RAILPROS

Finalized New Interconnected Crossing Review Report

DOT # 979302J

Railroad Interconnected Traffic Signal at:

Park Avenue at Logan Avenue

Renton, WA

BNSF

Seattle Subdivision

MP 3.70

23 U.S.C. § 409 Document

Prepared For: BNSF RAILWAY

August 23, 2022

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Appendices

Certification

I, Karen Hankinson, certify that this report was prepared under my responsible charge.

Sincerely,

Karen Hankinson, PE
RailPros Inc.
949-383-2314
karen.hankinson@railpros.com

BNSF Contact Information

In case of crossing related emergency, call the BNSF Hotline number posted on the Emergency Notification System (ENS) sign at the crossing: 800-832-5452.

In case of any proposed physical changes, operational changes, or traffic control work at/near the grade crossing, contact Stephen Semenick at BNSF 206-625-6152.

Executive Summary

Crossing ADT: N/A

Rail Traffic: 3 trains/week*

Vehicular Speed Limit: 30 mph

Maximum Train Speed: 10 mph*

Number of Lanes at Crossing: 3 lanes**

Number of Tracks: 1 Spur Line

Highway Authority Contact: Robert Hanson, City of Renton **Phone:** 425-430-7223 **Email:** bhanson@rentonwa.gov

Railroad Contact: Stephen Semenick, BNSF **Phone:** 206-625-6152 **Email:** stephen.semenick@bnsf.com

Railroad Reviewer: Karen Hankinson, RailPros **Phone:** 949-383-2314 **Email:** karen.hankinson@railpros.com

*Data from adjacent grade crossing at Boeing Company Employee Walkway (DOT #091727P) FRA Inventory Report (Data taken in 2000)
**Data from proposed new grade crossing plans

Existing Conditions

There is no existing grade crossing at this location. A new active grade crossing is proposed.

Proposed Project Design

The proposed design includes the following:

- Installing a new roadway north of the 757th Avenue/Park Avenue intersection.
- Establishing a new RR grade crossing north of the 757th Avenue/Park Avenue intersection with 1 northbound lane and 2 southbound lanes.
- Modifying the existing Logan Avenue/Park Avenue traffic signal to include the 757th Avenue/Park Avenue intersection and install a presignal for southbound traffic at the new grade crossing.
- Installing new interconnection from the RR signal system to the Logan Avenue/Park Avenue traffic signal.
- Installing 2 new RR entrance gates with flashers and backflashers in the northwest and southeast quadrants of the new grade crossing.
- Installing 1 new RR signal with flashers in the median north of the new grade crossing for southbound motorists.
- Installing new sidewalk approaches along the east and west sides of Park Avenue approaching the new grade crossing as well as between the 757th Avenue/Park Avenue and Logan Avenue/Park Avenue intersections.
- Installing new raised medians on both sides of the new grade crossing.
- Installing new detectable warning surfaces in all quadrants of the new grade crossing.
- Installing a new RR signal house in the northeast quadrant of the grade crossing.
- Installing crosswalks on the east and west legs of the 757th Avenue/Park Avenue intersection.
- Reconfiguring the eastbound approach to the 757th Avenue/Park Avenue intersection to have 1 left/thru/right lane and 1 right turn lane.

Proposed Project Design (continued)

- Reconfiguring the southbound approach to the Logan Avenue/Park Avenue intersection to include 1 left turn lane, 1 thru/left lane, and 1 thru/right lane.
- Requesting 25 seconds of advance preemption time (APT) for the signalized intersection of Logan Avenue/Park Avenue.

Preemption Time Summary

Table 1: Preemption Time Summary
Park Avenue at Logan Avenue, Bellingham, WA
Park Avenue Grade Crossing, BNSF Seattle Subdivision Spur Line DOT #979302J

	Proposed Preemption Values (Sec)
Minimum Time	20
Clearance Time (CT)*	3
Additional Gate Delay*	2
Total Warning Time	25
Advance Preemption Time (APT)	25**
Total Approach Time (TAT)	**50*** **

* Railroad to verify time needed during RR Signal Design Process.
** Per the preemption request form, 22 seconds maximum of the 25 second APT request may be used to serve any active pedestrian phase at the time of preemption.
*** Note that trains will operate under “stop and proceed” operations at this crossing. Once APT request has been provided, the crossing will activate with the RR lights flashing and gates descending. When the crossing is free of vehicles/pedestrians and the gates are horizontal, the train may proceed through the crossing.

Summary of RailPros Comments

Table 2: Grade Crossing Comment Summary Table
Park Avenue, Renton, WA
Park Avenue Grade Crossing, BNSF Seattle Subdivision Spur Line DOT #979302J

No.	RailPros Recommendations	Standard/Reference	Agency Responses (12/18/21)	RailPros Responses (3/9/22)	Agency Responses (4/1/22)	RailPros Responses (8/23/22)
1	Provide finalized diagnostic meeting minutes.	Diagnostic Meeting Minutes (**Appendix B**); Standard Practice	Provided. See attachment A.	-	-	-
2	Preemption Calculations: Confirm the CSD is the distance available for vehicle storage measured 6' from the rail nearest to the intersection to the normal stopping point on the highway, as appropriate, to obtain the shorter distance. Please revise dimension in the preemption calculations and in the preemption distance measurement exhibit accordingly.	AREMA C&S Manual Part 1.1.1 (2021) [Guidance]; FHWA Highway-Rail Crossing Handbook (pg. 76-77) (2019) [Guidance]; TXDOT Preemption Calculation Instructions (2017) [Standard]	Decreased to 157 feet since normal stopping point is stop line.	-	-	-
3	Preemption Calculations: Confirm that the MTCD is measured from the RR warning device to 6' beyond the track measured perpendicular to the far rail. Measure the distance along the centerline or edge line of the highway, as appropriate, to obtain the longer distance. Please revise dimension in the preemption calculations and in the preemption distance measurement exhibit accordingly.	AREMA C&S Manual Part 1.1.1 (2021) [Guidance]; FHWA Highway-Rail Crossing Handbook (pg. 76-77) (2019) [Guidance]; TXDOT Preemption Calculation Instructions (2017) [Standard]	Increased to 32 feet.	-	-	-
4	Preemption Calculations: Review if left-turn towards tracks (Line 28) should be checked "yes". The crossing is located relatively far away from the intersection and allows enough space for a vehicle to queue downstream of the Park Avenue/Southport Drive intersection but upstream of the grade crossing.	Standard Practice; TXDOT Preemption Calculation Instructions (2017) [Standard]	“Yes” is appropriate because of movements from 757th across tracks. (We agree that if we only needed document the movement from Logan Ave N, this box would be “No”.)	Consider selecting "no" for left turns towards tracks due to the unique configuration of the intersection and the traffic signal phasing. By selecting "no", the total approach time can be reduced to 50 secs (not including the equipment response time), which will meet the AREMA 50 Second rule.	Revised to “no”.	-
5	Preemption Calculations: Design vehicle turning templates state a different length. Clarify and revise calculations/plans accordingly.	Standard Practice	Turning template being referenced in this comment is a vehicle that will turn west into Boeing and is not anticipated to cross the railroad. Value of 82 feet in calculations is accurate.	-	-	-

