. Lanes shall be a minimum of 12 feet wide on entrance and exit ramps. Paved shoulders shall be provided on both sides of each ramp and shall be a minimum of 2 feet wide. Wider ramp widths than these minimums shall be required where necessary to satisfy AASHTO design widths for turning roadways and horizontal stopping sight distances, and to accommodate WB-67 design vehicle tracking. Refer to the WSDOT *Design Manual*. All exit ramp tapers shall use a desirable taper rate of 20:1, and a minimum taper rate of 15:1.

Turning movements at the ramp terminals shall be designed to accommodate a WB-67 design vehicle.

2.22.4.4.3 Local Roads During Construction

The Design-Builder shall maintain the existing local street configuration at all times outside the allowable closures from the Local Agencies, unless otherwise permitted in this Section.

All TCPs affecting local roads shall follow the requirements of each Local Agency impacted. The Design-Builder shall be responsible for submitting plans

and obtaining approvals from the Local Agencies for each planned closure and detour route. Allowable closure hours for lane and roadway closures on local roads shall be approved by the corresponding Local Agency. The Design-Builder shall coordinate with City of Puyallup, City of Sumner, Pierce County, Pierce Transit, Puyallup Tribe of Indians, BNSF Railway Company, or other affected agencies and stakeholders regarding concurrent construction work along city cross-streets that may be affected by traffic control for the Project; see *Right of Way Use Permits* (Appendix R).

The Design-Builder shall provide written notice to the WSDOT Engineer and the affected Local Agencies a minimum of 30 Calendar Days prior to restricting local traffic. The Design-Builder shall be responsible for obtaining approval for each planned lane closure from WSDOT, Transit Agency, and the Local Agencies affected by the Work. The Design-Builder shall be responsible for obtaining all necessary permits from Local Agencies associated with lane closures on local streets. The Design-Builder shall maintain access to all affected businesses and residences during the lane closures.

2.22.4.4.3.1 Design Criteria

The design speed of all local roads during construction shall be the existing posted speed limit. Reductions from the existing posted speed limit shall be identified in the TMP and requires approval by the corresponding Local Agency.

The existing number of through lanes shall be maintained at all times except as approved by the WSDOT Engineer and the affected Local Agency. All lanes for local roads shall be a minimum of 11 feet wide, excluding gutter width, unless the existing lane width is less than 11 feet, in which case the lane shall not be less than the existing width.

2.22.4.4.3.2 Detours

All detours shall be in place, including all signing, prior to road closures. Detours using local roads shall follow traffic control permit requirements for each Local Agency impacted.

Detour signing for interstate/freeway, roadway, or entrance ramp closures shall include specific route shield, cardinal direction, and arrow of appropriate orientation comprised on one sign of either 48” x 48” (posted speeds of 45 mph or greater) or 36” x 36” (below 45 mph) in size.

The Design-Builder shall identify all bus routes, including school bus routes, which may be affected by the detour; and shall coordinate with the bus agency regarding impacts to the schedule and location of the bus stops.

2.22.4.4.4 Temporary Guardrail, Barrier Attenuators, and Glare Screen

2.22.4.4.4.1 Vehicle Protection

The Design-Builder shall be responsible for using temporary guardrail, barrier, and attenuators to protect the traveling public from the following:

1. Fixed objects within the clear zone
2. Drop-offs as required by this Section
3. Slopes steeper than 4H:1V (Horizontal:Vertical)

2.22.4.4.4.2 Barrier and Glare Screen

Opposing traffic lanes of mainline SR 167, SR 512 and SR 410 shall be separated by permanent barrier or TCB in accordance with WSDOT design requirements.

TCB placed along the edge of a bridge structure shall be anchored.

The end of TCB shall not be placed within the clear zone of approaching traffic unless an appropriate attenuator is used. Refer to the Chapter 1010 of the WSDOT *Design Manual* for the approved attenuator list and for minimum taper rates and additional details.

The Design-Builder shall provide a lateral displacement distance behind all barriers (including TCB) equal to or greater than the longitudinal barrier deflection shown in Exhibit 1610-3 of the WSDOT *Design Manual.* The lateral displacement area shall be kept clear of fixed objects and shall not be used as a Work area.

When mainline median crossovers are used, temporary glare screen, in accordance with Sections 8-25 and 9-16 of the Standard Specifications, using slats shall be placed on top of the median TCB to reduce the headlight glare of approaching vehicles. All concrete barriers shall have reflectorized barrier delineators of the appropriate color with 20-foot maximum spacing. The barrier delineators shall be side-mounted.

2.22.4.4.5 Pedestrian and Bicycle Access During Construction

The Design-Builder shall maintain existing pedestrian access on all sidewalks, transit facilities, Riverwalk Trail, Puyallup Recreation Center, and intersections. The Design-Builder shall also maintain safe pedestrian access and passage for all pedestrian facilities. Pedestrian sidewalks and paths shall be maintained and continue to conform to the requirements of the WSDOT *Design Manual*.

Occupational safety regulations that apply to the Project limits shall also be considered the minimum standard for personal safety to pedestrians. If Work will be performed over pedestrian and bicycle routes, temporary lighted covered walkways shall be provided to protect pedestrians and bicyclists from overhead hazards.

When the Design-Builder allows Work areas to encroach upon a sidewalk or crosswalk area and a minimum clear width of 48 inches, exclusive of curb, cannot be maintained for pedestrian use, an alternative accessible pedestrian route shall be provided. Separation of pedestrians from the Work area and vehicular traffic is required.

Protective barricades, fencing, and bridges, together with warning and guidance devices and signs, shall be used so that the passageway for pedestrians is safe, well defined, and accessible. Whenever pedestrian walkways are provided across excavations, they shall be provided with handrails in accordance with ADA requirements. Footbridges shall be designed in accordance with AASHTO LRFD specifications; have a slip-resistant coating; and be free of cracks, holes, and irregularities that could cause tripping. Ramps with a maximum slope of 8.3 percent shall be provided at the entrance and exit of all raised footbridges. The maximum cross slope shall be 2 percent. When the existing facility is illuminated or TCPs require illumination, illumination shall be provided during the hours of darkness. Retroreflective delineation, with or without illumination, shall be provided during hours of darkness.

Where accessible pedestrian routes are allowed to be closed by the Design-Builder during construction, an alternate accessible pedestrian route shall be provided that complies with the *FHWA Manual on Uniform Traffic Control Devices for Streets and Highways*, the WSDOT *Design Manual* requirements, and this Section. The alternate accessible pedestrian route shall not have abrupt changes in grade or terrain. Pedestrian channelizing devices shall be detectable to pedestrians who have visual disabilities and a handrail meeting WSDOT *Design Manual* requirements. Where it is necessary to divert pedestrians into the roadway, barricading or channelizing devices shall be provided to separate the pedestrian route from the adjacent vehicular traffic lane. Barricading or channelizing devices used to separate pedestrian and vehicular traffic shall be crashworthy and when struck by vehicles, present a minimum threat to pedestrians, workers, and occupants of impacting vehicles. At no time shall pedestrians be diverted into a portion of the street used concurrently by moving vehicular traffic.

The Design-Builder shall not park motor vehicles or construction equipment on a pedestrian sidewalk or path, or use a pedestrian sidewalk or path for loading operations, stockpiling of materials, or allowing demolished or spoil materials to be deposited on the surface of a pedestrian sidewalk or path. Surface of a pedestrian sidewalk or path affected by the Work shall be restored to meet ADA requirements prior to re-opening to pedestrian traffic. The trail surface shall be swept or washed free of debris including, at a minimum, mud, gravel, grease, and excavated, spoiled, or stockpiled materials.

Pedestrian and bicycle routes shall not be closed except during full closures of the adjacent roadways. During full closures of the adjacent roadways, a Pedestrian and Bicycle Access Plan shall be implemented with a minimum of 14 Calendar Days advance notice provided to all pedestrians and bicyclists. The Design-Builder shall notify the affected Local Agencies and WSDOT Engineer prior to

the close of bicycle trails. A Pedestrian and Bicycle Access Plan shall not require pedestrians or bicyclists to travel more than 0.5 miles longer than the preconstruction distance, unless otherwise approved in writing by the Local Agency and WSDOT Engineer. Advance notice shall consist of signs located at the construction limits and all accesses serving the affected area; and public notification in accordance with Section 2.09, *Communications*. All access closures and Pedestrian and Bicycle Access Plans shall be shown in the TCPs. All detours and Work Sites shall be signed in accordance with the *FHWA Manual on Uniform Traffic Control Devices for Streets and Highways*, the ADA requirements, and this Section. Refer to Chapters 1510 and 1520 of the WSDOT *Design Manual*.

2.22.4.5 Public Convenience and Safety

2.22.4.5.1 Construction Under Traffic

The Design-Builder shall conduct all operations with the least possible obstruction and inconvenience to the public. The Design-Builder shall not have under construction a greater length or amount of Work than can be prosecuted properly with due regard to the rights of the public. To the extent possible, the Design-Builder shall finish each section of Work before commencing Work on the next section. The Design-Builder shall enter interstate highways only through legal movements from existing roads, streets, and other access points specifically permitted by the Contract.

No saw cuts or open trenches across mainline or ramps will be allowed, unless approved by the WSDOT Engineer.

In order to minimize public traffic disruption, the Design-Builder shall permit traffic to pass through the Work zone with the least possible inconvenience or delay. The Design-Builder shall maintain existing roads and streets within the Project limits, keeping them open, and in a good, clean, safe condition at all times. Deficiencies caused by the Design-Builder's operations shall be repaired at the Design-Builder's expense. Except where noted in this Section and Section 2.29, *Maintenance During Construction,* deficiencies not caused by the Design-Builder's operations shall be repaired by the Design-Builder, when directed by the WSDOT Engineer, at WSDOT's expense. Pothole damage shall be repaired by the Design-Builder at the Design-Builder's expense. The Design-Builder shall also maintain roads and streets adjacent to the Project limits when affected by the Design-Builder's operations. Snow and ice control will be performed in accordance with Section 2.29, *Maintenance During Construction*. The Design-Builder shall perform the following:

1. Remove or repair conditions resulting from the Work that might impede traffic or create a hazard.
2. Rumble strips or recesses shall be filled or removed prior to traffic being shifted.

3. Maintain operation of traffic signals and highway lighting systems as the Work proceeds.
4. Maintain the striping on the roadway.
5. Utilize, install, and maintain Type 2 Raised Pavement Markers (RPMs) for the full length of all alignments on State Routes. RPMs shall be a maximum of 40 feet on center for tangent sections and 20 feet on center in all horizontal curves.
6. Maintain existing permanent signing. Sign repairs will be at WSDOT's expense, except those damaged due to the Design-Builder's operations.
7. Keep drainage structures clean to allow for free flow of water.

To protect the rights of abutting property owners, the Design-Builder shall perform the following:

1. Conduct the construction so that abutting property owners are inconvenienced as little as possible.
2. Maintain access to driveways, houses, and buildings within the Project limits.
3. Provide temporary approaches to crossing or intersecting roads and keep these approaches in good condition.
4. Provide another access before closing an existing access whenever the Contract calls for removing and replacing an abutting owner's access.

When traffic must pass through grading areas to access private property, the Design-Builder shall perform the following:

1. Make cuts and fills that provide a reasonably smooth, even roadbed.
2. In advance of other grading Work, place enough fill at all culverts and bridges to permit traffic to cross.
3. After rough grading or placement of subsequent layers, prepare the final roadbed to a smooth, even surface free of humps and dips, suitable for use by public traffic.
4. Settle dust with water or other dust palliative.

If grading Work is on or next to a roadway in use, the Design-Builder shall finish the grade immediately after rough grading and place surfacing materials as the Work progresses.

Where planing is performed, live traffic will be allowed to drive on the ground surface for a maximum of 5 Calendar Days before an overlay is required in the planed section. Remaining edges from the planing operations shall be parallel or perpendicular to the current traffic channelization and shall be located at edge of traveled way or at existing lane line locations at all times.

