WSDOT

SR 167/I-5 TO SR 509
– NEW EXPRESSWAY PROJECT
DESIGN-BUILD PROJECT

PROPOSAL
JUNE 2, 2021

GRAHAM

In association with: PBS elcon R S&A

ZANN
Redefine growth. Measure results.

TERRA DYNAMICS INC.
PO Box 2479 • Auburn, WA 98071

Appendix C – Details of Technical Approach and Innovations

SR 167, I-5 TO SR 509 – NEW EXPRESSWAY PROJECT

APPENDIX C – TABLE OF CONTENTS

ATC #3 – NB I-5 Alignment Shift for MOT

Washington State Department of Transportation

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August 24, 2021

Greg Ritke
Graham Contracting Ltd.
13555 SE 36th Street, Suite 120
Bellevue, WA 98006

Dear Mr. Ritke:

We have reviewed your ATC003 Rev. 2 and have determined that the ATC is approved.

Please contact me at (360) 701-9413 if you have any questions.

Sincerely,

Steven D. Fuchs

Steve Fuchs, P.E.
SR 167 Completion Project Manager

ATC Title: NB I-5 Alignment Shift for MOT
ATC Number: 003

Brief Description: Includes a permanent NB I-5 alignment shift east for construction staging with use of reduced long-term temporary shoulders to 2 ft min at select locations.

Detailed description: The Design-Build team will utilize a geometric adjustment to NB I-5 east at the new Hylebos Creek bridge (Bridge 9) to allow for construction staging without NB Shoofly Concept depicted in Appendix T-6. A minor compound curve is utilized for NB I-5 (2148 ft to 2190 ft) to achieve the off-set with a shallow reverse curve 11,700 that accommodates turning on a normal crown (1% crown for existing I-5) at 60 mph.

The MOT alternative concept utilizes 2 ft shoulders at key select locations to assist in construction that minimizes impacts to the adjacent wetlands and Hylebos Creek and minimizes temporary works. The design also utilizes a NB HOV Cross-Over in addition to the Cross-Over shown in Appendix T-6 SB HOV, to better facilitate construction sequencing. The construction staging is optimized for SB I-5 to allow full 60 mph geometrics with only a reduction to 50 mph for horizontal stopping sight distance at select locations and in certain phases. NB I-5 will meet or exceed existing condition design speeds for horizontal stopping sight distance and meet 60 mph for temporary MOT phases for all other design aspects.

The alternative concept reduces construction duration by an estimated 6 months on the Interstate 5 corridor as compared to the Appendix T6 MOT concepts. Construction of permanent widening can take place concurrently with this alternative concept. It will also eliminate any scheduling constraints associated with fish window work. Eliminating constraints with fish window work also has benefits to overall project schedule because ATC 03 only has one fish window constraint compared to two with the Appendix T-6 concept. The RFP concept prohibits the concurrent construction of the RRP west of I-5. With this ATC, the grading, stream channelization, and planting of this area can begin significantly sooner, allowing for early planting of the area and plant establishment to begin. See comparison below:

Construction Activity	**ATC 03 Concept (Months)**	**RFP Appendix T6 Concepts (Months)**	**Comments**
ATC 03 Phase 1/ RFP Stage 0	4	10	Both Concepts need to have work timed with a Fish Window. Assumed both concept fish window is summer of 2022. Extensive wall construction, fill, roadway, and temporary bridge work with Appendix T6 concept. Assumes piles for permanent NB I-5 existing bridge widening

			completed with two other bridges in fish window for RFP concept
ATC 03 Phase 2/ RFP Stage 1	4	4	Both Concepts can't advance to this configuration until after fish window of 2022 and until existing 70th bridge removal. 1 month MOT, 3-month half bridge (bridge 9 for ATC 03 and bridge 10 for RFP) and permanent roadway works. RFP concept requires Olympic Pipeline Construction to be completed.
ATC 03 Phase 3/ RFP Stage 2	4	4	1 month MOT, 3-month half bridge (bridge 9 for ATC 03 and bridge 10 for RFP) and permanent roadway works
ATC 03 Phase 4/ RFP Stage 3	4	5	Assumes full construction of Bridge 9 and NB Bridge Widening in Stage 3 of RFP Concept. NB Bridge Widening needs to be timed with a fish window if piles not completed in Stage 0.
ATC 03 Phase 5/ RFP Stage 4(Removal of NB Shoofly)	4	3	Northbound Shoofly removal in RFP needs to be timed with a fish window. NB On-Ramp construction for RFP concept.
Total Months of Construction On Interstate 5	**20**	**26**	RFP Concept may have extended duration if timing of last Phase for removal of NB Shoofly doesn't line up with a Fish Window.

The Technical requirements do not prohibit splitting HOV Lanes from GP lanes nor a median crossover for HOV lanes. The WSDOT concept shows a SB HOV crossover per the Appendix T6 MOT concept. Justification for this ATCs NB HOV crossover benefits are summarized below;

- Reduced duration of construction on I-5 due to significant reduction of temporary roadway works (6 months).
- Reduced overall project schedule duration creating the ability to open SR 509 spur to partial traffic configuration earlier in the project.
- 60 mph SB horizontal curves and superelevation design that eliminates a 50 mph reverse curve depicted in Appendix T-6 concept per Stage 1.
- Achieving additional 60 mph sight lines for Horizontal Stopping Sight Distance (HSSD) for permanent NB I-5 as a result of the offset alignment towards the existing median barrier wall (protected in place).

- Reduce full NB closure with crossover for removal of the eastern span of the existing 70th bridge.
- Ability to reduce NB and SB full closures as permitted in requirements for MOT staging switchover with use off one lane closures while general purpose lanes are shifted.
- Ability to use HOV crossover with lane closures to accelerate overall Bridge 1 superstructure work over I-5 minimizing overall amount of lane closures for this bridge construction.
- Reduction in Environmental Wetland Long Term Impacts associated with the removal of the NB I-5 shoofly temporary embankment. See Appendix C for marked up Appendix T-6 drawings showing comparison to JARPA impacts.
- Ability to perform plant establishment in the RRP area much sooner by eliminating the WSDOT concept NB shoofly.
- Accelerated construction on I-5 helps move construction vehicle egress and access to the permanent ramps earlier. This in turn accelerates construction for the SR 509 spur and works to keep truck traffic off local roadways.
- Significantly less temporary construction and overall I-5 construction, hence reducing impacts to traffic during construction.

Usage: The proposed NB I-5 alignment shift will be the permanent condition for the project. MOT Stages depicted are anticipated to be approximately 20 months (for 5 stages) per the Design Builders Schedule of work.

Subsurface Investigation: The proposed revisions would not require additional subsurface investigations beyond the requirements of the basic configuration.

Proposed RFP modifications:

The General Provisions, Chapter 2, Section 2.22.4.4.1, is supplemented to have the following:

"The Design-Builder will be allowed longer term shoulder closures for SB and NB I-5 per concepts depicted in ATC 03 concept drawings in Attachment A. 2' minimum shoulders are required at all times as indicated in concept drawings except where additional shoulder is necessary for horizontal stopping sight distance or accommodating stalled vehicles as depicted in ATC 03 concept drawings in Attachment A."

In the General Provisions, Chapter 2, Section 2.22.4.4.1.1, the Conceptual Detour Design Speeds Table is supplemented with the following:

"I-5 Southbound 50 mph HSSD and 60 mph for all other design standards."

I-5 Northbound will meet or exceed existing condition of HSSD 57 mph for Fife. A localized minimum 53 mph HSSD design speed reduction near Bridge 9 construction (150 ft total length) in MOT Phase 3 shall be met to match the condition at existing 70th Bridge Pier for NB I-5 which meets 52 mph as an existing condition. I-5 Northbound shall be 60 mph design speed for all other design standards.

In the General Provisions, Chapter 1-01.3(1) states the Basic Configuration width for I-5 NB Bridge, 5/462-E. The width is widened beyond Basic Configuration by ATC 03.

Design Analysis: See Pro's vs Con's List identified in Attachment B Traffic and Safety Analysis

Analysis:

a. Functionality –
Better;

ATC 03 utilizes a minor compound curve of 2148 ft to 2190 ft on NB I-5. This geometry is not perceivable from a traffic or driver perspective. A shallow curve is used to match the existing roadway alignment that meets 60 mph for normal crown. Geometrics are considered comparable to the Appendix M3 NB I-5 geometrics in which more significant compound curves are required in the future.

ATC 03 maintains the same lane and shoulder configurations for SB I-5.

ATC 03 makes use of 10 ft shoulder adjacent to the N7N5 (I-5 NB On) ramp in areas that the conceptual design requires 8 ft shoulders to improve construction sequencing. The larger on ramp shoulder will better accommodate stalled vehicles. The permanent benefits of increased shoulder length off-sets reduces temporary shoulder configurations during construction.

ATC 03 increases HSSD for NB I-5, reducing risk of accidents and increasing overall functionality of NB I-5 in the permanent condition.

ATC 03 eliminates 50 mph design geometrics (except for Horizontal Stopping Sight Distance for SB HOV) reducing risk of accidents and increasing overall functionality of SB I-5 during construction. Increasing the design speed for SB I-5 increases the overall performance of the freeway.

Completion of construction on I-5 allows for the permanent ramp connections of I-5 to be used earlier in the project by the public, helping alleviate general traffic congestion in the area earlier. The concept allows accelerated construction creating a reduction of 6 months of construction on I-5. By completing I-5 sooner, construction access and egress to and from the 509 spur roadway can be done from I-5 rather than local roadways. This will improve Port of Tacoma traffic and local roadway traffic.

ATC 03 shoulders compared with the Appendix T-6 concept shoulders is shown in Attachment D. Some stages provide more or less shoulder than Appendix T-6 depending on direction of travel and stage of MOT. ATC 03 does provide substantially more outside shoulder as compared to the Appendix T-6 concept providing better ability to accommodate stalled vehicles and emergency vehicles for both SB and NB I-5.

See Pro's vs Con's List identified for Traffic Operations under Attachment B.

Temporary Scupper Concrete Barrier will be used to convey drainage to the outside of the roadway. Superelevation causes general flow from east to west for both SB and NB I-5 along the Fife curve. For NB, the inside shoulder is never reduced due to NB HSSD design requirements. The SB HOV crossover has larger shoulders of 8 ft min for passing of stalled vehicles. SB shoulder runoff flow spread will be validated during final MOT design. For SB I-5, 5 ft typical and

2 ft min shoulders will be utilized at select locations and scupper barrier will convey flow to outside the roadway. Scupper temporary concrete barrier will be utilized for all HOV median barrier crossover applications to allow water to flow in its existing path. All scuppers will be periodically checked for functionality and maintained throughout construction to ensure the scupper functionality is not compromised. Temporary drainage conveyance to the outside of SB I-5 for any temporary widening will be detailed or verified in final design to ensure drainage conveyance outside the roadway traveled lane is achieved per WSDOT standards.

b. Structural adequacy –
Equal; the proposed design revisions will have no effect on structural adequacy.

c. Safety –
Better;

The proposed ATC has several safety benefits. Safety Benefits include the following:

- Permanent NB I-5 HSSD is improved to 60 mph with larger shoulder along the Fife Curve (protecting existing median barrier wall sight obstruction in place). Current existing/RFP conceptual geometrics meet approximate design speed of 57 mph. Improvements are seen from at 2686+00 to 2694+00 achieving required shoulder width clear of sight obstructions increasing HSSD design speed to 60 mph for approximate 800 ft of roadway .
- The ATC proposes temporary roadway design geometric modifications to SB I-5 that utilizes roadway horizontal alignment and cross slope design that meets 60 mph design speeds compared to the WSDOT Shoofly concept presented in Appendix T-6 documents. HSSD for SB I-5 will meet or exceed 60 mph in conformance with the TR's and Appendix T-6 conceptual design. The temporary shoulder HSSD can only achieve 50 mph for the HOV SB Median Crossover. Eliminating 50 mph geometric design (reverse curve per Stage 1 of Appendix T-6 concept) during construction to SB I-5 is seen as major safety improvement considering past experience with roll overs and accidents on I-5 construction projects in recent years.
- Reduced construction duration on I-5 will reduce risk of motorists from adverse construction conditions.
- Use of MOT HOV Crossovers allows more flexibility in MOT Schemes helping reduce full closures associated with staging switchover and bridge demolition along with assisting faster construction Bridge 1 (overhead work).

See Pro's vs Con's List identified for Safety under Attachment B.

Temporary Scupper Concrete Barrier will be used to convey drainage to the outside of the roadway. See functionality section for detailed narrative.

d. Comparison of life cycle costs including repair and maintenance –
Equal; The proposed ATC does not have any impacts to repair or maintenance.

e. Aesthetics –
Equal; the proposed ATC 03 will have no effect on aesthetics.

f. Impacts on construction traffic –
Better;

ATC 03 provides a similar number of lane shifts compares to conceptual Appendix T-6 for SB I-5 and one additional stage for NB I-5. However, the additional stage for NB I-5 is less of a roadway change giving better ability to switch stages without significant roadway lane closures. Shoulder widths are comparable to shoulder widths utilized in Appendix T-6 Conceptual MOT Plans.

The proposed ATC provides the following construction traffic betterments:

- All SB I-5 Roadway Geometrics meet 60 mph except for 50 mph stopping sight distance associated with Phase 4 and 5 for the SB HOV crossover. Larger shoulders near the Fife curve or grading (shoulder break to 10% slope) details to see over temporary barrier will be utilized to help achieve 60 mph HSSD for SB I-5 General Purpose Lanes except for MOT Phase 5. Significant reverse curves are eliminated helping safe and efficient operations of SB I-5 through the bridge work zones for all lanes of travel.
- The use of both NB and SB crossovers reduces possible need for full closures for traffic switchovers during phase changes or helps assist with superstructure construction of Bridge 1 (above I-5) and removal of the existing 70th Bridge structure.
- Keeping the NB I-5 Bridge 5/462-E Widening and Temporary Bridge Widening together in MOT Phase 1 of ATC 03 helps keep construction scheduling constrained to one fish window for construction of challenging Bridges 9 and 10 from a MOT perspective. Keeping construction schedule constraints limited to one fish window will help accelerate overall construction, minimize temporary configurations on I-5 and limit impacts to traffic.
- The extensive material placement and removal associated with building the temporary NB Shoofly detour depicted in Appendix T-6 is eliminated from the project minimizing impacts to public to deliver materials and build these temporary facilities.
- See detailed description section for overall reduction in construction schedule associated with ATC 03 for construction of I-5 by 60 months. Reduced duration impacts traffic less.
- Completion of construction on I-5 allows for the permanent ramp connections of I-5 to be used earlier in the project for construction egress and access helping accelerate construction of the SR 509 spur roadway section and bridges. This will help keep truck traffic off local roadways and away from general Port of Tacoma truck traffic.
- Completion of construction on I-5 allows for the permanent ramp connections of I-5 to be used earlier in the project by the public helping alleviate general traffic congestion in the area earlier by opening permanent roadway facilities sooner.
- ATC 03 provides more outside shoulder emergency outside shoulder compared to the Appendix T-6 concept providing better ability to accommodate stalled vehicles for both SB and NB I-5. Giving more outside NB I-5 shoulder space will be key for accommodating stalled vehicles.

See Pro's vs Con's List identified for Traffic Operations under Attachment B.

g. Effect on or changes to environmental commitments identified in the RFP –
Better; The proposed ATC provides the following environmental betterments associated with the project:

- A reduction of estimated 66,000 sf of long-term temporary impacts to the wetlands east of I-5 as result of eliminating the NB I-5 Shoofly concept in Appendix T6. See Attachment C for estimate assumptions which are calculated using blue beam software on Appendix T-6 and JARPA drawings.

- The proposed ATC minimizes impacts to the existing Hylebos Creek by limiting work for existing NB I-5 Bridge 5/462-E Widening (permanent) in fish window that is paired with the temporary SB bridge widening. Impacts to the creek are kept to a minimum eliminating a full temporary bridge for NB I-5 over the existing Hylebos creek and eliminating need for creek temporary re-alignment. Impacts to Hylebos creek could potentially be limited to one fish window with ATC 03 Concept.
- The extensive material placement and removals associated with building the temporary NB Shoofly detour depicted in Appendix T-6 is eliminated from the project minimizing impacts to the environmental wetlands.
- The ATC allows early plant establishment of RRP area east of I-5 compared to the Appendix T-6 concept by eliminating the NB temporary Shoofly roadway.

The proposed ATC stays within the JARPA permanent impact limits by placing a small retained fill wall at the toe of the original RFP grading limits. See Attachment A drawings 1 -3.

h. Impacts to surrounding and adjacent communities, including EJ and LEP populations– Equal; The ATC has no negative impacts to the surrounding communities.

i. Changes needed in the location, length, height, or number of noise walls –
Equal; The proposed ATC shifts 14ft to open RRP zone east of I-5. It doesn't appear that a noise wall will be needed west of I-5 however a noise study will be prepared in final design to confirm assumption.

j. Impact on utilities and rail –
Better; The proposed ATC concept will minimize risk to damage of the newly constructed Olympic Pipe Line by eliminating the NB I-5 Detour Shoofly Concept per Appendix T-6. The concept eliminates the need for temporary light weight fill construction over the pipeline.

k. Discussion of additional ROW or easements required –
Equal; The proposed ATC does not require additional ROW or easements.

l. An assessment of Forward Compatibility –
Equal; ATC 03 provides better forward compatibility pertaining to Appendix M3 for accommodating a NB Direct Access HOV On Connection near Bridge 9 and I-5 NB Bridge 5/462-E.

The off-set alignment creates space for 15 to 16 ft of inside widening for Bridge 9 to potentially accommodate a HOV Direct Access NB HOV On Connection with additional lane per WSDOT Design Manual
Chapter 1420 requirements keeping work contained within the highway while minimizing impacts to wetlands east of the project (maintaining same eastern outside EOP for NB-5 near Bridge 9).

Near Bridge 5/462-E, reducing the outside shoulder 8 ft in and utilizing small shoulder deviation of 7 ft inside locally would allow the widened Bridge 5/462-E in this contract to remain as is for Appendix M3 condition. The ATC 03 widened condition with shoulder reductions noted above locally at the bridge will allowing a 12 ft add lane for the HOV Direct Access parallel gap acceptance for On Ramp design per current standards in WSDOT Design Manual Chapter1420. Widening would only be required to outside of NB I-5 north of the existing 5/462E in future project.

Attachments:

WSDOT Comment Responses

Attachment A – Concept Drawings (Plans and Sections)
Attachment B – Safety and Traffic Analysis Comparison
Attachment C – Environmental Wetland Reductions
Attachment D – Shoulder Comparison of RFP Appendix T-6 against ATC 03 concept
Attachment E – ATC 03 Median Cross Over Sections

ATC 005 Rev2 – Response to WSDOT Review Comments Round 2

• Regarding the *Proposed RFP modifications*, lines 31 through 34 on page 3 of the ATC are not acceptable as written. Section 2.22.4.4.1 is the correct location to modify the shoulder widths as it relates to traffic operations during construction. Addendum #14 clarified that 4' median shoulders and 8' right shoulders are the minimum shoulder widths, except where pinch points preclude the ability to provide these widths. For NB I-5 we understand the pinch point at the existing Hylebos Cr. bridge, but it is not clear why only a 2' outside shoulder is proposed for such a long length in Phase 1, especially on the outside of a horizontal curve.

- The general premise of the ATC is to get accepted shoulders as depicted in the ATC drawings or as noted. Will change the reference to 2.22.4.4.1 to as follows for shoulder modification write up:

  The General Provisions, Chapter 2, Section 2.22.4.4.1, is supplemented to have the following:

  "The Design-Builder will be allowed longer term shoulder closures for SB and NB I-5 per concepts depicted in ATC 03 concept drawings in Attachment A. 2' minimum shoulders are required at all times as indicated in concept drawings except where additional shoulder is necessary for horizontal stopping sight distance or accommodating stalled vehicles as depicted in ATC 03 concept drawings in Attachment A."

  NB I-5 in Phase 1 has been modified such that an 8' width is maintained throughout except locally near the existing Hylebos Creek Bridge widening which requires space for construction. See updated shoulder in Phase 1 of concept drawings in Attachment A. Note that this is a betterment beyond the Appendix T-6 Conceptual drawings which show a 2 ft outside shoulder all the way through the project.

  Updated shoulder comparison exhibit provided which shows favorable comparison for NB I-5 as an improvement in ATC 03 compared to Appendix T-6 conceptual MOT Plans.

• The location of the southern crossover point of the I-5 median is in conflict with the median retaining wall which ends approximately 280' south of the spiral curve. This location is visible in the existing topo MicroStation file. Please adjust your plans accordingly.

- The crossover at the south will be adjusted 280 south as noted to eliminate this issue per WSDOT comment. See updated plans for further information. Crossover for both NB and SB at the southern limits pushed fully back from I-5 Line 3663+30 which is around 300 ft south of Begin of Spiral at 3666+38.15 per supplied alignment base file of existing I-5 alignment. All crossovers are completed before 3663+30 in response to comment.

• For SB I-5 in Phases 2 thru 4, it appears that only a 5' outside shoulder is provided due to concerns for I-5 flooding. This is a long duration to have less than an 8' outside shoulder. As part of the No Rise analysis required per Section 2.30.5.2, it is worth noting that the 12th St. culvert is the key bottleneck downstream that causes floodwaters to backup onto I-5 in extreme flood events, as this may be advantageous as an early action in the construction schedule to help minimize the potential of I-5 flooding.

- As part of this ATC we will first remove the 12th Street culvert to alleviate flood hazard concern before the shoofly is constructed. Construction sequence will be evaluated to likely remove the culvert concurrently with Phase 2 depending on construction season (dry months) with hydraulic assessment.

• Please clarify what radii are used for the SB I-5 reverse curves to shift onto the temporary alignment in Phases 2 thru 4 and indicate what the cross slope of I-5 is during this reverse curve. This needs close analysis to understand the adverse cross slope that could be associated with this reverse curve.

- The design for Phases 2 thru 4 for the long-term SB detour (modified shoofly from Appendix T-6) has two 11,700 ft curves that are true reverse curves. Per WSDOT Design Manual section 1250.03, a 11,675 ft curve can be used on a normal crown (normal crown, -2% adverse cross slope). The end of the southern reverse curve is at approximate station 4700+00 of SB I-5. Widening of the temporary SB I-5 shoofly to match existing cross slope where the existing cross slope is -0.5% (based on section cut at this exact station per the WSDOT supplied existing DTM). Cross slope varies north on existing SB I-5 and is typically a normal crown of 1%. The design meets full 60 mph standards. This design speed is higher than the TR required 50 mph design speed assumed for the Appendix T-6 SB Temporary Shoofly design.

• Please clarify that the existing SB I-5 Hylebos Creek Bridge widening is a permanent widening.

- The existing SB I-5 Hylebos Creek Bridge, widened in phase 1 will be permanent.

• For NB I-5 Phase 3, please clarify why the outside shoulder cannot be increased to 8' after crossing the eastern pier of Bridge 1 and why the inside shoulder cannot be increased after crossing the existing Hylebos Creek bridge.

- The shoulder has been increased to 8' and is now shown in the Attachment A drawings for Phase 3-5 for the NB Shoulder north of eastern Bridge Pier 1. The inside shoulder has also been increased for Phase 3, 4, and 5 as noted to the maximum extent feasible within design constraints. See updated Attachment A drawings.

• Please fix all of the legends on the figures so the colors on the plan match the legend.

- All legends are corrected for color scheme of NB and SB I-5. See updated Attachment A drawings.

PREVIOUS SUBMITTAL COMMENT RESPONSES

ATC 003 – Response to WSDOT Review Comments

• Crossover designs are not preferred by WSDOT or FHWA and are only considered when absolutely necessary or significant safety benefits can be achieved. Please provide clear justification to the use of crossovers including the benefits to the traveling public, such as reduced durations of MOT phases and improved safety.

Key justification points are 60 mph SB Geometrics, overall construction schedule duration on I-5, reduced overall full closures with crossover for staging switch over and existing bridge demolition, and minimizing environmental impacts. See Appendix C for ATC benefits list and narrative for justification in ATC functionality and safety writeup.

• The use of 2 ft. shoulders for extended distances, especially on the right shoulder is not equal to WSDOT's concept. Please provide an assessment of the length of 2 ft. shoulders of both left and right shoulders for each direction as compared to the WSDOT concept.

WSDOT concept doesn't give specifics online work and overall design based on PDF and two sections. Assumed shoulder comparison is provided in Appendix D for right shoulders. Note that TR's state provide 8 ft min shoulder when feasible with 2 ft minimum.

• Drainage design is very critical in an area with multiple lanes superelevated and 2 ft. shoulders typically are not adequate, especially during torrential rains or when debris plugs an inlet. Please ensure this is evaluated with this ATC.

Based on comment 5, a 6 ft shoulder is required for SB I-5 for HSSD for 50 mph. That size with scupper monitoring and maintenance by Graham should be sufficient. Scuppers are often used during construction to manage temporary roadways. Temporary drainage will be analyzed to ensure proper conveyance behind temporary concrete barrier.

• The HOV crossover designs in both directions are in conflict with the existing I-5 median retaining wall. Please review the asbuilts and adjust the concept accordingly.

Median wall is along the curve. Crossovers happen outside the curve. Existing roadway sections cut at crossover locations. Our median crossover matches the similar Appendix T-6 concept.

• The use of a steeper shoulder cross slope for southbound I-5 is not acceptable in concert with a narrow shoulder due to safety of errant vehicles.

Design was done to achieve 60 mph HSSD for SB I-5 to see over temporary concrete barrier. If WSDOT feels that a grade break of 6% to 10% for a shoulder is more dangerous than the reduced HSSD, then Graham will eliminate this aspect of the design. Increases in temporary construction required with 6 ft shoulders.

• Please indicate where the 90,000 sf of avoidance area is expected to occur with this ATC.

We prepared an exhibit located in attachment C. This is a markup of Appendix T-6 MOT Plans and JARPA drawings depicting where impacts have been reduced. No CADD information provided for these conceptual MOT designs and approximated based on PDFs supplied by WSDOT.

• Please indicate where the 12,000 sf of long-term temporary impacts along southbound I-5 are avoided.

We prepared an exhibit located in attachment C. This is a markup of Appendix T-6 MOT Plans and JARPA drawings depicting where impacts have been reduced. No CADD information provided for these conceptual MOT designs and approximated based on PDFs supplied by WSDOT.

• Please provide the amount of additional permanent impacts to wetlands associated with the overbuilding of the new northbound I-5 bridge.

None. Permanent wall is constructed at grading limits as depicted in notes on the plans for permanent configuration.

• This ATC would avoid impacting a large section of existing wetlands along northbound I-5. Even though this area would not be impacted by construction, all of the reed canary grass in this area would need to be addressed by the Proposer in the roadside restoration effort as we do not want it to remain and be a seed source to contaminate all of the RRP areas adjacent to this roadside.

It was always assumed that other aspects of the contract still had to be met. No change to write up or design.

• Per TR Section 2.8, a supplemental noise analysis would be required if the horizontal alignment is shifted more than 10 ft.

Shifts 14 ft to open field side. It doesn't appear that a noise wall will be needed west of I-5. A noise study will be prepared in final design to confirm assumption.

• In Attachment B, many of the legends are mislabeled.

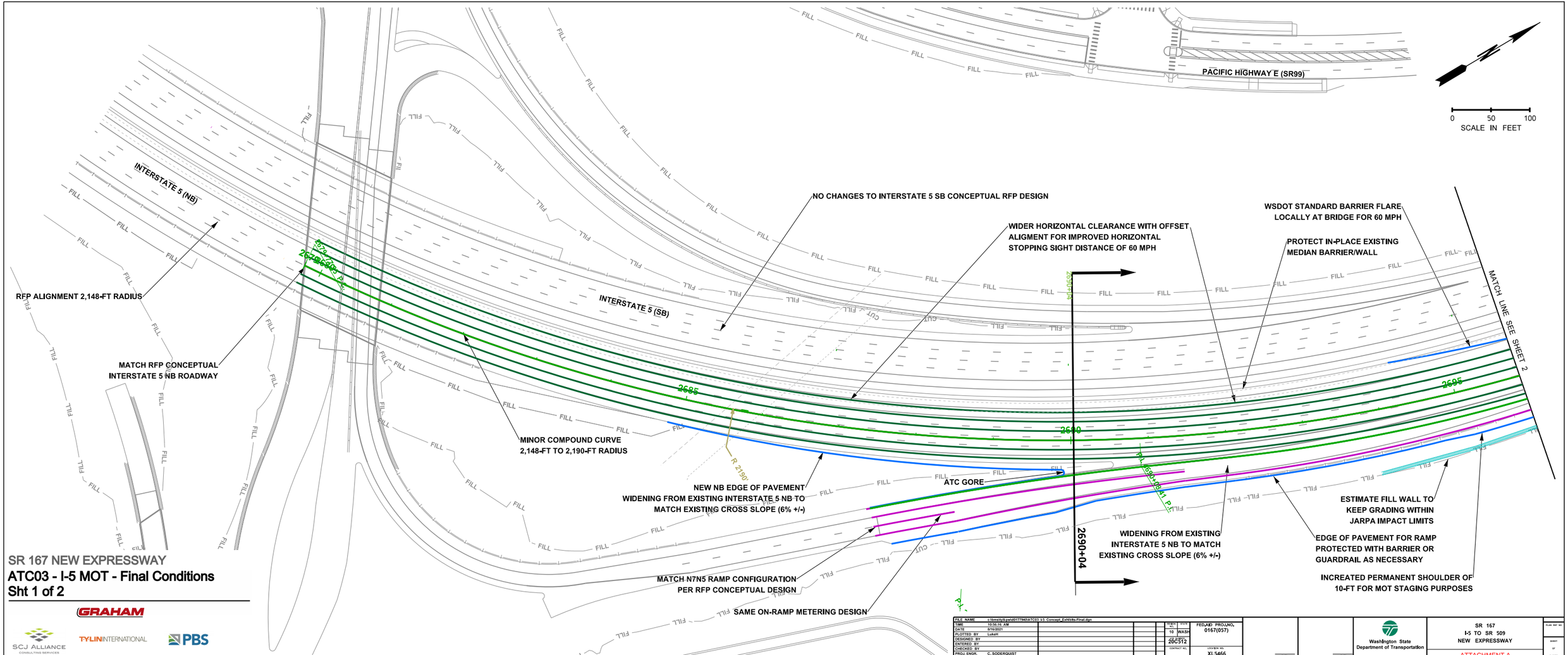
Assume comment is referring to typos in Attachment B. Will correct typos in Attachment B.

• In Phases 1 thru 5, there appear to be horizontal angle points within many of the curves and this would not be allowed. Please ensure the lane geometry is colinear.

Lane geometry is or will be colinear. Corrections to the ATC concept design will be corrected as necessary in final design to eliminate angle points that don't meet the WSDOT design manual standards for 60 mph. Note tapers of 60 mph are acceptable per the TR's.

• Note that temporary median concrete barrier must be anchored where less than 3 ft. shoulder width is provided.

Noted. Barrier will be pinned where 3 ft of slide isn't provided. Note defining this on median barrier for crossover in typical sections.



SR 167 NEW EXPRESSWAY

ATC03 - I-5 MOT - Final Conditions

Sht 1 of 2

GRAHAM

SCJ ALLIANCE CONSULTING SERVICES

TYLIN INTERNATIONAL

PBS

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DATE	8/16/2021
PLOTTED_BY	Lukeh
DESIGNED_BY	
ENTERED_BY	
CHECKED_BY	
PROJ. ENGR.	C. SODERQUIST
REGIONAL ADM.	J. WHITE

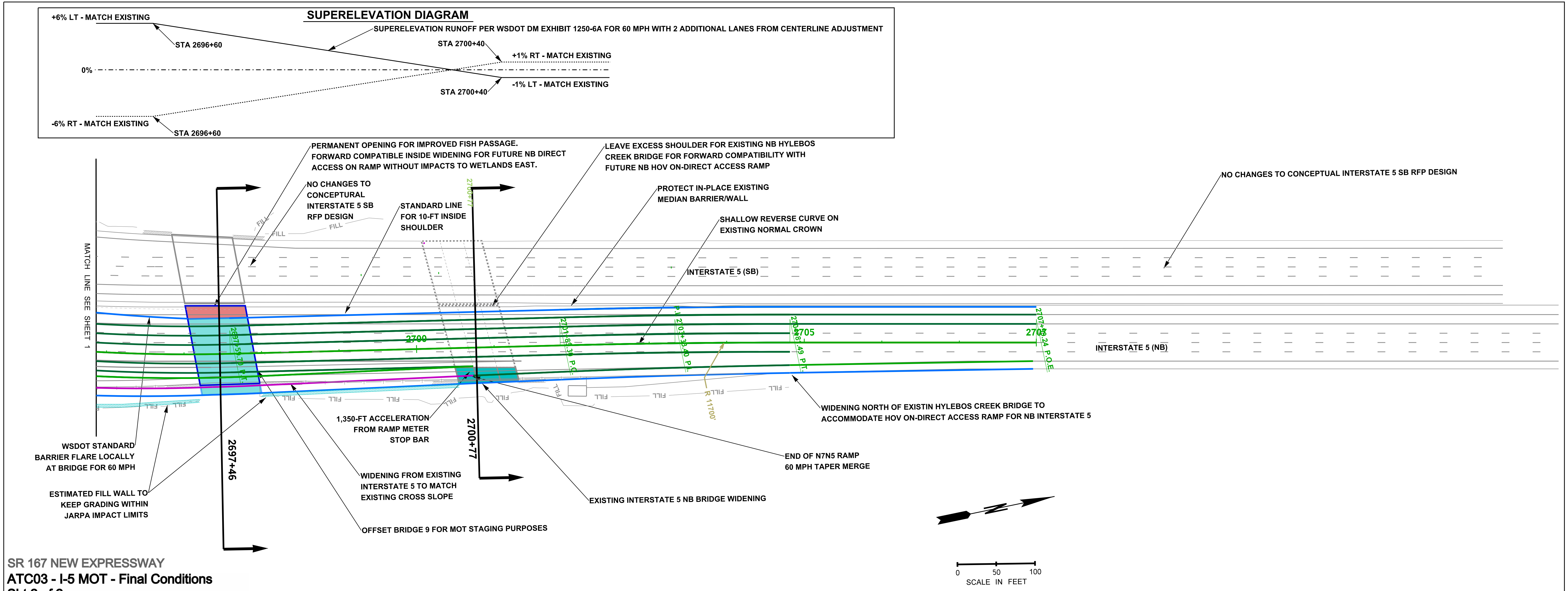
REVISION	DATE	BY

REGION NO.	10
STATE	WASH
CONTRACT NO.	20C512
LOCATION NO.	XL5466
FED.AID PROJ.NO.	0167(057)

Washington State Department of Transportation

SR 167
I-5 TO SR 509
NEW EXPRESSWAY

ATTACHMENT A



SUPERELEVATION DIAGRAM
+6% LT - MATCH EXISTING
STA 2696+60
SUPERELEVATION RUNOFF PER WSDOT DM EXHIBIT 1250-6A FOR 60 MPH WITH 2 ADDITIONAL LANES FROM CENTERLINE ADJUSTMENT
STA 2700+40
+1% RT - MATCH EXISTING
0%
-1% LT - MATCH EXISTING
STA 2700+40
-6% RT - MATCH EXISTING
STA 2696+60
PERMANENT OPENING FOR IMPROVED FISH PASSAGE.
FORWARD COMPATIBLE INSIDE WIDENING FOR FUTURE NB DIRECT
ACCESS ON RAMP WITHOUT IMPACTS TO WETLANDS EAST.
LEAVE EXCESS SHOULDER FOR EXISTING NB HYLEBOS
CREEK BRIDGE FOR FORWARD COMPATIBILITY WITH
FUTURE NB HOV ON-DIRECT ACCESS RAMP
NO CHANGES TO CONCEPTUAL INTERSTATE 5 SB RFP DESIGN
NO CHANGES TO
CONCEPTUAL
INTERSTATE 5 SB
RFP DESIGN
STANDARD LINE
FOR 10-FT INSIDE
SHOULDER
PROTECT IN-PLACE EXISTING
MEDIAN BARRIER/WALL
SHALLOW REVERSE CURVE ON
EXISTING NORMAL CROWN
MATCH LINE SEE SHEET 1
INTERSTATE 5 (SB)
INTERSTATE 5 (NB)
2700
2705
2697+46
2700+77
R 11700'
WIDENING NORTH OF EXISTIN HYLEBOS CREEK BRIDGE TO
ACCOMMODATE HOV ON-DIRECT ACCESS RAMP FOR NB INTERSTATE 5
WSDOT STANDARD
BARRIER FLARE LOCALLY
AT BRIDGE FOR 60 MPH
1,350-FT ACCELERATION
FROM RAMP METER
STOP BAR
END OF N7N5 RAMP
60 MPH TAPER MERGE
ESTIMATED FILL WALL TO
KEEP GRADING WITHIN
JARPA IMPACT LIMITS
WIDENING FROM EXISTING
INTERSTATE 5 TO MATCH
EXISTING CROSS SLOPE
EXISTING INTERSTATE 5 NB BRIDGE WIDENING
OFFSET BRIDGE 9 FOR MOT STAGING PURPOSES
FILL
0
50
100
SCALE IN FEET

SR 167 NEW EXPRESSWAY

ATC03 - I-5 MOT - Final Conditions

Sht 2 of 2

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FILE NAME	c:\bms\tyll-pw\d0177940\ATC03 I-5 Concept_Exhibits-Final.dgn				REGION NO. 10 / STATE WASH	FED.AID PROJ.NO. 0167(057)
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DATE	8/16/2021				CONTRACT NO.	LOCATION NO. XL5466
PLOTTED BY	LukeH					
DESIGNED BY						
ENTERED BY						
CHECKED BY						
PROJ. ENGR.	C. SODERQUIST					
REGIONAL ADM.	J. WHITE	REVISION	DATE	BY		

P.E. STAMP BOX DATE

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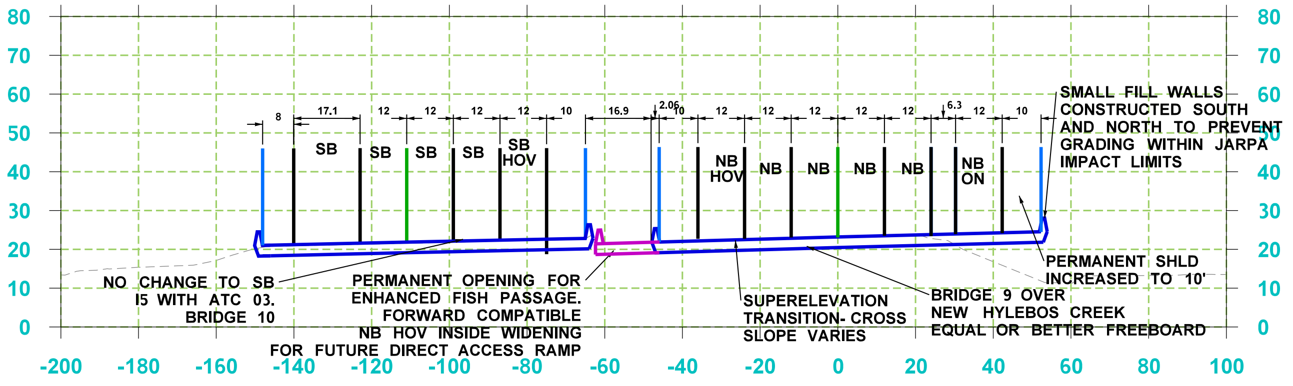
SR 167
I-5 TO SR 509
NEW EXPRESSWAY

ATTACHMENT A

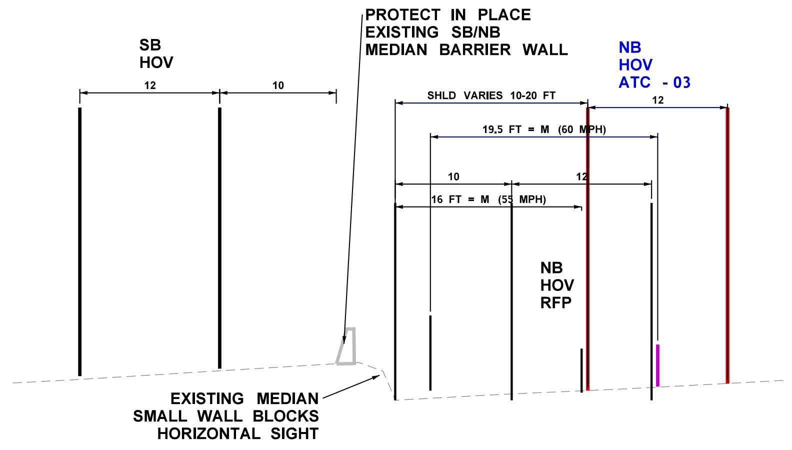
PLAN REF NO

SHEET OF SHEETS



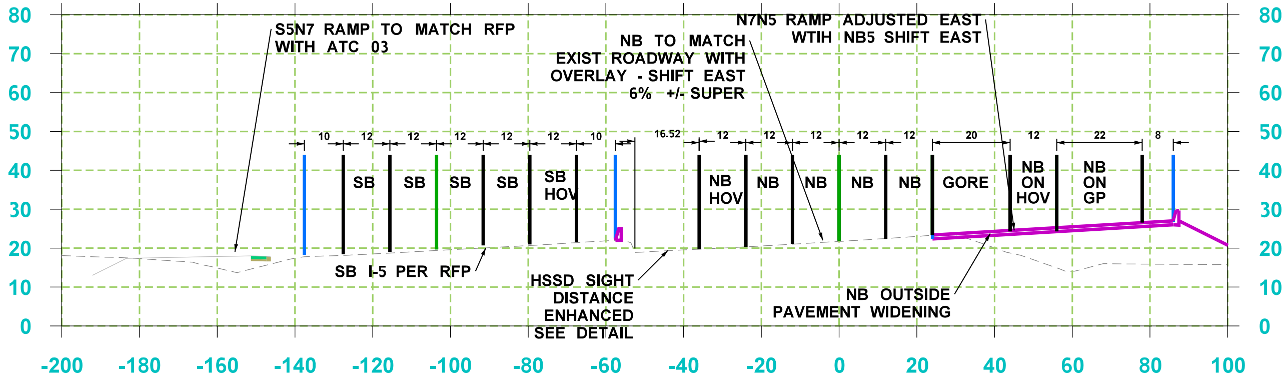
SMALL FILL WALLS CONSTRUCTED SOUTH AND NORTH TO PREVENT GRADING WITHIN JARPA IMPACT LIMITS
SB
SB
SB
SB
SB HOV
NB HOV
NB
NB
NB
NB
NB ON
NO CHANGE TO SB I5 WITH ATC 03. BRIDGE 10
PERMANENT OPENING FOR ENHANCED FISH PASSAGE. FORWARD COMPATIBLE NB HOV INSIDE WIDENING FOR FUTURE DIRECT ACCESS RAMP
SUPERELEVATION TRANSITION- CROSS SLOPE VARIES
BRIDGE 9 OVER NEW HYLEBOS CREEK EQUAL OR BETTER FREEBOARD
PERMANENT SHLD INCREASED TO 10'

FINAL - 2697+46



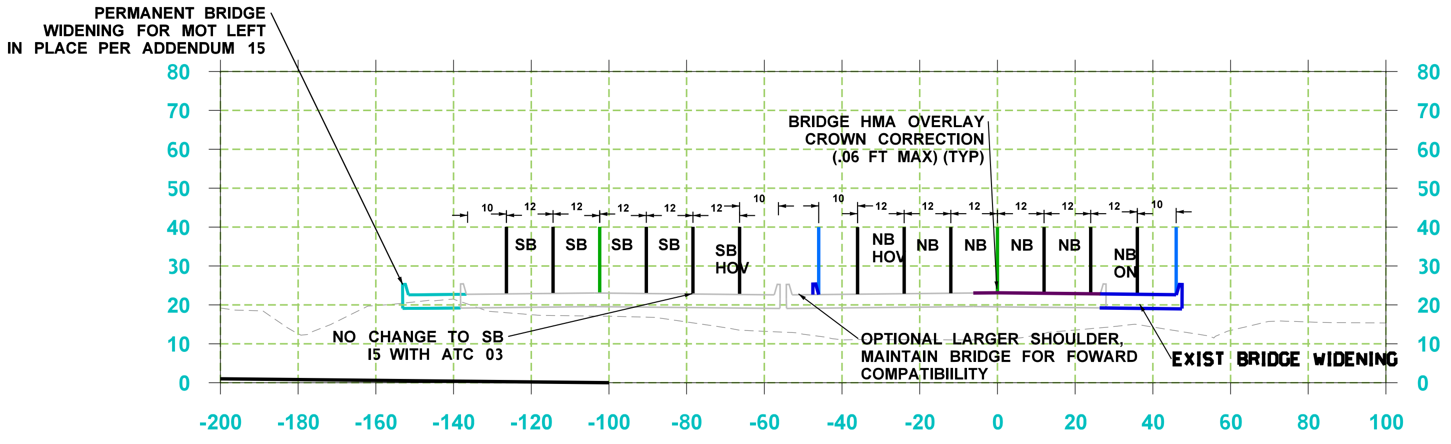
0 20 40
SCALE IN FEET

IMPROVED HORIZONTAL STOPPING SIGHT DISTANCE



S5N7 RAMP TO MATCH RFP WITH ATC 03
NB TO MATCH EXIST ROADWAY WITH OVERLAY - SHIFT EAST 6% +/- SUPER
N7N5 RAMP ADJUSTED EAST WTIH NB5 SHIFT EAST
SB
SB
SB
SB
SB HOV
NB HOV
NB
NB
NB
NB
GORE
NB ON HOV
NB ON GP
SB I-5 PER RFP
HSSD SIGHT DISTANCE ENHANCED SEE DETAIL
NB OUTSIDE PAVEMENT WIDENING

FINAL - 2690+04



PERMANENT BRIDGE WIDENING FOR MOT LEFT IN PLACE PER ADDENDUM 15
BRIDGE HMA OVERLAY CROWN CORRECTION (.06 FT MAX) (TYP)
SB
SB
SB
SB
SB HOV
NB HOV
NB
NB
NB
NB
NB ON
NO CHANGE TO SB I5 WITH ATC 03
OPTIONAL LARGER SHOULDER, MAINTAIN BRIDGE FOR FOWARD COMPATIBIILITY
EXIST BRIDGE WIDENING

FINAL - 2700+77

SR 167 NEW EXPRESSWAY
ATC03 - I-5 MOT - Final Conditions Section Cuts

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DATE	8/16/2021
PLOTTED BY	johnb
DESIGNED BY	
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CHECKED BY	
PROJ. ENGR.	C. SODERQUIST
REGIONAL ADM.	J. WHITE

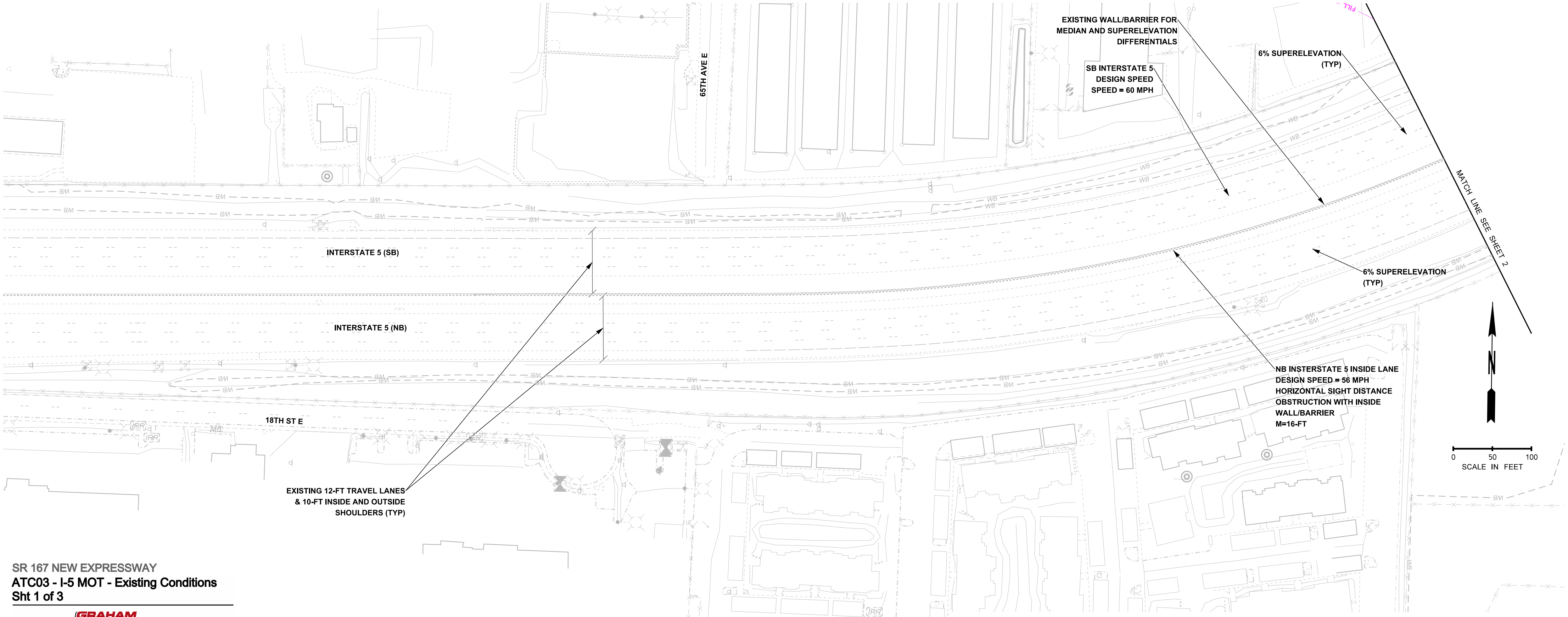
REVISION | DATE | BY

REGION NO. 10 | STATE WASH | FED.AID PROJ.NO. 0167(057)
JOB NUMBER 20C512
CONTRACT NO. | LOCATION NO. XL5466

Washington State Department of Transportation

SR 167
I-5 TO SR 509
NEW EXPRESSWAY

ATTACHMENT A



SR 167 NEW EXPRESSWAY

ATC03 - I-5 MOT - Existing Conditions

Sht 1 of 3

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SR 167
I-5 TO SR 509
NEW EXPRESSWAY