Table 2: Grade Crossing Comment Summary Table (continued)
Park Avenue, Renton, WA
Park Avenue Grade Crossing, BNSF Seattle Subdivision Spur Line DOT #979302J

No.	RailPros Recommendations	Standard/Reference	Agency Responses (12/18/21)	RailPros Responses (3/9/22)	Agency Responses (4/1/22)	RailPros Responses (8/23/22)
6	Preemption Calculations: Consider reducing minimum green time in order to lower right-of-way transfer time.	ITE Recommended Practice: Preemption of Traffic Signals Near Railroad Crossings Parts 2.4.1 & 2.4.2 (2021) [Guidance]; Recommended Practice	Minimum green time to remain at 5 seconds per City standards.	Total Approach Time (TAT) currently exceeds the AREMA 50 Second Rule (50 second of warning time excluding equipment response time). Please see our responses to Comments 4 and 7 to help reduce the TAT.	Did not adjust minimum green time. See comment response #4, which reduced the TAT to acceptable levels per RailPros comments.	Per further coordination with BNSF and the agency, 50 seconds of Total Approach Time will be provided (20 secs of Minimum Warning Time, 3 secs of Clearance Time, 2 secs of Additional Gate Delay, and 25 secs of Advance Preemption Time).
7	Preemption Calculations: Clarify how the advance pedestrian preemption time is being calculated. The longest crosswalk length appears to be the north leg of the Park Ave/Southport Drive intersection. Also, consider splitting the pedestrian clearance time/crosswalk length into two time intervals/measurements due to the pedestrian refuge area.	Standard Practice	Corrected labeling of crosswalk. This 103' dimension is for the north crosswalk, which is the longest at the intersection. Calculation to remain unchanged.	Pedestrian time requested can be provided via a pedestrian preemption relay circuit, but request of 30 seconds exceeds the maximum allowance that BNSF can provide. Per comments on preemption calculations, consider partially truncating the pedestrian clearance interval and allowing pedestrian clearance during yellow and all-red intervals.	We are not able to reduce pedestrian timings due to length of crosswalk and MUTCD crossing speeds. The movement must remain as a single pedestrian crossing—it cannot be divided—due to the phasing design for the traffic signal, which has no additional capacity to handle extra pedestrian phases. The 30 second value must remain as-is for this crossing.	Per further coordination with BNSF and the agency, 25 seconds of APT will be provided. 22 seconds maximum of the 25 second APT request will be used to serve an active pedestrian phase at the time of preemption.
8	Preemption Request Form: Preemption distance measurement exhibit and preemption calculations indicate interconnection with the Park Avenue/Logan Avenue intersection, while the Preemption Request Form indicates interconnection with the 757th Avenue/Park Avenue intersection. Please clarify and revise accordingly.	Standard Practice	Revised to Park/Logan intersection for parallel street name.	-	-	-
9	Preemption Request Form: Wiring schedule on traffic signal plans indicates four #4 cables. Revise the value in the preemption request form to include total number of RR conductors and to remain consistent with number of circuits specified on plans and on this request form.	Standard Practice	2-#4 cables are for power to a non-BNSF/RR device. The Plans are accurate and consistent with the PRF in showing 2-#4 to BNSF/RR cabinet.	-	-	Per further coordination with the agency, the Preemption Request Form has been updated to indicate 12-#14 conductors to accommodate the requested RR relays.

Table 2: Grade Crossing Comment Summary Table (continued)
Park Avenue, Renton, WA
Park Avenue Grade Crossing, BNSF Seattle Subdivision Spur Line DOT #979302J

No.	RailPros Recommendations	Standard/Reference	Agency Responses (12/18/21)	RailPros Responses (3/9/22)	Agency Responses (4/1/22)	RailPros Responses (8/23/22)
10	City to review if pedestrian gates will be proposed. Per diagnostic meeting minutes, BNSF grade crossings with pedestrian gates have typically had one of more of the following characteristics: high-speed trains, limited sight distances, and high pedestrian volumes.	Diagnostic Meeting Minutes (**Appendix B**); Recommended Practice	Pedestrian gates will not be installed at this location because there are no high-speed trains, sight distance is good, and there are not anticipated to be high pedestrian volumes.	-	-	-
11	Provide a 4' x 4' minimum square of unwalkable surface around all RR warning devices to discourage pedestrians but does not limit RR maintenance personnel from accessing RR equipment. Loose ballast or decomposed granite is generally preferred.	Recommended Practice	Surrounded all RR poles with river rock paving treatment used in planter strips that is a bumpy surface to deter pedestrian access. (See drawing RS1, MD3, MD4, PL1, and PL2.)	Revise BNSF Crossing Layout plan sheet to reflect this change as well.	Revised.	-
12	RR gate lengths should be measured from the gate tip to center of RR gate mechanism. Please revise dimensions shown accordingly.	BNSF Standard	Revised. See drawing RR1.	Gate lengths should be measured from the center of the RR gate mechanism, not the edge. Revise dimensions and construction notes in plan sheet RR1 accordingly. Revise BNSF Crossing Layout plan sheet to stay consistent with plan sheet RR1.	Revised.	-
13	Specify lane widths at the grade crossing on plans.	Standard Practice	Specified on drawing CH1.	Revise BNSF Crossing Layout plan sheet to stay consistent with plan sheet CH1.	Revised.	-
14	In the raised median north of the crossing, specify the RR warning device to be 15' from centerline of track.	BNSF Standard	Station provided on drawing RR1 provides 15’ clearance from centerline.	Specify 15’ from center of RR gate mechanism to centerline of tracks on plan sheet RR1. Revise dimension on “BNSF Crossing Layout” plan sheet to stay consistent with plan sheet RR1.	Revised.	-
15	Specify all RR signal equipment to be installed by BNSF forces.	Standard Practice	Revised.	Specify on the BNSF Crossing Layout plan sheet that RR signal house and gates will be installed by BNSF forces (and to stay consistent with plan sheet RR1).	Revised.	-
16	Grade crossing track panels should be limited to traveled way for vehicles and pedestrians but still extending at least 2' beyond traveled way on both sides of the grade crossing. Please revise accordingly. Also specify the total grade crossing surface length. Show dimensions on plans.	BNSF Standard	Revised. See “Bungalow Access Detail” on drawing MD3.	Revise BNSF Crossing Layout plan sheet to stay consistent with details shown in plan sheet MD3.	Revised.	-