The Design-Builder shall conduct all operations to minimize drop-offs (abrupt changes in roadway elevation) left exposed to traffic during non-working hours.

Grinding shall not be allowed after the final paving lift is completed. Drop-offs left exposed to traffic during nonworking hours shall be protected as follows and shall be shown in the RFC TCP submitted in accordance with this Section:

1. Drop-offs up to 0.20 feet may remain exposed with appropriate warning signs alerting motorists of the condition. The drop-offs shall not remain open for more than 3 Calendar Days.

2. Drop-offs more than 0.20 feet that are in the Traveled Way or Auxiliary Lane will not be allowed unless protected with appropriate warning signs and further protected as indicated in 3b or 3c below.

3. Drop-offs more than 0.20 feet, but no more than 0.50 feet, that are not within the Traveled Way or Auxiliary Lanes shall be protected with appropriate warning signs and further protected by using one of the following:

    a) A wedge of compacted stable material placed at a slope of 4H:1V or flatter.

    b) Channelizing devices (Type I barricades, plastic safety drums, or other devices 36 inches or more in height) placed along the traffic side of the drop-off and a new edge of pavement stripes placed a minimum of 3 feet from the drop-off. The maximum spacing between the devices in feet shall be the posted speed in mph. Pavement drop-off warning signs shall be placed in advance and throughout the drop-off treatment.

    c) A TCB or other approved barrier installed on the traffic side of the drop-off with a new edge line placed a minimum of 2 feet from the traffic face of the barrier. The barrier shall have a lateral offset from the edge of the drop-off to the back of the barrier as follows:

        (1) A minimum offset of 3-feet for temporary Type F or Type 2 concrete barrier when unanchored.

        (2) A minimum offset of 1-foot for temporary Type F or Type 2 concrete barrier when anchored on hot mix asphalt pavement as shown on WSDOT Standard Plan C-60.10 or K-80.35.

        (3) A minimum offset of 1-foot for temporary Type F concrete barrier when anchored on cement concrete pavement as shown on WSDOT Standard Plan C-60.10.

        (4) A minimum offset of 9-inches for temporary Type F or Type 2 concrete barrier when anchored on cement concrete pavement or concrete bridge decks as shown on WSDOT Standard Plan K-80.35.

        (5) A minimum offset of 6-inches or 9-inches for temporary Type F or Type 2 narrow base concrete barrier when anchored on cement concrete pavement and concrete bridge decks as shown on WSDOT Standard Plan K-80.37.

(6) A minimum offset following manufacturer recommendations for temporary steel barrier when not anchored; or when anchored on hot mix asphalt pavement, cement concrete pavement, or concrete bridge decks.

d) An approved terminal, flare, or impact attenuator shall be required at the approach end of the barrier run and is required at the trailing end of a barrier run in two-way operations when shown on the RFC TCPs. For night use, the barrier shall have standard delineation such as paint, reflective tape, lane markers, or warning lights.

4. Drop-offs more than 0.50 feet not within the Traveled Way or Auxiliary Lane shall be protected with appropriate warning signs and further protected as indicated in 3a, 3b, or 3c above, if all of the following conditions are met:

a) The drop-off is less than 2 feet.

b) The total length throughout the Project is less than 1 mile.

c) The drop-off does not remain for more than 3 Calendar Days.

d) The drop-off is not present on holidays or holiday weekends described in this Section.

e) The drop-off is only on one side of the roadway.

5. Drop-offs more than 0.50 feet that are not within the Traveled Way or Auxiliary Lane and are not otherwise accounted for by No. 4 above, shall be protected with appropriate warning signs, and further protected as indicated in 3a or 3c above.

6. Open trenches within the Traveled Way or Auxiliary Lane shall have a steel-plate cover placed and anchored over them. A wedge of suitable material, if required, shall be placed for a smooth transition between the pavement and the steel plate. Warning signs shall be used to alert motorists of the presence of the steel plates.

2.22.4.5.2 Work Zone Clear Zone

The Work Zone Clear Zone (WZCZ) applies during working and non-working hours. The WZCZ applies only to temporary roadside objects introduced by the Design-Builder's operations and does not apply to preexisting conditions or permanent Work. Those work operations that are actively in progress shall be in accordance with RFC TCPs, and these Technical Requirements.

During nonworking hours equipment or materials shall not be within the WZCZ unless they are protected by permanent guardrail or temporary concrete barrier. The use of temporary concrete barrier shall be permitted only if the WSDOT Engineer approves the installation and location.

During actual hours of active construction Work, unless protected as described above, only materials absolutely necessary for construction shall be allowed within the WZCZ and only construction vehicles absolutely necessary for

construction shall be allowed within the WZCZ or allowed to stop or park on the shoulder of the roadway. No equipment shall be stored within the WZCZ between shifts of active construction Work.

The Design-Builder's nonessential vehicles and employees' private vehicles shall not be permitted to park within the WZCZ, unless protected as described above.

Deviation from the above requirements shall not occur unless the Design-Builder has requested the deviation in writing and the WSDOT Engineer has provided written approval.

Minimum WZCZ distances are measured from the edge of the Traveled Way, and shall be determined as follows:

Minimum Work Zone Clear Zone Distance

Posted Speed	Distance From Traveled Way (Feet)
35 mph or less	10
40 mph	15
45 to 50 mph	20
55 to 60 mph	30
65 mph or greater	35

Construction vehicles using a closed traffic lane shall travel only in the normal direction of traffic flow, unless expressly allowed in the RFC TCPs. Construction vehicles shall be equipped with flashing or rotating amber lights.

Work over an open lane of traffic shall not be allowed, unless a plan for the protection of the traveling public from debris falling onto the Traveled Way is approved by the Engineer of Record and the WSDOT Engineer. This protection shall remain in place during construction and shall meet minimum vertical clearance for the highway.

2.22.4.5.2.1 Controlled Access

The Design-Builder shall not be allowed special access, egress, including leaving the roadway shoulder to enter the Work area, or breaks in limited access, other than normal legal movements or movements as approved by the WSDOT Engineer. The Design-Builder shall be allowed short-duration shoulder stops in the Work area, using light vehicles properly equipped with amber warning lights.

All ingress and egress to the Work area shall be shown on Site-specific RFC TCPs. The Design-Builder shall provide appropriate warning signs and traffic control devices when vehicles will be departing or entering highway and city streets. Ingress and egress to the Work area shall not be located at a gore.

The Design-Builder shall close a lane of traffic in locations where the length and width of the shoulder is not adequate for construction vehicles to decelerate from departing the mainline traffic to enter the Work area or to accelerate from exiting the Work area to merge with the mainline traffic. The design speed for departing

and merging into a mainline shall not be less than 10 mph below the design speed of the mainline. Access for large construction vehicles to and from an open lane, meeting the criteria above, shall only be between the hours of 9:00 a.m. and 3:00 p.m. daily, and during the lane closure hours described in this Section. Light vehicles properly equipped with amber warning lights shall be allowed access to the Work area to and from an open lane, meeting the criteria above, at all times.

Lane closures and ingress and egress to the Work area shall be restricted to the hours described in this Section, unless otherwise approved by the WSDOT Engineer.

Access to the Work area from adjacent properties outside of the Right of Way shall be in accordance with Section 1-07.16(1) of the *General Provisions*.

For an approved break in limited access, the Design-Builder shall prohibit unauthorized use of the access from adjacent property. Access from outside the limited access lines shall be closed by use of a locked gate when the access point is not being used.

The access location shall not adversely affect wetlands or other sensitive areas. Airborne particulates created as a result of using the access shall be effectively controlled. The continuity of the existing drainage system shall be maintained throughout the access Site.

At the Physical Completion of the Project, the Design-Builder shall restore the area of the access Site to its original, pre-Contract, condition. All damage to the Traveled Way, shoulders, Auxiliary Lanes, sidewalks, side slopes or other areas caused by the access shall be repaired. All Work to comply with this provision or to build, maintain, provide erosion control, control airborne particulates, ensure that drainage continues throughout the access Site, provide traffic control, remove the temporary access, and restore the surrounding area when no longer required for use is the responsibility of the Design-Builder. The Design-Builder shall include all related costs in the Proposal Price of the Contract.

2.22.4.5.2.2 Work During Hours of Darkness

Work during hours of darkness may be required for the Project. The Design-Builder shall obtain the required noise variance or exemption for such Work. The Design-Builder shall, at no additional cost to WSDOT, make all arrangements for operations during hours of darkness.

Flagger station illumination shall meet the requirements of section 2.22.4.7.3 and the FHWA *Manual on Uniform Traffic Control Devices for Streets and Highways.*

Lighting for construction activity shall be directed away from maintained traffic to minimize glare to motorists.

Refer to this Section and Section 1-07 of the *General Provisions* for additional requirements.

2.22.4.5.2.3 Signs and Traffic Control Devices

All signs and traffic control devices for lane and roadway closures shall be installed only during the hours specified in this Section. If placed earlier than the specified hours of closure, the construction signs shall be turned or covered so as not to be visible to motorists.

2.22.4.5.2.4 Advance Notification

The Design-Builder shall submit TCPs for lane and shoulder closure requests in writing to the WSDOT Engineer 14 Calendar Days in advance of the proposed closure.

2.22.4.5.2.5 Hour Adjustment

If the permitted closure hours adversely affect traffic, causing queues that extend beyond 1 mile or delay traffic for longer than 15 minutes for a lane or total roadway closure, the Design-Builder shall evaluate the Contract hours and recommend new hours to the WSDOT Engineer for Review and Comment.

2.22.4.5.2.6 Public Notification

The Design-Builder shall refer to Section 2.09, *Communications*, for additional notification requirements.

The Design-Builder shall furnish and install information signs that provide advance notification of ramp and roadway closures a minimum of 7 Calendar Days prior to the scheduled closure. The signs shall have a black legend on a white reflective background. Sign locations, messages, letter sizes, and sign sizes shall be shown in the TCPs. For ramp and local road closures, PCMS shall be used to supplement the required signs. The Design-Builder shall notify the WSP, local fire departments, police departments, city engineering departments, public transit agencies, and the affected school districts in writing a minimum of 7 Calendar Days prior to scheduled closures. The Design-Builder shall provide these notifications to WSDOT.

The Design-Builder shall notify affected business, residence, and other properties in writing a minimum of 5 Calendar Days in advance of any closure of said property's access/driveway. The Design-Builder shall maintain existing access to all adjacent properties at all times, or shall provide a detour/alternate access. Exceptions may be granted by the WSDOT Engineer for a non-occupied property if written permission is granted by the property owner. The Design-Builder shall provide these notifications and/or written exceptions when submitting the closure request to the WSDOT Engineer

2.22.4.5.2.7 Mast Arm Erection and Traffic Block Allowance

During erection of mast arm assemblies, the Design-Builder may, with the prior authorization from the WSDOT Engineer, block all traffic for intervals of a maximum of 5 minutes between midnight and 4:00 a.m. These 5-minute

blockages shall be separated by an interval long enough to allow the delayed vehicles to clear.

2.22.4.5.3 Construction and Maintenance of Detours

Unless otherwise approved, the Design-Builder shall maintain two-way traffic during construction. The Design-Builder shall build, maintain in a safe condition, keep open to traffic, and remove when no longer needed, the following:

1. Detours and detour bridges that will accommodate traffic diverted from the roadway or bridge during construction
2. Detour crossings of intersecting highways
3. Temporary approaches

The Design-Builder shall pay all costs to build, maintain, and remove other detours, whether built for the Design-Builder's convenience or to facilitate construction operations. Detours proposed by the Design-Builder shall conform to the requirements of the Contract. Surfacing and paving shall be consistent with traffic requirements and in accordance with Section 2.07, *Pavement*.

Upon failure of the Design-Builder to immediately provide, maintain, or remove detours or detour bridges, the WSDOT Engineer may, without further notice to the Design-Builder or the Surety, perform the above and deduct all of the costs from payments due or coming due to the Design-Builder.