ATTACHMENT A

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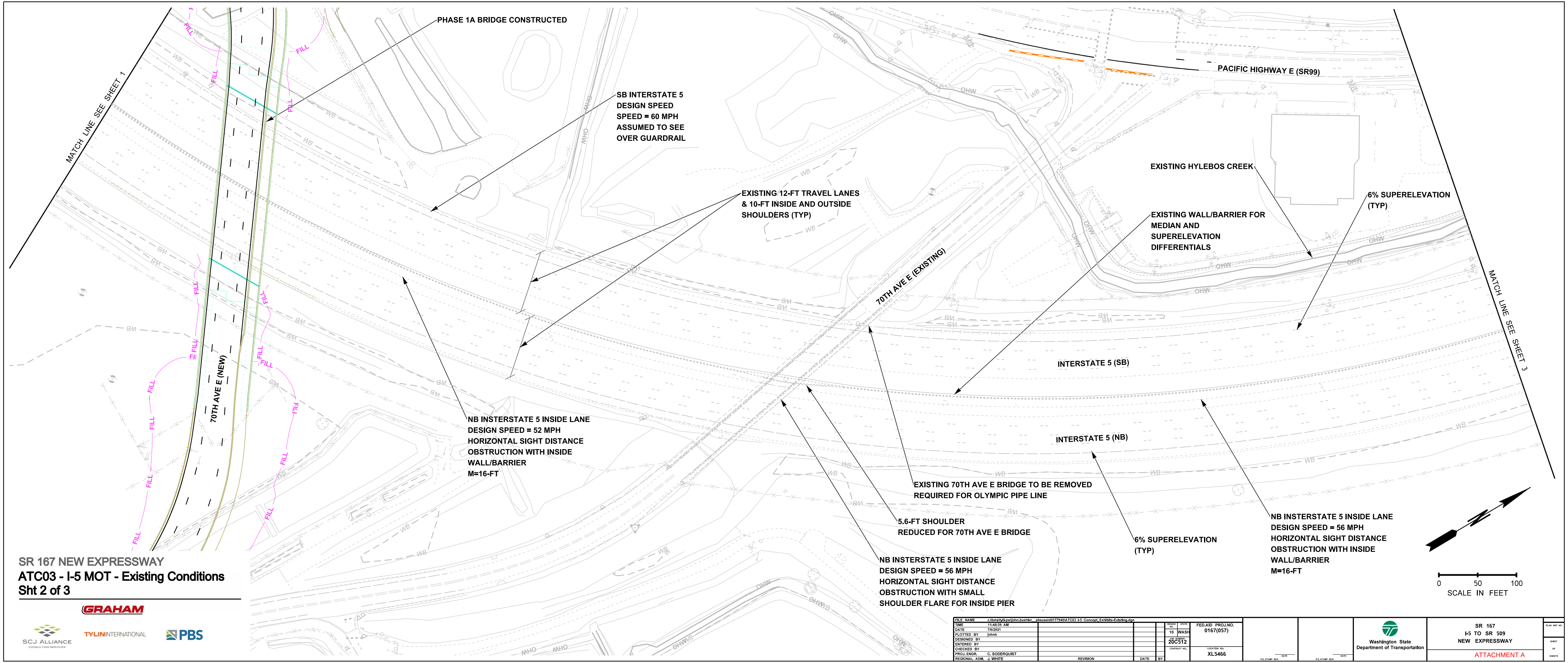
MATCH LINE SEE SHEET 1
PHASE 1A BRIDGE CONSTRUCTED
SB INTERSTATE 5
DESIGN SPEED
SPEED = 60 MPH
ASSUMED TO SEE
OVER GUARDRAIL
PACIFIC HIGHWAY E (SR99)
EXISTING HYLEBOS CREEK
EXISTING 12-FT TRAVEL LANES
& 10-FT INSIDE AND OUTSIDE
SHOULDERS (TYP)
6% SUPERELEVATION
(TYP)
EXISTING WALL/BARRIER FOR
MEDIAN AND
SUPERELEVATION
DIFFERENTIALS
70TH AVE E (EXISTING)
MATCH LINE SEE SHEET 3
INTERSTATE 5 (SB)
70TH AVE E (NEW)
NB INTERSTATE 5 INSIDE LANE
DESIGN SPEED = 52 MPH
HORIZONTAL SIGHT DISTANCE
OBSTRUCTION WITH INSIDE
WALL/BARRIER
M=16-FT
INTERSTATE 5 (NB)
EXISTING 70TH AVE E BRIDGE TO BE REMOVED
REQUIRED FOR OLYMPIC PIPE LINE
5.6-FT SHOULDER
REDUCED FOR 70TH AVE E BRIDGE
6% SUPERELEVATION
(TYP)
NB INTERSTATE 5 INSIDE LANE
DESIGN SPEED = 56 MPH
HORIZONTAL SIGHT DISTANCE
OBSTRUCTION WITH INSIDE
WALL/BARRIER
M=16-FT
NB INTERSTATE 5 INSIDE LANE
DESIGN SPEED = 56 MPH
HORIZONTAL SIGHT DISTANCE
OBSTRUCTION WITH SMALL
SHOULDER FLARE FOR INSIDE PIER
0 50 100
SCALE IN FEET
SR 167 NEW EXPRESSWAY
ATC03 - I-5 MOT - Existing Conditions
Sht 2 of 3
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TIME 11:48:59 AM
DATE 7/6/2021
PLOTTED BY johnb
DESIGNED BY
ENTERED BY
CHECKED BY
PROJ. ENGR. C. SODERQUIST
REGIONAL ADM. J. WHITE
REVISION
DATE
BY
REGION NO. 10
STATE WASH
FED.AID PROJ.NO. 0167(057)
JOB NUMBER 20C512
CONTRACT NO.
LOCATION NO. XL5466
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SR 167
I-5 TO SR 509
NEW EXPRESSWAY
ATTACHMENT A
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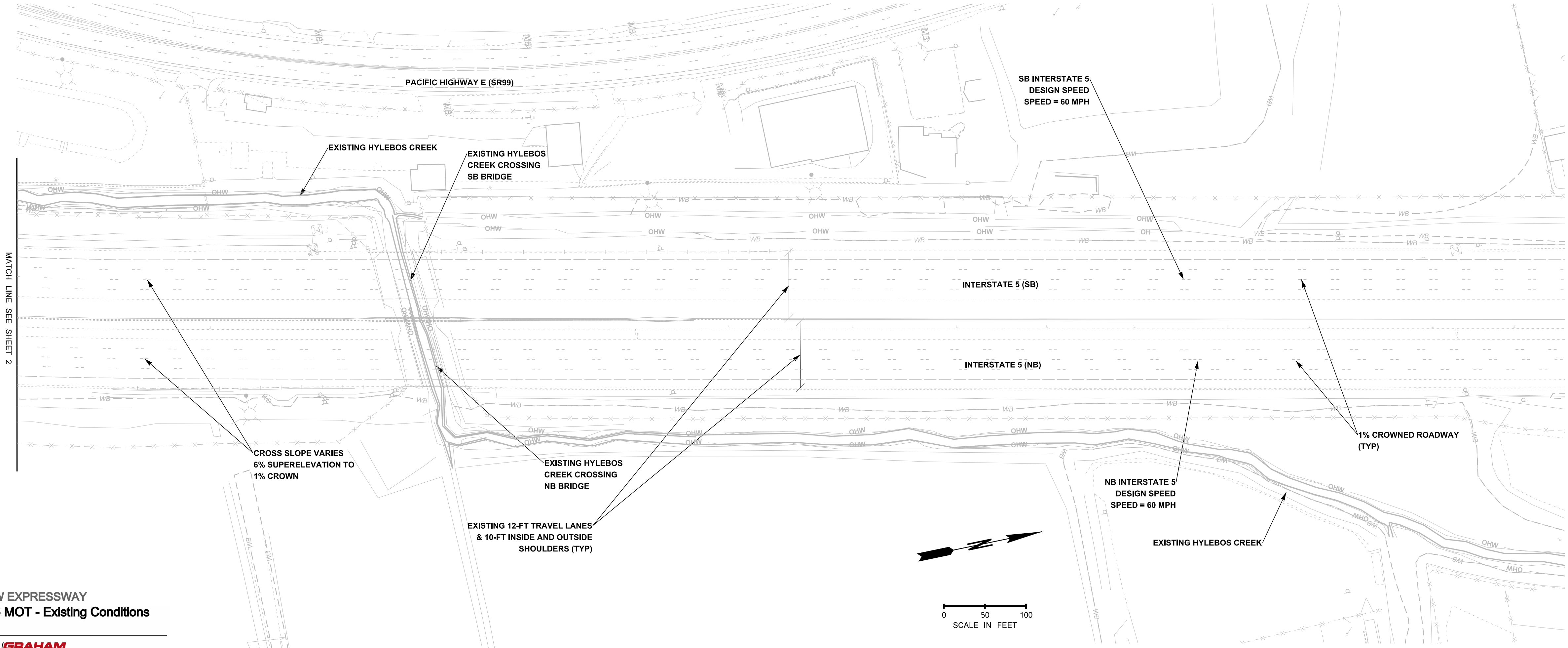

SR 167 NEW EXPRESSWAY

ATC03 - I-5 MOT - Existing Conditions

Sht 3 of 3

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DESIGNED BY					CONTRACT NO.		LOCATION NO. XL5466
ENTERED BY							
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PROJ. ENGR.	C. SODERQUIST						
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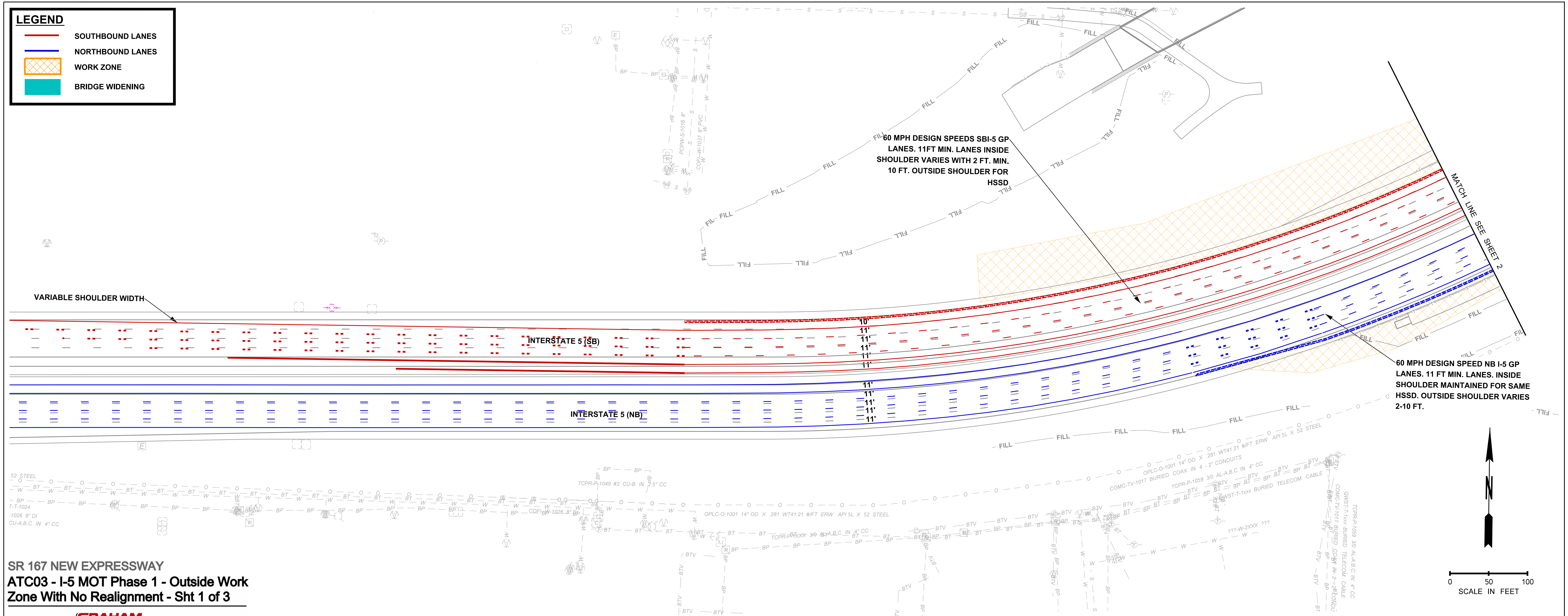
SR 167
I-5 TO SR 509
NEW EXPRESSWAY

ATTACHMENT A

PLAN REF NO

SHEET OF SHEETS



SR 167 NEW EXPRESSWAY
ATC03 - I-5 MOT Phase 1 - Outside Work Zone With No Realignment - Sht 1 of 3

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PLOTTED BY	LukeH			
DESIGNED BY				
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CHECKED BY				
PROJ. ENGR.	C. SODERQUIST			
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REGION NO. 10 | STATE WASH | FED.AID PROJ.NO. 0167(057)
JOB NUMBER 20C512
CONTRACT NO.
LOCATION NO. XL5466

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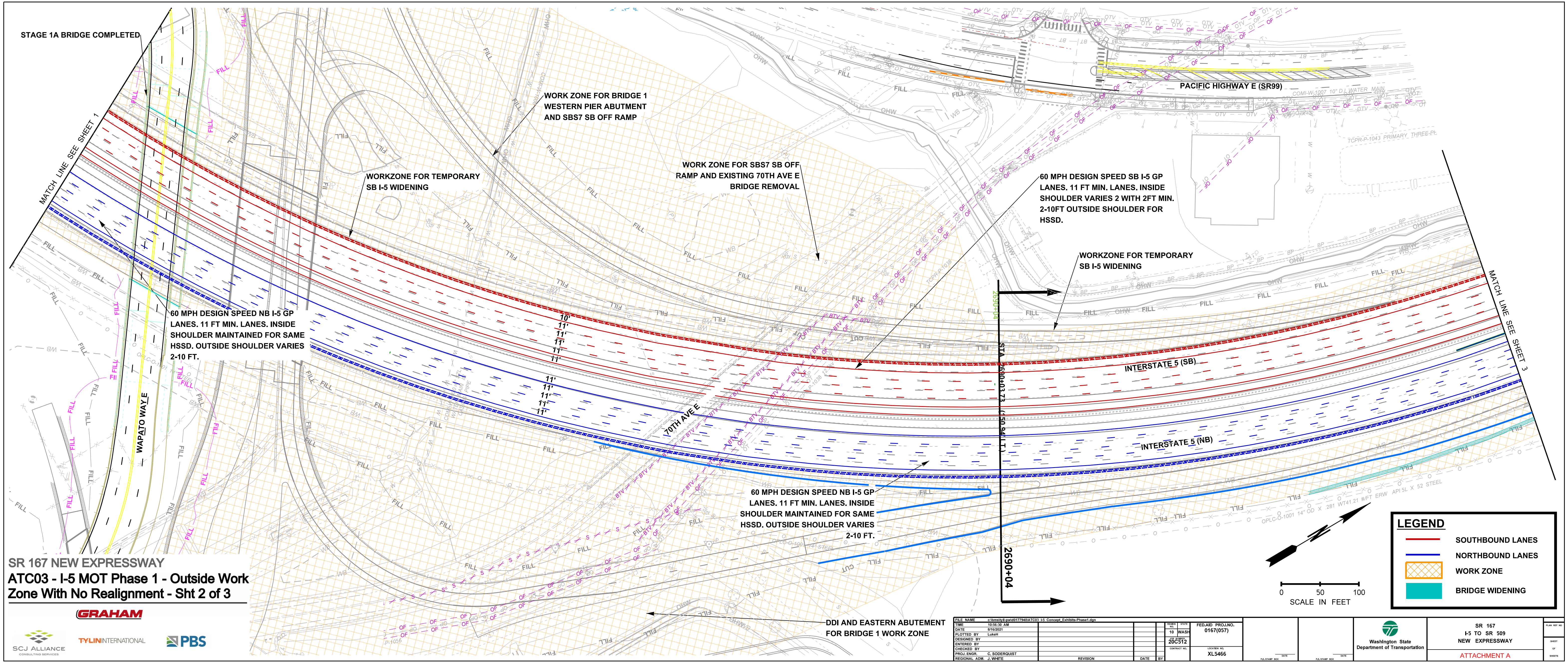
SR 167
I-5 TO SR 509
NEW EXPRESSWAY

ATTACHMENT A

PLAN REF NO
SHEET OF SHEETS


STAGE 1A BRIDGE COMPLETED
MATCH LINE SEE SHEET 1
WORK ZONE FOR BRIDGE 1 WESTERN PIER ABUTMENT AND SBS7 SB OFF RAMP
WORKZONE FOR TEMPORARY SB I-5 WIDENING
WORK ZONE FOR SBS7 SB OFF RAMP AND EXISTING 70TH AVE E BRIDGE REMOVAL
PACIFIC HIGHWAY E (SR99)
60 MPH DESIGN SPEED SB I-5 GP LANES. 11 FT MIN. LANES. INSIDE SHOULDER VARIES 2 WITH 2FT MIN. 2-10FT OUTSIDE SHOULDER FOR HSSD.
WORKZONE FOR TEMPORARY SB I-5 WIDENING
MATCH LINE SEE SHEET 3
60 MPH DESIGN SPEED NB I-5 GP LANES. 11 FT MIN. LANES. INSIDE SHOULDER MAINTAINED FOR SAME HSSD. OUTSIDE SHOULDER VARIES 2-10 FT.
10'
11'
11'
11'
11'
11'
11'
11'
11'
11'
11'
INTERSTATE 5 (SB)
INTERSTATE 5 (NB)
70TH AVE E
WAPATO WAY E
STA 2690+0.73 (50.94' LT)
2690+04
60 MPH DESIGN SPEED NB I-5 GP LANES. 11 FT MIN. LANES. INSIDE SHOULDER MAINTAINED FOR SAME HSSD. OUTSIDE SHOULDER VARIES 2-10 FT.
DDI AND EASTERN ABUTEMENT FOR BRIDGE 1 WORK ZONE
0 50 100
SCALE IN FEET
LEGEND
SOUTHBOUND LANES
NORTHBOUND LANES
WORK ZONE
BRIDGE WIDENING
FED.AID PROJ.NO. 0167(057)
20C512
XL5466
Washington State Department of Transportation
SR 167
I-5 TO SR 509
NEW EXPRESSWAY
ATTACHMENT A

SR 167 NEW EXPRESSWAY

ATCO3 - I-5 MOT Phase 1 - Outside Work Zone With No Realignment - Sht 2 of 3

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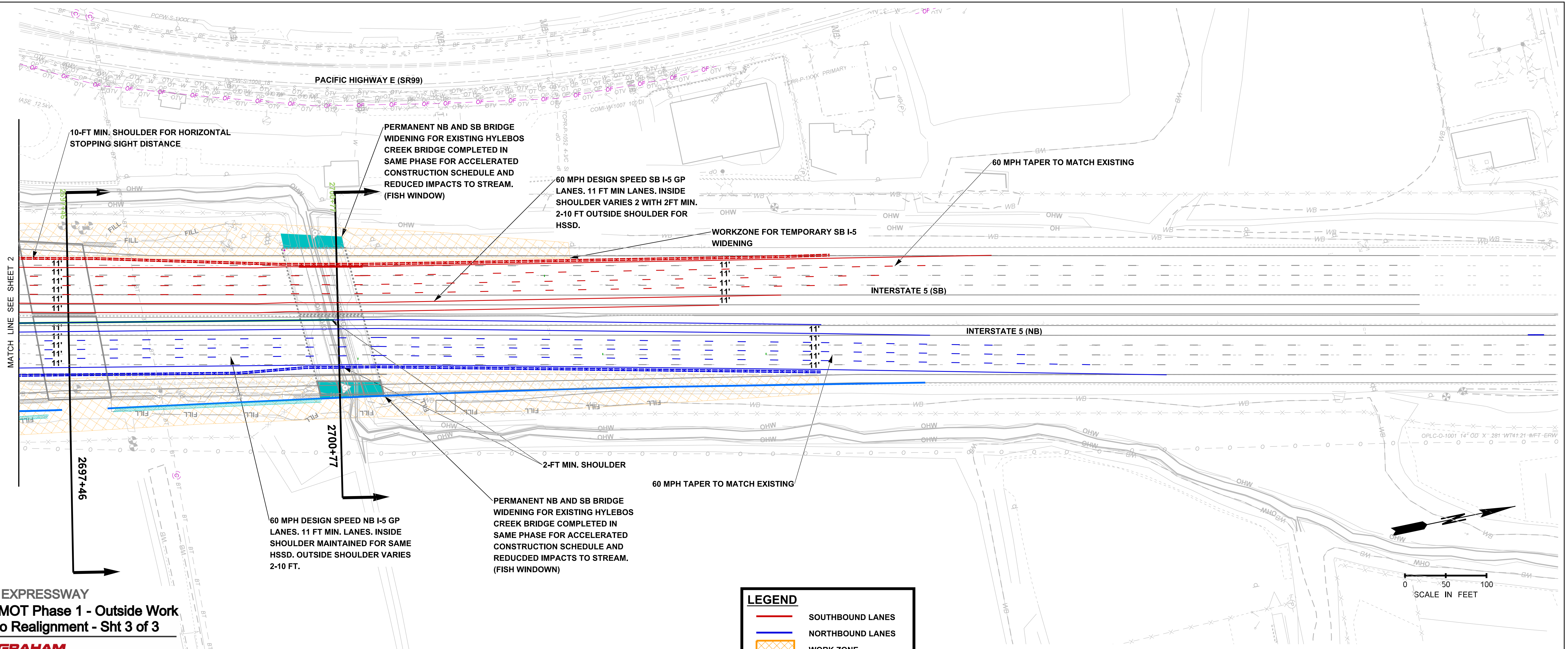
PACIFIC HIGHWAY E (SR99)
10-FT MIN. SHOULDER FOR HORIZONTAL STOPPING SIGHT DISTANCE
PERMANENT NB AND SB BRIDGE WIDENING FOR EXISTING HYLEBOS CREEK BRIDGE COMPLETED IN SAME PHASE FOR ACCELERATED CONSTRUCTION SCHEDULE AND REDUCED IMPACTS TO STREAM. (FISH WINDOW)
60 MPH DESIGN SPEED SB I-5 GP LANES. 11 FT MIN LANES. INSIDE SHOULDER VARIES 2 WITH 2FT MIN. 2-10 FT OUTSIDE SHOULDER FOR HSSD.
60 MPH TAPER TO MATCH EXISTING
WORKZONE FOR TEMPORARY SB I-5 WIDENING
MATCH LINE SEE SHEET 2
INTERSTATE 5 (SB)
INTERSTATE 5 (NB)
11'
2697+46
2700+77
2-FT MIN. SHOULDER
60 MPH TAPER TO MATCH EXISTING
60 MPH DESIGN SPEED NB I-5 GP LANES. 11 FT MIN. LANES. INSIDE SHOULDER MAINTAINED FOR SAME HSSD. OUTSIDE SHOULDER VARIES 2-10 FT.
PERMANENT NB AND SB BRIDGE WIDENING FOR EXISTING HYLEBOS CREEK BRIDGE COMPLETED IN SAME PHASE FOR ACCELERATED CONSTRUCTION SCHEDULE AND REDUCDED IMPACTS TO STREAM. (FISH WINDOWN)
0 50 100
SCALE IN FEET

SR 167 NEW EXPRESSWAY

ATC03 - I-5 MOT Phase 1 - Outside Work Zone With No Realignment - Sht 3 of 3

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LEGEND

- SOUTHBOUND LANES
- NORTHBOUND LANES
- WORK ZONE
- BRIDGE WIDENING

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DATE	8/16/2021			
PLOTTED BY	LukeH			
DESIGNED BY				
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PROJ. ENGR.	C. SODERQUIST			
REGIONAL ADM.	J. WHITE	REVISION	DATE	BY

REGION NO. 10 | STATE WASH | FED.AID PROJ.NO. 0167(057)
JOB NUMBER 20C512
CONTRACT NO.
LOCATION NO. XL5466

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P.E. STAMP BOX DATE

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SR 167
I-5 TO SR 509
NEW EXPRESSWAY

ATTACHMENT A

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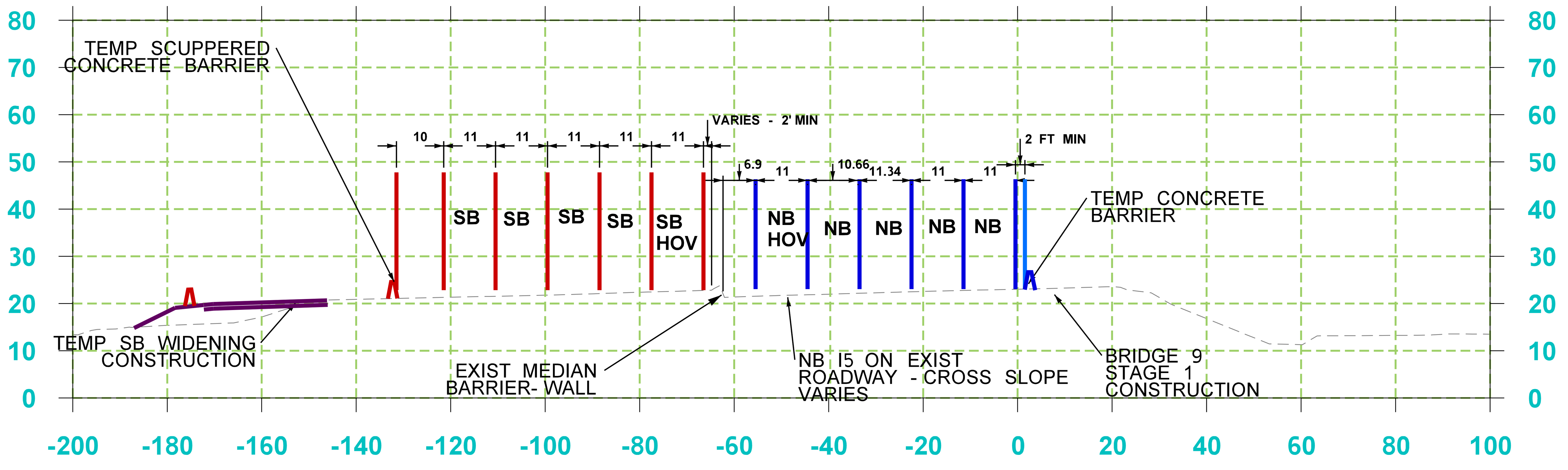
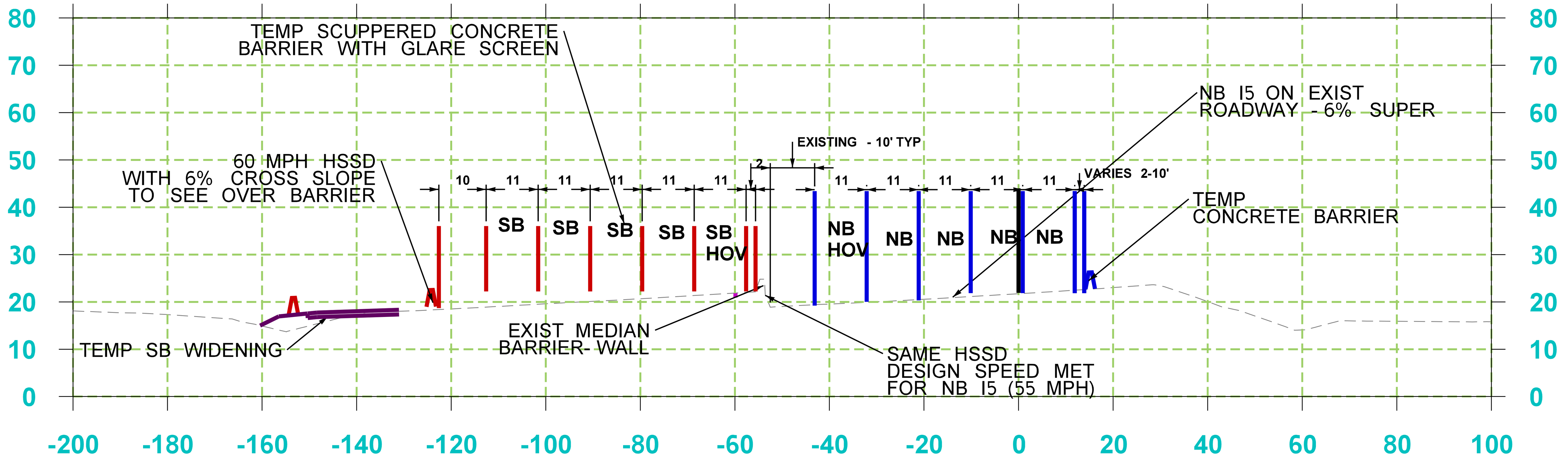
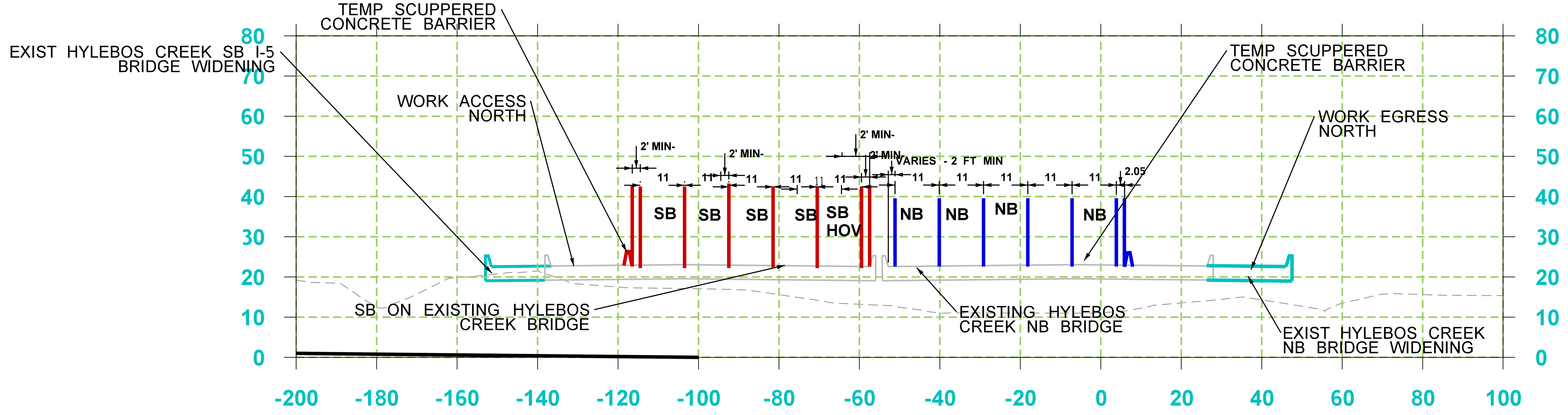
0 20 40
SCALE IN FEET



2697+46 - PHASE 1


TEMP SCUPPERED CONCRETE
BARRIER WITH GLARE SCREEN
NB I5 ON EXIST
ROADWAY - 6% SUPER
EXISTING - 10' TYP
VARIES 2-10'
60 MPH HSSD
WITH 6% CROSS SLOPE
TO SEE OVER BARRIER
SB SB SB SB SB HOV
NB HOV NB NB NB NB
TEMP
CONCRETE BARRIER
TEMP SB WIDENING
EXIST MEDIAN
BARRIER- WALL
SAME HSSD
DESIGN SPEED MET
FOR NB I5 (55 MPH)

2690+04 - PHASE 1


TEMP SCUPPERED
CONCRETE BARRIER
EXIST HYLEBOS CREEK SB I-5
BRIDGE WIDENING
WORK ACCESS
NORTH
TEMP SCUPPERED
CONCRETE BARRIER
WORK EGRESS
NORTH
VARIES - 2 FT MIN
SB SB SB SB SB HOV
NB NB NB NB
SB ON EXISTING HYLEBOS
CREEK BRIDGE
EXISTING HYLEBOS
CREEK NB BRIDGE
EXIST HYLEBOS CREEK
NB BRIDGE WIDENING

2700+77 - PHASE 1

SR 167 NEW EXPRESSWAY

ATC03 - I-5 MOT Phase 1 - Outside Work Zone With No Realignment - Section Cuts

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TIME	3:39:35 PM		
DATE	8/16/2021		
PLOTTED BY	johnb		
DESIGNED BY			
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CHECKED BY			
PROJ. ENGR.	C. SODERQUIST		
REGIONAL ADM.	J. WHITE	REVISION	DATE BY

REGION NO. 10 STATE WASH FED.AID PROJ.NO. 0167(057)

JOB NUMBER 20C512

CONTRACT NO. LOCATION NO. XL5466

P.E. STAMP BOX DATE P.E. STAMP BOX DATE

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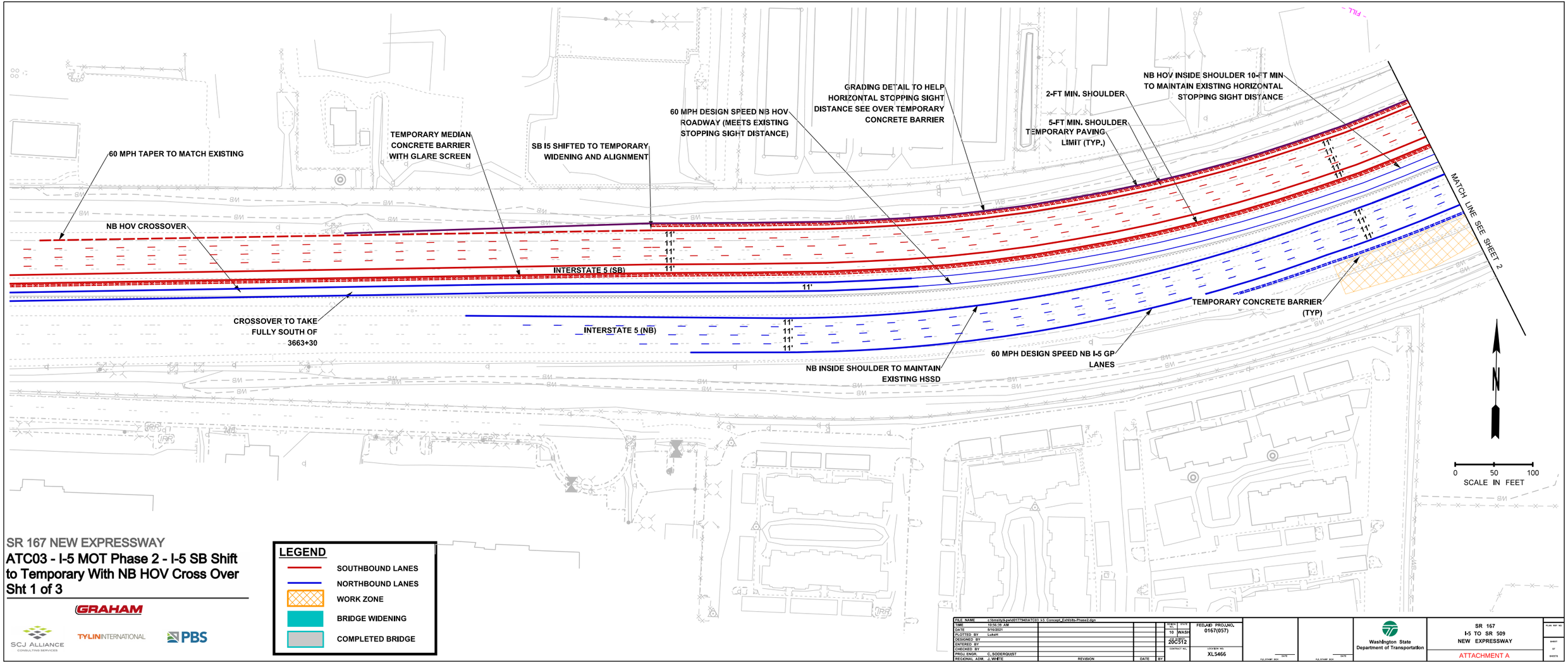
SR 167
I-5 TO SR 509
NEW EXPRESSWAY

ATTACHMENT A

PLAN REF NO. SHEET OF SHEETS



SR 167 NEW EXPRESSWAY

ATC03 - I-5 MOT Phase 2 - I-5 SB Shift to Temporary With NB HOV Cross Over

Sht 1 of 3

GRAHAM

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LEGEND

- SOUTHBOUND LANES
- NORTHBOUND LANES
- WORK ZONE
- BRIDGE WIDENING
- COMPLETED BRIDGE

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PLOTTED BY	Lukehl
DESIGNED BY	
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PROJ. ENGR.	C. SODERQUIST
REGIONAL ADM.	J. WHITE

REVISION	DATE	BY

REGION NO.	10
STATE	WASH
FED.AID PROJ.NO.	0167(057)
CONTRACT NO.	20C512
JOB/BTA NO.	XL5466

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I-5 TO SR 509
NEW EXPRESSWAY

ATTACHMENT A

PLAN REF NO.

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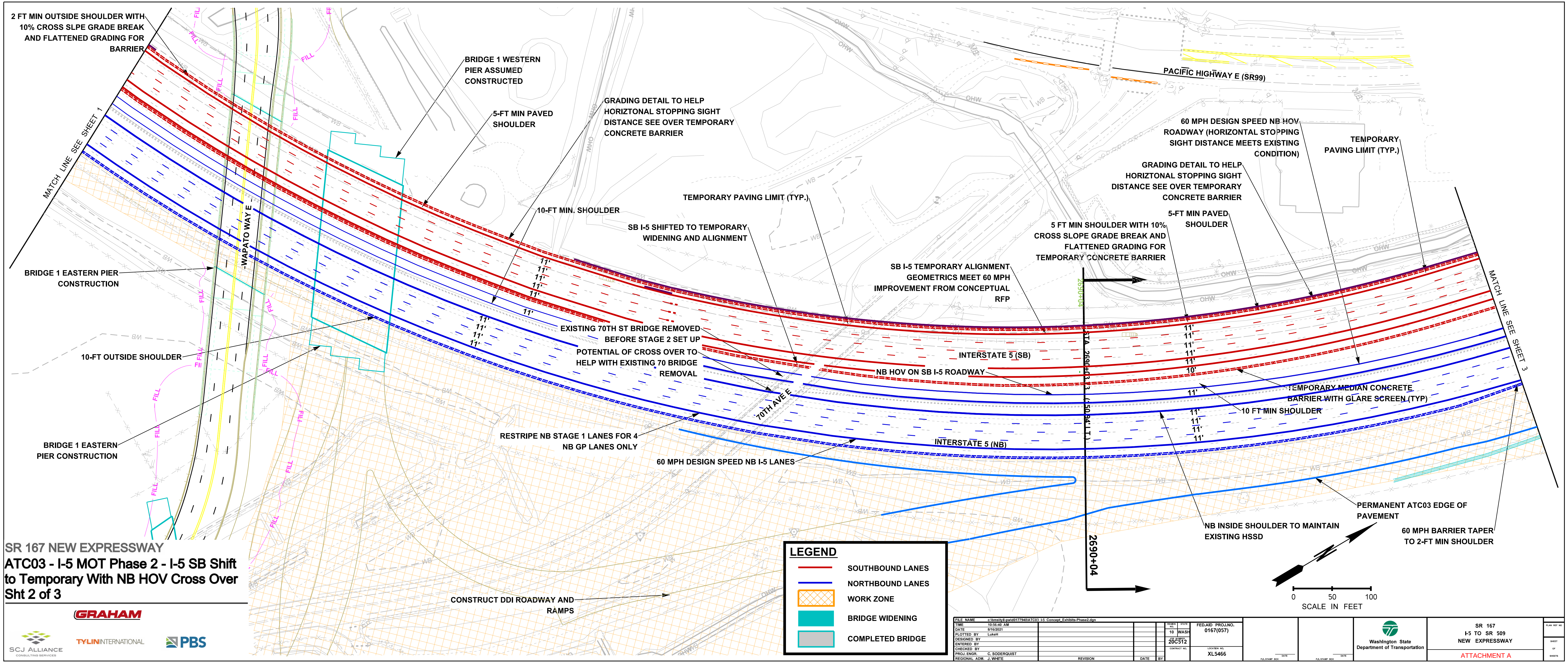
2 FT MIN OUTSIDE SHOULDER WITH 10% CROSS SLPE GRADE BREAK AND FLATTENED GRADING FOR BARRIER
BRIDGE 1 WESTERN PIER ASSUMED CONSTRUCTED
5-FT MIN PAVED SHOULDER
GRADING DETAIL TO HELP HORIZTONAL STOPPING SIGHT DISTANCE SEE OVER TEMPORARY CONCRETE BARRIER
PACIFIC HIGHWAY E (SR99)
60 MPH DESIGN SPEED NB HOV ROADWAY (HORIZONTAL STOPPING SIGHT DISTANCE MEETS EXISTING CONDITION)
TEMPORARY PAVING LIMIT (TYP.)
GRADING DETAIL TO HELP HORIZTONAL STOPPING SIGHT DISTANCE SEE OVER TEMPORARY CONCRETE BARRIER
5-FT MIN PAVED SHOULDER
MATCH LINE SEE SHEET 1
TEMPORARY PAVING LIMIT (TYP.)
10-FT MIN. SHOULDER
SB I-5 SHIFTED TO TEMPORARY WIDENING AND ALIGNMENT
5 FT MIN SHOULDER WITH 10% CROSS SLOPE GRADE BREAK AND FLATTENED GRADING FOR TEMPORARY CONCRETE BARRIER
WAPATO WAY E
BRIDGE 1 EASTERN PIER CONSTRUCTION
SB I-5 TEMPORARY ALIGNMENT GEOMETRICS MEET 60 MPH IMPROVEMENT FROM CONCEPTUAL RFP
MATCH LINE SEE SHEET 3
EXISTING 70TH ST BRIDGE REMOVED BEFORE STAGE 2 SET UP
INTERSTATE 5 (SB)
10-FT OUTSIDE SHOULDER
POTENTIAL OF CROSS OVER TO HELP WITH EXISTING 70 BRIDGE REMOVAL
NB HOV ON SB I-5 ROADWAY
TEMPORARY MEDIAN CONCRETE BARRIER WITH GLARE SCREEN (TYP)
10 FT MIN SHOULDER
70TH AVE E
STA 2691+31.1 (150.24 LT)
BRIDGE 1 EASTERN PIER CONSTRUCTION
RESTRIPE NB STAGE 1 LANES FOR 4 NB GP LANES ONLY
INTERSTATE 5 (NB)
60 MPH DESIGN SPEED NB I-5 LANES
PERMANENT ATC03 EDGE OF PAVEMENT
NB INSIDE SHOULDER TO MAINTAIN EXISTING HSSD
60 MPH BARRIER TAPER TO 2-FT MIN SHOULDER
2690+04
CONSTRUCT DDI ROADWAY AND RAMPS
SR 167 NEW EXPRESSWAY
ATC03 - I-5 MOT Phase 2 - I-5 SB Shift to Temporary With NB HOV Cross Over Sht 2 of 3
GRAHAM
SCJ ALLIANCE
TYLININTERNATIONAL
PBS
LEGEND
SOUTHBOUND LANES
NORTHBOUND LANES
WORK ZONE
BRIDGE WIDENING
COMPLETED BRIDGE
0 50 100
SCALE IN FEET
PLOTTED BY LukeH
PROJ. ENGR. C. SODERQUIST
REGIONAL ADM. J. WHITE
FED.AID PROJ.NO. 0167(057)
20C512
XL5466
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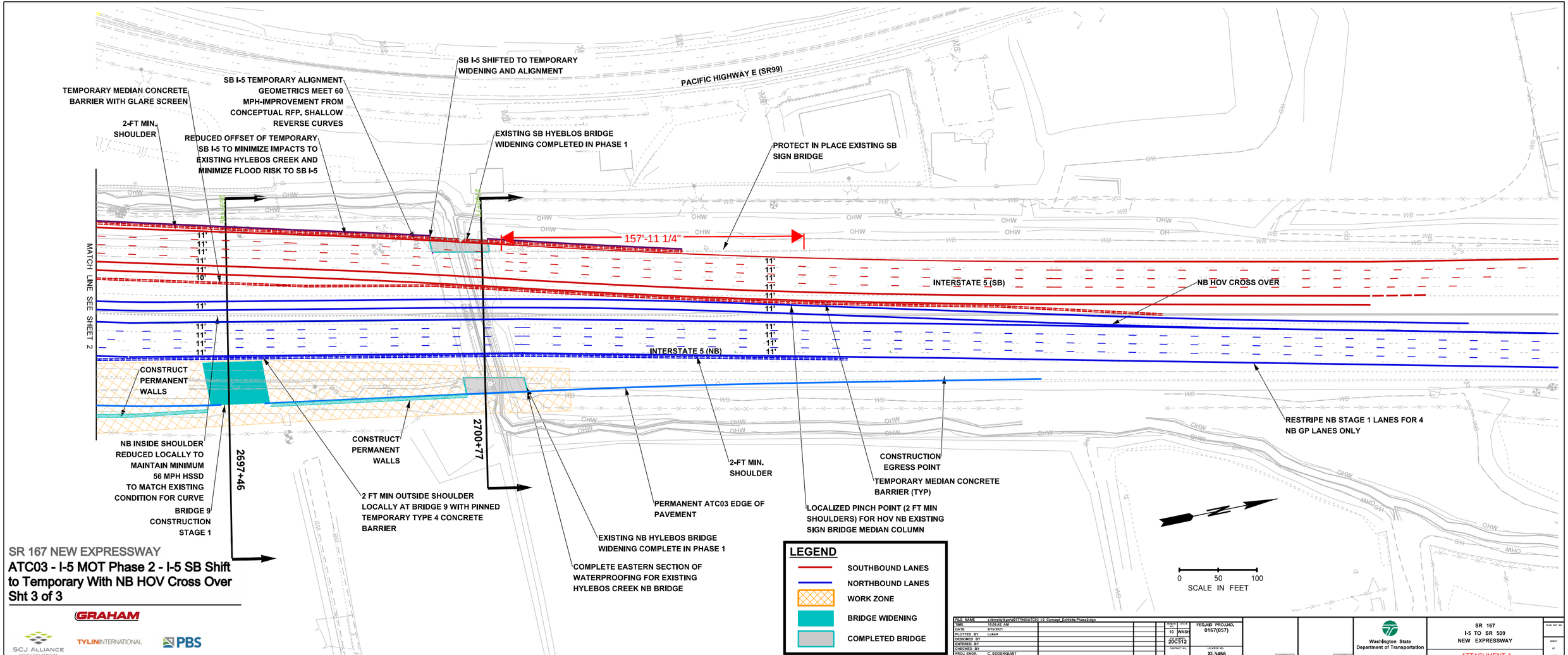
SR 167
I-5 TO SR 509
NEW EXPRESSWAY
ATTACHMENT A



SR 167 NEW EXPRESSWAY

ATC03 - I-5 MOT Phase 2 - I-5 SB Shift to Temporary With NB HOV Cross Over

Sht 3 of 3

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DESIGNED BY	
ENTERED BY	
CHECKED BY	
PROJ. ENGR.	C. SODERQUIST
REGIONAL ADM.	J. WHITE

REVISION	DATE	BY

REGION NO.	STATE
10	WASH
CONTRACT NO.	
20C512	
LOCATION NO.	
XL5466	

FED.AID PROJ.NO. 0167(057)

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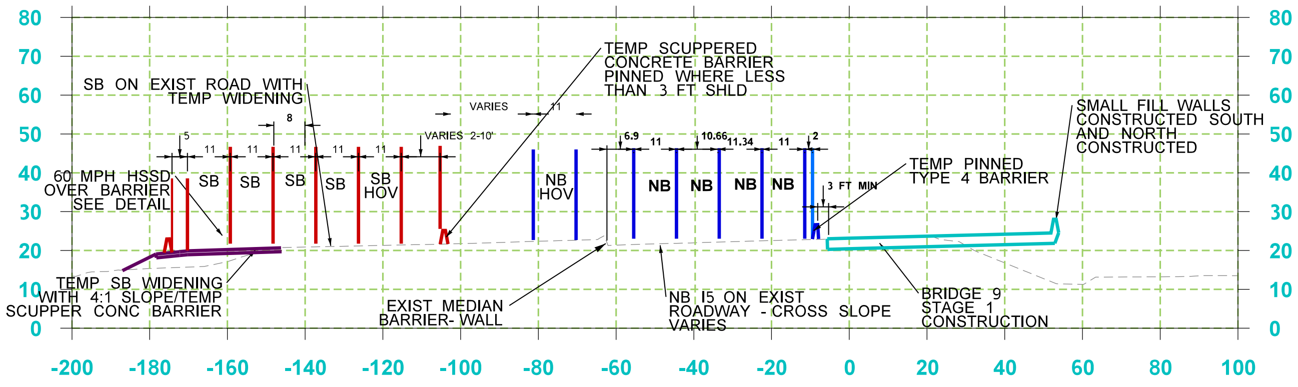
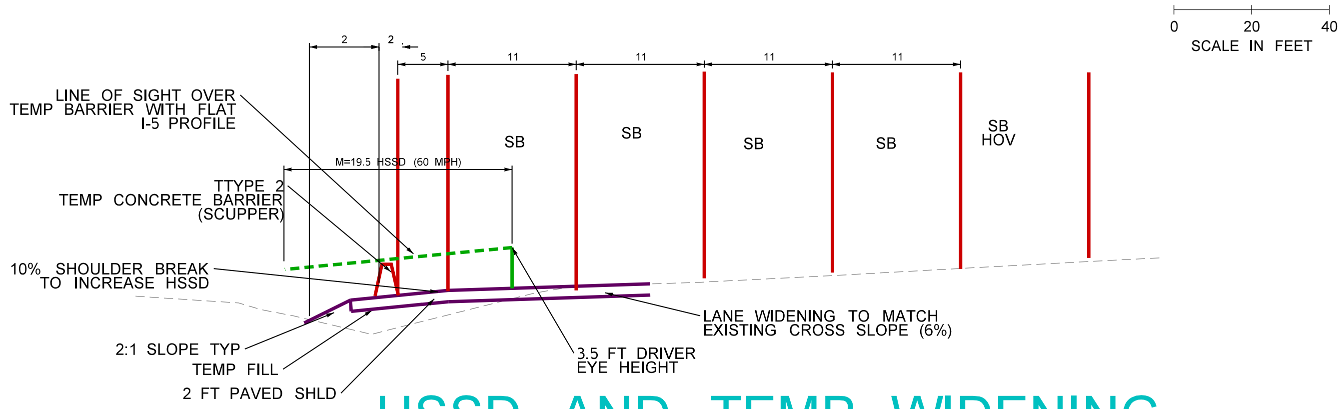
SR 167
I-5 TO SR 509
NEW EXPRESSWAY

ATTACHMENT A

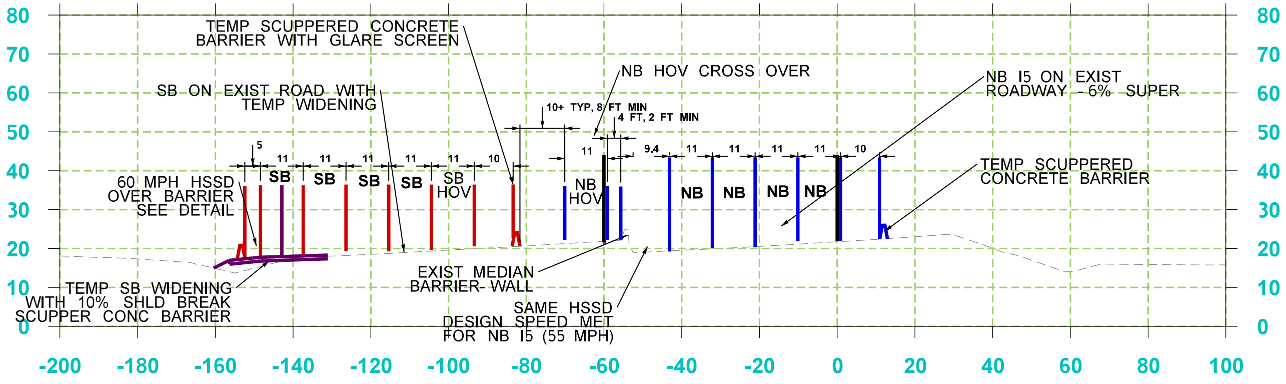
PLAN REF. NO. SHEET OF SHEETS


SB ON EXIST ROAD WITH TEMP WIDENING
TEMP SCUPPERED CONCRETE BARRIER PINNED WHERE LESS THAN 3 FT SHLD
SMALL FILL WALLS CONSTRUCTED SOUTH AND NORTH CONSTRUCTED
60 MPH HSSD OVER BARRIER SEE DETAIL
SB
SB
SB
SB
SB HOV
NB HOV
NB
NB
NB
NB
TEMP PINNED TYPE 4 BARRIER
3 FT MIN
TEMP SB WIDENING WITH 4:1 SLOPE/TEMP SCUPPER CONC BARRIER
EXIST MEDIAN BARRIER- WALL
NB I5 ON EXIST ROADWAY - CROSS SLOPE VARIES
BRIDGE 9 STAGE 1 CONSTRUCTION
VARIES
VARIES 2-10'

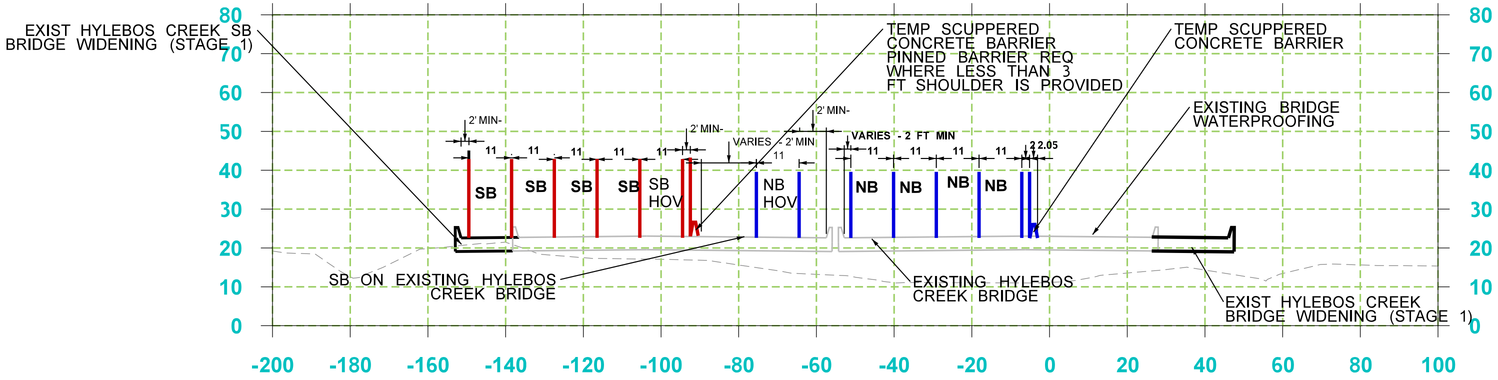
2697+46 - PHASE 2


0 20 40
SCALE IN FEET
LINE OF SIGHT OVER TEMP BARRIER WITH FLAT I-5 PROFILE
TTYPE 2 TEMP CONCRETE BARRIER (SCUPPER)
M=19.5 HSSD (60 MPH)
SB
SB
SB
SB
SB HOV
10% SHOULDER BREAK TO INCREASE HSSD
LANE WIDENING TO MATCH EXISTING CROSS SLOPE (6%)
2:1 SLOPE TYP
TEMP FILL
2 FT PAVED SHLD
3.5 FT DRIVER EYE HEIGHT

HSSD AND TEMP WIDENING FOR TEMPORARY SB I-5


TEMP SCUPPERED CONCRETE BARRIER WITH GLARE SCREEN
SB ON EXIST ROAD WITH TEMP WIDENING
NB HOV CROSS OVER
NB I5 ON EXIST ROADWAY - 6% SUPER
10+ TYP, 8 FT MIN
4 FT, 2 FT MIN
60 MPH HSSD OVER BARRIER SEE DETAIL
SB
SB
SB
SB
SB HOV
NB HOV
NB
NB
NB
NB
TEMP SCUPPERED CONCRETE BARRIER
TEMP SB WIDENING WITH 10% SHLD BREAK SCUPPER CONC BARRIER
EXIST MEDIAN BARRIER- WALL
SAME HSSD DESIGN SPEED MET FOR NB I5 (55 MPH)

2690+04 - PHASE 2


EXIST HYLEBOS CREEK SB BRIDGE WIDENING (STAGE 1)
TEMP SCUPPERED CONCRETE BARRIER PINNED BARRIER REQ WHERE LESS THAN 3 FT SHOULDER IS PROVIDED
TEMP SCUPPERED CONCRETE BARRIER
EXISTING BRIDGE WATERPROOFING
2' MIN-
VARIES - 2' MIN
VARIES - 2 FT MIN
SB
SB
SB
SB
SB HOV
NB HOV
NB
NB
NB
NB
SB ON EXISTING HYLEBOS CREEK BRIDGE
EXISTING HYLEBOS CREEK BRIDGE
EXIST HYLEBOS CREEK BRIDGE WIDENING (STAGE 1)