Table 2: Grade Crossing Comment Summary Table (continued)
Park Avenue, Renton, WA
Park Avenue Grade Crossing, BNSF Seattle Subdivision Spur Line DOT #979302J

No.	RailPros Recommendations	Standard/Reference	Agency Responses (12/18/21)	RailPros Responses (3/9/22)	Agency Responses (4/1/22)	RailPros Responses (8/23/22
17	Specify proposed RR signal house to be installed by BNSF forces.	BNSF Standard	Specified on drawing RR1, General Note #1.	Specify all proposed RR signal equipment to be installed by BNSF forces on the "BNSF Crossing Layout" plan sheet.	Revised.	-
18	Remove Railroad Gate Support Foundations plan sheet "ST3" from plan set. All RR gates will be installed by BNSF forces per BNSF standards.	BNSF Standard	Removed sheet.	Plan set still includes sheet ST3. BNSF will install all RR gate mechanisms and their respective foundations per their standards. Please remove plan sheet ST3 from plan set accordingly.	Plan sheet ST3 no longer includes railroad foundation information. See ST3 drawing dated 12/2021. This sheet contains structural curb details. Sheet ST3 is not removed.	-
19	Per Diagnostic Meeting Minutes, verify that any proposed plants/vegetation will not block motorists' visibility of the RR flashers or traffic signals at any time.	Diagnostic Meeting Minutes (**Appendix B**); Standard Practice	Verified.	-	-	-
20	Consider installing 8" curb height to provide better motorist channelization at the grade crossing and to mitigate future maintenance issues related to roadway paving.	Recommended Practice	Recommendation will not be incorporated; curb height will remain at 6" to be consistent with City of Renton standards and requirements.	-	-	-
21	Specify that the edge of the raised median is 10' from the centerline of track.	BNSF Standard	The edge of the raised median slightly exceeds 10' from centerline of track. Island shape is defined in the details in the Plans (MD4) and a separate dimension is not required.	-	-	-
22	Provide 2' minimum of asphalt adjacent to grade crossing panels for sidewalk approaches.	BNSF Standard	Provided. See drawing PV1. (Prior sidewalk adjacent to tracks removed and replaced with HMA.)	Revise asphalt placement in "BNSF Crossing Layout" plan sheet to stay consistent with plan sheet PV1.	Revised.	-
23	Indicate the type of barrier to be used to prohibit any vehicular movements towards BNSF ROW during Construction Phase 1B and 2A.	Standard Practice	Type 3 barricades to be used. See special provision 1-10.3(3).	Specify that ROW fencing will be maintained during all phases of construction until the project is completed. Both pedestrians and motorists should be prohibited from accessing the railroad tracks throughout construction.	Revised traffic control plan sheets and specifications to require contractor to erect temporary (chain link) construction fencing along ROW boundary during all non-working hours to prohibit pedestrian and vehicle access.	-

Table 2: Grade Crossing Comment Summary Table (continued)
Park Avenue, Renton, WA
Park Avenue Grade Crossing, BNSF Seattle Subdivision Spur Line DOT #979302J

No.	RailPros Recommendations	Standard/Reference	Agency Responses (12/18/21)	RailPros Responses (3/9/22)	Agency Responses (4/1/22)	RailPros Responses (8/23/22)
24	Verify that the diamond heavy haul truck's intended path of travel will be cleared of any regular vehicles as well as other vehicles of this size prior to making these turning movements. Due to the intrusion of the turning movement into opposing traffic lanes, the presence of other vehicles in the surrounding area can potentially result in complications with completing the turning movement and/or vehicle collisions.	Standard Practice	Confirmed. Diamond Heavy Haul truck events are very rare (less than once per year), require a permit, and close roadways to other vehicles.	-	-	-
25	Provide a more substantial barrier or curb to prohibit any vehicular movements towards the crossing during Construction Phases 1C and 2C.	Recommended Practice	Type 3 barricades to be used. See special provision 1-10.3(3).	Specify that ROW fencing will be maintained during all phases of construction until the project is completed. Both pedestrians and motorists should be prohibited from accessing the railroad tracks throughout construction.	See response to Comment #23.	-
26	Specify if Boeing delivery vehicles will be traveling on 757th Avenue during each stage of construction, as applicable, and verify if there is adequate room for turning movements. Provide turning templates as needed.	Standard Practice	General notes and specifications instruct contractor to be aware that Boeing trucks may turn through the work zone during all phases. Contractor is responsible for facilitating adequate room for movements.	-	-	-
27	Install a W10-1 sign and RxR pavement markings on the southbound approach and a W10-1 sign on the northbound approach along Park Ave to provide adequate warning to motorists of the grade crossing and per MUTCD standards. The RxR pavement marking should be placed such that a portion of the "X" is directly adjacent to the W10-1 sign.	MUTCD Figure 8B-6 (2009); MUTCD Table 2C-4 (2009); MUTCD 8B.27 (2009) [Guidance]; Standard Practice	Shifted the location of the W10-1 to the location specified and will add W10-1 sign for the southbound direction. (Note the design previously included northbound W10-1 signing.) See drawings CH1 and CH2.	Per email coordination on 2/25/22, a supplemental W10-1 sign is being provided on the left side of the southbound approach to the grade crossing to provide additional warning to motorists.	Agree. Revised documents accordingly.	-
28	Install a W10-2(LT) sign on the eastbound approach along 757th Avenue to provide adequate warning to motorists of the grade crossing.	MUTCD Figure 8B-6 (2009); MUTCD Table 2C-4 (2009); MUTCD 8B.06 (2009) [Standard]; Standard Practice	Added. See drawings CH1 and CH2.	-	-	-

Table 2: Grade Crossing Comment Summary Table (continued)
Park Avenue, Renton, WA
Park Avenue Grade Crossing, BNSF Seattle Subdivision Spur Line DOT #979302J