2.22.4.6 Construction Requirements

2.22.4.6.1 General

The Design-Builder shall plan, manage, supervise, and perform all temporary traffic control activities required to support the Work using labor, equipment, and materials provided by the Design-Builder (except when such labor, equipment, or materials are to be provided by WSDOT specifically identified herein).

The Design-Builder shall be responsible for all MOT starting at 12:01 a.m. on the day following NTP1. The temporary traffic control devices, including temporary signal systems, shall be continually and adequately monitored and maintained to ensure proper placement and working order, and to ensure the safe and efficient flow of all traffic through and adjacent to the Project. Such responsibility and maintenance shall continue until 11:59 p.m. on the day of Physical Completion of the Project. The WSDOT Engineer may, in writing, temporarily suspend such responsibility in conjunction with an official suspension for weather or other reasons.

2.22.4.6.2 Materials

All materials shall meet the requirements of Section 9-35 of the Standard Specifications. Additionally, all materials shall conform to the requirements of the General Special Provisions.

2.22.4.6.3 Traffic Control During Construction

The Design-Builder shall provide flaggers and all other personnel required for traffic control activities, unless specified in the Contract as being provided by WSDOT.

The Design-Builder shall perform all procedures necessary to support the Work.

The Design-Builder shall provide signs and other traffic control devices not otherwise specified in the Contract as being provided by WSDOT. The Design-Builder shall erect and maintain all construction signs, warning signs, detour signs, and other traffic control devices necessary to warn and protect the public at all times from injury or damage as a result of the Design-Builder's operations which may occur on or adjacent to highways, roads, or streets. No Work shall be done on or adjacent to the roadway until all necessary signs and traffic control devices are in place.

The traffic control resources and activities described shall be used for the safety of the public, the Design-Builder's employees, and WSDOT personnel; and to facilitate the movement of the traveling public. Traffic control resources and activities may be used for the separation or merging of public and construction traffic when such use is in accordance with the RFC TCPs.

Upon failure of the Design-Builder to immediately provide flaggers; erect, maintain, and remove signs; or provide, erect, maintain, and remove other traffic control devices when requested to do so by the WSDOT Engineer, the WSDOT Engineer may, without further notice to the Design-Builder or the Surety, perform the above and deduct all of the costs from payments due or coming due to the Design-Builder.

The Design-Builder shall be responsible for providing adequate labor, sufficient signs, and other traffic control devices; and for performing traffic control procedures needed for the protection of the Work and the public at all times regardless of whether or not the labor, devices, or procedures have been ordered by the WSDOT Engineer, provided by the WSDOT Engineer, or paid for by WSDOT.

When performing Work, the Design-Builder's equipment shall follow normal and legal traffic movements. The Design-Builder's ingress and egress of the Work area shall be accomplished with as little disruption to traffic as possible. Traffic control devices shall be removed by picking up the devices in a reverse sequence to that used for installation. This may require backing up through the Work area. When located behind barrier or at other locations shown on RFC TCPs, equipment may operate in a direction opposite to adjacent traffic.

Under the Contract, the Design-Builder is responsible for all traffic control, and participation by law enforcement personnel in traffic control activities shall be preceded by an agreement. Nothing in the Contract is intended to create an entitlement, on the part of the Design-Builder, to the services or participation of the law enforcement organization.

2.22.4.6.4 Signing, Pavement Markings, and Traffic Control Devices During Construction

The Design-Builder shall inspect all signing (existing and temporary) daily noting damaged signs, misplaced signs, and graffiti affecting legibility of the signs. Every detour route shall be driven hourly to ensure all detour signing is in place. Signing for detours shall be covered or removed when detours are not in use. The Design-Builder shall provide a schedule for repairing, cleaning, or replacing signs; procedures shall address rectifying incorrect or misleading signing that may present a hazard to road users.

The Design-Builder shall ensure there are no conflicting or misleading signs due to adjacent projects. The Design-Builder shall coordinate with adjacent projects and relocate signs as required to avoid conflicting information. Temporary pavement markings shall be installed in accordance with Sections 8-23 and 9-34 of the Standard Specifications.

The Design-Builder shall ensure temporary pavement markings do not conflict with existing pavement markings including recessed and raised markings. If a conflict occurs with existing recessed pavement markings the Design-Builder shall remove the recessed pavement markings by filling the recess with a hot-applied, pourable, aggregate-filled, polymer-modified asphalt pavement repair mastic in accordance with Section 5-03 of the Standard Specifications.

Immediately after implementing any revision to the temporary channelization, the Design-Builder shall obliterate all ghost striping and blemishes resulting from the removal of temporary pavement markings by shotblasting or hydroblasting. Pavement markings that are behind barrier may remain, provided they are not visible to the motoring public.

Roadway surfaces where pavement markings are removed shall be scarified using shotblasting or hydroblasting to remove all ghost stripes from roadway surfaces visible to the motoring public. Shotblasting or hydroblasting shall be completed with a minimum 3-foot-wide strip centered over the ghost stripe or blemishes, and the entire removal area shall be feathered into the existing pavement until all ghost stripes and blemishes are unidentifiable as a pavement marking. Ghost striping is defined as the shadow or scarring on the pavement surface where pavement markings have been removed. See Section 2.13, *Bridges and Structures*, for additional requirements for removal of pavement markings on bridge decks and approach slabs.

The pavement marking removal will be considered adequate when pavement marking material is not visible to a person with normal vision observing the removal area from a standing position looking 40 feet ahead. In no case shall the pavement marking removal remove more than 0.0625 inches of existing pavement. The Design-Builder shall ensure that the sections of the traveled way where pavement markings are removed will continue to adequately allow water to drain to the shoulders and that no areas of ponding remain.

Prior to application of permanent pavement markings on concrete surfaces, the Design-Builder shall scarify the roadway surface using shotblasting or hydroblasting to remove all ghost stripes and texture the entire width of the traveled way in accordance with this Section and Section 2.20, *Pavement Marking*. Asphalt driving surfaces with damage or ghost striping shall also be planed and overlayed the entire width of the traveled way prior to placing final pavement markings.

The Design-Builder shall use temporary removable tape for temporary pavement marking configurations in areas that will not be ground or overlaid. Refer to Section 2.20, *Pavement Marking*, and the WSDOT *Olympic Region Pavement Marking Policy* (Appendix T) for tape specification and for additional requirements prior to application of permanent pavement markings.

Temporary pavement markings shall be identified on the TCPs and the TMP. If paint or temporary removable tape is used for temporary markings that will remain in place for 48 hours or longer, the markings shall be supplemented with Type 2 RPM installed at a maximum of 40-foot spacing on center for tangent sections and 20 feet on center in all horizontal curves and in accordance with Standard Plan M-20.30. In areas where Type 2 RPM are used to supplement temporary removable tape, the adhesive for the Type 2 RPM shall be butyl rubber. The Design-Builder shall follow all manufacturers' preparation and application procedures for this product. In areas that will be ground or overlaid, Standard Plan M-20.50 shall be used for striping configurations lasting more than 30 Calendar Days.

The Design-Builder shall not use a grinder to remove painted markings. For removal of plastic markings, grinding will be allowed down to the pavement surface.

Sand or other material deposited on the pavement surface as a result of removing pavement markings shall be removed as the Work progresses to avoid hazardous conditions. Accumulation of sand or other material which might interfere with drainage shall not be permitted. Temporary paint on the final pavement surface shall be placed only in the final pavement marking configuration.

The Design-Builder shall inspect all pavement markings daily. The Design-Builder shall provide a schedule for replacing damaged pavement markings and establish minimum replacement time frames based on the degree of degradation. If missing or damaged pavement markings present a hazardous condition, WSDOT may require the Design-Builder to close lanes or replace the pavement markings within 24 hours.

The Design-Builder shall clean or replace all pavement markings when they become damaged or lose reflectivity.

The Design-Builder shall replace or clean temporary pavement markings whenever the reflectance of the markings has deteriorated to less than 100 mcd/m^2/lux. The Design-Builder shall perform the required tests monthly, at 1-mile intervals or at specific locations requested by the WSDOT Engineer.

As each construction phase is completed, the Design-Builder shall install the final signing and pavement markings required to safely open the road to traffic. This Work shall be completed on or before the date of opening. Overhead signs except exit only signs may be temporarily ground-mounted at the Design-Builder's expense.

The Design-Builder shall have adequate spare sections of temporary barrier and the necessary equipment on-site to replace and repair temporary barrier within 4 hours of identification by or notice given to the Design-Builder of damaged barrier. This requirement shall include replacement of impact attenuators. Temporary traffic control shall be set up immediately upon notice of damage to ensure vehicle safety.

2.22.4.6.5 Temporary Signalization

This Section applies to new temporary signals necessary for detour routes or other construction staging. Modifications to existing traffic signals shall be shown in the TCPs and approved by the operating agency. Modifications proposed for signal timing or staging shall be coordinated with and approved by the operating agency. A traffic signal warrant analysis may be required for approval.

2.22.4.6.5.1 Temporary Signal Requirements

The Design-Builder shall furnish and install all required materials for the temporary signalization. The Design-Builder shall provide vehicle detection methods to optimize all temporary signal system installations. The Design-Builder may use Type 3 induction loops or video image detection for temporary signal installations.

2.22.4.6.5.2 WSDOT Inspection

The Design-Builder shall provide a minimum of 7 Calendar Days' notice to the WSDOT Engineer prior to implementing temporary signalization. The WSDOT Engineer will perform the final electrical inspection and acceptance of temporary signal systems in accordance with WAC 296-46B. When signals are owned and operated by other Local Agencies, the Design-Builder shall follow that jurisdiction's requirements.

2.22.4.6.5.3 Signal Turn-On

The Design-Builder shall secure and pay for the services of a law enforcement agency to perform traffic control while the traffic signal is being placed into service. Appropriate signing shall be installed by the Design-Builder in advance of signal turn-on. The Design-Builder shall request a timeframe for signal turn-on from the WSDOT Engineer. The request for the signal turn-on shall be submitted 14 Calendar Days in advance for the desired date, and approval by the WSDOT Engineer shall be obtained at least seven days prior to actual turn-on date.

2.22.4.6.5.4 Operation and Maintenance

The Design-Builder shall develop Timing Plans and staging for the temporary signal operation. WSDOT or the operating agency will enter the timing parameters into the signal controller. The Design-Builder may be allowed to enter the timing parameters into the signal controller with the approval of the WSDOT Engineer or the operating agency.

WSDOT or the operating agency will operate and maintain the temporary signal systems once the signal is turned on and operational. The Design-Builder shall remove all temporary signal systems upon completion and operation of the new permanent signal systems.

Temporary signal operation and maintenance responsibilities are the same as for permanent signal systems, as described in Section 2.17, *Traffic Signals*.

2.22.4.6.6 Temporary Illumination

The Design-Builder shall evaluate the lighting values of the existing illumination in relation to the temporary configuration to determine if the existing illumination provides the required illumination values. If the required illumination values are not satisfied, the Design-Builder shall provide temporary illumination satisfying the "construction lanes and detours" light level and uniformity ratios in accordance with the WSDOT *Design Manual*.

Where temporary illumination is required, the existing illumination system shall not be removed until the temporary system is operational. Only lighting equipment no longer needed for illumination of the roadway shall be removed.

The Design-Builder shall provide temporary lighting satisfying the "construction lanes and detours" light level and uniformity ratios when existing lighting must be removed or disconnected, and new lighting is not in operation.

The Design-Builder shall provide temporary lighting for all intersections where traffic control devices are in place. The temporary lighting shall satisfy the greater of the "construction lanes and detours" or the specific intersection light level and uniformity ratios.

Temporary lighting is required when an obstruction (such as a new bridge) is placed over an area requiring illumination and shall be installed prior to placing the obstruction.

The Design-Builder shall provide temporary lighting satisfying the "construction lanes and detours" light level.