2700+77 - PHASE 2

SR 167 NEW EXPRESSWAY

ATC03 - I-5 MOT Phase 2 - I-5 SB Shift to Temporary With NB HOV Cross Over Section Cuts

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TIME	3:39:40 PM		
DATE	8/16/2021		
PLOTTED BY	johnb		
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PROJ. ENGR.	C. SODERQUIST		
REGIONAL ADM.	J. WHITE	REVISION	DATE BY

REGION NO. 10 | STATE WASH | FED.AID PROJ.NO. 0167(057)

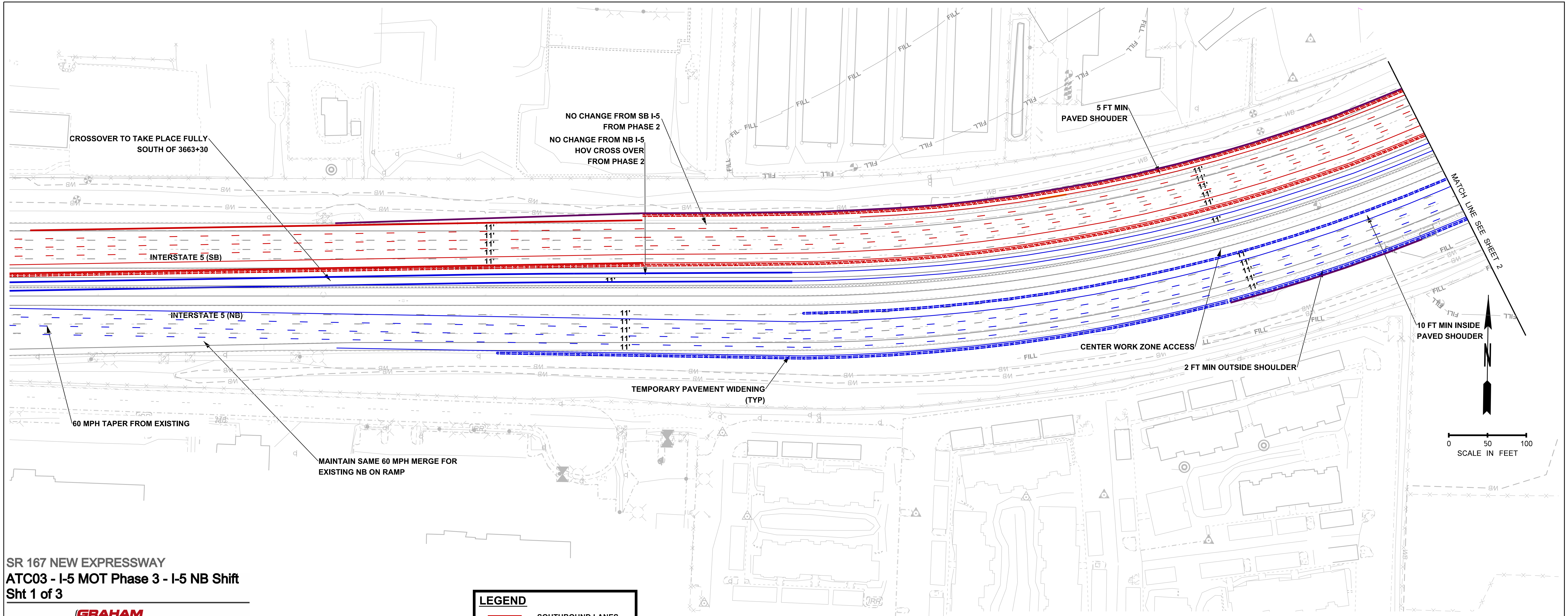
JOB NUMBER 20C512

LOCATION NO. XL5466

Washington State Department of Transportation

SR 167
I-5 TO SR 509
NEW EXPRESSWAY

ATTACHMENT A



SR 167 NEW EXPRESSWAY

ATC03 - I-5 MOT Phase 3 - I-5 NB Shift
Sht 1 of 3

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LEGEND

(red line)	SOUTHBOUND LANES
(blue line)	NORTHBOUND LANES

FILE NAME	c:\bms\tyll-pw\d0177940\ATC03 I-5 Concept_Exhibits-Phase3.dgn			
TIME	10:56:49 AM			
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JOB NUMBER 20C512 | CONTRACT NO. | LOCATION NO. XL5466

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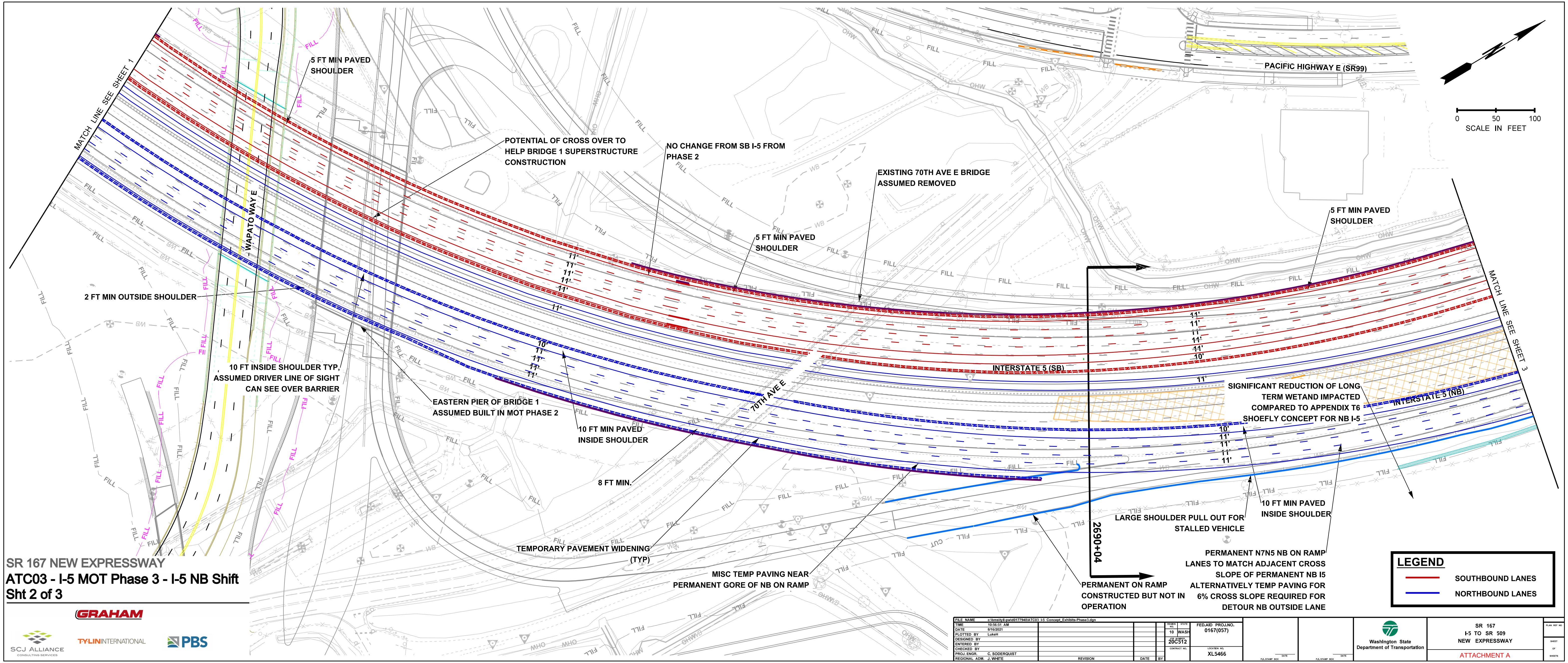
Washington State Department of Transportation

SR 167
I-5 TO SR 509
NEW EXPRESSWAY

ATTACHMENT A

PLAN REF NO | SHEET OF SHEETS



MATCH LINE SEE SHEET 1
5 FT MIN PAVED SHOULDER
POTENTIAL OF CROSS OVER TO HELP BRIDGE 1 SUPERSTRUCTURE CONSTRUCTION
NO CHANGE FROM SB I-5 FROM PHASE 2
EXISTING 70TH AVE E BRIDGE ASSUMED REMOVED
PACIFIC HIGHWAY E (SR99)
0 50 100
SCALE IN FEET
5 FT MIN PAVED SHOULDER
5 FT MIN PAVED SHOULDER
WAPATO WAY E
2 FT MIN OUTSIDE SHOULDER
MATCH LINE SEE SHEET 3
INTERSTATE 5 (SB)
INTERSTATE 5 (NB)
70TH AVE E
10 FT INSIDE SHOULDER TYP, ASSUMED DRIVER LINE OF SIGHT CAN SEE OVER BARRIER
EASTERN PIER OF BRIDGE 1 ASSUMED BUILT IN MOT PHASE 2
10 FT MIN PAVED INSIDE SHOULDER
SIGNIFICANT REDUCTION OF LONG TERM WETAND IMPACTED COMPARED TO APPENDIX T6 SHOEFLY CONCEPT FOR NB I-5
8 FT MIN.
10 FT MIN PAVED INSIDE SHOULDER
LARGE SHOULDER PULL OUT FOR STALLED VEHICLE
2690+04
TEMPORARY PAVEMENT WIDENING (TYP)
MISC TEMP PAVING NEAR PERMANENT GORE OF NB ON RAMP
PERMANENT ON RAMP CONSTRUCTED BUT NOT IN OPERATION
PERMANENT N7N5 NB ON RAMP LANES TO MATCH ADJACENT CROSS SLOPE OF PERMANENT NB I5 ALTERNATIVELY TEMP PAVING FOR 6% CROSS SLOPE REQUIRED FOR DETOUR NB OUTSIDE LANE
LEGEND
SOUTHBOUND LANES
NORTHBOUND LANES
SR 167 NEW EXPRESSWAY
ATC03 - I-5 MOT Phase 3 - I-5 NB Shift
Sht 2 of 3
GRAHAM
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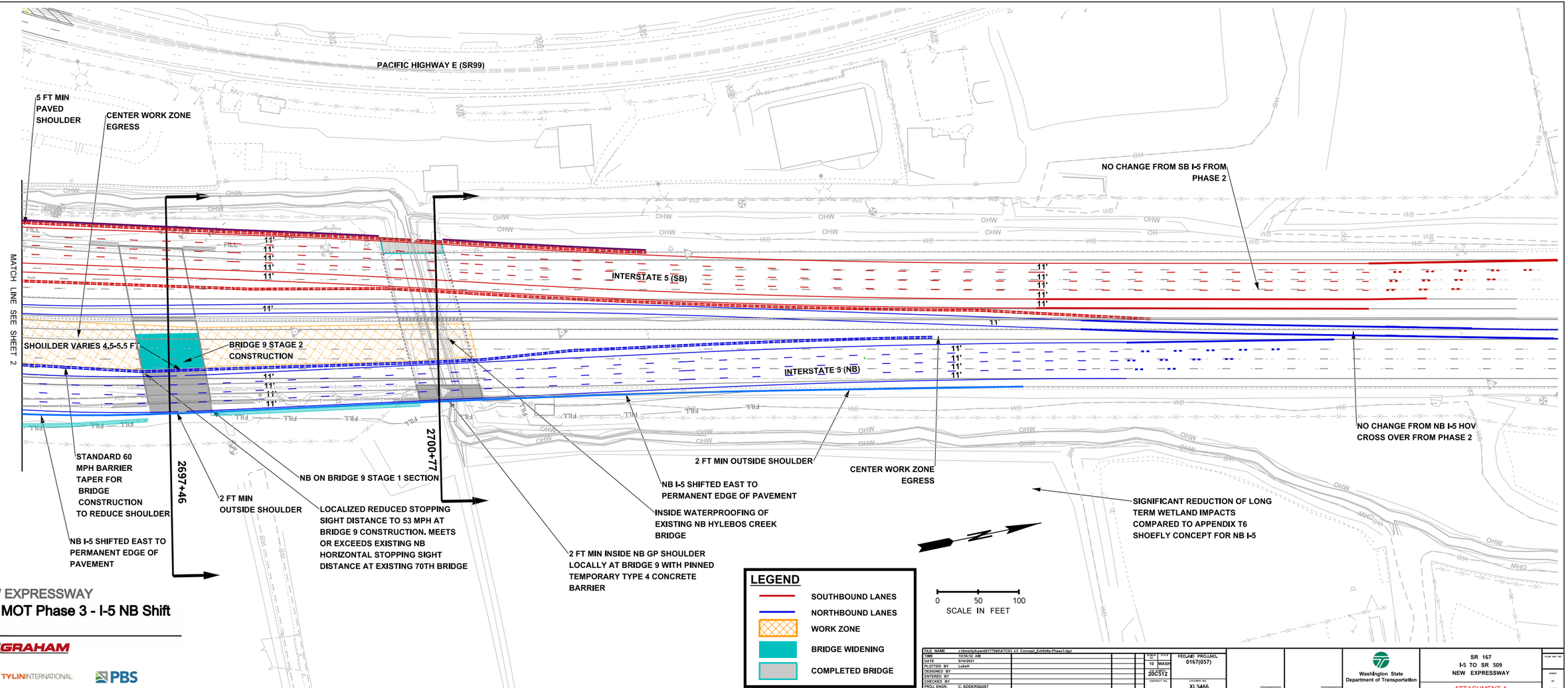
0167(057)
20C512
XL5466
Washington State Department of Transportation
SR 167
I-5 TO SR 509
NEW EXPRESSWAY
ATTACHMENT A



SR 167 NEW EXPRESSWAY

ATC03 - I-5 MOT Phase 3 - I-5 NB Shift

Sht 3 of 3

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PLOTTED BY	LukeH
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PROJ. ENGR.	C. SODERQUIST
REGIONAL ADM.	J. WHITE

REVISION	DATE	BY

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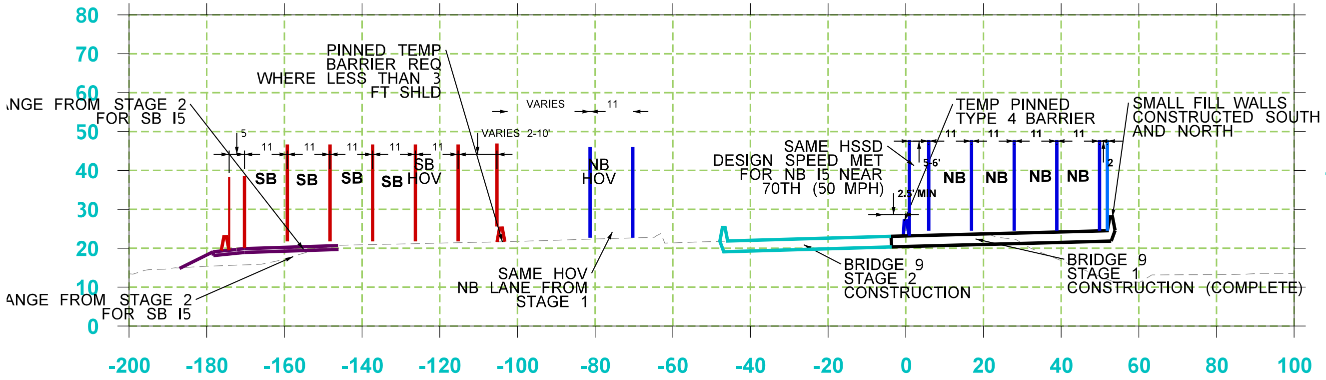
CONTRACT NO. 20C512

LOCATION NO. XL5466

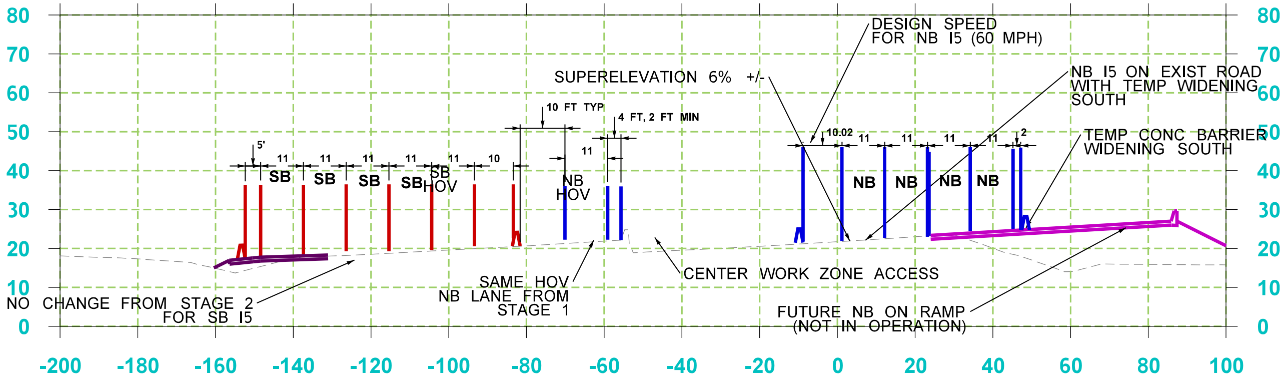
Washington State Department of Transportation

SR 167
I-5 TO SR 509
NEW EXPRESSWAY

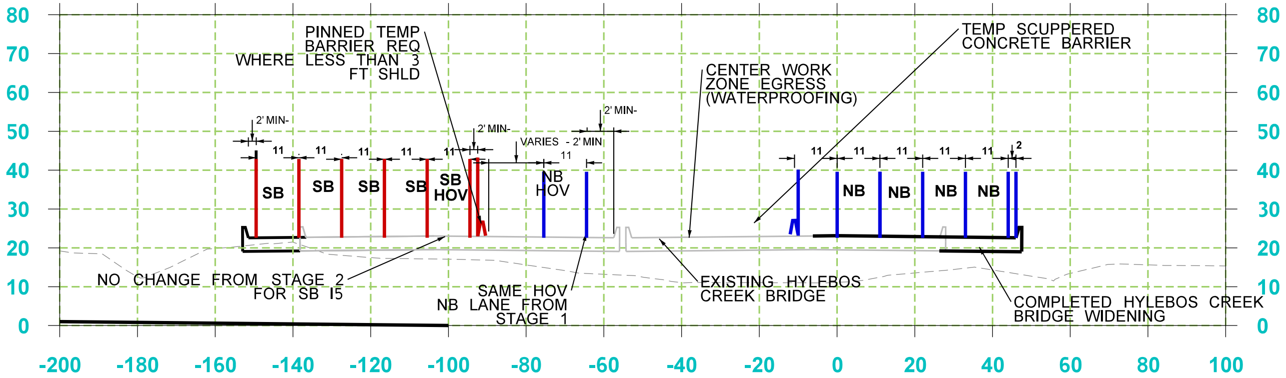
ATTACHMENT A


PINNED TEMP BARRIER REQ WHERE LESS THAN 3 FT SHLD
NGE FROM STAGE 2 FOR SB I5
VARIES
VARIES 2-10'
SB
SB
SB
SB
SB HOV
NB HOV
SAME HOV NB LANE FROM STAGE 1
TEMP PINNED TYPE 4 BARRIER
SAME HSSD DESIGN SPEED MET FOR NB I5 NEAR 70TH (50 MPH)
2.5' MIN
NB
NB
NB
NB
SMALL FILL WALLS CONSTRUCTED SOUTH AND NORTH
BRIDGE 9 STAGE 2 CONSTRUCTION
BRIDGE 9 STAGE 1 CONSTRUCTION (COMPLETE)
NGE FROM STAGE 2 FOR SB I5

2697+46 - PHASE 3


DESIGN SPEED FOR NB I5 (60 MPH)
SUPERELEVATION 6% +/-
10 FT TYP
4 FT, 2 FT MIN
NB I5 ON EXIST ROAD WITH TEMP WIDENING SOUTH
TEMP CONC BARRIER WIDENING SOUTH
SB
SB
SB
SB
SB HOV
NB HOV
NB
NB
NB
NB
NO CHANGE FROM STAGE 2 FOR SB I5
SAME HOV NB LANE FROM STAGE 1
CENTER WORK ZONE ACCESS
FUTURE NB ON RAMP (NOT IN OPERATION)

2690+04 - PHASE 3


PINNED TEMP BARRIER REQ WHERE LESS THAN 3 FT SHLD
TEMP SCUPPERED CONCRETE BARRIER
CENTER WORK ZONE EGRESS (WATERPROOFING)
2' MIN
VARIES - 2' MIN
SB
SB
SB
SB
SB HOV
NB HOV
NB
NB
NB
NB
NO CHANGE FROM STAGE 2 FOR SB I5
SAME HOV NB LANE FROM STAGE 1
EXISTING HYLEBOS CREEK BRIDGE
COMPLETED HYLEBOS CREEK BRIDGE WIDENING

2700+77 - PHASE 3

SR 167 NEW EXPRESSWAY

ATC03 - I-5 MOT Phase 3 - I-5 NB Shift Section Cuts

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PLOTTED BY	johnb			
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REGION NO. 10 | STATE WASH | FED.AID PROJ.NO. 0167(057)

JOB NUMBER 20C512 | CONTRACT NO. | LOCATION NO. XL5466

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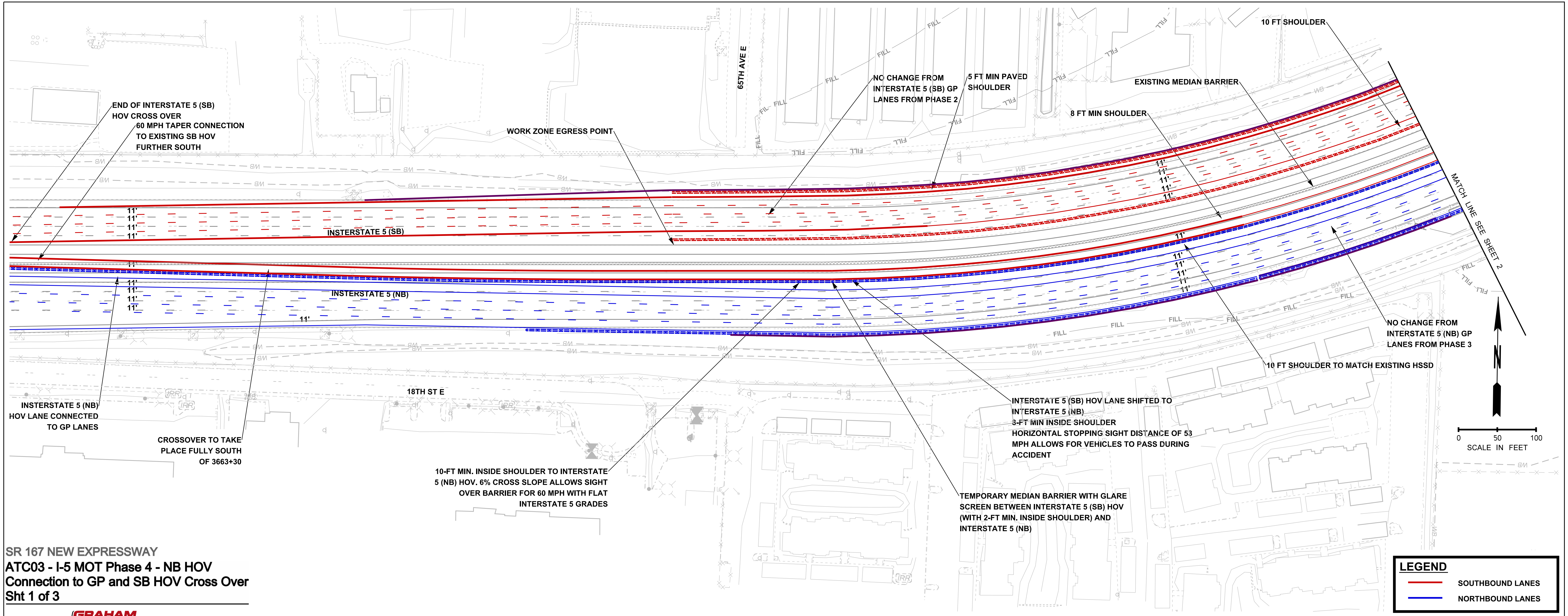
Washington State Department of Transportation

SR 167
I-5 TO SR 509
NEW EXPRESSWAY

ATTACHMENT A

PLAN REF NO | SHEET OF SHEETS



65TH AVE E
10 FT SHOULDER
EXISTING MEDIAN BARRIER
END OF INTERSTATE 5 (SB) HOV CROSS OVER
60 MPH TAPER CONNECTION TO EXISTING SB HOV FURTHER SOUTH
WORK ZONE EGRESS POINT
NO CHANGE FROM INTERSTATE 5 (SB) GP LANES FROM PHASE 2
5 FT MIN PAVED SHOULDER
8 FT MIN SHOULDER
MATCH LINE SEE SHEET 2
INTERSTATE 5 (SB)
INTERSTATE 5 (NB)
11'
NO CHANGE FROM INTERSTATE 5 (NB) GP LANES FROM PHASE 3
10 FT SHOULDER TO MATCH EXISTING HSSD
18TH ST E
INTERSTATE 5 (NB) HOV LANE CONNECTED TO GP LANES
CROSSOVER TO TAKE PLACE FULLY SOUTH OF 3663+30
INTERSTATE 5 (SB) HOV LANE SHIFTED TO INTERSTATE 5 (NB)
3-FT MIN INSIDE SHOULDER
HORIZONTAL STOPPING SIGHT DISTANCE OF 53 MPH ALLOWS FOR VEHICLES TO PASS DURING ACCIDENT
10-FT MIN. INSIDE SHOULDER TO INTERSTATE 5 (NB) HOV. 6% CROSS SLOPE ALLOWS SIGHT OVER BARRIER FOR 60 MPH WITH FLAT INTERSTATE 5 GRADES
TEMPORARY MEDIAN BARRIER WITH GLARE SCREEN BETWEEN INTERSTATE 5 (SB) HOV (WITH 2-FT MIN. INSIDE SHOULDER) AND INTERSTATE 5 (NB)
N
0 50 100
SCALE IN FEET
LEGEND
SOUTHBOUND LANES
NORTHBOUND LANES

SR 167 NEW EXPRESSWAY

ATC03 - I-5 MOT Phase 4 - NB HOV Connection to GP and SB HOV Cross Over Sht 1 of 3

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JOB NUMBER 20C512 · CONTRACT NO. · LOCATION NO. XL5466

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SR 167
I-5 TO SR 509
NEW EXPRESSWAY

ATTACHMENT A

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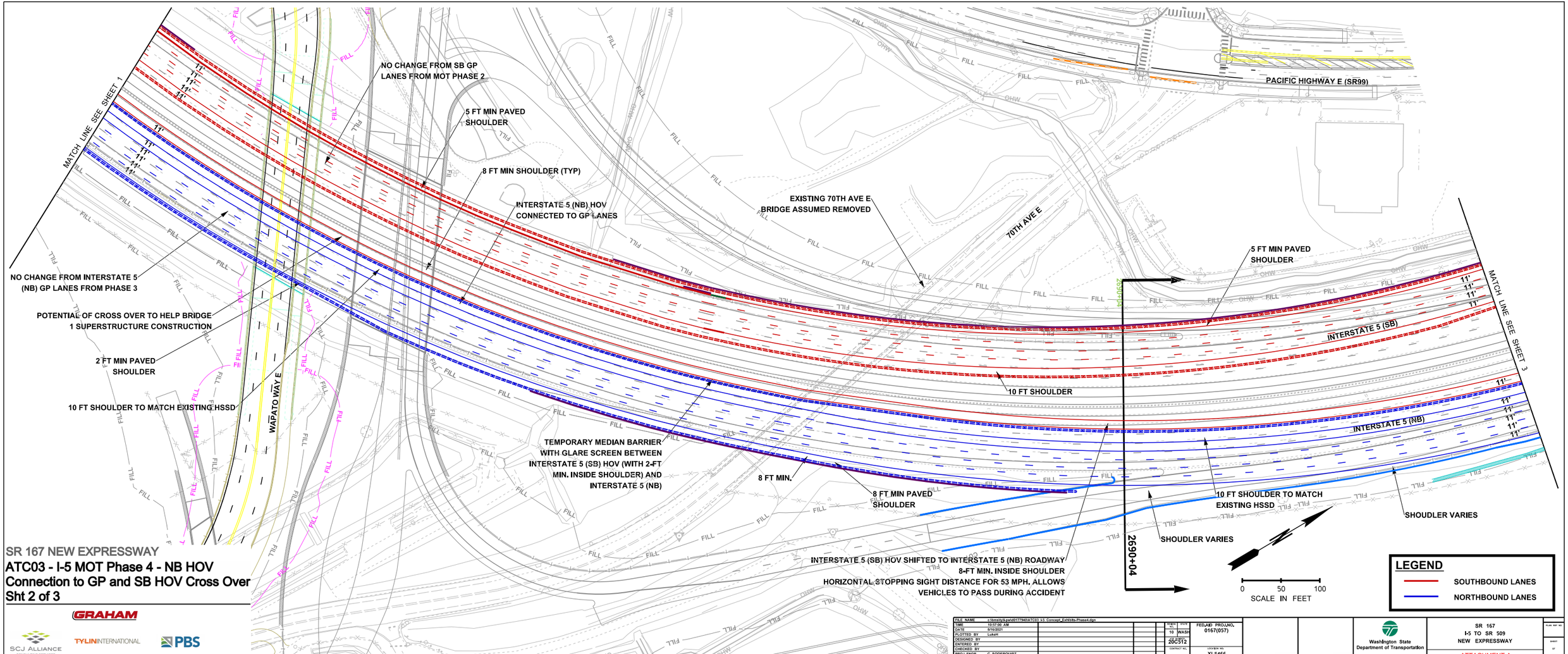

SR 167 NEW EXPRESSWAY

ATC03 - I-5 MOT Phase 4 - NB HOV Connection to GP and SB HOV Cross Over

Sht 2 of 3

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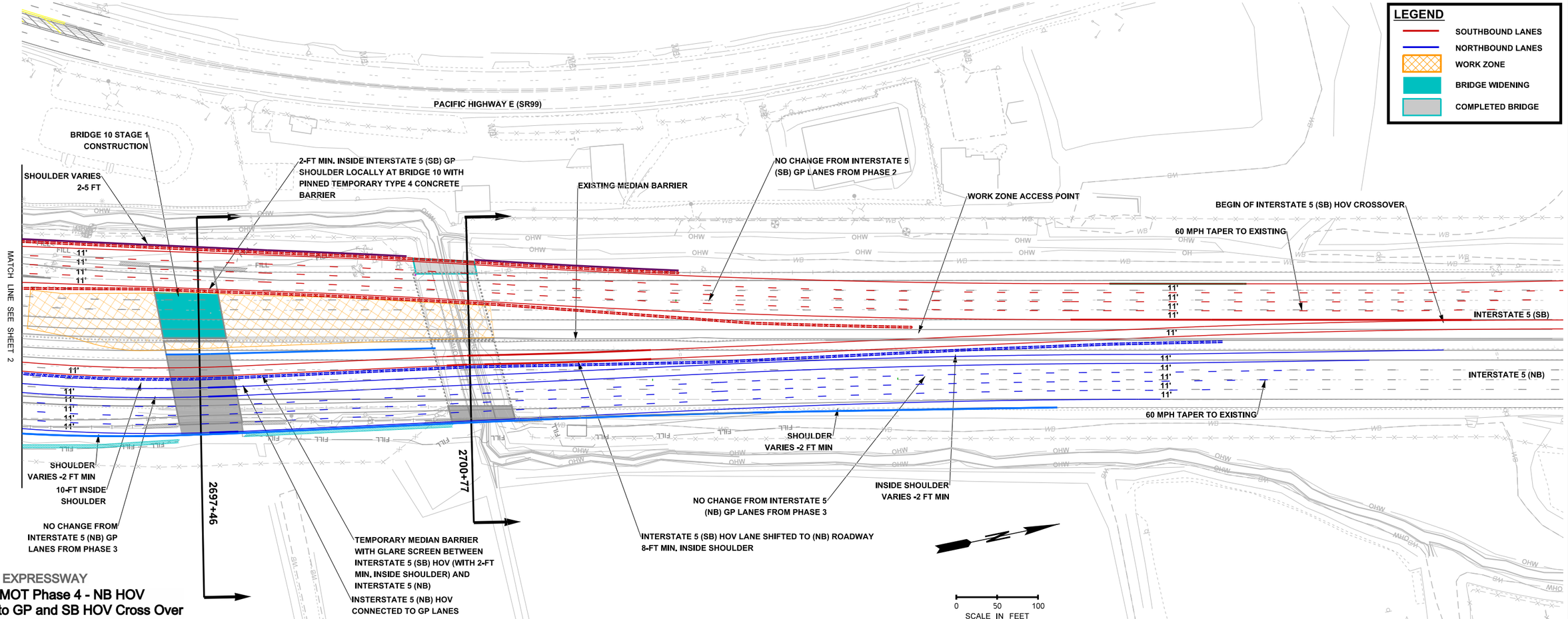
SR 167
I-5 TO SR 509
NEW EXPRESSWAY

ATTACHMENT A



SR 167 NEW EXPRESSWAY

ATC03 - I-5 MOT Phase 4 - NB HOV Connection to GP and SB HOV Cross Over Sht 3 of 3

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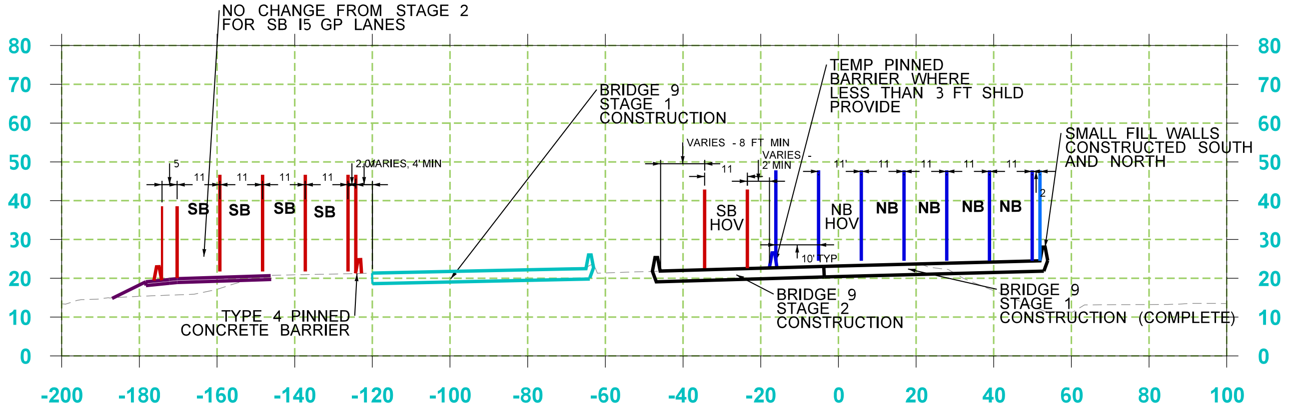
SR 167
I-5 TO SR 509
NEW EXPRESSWAY

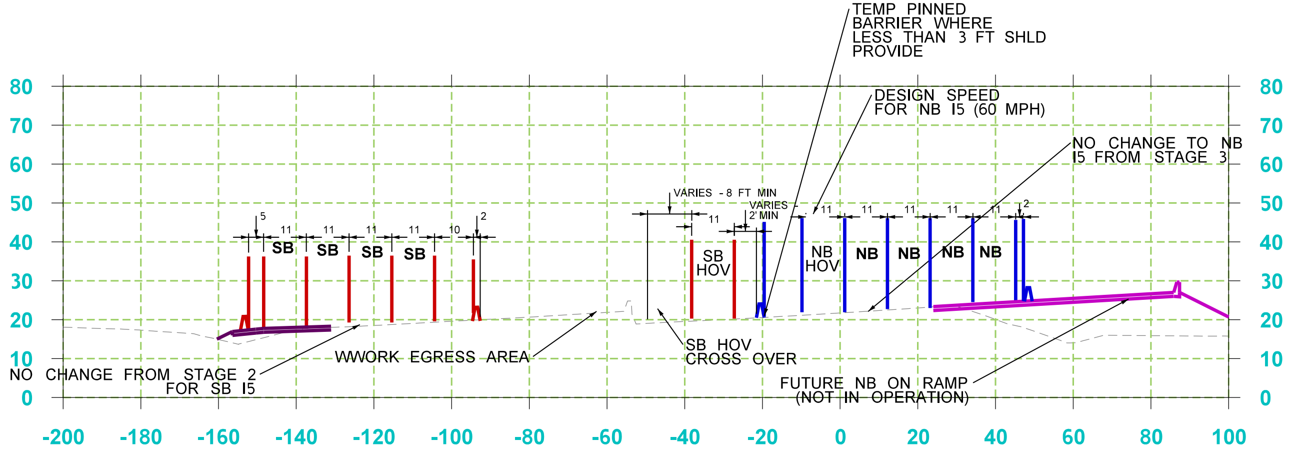
ATTACHMENT A

0 20 40
SCALE IN FEET



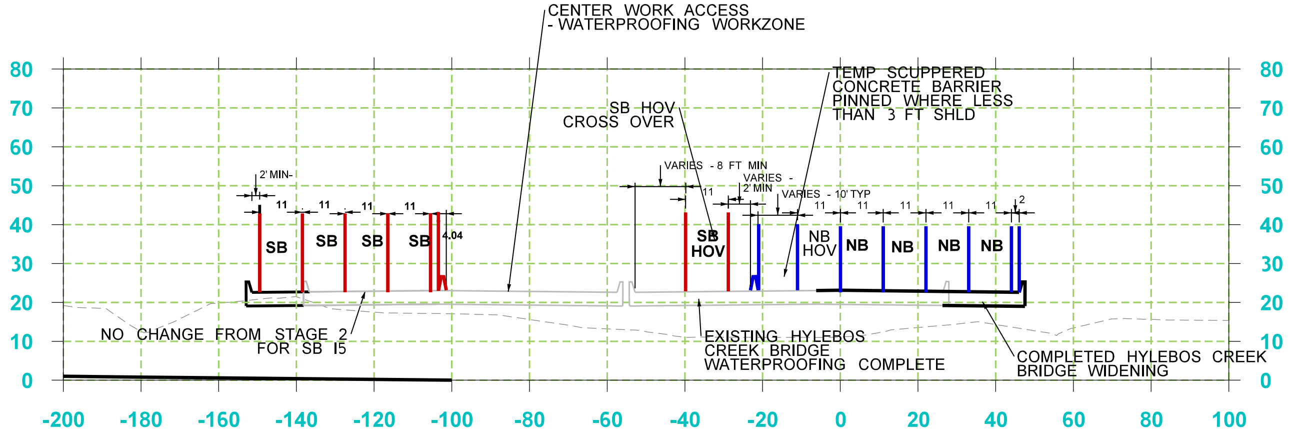
NO CHANGE FROM STAGE 2
FOR SB I5 GP LANES
BRIDGE 9
STAGE 1
CONSTRUCTION
TEMP PINNED
BARRIER WHERE
LESS THAN 3 FT SHLD
PROVIDE
SMALL FILL WALLS
CONSTRUCTED SOUTH
AND NORTH
VARIES - 8 FT MIN
VARIES - 2' MIN
VARIES, 4' MIN
SB
SB
SB
SB
SB HOV
NB HOV
NB
NB
NB
NB
10' TYP
TYPE 4 PINNED
CONCRETE BARRIER
BRIDGE 9
STAGE 2
CONSTRUCTION
BRIDGE 9
STAGE 1
CONSTRUCTION (COMPLETE)

2697+46 - PHASE 4



TEMP PINNED
BARRIER WHERE
LESS THAN 3 FT SHLD
PROVIDE
DESIGN SPEED
FOR NB I5 (60 MPH)
NO CHANGE TO NB
I5 FROM STAGE 3
VARIES - 8 FT MIN
VARIES - 2' MIN
SB
SB
SB
SB
SB HOV
NB HOV
NB
NB
NB
NB
NO CHANGE FROM STAGE 2
FOR SB I5
WWORK EGRESS AREA
SB HOV
CROSS OVER
FUTURE NB ON RAMP
(NOT IN OPERATION)

2690+04 - PHASE 4



CENTER WORK ACCESS
- WATERPROOFING WORKZONE
SB HOV
CROSS OVER
TEMP SCUPPERED
CONCRETE BARRIER
PINNED WHERE LESS
THAN 3 FT SHLD
VARIES - 8 FT MIN
VARIES - 2' MIN
VARIES - 10' TYP
2' MIN
SB
SB
SB
SB
4.04
SB HOV
NB HOV
NB
NB
NB
NB
NO CHANGE FROM STAGE 2
FOR SB I5
EXISTING HYLEBOS
CREEK BRIDGE
WATERPROOFING COMPLETE
COMPLETED HYLEBOS CREEK
BRIDGE WIDENING

2700+77 - PHASE 4

SR 167 NEW EXPRESSWAY

ATC03 - I-5 MOT Phase 4 - NB HOV Connection to GP and SB HOV Cross Over Section Cuts

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DATE	8/16/2021	JOB NUMBER 20C512	
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REGIONAL ADM.	J. WHITE		

REVISION | DATE | BY

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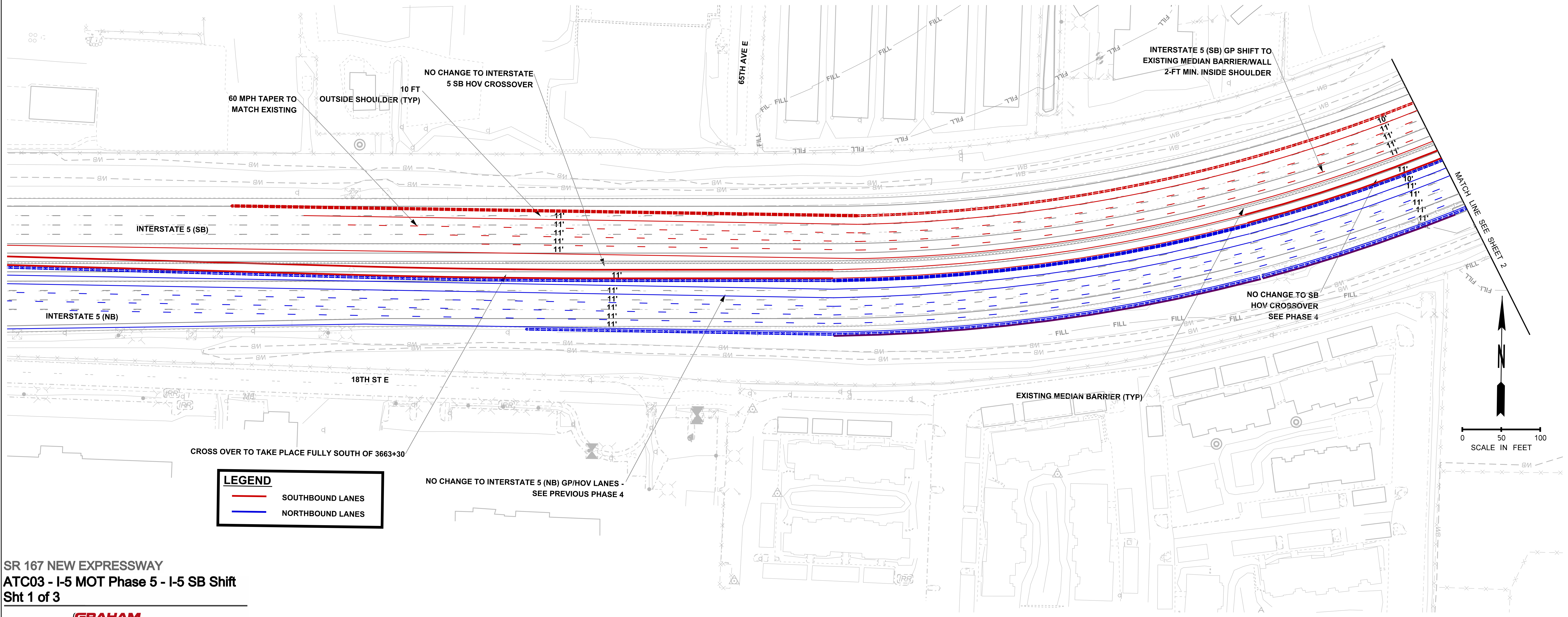
I-5 TO SR 509
NEW EXPRESSWAY

ATTACHMENT A


INTERSTATE 5 (SB) GP SHIFT TO
EXISTING MEDIAN BARRIER/WALL
2-FT MIN. INSIDE SHOULDER
NO CHANGE TO INTERSTATE
5 SB HOV CROSSOVER
10 FT
OUTSIDE SHOULDER (TYP)
60 MPH TAPER TO
MATCH EXISTING
65TH AVE E
INTERSTATE 5 (SB)
INTERSTATE 5 (NB)
MATCH LINE SEE SHEET 2
NO CHANGE TO SB
HOV CROSSOVER
SEE PHASE 4
18TH ST E
EXISTING MEDIAN BARRIER (TYP)
CROSS OVER TO TAKE PLACE FULLY SOUTH OF 3663+30
NO CHANGE TO INTERSTATE 5 (NB) GP/HOV LANES -
SEE PREVIOUS PHASE 4
LEGEND
SOUTHBOUND LANES
NORTHBOUND LANES
N
0 50 100
SCALE IN FEET

SR 167 NEW EXPRESSWAY

ATC03 - I-5 MOT Phase 5 - I-5 SB Shift

Sht 1 of 3

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REGION NO. 10 · STATE WASH · FED.AID PROJ.NO. 0167(057) · JOB NUMBER 20C512 · CONTRACT NO. · LOCATION NO. XL5466

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SR 167
I-5 TO SR 509
NEW EXPRESSWAY

ATTACHMENT A

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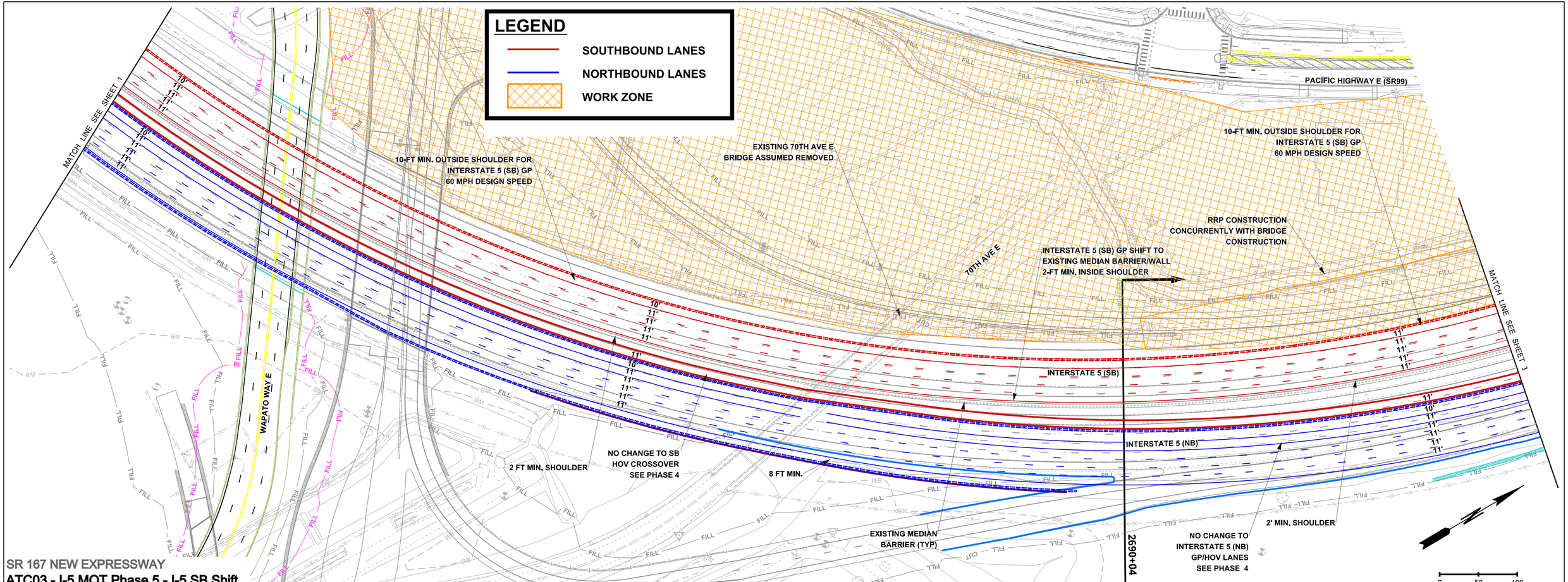

SR 167 NEW EXPRESSWAY

ATC03 - I-5 MOT Phase 5 - I-5 SB Shift

Sht 2 of 3

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REGIONAL ADM.	J. WHITE

REVISION	DATE	BY

FEDERAL PROJ. NO. 0167(057)

CONTRACT NO. 20C512

LOCAL AGY. NO. XL5466

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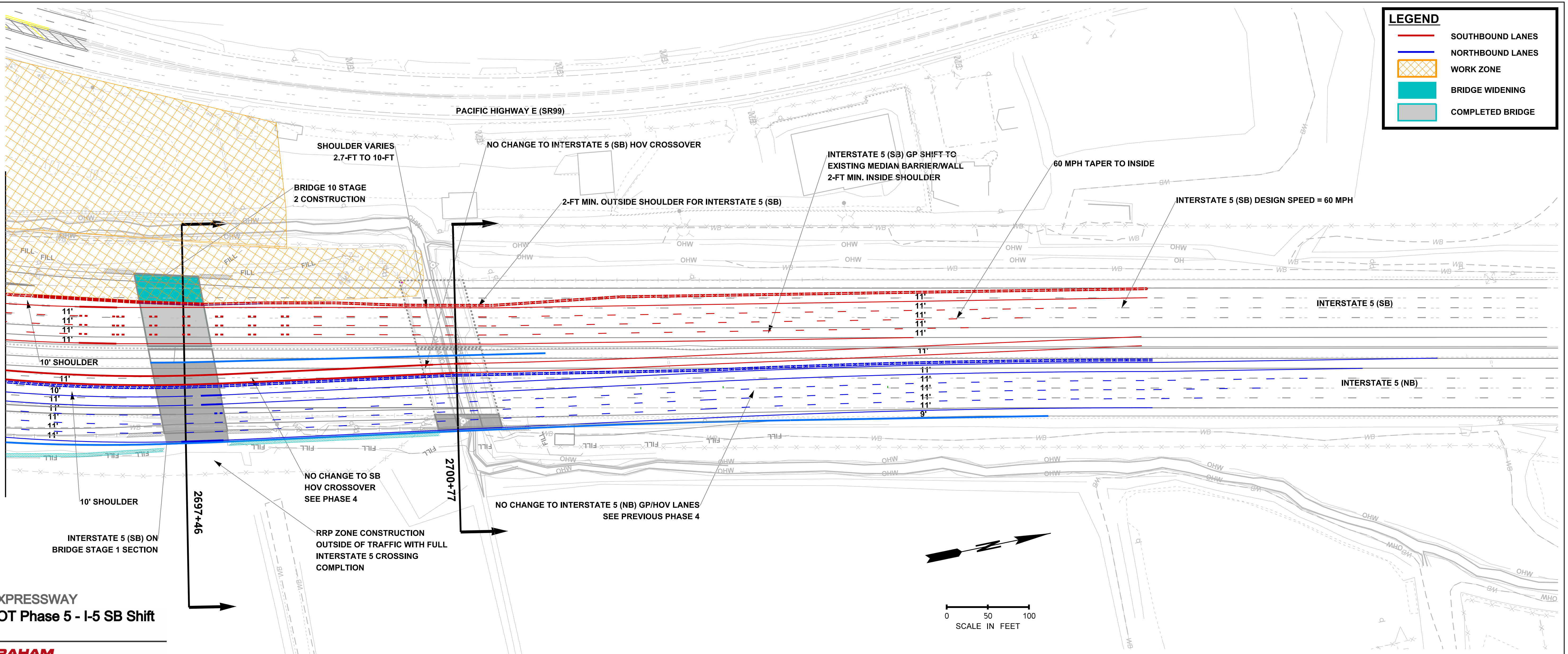
SR 167
I-5 TO SR 509
NEW EXPRESSWAY

ATTACHMENT A


LEGEND
SOUTHBOUND LANES
NORTHBOUND LANES
WORK ZONE
BRIDGE WIDENING
COMPLETED BRIDGE
PACIFIC HIGHWAY E (SR99)
SHOULDER VARIES
2.7-FT TO 10-FT
NO CHANGE TO INTERSTATE 5 (SB) HOV CROSSOVER
INTERSTATE 5 (SB) GP SHIFT TO
EXISTING MEDIAN BARRIER/WALL
2-FT MIN. INSIDE SHOULDER
60 MPH TAPER TO INSIDE
BRIDGE 10 STAGE
2 CONSTRUCTION
2-FT MIN. OUTSIDE SHOULDER FOR INTERSTATE 5 (SB)
INTERSTATE 5 (SB) DESIGN SPEED = 60 MPH
MATCH LINE SEE SHEET 2
INTERSTATE 5 (SB)
10' SHOULDER
INTERSTATE 5 (NB)
2697+46
2700+77
NO CHANGE TO SB
HOV CROSSOVER
SEE PHASE 4
NO CHANGE TO INTERSTATE 5 (NB) GP/HOV LANES
SEE PREVIOUS PHASE 4
10' SHOULDER
INTERSTATE 5 (SB) ON
BRIDGE STAGE 1 SECTION
RRP ZONE CONSTRUCTION
OUTSIDE OF TRAFFIC WITH FULL
INTERSTATE 5 CROSSING
COMPLTION
N
0 50 100
SCALE IN FEET