No.	RailPros Recommendations	Standard/Reference	Agency Responses (12/18/21)	RailPros Responses (3/9/22)	Agency Responses (4/1/22)	RailPros Responses (8/23/22)
29	Consider installing R15-8 "LOOK" signs adjacent to the detectable warning surfaces in all quadrants of the grade crossing for pedestrians approaching the grade crossing.	MUTCD 8B.17 (2009) [Option]; Recommended Practice	Added. See drawings CH1, CH2, SG1, and SG2.	Visually show R15-8 "LOOK" signs to be facing pedestrians approaching the grade crossing instead of exiting the grade crossing. Include installation of a "LOOK" sign in the southwest quadrant of the grade crossing.	Revised sign directions to face away from tracks. Sign is already included in southwest quadrants, see plans SG1 and SG2.	-
30	Consider restricting westbound right turns from 757th Avenue onto Park Avenue due to roadway geometry restrictions. Install thru-left pavement markings and R3-6 signage accordingly.	Recommended Practice	This turning movement is restricted already in the design and R3-6 signage is provided.	Specify where proposed R3-6(LT) signage is located along the westbound approach on 757th Avenue. Update sign schedule accordingly.	12/18/2021 response should have listed that the design includes R3-1 signing for a right-turn restriction. The design does not include R3-6 signing. R3-6 signing will not be added.	-
31	Specify all RxR pavement markings to be installed along with transverse lines per MUTCD and WSDOT standard plan M-11.10-03.	MUTCD 8B.27 (2009) [Standard]; MUTCD Figure 8B-7A (2009) [Standard]; WSDOT Standard Plan M-11.10-03	Revised note text to clarify that transverse lines are included. See drawing CH1, Construction Note 18.	Visually show the RxR pavement marking in plan sheet “G1” to include transverse lines per MUTCD standards and WSDOT standard plan M-11.10-03.	Now shown on plan sheet G1.	-
32	Verify that any proposed signage near the grade crossing will not block motorists' visibility of RR flashers at any time.	AREMA C&S Manual 3.2.5 Section C.7 (2021) [Guidance]; Standard Practice	Verified.	-	-	-
33	Consider installing median striping between the grade crossing panels and the median to discourage motorists from turning onto the tracks.	Recommended Practice	Added. See drawing CH1.	-	-	-
34	Consider adding lane line extension striping for the southbound dual left-turn from Park Avenue onto Southport Drive.	MUTCD 3B.08 (2009) [Guidance]; Recommended Practice	Added. See drawing CH1.	-	-	-
35	Specify limit lines to be 24" wide for roadway approaches leading towards the grade crossing.	Standard Practice; WSDOT Standard Plan M-11.10-03	Stop lines for roadway approaches revised to 24”. See drawing CH1.	-	-	-
36	Consider installing edge line striping to channelize motorists through the grade crossing and discourage any turning onto the tracks.	MUTCD 8D.04 (2009) [Option]; Recommended Practice	Added. See drawing CH1.	-	-	-
37	Consider installing R3-2 "NO LEFT TURN" blankout signs for eastbound traffic on 757th Avenue to restrict turns towards the crossing during a preemption event.	ITE Recommended Practice: Preemption of Traffic Signals Near Railroad Crossings Part 2.4.6 (pg. 42-43) (2021) [Guidance]; MUTCD 8B.08 (2009) [Guidance]/[Option]; Recommended Practice	Have decided to not install blank-out sign due to controller limitations.	-	-	-

Table 2: Grade Crossing Comment Summary Table (continued)
Park Avenue, Renton, WA
Park Avenue Grade Crossing, BNSF Seattle Subdivision Spur Line DOT #979302J

No.	RailPros Recommendations	Standard/Reference	Agency Responses (12/18/21)	RailPros Responses (3/9/22)	Agency Responses (4/1/22)	RailPros Responses (8/23/22)
38	Specify controller type, controller software and RR interface panel. Verify the proposed traffic signal controller's capabilities to provide full functionality with proposed RR relays.	ITE Recommended Practice: Preemption of Traffic Signals Near Railroad Crossings Part 1.1 (2021) [Guidance]; Standard Practice	This information is specified in the contract specifications, see 9-29.13(3).	Specify the proposed RR interface panel, and confirm that the traffic signal controller will be able to provide full functionality with the proposed RR relays.	Added part number (Western Systems #2010052029, Railroad Preempt Panel Renton) to specifications 9-29.13(10)A.	Per further discussions and coordination with the agency, the Riotech x-RPS Railroad Preemption System will be used as the RR interface.
39	Consider providing a back-up power supply for proposed traffic signal.	ITE Recommended Practice: Preemption of Traffic Signals Near Railroad Grade Crossings Part 2.2.1 (2021) [Guidance]; MUTCD 4D.27 (2009) [Guidance]; Standard Practice	Signal already includes battery back-up system in existing condition and this will remain with the project.	-	-	-
40	Consider providing PV (programmed visibility) signal heads for southbound traffic (B1, B2, and B3) at the Park Ave/Logan Ave intersection. The PV heads should be visible for motorists downstream of the RR limit line and guiding them through the grade crossing and 757th Ave/Park Ave intersection. However, if a motorist has not traveled past the RR limit line when preemption begins, the PV heads will discourage them from attempting to cross as the RR warning devices activate.	ITE Recommended Practice: Preemption of Traffic Signals Near Railroad Crossings Part 2.3.1 (Page 29) (2021) [Guidance]; MUTCD 8C.09 (2009) [Guidance]; Recommended Practice	Provided. See drawing SG1.	-	-	-
41	Specify that pedestrian gates will descend along with the vehicular gates. Pedestrian movements should not be controlled by the RR gates.	Standard Practice	Note related to this comment is outdated and will be deleted. Pedestrian routes will not have gate arms across them.	-	-	-
42	Detail how traffic signal will transition from normal operations to RR preemption operations. Specify which RR relay inputs cause phasing sequence changes as shown during RR preemption.	BNSF Standard; ITE Recommended Practice: Preemption of Traffic Signals Near Railroad Crossings Part 1.1 (2021) [Guidance]; MUTCD 8C.09 (2009) [Standard]; Standard Practice	Pre-emption calculations will be provided in contract specifications as reference material for Contractor to enact during signal programming in collaboration with City staff.	The preemption calculations (and preemption request form) do show the designed warning time and proposed railroad relays, but do not specify how those relays are related to traffic signal operations. Show on the phasing diagram in plan sheet SG1 which railroad relays will cause the change in each traffic signal phasing sequence.	Added advanced preemption detection and advance vehicle preemption connected relays on SG1 phase diagram.	Per further coordination with the agency, phase diagrams have been updated to show traffic signal transitioning from normal to preemption operations.

Table 2: Grade Crossing Comment Summary Table (continued)
Park Avenue, Renton, WA
Park Avenue Grade Crossing, BNSF Seattle Subdivision Spur Line DOT #979302J

No.	RailPros Recommendations	Standard/Reference	Agency Responses (12/18/21)	RailPros Responses (3/9/22)	Agency Responses (4/1/22)	RailPros Responses (8/23/22)
43	Indicate if green extension for southbound traffic on Park Avenue will be provided to allow queue prevention at the grade crossing during normal operations.	ITE Traffic Control Devices Handbook (pg. 467-468) (2013) [Guidance]; Standard Practice	That is the intent. However, signal timing information will not be included on contract plans. Contractor and City staff to enact timing during signal programming. See Attachment B for preliminary signal timing outputs.	-	-	-
44	Westbound traffic should not be allowed during preemption operations. Revise accordingly.	Standard Practice	It is not allowed. This is a typo in the diagram that is now corrected. See drawing SG1.	-	-	-
45	Show the interconnection conduit from the traffic signal controller to the RR signal house.	Standard Practice	Conduit is shown on drawing RR1.	Show interconnection conduit on traffic signal plan sheet “SG1” and update wiring schedule in plan sheet “SG2”.	Revised to show on SG drawings.	-
46	Provide a Interconnected Warning Label in the traffic signal cabinet to warn traffic signal technicians that the traffic signal is interconnected with the railroad and providing both highway and railroad agency contact information.	AREMA C&S Manual 3.1.10 Section C.4 (2021) [Guidance]; BNSF Standard	Added requirement to provide label in special provision 8-20.1.	-	-	-
47	Implement a preemption operation and maintenance program with BNSF.	FRA Safety Advisory 2010-02 (2010); FRA Technical Bulletin S-12-01 (2012); MUTCD 4D.02 (2009) [Guidance]; Standard Practice.	The City currently has an Annual Signal Testing Program with BNSF. The Grade Crossing Construction and Maintenance Agreement will also provide provisions for future inspection and/or maintenance of the signal equipment, crossing signal house.	-	-	-
48	See attached plan sheets for additional comments.	See **Appendix E**	Noted.	See attached plan sheets for additional comments.	See attached responses to plan comments.	-