In addition to the requirements of the WSDOT *Design Manual*, the Design-Builder shall provide temporary lighting satisfying the "construction lanes and detours" light level and uniformity ratios for temporary channelization or traffic control.

Portable light stands shall not be used for temporary roadway lighting.

The Design-Builder shall provide temporary illumination satisfying the "required illumination" described in the WSDOT *Design Manual*. Temporary illumination shall be in place and in operation prior to implementing the TCPs which require the temporary illumination.

2.22.4.6.6.1 General

At a minimum, the Design-Builder shall perform the following:

1. Design Temporary Lighting Plans.
2. Maintain current levels of roadway illumination for all roadway segments and intersections that are currently lit.
3. Provide all materials and equipment for temporary lighting installations.
4. In the clear zone, provide only lighting units that are breakaway or protected from crash potential.
5. Provide maintenance for the temporary lighting system. Damage to the existing illumination system shall be repaired prior to hours of darkness on the following day.

Temporary illumination shall be provided in accordance with the requirements for construction lanes and detours in the WSDOT *Design Manual*.

2.22.4.6.6.2 Timber Light Standards

Timber light standards may be used for temporary lighting where breakaway or slip bases are not required. Timber light standards shall be outside of the design clear zone or protected by barrier.

2.22.4.7 Traffic Control Personnel

The Design-Builder shall plan, conduct, and safely perform the Work. The Design-Builder shall manage temporary traffic control.

The Design-Builder shall provide all personnel for flagging; execution of all procedures related to temporary traffic control; and setup, maintenance, and removal of all temporary traffic control devices and construction signs necessary to control traffic during construction operations.

2.22.4.7.1 Traffic Control Management

One or more of the Design-Builder's supervisors, who are actively involved in the planning and management of field contract activities, shall assume the responsibilities for traffic control management. The Design-Builder shall provide the WSDOT Engineer with a copy of the formal assignment. The duties of traffic control management shall not be Subcontracted.

The Design-Builder's traffic control management personnel shall be responsible for the following:

1. Overseeing and approving the actions of the TCS to ensure that proper safety and traffic control measures are implemented and consistent with the specific requirements of the Project. An alternate form of oversight shall be in place and effective when the traffic control management personnel are not present at the Work area.
2. Providing the Design-Builder's designated TCS with RFC TCPs which are compatible with the Work and traffic control for which they will be implemented.
3. Discussing proposed traffic control measures and coordinating implementation of the TCPs with the WSDOT Engineer.
4. Coordinating all traffic control operations, including those of Subcontractors and suppliers, with each other and with adjacent construction or maintenance operations.
5. Coordinating the Project's activities (such as ramp closures, road closures, and lane closures) with appropriate police, fire control agencies, city or county engineering, medical emergency agencies, school districts, and transit companies.
6. Coordination with Railroad Inspectors and Railroad Flaggers shall be in accordance with required permits/licenses defined in Section 2.23, *Railroad*.
7. Overseeing all requirements of the Contract that contribute to the convenience, safety, and orderly movement of vehicular and pedestrian traffic.
8. Reviewing the TCS's diaries daily and being aware of field traffic control operations.
9. Coordination, review, and retention of video log and storage.
10. Have available at all times, on-site, all applicable standards and specifications as described in this Section.

Failure to carry out the above-referenced responsibilities shall be considered a failure to comply with the Contract and may result in a suspension of Work as described in Section 1-08 of the *General Provisions*.

2.22.4.7.2 Traffic Control Supervisor

The Design-Builder shall designate one or more people to perform the duties of the primary TCS and identify an alternate TCS who can assume the duties of the primary TCS in the event of that person's inability to perform. The TCS shall be responsible for safe implementation of the RFC TCPs.

TCS shall have at least 5 years of practical temporary traffic control experience with design and implementation of TCPs on freeway construction projects.

The TCS shall possess a current Washington State Traffic Control Supervisor card and be certified as a Work Site Traffic Control Supervisor by one of the following agencies:

The Northwest Laborers-Employers Training Trust
27055 Ohio Avenue
Kingston, WA 98346
360-297-3035

Evergreen Safety Council
12545 135th Avenue NE
Kirkland, WA 98034
(800) 521-0778 or 425-814-3868

American Traffic Safety Services Association
15 Riverside Parkway
Suite 100
Fredericksburg, VA 22406
(800) 272-8772 or 540-368-1701

Integrity Safety
13912 NE 20th Ave.
Vancouver, WA 98686
(360) 574-6071
https://www.integritysafety.com

US Safety Alliance
(904) 705-5660
https://www.ussafetyalliance.com

K&D Services
2719 Rockefeller Ave.
Everett, WA 98201
(800) 343-4049
https://www.kndservices.net/

Possession of a current flagging card, issued by the State of Washington, Oregon, Montana, or Idaho, by the TCS is mandatory.

A TCS shall be present on the Project whenever flagging, or other traffic control is occurring; or less frequently, as authorized by the WSDOT Engineer.

During nonworking hours, the TCS shall be on-site within 45 minutes after notification by the WSDOT Engineer.

The TCS shall perform all of the duties listed below:

1. Possess a current set of RFC TCPs; applicable Contract Requirements as provided by the Design-Builder; the Washington State Modifications to the Manual on Uniform Traffic Control Devices; the *FHWA Manual on Uniform Traffic Control Devices for Streets and Highways*; the *ATSSA Quality Guidelines for Work Zone Traffic Control Devices*; and applicable standards and specifications.

2. Inspect traffic control devices and nighttime lighting for proper location, installation, message, cleanliness, and effect on the traveling public. Traffic control devices shall be inspected at least once per hour during working

hours, except that Class A signs and nighttime lighting may be inspected only twice a week. Traffic control devices left in place for 24 hours or more shall also be inspected once during nonworking hours when they are initially set up (during daylight or darkness, whichever is opposite of the working hours). The TCS shall correct, or arrange to have corrected, deficiencies noted during these inspections.

3. Prepare a daily traffic control diary on each day that traffic control is performed using WSDOT Form 421-040A EF, *Contractor's Daily Report of Traffic Control - Summary* and WSDOT Form 421-040B EF *Contactor's Daily Report of Traffic Control – Traffic Control Log*. The Design-Builder shall maintain all copies of the daily traffic control diaries and shall make them available to the WSDOT Engineer no later than the end of the next business day. The Design-Builder may use alternate forms if approved by the WSDOT Engineer. Diary entries shall include, at a minimum, the following:

   a) Time of day when signs and traffic control devices are installed and removed

   b) Location and condition of signs and traffic control devices

   c) Revisions to the TCPs

   d) Lighting used at night

   e) Observations of traffic conditions

   f) Identify TCPs in use and provide location on the Project where TCPs are used

4. Make minor revisions to the TCPs to accommodate Site conditions and minimize obstructions, provided that the original intent of the TCPs is maintained. The revisions shall only shift devices laterally without adding or deleting devices and shall be documented in the daily traffic control diary. The TCPs shall be revised and re-released when determined necessary by the WTEM.

5. Attend traffic control coordination meetings or coordination activities, including meetings and activities for adjacent projects, as necessary, for a complete understanding of the Project and effective performance.

6. Ensure that all required traffic control devices and equipment are available and in good working condition prior to the need to install or use them.

7. Ensuring that all pedestrian routes or access points, existing or temporary, are kept clear and free of obstructions and that all temporary pedestrian routes or access points are detectable and accessible to persons with disabilities as provided for in the RFC TCPs.

8. Have available at all times, on-site, all applicable standards and specifications available as described in this Section.

Provided that the duties of the TCS are accomplished, the TCS may perform other duties described in this Section.

The TCS shall be considered a critical component of the Design-Builder's management team and shall have prior experience managing TCP operations on similarly complex projects. Registration as a Professional Engineer is not required; however, the Design-Builder may elect to use the WTEM in this position. The TCS shall attend all MOT task force meetings. The TCS shall also coordinate activities with the Communications Specialist.

The TCS or a designee shall be available on a 24-hour basis with a single contact phone number throughout the duration of the Project; supervise and verify all changes in the TCP setup; and perform daily Project Reviews to verify that traffic control devices are correctly placed and traffic is safely and efficiently moving through the Project. The TCS or an alternate TCS shall be on-site within 45 minutes of notification of an emergency situation and shall be prepared to positively respond to the need to repair the traffic control system or to provide alternate traffic arrangements. The TCS shall have the resources, ability, and authority to expeditiously correct deficiencies in the traffic control system, or to de-mobilize construction operation that is resulting in excessive delays to traffic or creating an unsafe condition.

The TCS shall maintain a 30 Calendar Day advance schedule of all traffic control activities and a long-range schedule for all planned ramp and roadway closures. The TCS shall coordinate with the Design-Builder's Communications Specialist to ensure the information is disseminated to WSDOT, Local Agencies, and the public.

The TCS shall perform drive-through inspections as indicated above and immediately after all shifts in TCP setup, while crews are still on-site to make modifications. If the Project has signalized intersections, the review shall be done prior to each morning peak traffic period, and each signal cycle shall be reviewed. At least two of the daily inspections each week shall be performed at night so that the arrangement and condition of the lights can be reviewed. The inspections shall also include assurances that pedestrians and bicyclists have a safe travel path around or through the Project area, and that existing businesses have adequate access during business hours, if applicable. The results of the inspections shall be documented in a daily report that, at a minimum, lists the time frame of the drive-through inspection and the defects noted. The report shall also document maintenance or corrective actions ordered as a result of the inspection, and the name and position of the Design-Builder's personnel who have been directed to provide the maintenance or corrective action. The daily report shall state that the TCP setup and all traffic control devices substantially conform to the Contract requirements, except as noted, and shall be signed by the TCS.

2.22.4.7.3 Flaggers

Workers engaged as flaggers shall wear reflective vests and hard hats. High-visibility apparel shall be in accordance with Section 1-07 of the *General Provisions*.

Flaggers shall be posted where shown on the RFC TCPs. All flaggers shall possess a current flagging card issued by the states of Washington, Oregon, Montana, or Idaho. The flagging card shall be immediately available and shown to the WSDOT Engineer upon request.

Flagging stations shall be shown on TCPs at locations where construction operations require stopping or diverting public traffic. Flagging stations shall be staffed only when flagging is required. This staffing may be continuous or intermittent, depending on the nature of the construction activity. Whenever a flagger is not required to stop or divert traffic, the flagger shall move away from the flagging station to a safer location.

Flaggers shall be equipped with portable two-way radios, with a range suitable for the Project. The radios shall be capable of having direct contact with Project management (e.g., foremen and superintendents).

During hours of darkness, flagging stations shall be illuminated in a manner meeting the requirements of FHWA *Manual on Uniform Traffic Control Devices for Streets and Highways* and this Section.

The Design-Builder shall provide portable lighting equipment capable of sufficiently illuminating a flagger station without creating glare for oncoming motorists or for the flagger while meeting the mobility requirements of the operation. The equipment shall be located on the same side of the roadway as the flagger, positioned 5 to 10 feet from the edge of the traveled lane and be aimed down at the flagging station. The flagger shall be visible and discernable as a flagger from a distance of 1,000 feet.

The Design-Builder shall provide the standard stop/slow paddles for all flagging operations. Stop/slow paddles shall conform to the Standard Specifications.

No flaggers shall be used on freeways.

Requirements for flaggers related to Work within a BNSF Railway Company's Right of Way or property shall be in accordance with Section 2.23, *Railroad*.

Traffic stops during daytime hours for tree falling shall be 5 minutes or less. Short term traffic stops during daytime hours for truck ingress/egress shall be 1 minute or less.

2.22.4.7.4 WSDOT Electrical Inspector

The Washington State Department of Labor and Industries has authority over all electrical installations within the State. WSDOT has been granted authority over all electrical installations within the Right 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

Applicable Laws. It is the role of the WSDOT Electrical Inspector to ensure that all electrical installations, including Illumination, Traffic Signal, and ITS installations, meet the requirements of the National Electrical Code and Applicable Laws and provisions.