SR 167 NEW EXPRESSWAY

ATC03 - I-5 MOT Phase 5 - I-5 SB Shift

Sht 3 of 3

GRAHAM

SCJ ALLIANCE CONSULTING SERVICES

TYLININTERNATIONAL

PBS

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DATE	8/16/2021			
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DESIGNED BY				
ENTERED BY				
CHECKED BY				
PROJ. ENGR.	C. SODERQUIST			
REGIONAL ADM.	J. WHITE	REVISION	DATE	BY

REGION NO. 10 | STATE WASH | FED.AID PROJ.NO. 0167(057)

JOB NUMBER 20C512

CONTRACT NO. | LOCATION NO. XL5466

P.E. STAMP BOX DATE

P.E. STAMP BOX DATE

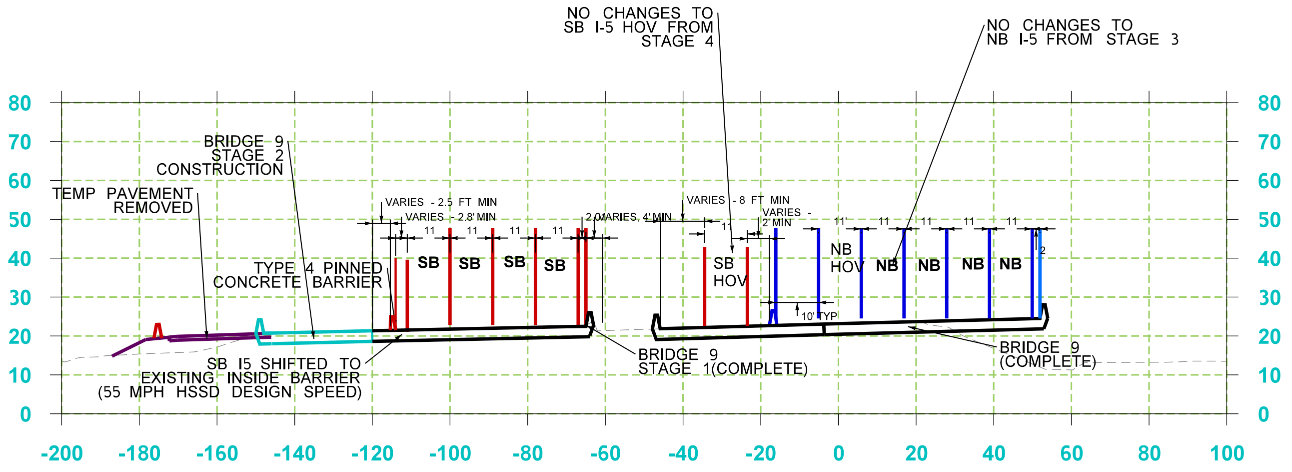
Washington State Department of Transportation

SR 167
I-5 TO SR 509
NEW EXPRESSWAY

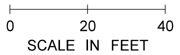
ATTACHMENT A

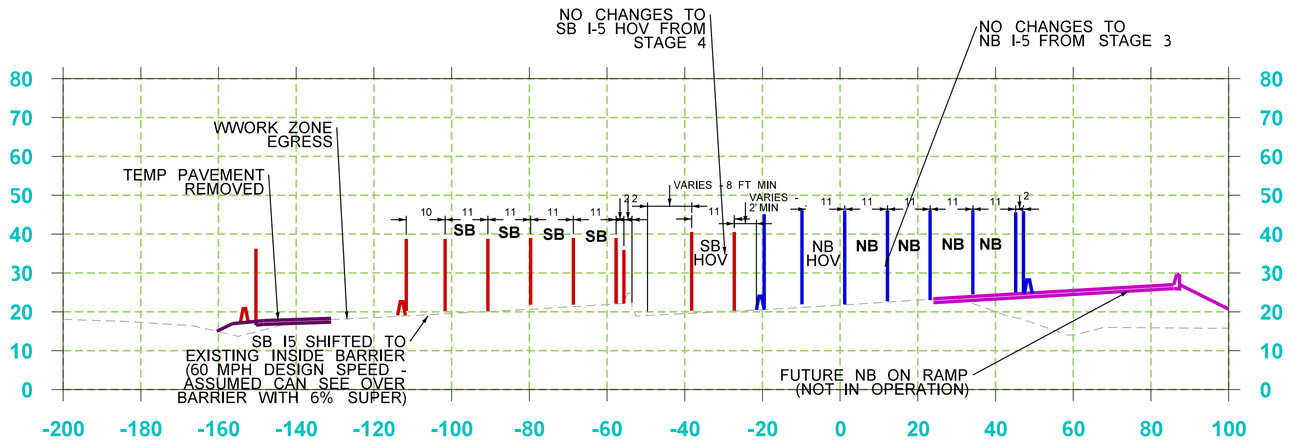
PLAN REF NO

SHEET OF SHEETS

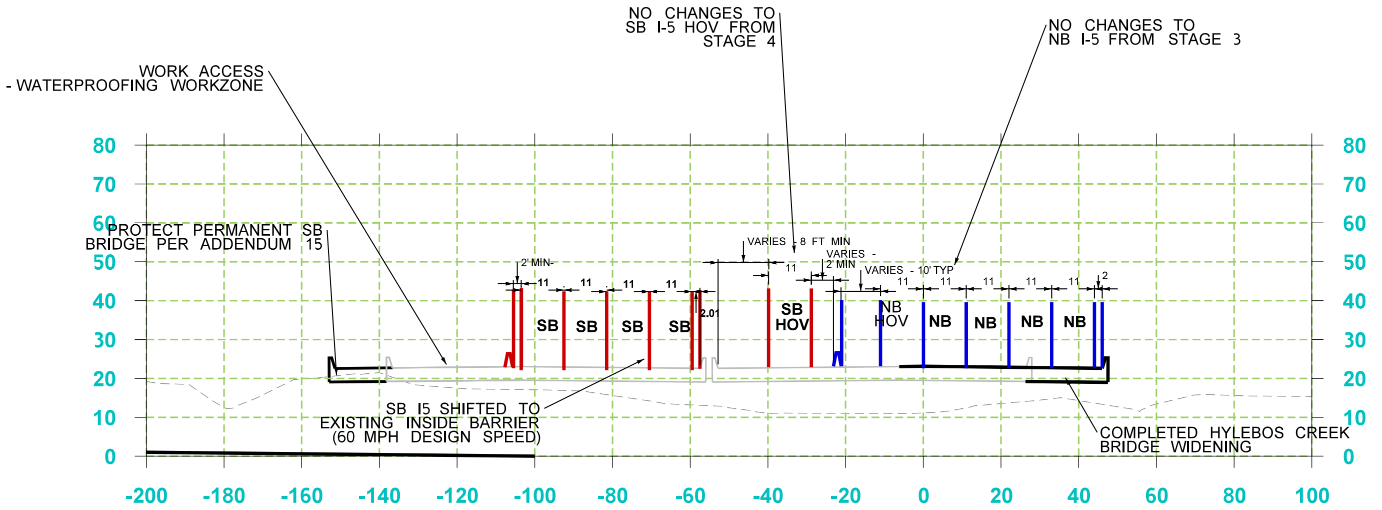

NO CHANGES TO SB I-5 HOV FROM STAGE 4
NO CHANGES TO NB I-5 FROM STAGE 3
BRIDGE 9 STAGE 2 CONSTRUCTION
TEMP PAVEMENT REMOVED
TYPE 4 PINNED CONCRETE BARRIER
SB
SB
SB
SB
SB HOV
NB HOV
NB
NB
NB
NB
VARIES - 2.5 FT MIN
VARIES - 2.8' MIN
VARIES - 8 FT MIN
10' TYP
SB I5 SHIFTED TO EXISTING INSIDE BARRIER (55 MPH HSSD DESIGN SPEED)
BRIDGE 9 STAGE 1(COMPLETE)
BRIDGE 9 (COMPLETE)

2697+46 - PHASE 5




NO CHANGES TO SB I-5 HOV FROM STAGE 4
NO CHANGES TO NB I-5 FROM STAGE 3
WWORK ZONE EGRESS
TEMP PAVEMENT REMOVED
SB
SB
SB
SB
SB HOV
NB HOV
NB
NB
NB
NB
VARIES - 8 FT MIN
SB I5 SHIFTED TO EXISTING INSIDE BARRIER (60 MPH DESIGN SPEED - ASSUMED CAN SEE OVER BARRIER WITH 6% SUPER)
FUTURE NB ON RAMP (NOT IN OPERATION)

2690+04 - PHASE 5


NO CHANGES TO SB I-5 HOV FROM STAGE 4
NO CHANGES TO NB I-5 FROM STAGE 3
WORK ACCESS - WATERPROOFING WORKZONE
PROTECT PERMANENT SB BRIDGE PER ADDENDUM 15
SB
SB
SB
SB
SB HOV
NB HOV
NB
NB
NB
NB
VARIES - 8 FT MIN
VARIES - 10' TYP
SB I5 SHIFTED TO EXISTING INSIDE BARRIER (60 MPH DESIGN SPEED)
COMPLETED HYLEBOS CREEK BRIDGE WIDENING

2700+77 - PHASE 5

SR 167 NEW EXPRESSWAY

ATC03 - I-5 MOT Phase 5 - I-5 SB Shift
Section Cuts

GRAHAM

SCJ ALLIANCE CONSULTING SERVICES | TYLININTERNATIONAL | PBS

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PLOTTED BY	johnb				JOB NUMBER 20C512	
DESIGNED BY						
ENTERED BY					CONTRACT NO.	LOCATION NO. XL5466
CHECKED BY						
PROJ. ENGR.	C. SODERQUIST					
REGIONAL ADM.	J. WHITE	REVISION	DATE	BY		

P.E. STAMP BOX DATE

P.E. STAMP BOX DATE

Washington State Department of Transportation

SR 167
I-5 TO SR 509
NEW EXPRESSWAY

ATTACHMENT A

PLAN REF NO

SHEET OF SHEETS

ATC 03 CONCEPT - COMPARISON OF PROS VERSUS CONS

	Pros	Cons
TRAFFIC OPERATIONS	Increased N7N5 NB on ramp shoulder to 10 feet for 400 feet. Can help with traffic operations for significant freight that will use this ramp facility.	Decreased shoulder to 2 feet minimum at select locations in temporary configuration depending on I-5 phase of construction. Note Appendix T-6 concepts have reduced temporary shoulders to 2 feet minimum.
	Better traffic operations with improved temporary I-5 SB geometrics to 60 mph with only HOV reduced design speeds related to horizontal stopping sight distance.	Additonal Temporary Traffic Phase configuration for NB I-5 may cause confusion to drivers.
	Utilization of crossovers for NB can help eliminate need for full closures related to MOT phase switches on NB I-5.	Use of an HOV NB crossover may have minor effects on traffic operations.
	Less change to roadway realignment with removal of temporary NB I-5 shoefly concept.	
	6 Months less overall duration for construction on I-5. Eliminates work tied to two fish windows as a result of NB Shoofly construction eliminated. Also allows for interchange operation earlier.	
	Enhanced Outside Temporary Right Shoulder sections for NBI-5 and Left Shoulders for SB I-5. Ability to better accommodate stalled vehicles.	
	Reduced impacts to traffic/public as a result of signficant reduction of temporary works related to I-5 NB construction. Reduced truck egress and access to NB I-5 or trucks entering local roadways.	
SAFETY	Increased horizontal stopping sight distance safety to 60 mph with larger shoulder (approximately 800 feet of roadway) for permanent NB I-5 as a result of maintaining existing median barrier and offsetting the permanent NB I-5 alignment for construction staging.	Maintain same NB existing horizontal stopping sight distance design speeds for MOT phase construction.
	Reduced risk of high-speed accidents with improved temporary I-5 SB geometrics to 60 mph, with only HOV reduced design speeds related to horizontal stopping sight distance.	One more traffic switch for NB I-5 compared to Appendix T-6 MOT concepts.
	ATC 03 concept will help accelerate construction schedule, helping minimize duration of temporary roadway configurations on I-5. 6 month duration reduction	
	More potential to reduce full closures and lane closures for temporary construction and switch over with use of HOV crossover. Reduced closures and lane closures will reduce risk of traffic accidents. Potential to utilize crossovers to efficiently complete Bridge 1 superstructure construction and remove the existing 70th bridge.	

ATTACHMENT B - TRAFFIC AND SAFETY ANALYSIS

5-lane NB Shoofly & 4-lane SB Shoofly with Median Crossover for SB HOV

MOT Stage	Description	Duration [mos]
Stage 0	SB lanes shifted toward median at 50 mph	4
	NB lanes remain on existing at 60 mph - *no change*	4
Stage 1	SB GP lanes shifted to new SB shoofly at 50 mph	12
	SB HOV lane shifted to median crossover at 50 mph	12
	NB lanes shifted to new NB shoofly at 60 mph	12
Stage 2	SB GP lanes shifted toward median at 50 mph	3
	SB HOV lane remains on median crossover at 50 mph - *no change*	3
	NB lanes remain on new NB shoofly at 60 mph - *no change*	3
Stage 3	SB lanes shifted to final location	
	NB lanes remain on new NB shoofly at 60 mph - *no change*	3

ESTIMATED REDUCTION OF MEASURED 66,000 SF FOR NB DETOUR WITH ATC 03 CONCEPT. NB SHOOFLY REMOVED WITH ATC03

Stage 0: Construct Temporary Shooflies

General Notes:

1. No lane split is required for 5-lane NB (4 GP lanes and 1 HOV).
2. One lane split and median crossover is required for the SB HOV lane, however, no lane split is required for the 4 SB GP lanes.
3. Allows single stage construction of Bridge 9 (NB mainline).
4. Two-stage construction, with an additional traffic shift, is required for Bridge 10 (SB mainline).
5. No required ROW acquisition or impacts to the existing arsenic plume.
6. Requires extensive temporary work to construct shooflies and temporary bridges over Hylebos Creek
7. Requires significant temporary wetland impacts.
8. Lightweight fill to be used in areas where the temporary shoofly wall is immediately adjacent to the Olympic Pipeline alignment.

Geometric Summary:

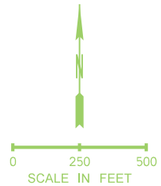
NB Lanes:
No change - traffic remains on existing mainline.

SB Lanes:
50 MPH Design Speed
11' Minimum Lane Width
2' Minimum Shoulder Width
No lane split required
No Shift Tapers required
Minimum clearance of 5' between Bridge 10 and temporary barrier

NO CREEK DIVERSION OR TEMPORARY BRIDGE CONSTRUCTION OVER CREEK REQUIRED WITH ATC 03

Major Construction Activities:

1. Demolish the existing 70th Street bridge using a combination of lane and nightly full I-5 closures.
2. Divert Hylebos Creek to allow construction of the NB shoofly.
3. Construct NB Temporary Bridge over the diverted Hylebos Creek.
4. Shift SB traffic toward the median and construct widening of the existing SB mainline bridge.
5. Construct widening for the SB shoofly and median crossover.
6. Construct the NB 5-lane temporary shoofly and temporary retaining walls.



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DESIGNED BY	bartlet

Informational use only
Not intended for Contract Plans

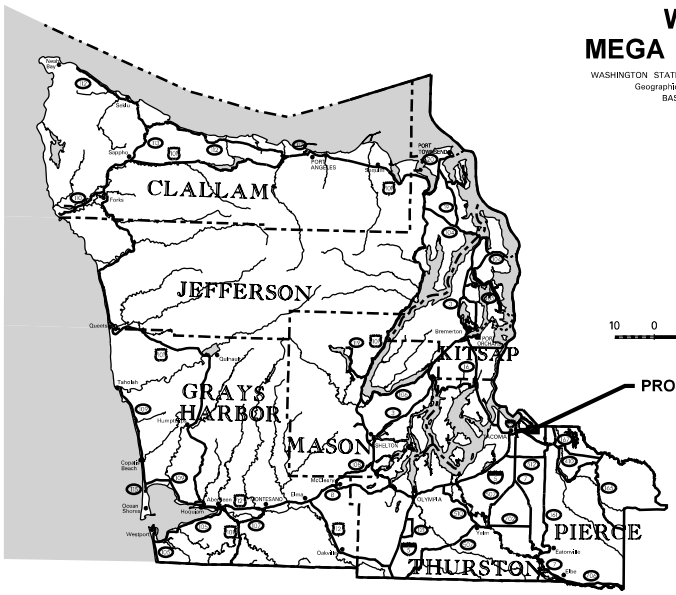
Washington State Department of Transportation

SR 167/I-5 to SR 509 - New Expressway
I-5 MOT Concept

ATTACHMENT C - WET IMPACT REDUCTIONS

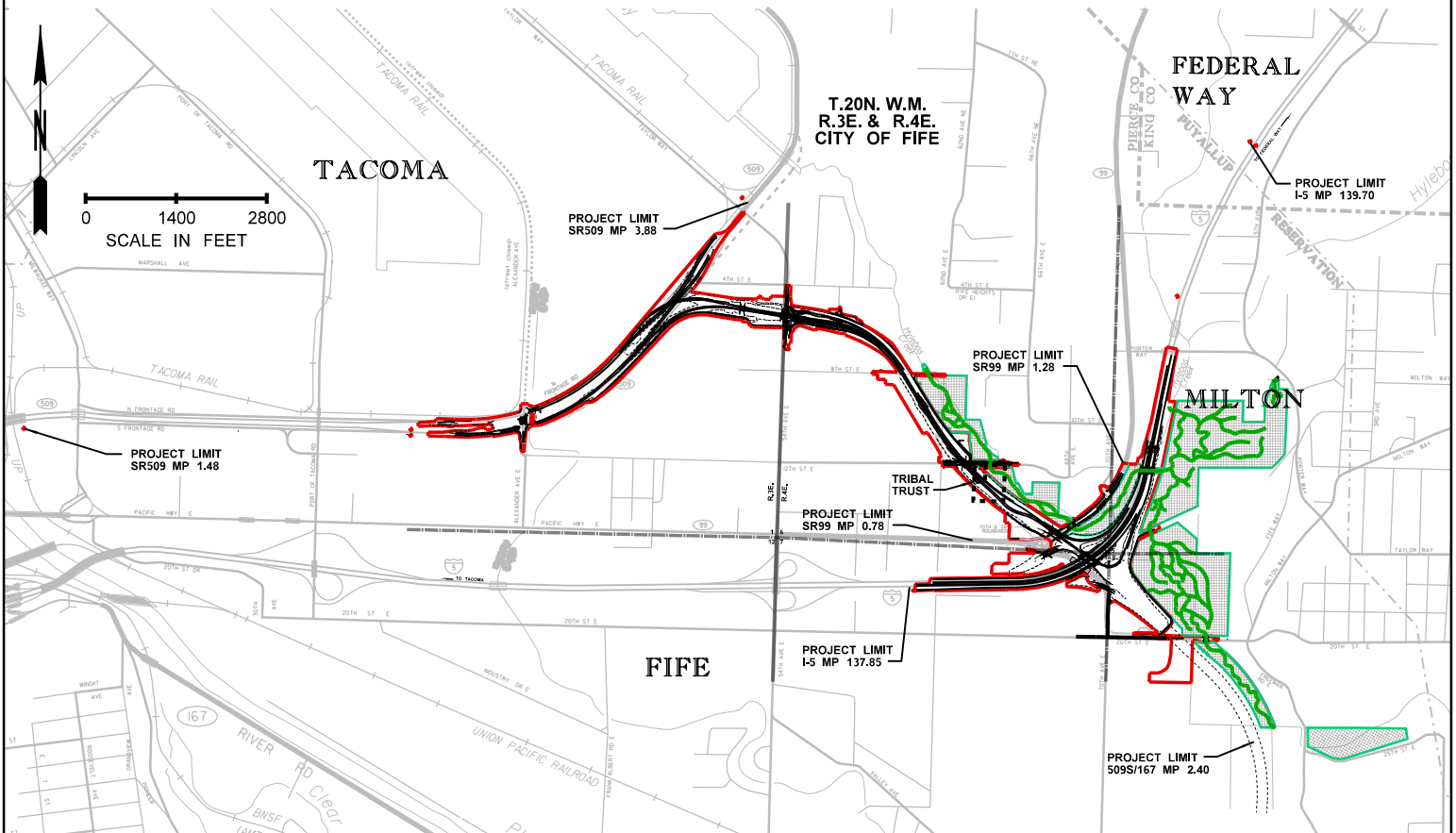
WSDOT
MEGA PROGRAMS

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
Geographic Services, Cartography/GIS
BASE MAP JULY 2000



LEGEND

- STAGE 1b GROUND DISTURBANCE LIMITS
- EXISTING FEATURES
- NEW ROADWAY FEATURES
- NEW STREAM CENTERLINE
- NEW RRP MITIGATION AREA
- FUTURE ROADWAY CORRIDOR



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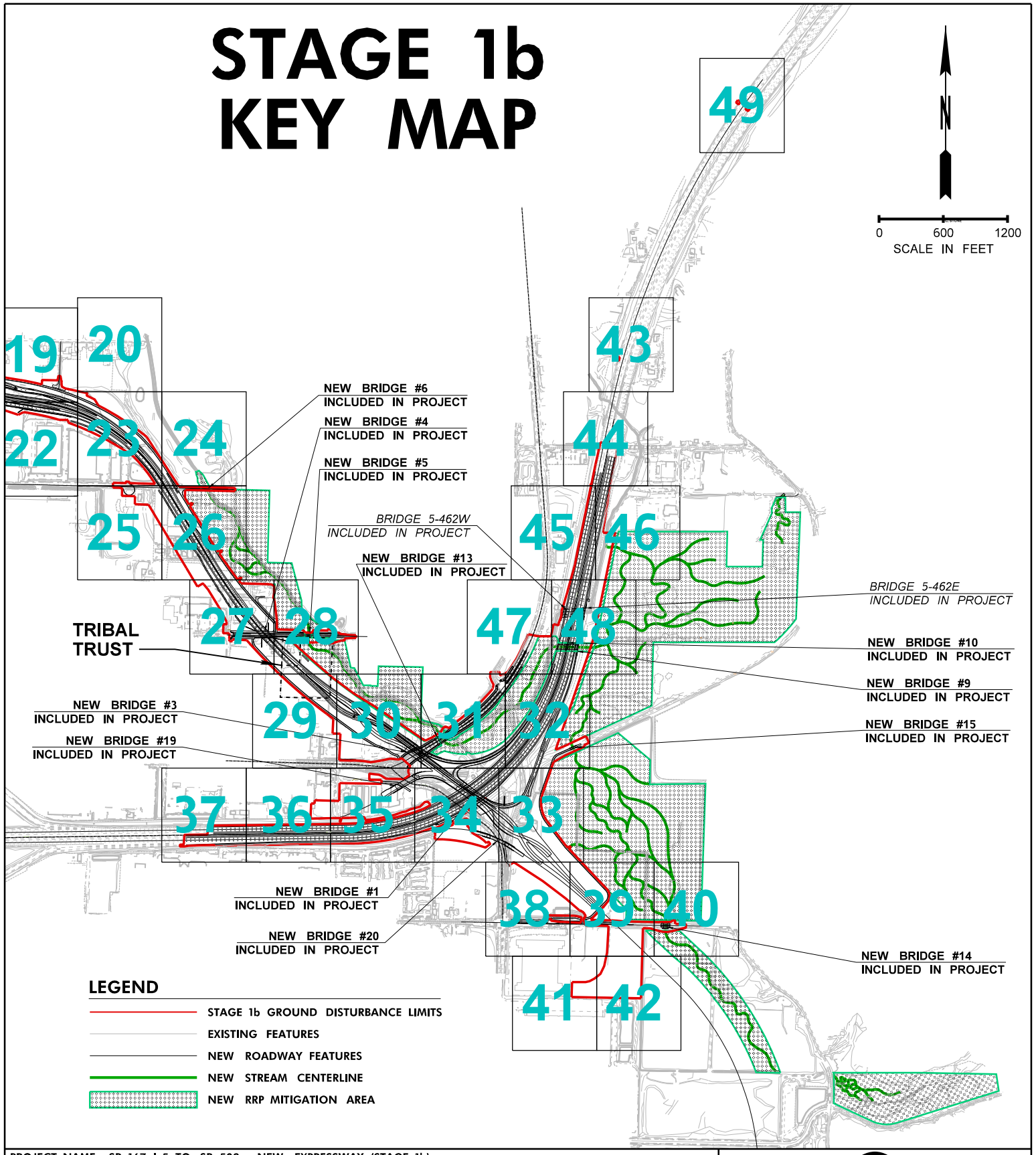
PURPOSE: NEW CORRIDOR CONSTRUCTION	REFERENCE: NWS–2020–864–DOT
PROPOSED: ROADWAY, BRIDGES, TRAIL, RRP, STORMWATER	APPLICANT: PUGET SOUND GATEWAY PROGRAM
LOCATION: CITIES OF FIFE, MILTON, EDGEWOOD, TACOMA	COUNTY: PIERCE
DATUM: NAD83, NAVD88	NEAR: WAPATO, FIFE DITCH
ADJACENT PROPERTY OWNERS: VARIES	WATER BODY: HYLEBOS, SURPRISE LAKE TRIB.
	DATE: SEPTEMBER 2020

Washington State Department of Transportation

SHEET: 1 OF: 94

ATTACHMENT C - WET IMPACT REDUCTIONS

STAGE 1b KEY MAP



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PURPOSE: NEW CORRIDOR CONSTRUCTION	REFERENCE: NWS–2020–864–DOT
PROPOSED: ROADWAY, BRIDGES, TRAIL, RRP, STORMWATER	APPLICANT: PUGET SOUND GATEWAY PROGRAM
LOCATION: CITIES OF FIFE, MILTON, EDGEWOOD, TACOMA	COUNTY: PIERCE
DATUM: NAD83, NAVD88	NEAR: WAPATO, FIFE DITCH
ADJACENT PROPERTY OWNERS: VARIES	WATER BODY: HYLEBOS, SURPRISE LAKE TRIB.
	DATE: SEPTEMBER 2020

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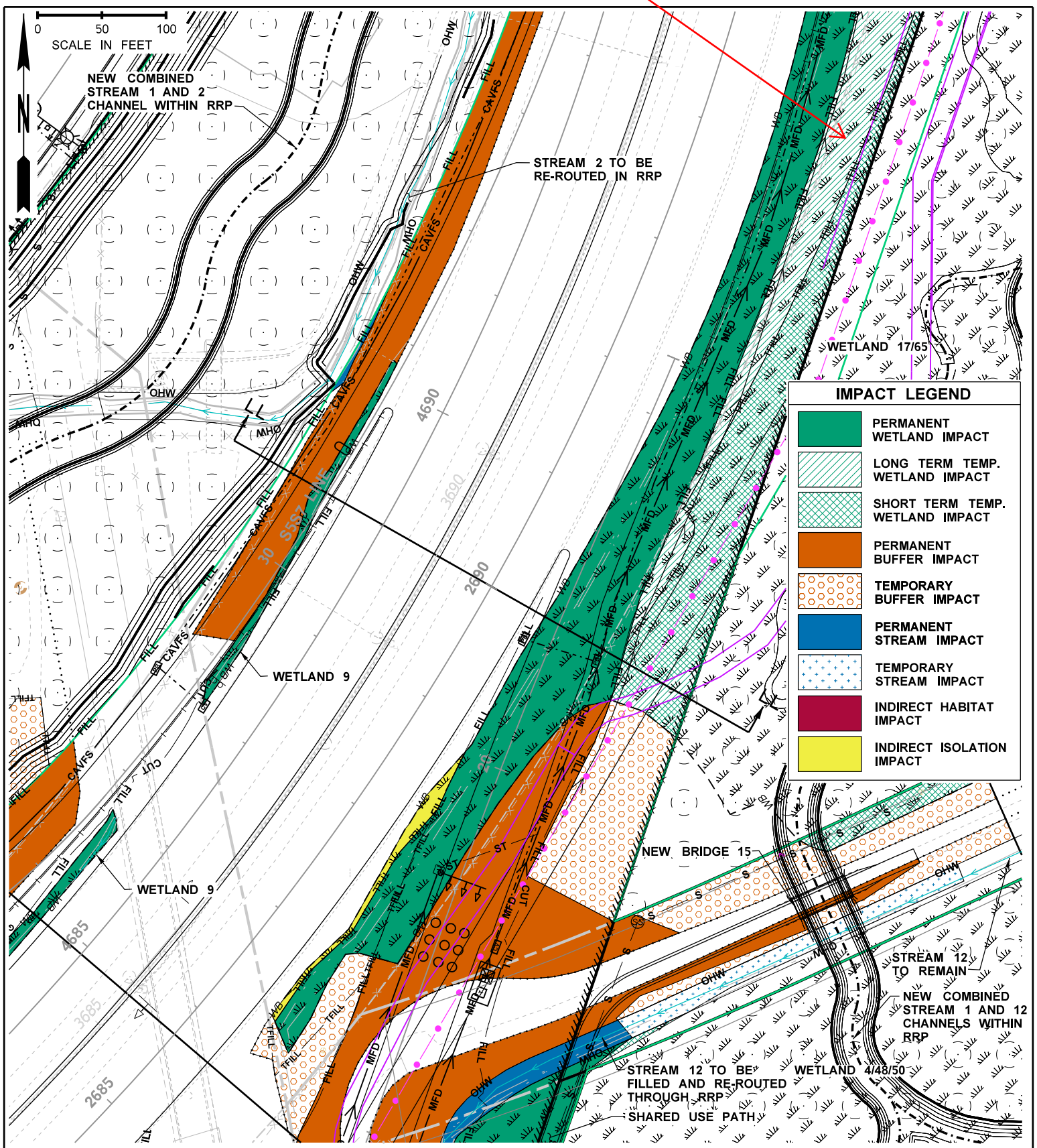
SHEET: 3 OF: 94

ATTACHMENT C - WET IMPACT REDUCTIONS

Approximate 12,000 sf long term wet land impacts eliminated



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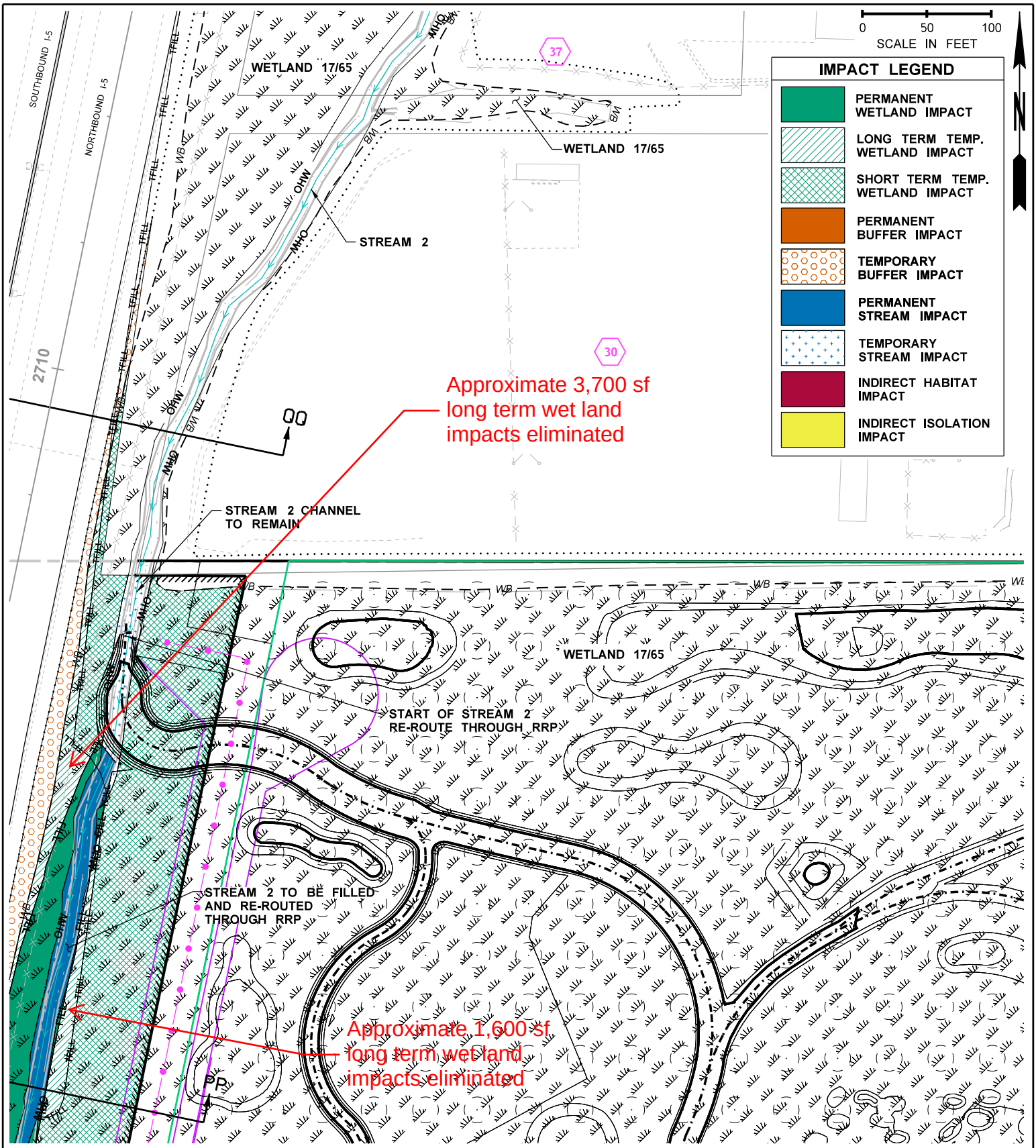
PURPOSE: NEW CORRIDOR CONSTRUCTION	REFERENCE: NWS–2020–864–DOT
PROPOSED: ROADWAY, BRIDGES, TRAIL, RRP, STORMWATER	APPLICANT: PUGET SOUND GATEWAY PROGRAM
LOCATION: CITIES OF FIFE, MILTON, EDGEWOOD, TACOMA	COUNTY: PIERCE
DATUM: NAD83, NAVD88	NEAR: WAPATO, FIFE DITCH
ADJACENT PROPERTY OWNERS: VARIES	WATER BODY: HYLEBOS, SURPRISE LAKE TRIB.
	DATE: SEPTEMBER 2020

Washington State Department of Transportation

SHEET: 32 OF: 94

ATTACHMENT C - WET IMPACT REDUCTIONS



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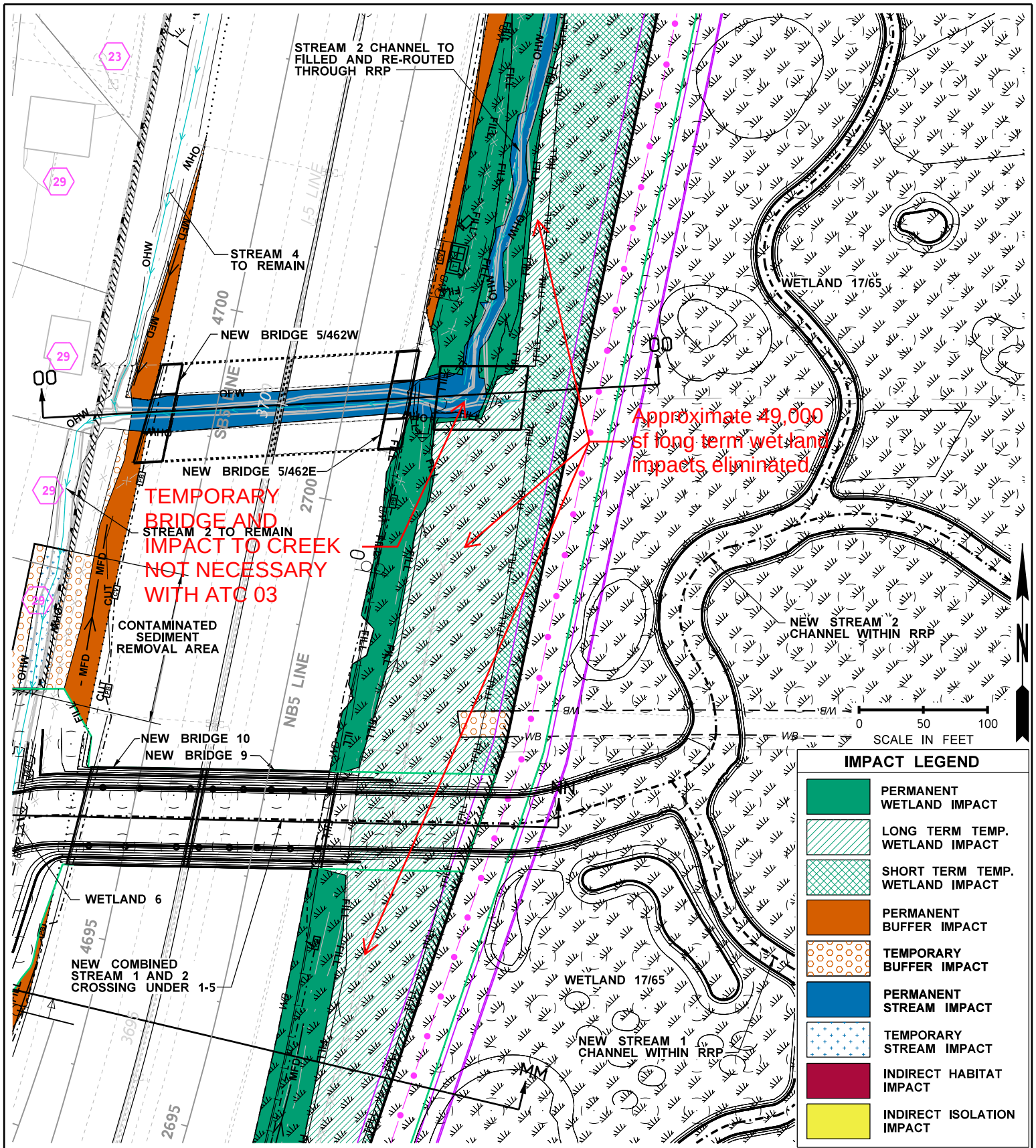
PURPOSE: NEW CORRIDOR CONSTRUCTION	REFERENCE: NWS–2020–864–DOT
PROPOSED: ROADWAY, BRIDGES, TRAIL, RRP, STORMWATER	APPLICANT: PUGET SOUND GATEWAY PROGRAM
LOCATION: CITIES OF FIFE, MILTON, EDGEWOOD, TACOMA	COUNTY: PIERCE
DATUM: NAD83, NAVD88	NEAR: WAPATO, FIFE DITCH
ADJACENT PROPERTY OWNERS: VARIES	WATER BODY: HYLEBOS, SURPRISE LAKE TRIB.
	DATE: SEPTEMBER 2020

Washington State Department of Transportation

SHEET: 46 OF: 94

ATTACHMENT C - WET IMPACT REDUCTIONS



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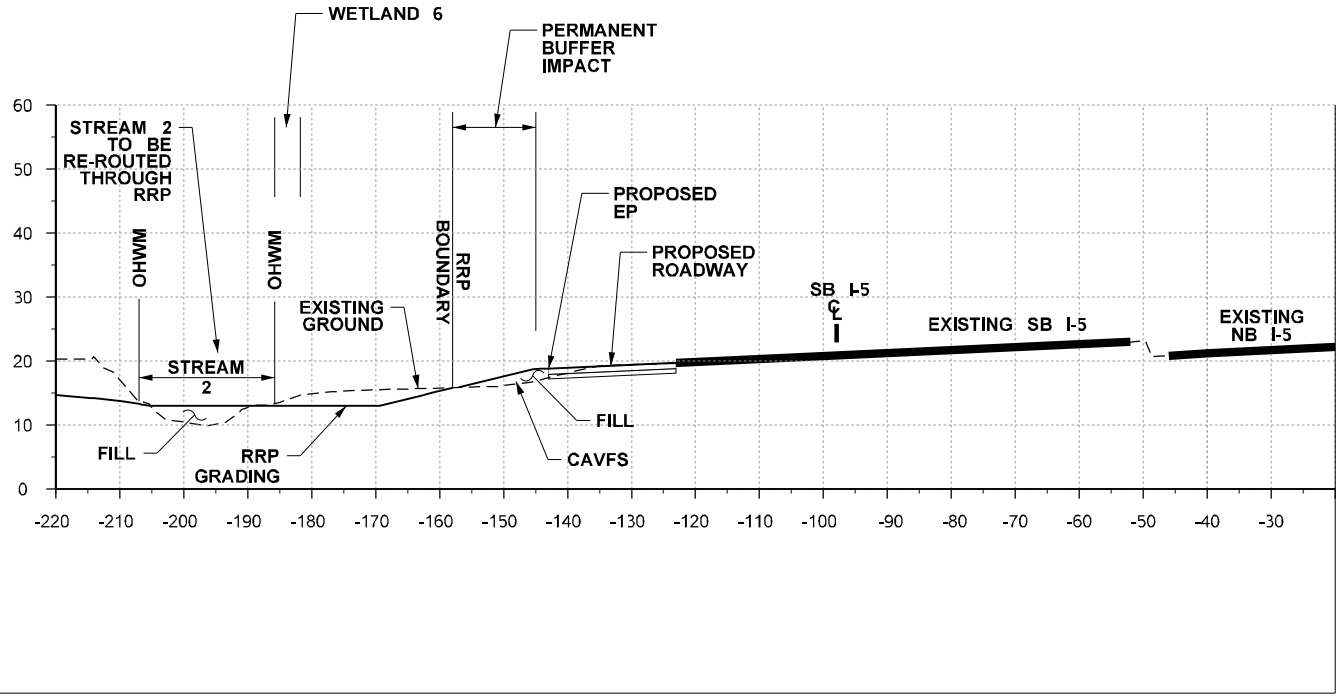
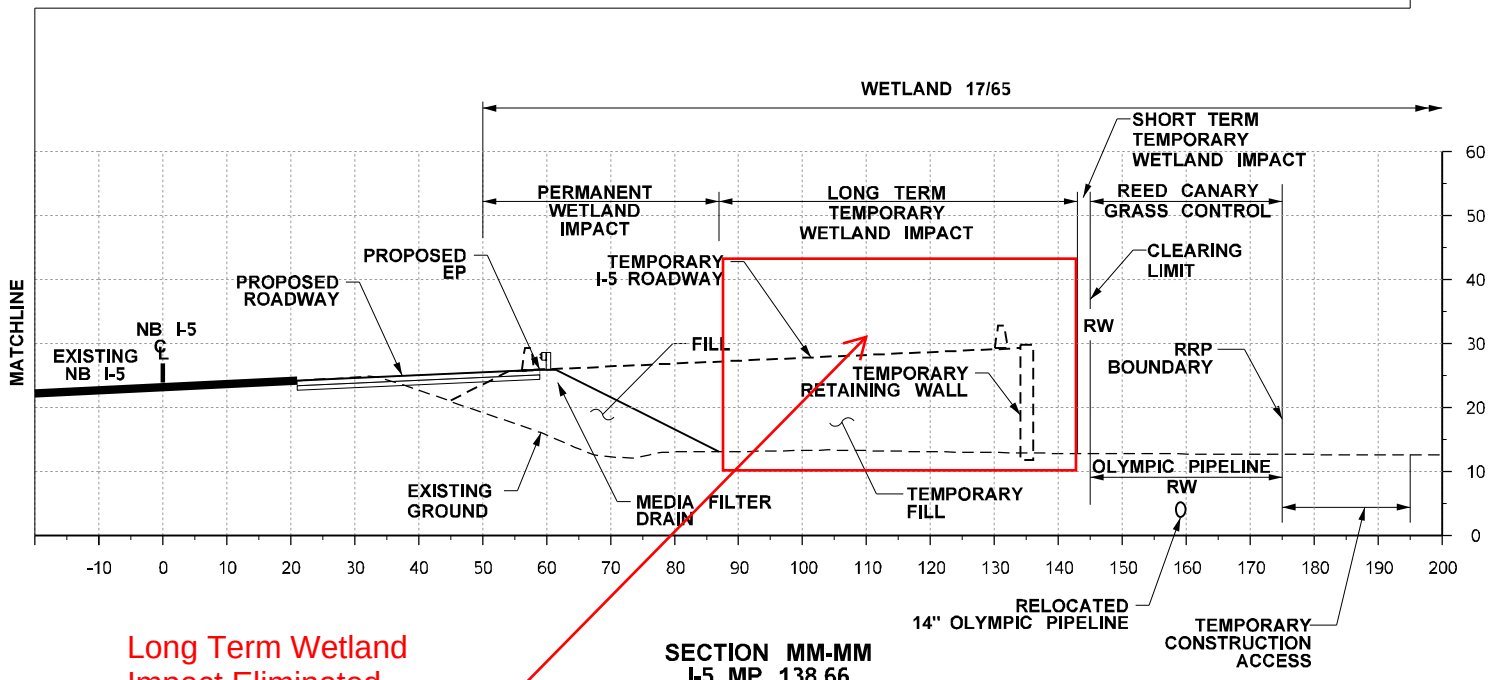
PROPOSED: ROADWAY, BRIDGES, TRAIL, RRP, STORMWATER	APPLICANT: PUGET SOUND GATEWAY PROGRAM
LOCATION: CITIES OF FIFE, MILTON, EDGEWOOD, TACOMA	COUNTY: PIERCE
DATUM: NAD83, NAVD88	NEAR: WAPATO, FIFE DITCH
ADJACENT PROPERTY OWNERS: VARIES	WATER BODY: HYLEBOS, SURPRISE LAKE TRIB.
	DATE: SEPTEMBER 2020

Washington State Department of Transportation

SHEET: 48 OF: 94

ATTACHMENT C - WET IMPACT REDUCTIONS





Long Term Wetland Impact Eliminated With Elimination of NB I-5 Shoofly

SECTION MM-MM
I-5 MP 138.66
NB I5 2695+75.00
WETLAND 6, 17/65
STREAM 2/HYLEBOS

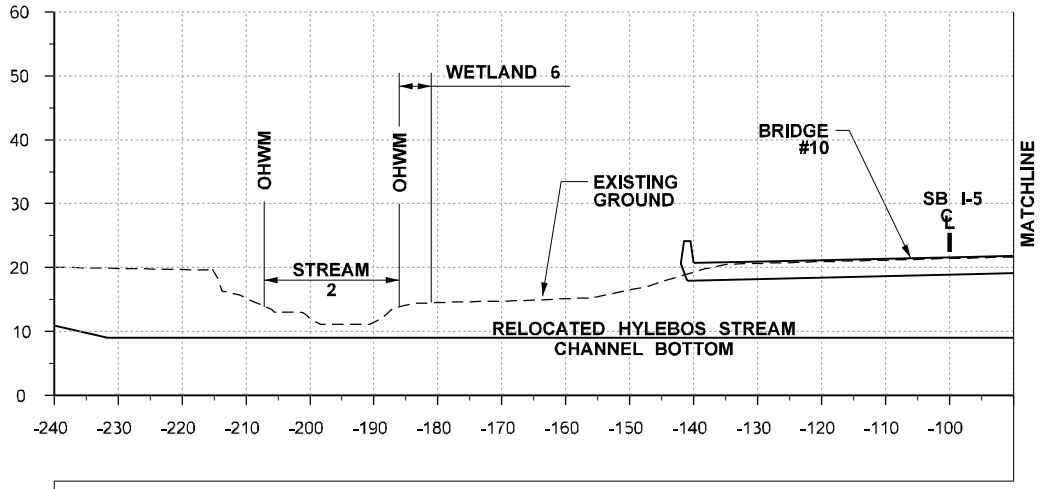
0 15 30
SCALE IN FEET

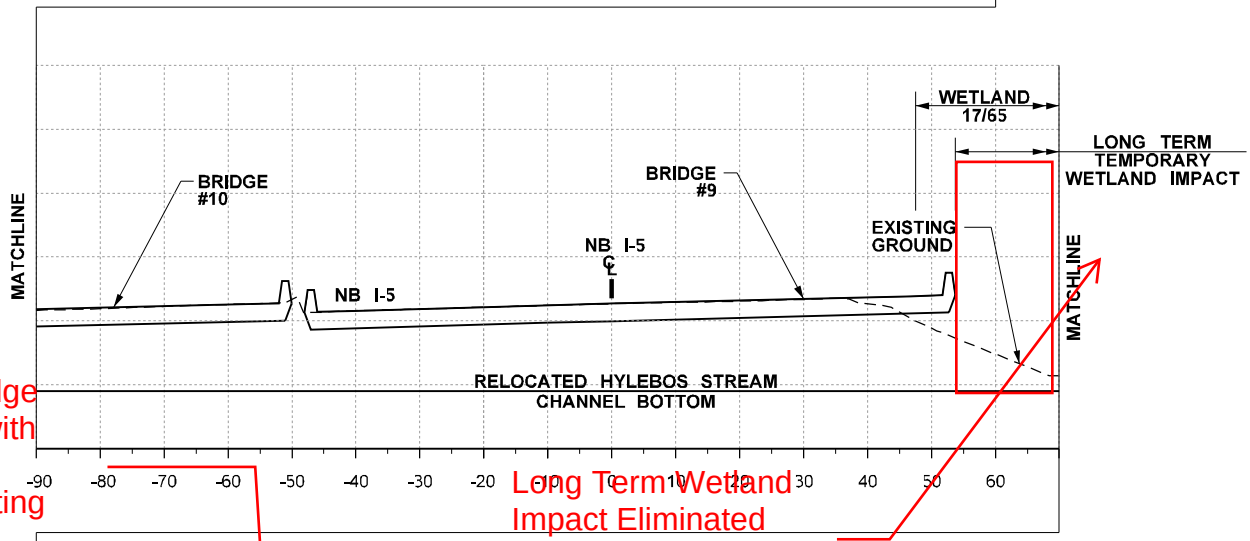
PROJECT NAME: SR 167/I-5 TO SR 509 – NEW EXPRESSWAY (STAGE 1b)	
PURPOSE: NEW CORRIDOR CONSTRUCTION	REFERENCE: NWS–2020–864–DOT
PROPOSED: ROADWAY, BRIDGES, TRAIL, RRP, STORMWATER	APPLICANT: PUGET SOUND GATEWAY PROGRAM
LOCATION: CITY OF FIFE, MILTON, EDGEWOOD, TACOMA	COUNTY: PIERCE
DATUM: NAD83, NAVD88	NEAR: WAPATO, FIFE DITCH
ADJACENT PROPERTY OWNERS: VARIES	WATER BODY: HYLEBOS, SURPRISE LAKE TRIB.
	DATE: SEPTEMBER 2020