Table 2: Grade Crossing Comment Summary Table (continued)
Park Avenue, Renton, WA
Park Avenue Grade Crossing, BNSF Seattle Subdivision Spur Line DOT #979302J

No.	RailPros Comments (3/9/22) Additional comments based on design plans provided on 12/18/21	Standard/ Reference	Agency Responses (4/1/22)	RailPros Responses (8/23/22)	-	-
49	Show backflashers on the RR warning device located in the north side median of the grade crossing.	Standard Practice	Added.	-	-	-
50	Please confirm if there any other vehicle types aside from passenger cars (such as emergency services, fire, delivery trucks) traveling through the grade crossing and into the Boeing facility. If so, verify that these vehicles will be able to clear the left turn from 757th Ave towards the grade crossing and also safely travel through the S-curve north of the grade crossing from either direction.	Recommended Practice	Confirmed; there are no other types of vehicles that will move between railroad crossing and Boeing.	-	-	-
51	R3-2 signage cannot be installed on RR signal equipment. Specify that R3-2 sign will be installed on a separate post, but placed such that sign will not block motorists' visibility of the RR flashers.	BNSF Standard; Standard Practice	Moved sign and confirm sight lines to flashers are not affected.	-	-	-
52	In the southwest quadrant, increase the distance of traffic signal from centerline of tracks if feasible. Future maintenance of traffic signal pole may impact grade crossing operations and safety.	Recommended Practice	This is not feasible and pole will not shift. All maintenance activity will be at least 15 feet from center of tracks.	-	-	-

Note: RailPros/BNSF have no further responses to the Agency's responses on 4/1/22.

Evaluation

The City of Renton is proposing to establish a new railroad grade crossing on Park Avenue by extending Park Avenue north from the 757th Avenue/Park Avenue intersection. The City is also proposing to modify the existing traffic signal at the Logan Avenue/Park Avenue intersection to include the 757th Avenue/Park Avenue intersection, install a southbound presignal and interconnection to the RR signal system, install RR entrances gates and RR flashers, install sidewalk approaches on both sides of the new grade crossing, install raised medians on both sides of the new grade crossing, and modify/add signing and striping. Existing field photos are provided in **Appendix A**. The diagnostic meeting minutes (dated 12.11.19), Preemption Request Form (dated 8.5.22) and project design plans (latest dated 8.5.22) have been provided for this review. This evaluation involved reviewing these items, providing comments, and recommending improvements.

Analysis of Preemption Calculations and Preemption Request Form

The Preemption Time Summary Table **(Table 1)** below shows the proposed preemption values. 20 seconds of Minimum Warning Time, 3 seconds of Clearance Time, 2 seconds of Additional Gate Delay time and 25 seconds of Advance Preemption Time is proposed for a Total Approach Time of 50 seconds. Note that trains will operate under "stop and proceed" operations at this crossing. Once the APT request has been provided, the crossing will activate with the RR lights flashing and gates descending. When the crossing is free of vehicles/pedestrians and the gates are horizontal, the train may proceed through the crossing. Per the preemption request form, 22 seconds maximum of the 25 second APT request may be used to serve any active pedestrian phase at the time of preemption. The breakdown of approach time is detailed in **Table 1**. Since the train operations are stop and proceed, the advance preemption time and approach time are controlled by these operations. Preemption calculations were prepared exclusively to establish track clearance green time. See **Appendix C** for RailPros provided preemption calculations.

The City of Renton has signed and submitted a BNSF Traffic Signal Preemption Request Form, and it is provided in **Appendix D**.

Table 1: Preemption Time Summary
Park Avenue at Logan Avenue, Bellingham, WA
Park Avenue Grade Crossing, BNSF Seattle Subdivision Spur Line DOT #979302J

	Proposed Preemption Values (Sec)
Minimum Time	20
Clearance Time (CT)*	3
Additional Gate Delay*	2
Total Warning Time	25
Advance Preemption Time (APT)	25**
Total Approach Time (TAT)	**50*** **

* Railroad to verify time needed during RR Signal Design Process.
** Per the preemption request form, 22 seconds maximum of the 25 second APT request may be used to serve any active pedestrian phase at the time of preemption.
*** Note that trains will operate under "stop and proceed" operations at this crossing. Once APT request has been provided, the crossing will activate with the RR lights flashing and gates descending. When the crossing is free of vehicles/pedestrians and the gates are horizontal, the train may proceed through the crossing.

Analysis of Proposed Design

The agency also provided their design plans for our project review. Please refer to **Appendix E** for those plans with comments from RailPros. The proposed design includes the establishment of a new grade crossing at Park Avenue, modification of the existing traffic signal at the Logan Avenue/Park Avenue intersection to include the 757th Avenue/Park Avenue intersection and installation of a southbound presignal, installation of new RR entrance gates and flashers, installation of new sidewalk approaches towards the new grade crossing, installation of raised medians, and modification of the existing signing and striping.

The design team has generally incorporated RailPros' comments on the proposed design as summarized in **Table 2**.

Refer to **Appendix F** for all standards and references related to these comments.

Continued Joint Agency Coordination

As the project moves forward, BNSF respectfully requests that the City of Renton continue to consult and partner with BNSF in this process. BNSF requests that the City of Renton provide traffic signal timing with the construction schedule at least two months prior to the traffic signal controller bench testing and four months prior to the proposed cutover with BNSF. BNSF also requests that RailPros attend both the bench testing and cutover to help facilitate the coordination between BNSF and the City of Renton at interconnected grade crossings.

As you are likely aware, the Federal Railroad Administration (FRA), thru its Safety Advisory 2010-02, details recommendations for annual joint testing of interconnected Railroad and Traffic Signal Systems. The FRA Technical Bulletin S-12-01(2012) provides guidance to State and Federal inspectors regarding performance of inspections of highway traffic signal preemption interconnections at highway-rail grade crossings. MUTCD 4D.02 also provides operation and maintenance guidance. BNSF would like to continue to work with the City of Renton to ensure that this new interconnected traffic signal will operate as agreed upon and that any future changes are discussed and jointly approved in a collaborative manner.