The WSDOT Electrical Inspector will perform the following:

1. Act as a resource for the electrical design team
2. Assist with electrical system plan reviews (as applicable)
3. Perform periodic electrical inspections during construction
4. Witness required field tests (as desired)
5. Perform inspections required before energizing new equipment or circuits
6. Inspect and approve all electrical installations in accordance with this Contract

2.22.4.7.5 Other Traffic Control Labor

In addition to flagging or spotting duties, the Design-Builder shall provide personnel for all other traffic control procedures required by the construction operations; and personnel to install, maintain, and remove traffic control devices shown on the TCPs.

2.22.4.8 Video Record

A drive-through video of all TCP devices shall be made each week; immediately after each accident causing injuries; and after each shift in TCP setup. The video recordings shall be saved digitally and maintained in a remote, fireproof location, and a log of the video recordings with dates and times shall be provided to the WSDOT Engineer on a monthly basis. The WSDOT Engineer shall have the right to review the video recordings with 24 hours' notice to the Design-Builder.

2.22.4.9 Traffic Control Procedures

2.22.4.9.1 Alternating One-Lane, Two-Way Traffic Control

As shown on an RFC TCP or directed by the Engineer of Record, on two-lane roadways, traffic may be placed in a single open lane under the control of flaggers, Automated Flagger Assistance Devices (AFADs), or temporary traffic signals to alternate the direction of traffic. Side roads will be controlled by flaggers, AFADs, signals or closed. If flaggers and a pilot car are used, driveways and private roads may be controlled by signing informing drivers to wait for a pilot car. Flagger, AFAD or signal stations shall be illuminated at night. If flaggers are used at an intersection, a flagger is required for each leg of the intersection and each direction of traffic should be reduced to one open lane approaching a flagger. Contractor vehicles shall not use the open traffic lane except while following the same rules and routes required of the public traffic. Alternating one-lane, two-way traffic controls shall remain in place until work is completed or the roadway can be opened in a safe operating condition.

2.22.4.9.2 Rolling Slowdown

Rolling slowdown traffic control operations use a rolling blockade of vehicles traveling at slow speeds to create a gap in traffic to enable completion of work activities requiring access across or over all the directional lanes of a roadway. It is critical no traffic gets between the rolling blockade and work area. Rolling slowdown operations are not to be used for routine Work that can be addressed by standard lane or shoulder closure traffic control. The Design-Builder shall provide a site-specific TCP that includes WSP enforcement as part of the traffic control strategy, and use of WSP shall be reflected on the TCPs. Refer to Chapter 1010 of the WSDOT *Design Manual* and Chapter 5 of the WSDOT *Traffic Manual* for additional requirements.

When a short-term roadway closure is needed for an infrequent, nonrepetitive Work operation such as a sign bridge removal or utility wire crossing, the Design-Builder may implement a rolling slowdown on a multilane roadway, as part of an RFC TCP.

The RFC TCP shall detail the expected delay time, interchange ramp control, and rolling slowdown distance. A portable changeable message sign shall be placed ahead of the starting point of the traffic control to warn traffic of the slowdown. The sign shall be placed far enough ahead of the Work to avoid expected backup of vehicles. A rolling slowdown blockade requires one traffic control vehicle with flashing amber lights for each lane to be slowed, plus a traffic control vehicle to serve as a chase vehicle following traffic ahead of the blockade. These traffic control vehicles shall enter the roadway and form a moving blockade to reduce traffic speeds and create a clear area ahead of the blockade. All on-ramps and entrances to the Roadway between the moving blockade and Work operation shall be temporarily closed with traffic control vehicles and freeway-to-freeway on-ramps to be closed with standard traffic control devices. When the chase vehicle reaches the work area, work may begin.

Communications between the Work operation and the moving blockade vehicles shall establish and adjust the speed of the blockade and closure times needed based on the work progress. The RFC TCP shall detail the calculated location where the traffic control vehicles shall begin the slowdown and the speed at which the moving blockade will travel based on the estimated time needed for closure. The duration of the rolling slowdown operation shall not exceed 15 minutes. The RFC TCP shall also include the locations of portable changeable message signs, blockade vehicles, chase vehicle and ramp control vehicles needed for the operation.

The location where the traffic control vehicles shall begin the slowdown and the speed at which the moving blockade will be allowed to travel will be calculated to accommodate the estimated time needed for closure. The chase control vehicle shall follow the slowest vehicle ahead of the blockade. When the chase vehicle reaches the work area, the Design-Builder may begin the Work operation. In the event that the Work operation is not completed when the moving blockade

reaches the site, all Work except that necessary to clear the Roadway shall cease immediately and the Roadway shall be cleared and reopened as soon as possible.

2.22.4.9.3 Lane Closure Setup/Takedown

Where allowed by the Contract, shown on the RFC TCPs, or directed by Engineer of Record, the Design-Builder shall establish traffic control measures to close one or more lanes of a freeway or multi-lane roadway 45 mph or higher. When this is scheduled to occur, the Design-Builder shall adhere to the following sequence:

1. If shown on the RFC TCP place portable changeable message sign(s).
2. Set up advance warning signs on the shoulder of the roadway opposite the lane to be closed.
3. Set up advance warning signs on the same shoulder as the lane to be closed.
4. Move a TA with arrow board in arrow mode, into the lane being closed to protect workers. Only the operator is allowed in this vehicle.
5. Place channelization devices and arrow board to mark the closure taper as shown on the RFC TCP.
6. The TA/arrow board combination is repositioned within the closed lane, now with the arrow board in caution mode in advance of the workers installing the remaining devices.

If additional lanes are to be closed, this shall be done in sequence with previous lane closures, using the same sequence of activities. A TA with arrow board is required during the process of closing each additional lane and may be replaced with an arrow board without attenuator after the lane is closed. Each closed lane shall be marked with a separate arrow board at all times.
Channelization devices shall not be moved by traffic control personnel across an open lane of traffic. If an existing setup or staging of traffic control devices require crossing an open lane of traffic, the traffic control devices shall be taken down completely and then set up in the new configuration.

Traffic control for lane closures shall be removed in the reverse order of its installation.

2.22.4.9.4 Patrol and Maintain Traffic Control Measures

When temporary traffic control measures are in place, the Design-Builder shall patrol and maintain these measures, at all times. The Work shall consist of resetting displaced devices; assuring visibility of all devices; cleaning and repairing where necessary; providing maintenance for all equipment, including replacing batteries and light bulbs, as well as keeping motorized and electronic items functioning; and adjusting the quantity and location of devices to respond to actual conditions, such as queue length, unanticipated traffic conflicts, and other areas where planned traffic control has proven ineffective.

This Work shall be performed by the Design-Builder, either by or under the direction of the TCS. Personnel, with vehicles, if necessary, shall be dispatched so

that all traffic control can be reviewed at least once per hour during working hours, and at least once during each Calendar Day.

2.22.4.10 Traffic Control Devices

Traffic control devices are used to visually guide drivers through Work zones. Signing, channelizing devices, arrow boards, and warning beacons all display a message to the driver. Work zone credibility is established through the proper use of these devices to send correct messages to drivers. Poor Work zone credibility has a direct, negative impact on Work zone safety by causing driver confusion, frustration, and disrespect, which results in an increased potential for accidents.

All traffic control devices shall be removed from the Work Zone Clear Zone or placed behind barrier or guardrail away from traffic when not in use. Traffic safety drums, traffic cones, tubular markers or tall channelizing devices may remain in the Work Zone Clear Zone if they can be placed off the paved shoulder.

The Design-Builder shall locate traffic control devices so as not to block the existing sidewalk to pedestrians, and to provide adequate space for wheelchairs.

2.22.4.10.1 Construction Signs

All construction signs required by the RFC TCPs, as well as other appropriate signs directed by the Engineer of Record or as requested by the WSDOT Engineer, shall be provided by the Design-Builder. The Design-Builder shall provide the posts or supports, and erect and maintain the signs in a clean, neat, and presentable condition until they are no longer required. Post-mounted signs shall be installed as shown in the Standard Plans. Sign attachment to posts shall conform to the applicable detail shown in the Standard Plans. When the construction signs are no longer required, the Design-Builder shall remove all signs, posts, and supports from the Project and they shall remain the property of the Design-Builder.

No passing zones on the existing roadway that are marked with paint striping and where striping is anticipated to be destroyed by construction operations shall be replaced by “Do Not Pass” and “Pass With Care” signs. The Design-Builder shall furnish and install the signs and posts. The signs shall be maintained by the Design-Builder until they are removed, or upon Physical Completion. When the Project includes striping by the Design-Builder, the signs and posts shall be removed by the Design-Builder when the no-passing zones are re-established by striping. The signs and posts shall become the property of the Design-Builder.

All existing signs, new permanent signs installed as part of the Work, and construction signs installed as part of the Work that are inappropriate for the traffic configuration at a given time, shall be removed or covered in accordance with Section 8-21.3(3) of the Standard Specifications.

When variable work zone speed limits are used, existing regulatory speed limit signs shall be removed or covered in accordance with Section 8-21.3(3) of the Standard Specifications. Temporary regulatory speed limit signs shall be posted on 5-foot temporary mountings or barrier-mounted near each removed or covered

speed limit sign. The existing speed limit shall remain posted unless a variable work zone speed limit is in effect in accordance with the traffic control plan. Temporary regulatory speed limit signs shall be black on white background. On multilane roadways 45 mph and higher, temporary regulatory speed limit signs shall be 36"×48" signage (36"×72" if separate truck speed limit is used). On other roadways, the temporary regulatory speed limit signs shall use 24"×30" signage.

Construction signs are divided into two classes. Class A construction signs are those signs that remain in service throughout the construction or during a major phase of the Work. They are mounted on posts, existing fixed structures, or substantial supports of a semi-permanent nature. Class A signs shall be designated as such on the RFC TCPs. "Do Not Pass" and "Pass With Care" signs are Class A construction signs. Sign and support installation for Class A signs shall be in accordance with the Contract or the Standard Plans. Class B construction signs are those signs that are placed and removed daily, or are used for short durations, which may extend up to 7 Calendar Days. They are mounted on portable or temporary mountings.

Class A construction signs mounted behind traffic barrels shall be mounted a minimum of 5 feet above the ground (ground to bottom of sign).

Where it is necessary to add weight to signs for stability, sandbags or other similar ballast may be used, but the top of ballast shall not be more than 4 inches above the Roadway surface and shall not interfere with the breakaway features of the device. The Design-Builder shall follow the manufacturer's recommendations for sign ballasting.

Signs, posts, or supports that are lost, stolen, damaged, destroyed, or which the WSDOT Engineer deems to be unacceptable while used on the Project, shall be replaced by the Design-Builder.

2.22.4.10.2 Sequential Arrow Signs

Sequential arrow signs shall be shown on the TCPs either as a stand-alone unit without a TA or as a unit with a TA. When required, and as shown on the TCPs, the Design-Builder shall provide, operate and maintain sequential arrow signs.

Sequential arrow signs (arrow boards) on this Project shall also have the following communication abilities:

1. Provide electronic Work Zone Data Exchange (WZDx) Specification compliant data feeds to WSDOT from the arrow board or the Arrow Boards central server.
2. Arrow Boards used on this Project shall have the ability to transmit its GPS coordinates (latitude and longitude) with an accuracy of 30-foot diameter of its actual location.
3. Arrow Boards shall transmit its GPS coordinates and mode of operation data to a compatible publicly accessible mapping app service.
4. Arrow Boards shall transmit status and location as follows:

a. Mode change within 2 minutes.

b. Location (if moved more than 500 feet) within 2 minutes.

c. Health checks every 30 minutes.

d. Current "indication" posted on Board (e.g., left or right chevron, arrow direction, four corner flash, etc.).

If Arrow Board repairs are required, the Design-Builder shall control traffic with Arrow Board without GPS and remote communication abilities, and the Arrow Board needing repairs shall be repaired or replaced within 48 hours.

Arrow Boards shall be deactivated immediately when the unit is not in use in accordance with the accepted traffic control plan.