Washington State Department of Transportation

SHEET: 82 OF: 94

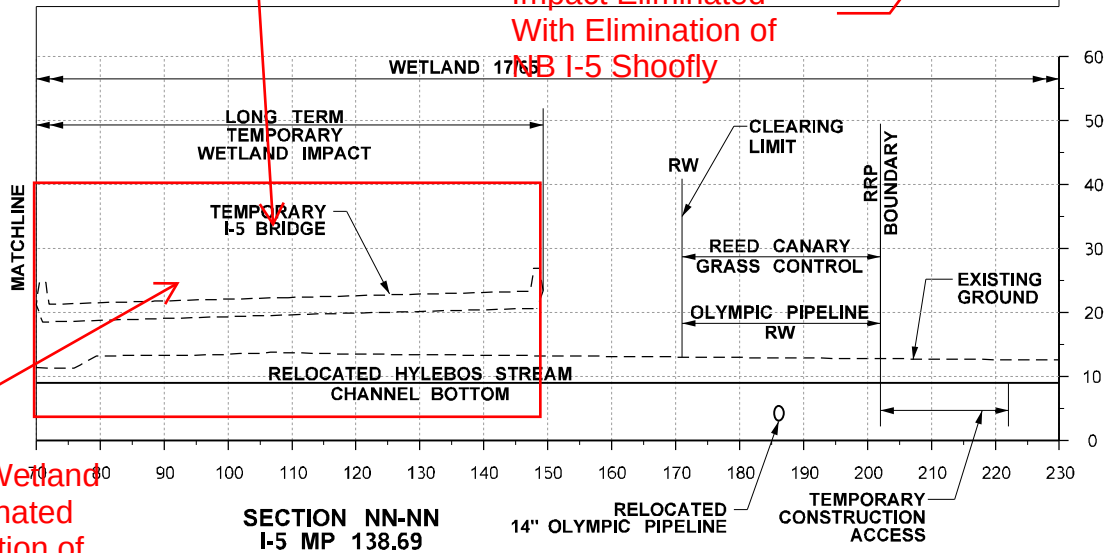
ATTACHMENT C - WET IMPACT REDUCTIONS





Temporary Bridge Not Required with ATC 03 limiting impacts to existing creek

Long Term Wetland Impact Eliminated With Elimination of NB I-5 Shoofly



Long Term Wetland Impact Eliminated With Elimination of NB I-5 Shoofly

SECTION NN-NN
I-5 MP 138.69
NB I5 2697+75.00
WETLAND 6, 17/65
STREAM 2/HYLEBOS

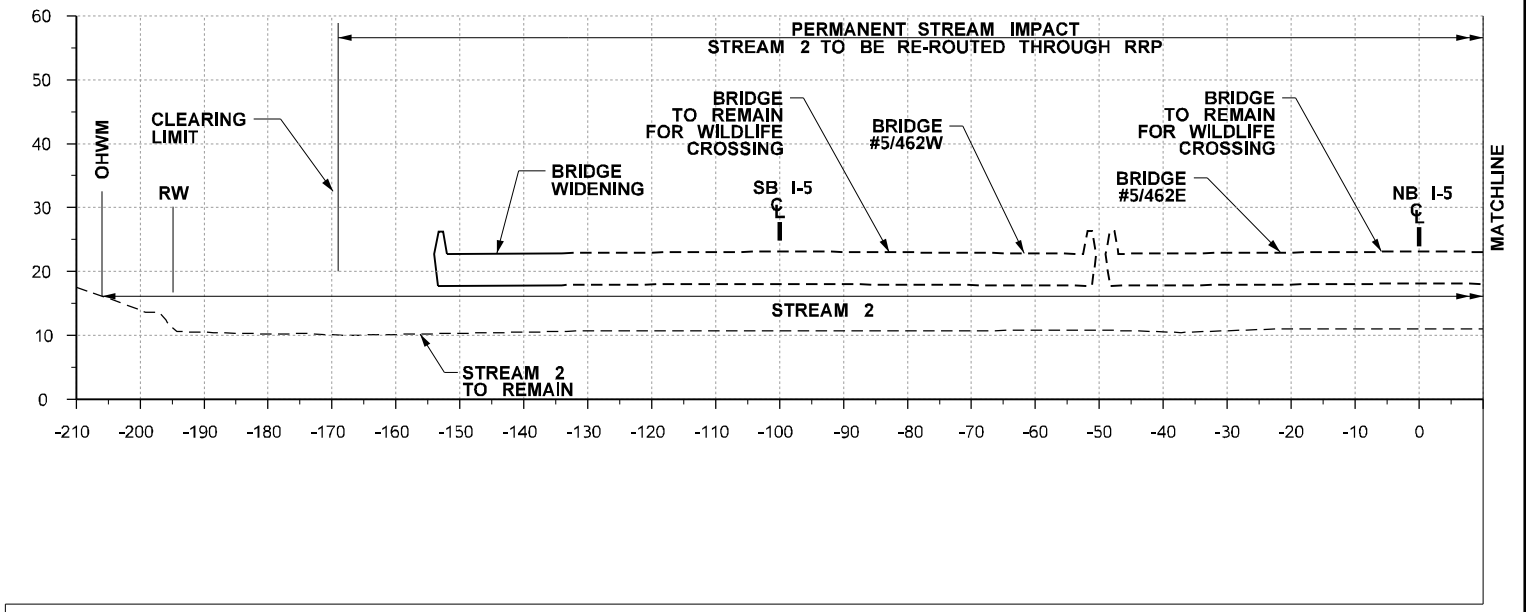
0 15 30
SCALE IN FEET

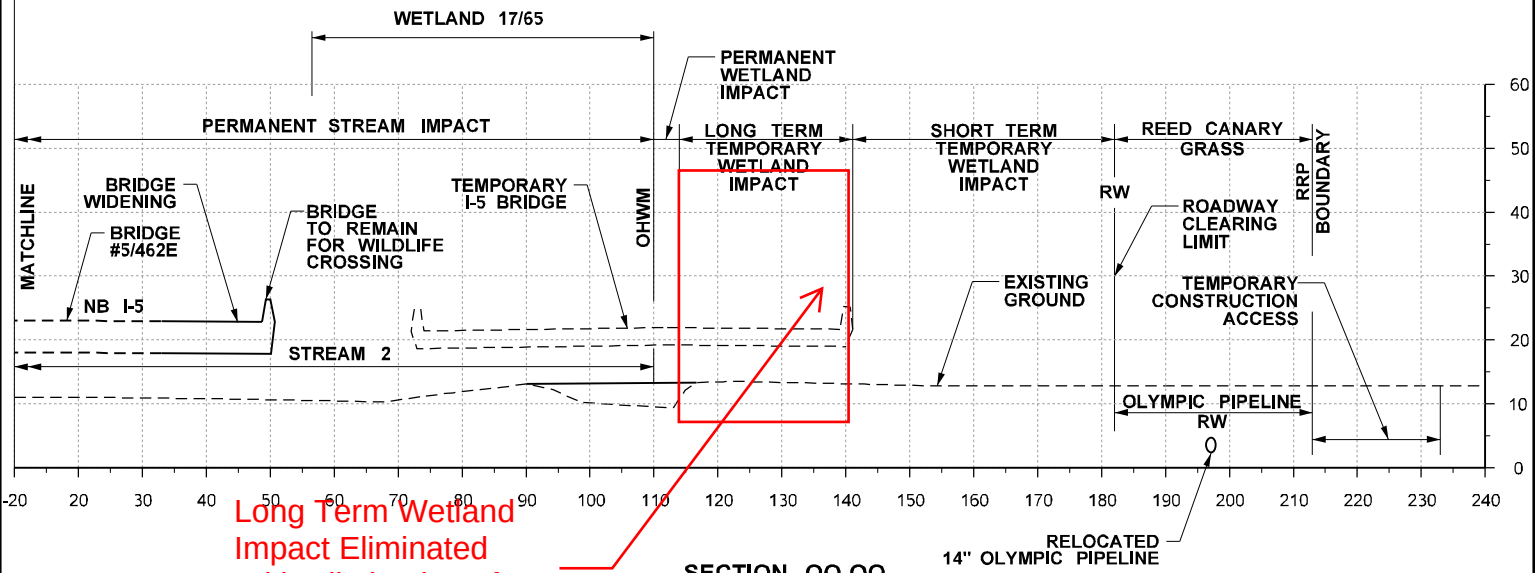
PROJECT NAME: SR 167/I-5 TO SR 509 – NEW EXPRESSWAY (STAGE 1b)	
PURPOSE: NEW CORRIDOR CONSTRUCTION	REFERENCE: NWS-2020-864-DOT
PROPOSED: ROADWAY, BRIDGES, TRAIL, RRP, STORMWATER	APPLICANT: PUGET SOUND GATEWAY PROGRAM
LOCATION: CITY OF FIFE, MILTON, EDGEWOOD, TACOMA	COUNTY: PIERCE
DATUM: NAD83, NAVD88	NEAR: WAPATO, FIFE DITCH
ADJACENT PROPERTY OWNERS: VARIES	WATER BODY: HYLEBOS, SURPRISE LAKE TRIB.
	DATE: SEPTEMBER 2020

Washington State Department of Transportation

SHEET: 83 OF: 94

ATTACHMENT C - WET IMPACT REDUCTIONS





Long Term Wetland Impact Eliminated With Elimination of NB I-5 Shoofly

SECTION OO-OO
I-5 MP 139.29
NB I5 2700+75.00
WETLAND 17/65
STREAM 2/HYLEBOS

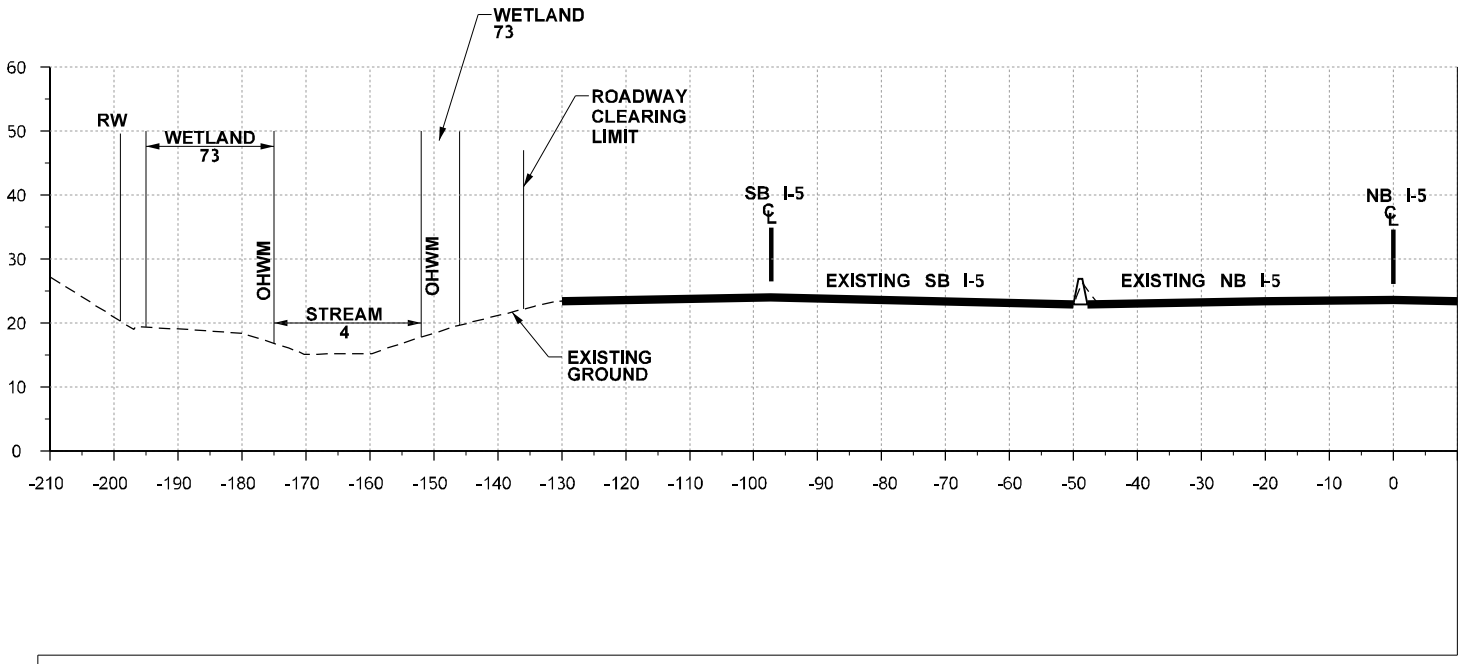
0 15 30
SCALE IN FEET

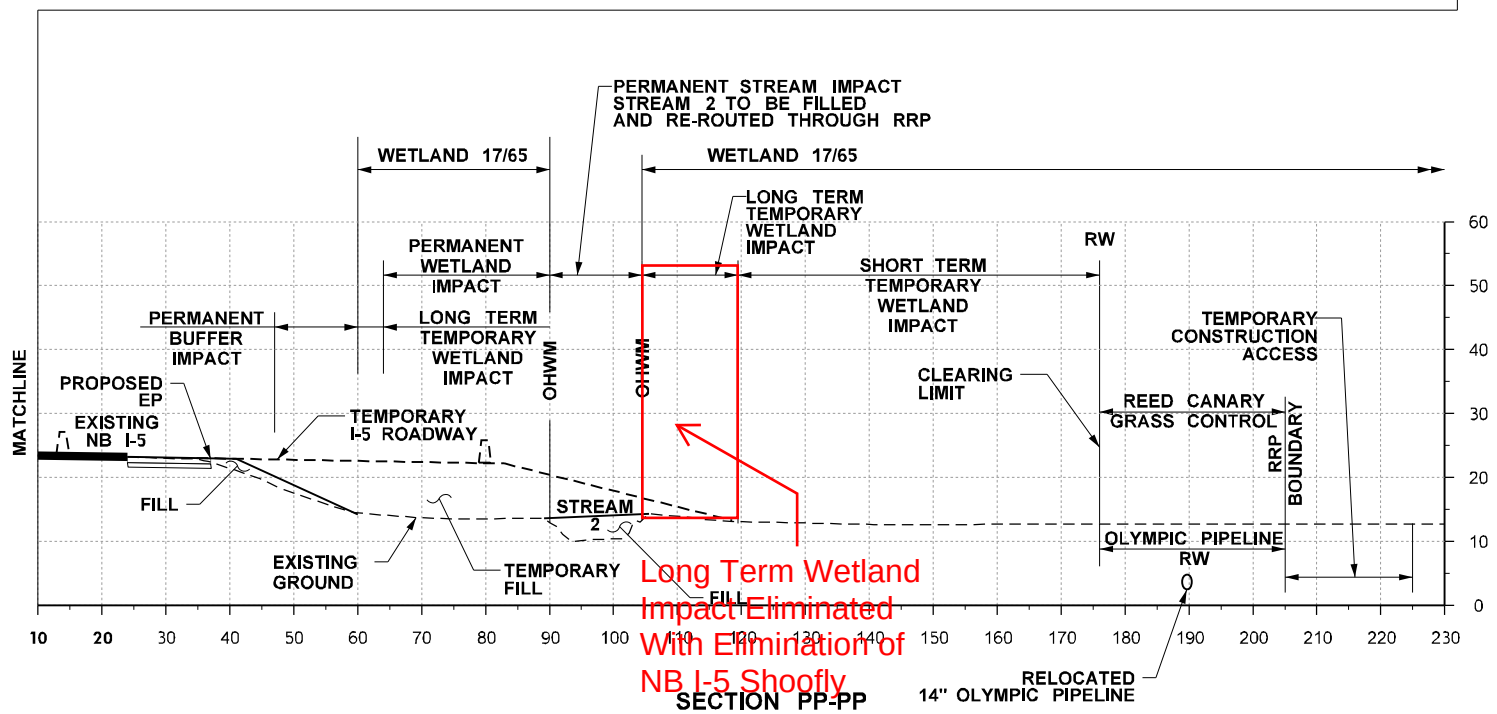
PROJECT NAME: SR 167/I-5 TO SR 509 – NEW EXPRESSWAY (STAGE 1b)	
PURPOSE: NEW CORRIDOR CONSTRUCTION	REFERENCE: NWS-2020-864-DOT
PROPOSED: ROADWAY, BRIDGES, TRAIL, RRP, STORMWATER	APPLICANT: PUGET SOUND GATEWAY PROGRAM
LOCATION: CITY OF FIFE, MILTON, EDGEWOOD, TACOMA	COUNTY: PIERCE
DATUM: NAD83, NAVD88	NEAR: WAPATO, FIFE DITCH
ADJACENT PROPERTY OWNERS: VARIES	WATER BODY: HYLEBOS, SURPRISE LAKE TRIB.
	DATE: SEPTEMBER 2020

Washington State Department of Transportation

SHEET: 84 OF: 94

ATTACHMENT C - WET IMPACT REDUCTIONS





Long Term Wetland Impact Eliminated With Elimination of NB I-5 Shoofly

SECTION PP-PP
I-5 MP 138.84
NB I5 2704+50.00
WETLAND 17/65, 73
STREAM 2/HYLEBOS, STREAM 4

0 15 30
SCALE IN FEET

PROJECT NAME: SR 167/I-5 TO SR 509 – NEW EXPRESSWAY (STAGE 1b)	
PURPOSE: NEW CORRIDOR CONSTRUCTION	REFERENCE: NWS-2020-864-DOT
PROPOSED: ROADWAY, BRIDGES, TRAIL, RRP, STORMWATER	APPLICANT: PUGET SOUND GATEWAY PROGRAM
LOCATION: CITY OF FIFE, MILTON, EDGEWOOD, TACOMA	COUNTY: PIERCE
DATUM: NAD83, NAVD88	NEAR: WAPATO, FIFE DITCH
ADJACENT PROPERTY OWNERS: VARIES	WATER BODY: HYLEBOS, SURPRISE LAKE TRIB.
	DATE: SEPTEMBER 2020

Washington State Department of Transportation

SHEET: 85 OF: 94

ATTACHMENT C - WET IMPACT REDUCTIONS

ANALYSIS OF SHOULDERS DONE BY MEASUREMENTS IN BLUE BEAM FOR APPENDIX T6

RFP APPENDIXT T-6 STAGE 0 / ATC PHASE 1

5-lane NB Shoofly & 4-lane SB Shoofly with Median Crossover for SB HOV

MOT Stage	Description	Duration [mos]
Stage 0	SB lanes shifted toward median at 50 mph	4
	NB lanes remain on existing at 60 mph - *no change*	4
Stage 1	SB GP lanes shifted to new SB shoofly at 50 mph	12
	SB HOV lane shifted to median crossover at 50 mph	12
	NB lanes shifted to new NB shoofly at 60 mph	12
Stage 2	SB GP lanes shifted toward median at 50 mph	3
	SB HOV lane remains on median crossover at 50 mph - *no change*	3
	NB lanes remain on new NB shoofly at 60 mph - *no change*	3
Stage 3	SB lanes shifted to final location	
	NB lanes remain on new NB shoofly at 60 mph - *no change*	3

General Notes:

1. No lane split is required for 5-lane NB (4 GP lanes and 1 HOV).
2. One lane split and median crossover is required for the SB HOV lane, however, no lane split is required for the 4 SB GP lanes.
3. Allows single stage construction of Bridge 9 (NB mainline).
4. Two-stage construction, with an additional traffic shift, is required for Bridge 10 (SB mainline).
5. No required ROW acquisition or impacts to the existing arsenic plume.
6. Requires extensive temporary work to construct shooflies and temporary bridges over Hylebos Creek
7. Requires significant temporary wetland impacts.
8. Lightweight fill to be used in areas where the temporary shoofly wall is immediately adjacent to the Olympic Pipeline alignment.

Stage 0: Construct Temporary Shooflies

Geometric Summary:

NB Lanes:
No change - traffic remains on existing mainline.

SB Lanes:
50 MPH Design Speed
11' Minimum Lane Width
2' Minimum Shoulder Width
No lane split required
No Shift Tapers required
Minimum clearance of 5' between Bridge 10 and temporary barrier

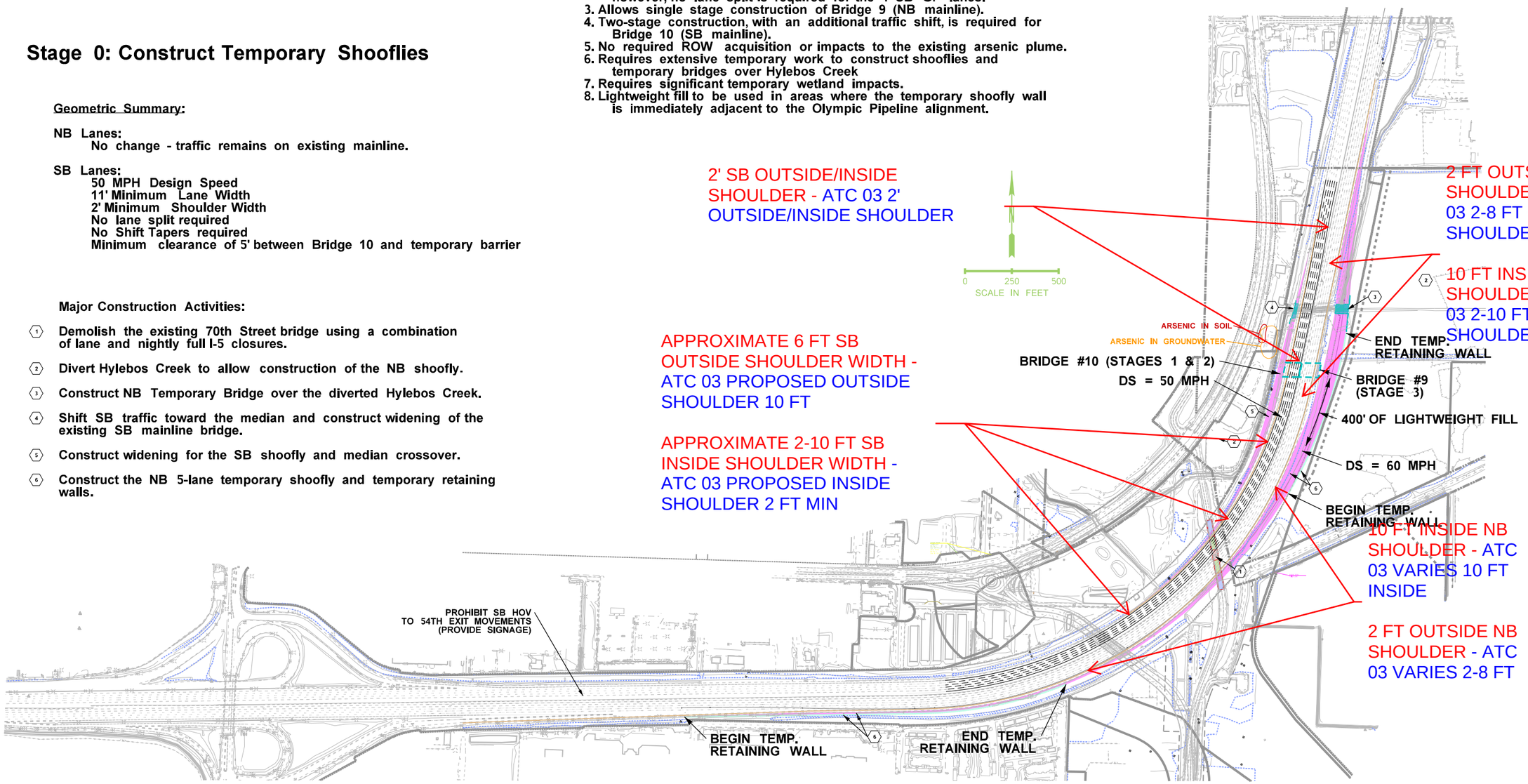
Major Construction Activities:

1. Demolish the existing 70th Street bridge using a combination of lane and nightly full I-5 closures.
2. Divert Hylebos Creek to allow construction of the NB shoofly.
3. Construct NB Temporary Bridge over the diverted Hylebos Creek.
4. Shift SB traffic toward the median and construct widening of the existing SB mainline bridge.
5. Construct widening for the SB shoofly and median crossover.
6. Construct the NB 5-lane temporary shoofly and temporary retaining walls.

2' SB OUTSIDE/INSIDE SHOULDER - ATC 03 2' OUTSIDE/INSIDE SHOULDER

APPROXIMATE 6 FT SB OUTSIDE SHOULDER WIDTH - ATC 03 PROPOSED OUTSIDE SHOULDER 10 FT

APPROXIMATE 2-10 FT SB INSIDE SHOULDER WIDTH - ATC 03 PROPOSED INSIDE SHOULDER 2 FT MIN



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Washington State Department of Transportation

SR 167/I-5 to SR 509 - New Expressway
I-5 MOT Concept

ATTACHMENT D - SHOULDER COMPARISONS

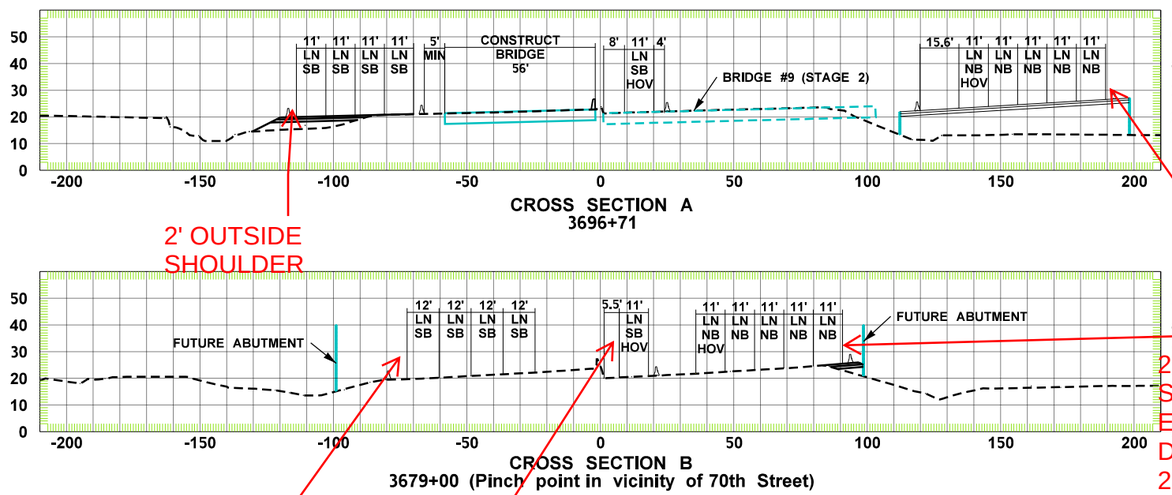
ANALYSIS OF SHOULDERS DONE BY MEASUREMENTS IN BLUE BEAM FOR APPENDIX T6

RFP APPENDIXT T-6 STAGE 1 / ATC PHASE 2

5-lane NB Shoofly & 4-lane SB Shoofly with SB Median Crossover for SB HOV

Stage 1: Construct the Inside Half of Bridge 10

MOT Stage	Description	Duration [mos]
Stage 0	SB lanes shifted toward median at 50 mph	4
	NB lanes remain on existing at 60 mph - *no change*	4
Stage 1	SB GP lanes shifted to new SB shoofly at 50 mph	12
	SB HOV lane shifted to median crossover at 50 mph	12
	NB lanes shifted to new NB shoofly at 60 mph	12
Stage 2	SB GP lanes shifted toward median at 50 mph	3
	SB HOV lane remains on median crossover at 50 mph - *no change*	3
	NB lanes remain on new NB shoofly at 60 mph - *no change*	3
Stage 3	SB lanes shifted to final location	
	NB lanes remain on new NB shoofly at 60 mph - *no change*	3



CROSS SECTION A
3696+71

2' OUTSIDE SHOULDER

CROSS SECTION B
3679+00 (Pinch point in vicinity of 70th Street)

APPROXIMATE 5-6 SHOULDER

ATC 03 provides 8 ft min shoulder for stalled vehicles ON ALL CROSSOVERS

APPROXIMATE 6 FT SB OUTSIDE SHOULDER WIDTH - ATC 03 PROPOSED OUTSIDE SHOULDER 5 FT

APPROXIMATE 2 FT SB INSIDE SHOULDER WIDTH - ATC 03 PROPOSED INSIDE SHOULDER 2-10 FT

2 FT OUTSIDE SHOULDER - ENTIRE NB DETOUR PHASES 1, 2, AND 3

Geometric Summary:

NB Lanes:
- 60 MPH Design Speed
- 11' Minimum Lane Width
- 2' Minimum Shoulder Width

(Typical 14.5'LT SHLD for Sight Distance)
- No Lane Split required
- No Shift Tapers required

SB Lanes:
- 50 MPH Design Speed
- 11' Minimum Lane Width
- 2' Minimum Shoulder Width

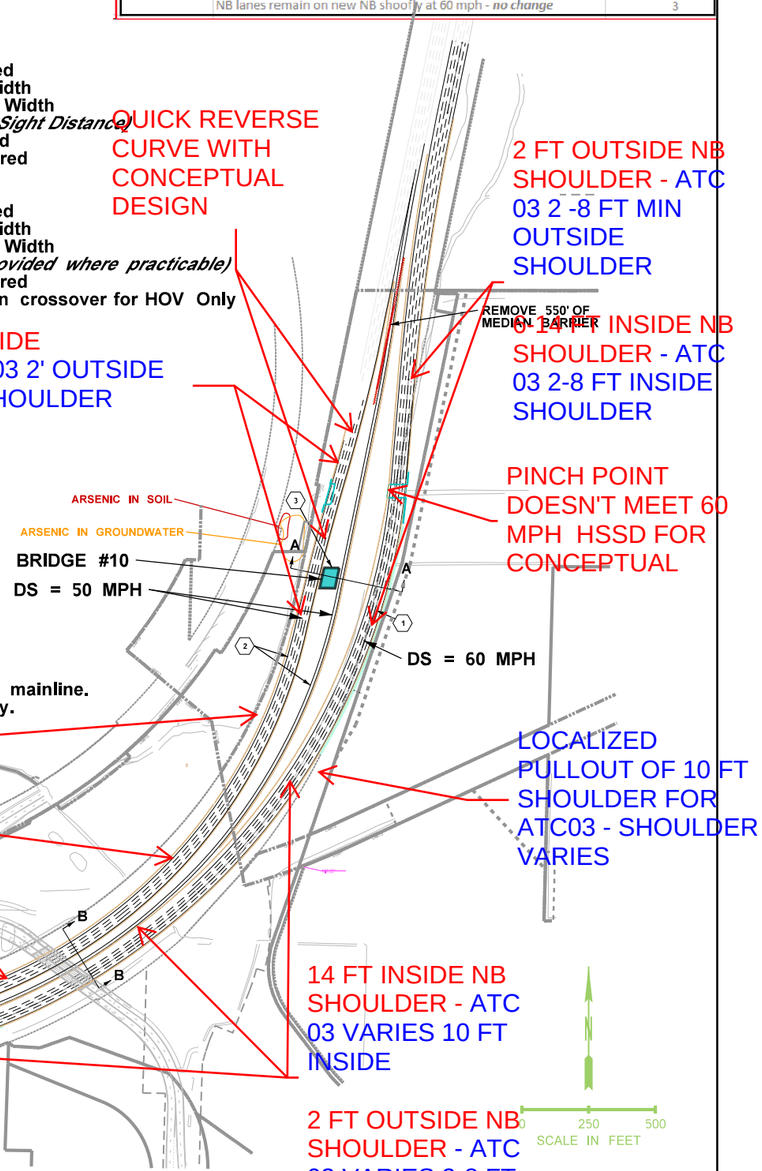
(8'RT and 4'LT SHLDs provided where practicable)
- No Shift Tapers required
- Lane Split and median crossover for HOV Only

QUICK REVERSE CURVE WITH CONCEPTUAL DESIGN

2' SB OUTSIDE/INSIDE SHOULDER - ATC 03 2' OUTSIDE AND 2-10 NSIDE SHOULDER

Major Construction Activities:

1. Shift NB traffic to the temporary NB shoofly.
2. Shift the SB HOV lane to the vacated (existing) NB mainline. Shift 4 lanes SB traffic to the temporary SB shoofly.
3. Construct the inside half of bridge #10.



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SR 167/I-5 to SR 509 - New Expressway
I-5 MOT Concept

ATTACHMENT D - SHOULDER COMPARISONS

ANALYSIS OF SHOULDERS DONE BY MEASUREMENTS IN BLUE BEAM FOR APPENDIX T6

RFP APPENDIXT T-6 STAGE 2 / ATC PHASE 3

5-lane NB Shoofly & 4-lane SB Shoofly with Median Crossover for SB HOV

Stage 2: Construct the Outside Half of Bridge 10

MOT Stage	Description	Duration [mos]
Stage 0	SB lanes shifted toward median at 50 mph	4
	NB lanes remain on existing at 60 mph - *no change*	4
Stage 1	SB GP lanes shifted to new SB shoofly at 50 mph	12
	SB HOV lane shifted to median crossover at 50 mph	12
	NB lanes shifted to new NB shoofly at 60 mph	12
Stage 2	**SB GP lanes shifted toward median at 50 mph**	**3**
	SB HOV lane remains on median crossover at 50 mph - *no change*	**3**
	NB lanes remain on new NB shoofly at 60 mph - *no change*	**3**
Stage 3	SB lanes shifted to final location	
	NB lanes remain on new NB shoofly at 60 mph - *no change*	3

Geometric Summary:

NB Lanes:
No change - traffic remains on temporary NB shoofly

SB Lanes:
No change to HOV lane - remains on crossover location
SB general purpose lanes shift adjacent to the median
- 50 MPH Design Speed
- 11' Minimum Lane Width
- 2' Minimum Shoulder Width
- No Shift Tapers required
- Minimum clearance of 5' between Bridge 10 and temporary barrier

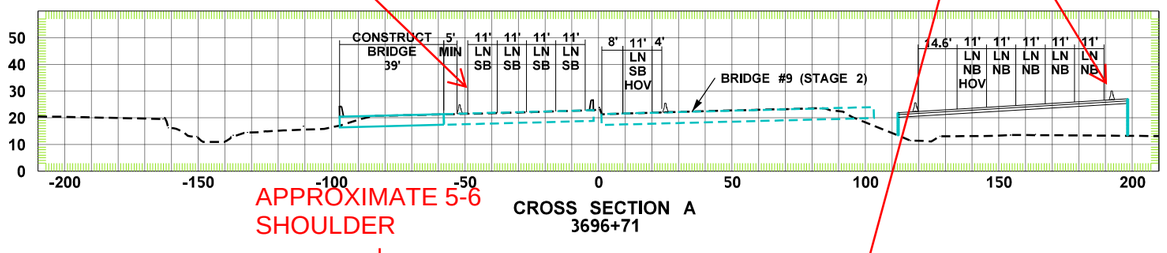
2' SB OUTSIDE AND 2-10 FT INSIDE SHOULDER - ATC 03 2' OUTSIDE AND 2-10 NSIDE SHOULDER

Major Construction Activities:

1. Shift SB traffic (except the HOV lane) to the inside of SB I-5.
2. Construct the outside half of bridge #10.

2' OUTSIDE SHOULDER

2 FT OUTSIDE SHOULDER - ENTIRE NB DETOUR PHASES 1, 2, AND 3

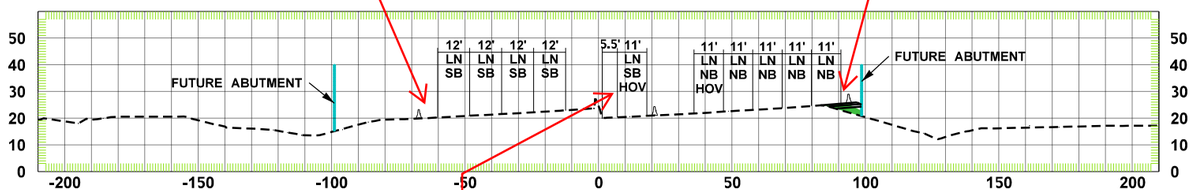


CROSS SECTION A
3696+71

APPROXIMATE 6 FT SB OUTSIDE SHOULDER WIDTH - ATC 03 PROPOSED OUTSIDE SHOULDER 5 FT

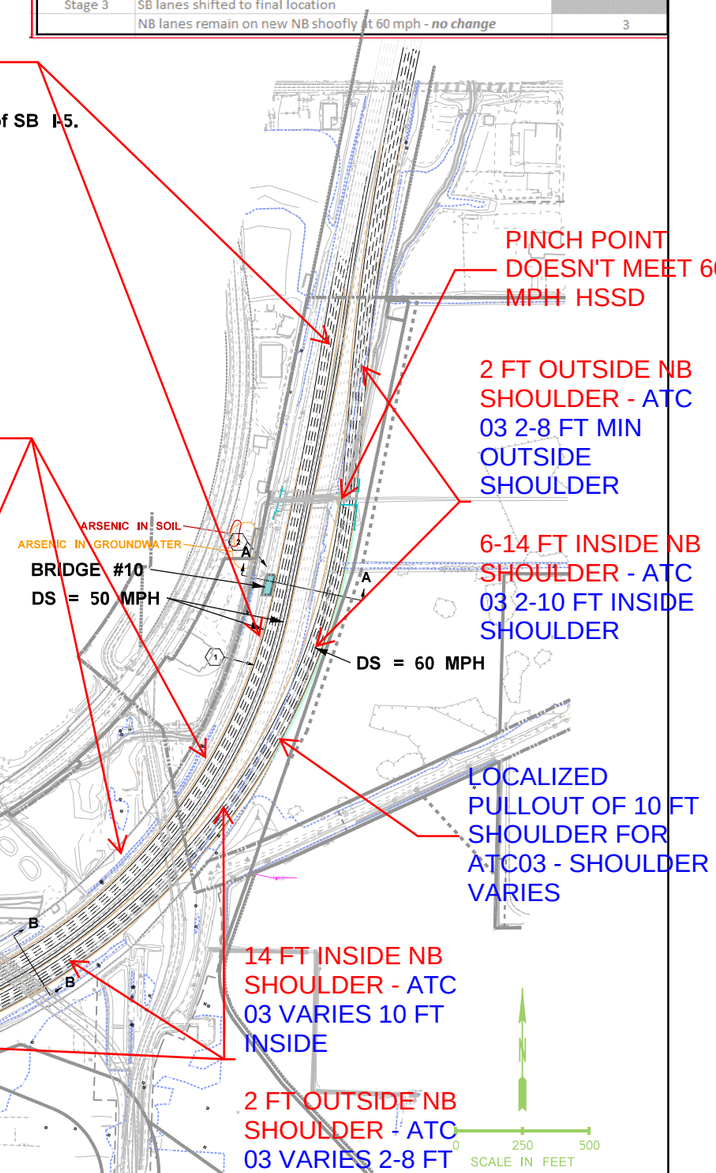
APPROXIMATE 2 FT SB INSIDE SHOULDER WIDTH - ATC 03 PROPOSED INSIDE SHOULDER 2-10 FT

APPROXIMATE 5-6 SHOULDER



CROSS SECTION B
3679+00

ATC 03 provides 8 ft min shoulder



PINCH POINT DOESN'T MEET 60 MPH HSSD

2 FT OUTSIDE NB SHOULDER - ATC 03 2-8 FT MIN OUTSIDE SHOULDER

6-14 FT INSIDE NB SHOULDER - ATC 03 2-10 FT INSIDE SHOULDER

LOCALIZED PULLOUT OF 10 FT SHOULDER FOR ATC03 - SHOULDER VARIES

14 FT INSIDE NB SHOULDER - ATC 03 VARIES 10 FT INSIDE

2 FT OUTSIDE NB SHOULDER - ATC 03 VARIES 2-8 FT

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SR 167/I-5 to SR 509 - New Expressway
I-5 MOT Concept

ATTACHMENT D - SHOULDER COMPARISONS

RFP APPENDIXT T-6 STAGE 3 / ATC PHASE 4

5-lane NB Shoofly & 4-lane SB Shoofly with Median Crossover for SB HOV

ANALYSIS OF SHOULDERS DONE BY MEASUREMENTS IN BLUE BEAM FOR APPENDIX T6

MOT Stage	Description	Duration [mos]
Stage 0	SB lanes shifted toward median at 50 mph	4
	NB lanes remain on existing at 60 mph - *no change*	4
Stage 1	SB GP lanes shifted to new SB shoofly at 50 mph	12
	SB HOV lane shifted to median crossover at 50 mph	12
	NB lanes shifted to new NB shoofly at 60 mph	12
Stage 2	SB GP lanes shifted toward median at 50 mph	3
	SB HOV lane remains on median crossover at 50 mph - *no change*	3
	NB lanes remain on new NB shoofly at 60 mph - *no change*	3
Stage 3	SB lanes shifted to final location	
	NB lanes remain on new NB shoofly at 60 mph - *no change*	3

Stage 3: Construct Bridge 9

Geometric Summary:

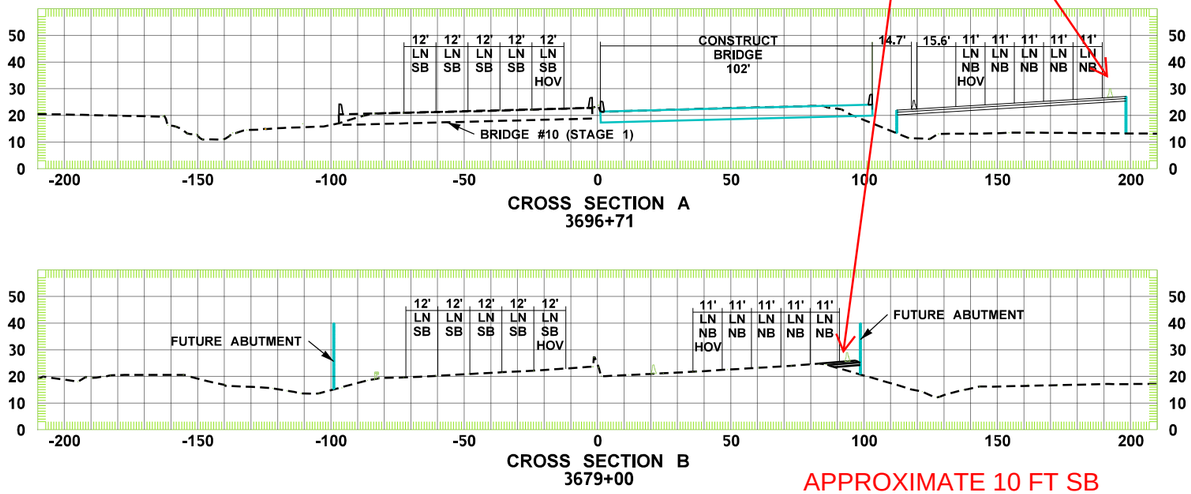
NB Lanes:
No change - traffic remains on temporary NB shoofly

SB Lanes:
Revert back to the existing I-5 SB mainline lane locations
- 60 MPH Design Speed
- 12-foot lanes
- Full width shoulders

Major Construction Activities:

1. Shift the SB HOV lane back to existing SB mainline and remove SB HOV crossover.
2. Construct bridge #9.

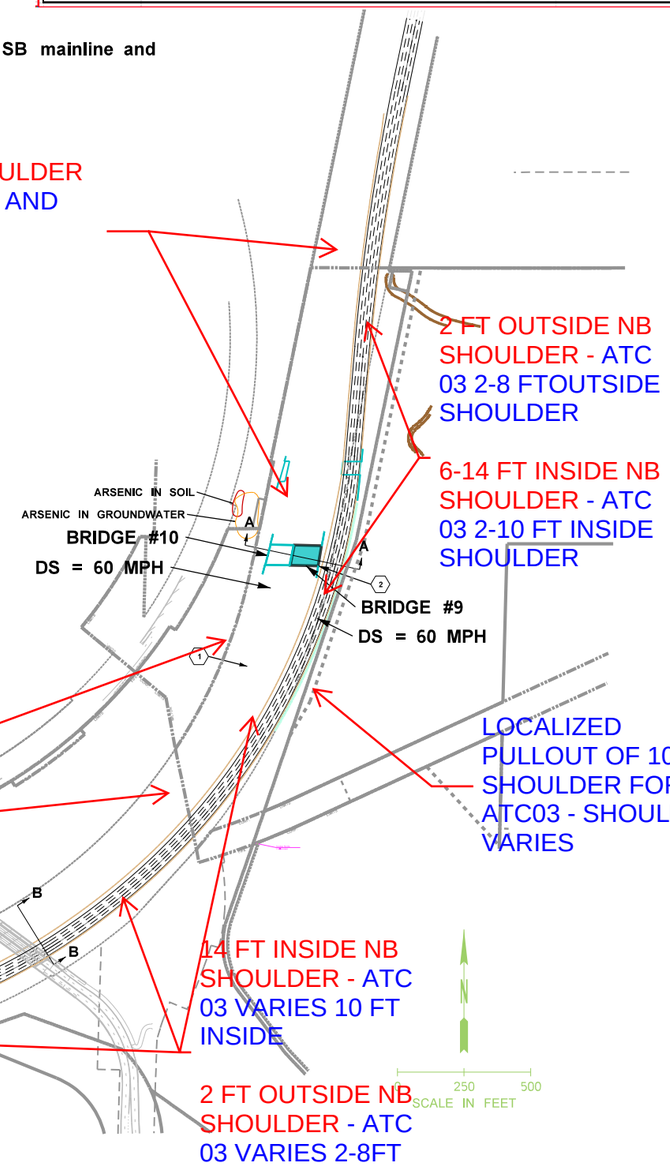
2 FT OUTSIDE SHOULDER - ENTIRE NB DETOUR PHASES 1, 2, AND 3



CROSS SECTION A
3696+71

CROSS SECTION B
3679+00

SB OUTSIDE/INSIDE SHOULDER 10' - ATC 03 2' -5'OUTSIDE AND 2-10 NSIDE SHOULDER



2 FT OUTSIDE NB SHOULDER - ATC 03 2-8 FTOUTSIDE SHOULDER

6-14 FT INSIDE NB SHOULDER - ATC 03 2-10 FT INSIDE SHOULDER

APPROXIMATE 10 FT SB OUTSIDE SHOULDER WIDTH - ATC 03 PROPOSED OUTSIDE SHOULDER 5 FT

APPROXIMATE 10 FT SB INSIDE SHOULDER WIDTH - ATC 03 PROPOSED INSIDE SHOULDER 2-10 FT

LOCALIZED PULLOUT OF 10 FT SHOULDER FOR ATC03 - SHOULDER VARIES

14 FT INSIDE NB SHOULDER - ATC 03 VARIES 10 FT INSIDE

2 FT OUTSIDE NB SHOULDER - ATC 03 VARIES 2-8FT

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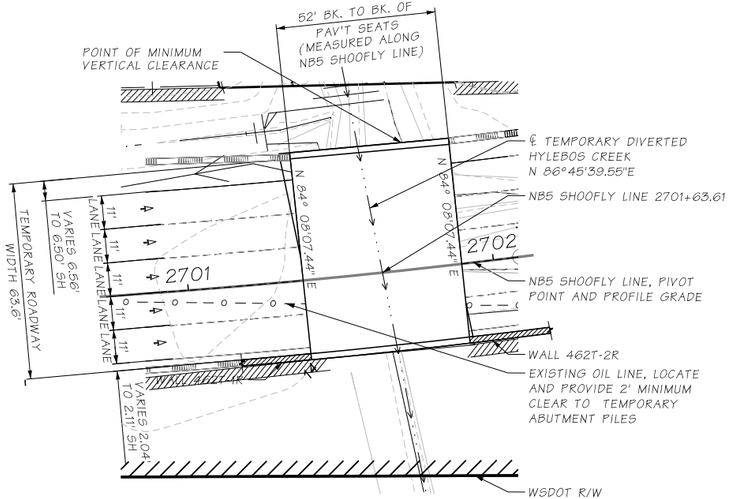
SR 167/I-5 to SR 509 - New Expressway
I-5 MOT Concept

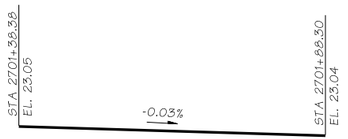
ATTACHMENT D - SHOULDER COMPARISONS



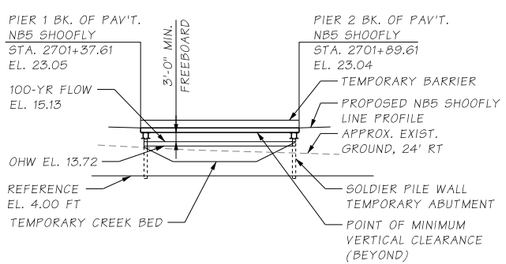
PLAN - TEMPORARY BRIDGE 5/462T SHOOFLY

SEC. 6, T.20N., R.4E.
CITY OF FIFE

	CURVE DATA				
PCC STATION	DELTA	RADIUS	TANGENT	LENGTH	BK. TAN. BEARING
NB5 SHOOFLY 2684+45.33	42° 24'0.5.7" LT	2383.00'	924.34'	1763.53'	N 47° 14'00.5" E

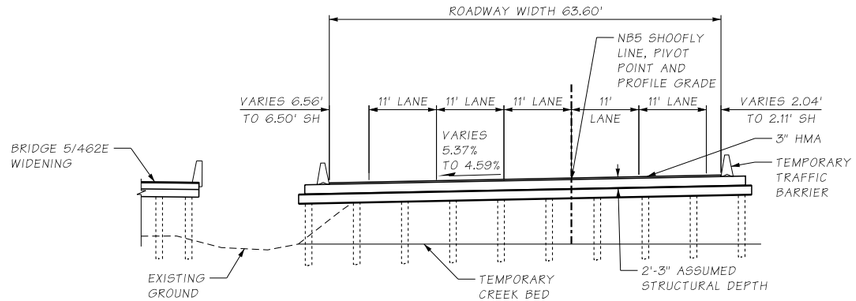


NB5 SHOOFLY LINE PROFILE



ELEVATION - TEMPORARY BRIDGE 5/462T SHOOFLY

GRADE ELEVATIONS SHOWN ARE FINISH GRADES AT TOP OF
BRIDGE DECK ON NB5 SHOOFLY LINE AND ARE EQUAL TO PROFILE GRADE.



TYPICAL SECTION - TEMPORARY BRIDGE 5/462T SHOOFLY

LOADING: HL93
P.C. GIRDERS (24" P.C. SLABS WITH 3" HMA)

DATUM
(NAVD) 88

AD COPY
CONCEPTUAL DESIGN
NOT FOR CONSTRUCTION

SCALE IN FEET 0 10 20

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DATE	3/4/2021						
PLOTTED BY	delacruzd						
DESIGNED BY	M. MOHANAMURTHY						
ENTERED BY	D. DE LA CRUZ						
CHECKED BY	Y. POLYAKOV						
PROJ. ENGR.	C. SODERQUIST						
REGIONAL ADM.	J. WHITE						
		REVISION	DATE	BY			

FED.AID PROJ.NO. 0167(057)
CONTRACT NO. 20C512
CONTRACT NO. XL5466

CONCEPTUAL DESIGN NOT FOR CONSTRUCTION

Washington State Department of Transportation

SR 167
I-5 TO SR 509
NEW EXPRESSWAY

CONCEPTUAL PLAN-TEMP. BRIDGE NO. 5/462T

PLAN REF. NO.
SHEET
OF
SHEETS

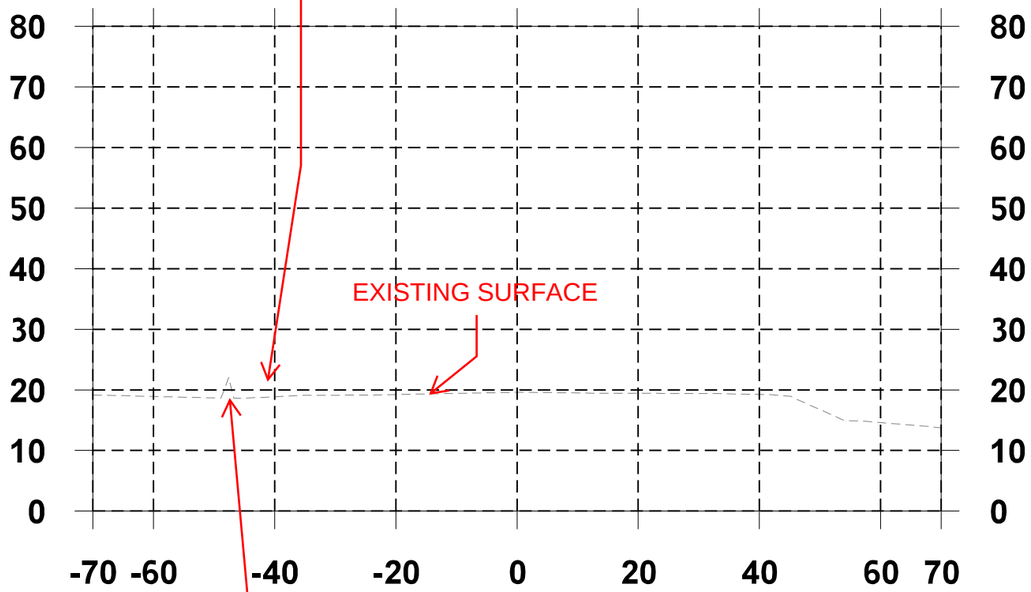
PROJ. NO. XL5466 ~ OLYMPIC REGION ~ M.P. 36.176, SR 5, HYLEBOS CR. TEMPORARY BRIDGE 5/462T SHOOFLY

$FILELS

NOTE: MEDIAN CROSS OVER LOCATIONS GENERALLY MATCH RFP APPENDIX T6 CONCEPT FOR SB HOV CROSS OVER

PER WSDOT COMMENT - SOUTH CROSS OVER SHALL BE SOUTH OF I-5 3663+30

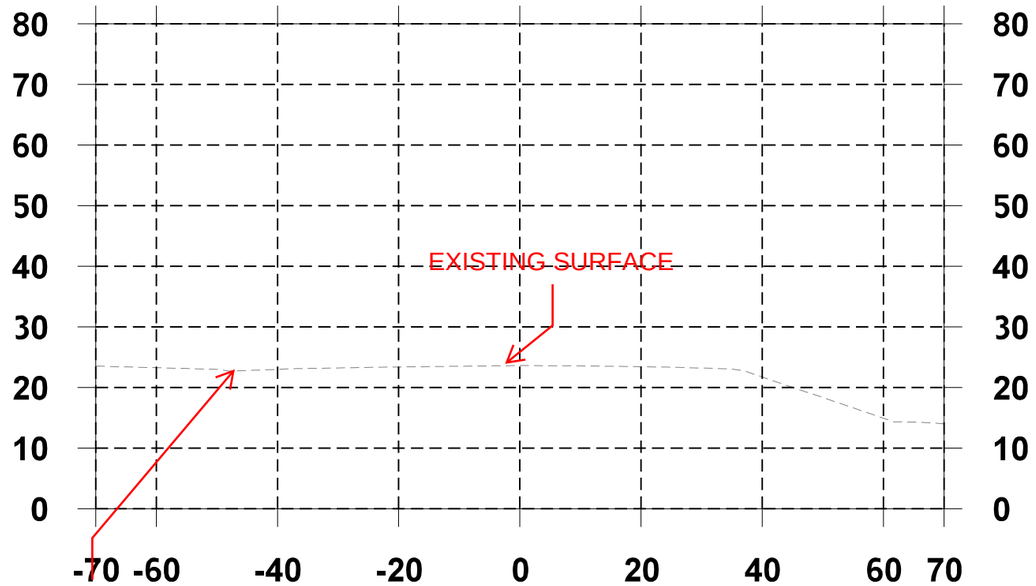
SOUTH MEDIAN CROSS OVER



NO GRADE DIFFERENTIAL AT MEDIAN BARRIER FOR SOUTH CROSS OVER

2657+00

SOUTH MEDIAN CROSS OVER



LITTLE TO NO GRADE DIFFERENTIAL AT NORTH CROSS OVER

2706+00

ATTACHMENT E - MEDIAN CROSSOEVER LOCATIONS FOR ATC 03

ATC #4 – SR 99 Detour to 70th

Washington State Department of Transportation

Puget Sound Gateway SR 509/SR 167
SR 509: 401 2nd Ave South, Ste. 300
Seattle, WA 98104
SR 167: 5720 Capitol Blvd SE
Tumwater, WA 98501
206-464-1220
TTY: 1-800-833-6388
www.wsdot.wa.gov

August 23, 2021

Greg Ritke
Graham Contracting Ltd.
13555 SE 36th Street, Suite 120
Bellevue, WA 98006

Dear Mr. Ritke:

We have reviewed your ATC004 Rev. 2 and have determined that the ATC is approved.