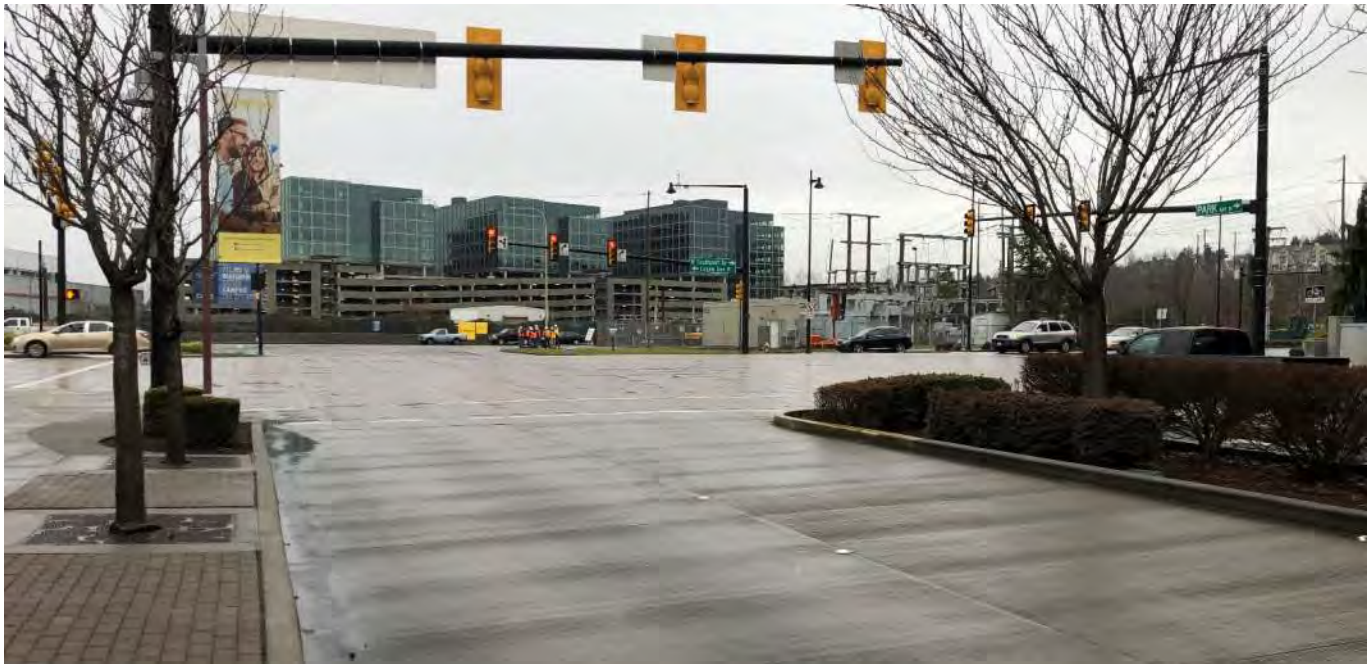
Conclusion

Over the past months, the City of Renton, BNSF, and RailPros have worked together to resolve issues of concern for the proposed Park Avenue grade crossing project. We recommend that the project moves forward to the railroad signal phase.

Appendices

Appendix A

Field Photos (12.11.19)



Park Avenue – Looking North Towards Park Avenue/Southport Drive Intersection

Logan Avenue – Looking East Towards Park Avenue/Southport Drive Intersection

Logan Avenue - Looking South

Park Avenue – Looking West

Park Avenue – Looking North Towards Future Crossing Location

757th Avenue – Looking West

Park Avenue – Looking Northbound

757th Avenue – Looking Eastbound

Appendix B

Diagnostic Meeting Minutes (dated 12.11.19)

MEETING NOTES

505 5th Avenue S, Suite 300, Seattle, WA 98104 | P 206.436.0515

Client: City of Renton
Project: 20160266.000 - N Park Avenue Extension
Time/Date: 9:00-10:30 December 11, 2019
Location: Park Avenue N Extension Project Site
RE: BNSF Comments Meeting

Attendees:
Hebé Bernardo, City of Renton, Public Works, City Project Manager
Bob Hanson, City of Renton, Public Works, Transportation Design Manager
Peter De Boldt, Perteet, Project Manager
Brent Powell, Perteet, Project Engineer
Stephen Semenick, BNSF, Manager Public Projects
Paul Robinson, BNSF, Signal Manager
Ron Shaffer, BNSF, Signal Supervisor
Kris Peterson, BNSF, Signal
Todd Belt, BNSF, Signal
Jason Flores, BNSF
Karen Hankinson, RailPros, Senior Project Manager
Ross Widener, Widener & Associates, Manager
Tim Oster, CTC Inc., Senior Project Engineer

Discussion:

Ron led a safety briefing for the group.

Steven led introductions of the attendees.

Peter explained the key elements of the City's proposed grade crossing:

- One northbound travel lane, with three southbound travel lanes
- Sidewalks on each side of the crossing
- No bike lanes through the crossing
- The crossing will facilitate a second access point for the SECO development (Southport) on Lake Washington
- Boeing has made it a requirement that the proposed design accommodate cross-street through movements for fuselage unloading operations
    - Boeing requested control option to put traffic signal in red flash
    - Crossing may be occupied due to Boeing train operations.
- The proposed gate south of 757th Avenue is not required from the City's perspective, but we want BNSF feedback on that proposed gate before removing it. RR gate mechanism could potentially be relocated to south of tracks but north of 757th Avenue. Verify adequate clearance from tracks and face of curb.

<u>Gate Configurations and Design Criteria</u>

BNSF presented design criteria for the locations of the gate poles and general gate system design:

- 15', minimum clearance, from center of track to center of RR gate mechanism.
- 5'-3", minimum clearance, from face of curb to center of RR gate mechanism

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RE: BNSF Comments Meeting

- 4'-3", minimum clearance, from face of curb to center of pole (all other sides of poles)
- 32' maximum for all gate arms
- All travel lanes must be at least 90% covered by gate arm length
- RR gate mechanisms must be placed between sidewalk and curb, so that they do not restrict/collide with pedestrians
- BNSF warning devices should be placed a minimum of 5' from center of device to center of City traffic signal and/or illumination poles. Do not block visibility of RR flashers.
- The railroad crossing should be lighted to the standards for an intersection
- The bungalow must be placed 30' from edge of traveled way and 25' from nearest rail
- The bungalow must be at the elevation of the track. A grade concern was noted between the track elevation and 757th Avenue/Park Avenue intersection.
- Trees or taller vegetation should not be placed anywhere that would block the view of the BNSF warning devices
- Pedestrian gates, if used, must provide for an exit zone/device at each crosswalk. Diagnostic Team to determine pedestrian volumes for pedestrian gate consideration.
- Cantilevered lights are required for multi-lane gates. One pair of RR flashers are required for each approach lane to the grade crossing per AREMA standards.
- Medians must be 10' wide to accommodate installation of RR warning device.
- 17' minimum to bottom of cantilever.
- River rock was noted as a potential material to use in agency's design of unwalkable surfaces.