Any data service costs for communications shall be the responsibility of the Design-Builder.

2.22.4.10.3 Portable Changeable Message Signs

Where shown on a RFC TCP or when requested by the WSDOT Engineer, the Design-Builder shall provide, operate, and maintain a portable changeable message sign (PCMS). A PCMS shall be a full sized PCMS, mini portable changeable message sign (mPCMS), or truck-mounted PCMS. mPCMSs are compact version of full-size PCMSs. Truck-mounted PCMSs are permanently affixed to a traffic control vehicle and meant to be mobile.

Position full sized PCMS or mPCMSs to provide at least 2 feet of lateral clearance from the nearest open lane and transversely delineate with at least 3 channelization devices. For truck-mounted PCMSs, provide 2 feet of lateral clearance but transverse delineation is not required.

The Design-Builder shall remove these devices from the work zone clear zone when not in use unless protected by barrier or guardrail. All Portable Changeable Message Signs shall be in accordance with Section 9-35.5 of the Standard Specifications.

Where shown as a smart work zone device on an RFC TCP, the PCMS shall have remote communications and be used as part of the strategy approved by the Engineer of Record.

BETTERMENT

The Design-Builder has committed to providing one additional PCMS in each direction of SR 167 and Meridian to communicate information ahead of major road closures and traffic staging shifts.

2.22.4.10.4 Barricades

Where shown on the RFC TCPs or when requested by the WSDOT Engineer, the Design-Builder shall furnish, install, and maintain barricades. Barricades shall be kept in acceptable condition, as defined in the *ATSSA Quality Guidelines for Work Zone Traffic Control Devices*.

Where it is necessary to add weight to barricades for stability, the Design-Builder shall follow the manufacturer's recommendations for sign ballasting.

2.22.4.10.5 Traffic Safety Drums

Where shown on the RFC TCPs, or when requested by the WSDOT Engineer, the Design-Builder shall furnish, install, and maintain traffic safety drums.

All traffic safety drums shall be in accordance with Section 9-35.7 of the Standard Specifications and have the same reflective sheeting type. Used traffic safety drums may be utilized, provided all drums used on the Project are of essentially the same configuration and in acceptable condition, as defined in the *ATSSA Quality Guidelines for Work Zone Traffic Control Devices*. Used traffic safety drums shall meet the requirements of this Section.

Traffic safety drums shall be designed to resist overturning by means of a weighted lower unit that shall separate from the drum when impacted by a vehicle.

Traffic safety drums shall be regularly maintained to ensure that they are clean and that the drum and reflective material are in good condition. When a drum has been damaged beyond usefulness, or provides inadequate reflectivity, a replacement drum shall be provided by the Design-Builder at no cost to WSDOT.

When the traffic safety drums are no longer required, they shall be removed from the Project and shall remain the property of the Design-Builder.

2.22.4.10.6 Traffic Cones

Where shown on the RFC TCPs, or when requested by the WSDOT Engineer, the Design-Builder shall furnish, install, and maintain traffic cones. The Design-Builder shall not use traffic cones on State highways nor interstates. Traffic cones shall be kept in good repair and shall be removed immediately when directed by the WSDOT Engineer. Where wind or moving traffic frequently displaces cones, an effective method of stabilizing cones, such as stacking two together at each location, shall be employed.

2.22.4.10.7 Tubular Markers and 42-Inch-Tall Channelizing Devices

The Design-Builder shall not use tubular markers or tall channelizing devices on State highways or interstates for temporary lane closures or temporary channelization, unless specifically requested in writing by the Design-Builder and approved by the WSDOT Engineer.

2.22.4.10.8 Warning Lights and Flashers

Where shown on a RFC TCP attached to traffic control devices or ordered by the WSDOT Engineer, the Design-Builder shall provide and maintain warning lights. Lights attached to signs or a specific device shall be a Type A or B, flashing. Lights attached to traffic safety drums or 42-inch-tall channelization devices shall

be Type C, steady-burning. The devices and light unit shall conform to section 2.22.2.1.

2.22.4.10.9 Transportable Attenuator

Where shown on the RFC TCPs, or when requested by the Engineer of Record, the Design-Builder shall provide, operate, and maintain TAs. These TAs shall be available, on-site, for the entire duration of their anticipated use.

The TA shall be placed on each closed lane to separate and protect construction Work zone activities from normal traffic flow. During use, the attenuator shall be in the full down-and-locked position. For stationary operations, the truck's parking brake shall be set.

A TA may be used in lieu of a temporary impact attenuator as part of a stage traffic control shift to protect an object such as a blunt barrier end or a bridge pier column that is located within the WZCZ. This use of a TA is restricted to a maximum of 24 hours unless the WSDOT Engineer approves an extension.

2.22.4.10.10 Temporary Concrete Barrier

TCB shall be either Concrete Barrier Type 2 or Type F. TCB with scuppers shall require supporting Hydraulic Analysis meeting the requirements of Section 2.14, *Stormwater*.

Impact attenuators shall be used to protect the ends of barrier within the clear zone. Refer to Sections 6-10 and 8-17 of the Standard Specifications and Chapters 1610, 1620, 1010, and 1030 of the WSDOT *Design Manual* for material and construction details regarding the barrier, glare screen, attenuators, and barrier delineators. Glare screen on TCB shall conform to the requirements of this Section and the General Special Provisions.

2.22.4.10.11 Automated Flagger Assistance Device

Automated Flagger Assistance Devices (AFADs) are required if shown on a RFC TCP or directed by the Engineer of Record.

Where shown on a RFC TCP, the Design-Builder shall provide, operate, and maintain AFADs.

An AFAD is a self-contained, portable traffic control system that enables a flagger to avoid standing on the roadway while still controlling road users alternating through a single open lane.

AFADs shall meet the requirements of the MUTCD Red/Yellow Lens Automated Flagger Assistance Devices.

AFAD Operation

Each AFAD shall be controlled only by a flagger who has been trained on the operation of the AFADs by a manufacturer or supplier representative in addition to the requirements in accordance with section 2.22.4.7.3. The flagger shall be positioned to visually see both the AFAD and approaching traffic. When this is

not feasible, digital alternatives are allowable. The flagger is prohibited from leaving the AFAD unattended at any time while the AFAD is in operation and controlling traffic.

If AFAD repairs are required, the Design-Builder shall control traffic with flaggers and stop/slow paddles and the AFAD shall be repaired or replaced within 48 hours.

AFAD Location and Use

An AFAD shall only be used in situations where there is only one lane of approaching traffic in the direction to be controlled. AFADs shall not be used within 1,500 feet of existing or temporary traffic signals. When used at night, the AFAD location shall be illuminated in accordance with section 2.22.4.7.3.

The AFAD may be positioned up to the edge of the open travel lane without any lateral clearance, but only the AFAD gate arm can be within the open travel lane when traffic is being stopped. The AFAD shall be delineated by at least 3 transverse channelization devices in advance when not within a closed lane or shoulder.

The "STOP HERE ON RED" R10-6 (24 by 36 inch, B/W) or R10-6a (24 by 36 inch, B/W) sign may be attached to the AFAD below the red/yellow lens. The AFAD may have a supplemental amber LED changeable message sign with minimum 10-inch characters attached to provide road users additional information, provided it does not block any signal display or signage.

The Engineer of Record or WSDOT Engineer may order adjustments to the location as needed based on traffic and field conditions. The Design-Builder shall avoid placing the AFAD within or immediately following horizontal and/or vertical curves when feasible.

Setup and Takedown

During the setup and take down operation of the work area, the AFAD display shall be set to a yellow flash mode when the signal heads are deployed into normal operating position.

Except during setup prior to use and removal after use, the AFAD shall be removed from the work zone clear zone when not in use unless protected by barrier or guardrail.

2.22.4.10.12 Radar Speed Display Sign

Radar speed display signs (RSDS) are required on roadways with approved speed reduction through a work zone, unless otherwise approved by the WSDOT Engineer.

Where shown on a RFC TCP or where ordered by the WSDOT Engineer, the Design-Builder shall provide, operate, and maintain RSDS. A RSDS shall be placed with a minimum of 4 feet of lateral clearance to edge of a travelled lane and be delineated by channelization devices. The Design-Builder shall remove the

RSDS from the clear zone when not in use unless protected by barrier or guardrail.

RSDS shall consist of a fully self-contained see-through trailer with power supply and an LED speed indicator display with a one-direction radar. Above or below the display shall be the message "YOUR SPEED" or "YOUR SPEED IS" in letters of 5 to 8 inches in height. The lowest portion of the display shall be high enough to be visible over concrete barriers or safety drums and a 36 by 48-inch speed limit sign as shown on the RFC TCP shall be mounted above the speed display.

The radar speed measurement shall provide a minimum detection distance of 1,000 feet and have an accuracy of +/ - 1 mph. The radar shall be mounted so detection will function when located behind concrete barrier or drums.

The numeric speed display range shall be 0 to 99 mph with numerals of 18 inches in height minimum, amber in color with a black background with automatic dimming for nighttime operations.

The speed indicator display shall be equipped with a violation alert that flashes the displayed detected speed when the work zone posted speed limit is exceeded. The speed indicator shall have a maximum speed cutoff. Detected speeds more than 25 mph over the posted speed shall not be displayed and speeds under 25 mph shall not be displayed.

The unit shall have traffic data collection capabilities. Upon request, traffic data shall be collected and transmitted to the WSDOT Engineer within 7 Calendar Days of the request.

2.22.4.10.13 Smart Work Zone System

Where shown on a RFC TCP, the Design-Builder shall provide, operate, maintain, and remove a SWZS. A SWZS uses portable roadside sensor information to display real-time dynamic work zone traffic information and instructions to motorists on a series of PCMSs approaching a work zone.

The SWZS shall be capable of communicating three types of work zone traffic information:

1. **Queue detection warning** for slowed or queued traffic ahead.
2. **Dynamic lane merge** guidance to use all open lanes up to the lane closure tapers and zipper merge instructions during times of congestion.
3. **Work zone travel delay** for current work zone delays in minutes.

In locations with multiple SWZS setups each setup shall be capable of operating independently. One SWZS Technician may operate all systems concurrently.

Vendor

The Design-Builder shall select an independent vendor listed below to provide the SWZS as shown a RFC TCP:

Highway Specialties, LLC
Phone: (360) 437-1900
Website: https://www.highwayspecialties.com

Hill and Smith Inc.
Phone: (302) 328-3220
Website: https://www.hillandsmith.com/portfolio_category/its-smart-work-zone/

ICONE by ICONE Products
Phone: (315) 626-6800
Website: http://iconeproducts.com/

Road-Tech Safety Services, Inc.
Phone: (888) 762-3832
Website: https://www.road-tech.com/

SolarTech
Phone: (610) 391-8600
Website: http://solartechnology.com/

Street Smart
Phone: (888) 653-6800
Website: https://www.streetsmartrental.com/smart-work-zones/

Superior Traffic Services
Phone: (888) 928-5999
Website: https://www.superiortrafficservices.com/

Ver-Mac
Phone: (888) 488-7446
Website: https://www.ver-mac.com/en/jamlogic-software/smart-work-zones

WANCO
Phone: (800) 972-0755
Website: https://www.wanco.com

Devices and Communications

The Design-Builder and/or Vendor shall provide all devices necessary to operate the system in accordance with the accepted traffic control plans and these specifications.

The traffic sensors shown in the traffic control plans in advance of lane closure tapers are used to operate the SWZS by detecting vehicle speed approaching the lane closures, where queuing is expected. Typically, these traffic sensors use Doppler radar technology.

Separate side-fire traffic sensor(s), Wavetronix SmartSensor HD or similar accepted by the WSDOT Engineer, shall be post-mounted or trailer-mounted to obtain traffic volume/speed data where shown in the traffic control plans. If not shown, then the side-fire traffic sensor shall be placed after the final lane closure

taper but before lanes are reopened or any open on-ramps to measure the following:

1. Traffic volume, in vehicles per hour per open lane
2. Speed – time graph used to determine the median & 85th percentile speed in each open lane

The Design-Builder shall use and relocate as necessary side-fire traffic sensor(s) at locations compatible with lane closures. As an alternative, multiple side-fire traffic sensors can be used throughout the Project limits provide the traffic volume/speed data remains accurate.