Please contact me at (360) 701-9413 if you have any questions.

Sincerely,

Steven D. Fuchs

Steve Fuchs, P.E.
SR 167 Completion Project Manager

ATC Title: SR 99 Detour to 70th
ATC Number: 004

Brief Description: Long Term Detour of SR 99 NB to Phase 1A 70th Ave NE and Existing 70th Ave NE Roadways to assist with Construction Staging of SR 99 Construction (Roadway, Utilities, Bridge 13, and Bridge 3).

Detailed description: The Design-Build team proposes use of a 6-month duration NB 99 detour with use of the existing 70th Ave NE roadway, the Wapato Way E roadway built in Stage 1A, and a temporary constructed intersection to route SR 99 Northbound off SR 99 to help facilitate construction and minimize impacts. The proposed design would install a temporary intersection at the approximate location of existing 70th Ave NE built in Phase 1A and 70th Ave NE with NB 99 closed from north of the Phase 1A roundabout to the northern SR 99 construction limits of the project. SB 99 will remain on the existing SR 99 roadway with 11 ft min lanes and provide the same SB shoulder for pedestrian movements to facilitate a long term staged work zone. SB 99 may be shifted to the east as necessary to stage SR 99, Bridge 13, and Bridge 3 pier construction.

Also, as part of this ATC, a nighttime set up is proposed such that both SR 99 SB and NB are also routed off SR 99 during nighttime hours for lane closures as allowed per the Technical Requirements.

See Attachment A for design detour concepts and intersection details.

The concept reduces construction duration by an estimated 11 months on the SR 99 corridor as compared to the Appendix T6 MOT concepts. Construction of Bridge 13 and 3 can take place concurrently with this concept along with eliminating any scheduling constraints associated with fish window work. Eliminating constraints with fish window work also has benefits to overall project schedule. See comparison below:

Construction Activity	**ATC 04 Concept (Months)**	**RFP Appendix T6 Concepts (Months**	**Comments**
Temporary MOT Set UP	1	3	Appendix T6 Concept also constrained to wait for Fish Window to commence work on SR 99
Construction of Bridge 13	6	6	

Ground Improvements or Consolidation for Bridge 3		3	Consolidation or ground improvements may be done concurrently with Bridge 13 construction in ATC 04 concept.
Completion of SR 99 Roadway and Bridge 3 Piers	0	3	Assumes Piers for Bridge 3 constructed in conjunction with Bridge 13 during ATC 04 concept. Bridge 3 eastern pier in conflict with temporary shoofly per Appendix T6. Appendix T6 Concept must wait for shoofly *removal* once the shoofly is non-operational
RRP Grading, Stream, and Planting		3	RRP Between SR 99 & I-5 cannot be completed until shoofly is removed which correlates with fish window.
Superstructure Construction of Bridge 3	4	4	
Total Months of Construction On or Above SR 99	**11**	**22**	

In response to WSDOT comments about traffic delay vs. benefits, the safety and traffic benefits of the ATC are highlighted below:

ATC 04 Benefit Summary

Benefit	**Safety Benefit**	**Traffic Benefit**
Reduced Construction Schedule on SR 99 by 11 months. Reduced overall temporary traffic conditions will reduce risk to accidents associated with reduced roadway widths and elements.	X	X

No temporary fill or temporary culvert drainage between SR 99 and I-5. Reduce risk to flooding for both SR 99 and Interstate 5 construction as Appendix T-6 concept would be constructed in at least one set of winter months. Eliminates need to hold on SR 99 work until 12th St culvert is replaced	X	X
Concept allows construction of Bridge 3 concurrently with SR 99 work on Bridge 13. This provides faster access from I-5 to SR 509 spur during heavy earthwork construction for construction vehicles. The public will ultimately use the I-5 interchange with the 509 Spur earlier. Potentially remove trucks from local roadways earlier in the project for spur construction	X	X
No reduced posted speed and straight geometrics for SB-99.	X	X
Removal of NB SR 99 from existing SR 99 roadway allows utility relocation and roadway construction to take place near Bridge 3 area without lane closure schemes.	X	X
More construction buffer space for construction of foundations/piers for Bridge 3. Larger buffers increase safety to both public users of SR 99 and construction workers building the project.	X	
Accelerated Schedule will ultimately lead to quicker construction of pedestrian facilities on SR 99 which doesn't have any designated facilities with only smaller shoulders for pedestrian movements.	X	

Usage: The proposed design would be implemented for maximum 6 months to construct parts of the SR 99 Roadway, Utility Relocations, Bridge 13 Construction, and Pier Construction for Bridge 3. The ATC will also be used to assist with Bridge 3 construction over SR 99 for the SR 167 Spur roadways with night-time detour concept presented in Attachment A after the 6-month duration if the existing 70th bridge hasn't been removed.

Subsurface Investigation: The proposed revisions would not require additional subsurface investigations beyond the requirements of the basic configuration.

Proposed RFP modifications:

In the General Provisions, Chapter 2, Section 2.22.4.3.2.4, is supplemented to have the following: "The design builder will be allowed to re-route NB SR 99 at all hours for an extended long term detour of 6 months duration per ATC 04 concept depicted in Attachment A. The detour concept for NB SR 99 per ATC 04 doesn't subtract or use the allotted six closures of SR 99. With WSDOT approval and satisfactory traffic operations, the 6 month maximum duration may be extended to help accelerate SR 99 construction and Bridge 3 construction."

Design Analysis: No geometric design analysis is submitted with the ATC. Traffic Synchro Analysis is provided for assessment of traffic conditions on 70th Ave NE including the temporary

intersection traffic analysis. Temporary traffic analysis was performed based on existing traffic volumes presented in Appendix T22 for ICE prepared at Wapato Way and SR 99.

Analysis:

a. Functionality – Equal;

The ATC provides the ability for less overall lane closures permitted on SR 99 per the technical requirements 2.22.4.3.1.4 with long term staging while still maintaining two NB and two SB lanes. The ATC 6-month duration daytime concept will provide better ability to perform construction of roadway improvements and bridge 13 for SR 99 without short duration lane closures.

Synchro and SIDRA analysis of the temporary intersection configurations are shown in detail in Attachment B. Overall trip lengths through the project site serve to analyze assessment of ATC 04 against the Appendix T-6 SR 99 Shoofly MOT Concept. These results are summarized as follows which only has delay increase for NB 99 (most attributed to extra travel length).

ATC 04 TRIP TIME SUMMARY

Movement Duration	ATC 04 Travel Total Increase- AM Peak (Sec)	ATC 04 Travel Total Increase- PM Peak (Sec)
NB 99- South of Phase 1A Roundabout to North of 70th/SR 99 Intersection	25	6
SB 99- North of 70th/SR99 Intersection to South of Phase 1A Roundabout	-4	-10
NB 99 to Wapato Way - South of Phase 1A Roundabout to South of ATC 04 Temp Intersection	-2	-15
SB 99 to Wapato Way - 70th/SR99 Intersection to South of ATC 04 Temp Intersection	-5	-17
Wapato Way to NB 99 - ATC 04 Temp Intersection to 70th/SR99 Intersection	-28	-32
Wapato Way to SB 99 - ATC 04 Temp Intersection to South of Phase 1A Roundabout	6	-11

Note – Negative Values are decrease in delay to existing condition

The design build team analyzed the intersections based on 2030 model data since Appendix T22 ICE for the Wapato Roundabout provided approach volumes, but didn't provide turn movement volumes for the existing conditions (2017). Note that this comparison is conservative in nature but the only true means to compare the Appendix T-22 Conceptual SR 99 MOT scheme vs ATC 04. It is noted that the increase in delay for NB 99 (most attributed to detour travel length) can be off-set wholistically by reduced travel times for other routes.

ATC 04 QUEUE LENGTH SUMMARY

Movement	ATC 04 AM Queue - 95th (LF)	ATC 04 PM Queue - 95th (LF)	Distance to Closest Intersection
NB 99	118	168	1020
Wapato Way to NB 99	15	15	785
Wapato Way to SB 99	26	37	785

95% queue lengths are seen to be away from adjacent intersections not significantly impacting traffic with a 136 ft maximum queue length anticipated well away from the Phase 1A Roundabout at Wapato Way and SR 99. See Attachment B for traffic analysis of the temporary intersection queue lengths for further information..

- ATC 04 benefits compared marginal Increases in delay to NB 99 along with the reduced delay in other directions of travel is summarized in the detailed section write up. .

The ATC concept reduces overall heavy construction on SR 99 by 11 months due to eliminating temporary detour interface with the existing Hylebos Creek (and associated permitted fish windows for construction) and allowing concurrent Bridge 13 and Bridge 3 construction on SR 99. Reduction in overall construction schedule within the corridor has significant benefits to overall traffic operations, achieving full pedestrian improvements on SR 99 earlier, and general project construction sequencing tied directly to the RRP, Bridge 3, and Bridge 1. See schedule benefits outlined previously in detailed description.

The design detour route provides for a design vehicle of WB 67 and accommodates a larger design vehicle for girder deliveries (200 ft beam analyzed). See AutoTurn Truck Exhibits for further information in Attachment C. Longer 200 ft beams were analyzed for NB 99 in which the movement can be made without encroaching on-coming direction of travel. SB 99 would match existing conditions for the longer loads as an improvement to the Appendix T22 concept. Appendix T22 only analyzed longer loads for SB 99 in which ATC 04 has validated both NB and SB SR 99. All other truck turning movements meet or exceed existing conditions.

Pedestrian access will be maintained for the existing shoulders on existing 70 roadway or on the west or east maintained shoulder on SR 99 depending on stage of construction to maintain pedestrian connectivity and match existing conditions.

Right-In and Right-Out turns at the existing 70th Intersection will have minimal impact to the existing Fife neighborhood in which traffic won't be impacted by the set up. The detour routing of NB 99 left turns (originally at 70th) to Porter Way increases travel times by 3 seconds or direct

travel time outside of signal delay that is managed through a simple detour to Porter Way with standard MUTCD signing. This concept equally matches concepts depicted in the Appendix T-6 MOT Concepts. Signal improvements/adjustments to Porter Way in conjunction with modifications to queue left turn storage length will be assessed during final design for extra vehicles associated with the detour. Other routes to 64th Ave E to 12th St E may be utilized by residents to get to the local Fife neighborhoods as an alternate detour route in which traffic will utilize the appropriate alternate routes during construction. Traffic volumes for detour related to left turn removal are minimal with 4 vehicles per hour (VPH) in the AM peak and 33 VPH in the PM peak. See Attachment D for Local Neighborhood Detour Routes.

b. Structural adequacy –
Equal; the proposed design revisions will have no effect on structural adequacy.

c. Safety –
Better; The proposed ATC has several safety benefits outlined below.

ATC 004 provides better work zone buffers for workers and the traveling public than conventional lane closures. The ATC's potential for reduction in one lane closures and long detour closures keeps the roadway configuration consistent with driver expectations and therefor increases roadway safety.

The elimination of excessive temporary roadway construction within the wetland flood plain storage minimizes the risk of flooding of Interstate 5 and SR 99 during construction. Temporary fill for temporary long term roadway detour construction of SR 99 eliminates flood risk on Interstate 5 SB as a result of temporary roadway construction. This eliminates schedule dependency on the 12th St Culvert removal associated with SR 99 shoofly construction.

The ATC 04 concept provides large safety buffers for Bridge 3 Pier construction. The ATC concept also reduces overall heavy construction on SR 99 by 11 months. See detailed description section for comparison of schedule to Appendix T6 concept. This reduces overall exposure duration of public and construction labor to increased hazards associated with temporary roadway configurations.

See detailed description for assessment of SR 99 safety and traffic benefits table.

d. Comparison of life cycle costs including repair and maintenance –
Equal; The proposed ATC does not have any impacts on repair or maintenance cost.

e. Aesthetics –
Equal; the proposed ATC 004 will have no effect on aesthetics.

f. Impacts on construction traffic –
Better; The proposed ATC provides the following construction traffic betterments associated with the project:

- The proposed ATC helps reduce overall project schedule by 11 months on SR 99 helping minimize disruption to traffic on SR 99. See detailed description section for comparison of schedules to Appendix T6 Conceptual MOT Plan.
- Reduced delays in directions of travel other than NB 99. See Functionality assessment and Attachment B for traffic analysis

- Accelerated construction techniques as depicted with ATC 04 typically lend to less impact to traffic overall during construction by keeping work activities as efficient as possible.
- The proposed detour utilizes existing roadways for the long-term NB SR 99 detour helping reduce short term lane closures for construction. Keeping roadways consistent as much as feasible limits the impacts to traffic during construction reducing driver confusion.
- The use of existing roadways for the NB detour prevents the need for a shoofly design for NB and SB SR 99 eliminating lane closures and impacts to traffic associated with construction of temporary roadways per Appendix T6-MOT Concepts.
- The concept helps advance construction of foundations for Bridge 3 concurrently with Bridge 13 construction helping advance construction of the project giving construction access from Interstate 5 directly to the heavy earthwork construction on the SR 509 spur roadway. This reduces truck traffic on local roadways already heavily saturated with trucks.

g. Effect on or changes to environmental commitments identified in the RFP –
Better; The proposed ATC provides the following environmental betterments associated with the project:

- The proposed detour eliminates the need for temporary shoofly roadways identified in Appendix T6 reducing temporary long-term impacts to wetlands by approximately 53,000 SF.
- The proposed detour scheme eliminates the need for a temporary bridge over the existing Hylebos Creek and a temporary culvert for Surprise Lake Tributary, minimizing impacts to the existing creek as a result of SR 99 construction.
- The proposed ATC minimizes temporary construction of roadways, fill, culvert, walls, and bridges over the existing Hylebos Creek & Surprise Lake Tributary. Reduction in temporary works within the work zone eliminates impacts to the wetlands in two different fish windows with removal of Appendix T6 MOT concept shoofly design for both SB and NB SR 99.
- The elimination of temporary roadway construction within the existing Hylebos Creek and wetlands will help the RRP work advance to completion faster in the project schedule.
- Concept provides flexibility in RRP construction earlier between SR 99 and I-5, potentially helping establish plant species and RRP elements earlier in the project.

h. Impacts to surrounding and adjacent communities, including EJ and LEP populations–
Better; The ATC will help minimize impacts to the surrounding and adjacent communities by the following:

- The ATC concept will help minimize impacts to the public by reducing overall project construction on SR 99 by approximately 11 months. See detailed description section for further information in comparison of schedule to Appendix T-6 conceptual plan.
- The ATC will minimize detour traffic and limit lane closures, keeping consistent access to the adjacent neighborhoods. Consistency in construction and traffic will help minimize impacts the adjacent communities.
- It will help accelerate construction by long-term staging minimizing noise and disturbances to the adjacent communities and minimize night work (noise at night) due to constrained work zones requiring short term lane closures.
- The ATC helps complete SR 99 corridor improvements earlier in the project by removing temporary roadway configurations per Conceptual MOT Plans under Appendix T6, giving permanent SR 99 facility benefits to the project and public sooner.

- It eliminates SR 99 temporary construction over the Hylebos Creek and Surprise Lake Tributary, helping keep SR 99 construction tied to fish window restrictions and helping accelerate construction.
- The concept helps advance overall construction schedule of the project by allowing concurrent construction of Bridges 13 and 3 on SR 99.
- The concept gives potential to open construction access from I-5 to heavy earthworks associated with the SR 509 spur by advancing Bridge 13 and 3 simultaneously.

i. Changes needed in the location, length, height, or number of noise walls –
Equal; The proposed ATC concept for MOT will have no effect on noise walls.

j. Impact on utilities and rail –
Equal; The proposed ATC concept for MOT will have no effect on utilities and railroads.

k. Discussion of additional ROW or easements required –
Equal; The proposed ATC does not require additional ROW or easements.

l. An assessment of Forward Compatibility –
Equal; Temporary detours and temporary roadways have no negative impacts on forward compatibility.

Attachments:

Attachment A – Concept Drawings and Intersection Details
Attachment B – Traffic Analysis
Attachment C – Auto-Turn Truck Turn Analysis
Attachment D – Local Roadway Detour Routes

ATC 004 Rev1 – Response to WSDOT Review Comments – Round 2

• WSDOT does not consider the temporary signal and the associated detour route as equal or better to the conceptual plans. The impacts to the traveling public are greater and there is no marked safety benefit.

See updated temporary intersection concept of a free right and merge for Wapato Way to NB 99 with two ped crossings near the temporary 70th intersection and Wapato Way. This has a LOS of A with less delay for both WB Wapato Way to SB 99 and NB 99. The WB Wapato Way Right Turn Yield movement matches existing movement condition seen at the Phase 1A roundabout (existing). See attached exhibits for further information. Level of delay and queue length comparison is shown below and now in front part of ATC write up:

ATC 04 TRIP TIME SUMMARY

Movement Duration	ATC 04 Travel Total Increase- AM Peak (Sec)	ATC 04 Travel Total Increase- PM Peak (Sec)
NB 99- South of Phase 1A Roundabout to North of 70th/SR 99 Intersection	25	6
SB 99- North of 70th/SR99 Intersection to South of Phase 1A Roundabout	-4	-10
NB 99 to Wapato Way - South of Phase 1A Roundabout to South of ATC 04 Temp Intersection	-2	-15
SB 99 to Wapato Way - 70th/SR99 Intersection to South of ATC 04 Temp Intersection	-5	-17
Wapato Way to NB 99 - ATC 04 Temp Intersection to 70th/SR99 Intersection	-28	-32
Wapato Way to SB 99 - ATC 04 Temp Intersection to South of Phase 1A Roundabout	6	-11

Note – Negative Values are decrease in delay to existing condition

ATC 04 QUEUE LENGTH SUMMARY

Movement	ATC 04 AM Queue - 95th (LF)	ATC 04 PM Queue - 95th (LF)	Distance to Closest Intersection
NB 99	118	168	1020

Wapato Way to NB 99	15	15	785
Wapato Way to SB 99	26	37	785

In response to the comment, benefits from a safety perspective include the following but aren't limited to:

ATC 04 Benefit Summary

Benefit	Safety Benefit	Traffic Benefit
Reduced Construction Schedule on SR 99 by 11 months. Reduced overall temporary traffic conditions will reduce risk to accidents associated with reduced roadway widths and elements.	X	X
No temporary fill or temporary culvert drainage between SR 99 and I-5. Reduce risk to flooding for both SR 99 and Interstate 5 construction as Appendix T-6 concept would be constructed in at least one set of winter months. Eliminates need to hold on SR 99 work until 12th St culvert is replaced	X	X
Concept allows construction of Bridge 3 concurrently with SR 99 work on Bridge 13. This provides faster access from I-5 to SR 509 spur heavy earthwork construction for construction vehicles. This ultimately the public use of the I-5 interchange with the 509 Spur. Potentially remove trucks from local roadways earlier in the project for spur construction	X	X
No reduced posted speed and straight geometrics for SB-99.	X	X
Removal of NB SR 99 from existing SR 99 roadway allows utility relocation and roadway construction to take place near Bridge 3 area without lane closure schemes.	X	X
More construction buffer space for construction of foundations/piers for Bridge 3. Larger buffers increase safety to both public users of SR 99 and construction workers building the project.	X	
Accelerated Schedule will ultimately lead to quicker construction of pedestrian facilities on SR 99 which doesn't have any designated facilities with only smaller shoulders for pedestrian movements.	X	

It is the opinion of the design build team that all the benefits associated with safety as well as traffic benefits outlined in ATC write up outweigh the marginal increase in peak hour traffic delays for a 6-month duration.

• WSDOT does believe that this detour route could be viable for night operations when traffic volumes are low, however, we are not sure how the southbound SR 99 to southbound Wapato Way East movement is accommodated by this ATC in the two-way traffic on 70th Ave.

U-Turn at the roundabout would accommodate this movement. Based on bullet 3, if routing one lane in each direction around on the existing 70th counts toward a full closure than there is no need to incorporate night-time elements into the ATC. Night-time aspects of ATC have been removed.

• If all of the SR 99 traffic is detoured to a local street, that is considered a full closure of SR 99, not lane closures.

Can remove this part of the ATC if necessary. If routing one lane in each direction via existing 70th counts toward a full closure, then there is no need to incorporate night-time elements to the ATC. Night-time aspects of ATC have been removed.

• A review of the proposed detour revealed that oversized loads would have difficulty navigating the Wapato Way East\70th Ave. intersection, so please give this some consideration when designing this detour route.

Moving to separated right turn allows for larger radius and would easily provide accommodation of WB 67. See Attachment C for WB 67 turns. Super-loads for NB 99 to match the Appendix T-6 concept provided previously in Attachment C. Super-loads weren't depicted for the Wapato Way to NB 99 movement in the Appendix T-6 plans and don't appear feasible with the current intersection. Mountable curb or coordination of loads to 54th could be performed during construction for oversized loads for this movement.

PREVIOUS SUBMITTAL COMMENT RESPONSES

ATC 004 – Response to WSDOT Review Comments

• The traffic analysis of the temporary detour signalized intersection southeast of I-5 shows zero northbound Wapato Way East right turn volume. In the analysis files, this is listed as a northwest right turn movement, but has zero volume. These vehicles need to be accounted for in the analysis, and truck movements and turning templates are not provided for this movement.

Traffic Analysis performed to match concept condition at temporary intersection. LOS B worst case scenario in PM peak with 195 ft max queue anticipated in PM as worst case for NB99 detour. No detour queue back up's to roundabout at SR 99 or 70th/20th intersection to the south. See functionality section of ATC write up and Attachment B for further information.

• Please document the traffic volumes used in this analysis as we were not able to verify what the volumes are based on.

Volumes documents from RFP documents. Volumes will be provided in exhibit format derived from Appendix T-22 ICE for the intersection of Wapato Way and SR 99 in the Stage 1A project. See Attachment B for further information.

• The SR 99/70th Ave. intersection access to Fife Heights would be limited to right-in\right-out during daytime operations. This would be an impact for trips to and from that community as they would have to detour around the area. Please provide information that documents where these trips would be rerouted and what the impact would be to those users.

Made exhibit showing logical routes NB 99 left detour to Porter in which two simple detour alternate routes are available to traffic serving the fife neighborhood. Note this is shown in the MOT conceptual Appendix T-6. Impacts for Right in/ Right Out are minimal as detour routes left out of 70th would be shorter route. NB 99 taking left at Porter now as volumes fairly low (4 vph in AM peak and 33 vph in PM peak) and anticipated delay minimal in nature. Signal refinements and channelization for additional queue storage length to be assessed during final design. See Attachment D for detour routes and Functionality section of ATC write up.

• The SR 99/70th Ave. intersection access to Fife Heights appears to be closed at night. There is a stop sign indicated on the plan sheet, however the barrel configuration shows no access in or out of Fife Heights. If closed, this would be an impact for trips to and from the community. This needs to be clarified and quantified.

Stop Sign with Right Turn Only movement intended for night time concept. See revised drawings/notes in Attachment A.

• The concept seems to indicate the SR99/70th Ave. signal would be just for managing pedestrian movements. There seems to be no vehicle conflicts (aside from comment above regarding the stop sign) so the signal would be green at all times and only actuated with pedestrian calls. Please clarify.

It is intended that the pedestrian signal be operating at all times. Note placed in the plans on Attachment A drawings.

• Overall, there is an increase in delay by routing vehicles through the detour, both daytime and nighttime. This delay increase needs to be quantified. We anticipate this delay would be offset by more

efficient construction and opening to traffic sooner than the baseline concept, but no statement has been provided. WSDOT requires a specific duration that this detour would be in effect and to specify the benefits to the traveling public if this ATC were to be approved.

Schedule Benefit of estimated 11 months compared to Appendix T6 Concept. Other qualitative benefits are described in the ATC functionality write up to counterbalance minimal increase in delay to NB 99 and 70th right turn to temporary intersection. True full closure detours eliminated with night-time concept and use with Bridge 3 construction along with many other benefits bulleted out in the ATC write up.

• The ATC makes a statement that this detour "may be used to assist with Bridge 3 construction over SR 99 for the SR 167 Spur roadways." This is open-ended and it is not clear if this would be accomplished within the 6-month duration. Related to comment above, it is not clear how this ATC provides a benefit to WSDOT or the traveling public as compared to the baseline concept.

Changed language and use for 6 months duration and used for SR 99 construction, Bridge 13 construction, utilities, and piers for Bridge 3 construction. Night-time set up still applicable to Bridge 3 superstructure construction assuming the existing 70th bridge crossing over I-5 isn't removed yet. Believe the TR changes are clear now. See proposed RFP modifications and usage.

• In the Proposed RFP modifications, there appears to be a couple of typos and it needs to be clarified that the ATC proposal would utilize a single lane closure for both northbound and southbound SR 99 and then route both directions of travel through the detour during select hours as verified by the traffic analysis.

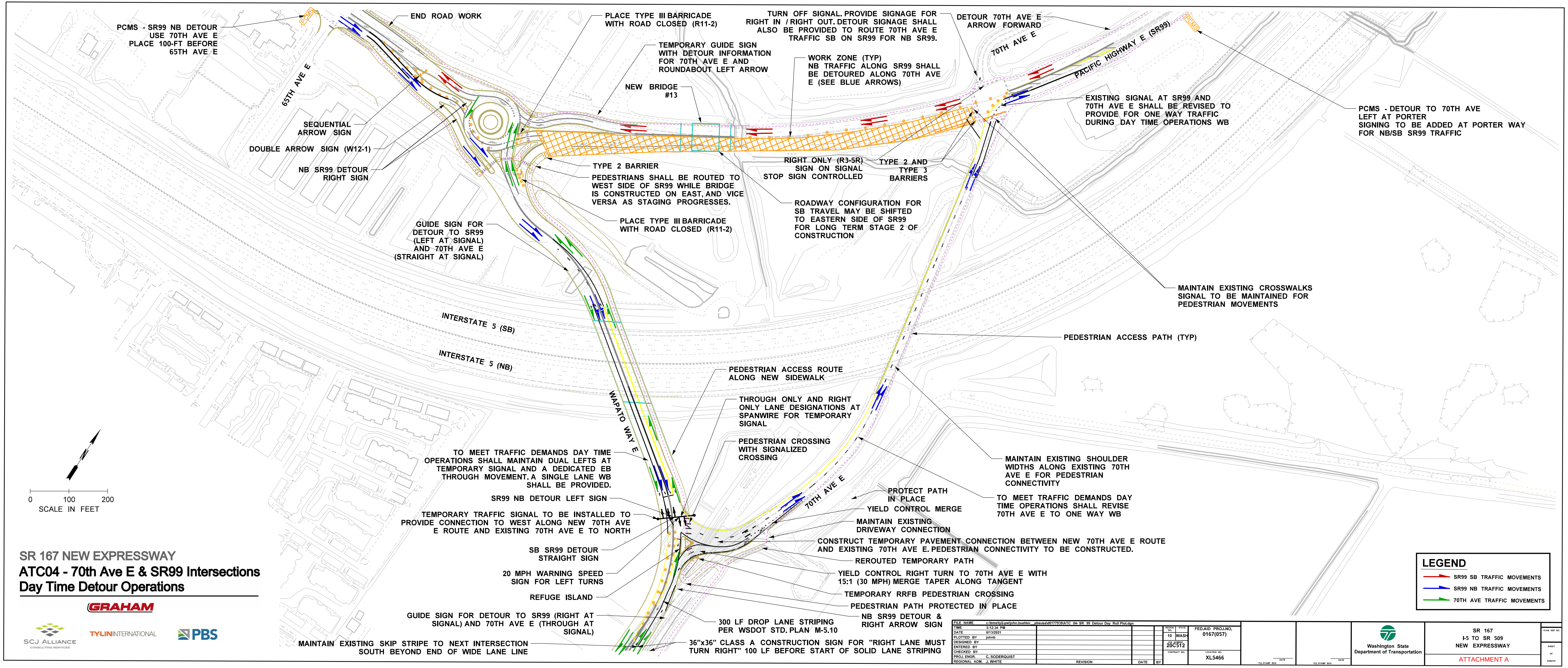
Will fix and clarify statement and define hours to night-time closure hours listed TR's. Clarified core of RFP modifications to hopefully better clarify intent of TR changes. See proposed RFP modifications.

• This ATC concept requires the northbound right lane on Wapato Way East must turn right at the proposed temporary signal location. Please clarify how this will be implemented beginning at the intersection of 20th St.\Wapato Way East.

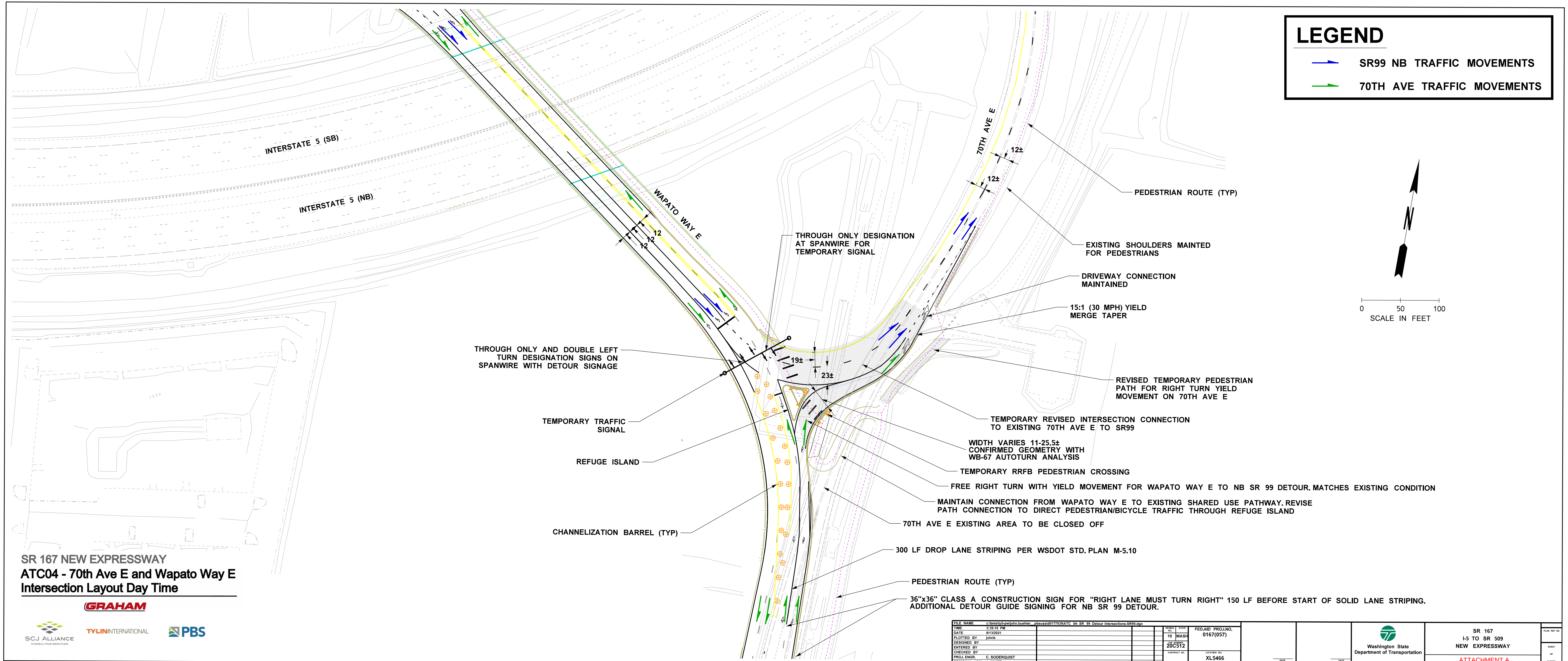
Will provide signage making this a right turn only lane and symbols showing right turn only with guidance signing for NB SR 99. Signing and pavement marking will be per MUTCD, WSDOT, and/or City of Milton Standards. Notes and line work changed in Attachment A drawings.

•This ATC includes the potential for multiple switches from one-way traffic to two-way traffic on the old 70th Avenue roadway. Extreme attention to detailed signing and channelization will be required to avoid wrong way drivers and head-on collisions, especially during night-time operations. Please make sure this is fully vetted in your safety analysis.

Hours will be restricted to night only from 9:00 PM to 5:00 AM and utilized for key activities at night only minimizing switches in traffic while optimizing construction. A TCP will be outlined to follow MUTCD Standards and signing and barrier devices will be used to clearly mark traveling public paths.



PCMS - SR99 NB DETOUR USE 70TH AVE E PLACE 100-FT BEFORE 65TH AVE E
END ROAD WORK
PLACE TYPE III BARRICADE WITH ROAD CLOSED (R11-2)
TURN OFF SIGNAL. PROVIDE SIGNAGE FOR RIGHT IN / RIGHT OUT. DETOUR SIGNAGE SHALL ALSO BE PROVIDED TO ROUTE 70TH AVE E TRAFFIC SB ON SR99 FOR NB SR99.
DETOUR 70TH AVE E ARROW FORWARD
70TH AVE E
PACIFIC HIGHWAY E (SR99)
TEMPORARY GUIDE SIGN WITH DETOUR INFORMATION FOR 70TH AVE E AND ROUNDABOUT LEFT ARROW
WORK ZONE (TYP) NB TRAFFIC ALONG SR99 SHALL BE DETOURED ALONG 70TH AVE E (SEE BLUE ARROWS)
65TH AVE E
NEW BRIDGE #13
EXISTING SIGNAL AT SR99 AND 70TH AVE E SHALL BE REVISED TO PROVIDE FOR ONE WAY TRAFFIC DURING DAY TIME OPERATIONS WB
PCMS - DETOUR TO 70TH AVE LEFT AT PORTER SIGNING TO BE ADDED AT PORTER WAY FOR NB/SB SR99 TRAFFIC
SEQUENTIAL ARROW SIGN
DOUBLE ARROW SIGN (W12-1)
NB SR99 DETOUR RIGHT SIGN
TYPE 2 BARRIER
PEDESTRIANS SHALL BE ROUTED TO WEST SIDE OF SR99 WHILE BRIDGE IS CONSTRUCTED ON EAST, AND VICE VERSA AS STAGING PROGRESSES.
RIGHT ONLY (R3-5R) SIGN ON SIGNAL STOP SIGN CONTROLLED
TYPE 2 AND TYPE 3 BARRIERS
ROADWAY CONFIGURATION FOR SB TRAVEL MAY BE SHIFTED TO EASTERN SIDE OF SR99 FOR LONG TERM STAGE 2 OF CONSTRUCTION
GUIDE SIGN FOR DETOUR TO SR99 (LEFT AT SIGNAL) AND 70TH AVE E (STRAIGHT AT SIGNAL)
PLACE TYPE III BARRICADE WITH ROAD CLOSED (R11-2)
MAINTAIN EXISTING CROSSWALKS SIGNAL TO BE MAINTAINED FOR PEDESTRIAN MOVEMENTS
INTERSTATE 5 (SB)
INTERSTATE 5 (NB)
PEDESTRIAN ACCESS PATH (TYP)
PEDESTRIAN ACCESS ROUTE ALONG NEW SIDEWALK
THROUGH ONLY AND RIGHT ONLY LANE DESIGNATIONS AT SPANWIRE FOR TEMPORARY SIGNAL
WAPATO WAY E
PEDESTRIAN CROSSING WITH SIGNALIZED CROSSING
MAINTAIN EXISTING SHOULDER WIDTHS ALONG EXISTING 70TH AVE E FOR PEDESTRIAN CONNECTIVITY
TO MEET TRAFFIC DEMANDS DAY TIME OPERATIONS SHALL MAINTAIN DUAL LEFTS AT TEMPORARY SIGNAL AND A DEDICATED EB THROUGH MOVEMENT. A SINGLE LANE WB SHALL BE PROVIDED.
70TH AVE E
PROTECT PATH IN PLACE
TO MEET TRAFFIC DEMANDS DAY TIME OPERATIONS SHALL REVISE 70TH AVE E TO ONE WAY WB
0 100 200
SCALE IN FEET
SR99 NB DETOUR LEFT SIGN
YIELD CONTROL MERGE
TEMPORARY TRAFFIC SIGNAL TO BE INSTALLED TO PROVIDE CONNECTION TO WEST ALONG NEW 70TH AVE E ROUTE AND EXISTING 70TH AVE E TO NORTH
MAINTAIN EXISTING DRIVEWAY CONNECTION
CONSTRUCT TEMPORARY PAVEMENT CONNECTION BETWEEN NEW 70TH AVE E ROUTE AND EXISTING 70TH AVE E. PEDESTRIAN CONNECTIVITY TO BE CONSTRUCTED.
SB SR99 DETOUR STRAIGHT SIGN
REROUTED TEMPORARY PATH
20 MPH WARNING SPEED SIGN FOR LEFT TURNS
YIELD CONTROL RIGHT TURN TO 70TH AVE E WITH 15:1 (30 MPH) MERGE TAPER ALONG TANGENT
REFUGE ISLAND
TEMPORARY RRFB PEDESTRIAN CROSSING
PEDESTRIAN PATH PROTECTED IN PLACE
GUIDE SIGN FOR DETOUR TO SR99 (RIGHT AT SIGNAL) AND 70TH AVE E (THROUGH AT SIGNAL)
300 LF DROP LANE STRIPING PER WSDOT STD. PLAN M-5.10
NB SR99 DETOUR & RIGHT ARROW SIGN
MAINTAIN EXISTING SKIP STRIPE TO NEXT INTERSECTION SOUTH BEYOND END OF WIDE LANE LINE
36"x36" CLASS A CONSTRUCTION SIGN FOR "RIGHT LANE MUST TURN RIGHT" 100 LF BEFORE START OF SOLID LANE STRIPING
SR 167 NEW EXPRESSWAY
ATC04 - 70th Ave E & SR99 Intersections
Day Time Detour Operations
GRAHAM
SCJ ALLIANCE CONSULTING SERVICES
TYLININTERNATIONAL
PBS
LEGEND
SR99 SB TRAFFIC MOVEMENTS
SR99 NB TRAFFIC MOVEMENTS
70TH AVE TRAFFIC MOVEMENTS
FED.AID PROJ.NO. 0167(057)
10 WASH
20C512
XL5466
C. SODERQUIST
J. WHITE
REVISION
DATE
BY
Washington State Department of Transportation
SR 167
I-5 TO SR 509
NEW EXPRESSWAY
ATTACHMENT A


LEGEND
SR99 NB TRAFFIC MOVEMENTS
70TH AVE TRAFFIC MOVEMENTS
INTERSTATE 5 (SB)
INTERSTATE 5 (NB)
WAPATO WAY E
70TH AVE E
12
12±
19±
23±
PEDESTRIAN ROUTE (TYP)
EXISTING SHOULDERS MAINTED FOR PEDESTRIANS
THROUGH ONLY DESIGNATION AT SPANWIRE FOR TEMPORARY SIGNAL
DRIVEWAY CONNECTION MAINTAINED
15:1 (30 MPH) YIELD MERGE TAPER
THROUGH ONLY AND DOUBLE LEFT TURN DESIGNATION SIGNS ON SPANWIRE WITH DETOUR SIGNAGE
REVISED TEMPORARY PEDESTRIAN PATH FOR RIGHT TURN YIELD MOVEMENT ON 70TH AVE E
TEMPORARY TRAFFIC SIGNAL
TEMPORARY REVISED INTERSECTION CONNECTION TO EXISTING 70TH AVE E TO SR99
WIDTH VARIES 11-25.5± CONFIRMED GEOMETRY WITH WB-67 AUTOTURN ANALYSIS
REFUGE ISLAND
TEMPORARY RRFB PEDESTRIAN CROSSING
FREE RIGHT TURN WITH YIELD MOVEMENT FOR WAPATO WAY E TO NB SR 99 DETOUR. MATCHES EXISTING CONDITION
MAINTAIN CONNECTION FROM WAPATO WAY E TO EXISTING SHARED USE PATHWAY. REVISE PATH CONNECTION TO DIRECT PEDESTRIAN/BICYCLE TRAFFIC THROUGH REFUGE ISLAND
70TH AVE E EXISTING AREA TO BE CLOSED OFF
CHANNELIZATION BARREL (TYP)
300 LF DROP LANE STRIPING PER WSDOT STD. PLAN M-5.10
PEDESTRIAN ROUTE (TYP)
36"x36" CLASS A CONSTRUCTION SIGN FOR "RIGHT LANE MUST TURN RIGHT" 150 LF BEFORE START OF SOLID LANE STRIPING.
ADDITIONAL DETOUR GUIDE SIGNING FOR NB SR 99 DETOUR.
N
0 50 100
SCALE IN FEET

SR 167 NEW EXPRESSWAY

ATC04 - 70th Ave E and Wapato Way E Intersection Layout Day Time

GRAHAM

SCJ ALLIANCE CONSULTING SERVICES · TYLININTERNATIONAL · PBS

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DESIGNED BY				
ENTERED BY				
CHECKED BY				
PROJ. ENGR.	C. SODERQUIST			
REGIONAL ADM.	J. WHITE	REVISION	DATE	BY

REGION NO. 10 · STATE WASH · FED.AID PROJ.NO. 0167(057) · JOB NUMBER 20C512 · CONTRACT NO. · LOCATION NO. XL5466

P.E. STAMP BOX · DATE · P.E. STAMP BOX · DATE

Washington State Department of Transportation

SR 167
I-5 TO SR 509
NEW EXPRESSWAY

ATTACHMENT A

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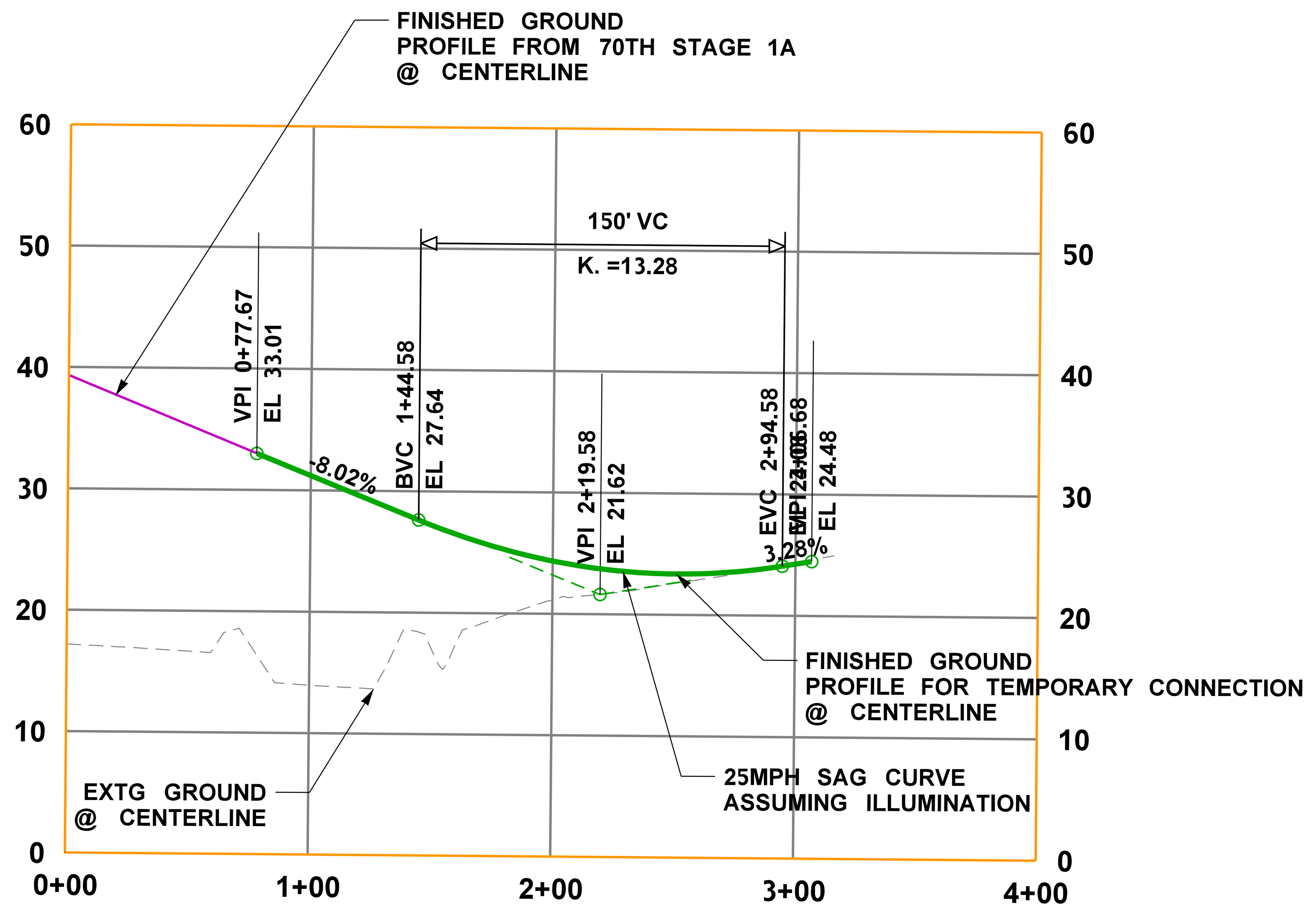
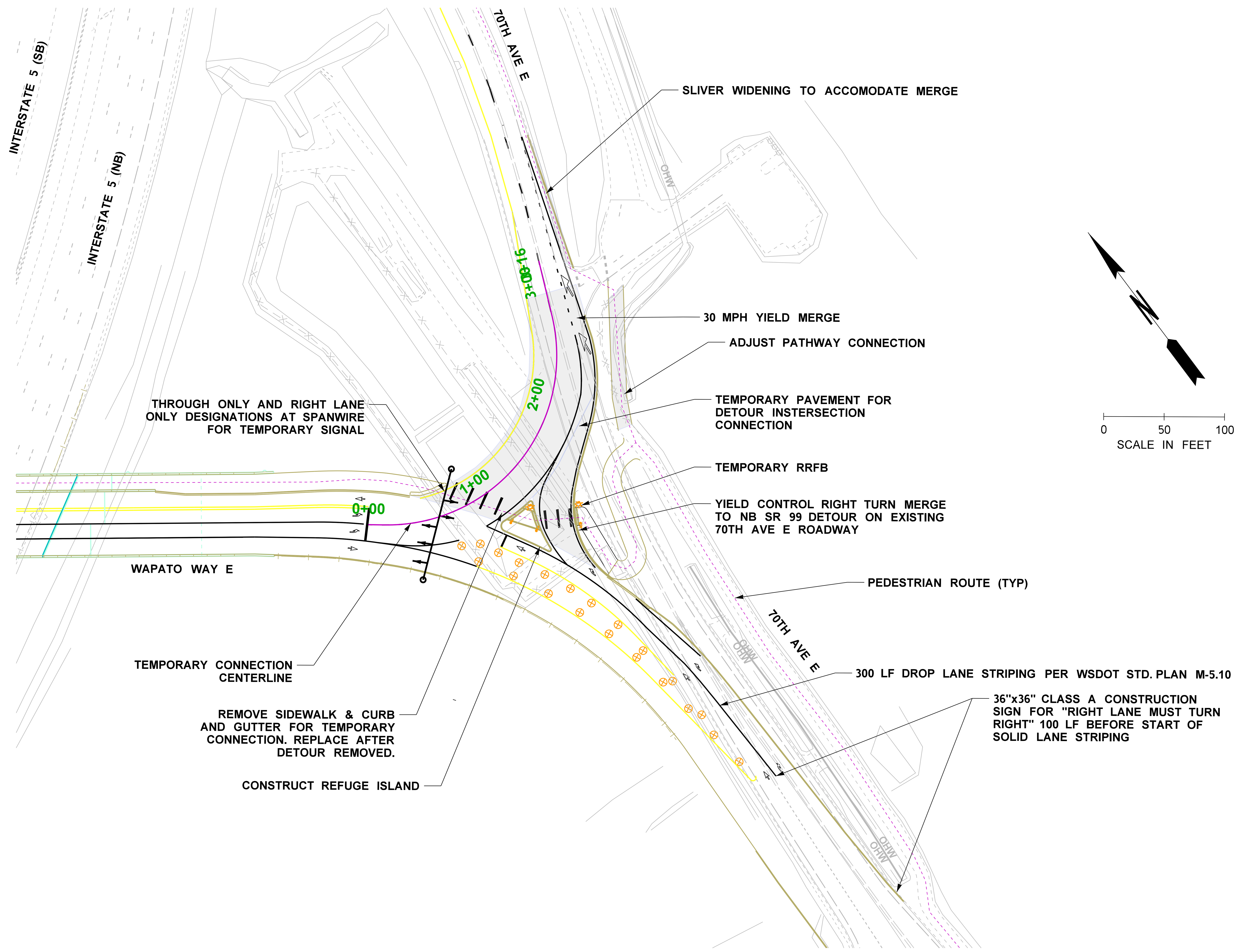

FINISHED GROUND PROFILE FROM 70TH STAGE 1A @ CENTERLINE
150' VC
K. =13.28
VPI 0+77.67 EL 33.01
-8.02%
BVC 1+44.58 EL 27.64
VPI 2+19.58 EL 21.62
EVC 2+94.58
3.28%
FINISHED GROUND PROFILE FOR TEMPORARY CONNECTION @ CENTERLINE
25MPH SAG CURVE ASSUMING ILLUMINATION
EXTG GROUND @ CENTERLINE
0+00
1+00
2+00
3+00
4+00
0 10 20 VERT
0 50 100 HORZ
SCALE IN FEET


INTERSTATE 5 (SB)
INTERSTATE 5 (NB)
70TH AVE E
SLIVER WIDENING TO ACCOMODATE MERGE
30 MPH YIELD MERGE
ADJUST PATHWAY CONNECTION
TEMPORARY PAVEMENT FOR DETOUR INTERSECTION CONNECTION
TEMPORARY RRFB
YIELD CONTROL RIGHT TURN MERGE TO NB SR 99 DETOUR ON EXISTING 70TH AVE E ROADWAY
PEDESTRIAN ROUTE (TYP)
300 LF DROP LANE STRIPING PER WSDOT STD. PLAN M-5.10
36"x36" CLASS A CONSTRUCTION SIGN FOR "RIGHT LANE MUST TURN RIGHT" 100 LF BEFORE START OF SOLID LANE STRIPING
THROUGH ONLY AND RIGHT LANE ONLY DESIGNATIONS AT SPANWIRE FOR TEMPORARY SIGNAL
WAPATO WAY E
TEMPORARY CONNECTION CENTERLINE
REMOVE SIDEWALK & CURB AND GUTTER FOR TEMPORARY CONNECTION. REPLACE AFTER DETOUR REMOVED.
CONSTRUCT REFUGE ISLAND
0+00
1+00
2+00
OHW
0 50 100
SCALE IN FEET

SR 167 NEW EXPRESSWAY

ATC04 - 70th Ave E and Wapato Way E Temporary Connection Plan / Profile

GRAHAM

SCJ ALLIANCE CONSULTING SERVICES

TYLININTERNATIONAL

PBS

FILE NAME	c:\bms\tyli-pw\john.buehler__pbsusa\d0177939\ATC 04- SR 99 Detour Temp Connection.dgn						
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DATE	8/13/2021						
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DESIGNED BY							
ENTERED BY					CONTRACT NO.		LOCATION NO. XL5466
CHECKED BY							
PROJ. ENGR.	C. SODERQUIST						
REGIONAL ADM.	J. WHITE	REVISION	DATE	BY			

P.E. STAMP BOX DATE

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Washington State Department of Transportation

SR 167
I-5 TO SR 509
NEW EXPRESSWAY

ATTACHMENT A

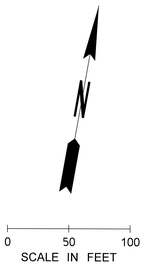
PLAN REF NO

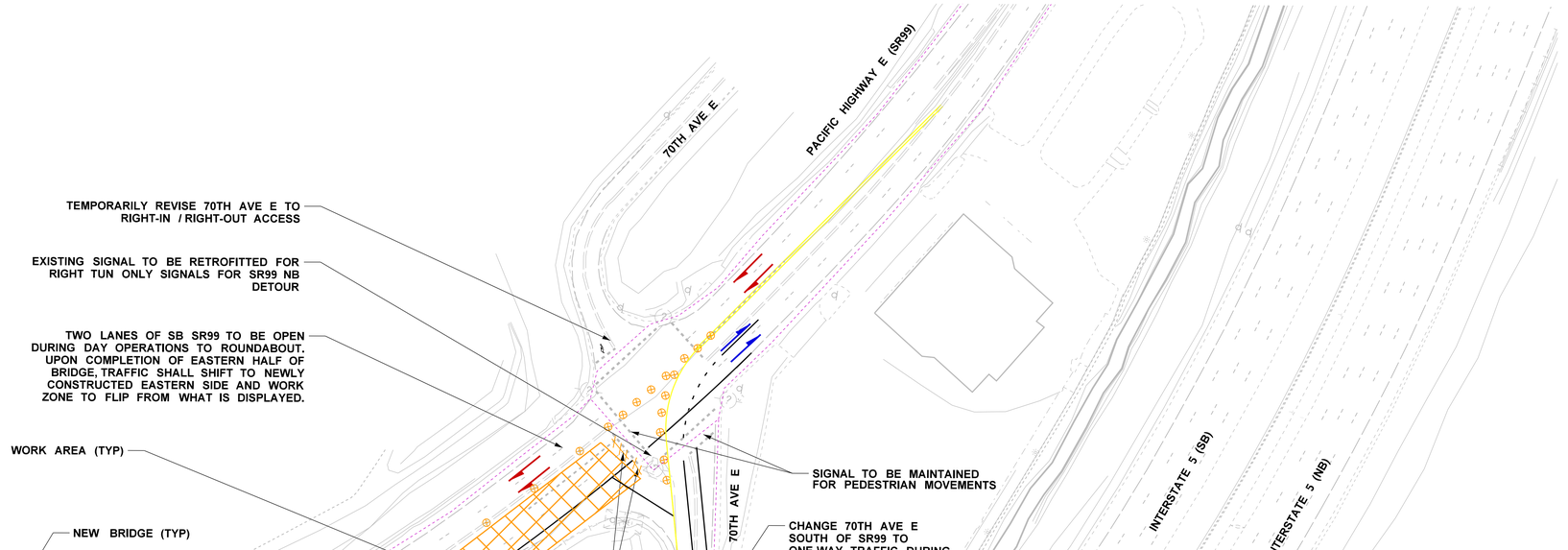
SHEET OF SHEETS

LEGEND

SB TRAFFIC MOVEMENTS

NB TRAFFIC MOVEMENTS





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SB 99 to Wapato Way - 70th/SR99 Intersection to South of ATC 04 Temp Intersection	-5	-17
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Wapato Way to SB 99 - ATC 04 Temp Intersection to South of Phase 1A Roundabout	6	-11