Peter asked if gates could be placed on the departure side of the intersection to cover an approach lane. BNSF said no, because departure-side gates must close later to avoid trapping vehicles, and so they can only service departure lanes.

The group agreed to remove the proposed gate pole (shown as Pole #3 in the 90% Plans on drawing RR1) south of 757th Avenue.

Crossing Design

The group discussed the proposed pedestrian gates in detail. BNSF noted that if pedestrian crossing gates are used, the design must accommodate some existing space to avoid trapping a pedestrian or bicyclist on the tracks. Karen noted that the 90% Plans do not show this feature. BNSF would not comment on if pedestrian gates should be provided. However, they discussed that other BNSF tracks with pedestrian gates have had one or more of the following: high-speed trains, limited sight distance, high pedestrian volumes.

BNSF commented that the aforementioned design criteria mean that the proposed three-lane crossing is not feasible as the 90% Plans show. The RR gate mechanisms should be placed to avoid trapping pedestrians or

Client: City of Renton
Project: 20160266.000 - N Park Avenue Extension
Time/Date: 9:00-10:30 December 11, 2019
Location: Park Avenue N Extension Project Site
RE: BNSF Comments Meeting

bicyclists between the RR gates during a train event. The vehicle gate devices should be placed 5'-3" from face of curb. The group discussed if replacing the inside southbound lane with an island north of the tracks, within which there would be a vehicle gate device, would satisfy design requirements. BNSF said yes.

The City will evaluate two options for how to achieve all of the design criteria within the shorter pedestrian refuge areas:

1. Modify curb lines on 757th Avenue
2. Shift the track curvature to the east so that the track is more centered in BNSF right-of-way across the Park Avenue N Extension.

Perteet expressed that the ability to move the 757th Avenue curbs may be limited by the required Boeing turn simulations.

Karen asked if the existing fencing on the south side of the tracks would be removed with the City's project. Bob said that the City is discussing fencing requirements with Boeing.

Stephen explained that the approximate cost for the installation of panels is $1,500 per (track) foot. That cost is a total cost, including soft costs and materials.

Peter asked what size panels BNSF places. Stephen explained they are 8 (track) feet long, and width varies as required by the site conditions.

Karen and Stephen said that BNSF likes to see the BNSF panels extend 2' beyond the edge of traveled way, and the City's sidewalk. Ideally, this gap is filled with asphalt so that BNSF can easily replace with any future maintenance activities. Peter asked if this could be a concrete panel, and BNSF said they preferred HMA. The also said that an expansion joint does not provide the same flexibility for their operations.

Karen requested that the City share truck turning movement diagrams with her. Brent confirmed that these will show the City's design vehicles making the turns that cross the tracks. Karen also said that it would be helpful to have the turning simulations that the City prepared for Boeing movements that do not cross the tracks.

Maintenance access to the crossing would need to be provided (generally 25' from centerline of traffic signal pole to centerline of RR warning device), or would need to provide funding for flagging costs.

<u>Preemption Design and BNSF Signalization</u>

Tim gave an overview of the proposed preemption time calculation that CTC performed and presented to the City previously. He explained that the preemption time calculations were based on a pedestrian having just entered the crosswalk, which requires a 3.5 feet per second crossing speed to complete the movement. Tim also noted that the train operates may be required to stop and wait at the start of the crossing for the preemption system to fully engage.

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RE: BNSF Comments Meeting

A long clear storage distance (CSD) was also noted. APT was noted to be 44 seconds, which BNSF was okay with since it is stop and proceed train operations.

Construction Requirements and Responsibilities

BNSF confirmed that the following elements will be provided and installed by BNSF:

- BNSF devices, gates, arms, and flashers
- Foundations for BNSF devices
- Conduits, wiring, and junction boxes for BNSF poles
- Bungalow and foundation

The only elements related to this gate crossing system that the City's contractor will install are conduits and cables from a City junction box to the BNSF bungalow. Peter asked and BNSF confirmed that a single 2" conduit provides adequate capacity. Karen said that the desired configuration would run the preemption wiring alone in a single conduit, with no City wiring for traffic signals or illumination.

Stephen explained that once BNSF finishes design, there will be around a 6-month lead time for new equipment to arrive.

Peter suggested that the City's Project Manual include a requirement that the contractor provide 30 days' notice to BNSF before doing any work in their right-of-way.

Appendix C

RailPros Provided Preemption Calculations

Preemption Calculations were provided for track clearance green (TCG) time establishment only, due to stop and proceed train operations.

RESET

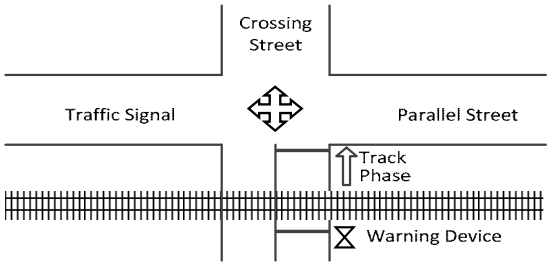
Texas Department of Transportation

Form 2304
(Rev. 7/19)

GUIDE FOR DETERMINING TIME REQUIREMENTS FOR TRAFFIC SIGNAL PREEMPTION AT HIGHWAY-RAIL GRADE CROSSINGS

City	Renton	CSJ	
County	King	Date	8/17/22
District	Northwest	Completed by	RailPros
		District Approval	

Show North Arrow



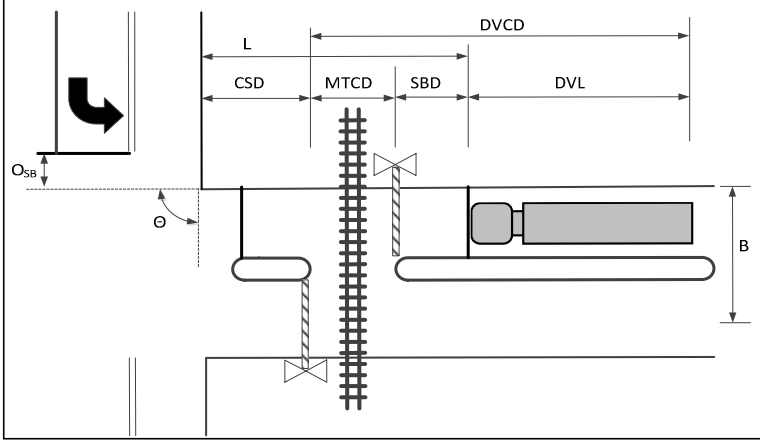
Parallel Street Name: Southport Dr/Logan Ave

Crossing Street Name: Park Ave

Railroad	BNSF Railway	Railroad Contact	Stephen Semenick
Crossing DOT#	979302J	Phone	(206) 625-6152

NOTE: After approval by the District, a copy of this form, along with the traffic signal design sheets and the phasing diagrams for normal and preempted operation, shall be placed in the traffic signal cabinet. See Section 7 for traffic signal timings.