A vendor website or other wireless remote system is required for monitoring SWZS functions and remote management of PCMS messages.

Technician

The vendor shall provide a technician skilled in the operation of all system equipment and software. The technician may be an employee of the vendor or someone trained and authorized by the vendor to operate the system. The technician shall be independent of the Design-Builder and TCS but shall collaborate and coordinate as appropriate. The technician shall be on site while the SWZS is in use and able to respond to system issues in person.

Duties of the technician include, but are not limited to, the following:

1. Program the automated, real-time operation of the SWZS with traffic sensor trigger speed thresholds and PCMS messages shown on the RFC TCP.
2. Service, debug, troubleshoot, and maintain all SWZS components.
3. Maintain SWZS equipment maintenance logs.
4. Collect and process system data and provide data as described below:
    a) **System Data** – System data shall include:
        (1) Data in table format of traffic volume (vehicles per hour per each open lane), 50th-percentile traffic speed of all open lanes, and 85th-percentile traffic speed of all open lanes for 15-minute intervals organized by Day and Hour of day for each SWZS implementation measured by the side-fire traffic sensor.
        (2) Day and Hour of day each traffic sensor was triggered, and the message displayed on each PCMS while the SWZS is in use.
    b) **Agency Access to System Data** – Provide password protected access to the WSDOT Engineer and identified WSDOT personnel to the System Data via a dedicated website or other wireless remote system.
    c) **Provide System Data to Agency** – At the completion of the Project, provide System Data logs in an electronic format approved by the WSDOT Engineer.

5. Immediately respond to all system failures in accordance with the **Smart Work Zone System Failure Protocol** section of these Specifications.

Operation

Operate the SWZS according to the following:

Scheduled Use

Use a dynamic lane merge, queue detection warning, and work zone travel delay system in accordance with requirements in the Transportation Management Plan.

Installation, Relocation, Removal, and Storage

The Design-Builder shall store, install, relocate, and remove all the SZWS components as follows:

1. Install all components with the SWZS Technician's concurrence at least 30 minutes prior to commencing the first lane closure
2. Relocate components as necessary with the SWZS Technician's concurrence
3. Assist the Technician as needed when the Smart Work Zone System Failure Protocol occurs
4. Remove all components within the Work Zone Clear Zone within 60 minutes when no longer required unless components are placed behind guardrail or barrier.

Initial SWZS Turn-On Meeting

The Design-Builder shall arrange a meeting at least one week before the initial system turn-on.

The meeting shall include the Design-Builder, Traffic Control Manager, TCS, Alternative TCS (if applicable), SWZS Technician, and WSDOT Project Engineering Office staff.

During this meeting, the following topics should be discussed at a minimum:

1. Provide and review the RFC TCPs, including lane closure plans and the associated SWZS plan that will be used.
2. Review roles and responsibilities for implementation of the SWZS.
3. Provide contact information for critical personnel.
4. Provide a schedule of the anticipated operation times, dates and durations for the initial operation.
5. Review Measurement and Payment for duties related to SWZS installation, operation, and removal.

SWZS Operation Coordination and Collaboration

The Design-Builder shall notify the WSDOT Engineer at least 72 hours in advance of using the SWZS including providing a schedule of the anticipated operation times, dates and durations for each subsequent operation.

The Design-Builder's Traffic Control Management shall coordinate and collaborate as needed for the successful implementation of the SWZS and associated lane closures. Any delays and associated costs due to implementing the SWZS shall be at the Contractor's expense.

Smart Work Zone System Failure Protocol

In the event of a failure, perform the following protocol:

1. **SWZS Technician** – Upon discovery of the malfunction, perform the following:
   a) Immediately notify Design-Builder Traffic Control Management.
   b) Begin troubleshooting the SWZS to address the malfunction.
   c) If the malfunction is not resolved within 15 minutes, notify Contractor Traffic Control Management. The SWZS shall be taken out of service and repaired within 12 hours of the malfunction.
2. **Contractor Traffic Management** – After receiving the initial notification of the malfunction, perform the following:
   a) Notify the TCS.
   b) Prepare crews to immediately implement the Emergency PCMS Implementation if the malfunction is not resolved within 15 minutes.
   c) Notify the WSDOT Engineer of the malfunction and failure protocol status.
   d) Collaborate with SWZS Technician to provide replacement parts needed to make repairs to the SWZS within 12 hours of the system or a system component malfunction.
3. **Emergency PCMS Implementation** – If the SWZS Technician has not resolved the issue within 15 minutes, perform following failure protocol:
   a) Install two PCMSs as described below until the SWZS is repaired, functioning properly, and back in service or until all lane closures have been reopened. The PCMSs may be from the SWZS if needed.
      i. PCMS #1: Maintain positioned 0.5 ± mile in advance of traffic queue, relocated as necessary, except when no traffic queue is present. PCMS #1 may be truck-mounted.

Phase 1	Phase 2
SLOW OR	NEXT
STOPPED	#
TRAFFIC	MILES

Where "#" is the approximate queue length
rounded up to the nearest mile

ii. PCMS #2: Place 1.5 ± mile in advance of first lane closure taper. Program message as appropriate. Phase 1 is to describe the current lane closure in place. Phase 2 is to describe the distance ahead to the beginning of the first lane closure rounded up to the nearest 0.5 mile interval. For example, if a double right lane closure is 1.5 mile ahead, the PCMS message would be: "2 RIGHT LANES CLOSED" / "1.5 MILE AHEAD".

2.22.4.10.14 Queue Warning System

Where shown on a RFC TCP, the Design-Builder shall provide, operate, maintain, and remove a QWS. A QWS uses portable roadside sensor information to display real-time traffic queue information to motorists on PCMS approaching a work zone. QWS is a simplified smart work zone system intended for work zone queues up to 2 miles, measured from the first lane closure taper, but may be modified for queuing up to 3 miles by extending spacing between the two PCMSs from 1 ± mile to 1.5 ± mile spacing and adjusting the PCMS messages. Traffic sensor placement remains unchanged.

The QWS shall be capable of communicating two types of work zone traffic information:

1. **Queue detection warning** for slowed or queued traffic ahead.
2. **Dynamic lane merge** guidance to use all open lanes up to the lane closure tapers and to take turns at merges during times of congestion.

In locations with multiple QWS setups each setup shall be capable of operating independently. One QWS technician may operate all systems concurrently.

Vendors

The Design-Builder shall select an independent vendor listed below to provide a QWS as shown on an RFC TCP:

Highway Specialties, LLC
Phone: (360) 437-1900
Website: https://www.highwayspecialties.com

Hill and Smith Inc.
Phone: (302) 328-3220
Website: https://www.hillandsmith.com/portfolio_category/its-smart-work-zone/

ICONE by ICONE Products
Phone: (315) 626-6800
Website: http://iconeproducts.com/

Road-Tech Safety Services, Inc.

Phone: (888) 762-3832
Website: https://www.road-tech.com/

SolarTech
Phone: (610) 391-8600
Website: http://solartechnology.com/

Street Smart
Phone: (888) 653-6800
Website: https://www.streetsmartrental.com/smart-work-zones/

Superior Traffic Services
Phone: (888) 928-5999
Website: https://www.superiortrafficservices.com/

Ver-Mac
Phone: (888) 488-7446
Website: https://www.ver-mac.com/en/jamlogic-software/smart-work-zones

WANCO
Phone: (800) 972-0755
Website: https://www.wanco.com

Devices and Communications

The Design-Builder and/or vendor shall provide all devices necessary to operate the system in accordance with the RFC TCPs and these specifications.

The traffic sensors shown in the RFC TCPs in advance of lane closure tapers are used to operate the SWZS by detecting vehicle speed approaching the lane closures, where queuing is expected. Typically, these traffic sensors use Doppler radar technology.

A vendor website or other wireless remote system is required for monitoring QWS functions and remote management of PCMS messages.

Technician

The vendor shall provide a technician skilled in the operation of all system equipment and software. The technician may be an employee of the vendor or someone trained and authorized by the vendor to operate the system. The technician may be Design-Builder or Subcontractor personnel, including the TCS. The technician is not required be on site while the QWS is in use but must be able to respond to any system issues remotely.

Duties of the technician or trained traffic control personnel include, but are not limited to, the following:

1. Program the automated, real-time operation of the QWS with traffic sensor trigger speed thresholds and PCMS messages shown on the RFC TCP or in this Section.
2. Service, debug, troubleshoot, and maintain all QWS components.

3. Maintain QWS equipment maintenance logs.
4. Immediately respond to all system failures in accordance with the **Queue Warning System Failure Protocol** section of this Section.

Operation

Operate the QWS according to the following:

Scheduled Use

QWS shall be implemented for all mainline SR 167, mainline SR 512, and mainline SR 410 lane closures wherein at least a 1-mile resultant queue is expected through a WSDOT Engineer-approved traffic analysis report unless otherwise approved by the WSDOT Engineer.

Installation, Relocation, Removal, and Storage

The Design-Builder or Subcontractor shall store, install, relocate, and remove all the QWS components as follows:

1. Install all QWS components with the QWS technician's concurrence prior to commencing the first lane closure.
2. Relocate components as necessary with the QWS technician's concurrence.
3. Assist the technician as needed when the Queue Warning System Failure Protocol occurs.
4. Remove all components within the Work Zone Clear Zone when no longer required unless components are placed behind guardrail or barrier.

QWS Operation Coordination and Collaboration

The Design-Builder shall notify the WSDOT Engineer at least 72 hours in advance of using the QWS including providing a schedule of the anticipated operation times, dates and durations for each subsequent operation.

The Design-Builder's Traffic Control Management shall coordinate and collaborate as needed for the successful implementation of the QWS and associated lane closures. Any delays and associated costs due to implementing the QWS shall be at the Design-Builder's expense.

Queue Warning System Failure Protocol

In the event of a failure that is not resolved within 15 minutes, reprogram QWS PCMSs to display the following message for the remainder of the scheduled use duration:

PCMS 1		PCMS 2	
Phase 1	Phase 2	Phase 1	Phase 2
WATCH	NEXT	(Lane)	1
FOR SLOW	2	(Closure)	MILE
TRAFFIC	MILES	(Description)	AHEAD
2.0 SEC	**2.0 SEC**	**2.0 SEC**	**2.0 SEC**
PCMS 1 placed 2± miles from first lane closure taper		PCMS 2 placed 1± mile from first lane closure taper	

(Lane Closure Description) message is similar to LEFT LANE CLOSED or LEFT 2 LANES CLOSED.

If the QWS as modified for queuing up to 3 miles, then modify the messaging as follows:

PCMS 1		PCMS 2	
Phase 1	Phase 2	Phase 1	Phase 2
WATCH	NEXT	(Lane)	1.5
FOR SLOW	3	(Closure)	MILES
TRAFFIC	MILES	(Description)	AHEAD
2.0 SEC	**2.0 SEC**	**2.0 SEC**	**2.0 SEC**
PCMS 1 placed 3± miles from first lane closure taper		PCMS 2 placed 1.5± miles from first lane closure taper”	

2.22.4.10.15 Temporary Portable Transverse Rumble Strips

Where shown on a RFC TCP or directed by the WSDOT Engineer, the Design-Builder shall provide, install, and maintain temporary portable transverse rumble strips.

Temporary portable transverse rumble strips may be used on two-way, two-lane roadways in conditions requiring traffic to stop.

Temporary portable transverse rumble strips shall not be placed on sharp horizontal or vertical curves, through pedestrian crossings or on bicycle routes. When placed on roadways used by bicyclists a minimum clear path of 4 feet shall be provided at each edge of the roadway or on each paved shoulder if feasible.