Note - Negative Values are a decrease in delay to existing condition

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Movement	ATC 04 AM Queue - 95th (LF)	ATC 04 PM Queue - 95th (LF)	Distance to Closest Intersection
NB 99	118	168	1020
Wapato Way to NB 99	15	15	785
Wapato Way to SB 99	26	37	785

Summary AM Peak Comparison - Using 2030 Turn Volumes per ICE in Appendix T22

Movement	ATC 04 Phase 1A Roundabout - Ave of High and Low Slip Lane Use (Sec)	ATC 04 Temp Intersection (Sec)	ATC 04 Roadwday Detour Travel (Sec)	Total ATC 04 (Sec)	Existing Phase 1A Roundabout (Sec)	Roadwday Detour Travel for Appendix T6 (Sec)	Total for Appendix T-6 (Sec)
NB 99	3.9	6.1	63.6	73.6	5.4	43.2	48.6
SB 99	4.4	0	35.5	39.9	5.3	38.6	43.9
NB 99 to Wapato Way	3.9	0	36.1	40.0	5.5	36.1	41.6
SB 99 to Wapato Way	10.2	0	54.5	64.7	11.5	58.0	69.5
Wapato Way to NB 99	0	4.1	36.4	40.5	4.1	64.1	68.2
Wapato Way to SB 99	10.2	8.2	36.1	54.5	12	36.1	48.1

Summary PM Peak Comparison - Using 2030 Turn Volumes per ICE in Appendix T22

Movement	ATC 04 Phase 1A Roundabout - Ave of High and Low Slip Lane Use (Sec)	ATC 04 Temp Intersection (Sec)	ATC 04 Roadwday Detour Travel (Sec)	Total ATC 04 (Sec)	Existing Phase 1A Roundabout (Sec)	Roadwday Detour Travel for Appendix T6 (Sec)	Total for Appendix T-6 (Sec)
NB 99	7.9	9.8	63.6	81.3	14.7	43.2	57.9
SB 99	5	0	35.5	40.5	6.6	38.6	45.2
NB 99 to Wapato Way	7.9	1.2	36.1	45.2	15.4	36.1	51.5
SB 99 to Wapato Way	11	1.2	54.5	66.7	13.2	58.0	71.2
Wapato Way to NB 99	0	3.9	36.4	40.3	3.9	64.1	68.0
Wapato Way to SB 99	9.9	8.9	36.1	54.9	11.3	36.1	47.4

See SIDRA and SYNCHRO Analysis Data for Additional Information

Appendix T22 ICE 2030 Turn Volume Information

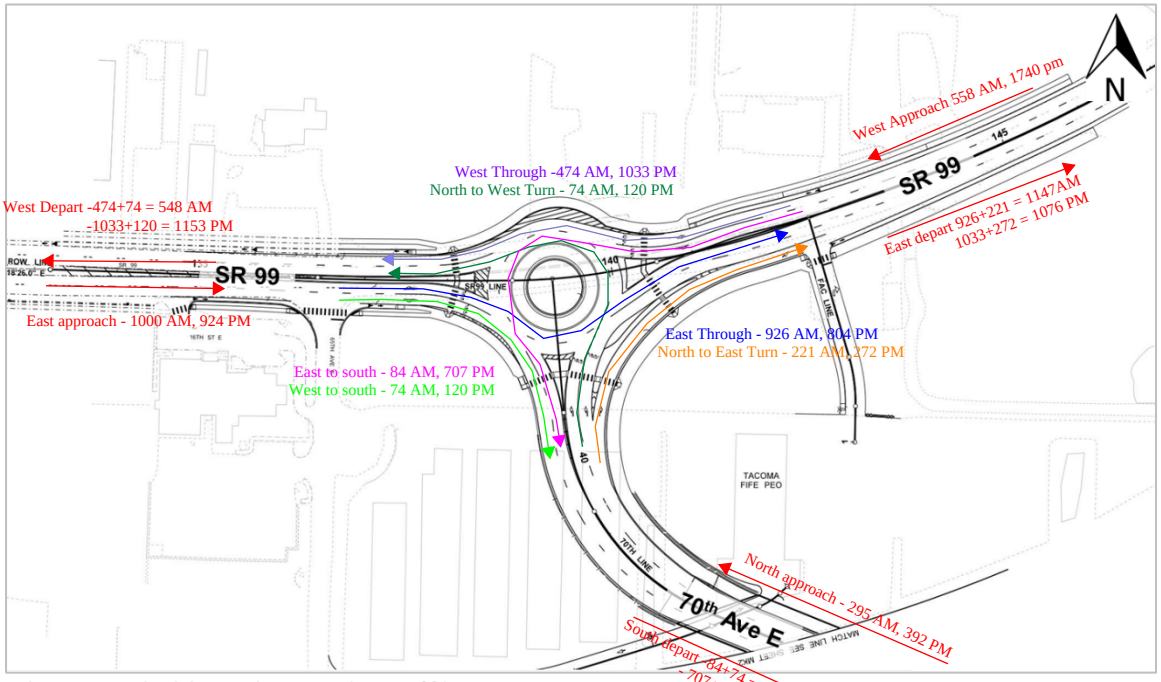


FIGURE 1 PROPOSED ROUNDABOUT LAYOUT

MOVEMENT SUMMARY

Site: F6-6 [SR 99 /70th Ave E - 2030 Build AM]

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: 70th Ave E											
3	L2	74	29.0	0.114	12.0	LOS A	0.4	11.8	0.55	0.82	28.7
18	R2	221	11.0	0.140	4.1	LOS A	0.5	14.6	0.36	0.53	32.3
Approach		295	15.5	0.140	6.1	LOS A	0.5	14.6	0.41	0.61	31.4
East: SR 99											
1	L2	84	6.0	0.242	11.5	LOS A	1.1	28.4	0.24	0.52	35.4
6	T1	474	5.0	0.242	5.3	LOS A	1.1	28.4	0.24	0.47	36.7
Approach		558	5.2	0.242	6.2	LOS A	1.1	28.4	0.24	0.48	36.4
West: SR 99											
2	T1	926	5.0	0.402	5.4	LOS A	2.1	56.2	0.26	0.45	36.9
12	R2	74	16.0	0.402	5.5	LOS A	2.1	56.2	0.26	0.45	32.9
Approach		1000	5.8	0.402	5.4	LOS A	2.1	56.2	0.26	0.45	36.5
All Vehicles		1853	7.2	0.402	5.7	LOS A	2.1	56.2	0.28	0.48	35.3

Site: F6-6 [SR 99 /70th Ave E - 2030 Build PM]

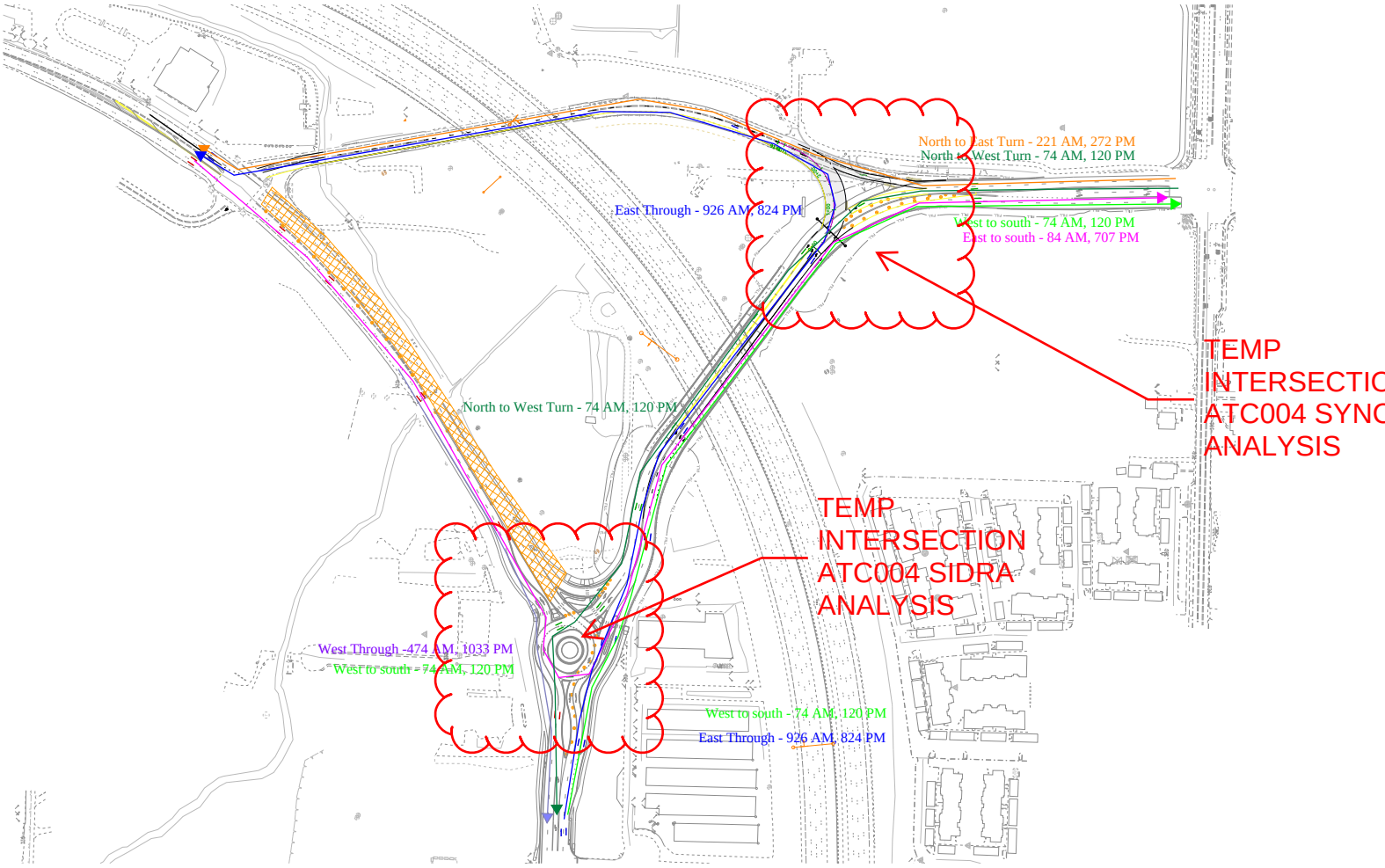
New Site
Roundabout

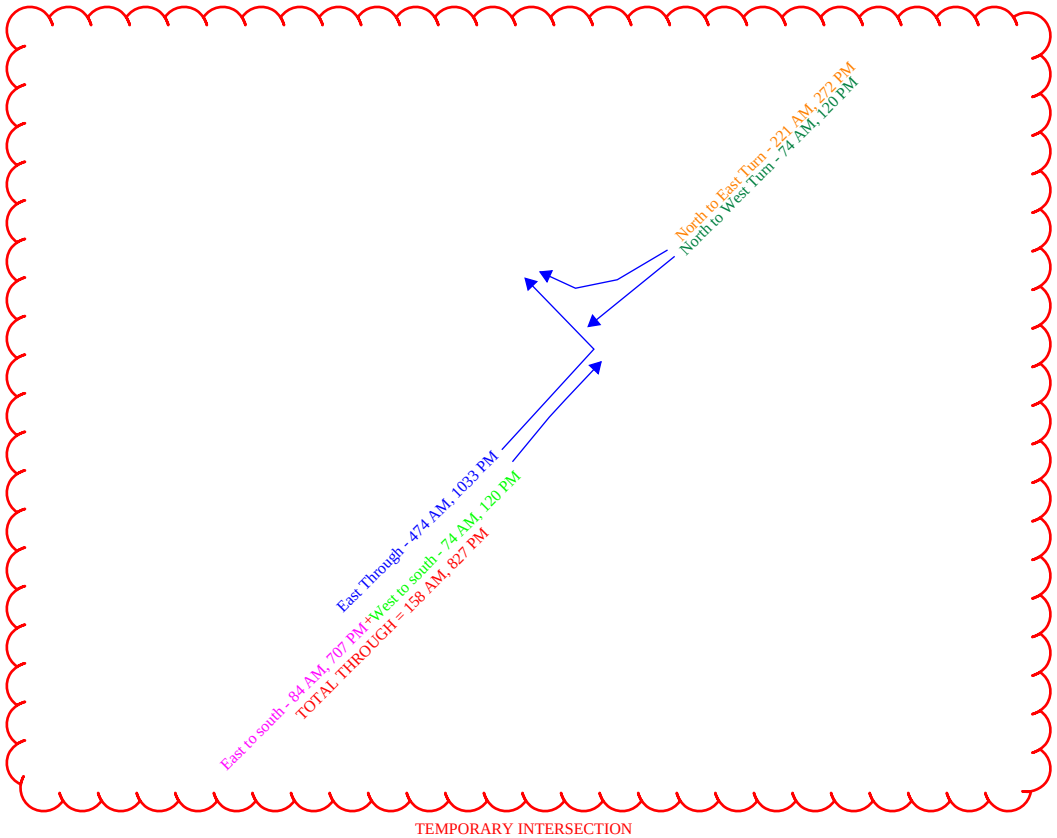
Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: 70th Ave E											
3	L2	120	20.0	0.181	11.3	LOS A	0.9	23.5	0.63	0.81	29.2
18	R2	272	7.0	0.181	3.9	LOS A	0.9	23.5	0.41	0.51	32.2
Approach		391	11.0	0.181	6.1	LOS A	0.9	23.5	0.48	0.60	31.3
East: SR 99											
1	L2	707	9.0	0.798	13.2	LOS A	8.5	225.8	0.65	0.68	32.6
6	T1	1033	5.0	0.798	6.6	LOS A	8.5	225.8	0.63	0.59	34.4
Approach		1739	6.6	0.798	9.3	LOS A	8.5	225.8	0.64	0.62	33.4
West: SR 99											
2	T1	804	5.0	0.691	14.7	LOS A	7.0	188.8	0.93	1.09	30.1
12	R2	120	21.0	0.691	15.4	LOS A	7.0	188.8	0.94	1.10	28.4
Approach		924	7.1	0.691	14.8	LOS B	7.0	188.8	0.94	1.09	29.8
All Vehicles		3054	7.3	0.798	10.5	LOS B	8.5	225.8	0.71	0.76	32.1

APPENDIX B - TEMPORARY TRAFFIC ANALYSIS

Appendix T22 Volumes Redistributed for ATC 04 Temporary Intersection





TEMPORARY INTERSECTION

MOVEMENT SUMMARY

Site: F6-6 [SR 99 /70th Ave E - 2030 Build AM]

New Site
Roundabout

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: 70th Ave E											
3	L2	74	29.0	0.114	12.0	LOS A	0.4	11.8	0.55	0.82	28.7
18	R2	221	11.0	0.140	4.1	LOS A	0.5	14.6	0.36	0.53	32.3
Approach		295	15.5	0.140	6.1	LOS A	0.5	14.6	0.41	0.61	31.4
East: SR 99											
1	L2	84	6.0	0.242	11.5	LOS A	1.1	28.4	0.24	0.52	35.4
6	T1	474	5.0	0.242	5.3	LOS A	1.1	28.4	0.24	0.47	36.7
Approach		558	5.2	0.242	6.2	LOS A	1.1	28.4	0.24	0.48	36.4
West: SR 99											
2	T1	926	5.0	0.402	5.4	LOS A	2.1	56.2	0.26	0.45	36.9
12	R2	74	16.0	0.402	5.5	LOS A	2.1	56.2	0.26	0.45	32.9
Approach		1000	5.8	0.402	5.4	LOS A	2.1	56.2	0.26	0.45	36.5
All Vehicles		1853	7.2	0.402	5.7	LOS A	2.1	56.2	0.28	0.48	35.3

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: WSP (PREVIOUSLY PARSONS BRINCKERHOFF) | Processed: Tuesday, January 15, 2019 10:11:15 AM
Project: J:\160329S_Y11918_SR_167_GEC\3.0 TASK ORDERS\BG Traffic Analysis\ICE\4-SR99_70thAveE\SR99_70thAveE v3.sip7

MOVEMENT SUMMARY

Site: F6-6 [SR 99 /70th Ave E - 2030 Build PM]

New Site
Roundabout

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: 70th Ave E											
3	L2	120	20.0	0.181	11.3	LOS A	0.9	23.5	0.63	0.81	29.2
18	R2	272	7.0	0.181	3.9	LOS A	0.9	23.5	0.41	0.51	32.2
Approach		391	11.0	0.181	6.1	LOS A	0.9	23.5	0.48	0.60	31.3
East: SR 99											
1	L2	707	9.0	0.798	13.2	LOS A	8.5	225.8	0.65	0.68	32.6
6	T1	1033	5.0	0.798	6.6	LOS A	8.5	225.8	0.63	0.59	34.4
Approach		1739	6.6	0.798	9.3	LOS A	8.5	225.8	0.64	0.62	33.4
West: SR 99											
2	T1	804	5.0	0.691	14.7	LOS A	7.0	188.8	0.93	1.09	30.1
12	R2	120	21.0	0.691	15.4	LOS A	7.0	188.8	0.94	1.10	28.4
Approach		924	7.1	0.691	14.8	LOS B	7.0	188.8	0.94	1.09	29.8
All Vehicles		3054	7.3	0.798	10.5	LOS B	8.5	225.8	0.71	0.76	32.1

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: WSP (PREVIOUSLY PARSONS BRINCKERHOFF) | Processed: Tuesday, January 15, 2019 10:11:16 AM
Project: J:\160329S_Y11918_SR_167_GEC\3.0 TASK ORDERS\BG Traffic Analysis\ICE\4-SR99_70thAveE\SR99_70thAveE v3.sip7

MOVEMENT SUMMARY

Site: 1 [2030 AM Peak Hour - High Slip Lane Utilization (Site Folder: General)]

ATC 04 - 2030 - High Slip Lane Utilization

MOT Analysis

Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: NB 70th Ave E														
3	L2	74	29.0	74	29.0	0.032	10.2	LOS B	0.0	0.0	0.00	0.64	0.00	34.2
Approach		74	29.0	74	29.0	0.032	10.2	LOS B	0.0	0.0	0.00	0.64	0.00	34.2
East: WB SR 99														
1	L2	84	6.0	84	6.0	0.209	10.2	LOS B	0.8	21.3	0.20	0.50	0.20	36.5
6	T1	474	5.0	474	5.0	0.209	4.4	LOS A	0.8	21.3	0.19	0.44	0.19	37.0
Approach		558	5.2	558	5.2	0.209	5.3	LOS A	0.8	21.3	0.19	0.45	0.19	37.0
West: EB SR 99														
12	R2	1000	5.0	1000	5.0	0.437	3.8	LOS A	1.0	25.4	0.06	0.44	0.06	36.9
Approach		1000	5.0	1000	5.0	0.437	3.8	LOS A	1.0	25.4	0.06	0.44	0.06	36.9
All Vehicles		1632	6.1	1632	6.1	0.437	4.6	LOS A	1.0	25.4	0.10	0.45	0.10	36.8

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1 [2030 PM Peak Hour - High Slip Lane Utilization (Site Folder: General)]

ATC 04 - 2030 - High Slip Lane Utilization

MOT Analysis

Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: NB 70th Ave E														
3	L2	120	9.0	120	9.0	0.044	9.9	LOS A	0.0	0.0	0.00	0.66	0.00	34.9
Approach		120	9.0	120	9.0	0.044	9.9	LOS A	0.0	0.0	0.00	0.66	0.00	34.9
East: WB SR 99														
1	L2	707	9.0	707	9.0	0.679	11.0	LOS B	5.1	136.1	0.45	0.64	0.45	34.2
6	T1	1033	5.0	1033	5.0	0.679	5.0	LOS A	5.1	136.1	0.42	0.48	0.42	36.3
Approach		1740	6.6	1740	6.6	0.679	7.4	LOS A	5.1	136.1	0.43	0.54	0.43	35.4
West: EB SR 99														
12	R2	924	5.0	924	5.0	0.376	5.1	LOS A	2.5	66.0	0.27	0.57	0.27	36.3
Approach		924	5.0	924	5.0	0.376	5.1	LOS A	2.5	66.0	0.27	0.57	0.27	36.3
All Vehicles		2784	6.2	2784	6.2	0.679	6.8	LOS A	5.1	136.1	0.36	0.56	0.36	35.6

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1 [2030 AM Peak Hour - Low Slip Lane Utilization (Site Folder: General)]

ATC 04 - 2030 - Low Slip Lane Utilization

MOT Analysis

Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: NB 70th Ave E														
3	L2	74	29.0	74	29.0	0.032	10.2	LOS B	0.0	0.0	0.00	0.64	0.00	34.2
Approach		74	29.0	74	29.0	0.032	10.2	LOS B	0.0	0.0	0.00	0.64	0.00	34.2
East: WB SR 99														
1	L2	84	6.0	84	6.0	0.209	10.2	LOS B	0.8	21.3	0.20	0.50	0.20	36.5
6	T1	474	5.0	474	5.0	0.209	4.4	LOS A	0.8	21.3	0.19	0.44	0.19	37.0
Approach		558	5.2	558	5.2	0.209	5.3	LOS A	0.8	21.3	0.19	0.45	0.19	37.0
West: EB SR 99														
12	R2	1000	5.0	1000	5.0	0.459	3.9	LOS A	2.7	71.0	0.17	0.45	0.17	36.7
Approach		1000	5.0	1000	5.0	0.459	3.9	LOS A	2.7	71.0	0.17	0.45	0.17	36.7
All Vehicles		1632	6.1	1632	6.1	0.459	4.7	LOS A	2.7	71.0	0.17	0.46	0.17	36.7

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1 [2030 PM Peak Hour - Low Slip Lane Utilization (Site Folder: General)]

ATC 04 - 2030 - Low Slip Lane Utilization

MOT Analysis

Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: NB 70th Ave E														
3	L2	120	9.0	120	9.0	0.044	9.9	LOS A	0.0	0.0	0.00	0.66	0.00	34.9
Approach		120	9.0	120	9.0	0.044	9.9	LOS A	0.0	0.0	0.00	0.66	0.00	34.9
East: WB SR 99														
1	L2	707	9.0	707	9.0	0.679	11.0	LOS B	5.1	135.9	0.45	0.64	0.45	34.2
6	T1	1033	5.0	1033	5.0	0.679	5.0	LOS A	5.1	135.9	0.42	0.48	0.42	36.3
Approach		1740	6.6	1740	6.6	0.679	7.4	LOS A	5.1	135.9	0.43	0.54	0.43	35.4
West: EB SR 99														
12	R2	924	5.0	924	5.0	0.738	10.7	LOS B	9.2	240.1	0.65	0.92	0.97	33.3
Approach		924	5.0	924	5.0	0.738	10.7	LOS B	9.2	240.1	0.65	0.92	0.97	33.3
All Vehicles		2784	6.2	2784	6.2	0.738	8.6	LOS A	9.2	240.1	0.49	0.67	0.59	34.6

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

WB WAPATO TO SB 99

WB WAPATO TO NB 99

NB 99

EB WAPATO

Lanes, Volumes, Timings 3:

08/16/2021

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	74	221	926	158
Future Volume (vph)	0	0	74	221	926	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	600	
Storage Lanes	0	0		1	1	
Taper Length (ft)	25				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	1.00
Frt				0.850		
Flt Protected					0.950	
Satd. Flow (prot)	0	0	1473	1455	3335	1681
Flt Permitted					0.950	
Satd. Flow (perm)	0	0	1473	1455	3335	1681
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)				240		
Link Speed (mph)	30		30			30
Link Distance (ft)	528		656			1464
Travel Time (s)	12.0		14.9			33.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	29%	11%	5%	13%
Adj. Flow (vph)	0	0	80	240	1007	172
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	80	240	1007	172
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	R NA	Left	Left
Median Width(ft)	0		24			24
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors			1	1	1	1
Detector Template						
Leading Detector (ft)			45	45	45	45
Trailing Detector (ft)			-5	-5	-5	-5
Detector 1 Position(ft)			-5	-5	-5	-5
Detector 1 Size(ft)			50	50	50	50
Detector 1 Type			Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)			0.0	0.0	0.0	0.0
Detector 1 Queue (s)			0.0	0.0	0.0	0.0
Detector 1 Delay (s)			0.0	0.0	0.0	0.0
Turn Type			NA	Free	Prot	NA
Protected Phases			6		5	2
Permitted Phases				Free		
Detector Phase			6		5	2
Switch Phase						
Minimum Initial (s)			5.0		5.0	5.0
Minimum Split (s)			23.0		10.0	23.0

ATTACHMENT B - TEMP SIGNAL SYNCHRO ANALYSIS

WB WAPATO TO SB 99

WB WAPATO TO NB 99

NB 99

EB WAPATO

Lanes, Volumes, Timings 3:

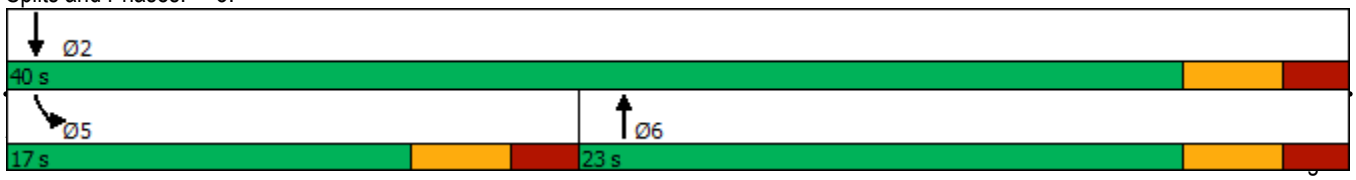
08/16/2021

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Total Split (s)			23.0		17.0	40.0
Total Split (%)			57.5%		42.5%	100.0%
Maximum Green (s)			18.0		12.0	35.0
Yellow Time (s)			3.0		3.0	3.0
All-Red Time (s)			2.0		2.0	2.0
Lost Time Adjust (s)			0.0		0.0	0.0
Total Lost Time (s)			5.0		5.0	5.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)			3.0		3.0	3.0
Recall Mode			None		None	None
Walk Time (s)			7.0			7.0
Flash Dont Walk (s)			11.0			11.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)			7.2	22.4	17.0	22.4
Actuated g/C Ratio			0.32	1.00	0.76	1.00
v/c Ratio			0.17	0.16	0.40	0.10
Control Delay			8.2	0.2	6.1	0.1
Queue Delay			0.0	0.0	0.0	0.0
Total Delay			8.2	0.2	6.1	0.1
LOS			A	A	A	A
Approach Delay			2.2			5.2
Approach LOS			A			A
Queue Length 50th (ft)			3	0	0	0
Queue Length 95th (ft)			26	0	#118	0
Internal Link Dist (ft)	448		576			1384
Turn Bay Length (ft)					600	
Base Capacity (vph)			1231	1455	2526	1681
Starvation Cap Reductn			0	0	0	0
Spillback Cap Reductn			0	0	0	0
Storage Cap Reductn			0	0	0	0
Reduced v/c Ratio			0.06	0.16	0.40	0.10

Intersection Summary			
Area Type:	Other		
Cycle Length: 40			
Actuated Cycle Length: 22.4			
Natural Cycle: 45			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.40			
Intersection Signal Delay: 4.6		Intersection LOS: A	
Intersection Capacity Utilization 37.3%		ICU Level of Service A	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3:



WB WAPATO TO SB 99

WB WAPATO TO NB 99

NB 99

EB WAPATO

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	74	221	926	158
Future Volume (veh/h)	0	0	74	221	926	158
Number			6	16	5	2
Initial Q (Qb), veh			0	0	0	0
Ped-Bike Adj(A_pbT)				1.00	1.00	
Parking Bus, Adj			1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln			1473	1712	1810	1681
Adj Flow Rate, veh/h			80	0	1007	172
Adj No. of Lanes			1	1	2	1
Peak Hour Factor			0.92	0.92	0.92	0.92
Percent Heavy Veh, %			29	11	5	13
Cap, veh/h			249	246	1387	1332
Arrive On Green			0.17	0.00	0.41	0.79
Sat Flow, veh/h			1473	1455	3343	1681
Grp Volume(v), veh/h			80	0	1007	172
Grp Sat Flow(s),veh/h/ln			1473	1455	1672	1681
Q Serve(g_s), s			1.1	0.0	6.1	0.6
Cycle Q Clear(g_c), s			1.1	0.0	6.1	0.6
Prop In Lane				1.00	1.00	
Lane Grp Cap(c), veh/h			249	246	1387	1332
V/C Ratio(X)			0.32	0.00	0.73	0.13
Avail Cap(c_a), veh/h			1102	1089	1668	2447
HCM Platoon Ratio			1.00	1.00	1.00	1.00
Upstream Filter(I)			1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh			8.8	0.0	5.9	0.6
Incr Delay (d2), s/veh			0.7	0.0	1.3	0.0
Initial Q Delay(d3),s/veh			0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln			0.5	0.0	2.9	0.3
LnGrp Delay(d),s/veh			9.5	0.0	7.2	0.6
LnGrp LOS			A		A	A
Approach Vol, veh/h			80			1179
Approach Delay, s/veh			9.5			6.2
Approach LOS			A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		
Phs Duration (G+Y+Rc), s		24.0			15.0	9.1		
Change Period (Y+Rc), s		5.0			5.0	5.0		
Max Green Setting (Gmax), s		35.0			12.0	18.0		
Max Q Clear Time (g_c+I1), s		2.6			8.1	3.1		
Green Ext Time (p_c), s		0.6			1.9	0.2		

Intersection Summary	
HCM 2010 Ctrl Delay	6.4
HCM 2010 LOS	A

ATTACHMENT B - TEMP SIGNAL SYNCHRO ANALYSIS

WB WAPATO TO SB 99

WB WAPATO TO NB 99

NB 99

EB WAPATO

Lanes, Volumes, Timings
3:

08/16/2021

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	120	272	804	827
Future Volume (vph)	0	0	120	272	804	827
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	600	
Storage Lanes	0	0		1	1	
Taper Length (ft)	25				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	1.00
Frt				0.850		
Flt Protected					0.950	
Satd. Flow (prot)	0	0	1583	1509	3335	1712
Flt Permitted					0.950	
Satd. Flow (perm)	0	0	1583	1509	3335	1712
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)				296		
Link Speed (mph)	30		30			30
Link Distance (ft)	528		656			1029
Travel Time (s)	12.0		14.9			23.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	20%	7%	5%	11%
Adj. Flow (vph)	0	0	130	296	874	899
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	130	296	874	899
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	R NA	Left	Left
Median Width(ft)	0		24			24
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors			1	1	1	1
Detector Template						
Leading Detector (ft)			45	45	45	45
Trailing Detector (ft)			-5	-5	-5	-5
Detector 1 Position(ft)			-5	-5	-5	-5
Detector 1 Size(ft)			50	50	50	50
Detector 1 Type			Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)			0.0	0.0	0.0	0.0
Detector 1 Queue (s)			0.0	0.0	0.0	0.0
Detector 1 Delay (s)			0.0	0.0	0.0	0.0
Turn Type			NA	Free	Prot	NA
Protected Phases			6		5	2
Permitted Phases				Free		
Detector Phase			6		5	2
Switch Phase						
Minimum Initial (s)			5.0		5.0	5.0
Minimum Split (s)			23.0		10.0	23.0

ATTACHMENT B - TEMP SIGNAL SYNCHRO ANALYSIS

WB WAPATO TO SB 99

WB WAPATO TO NB 99

NB 99

EB WAPATO

Lanes, Volumes, Timings
3:

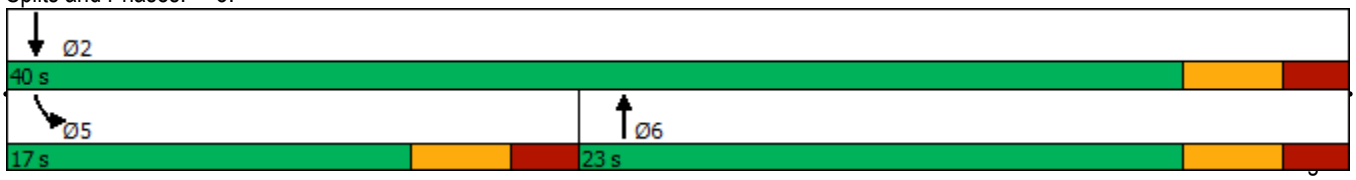
08/16/2021

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Total Split (s)			23.0		17.0	40.0
Total Split (%)			57.5%		42.5%	100.0%
Maximum Green (s)			18.0		12.0	35.0
Yellow Time (s)			3.0		3.0	3.0
All-Red Time (s)			2.0		2.0	2.0
Lost Time Adjust (s)			0.0		0.0	0.0
Total Lost Time (s)			5.0		5.0	5.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)			3.0		3.0	3.0
Recall Mode			None		None	None
Walk Time (s)			7.0			7.0
Flash Dont Walk (s)			11.0			11.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)			9.0	26.3	16.3	26.3
Actuated g/C Ratio			0.34	1.00	0.62	1.00
v/c Ratio			0.24	0.20	0.42	0.53
Control Delay			8.9	0.3	9.8	1.2
Queue Delay			0.0	0.0	0.0	0.0
Total Delay			8.9	0.3	9.8	1.2
LOS			A	A	A	A
Approach Delay			2.9			5.4
Approach LOS			A			A
Queue Length 50th (ft)			16	0	49	0
Queue Length 95th (ft)			37	0	#168	0
Internal Link Dist (ft)	448		576			949
Turn Bay Length (ft)					600	
Base Capacity (vph)			1154	1509	1960	1681
Starvation Cap Reductn			0	0	0	0
Spillback Cap Reductn			0	0	0	0
Storage Cap Reductn			0	0	0	0
Reduced v/c Ratio			0.11	0.20	0.45	0.53

Intersection Summary			
Area Type:	Other		
Cycle Length: 40			
Actuated Cycle Length: 26.3			
Natural Cycle: 40			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.53			
Intersection Signal Delay: 4.9		Intersection LOS: A	
Intersection Capacity Utilization 47.7%		ICU Level of Service A	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3:



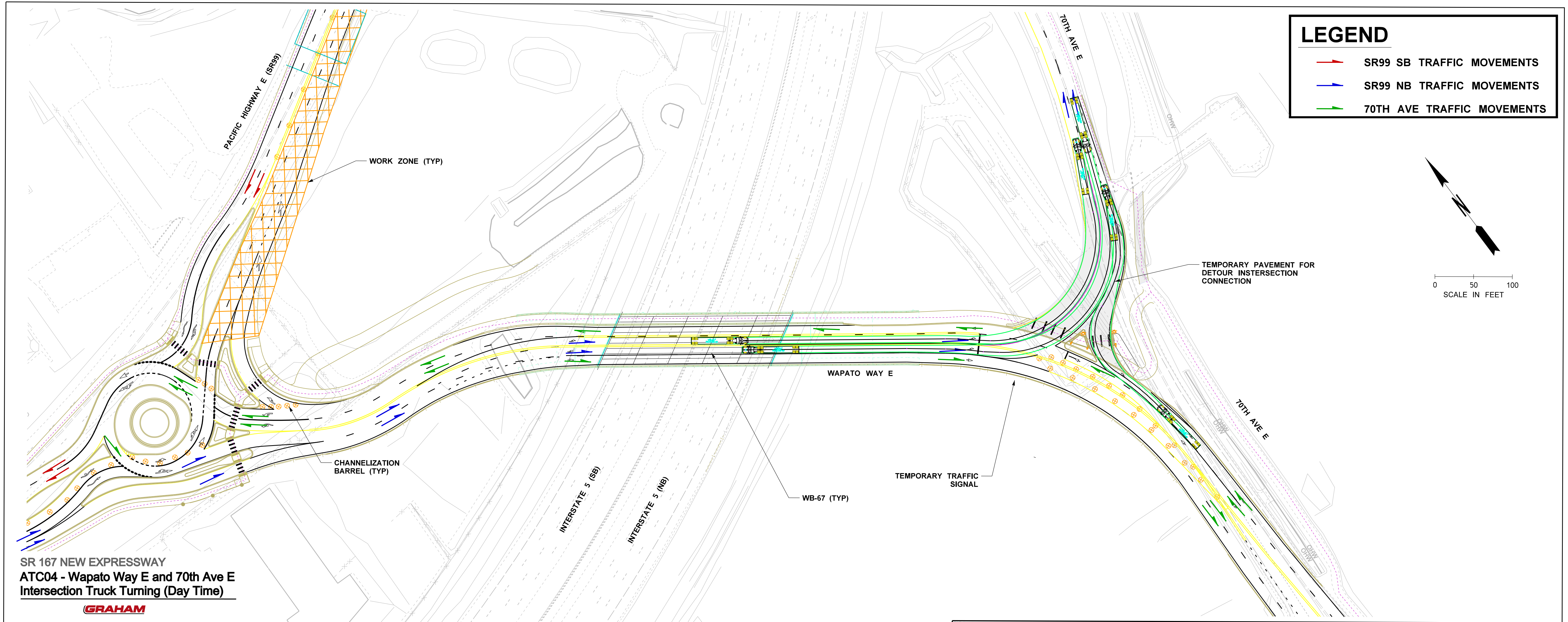
NB 99
EB WAPATO

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	120	272	804	827
Future Volume (veh/h)	0	0	120	272	804	827
Number			6	16	5	2
Initial Q (Qb), veh			0	0	0	0
Ped-Bike Adj(A_pbT)				1.00	1.00	
Parking Bus, Adj			1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln			1583	1776	1810	1712
Adj Flow Rate, veh/h			130	0	874	899
Adj No. of Lanes			1	1	2	1
Peak Hour Factor			0.92	0.92	0.92	0.92
Percent Heavy Veh, %			20	7	5	11
Cap, veh/h			327	312	1272	1358
Arrive On Green			0.21	0.00	0.38	0.79
Sat Flow, veh/h			1583	1509	3343	1712
Grp Volume(v), veh/h			130	0	874	899
Grp Sat Flow(s),veh/h/ln			1583	1509	1672	1712
Q Serve(g_s), s			1.7	0.0	5.3	5.5
Cycle Q Clear(g_c), s			1.7	0.0	5.3	5.5
Prop In Lane				1.00	1.00	
Lane Grp Cap(c), veh/h			327	312	1272	1358
V/C Ratio(X)			0.40	0.00	0.69	0.66
Avail Cap(c_a), veh/h			1178	1123	1658	2475
HCM Platoon Ratio			1.00	1.00	1.00	1.00
Upstream Filter(I)			1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh			8.3	0.0	6.3	1.1
Incr Delay (d2), s/veh			0.8	0.0	0.8	0.6
Initial Q Delay(d3),s/veh			0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln			0.8	0.0	2.4	2.5
LnGrp Delay(d),s/veh			9.1	0.0	7.1	1.6
LnGrp LOS			A		A	A
Approach Vol, veh/h			130			1773
Approach Delay, s/veh			9.1			4.3
Approach LOS			A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		
Phs Duration (G+Y+Rc), s		24.2			14.2	10.0		
Change Period (Y+Rc), s		5.0			5.0	5.0		
Max Green Setting (Gmax), s		35.0			12.0	18.0		
Max Q Clear Time (g_c+I1), s		7.5			7.3	3.7		
Green Ext Time (p_c), s		5.0			1.9	0.3		

Intersection Summary	
HCM 2010 Ctrl Delay	4.7
HCM 2010 LOS	A

ATTACHMENT B - TEMP SIGNAL SYNCHRO ANALYSIS



SR 167 NEW EXPRESSWAY

ATC04 - Wapato Way E and 70th Ave E Intersection Truck Turning (Day Time)

GRAHAM

SCJ ALLIANCE CONSULTING SERVICES | TYLININTERNATIONAL | PBS

FILE NAME	c:\bms\tyli-pw\john.buehler _pbsusa\d0177939\ATC 04- SR 99 Detour AutoTurn.dgn
TIME	11:00:46 AM
DATE	8/16/2021
PLOTTED BY	johnb
DESIGNED BY	
ENTERED BY	
CHECKED BY	
PROJ. ENGR.	C. SODERQUIST
REGIONAL ADM.	J. WHITE

REVISION | DATE | BY

REGION NO. 10 | STATE WASH | FED.AID PROJ.NO. 0167(057)

JOB NUMBER 20C512

CONTRACT NO. | LOCATION NO. XL5466

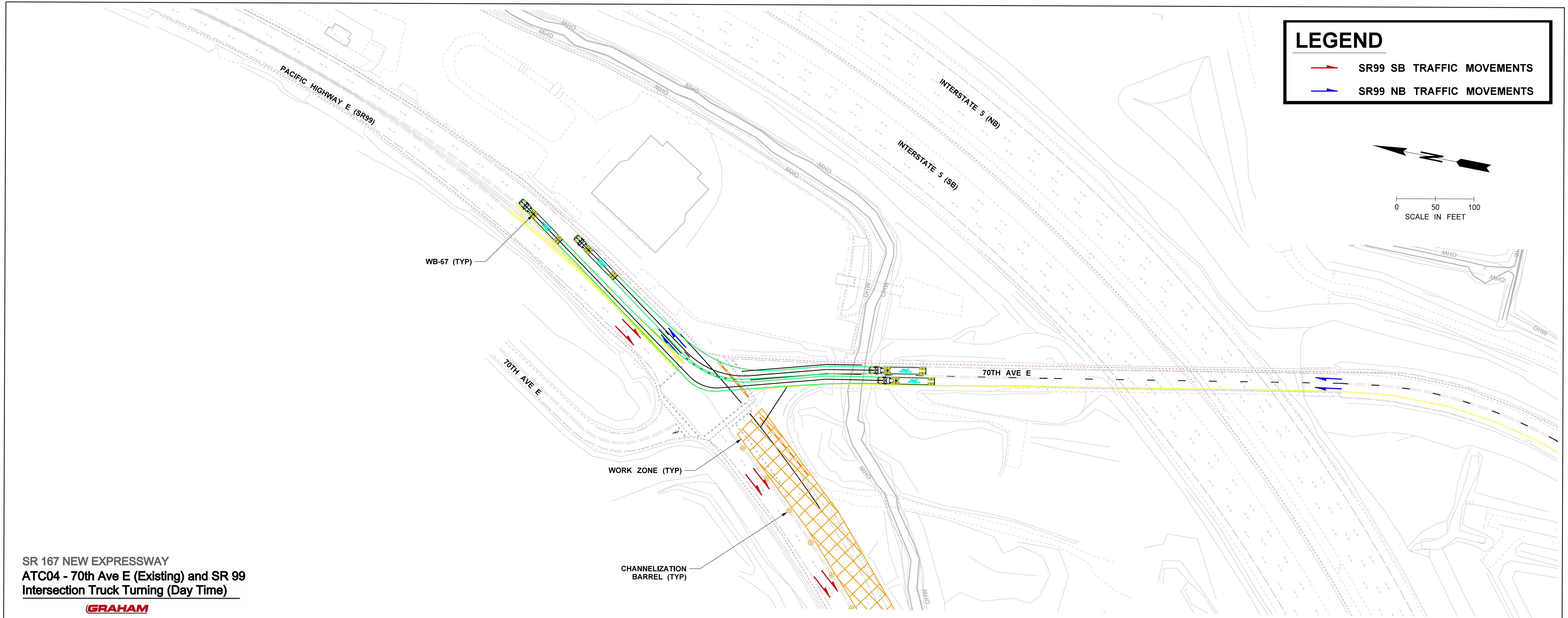
P.E. STAMP BOX DATE | P.E. STAMP BOX DATE

Washington State Department of Transportation

SR 167
I-5 TO SR 509
NEW EXPRESSWAY

ATTACHMENT C

PLAN REF NO | SHEET | OF | SHEETS



SR 167 NEW EXPRESSWAY

ATC04 - 70th Ave E (Existing) and SR 99 Intersection Truck Turning (Day Time)

GRAHAM

SCJ ALLIANCE CONSULTING SERVICES · TYLININTERNATIONAL · PBS

FILE NAME	c:\bms\tyli-pw\john.buehler__pbsusa\d0177939\ATC 04- SR 99 Detour AutoTurn.dgn			
TIME	11:00:45 AM			
DATE	8/16/2021			
PLOTTED BY	johnb			
DESIGNED BY				
ENTERED BY				
CHECKED BY				
PROJ. ENGR.	C. SODERQUIST			
REGIONAL ADM.	J. WHITE	REVISION	DATE	BY

REGION NO. 10 · STATE WASH · FED.AID PROJ.NO. 0167(057)

JOB NUMBER 20C512 · CONTRACT NO. · LOCATION NO. XL5466

P.E. STAMP BOX · DATE · P.E. STAMP BOX · DATE

Washington State Department of Transportation

SR 167
I-5 TO SR 509
NEW EXPRESSWAY

ATTACHMENT C

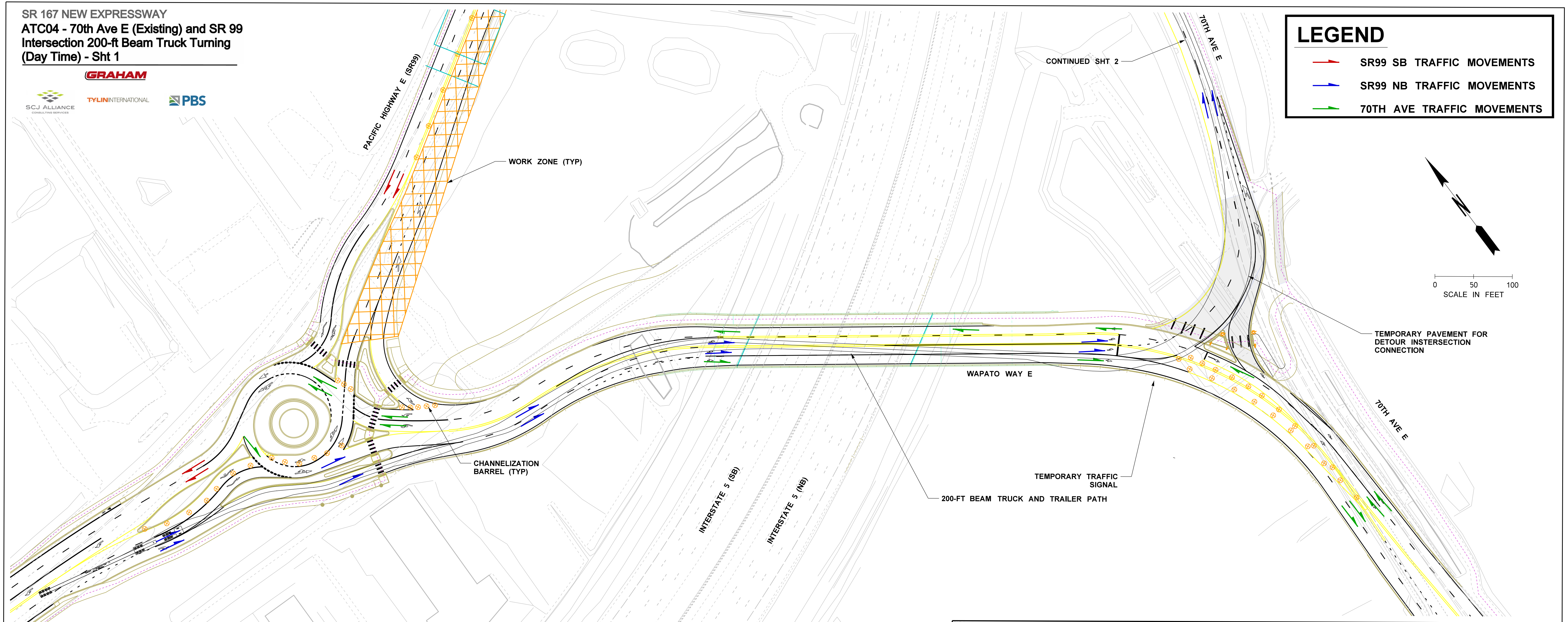
PLAN REF NO · SHEET · OF · SHEETS

SR 167 NEW EXPRESSWAY

ATC04 - 70th Ave E (Existing) and SR 99 Intersection 200-ft Beam Truck Turning (Day Time) - Sht 1

GRAHAM

SCJ ALLIANCE CONSULTING SERVICES | TYLININTERNATIONAL | PBS



FILE NAME	c:\bms\tyli-pw\john.buehler_pbsusa\d0177939\ATC 04- SR 99 Detour AutoTurn.dgn				
TIME	11:00:48 AM				
DATE	8/16/2021				
PLOTTED BY	johnb				
DESIGNED BY					
ENTERED BY					
CHECKED BY					
PROJ. ENGR.	C. SODERQUIST				
REGIONAL ADM.	J. WHITE	REVISION	DATE	BY	

REGION NO. 10 | STATE WASH | JOB NUMBER 20C512 | CONTRACT NO. | FED.AID PROJ.NO. 0167(057) | LOCATION NO. XL5466

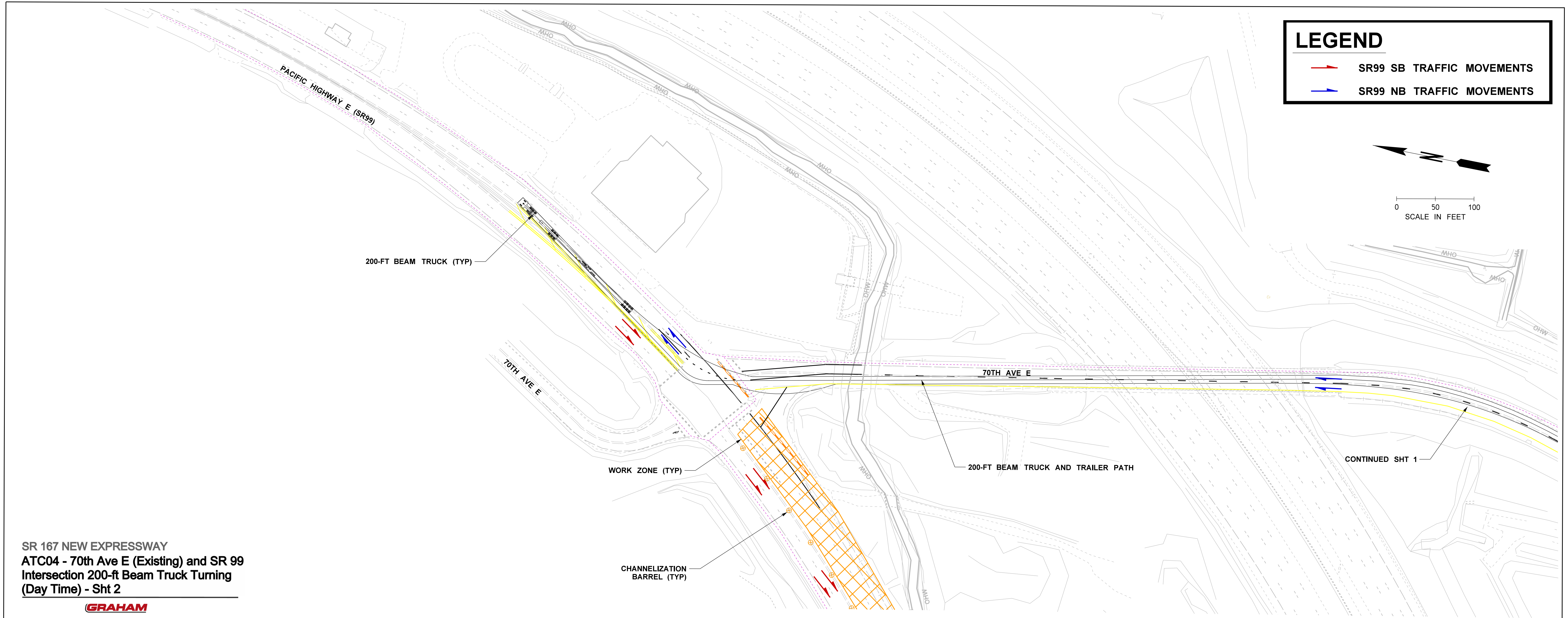
P.E. STAMP BOX DATE | P.E. STAMP BOX DATE

Washington State Department of Transportation

SR 167
I-5 TO SR 509
NEW EXPRESSWAY

ATTACHMENT C

PLAN REF NO | SHEET | OF | SHEETS



SR 167 NEW EXPRESSWAY

ATC04 - 70th Ave E (Existing) and SR 99 Intersection 200-ft Beam Truck Turning (Day Time) - Sht 2

GRAHAM

SCJ ALLIANCE CONSULTING SERVICES | TYLININTERNATIONAL | PBS

FILE NAME	c:\bms\tyli-pw\john.buehler__pbsusa\d0177939\ATC 04- SR 99 Detour AutoTurn.dgn			REGION NO. 10	STATE WASH	FED.AID PROJ.NO. 0167(057)	
TIME	11:00:50 AM			JOB NUMBER 20C512			
DATE	8/16/2021			CONTRACT NO.		LOCATION NO. XL5466	
PLOTTED BY	johnb						
DESIGNED BY							
ENTERED BY							
CHECKED BY							
PROJ. ENGR.	C. SODERQUIST						
REGIONAL ADM.	J. WHITE	REVISION	DATE	BY			

P.E. STAMP BOX DATE

P.E. STAMP BOX DATE

Washington State Department of Transportation

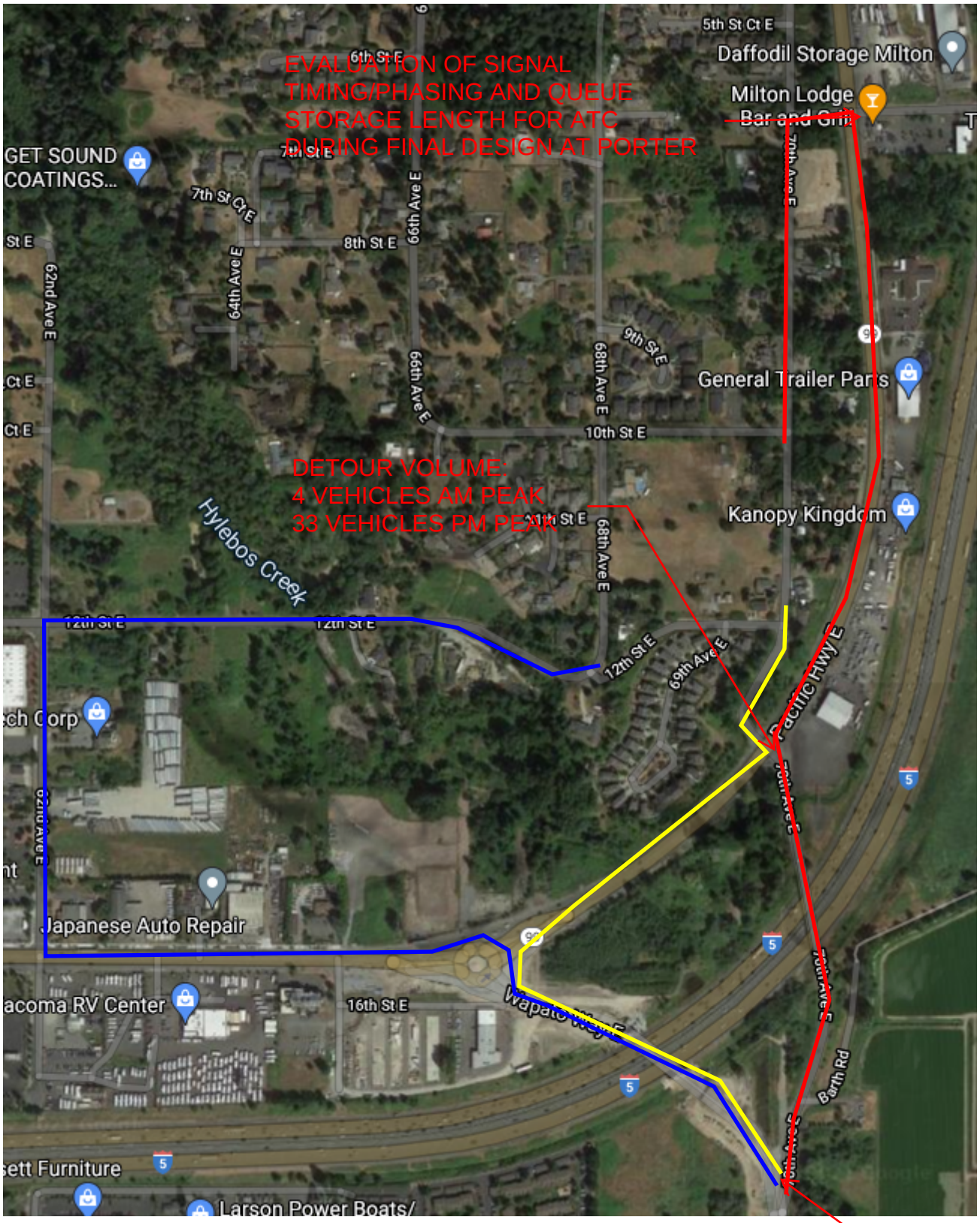
SR 167
I-5 TO SR 509
NEW EXPRESSWAY

ATTACHMENT C

PLAN REF NO

SHEET OF SHEETS

ATTACHMENT D - DETOUR ROUTES FOR FIFE NEIGHBORHOOD FOR REMOVAL OF LEFT TURN



DETOUR ROUTE 1 FOR LEFT TURNS TO 70TH AVE NE TO FIFE NEIGHBORHOOD = 4900 ft

DETOUR ROUTE 2 FOR LEFT TURNS TO 70TH AVE NE TO FIFE NEIGHBORHOOD = 6200 ft

EXISTING ROUTE FOR LEFT TURNS TO 70TH AVE NE TO FIFE NEIGHBORHOOD = 3100 ft

TEMPORARY ATC 04 INTERSECTION

ATC #7 – Reinforced Soil Slopes

Washington State Department of Transportation

Puget Sound Gateway SR 509/SR 167
SR 509: 401 2nd Ave South, Ste. 300
Seattle, WA 98104
SR 167: 5720 Capitol Blvd SE
Tumwater, WA 98501
206-464-1220
TTY: 1-800-833-6388
www.wsdot.wa.gov

July 20, 2021

Greg Ritke
Graham Contracting Ltd.
13555 SE 36th Street, Suite 120
Bellevue, WA 98006

Dear Mr. Ritke:

We have reviewed your ATC007.02 and have determined that the ATC is approved.