The Design-Builder shall remove the temporary portable transverse rumble strips in their entirety when they are no longer needed.

All damage caused by removing temporary portable transverse rumble strips shall be repaired by the Design-Builder at no additional cost to WSDOT.

Temporary portable transverse rumble strips shall be either the black RoadQuake 2 or the black RoadQuake 2F Folding Temporary Portable Rumble Strip manufactured by Plastic Safety Systems, Inc., all black Traffix Alert High Speed Rumble Strip manufactured by Traffix Devices or an approved equal.

Devices submitted for approval shall meet the following criteria:

1. Length shall be a minimum of 11 feet.
2. Width shall be a minimum of 10 inches.
3. Provides a bevel on leading edge.
4. Weighs a minimum of 100 pounds.
5. No greater than 3/4-inch profile height.
6. Flexible along the length of the strip to facilitate conformity to the road surface.
7. Withstands temperatures 0 to 180 degrees Fahrenheit without degradation in deployment, use or safety.
8. Function on roads with posted speed limits up to 70 mph; and retain original placement with minimal movement such that performance is not compromised.
9. Deemed safe by the manufacturer for use by motorcycles.

2.22.4.10.16 GPS and Remote Communications Requirements

This section is intentionally omitted.

2.22.4.10.17 Portable Temporary Traffic Control Signals

Where shown on an RFC TCP or directed by the WSDOT Engineer, the Design-Builder shall provide, operate, maintain, and remove a portable temporary traffic control signal system (PTSS) to provide automatic control of traffic through an intersection or alternating one-lane traffic operations on a two-way facility. A PTSS shall be defined as two or more traffic control units that operate together. The system shall be trailer-mounted, fully self-contained, and designed so that it can be easily transported and deployed at different locations.

The Design-Builder shall submit a Type 2 Working Drawing consisting of the manufacturer's specifications for the PTSS. A manufacturer's representative is required to demonstrate the capabilities of the PTSS prior to approval and provide training to Design-Builder personnel as necessary.

The Design-Builder shall notify the WSDOT Engineer 5 working days prior to PTSS turn-on. Unless approved by the WSDOT Engineer, testing and turn-on of PTSS shall be performed between 9:00 a.m. and 2:30 p.m., Monday through Thursday. Testing and turn-on will not be allowed on Fridays, weekends, holidays, or the day preceding a holiday or holiday weekend.

Remote manual control of the PTSS by the TCS or a qualified operator may be allowed if necessitated by Work area or traffic conditions and as allowed by the WSDOT Engineer.

Each PTSS shall provide two signal displays for all road approaches and driveways with existing signalization. Where signal displays are used for driveways between primary PTSS signal displays, only one signal display may be used. Where a PTSS controls a roadway with a through movement, one of the

signal displays for that approach shall be overhead. Where a PTSS controls a roadway without a through movement, such as the stem of a tee intersection, the use of an overhead signal display is not required if there is not enough room for the trailer and approved by the WSDOT Engineer. Maximum distance between signal display trailers shall be 1,500 feet unless otherwise shown on the RFC TCP or ordered by the WSDOT Engineer.

The WSDOT Engineer or designee will inspect the signal system at initial installation/operation and approve the signal timing. Final approval will be based on the results of the operational inspection.

The TCS shall monitor and ensure that the PTSS is fully operational and maintained as specified by the manufacturer. This Work may include cleaning and replacing lamps and other routine maintenance as needed.

In the event repairs or adjustments are required, the Design-Builder shall respond immediately replacing the PTSS operations with flagger traffic control. Flagger control shall remain in operation until the Roadway can be safely reopened to traffic. PTSS repairs or replacement with a backup unit shall occur within 24 hours.

The Design-Builder shall monitor the traffic, signal operation and order adjustments as needed based on traffic conditions. Timing adjustments require the approval of the WSDOT Engineer.

As shown on the RFC TCP, temporary stop bars and “STOP HERE ON RED” Signs (R10-6) shall be provided at the location traffic is expected to stop during the red display. The stop bar locations shall be illuminated at night. The illumination shall be the responsibility of the Design-Builder and shall be adjusted to ensure minimal glare to motorists.

When not in operation, remove signal heads from the view of traffic or cover signal heads with bags made of non-ripping material specifically designed for covering signal heads, including reflective backplates. Do not use trash bags of any type. Remove, cover, fold, or turn all inappropriate signs so that they are not readable by oncoming traffic.

The Design-Builder shall provide and install all field wiring to make a complete and operational PTSS and shall maintain the system throughout the life of the Contract.

PTSS shall not be installed within 300 feet of an at-grade railroad crossing. PTSS shall not be installed where driveways or Roadway access points are located between the primary signal displays unless the intersecting roadways and driveways are controlled by another PTSS signal as part of the overall PTSS.

2.22.4.10.18 Temporary Pedestrian Curb Ramps

Where shown on the RFC TCPs, or when requested by the Engineer of Record, the Design-Builder shall provide or construct, install, maintain, and remove temporary pedestrian curb ramps. The Design-Builder shall install or construct temporary curb ramps as shown in the RFC TCPs, or according to the

manufacturer's recommendations, if applicable. All temporary pedestrian facilities shall meet WSDOT *Design Manual* requirements. For curb ramps that cross or are placed adjacent to a gutter line or other drainage Structure, the Design-Builder shall prevent water from accumulating at the bottom of the ramp or overflowing onto the ramp surface.

2.22.4.10.19 Pedestrian Channelizing Devices

Where shown on the RFC TCPs, or when requested by the Engineer of Record, the Design-Builder shall provide, install, and maintain pedestrian channelizing devices.

Pedestrian channelizing devices shall be crashworthy when exposed to vehicular traffic. Devices used to channelize pedestrians shall be detectable to users of long canes and visible to pedestrians with vision disabilities. When used as a sidewalk closure, the device shall cover the entire width of the sidewalk. Pedestrian channelizing devices shall have continuous bottom and top surfaces. The bottom of the bottom portion shall be no higher than 2 inches above the walkway. The top edge of the bottom portion shall measure at least 8 inches above the walkway. The top of the top portion shall be no lower than 32 inches above the walkway. The top surface shall be smooth. Both upper and lower surfaces shall share a common vertical plane.

2.22.5 Submittals

TMP and TIMP require a draft and final submittal prior to commencement of construction activity that has the potential to impact traffic.

TCPs for individual construction phases require a Preliminary Design Submittal and a Final Design Submittal prior to approval for each phase of construction.

2.22.5.1 Transportation Management Plan

The Design-Builder shall submit an electronic copy of the draft TMP to the WSDOT Engineer for Review and Comment within 30 Calendar Days of NTP1.

The Design-Builder shall submit an electronic copy of the final TMP to the WSDOT Engineer for Review and Comment. The final TMP shall carry the WTEM's Professional Engineering stamp and signature. All comments to the TMP shall be resolved prior to commencement of construction activity that has the potential to impact traffic. Changes to the TMP shall be prepared and submitted to the WSDOT Engineer for Review and Comment 14 Calendar Days after the need to change is recognized by the WSDOT Engineer or the Design-Builder.

2.22.5.2 Traffic Incident Management Plan

The Design-Builder shall submit an electronic copy of the draft TIMP to the WSDOT Engineer for Review and Comment within 30 Calendar Days of NTP1.

The final TIMP shall carry the WTEM's Professional Engineering stamp and signature. The Design-Builder shall submit an electronic copy of the final TIMP

to the WSDOT Engineer for Review and Comment. All comments to the TIMP shall be resolved prior to commencement of construction activity that has the potential to impact traffic. Changes to the TIMP shall be prepared and submitted to the WSDOT Engineer for Review and Comment 14 Calendar Days after the need to change is recognized by the WSDOT Engineer or the Design-Builder.

2.22.5.3 Temporary Traffic Control Plans

The Design-Builder shall submit TCPs to the WSDOT Engineer for Review and Comment prior to the Preliminary and Final Design Submittals. The Design-Builder may submit TCPs separately for each phase of construction. The plans must be distributed and RFC prior to implementation. All traffic control implemented in the field shall be in accordance with RFC TCPs. The Design-Builder shall consider the review times when planning for implementation of construction phases. Reviews will only be waived or expedited if the Design-Builder obtains approval from the WSDOT Engineer. The WSDOT Engineer may, at its discretion, waive a review.

The Design-Builder shall prepare plan sheets in MicroStation format and in accordance with the Mandatory Standards and the WSDOT *Plans Preparation Manual*.

The Preliminary Design Submittal shall show lane configurations including typical cross-sections, signing, and Work zones. General notes to show the intent of the construction phase shall also be included. Stations and offsets of barriers, lane lines, edge lines, and tapers shall be included in the Preliminary Design Submittal. Stations and offsets of PCMS and signs are not required for the Preliminary Design Submittal. The Design-Builder shall submit one electronic copy of the TCPs to the WSDOT Engineer for Review and Comment.

The Final Design Submittal shall include, but is not limited to, all required details including station and offset for all elements, cross-sections, temporary drainage, pavement marking details, signing, traffic control devices, temporary or modified traffic signals, and temporary lighting. The Design-Builder shall submit one electronic copy of the TCPs to the WSDOT Engineer for Review and Comment.

When all comments from the Final Design Submittal TCPs have been resolved, the Design-Builder shall prepare RFC TCPs, carrying the stamp and signature of a Professional Engineer. For roadways outside of limited access, the Design-Builder shall submit TCPs for review and approval to the Local Agencies responsible for the roadway. The Design-Builder shall provide an informational copy of the submittal to the WSDOT Engineer. The Design-Builder shall allow a minimum of 14 Calendar Days for the Local Agencies to review the plans. If the plans are not approved, they shall be corrected and resubmitted until they are approved. Once approval is received and all requirements of the Quality Management Plan are satisfied, the plans may be RFC. The Design-Builder shall provide a set of the approved RFC TCPs to the WSDOT Engineer prior to implementation.

The RFC TCPs shall be distributed to all stakeholders a minimum of 14 Calendar Days prior to implementation of lane, ramp, sidewalk, or roadway closures or detours, in order to allow for public notification.

2.22.5.4 Temporary Signal Plans

Temporary Signal Plans shall be submitted to the WSDOT Engineer for Review and Comment prior to commencement of construction for temporary signals. Temporary Signal Plans shall be submitted as part of the TCPs packages for the phase in which they will be required.

2.22.5.5 Temporary Illumination Plans

Lighting level calculations, including electronic files, shall be submitted to the WSDOT Engineer for Review and Comment prior to planning pavement marking changes. When the analysis shows temporary illumination is required, the Design-Builder shall submit Temporary Illumination Plans as part of the TCPs package for the stage in which the illumination will be required.

2.22.5.6 Temporary Drainage Calculations

Calculations for the design of temporary drainage facilities shall be submitted to the WSDOT Engineer for Review and Comment with the TCPs Preliminary and Final Design Submittals. When the drainage analysis shows temporary drainage is required, the Design-Builder shall submit temporary drainage plans as part of the TCPs package for the stage in which the drainage will be required. Temporary drainage calculations shall meet the requirements in Section 2.14, *Stormwater,* that apply to permanent drainage facilities.

2.22.5.7 Other Submittal Requirements

The Design-Builder shall deliver to the WSDOT Engineer a list of all parties invited to take part in the MOT task force, and the responses to all of the invitations. The Design-Builder shall take meeting minutes and distribute them to all task force members.

A copy of the MOT diary shall be submitted to the WSDOT Engineer monthly. Upon Completion of the Project, the MOT diaries shall be delivered to the WSDOT Engineer.

A Closure Plan shall be submitted for each full highway closure. The Design-Builder shall submit the Closure Plan to the WSDOT Engineer for Review and Comment at least 30 Calendar Days prior to the scheduled closure.

2.22.5.8 Miscellaneous Submittals

At the request of the WSDOT Engineer, the Design-Builder shall deliver to the WSDOT Engineer Work-related submittals that do not fit in the previous categories but are prepared in accordance with this Section.

End of Section