Please contact me at (360) 701-9413 if you have any questions.

Sincerely,

Steven D. Fuchs

Steve Fuchs, P.E.
SR 167 Completion Project Manager

SR 167/I-5 to SR 509 - New Expressway Project

ATC Title: Reinforced Soil Slopes
ATC Number: 07

Brief Description: This ATC details the allowance of fill slopes steeper than 2H:1V by using Reinforced Soil Slopes (RSS). The potential use of RSS in some locations will facilitate the potential elimination of some traditional fill walls and the optimization of the project roadway alignments where the current 2H:1V slopes narrowly fits the current Right of Way.

Detailed description: The SR-167 / I-5 to SR 509 project corridor requires the construction of retaining walls for the highway embankment and structure approaches to accommodate the geometry and stay within the Right of Way corridor. In select locations, retaining walls may be eliminated and the alignment optimized with the use of a reinforced soil slope. The RFP Technical Requirements Section 2.15.4.12 states that slopes may not be steeper than 2H:1V. This ATC allows for the use of RSS to a maximum slope of 1.2H:1V. The current GDM allows RSS to be as steep as 0.5H:1V but this ATC proposed a maximum slope to 1.2H:1V. By staying to a maximum of 1.2H:1V, the face of the slope will not require any face treatment or wrapping which will allow planting of larger plants and trees to occur on the slope. Since geogrid is a mesh-like material with many openings, roots can grow in below the geogrid, further strengthening the wall. The slopes will be covered with compost, bark, compost socks and plantings. The landscape slope coverings along with the plantings will prevent erosion while highway runoff will be diverted away from the RSS to further prevent erosion.

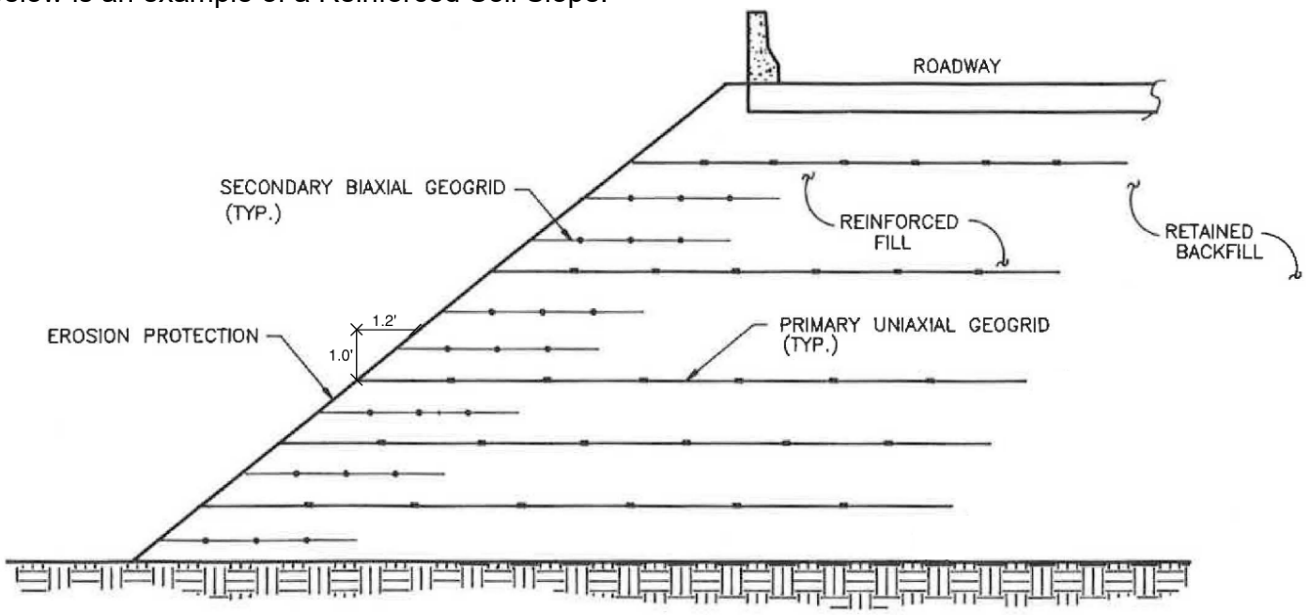
RSS embankments are extremely durable and long-lasting while at the same time offering extremely low maintenance costs. Once plant establishment is complete, RSS embankments will not need to be touched for decades. RSS slopes will only require occasional as-needed vegetation maintenance and management once plant establishment has completed. Geogrid listed on the WSDOT Qualified Products List (QPL) will be used on the project to ensure a long life and low maintenance service life. The RSS slope will meet or outlast the 75-year service life as required per the RFP.

There are multiple examples of RSS embankments in Washington State, with many being on WSDOT ROW. In Western Washington, many can be found along the I-405 corridor. Many of these RSS embankments have withstood the test of time, with some being over 25 years old. These projects include I-405 Tukwila to Factoria and I-405 NE 195th St to SR 527. These RSS embankments are not noticeable from the highway due to the significant vegetative area, unlike a traditional MSE wall with concrete panel fascia. Recently, RSS slopes have been installed at the SR 530 Trafton & Schoolyard Creek Design-Build Project, the I-82 Union Gap Interchange Design-Build Project, and will be built on the I-5 Portland Ave to Port of Tacoma Southbound HOV Design-Build Project.

Construction methods will follow Section 6-14 of the 2021 WSDOT Standard Specifications with maximum lift thickness to not exceed 10” compacted and will be reduced as necessary to reach necessary compaction density. Minimum lift thickness of 6” will be placed before equipment will be allowed on top of the geogrid, such as loaders, rollers, dozers, and dump trucks. Final determination of geogrid type, strap length, wire grid size and bar thickness, and strength will be

determined by a Washington State Registered Engineer designing the wall before RFCs are submitted.

Below is an example of a Reinforced Soil Slope:



RSS systems are available from many different manufacturers. Graham will choose a system from one or more of the suppliers below:

- Hilfiker Steepened Slopes
- Tensar RSS
- ACF West
- NW Linings

Usage: RSS embankments will be utilized to replace a portion of the proposed retaining wall 7-4L along northbound SR 509 and as approved by the Engineer.

Subsurface Investigation: No additional subsurface investigation is necessary for this ATC.

Proposed RFP modifications:

In the General Provisions, Chapter 2, Section 2.11.3.6, page 2.11-06 lines 12 through 14 revise the following:

12 In no cases shall side slopes
13 be steeper than 2:1 without Review and Comment by the WSDOT Engineer
1a as required by this Section unless approved by this ATC.

In the General Provisions, Chapter 2, Section 2.15.4.12, page 2.15-13 lines 14 through 16 revise the following:

14 The Design-Builder shall design side slopes and embankments to minimize
15 the use of barriers, metal guardrails, and fall restraint measures. Slopes in all
16 planting areas shall not be steeper than 2H:1V, ~~unless shown in the BLAS~~

unless the slope is designed as a reinforced soil slope (RSS) in accordance with the GDM.

Design Analysis: This proposed ATC does not require and additional design analysis.

Analysis:

a. Functionality –
Equal; RSS functionality is equal to the other allowable retaining wall types identified in the RFP.

b. Structural adequacy –
Equal; RSS structural adequacy is equal to the other allowable retaining wall types identified in the RFP.

c. Safety –
Better; RSS is better for safety than the RFP for construction workers and the traveling public. RSS requires less materials to be imported to the project site and RSS eliminates a tall vertical edge present on all traditional MSE walls.

d. Comparison of life cycle costs including repair and maintenance –
Better; RSS is better for life cycle costs than the RFP. RSS requires much less maintenance over the lifespan of the embankment. Geogrid material is very robust and durable and will outlast the design life of the embankment.

e. Aesthetics –
Better; RSS is better for aesthetics than the RFP. RSS embankments are planted and as time passes, vegetation will grow and cover the entire slope. Plants are more aesthetically pleasing than concrete panels for MSE walls and do not suffer from graffiti problems like concrete does in urban environments.

f. Impacts on construction traffic –
Better; RSS is better for impacts on construction traffic than the RFP. RSS embankments require considerably less materials than a traditional MSE wall. A traditional MSE wall will require dozens of truckloads to bring in concrete fascia panels while an RSS requires one or two loads of geogrid.

g. Effect on or changes to environmental commitments identified in the RFP –
Better; RSS is better for the environment than the RFP. Compared to a traditional MSE wall with concrete panel fascia, RSS offers additional planting areas on the project which provide the new SR 509 spur road corridor benefit from additional vegetation planting areas than the conceptual plans currently allow.

h. Impacts to surrounding and adjacent communities, including EJ and LEP populations–
Better; RSS is better to the surrounding communities than the RFP. RSS embankments are faster to build than a traditional MSE wall which reduces construction noise and vibrations to surrounding communities. RSS also is vegetated opposed to a concrete fascia which will reduce unsightly graffiti present in an urban area and also improve aesthetics by having plants instead of concrete.

i. Changes needed in the location, length, height, or number of noise walls –
Equal; RSS is equal in this instance and will not require any changes to noise walls on this project.

j. Impact on utilities and rail –
Equal; RSS is equal to impacts on utilities and rail than the RFP. Utilities and rail will not be affected by this ATC.

k. Discussion of additional ROW or easements required –
Equal or Better; RSS is equal to current ROW than the RFP. This ATC requires no additional ROW.

l. An assessment of Forward Compatibility –
Equal or Better; RSS is equal to forward compatibility than the RFP. RSS embankments proposed by this ATC will not affect forward compatibility.

ATC #14 – Consolidate Toll Gantry

Washington State Department of Transportation

Puget Sound Gateway SR 509/SR 167
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Seattle, WA 98104
SR 167: 5720 Capitol Blvd SE
Tumwater, WA 98501
206-464-1220
TTY: 1-800-833-6388
www.wsdot.wa.gov

August 9, 2021

Greg Ritke
Graham Contracting Ltd.
13555 SE 36th Street, Suite 120
Bellevue, WA 98006

Dear Mr. Ritke:

We have reviewed your ATC014 Rev. 2 and have determined that the ATC is approved.

Please contact me at (360) 701-9413 if you have any questions.

Sincerely,

Steven D. Fuchs

Steve Fuchs, P.E.
SR 167 Completion Project Manager

GRAHAM
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SR 167/I-5 to SR 509 - New Expressway Project

ATC Title: Consolidate Toll Gantry
ATC Number: 014

Brief Description: Replacement of the two gantry tolling system shown in the conceptual plans with a single gantry monotube sign bridge.

Detailed Description: The Design-Build team proposes to revise the basic configuration of the tolling infrastructure located along SR509 spur (509 S Line between station 46+00 and 49+00) between 8th St and 12th St from a dual toll gantry tolling system to a single monotube toll gantry tolling system spanning all NB and SB lanes.

Usage: The proposed revisions would affect the overall maintenance costs and safety of the SR 509 Spur corridor. Modifying two gantry systems as proposed in the conceptual plans and prefaced in the RFP to a single monotube toll gantry spanning all NB and SB lanes of the SR 509 Spur provides reduced roadside fixed collision objects and overall maintenance costs reduction of the tolling infrastructure.

Subsurface Investigation: The proposed revisions would not require additional subsurface investigations beyond the requirements of the basic configuration as it is not anticipated that the size of the toll gantry foundations will be significantly affected.

Proposed RFP modifications:
In the General Provisions, Chapter 2, Section 2.26.4.3, page 4, line 37-40, revise the following:

- ~~Each~~ Toll Points shall be supported by a ~~include one~~ Toll Gantry, spanning all lanes and shoulders in the direction of travel. Each Toll Gantry shall be no more than 100 feet away from the locations shown in the conceptual plans (Appendix M).

In the General Provisions, Chapter 2, Section 2.26.4.3, page 5, line 1-4, revise the following:

- The location of ~~the~~ Toll Gantries ~~Gantry at each Toll point~~ shall be coordinated with the Toll Vendor so that no expansion or construction joints in the pavement conflict with the Toll Vendor's in-pavement vehicle detection Toll Equipment.

In the General Provisions, Chapter 2, Section 2.26.4.3, page 5, line 7-9, revise the following:

- Toll Gantries for the northbound and southbound traffic may be aligned relative to the same roadway stationing, consolidated to a single gantry, or they may be offset to maximize the use of available space.

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SR 167/I-5 to SR 509 - New Expressway Project

In the General Provisions, Chapter 2, Section 2.26.4.3.2, page 5, line 39-40, and page 6, line 1, revise the following:

- The Design-Builder shall design and construct ~~the~~ a WSDOT full-span monotube Toll Gantry structure and foundations in accordance with these Technical Requirements.

Design Analysis: No design analysis is submitted with the ATC. The design-builder is aware that during final design a Design Analysis may be required if a dimension chosen for a design element that will be changed by the project is outside the range of values provided for that element in the Design Manual.

Analysis:

A. **Functionality – Equal**
   a. The proposed design revisions will have no effect on Toll System Functionality.
B. **Structural adequacy – Equal**
   a. The proposed design revisions will have no effect on structural adequacy.
C. **Safety – Better**
   a. The use of a single monotube Toll Gantry that spans all lanes of the SR 509 Spur will provide WSDOT with a reduced number of roadside fixed collision objects.
D. **Comparison of life cycle costs including repair and maintenance – Better**
   a. The use of a single monotube Toll Gantry that spans all lanes of the SR 509 Spur will reduce the life cycle cost of the Toll System by a factor of 2 or more as there will be half as many Toll Gantry structures.
E. **Aesthetics – Equal**
   a. The proposed design revisions will have no effect on aesthetics.
F. **Impacts on construction traffic – Better**
   a. The proposed design revisions provides the following construction traffic betterments associated with the project:
      i. Construction of the hauled material designated for use on the Toll Gantry foundations will be reduced by 50%.
      ii. Time spent erecting the Toll Gantries will be reduced by 50%.
G. **Effect on or changes to environmental commitments identified in the RFP – Equal**
   a. The proposed design revisions will have no impact on the environmental commitments identified in the RFP.
H. **Impacts to surrounding and adjacent communities, including EJ and LEP populations – Equal**
   a. The proposed design revisions will have no impact on the surrounding and adjacent communities, including EJ and LEP populations.

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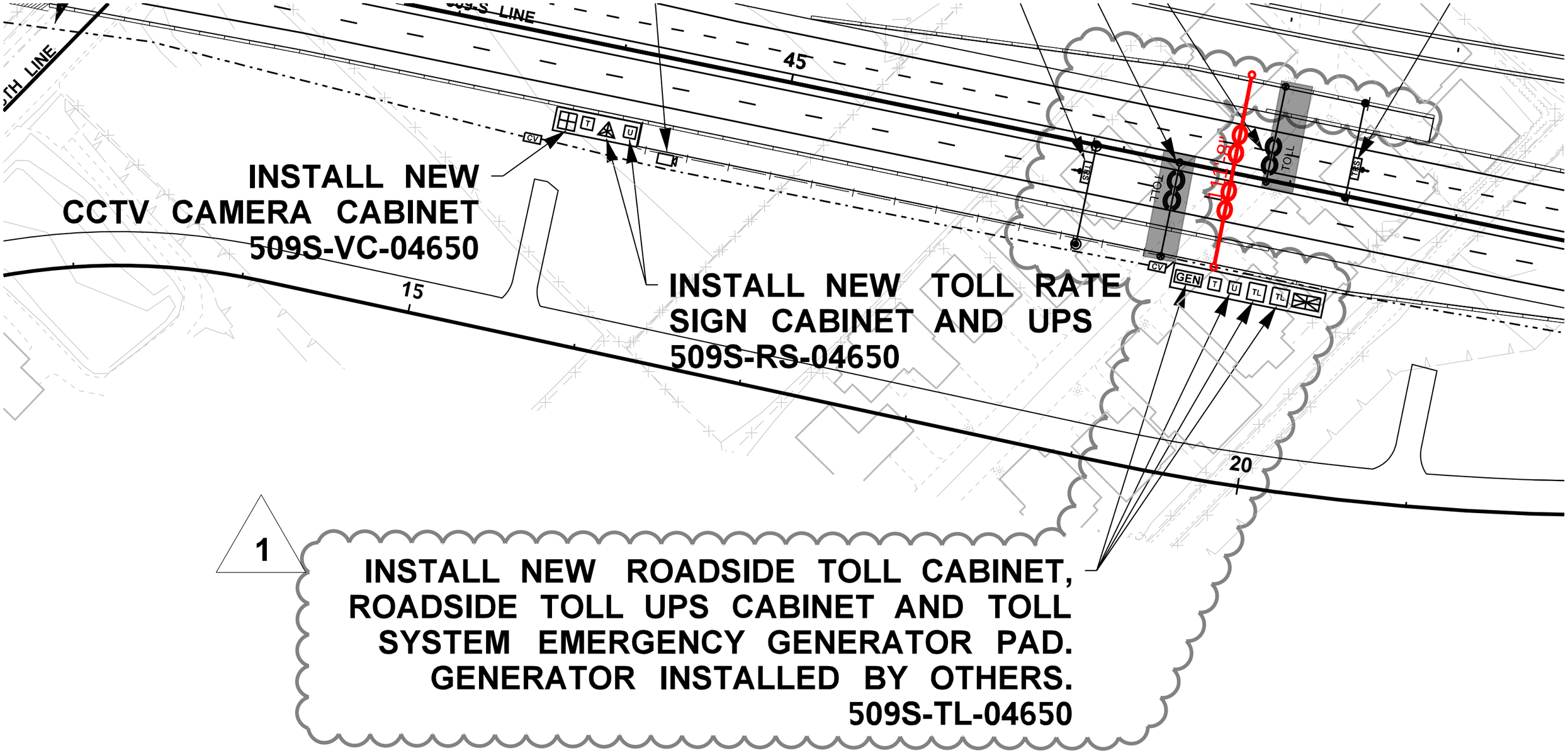
SR 167/I-5 to SR 509 - New Expressway Project

I. **Changes needed in the location, length, height, or number of noise walls – Equal**
   a. The proposed design revisions will have no impact on the location, length, height, or number of noise walls.

J. Impact on utilities and rail – Equal
   a. The proposed design revisions will have no impact on utilities and rail.

K. Discussion of additional ROW or easements required – Equal
   a. The proposed design revisions will have no impact on additional ROW or easements required.

L. An assessment of Forward Compatibility – Equal
   a. The proposed design revisions will have no effect on forward compatibility.


509-S LINE
45
15
20
INSTALL NEW
CCTV CAMERA CABINET
509S-VC-04650
INSTALL NEW TOLL RATE
SIGN CABINET AND UPS
509S-RS-04650
CV
TOLL
GEN
1
INSTALL NEW ROADSIDE TOLL CABINET, ROADSIDE TOLL UPS CABINET AND TOLL SYSTEM EMERGENCY GENERATOR PAD. GENERATOR INSTALLED BY OTHERS.
509S-TL-04650

LEGEND

- TYPE 2 JB
- TYPE 8 JB
- TL — ROADSIDE TOLL CABINET
- X — ELECTRICAL CABINET
- U — UPS CABINET
- CV — CABLE VAULT
- R — TOLL READER EQUIPMENT CABINET
- ITS DISTRIBUTION CONDUIT
- EMPTY CONDUIT FOR TOLL VENDOR USE

ABBREVIATIONS

COMM	COMMUNICATIONS
G	GENERATOR PAD
NB	NORTHBOUND
SB	SOUTHBOUND
ITS	INTELLIGENT TRANSPORATION SYSTEM
JB	JUNCTION BOX
TYP	TYPICAL
UPS	UNITERRUPTIBLE POWER SUPPLY

GENERAL NOTES

1. THE TYPICAL LAYOUT OF THE TOLL POINTS SHOWN HEREIN DOES NOT ATTEMPT TO ADDRESS ALL REQUIREMENTS IN THE CONTRACT. THE DESIGN-BUILDER SHALL REFER TO OTHER PARTS OF THE CONTRACT FOR DESIGN AND CONSTRUCTION REQUIREMENTS FOR THE TOLL POINTS.

FILE NAME	H:\167Gateway\RFP\Appendices\Toll Point Detail\167Stg1b_Toll_Point_Detail_v1.dgn			REGION NO. 10	STATE WASH
TIME	11:30:27 AM			JOB NUMBER	FED.AID PROJ.NO.
DATE	8/14/2020			CONTRACT NO.	LOCATION NO.
PLOTTED BY	beireke				
DESIGNED BY	K. BEIREIS				
ENTERED BY	K. BEIREIS				
CHECKED BY	C. BARNETT				
PROJ. ENGR.	S. FUCHS				
REGIONAL ADM.	J. WHITE	REVISION	DATE	BY	

P.E. STAMP BOX — DATE

P.E. STAMP BOX — DATE

Washington State Department of Transportation

SR 167
I-5 TO SR 509 -
NEW EXPRESSWAY PROJECT

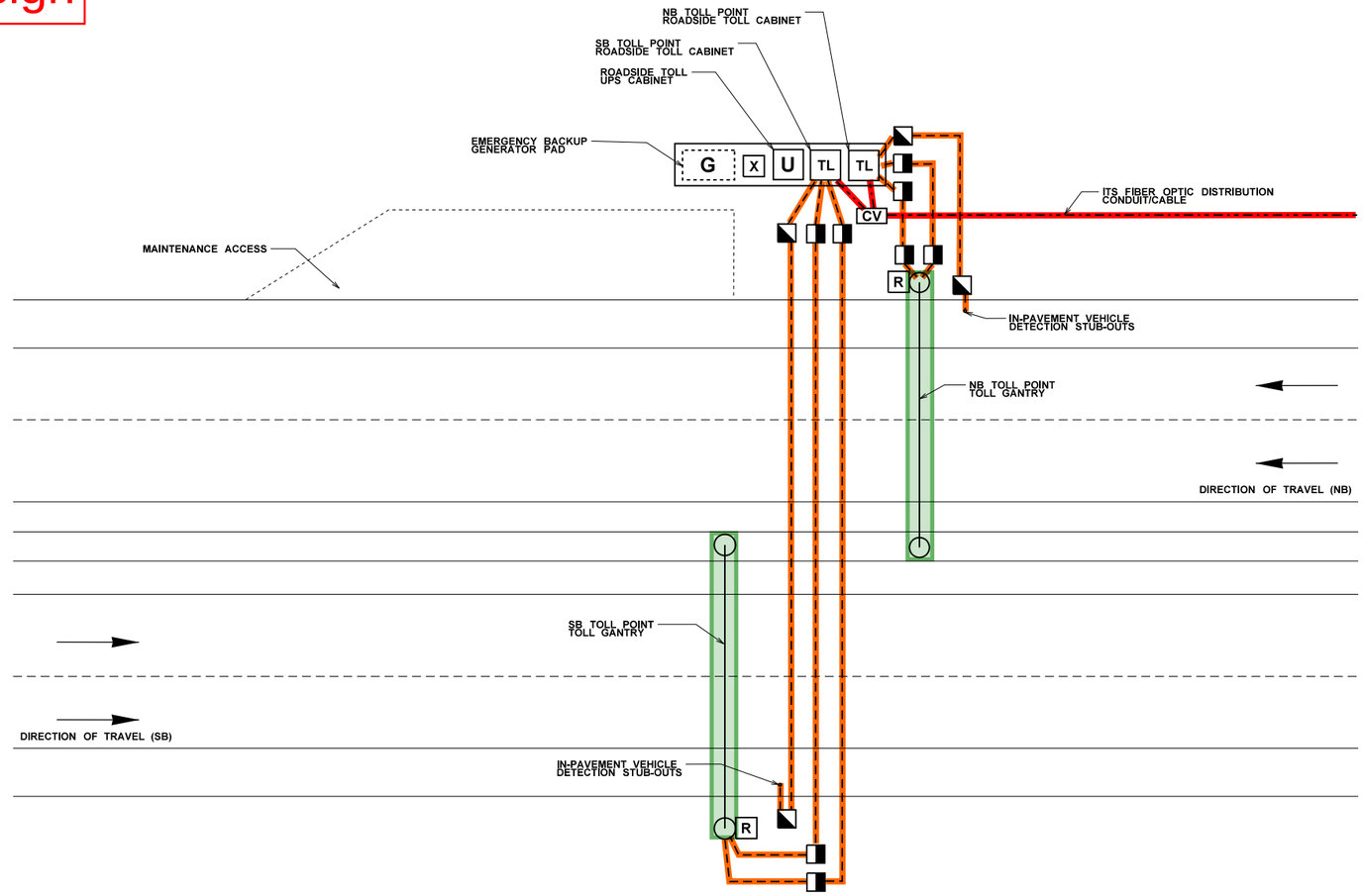
TOLL POINTS - LEGEND/NOTES

Plot 8

PLAN REF NO TL01

SHEET OF SHEETS

Conceptual Design



NOT TO SCALE

FILE NAME	H:\167Gateway\RFP\Appendices\Toll Point Detail\167Stg1b_Toll_Point_Detail_v1.dgn				REGION NO. 10	STATE WASH	FED.AID PROJ.NO.
TIME	11:31:10 AM						
DATE	8/14/2020						
PLOTTED BY	beireke						
DESIGNED BY	K. BEIREIS				JOB NUMBER		
ENTERED BY	K. BEIREIS						
CHECKED BY	C. BARNETT				CONTRACT NO.		LOCATION NO.
PROJ. ENGR.	S. FUCHS						
REGIONAL ADM.	J. WHITE	REVISION	DATE	BY			

P.E. STAMP BOX — DATE

P.E. STAMP BOX — DATE

Washington State Department of Transportation

SR 167
I-5 TO SR 509 -
NEW EXPRESSWAY PROJECT

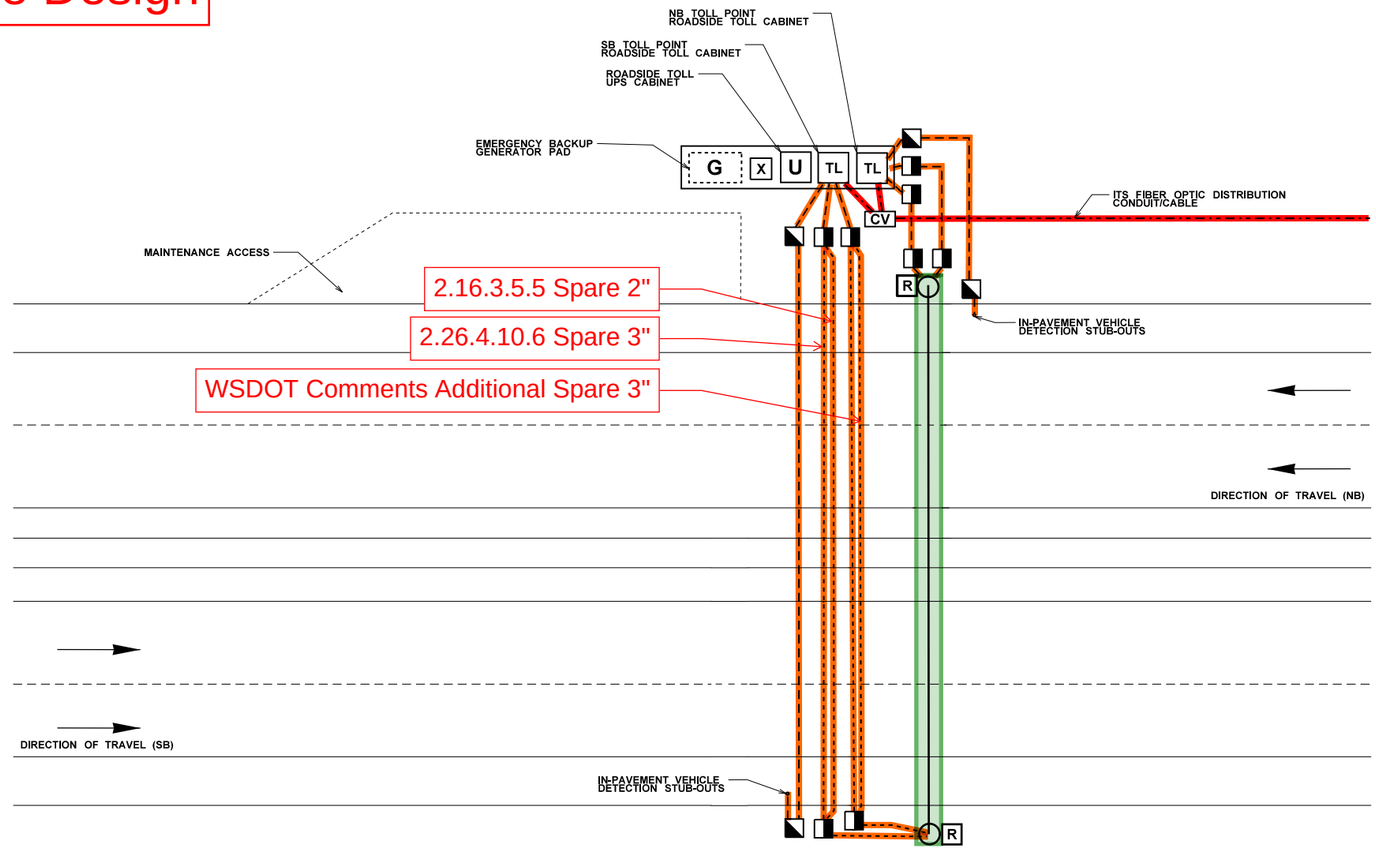
TOLL POINTS - LAYOUT

Plot 9

PLAN REF NO TL02

SHEET OF SHEETS

Single Monotube Design



NOT TO SCALE

FILE NAME	H:\167Gateway\RFP\Appendices\Toll Point Detail\167Stg1b_Toll_Point_Detail_v1.dgn				REGION NO.	STATE	FED.AID PROJ.NO.
TIME	11:31:10 AM				10	WASH	
DATE	8/14/2020				JOB NUMBER		
PLOTTED BY	beireke						
DESIGNED BY	K. BEIREIS						
ENTERED BY	K. BEIREIS				CONTRACT NO.		LOCATION NO.
CHECKED BY	C. BARNETT						
PROJ. ENGR.	S. FUCHS						
REGIONAL ADM.	J. WHITE	REVISION	DATE	BY			

P.E. STAMP BOX — DATE

P.E. STAMP BOX — DATE

Washington State Department of Transportation

SR 167
I-5 TO SR 509 -
NEW EXPRESSWAY PROJECT

TOLL POINTS - LAYOUT

Plot 9

PLAN REF NO
TL02

SHEET
OF
SHEETS

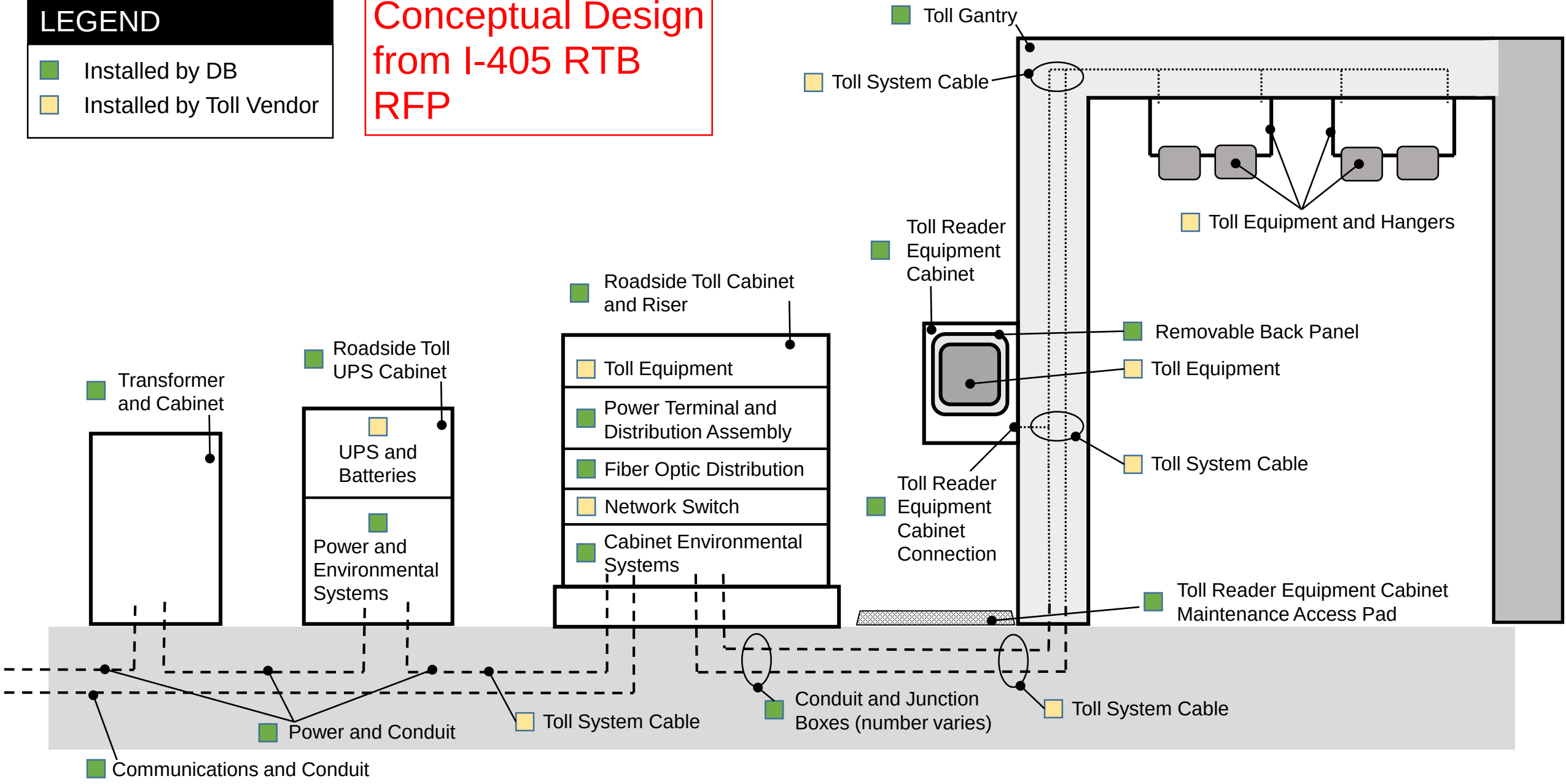
Illustrative Representation of a Toll Point

INFORMATIONAL ONLY

LEGEND

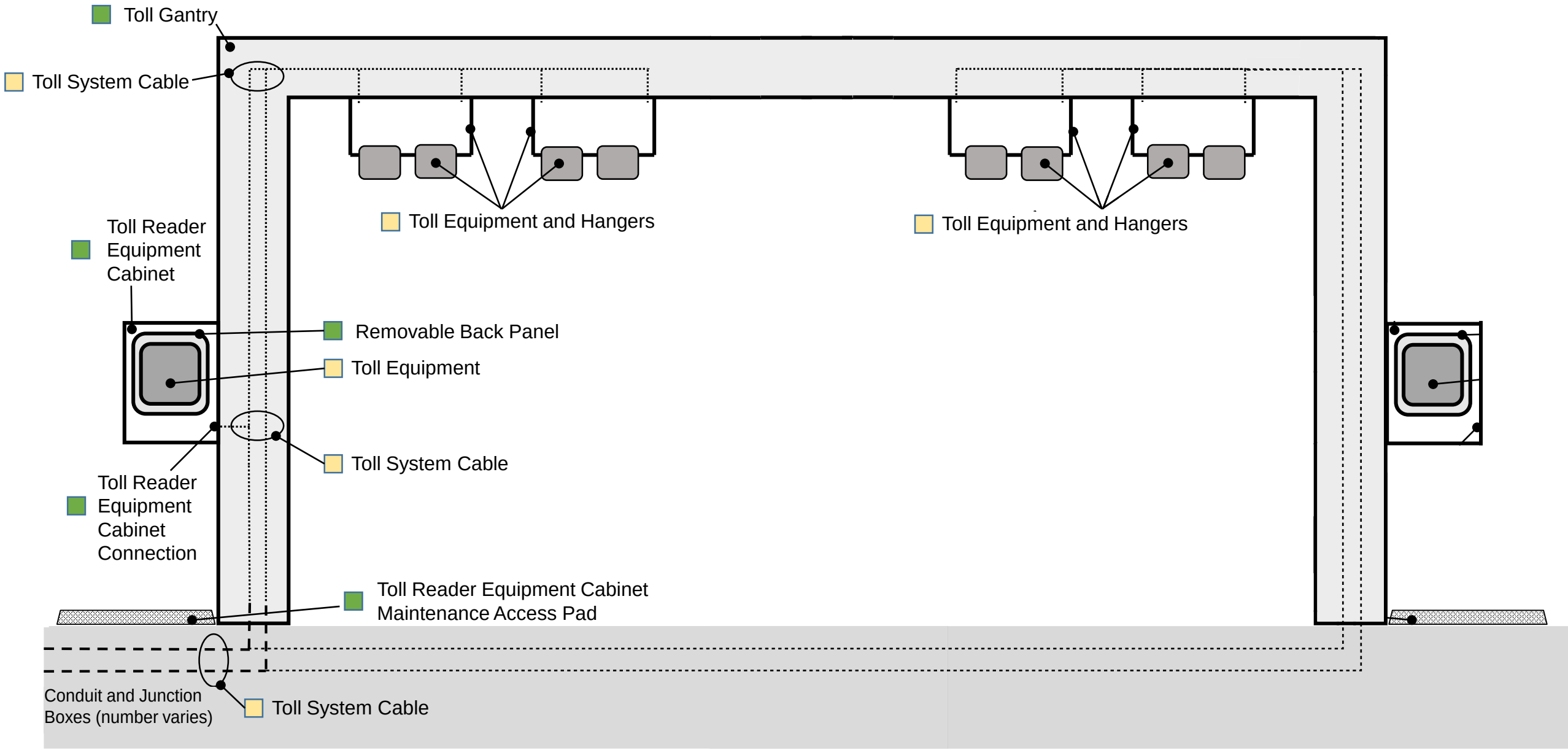
- Installed by DB
- Installed by Toll Vendor

Conceptual Design from I-405 RTB RFP



Illustrative Representation of a Toll Point
INFORMATIONAL ONLY

Single Monotube Design



ATC #16 – Use of Deck Bulb-Tee Girders for Pedestrian Bridges

Washington State Department of Transportation

Puget Sound Gateway SR 509/SR 167
SR 509: 401 2nd Ave South, Ste. 300
Seattle, WA 98104
SR 167: 5720 Capitol Blvd SE
Tumwater, WA 98501
206-464-1220
TTY: 1-800-833-6388
www.wsdot.wa.gov

August 10, 2021

Greg Ritke
Graham Contracting Ltd.
13555 SE 36th Street, Suite 120
Bellevue, WA 98006

Dear Mr. Ritke:

We have reviewed your ATC016.01 and have determined that the ATC is approved.

Please contact me at (360) 701-9413 if you have any questions.

Sincerely,

Steven D. Fuchs

Steve Fuchs, P.E.
SR 167 Completion Project Manager

ATC Title: Use of Deck Bulb-Tee Girders for Pedestrian Bridges
ATC Number: 016

Brief Description: This ATC recommends allowing prestressed concrete deck bulb-tee girders for pedestrian bridges.

Detailed description:
The Design-Build team requests permission for the use of deck bulb-tee girders for pedestrian bridges, as allowed by the 2020 WSDOT Bridge Design Manual in Section 5.6.7.D. The proposed ATC will eliminate the need for forming the soffit of the bridge deck, thus decreasing construction time and traffic impacts.

Usage:
The proposed ATC applies to pedestrian bridges only.

Subsurface Investigation:
The proposed ATC will not require additional subsurface investigation.

Proposed RFP modifications:
In RFP Chapter 2 Section 2.13.4.1, under "The following permanent bridge superstructure types are permitted for the Project", insert the following:

- Prestressed concrete deck bulb-tee girder with 5-inch CIP deck slab for pedestrian bridges only

Design Analysis:
No design analysis is submitted with the ATC.

Analysis:

a. Functionality –
Equal; The proposed ATC does not alter the functionality of pedestrian bridges.

b. Structural adequacy –
Equal; The proposed ATC has no impact on the structural adequacy of pedestrian bridges.

c. Safety –
Equal; The proposed ATC has no impact on public safety.

d. Comparison of life cycle costs including repair and maintenance –
Equal; The proposed ATC has no impact on life cycle costs.

e. Aesthetics –
Better; Prestressed concrete deck bulb-tee girders are visually similar to standard prestressed concrete girders such that the proposed ATC will have negligible impact on aesthetics.

f. Impacts on construction traffic –
Better; Through eliminating the need for forming a deck, the proposed ATC would shorten the construction schedule, thus reducing congestion caused by construction.

g. Effect on or changes to environmental commitments identified in the RFP –
Equal; The proposed ATC has no impact on the environmental commitments identified in the RFP.

h. Impacts to surrounding and adjacent communities, including EJ and LEP populations–
Better; By shortening the construction schedule and reducing truck traffic, this ATC would reduce impacts to the surrounding and adjacent communities during construction.

i. Changes needed in the location, length, height, or number of noise walls – N/A

j. Impact on utilities and rail
Equal; The proposed ATC has no impact on utilities and railroads.

k. Discussion of additional ROW or easements required –
Equal; The proposed ATC does not require additional ROW or easements.

l. An assessment of Forward Compatibility –
Equal; The proposed ATC does not impact the M2 and M3 forward compatibility.

ATC #17 – Reinforced Soil Slope Backfill Material Gradation

Washington State Department of Transportation

Puget Sound Gateway SR 509/SR 167
SR 509: 401 2nd Ave South, Ste. 300
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Tumwater, WA 98501
206-464-1220
TTY: 1-800-833-6388
www.wsdot.wa.gov

August 9, 2021

Greg Ritke
Graham Contracting Ltd.
13555 SE 36th Street, Suite 120
Bellevue, WA 98006

Dear Mr. Ritke:

We have reviewed your ATC017 and have determined that the ATC is approved.

Please contact me at (360) 701-9413 if you have any questions.

Sincerely,

Steven D. Fuchs

Steve Fuchs, P.E.
SR 167 Completion Project Manager

SR 167/I-5 to SR 509 - New Expressway Project

ATC Title: Reinforced Soil Slope Backfill Material Gradation
ATC Number: 17

Brief Description: The WSDOT Standard Specifications and Geotechnical Design Manual (GDM) call for gravel borrow to be used as backfill for reinforced soil slopes. This ATC proposes the use of the gradation found in the FHWA reference document "Design of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes" (Berg, et. al.) for reinforced soil slopes but with a limit to the fines content of 35% passing the No. 200 Sieve in order to utilize the roadway embankment material in the RSS fills.

Detailed description:
Section 15-A-3 of the GDM states that "For reinforced soil slopes, the gradation requirements in WSDOT *Standard Specifications* Section 9-03.14(4) shall be used, but modified to require the percent passing a No. 200 sieve of between 7 and 12 percent, and the minimum SE reduced to 15."
Below is a table of the specified RSS backfill gradation per the GDM:

Sieve Size	Geosynthetic Reinforcement percent Passing	Metallic Reinforcement percent Passing
4		99-100
2		75-100
1¼″	99-100	
1″	90-100	
No. 4	50-80	50-80
No. 40	30 max.	30 max.
No. 200	7-12	7-12
Sand Equivalent	15 Min.	15 Min.

All percentages are by weight

The table below is the proposed RSS gradation per FHWA with a modified percent passing the No. 200 Sieve:

Sieve Size	Percent Passing
4"	100
No. 4	20-100
No. 40	0-60
No. 200	35 Max.
PI	PI ≤ 20

RSS embankments have been successfully built in many parts of the state. More recently, a 1.5H:1V RSS was built at the SR 530 Trafton Creek & Schoolyard Creek Fish Passage Design-Build Project. At both the Trafton and Schoolyard Passages, RSS embankments were utilized

and backfilled with WSDOT Spec 9-03.14(3) common borrow. The slopes were then heavily vegetated and have survived through plant establishment.

This ATC proposed to use an RSS backfill gradation that is between the WSDOT and FHWA specifications. This will allow Graham to use general embankment borrow in the RSS which will reduce the amount of special fill to the jobsite and reduce schedule for the project by not having to switch material types because RSS slopes will be constructed concurrently with the roadway embankment.

To ensure the full 75-year service life of the RSS, the strap length of the reinforcement will be designed for this backfill material to meet all engineering requirements laid out in the technical requirements. Graham will install subdrains on the back side of the RSS to prevent buildup of hydrostatic pressure behind the reinforced zone as needed. Graham will also do laboratory strength testing of the borrow to ensure it will meet the performance required.

Usage: This ATC will be used at all RSS slopes located on the project.

Subsurface Investigation: No additional subsurface investigation is required. Graham has analyzed the gradations from local suppliers and previously stockpiled material already located within the project limits and at the off-site borrow sources.

Proposed RFP modifications:

Below is the proposed change to section 15-A-3 of the WSDOT Geotechnical Design Manual located in Appendix D9:

For reinforced soil slopes, the gradation requirements recommended in Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes (Berg, Christopher, and Samtani, 2009) ~~in WSDOT Standard Specifications Section 9-03.14(4)~~ shall be used, but modified to require the maximum percent passing a No. 200 sieve ~~of between 7 and 12~~ to be 35 percent, and the ~~minimum SE reduced to 15~~ maximum PI to be 10. Based on experience, for typical reinforced slopes, ~~it is difficult to compact slopes with cleaner soils as well~~ the increased fines content helps ~~as~~ to ~~prevent~~ reduce erosion of the slope face while the slope vegetation is becoming established and support better vegetation and long-term slope stability. However, due to the greater fines content, the reinforced soil is likely to drain more slowly than the MSE wall backfill, which should be considered in the reinforced slope design, depending on the anticipated seepage into the reinforced backfill. ¶

Insert the following table to RFP Chapter 2, Section 2.6.7.4 after line 38:

For 1.2H:1V Max Reinforced Soil Slopes, the following gradation may be used:

Sieve Size	Percent Passing
4"	100
No. 4	20-100
No. 40	0-60
No. 200	35 Max.
PI	PI ≤ 10

Design Analysis: This ATC does not require any additional design analysis.

Analysis:

a. Functionality –
Equal; RSS functionality will not be affected by changing to the proposed backfill material.

b. Structural adequacy –
Equal; Through soil testing and engineering, the structural adequacy of the RSS will not be affected by changing to the proposed backfill material. The addition of subdrains, as needed, will allow for drainage of water built up behind the RSS which will maintain the structural adequacy of the slope if that condition occurs.

c. Safety –
Equal; Safety will not be affected by this ATC.

d. Comparison of life cycle costs including repair and maintenance –
Better; The higher fines content of the proposed backfill in this ATC will improve the ability for vegetation planted along the slope to establish. Traditionally, RSS maintenance is limited to as-needed vegetation management once plant establishment has occurred. The higher fines content increases the chance of success for plant establishment which reduces erosion issues and in turn, reduces maintenance costs.

e. Aesthetics –
Better; With the proposed RSS backfill in this ATC, aesthetics will be improved by having a fully vegetated slope with greater plant establishment over a traditional gravel borrow backfill.

f. Impacts on construction traffic –
Better; With the use of roadway embankment material that meets the spec as RSS backfill in this ATC, the amount of import material from far away sources is greatly reduced. Import for backfill will now be coming from currently on-site stockpiled sources or from one of the close-by state provided borrow sources.

g. Effect on or changes to environmental commitments identified in the RFP –
Better; The higher fines content of the backfill proposed in this ATC will support vegetation much better than gravel borrow and give plants a higher chance at establishment. This ATC also reduces the need to produce a special material to be used as backfill and instead uses a more naturally found borrow not in need of crushing or screening to meet spec.

h. Impacts to surrounding and adjacent communities, including EJ and LEP populations –
Equal; This ATC will not affect the surrounding communities.

i. Changes needed in the location, length, height, or number of noise walls –
Equal; This ATC does not affect noise walls.

j. Impact on utilities and rail –
Equal; This ATC does not affect utilities and rail.

k. Discussion of additional ROW or easements required –
Equal; This ATC does not need additional ROW or easements.

l. An assessment of Forward Compatibility –
Equal; This ATC does not affect Forward Compatibility.

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Your Construction Solutions Partner