SECTION 1: GEOMETRY DATA & DEFAULTS



CSD = Clear storage distance (ft)
MTCD = Minimum track clearance distance (ft)
SBD = Stop bar setback distance (ft)
DVL = Design vehicle length (ft)
L = Queue start-up distance, also stop-line distance (ft)
DVCD = Design vehicle clearance distance (ft)
O_{SB} = Offset distance to Left-turn stop bar (ft)
B = Distance from curb line to center of nearest lane receiving left turns (ft)
Θ = Angle of turn (degrees)

GEOMETRIC DATA FOR CROSSING

			Remarks
1.	Clear storage distance (CSD, feet)	1. 157	
2.	Minimum track clearance distance (MTCD, feet)	2. 32	
3.	Stop bar setback distance (SBD, feet)	3. 10	Enter "0" if no stop bar is present
4.	Width of receiving approach (B, feet)	4. 42	
5.	Offset distance of left turn stop bar ($O_{SB,}$ feet)	5. 44	
6.	Approach grade. % (0 if approach is on downgrade)	6. 0.0	
7.	Angle of turn at Intersection (Θ, degrees)	7. 91	

DESIGN VEHICLE DATA

8. Select Design Vehicle

☐ School Bus ☑ Intermediate Truck ☐ Interstate Semi-Truck ☐ Other

9.	Default design vehicle length (feet)	9. 55	Based on selected Design Vehicle
a.	Additional vehicle length, if needed (feet)	9a. -25*	*Design Vehicle (SU30) Selected by Highway Authority
10.	Total design vehicle length (DVL, feet)	10. 30	Sum of line 9 and 9a
11.	Centerline turning radius of design vehicle (R, feet)	11. 41	Based on selected Design Vehicle
12.	Passenger car vehicle length (LV, feet)	12. 19	Default value

SECTION 2: RIGHT-OF-WAY TRANSFER TIME CALCULATION

Preempt verification and response time

				Remarks
13.	Preempt delay time (seconds)	13.	0	
14.	Controller response time to preempt (seconds)	14.	0.0	Manufacturer:
				Firmware Version:
15.	Preempt verification and response time (seconds): add lines 13 and 14	15.	0.0	

Worst-case conflicting vehicle time

				Remarks
16.	Minimum green time during right-of-way transfer (seconds)	16.	5	Value may be adjusted to meet local conditions
17.	Other green time during right-of-way transfer (seconds)	17.	0	
18.	Yellow change time (seconds)	18.	4.0	
19.	Red clearance time (seconds)	19.	2.0	
20.	Worst-case conflicting vehicle time (seconds): add lines 16 through 19	20.	11.0	

Worst-case conflicting pedestrian time

				Remarks
21.	Minimum walk time during right-of-way transfer (seconds)	21.	0	Value may be adjusted to meet local conditions
22.	Pedestrian clearance time during right-of-way transfer (seconds)	22.	0	Refer to instructions for pedestrian truncation guidance
23.	Vehicle yellow change time, if not included on line 22 (seconds)	23.	0.0	
24.	Vehicle red clearance time, if not included on line 22 (seconds)	24.	0.0	
25.	Worst-case conflicting pedestrian time (seconds): add lines 21 through 24	25.	0.0	

Worst-case conflicting vehicle or conflicting pedestrian time

26.	Worst-case conflicting vehicle or conflicting pedestrian time (seconds): maximum of lines 20 and 25	26.	11.0
27.	**Right-of-way transfer time (seconds): add lines 15 and 26**	27.	11.0

SECTION 3: QUEUE CLEARANCE TIME CALCULATION

				Remarks
28.	Are there left-turns towards the tracks? ☐ Yes ☑ No			
29.	Distance traveled by truck during left-turn (LTL, feet):	29.	0	LTL = ∏RΘ/180
30.	Travel speed of left-turning truck (S_{LTT}, mph):	30.	10	Default value
31.	Distance required to clear left-turning truck from travel lanes on track clearance approach (feet):	31.	0	Equation: (line 4 + line 5 + line 12 - line 11) + line 29 + line 10
32.	Additional time required to clear left-turning truck from travel lanes on track clearance approach (seconds):	32.	0.0	Equation: [(line 31 * 3600) / (line 30 * 5280) - line 18 - line 19]
33.	Worst-case Left Turning Truck time (seconds): if Line 28 = 'Yes', use line 32; otherwise Use 0	33.	0.0	
34.	Queue start-up distance, L (feet): add lines 1 through 3	34.	199	
35.	Time required for design vehicle to start moving (seconds): calculate as 2+(L÷20)	35.	12.0	
36.	Design vehicle clearance distance, DVCD (feet): add lines 2, 3 and 10	36.	72	
37.	Time for design vehicle to accelerate through the DVCD (seconds), level terrain	37.	11.2	
38.	Factor to account for slower acceleration on uphill grade	38.	1.00	
39.	Time for design vehcle to accelerate through DVCD (seconds), adjusted for grade: multiply lines 37 and 38	39.	11.2	
40.	**Queue clearance time (seconds): add lines 33, 35 and 39**	40.	23.1	

SECTION 4: MAXIMUM PREEMPTION TIME CALCULATION

				Remarks
41.	Right-of-way transfer time (seconds): line 27	41.	11.0	
42.	Queue clearance time (seconds): line 40	42.	23.1	
43.	Desired minimum separation time (seconds)	43.	0.0	Typical Value
44.	Maximum preemption time for Queue Clearance (seconds): add lines 41 through 43	44.	34.1	

SECTION 5: SUFFICIENT WARNING TIME CHECK

Remarks

45.	Required minimum time, MT (seconds): per regulations	**45.**	20
46.	Clearance time, CT (seconds): (line 2 -35) / 10 (rounded up to nearest second)	**46.**	0
47.	Total minimum warning time, MWT, needed (seconds): add lines 45 and 46 (excludes buffer time and equipment response time)	**47.**	20
48.	Required advance preemption time (APT) from railroad (seconds): subtract line 47 from line 44, round up to nearest full second, enter 0 if less than 0	**48.**	15
49.	APT currently provided by railroad (seconds): Enter "0" if new crossing or signal	**49.**	0

If the required advance preemption time (line 48) is greater than the amount of advance preemption time currently provided by the railroad (line 49), additional warning time must be requested from the railroad. Alternatively, the maximum preemption time (line 48) may be decreased after performing an engineering study to investigate the possibility of reducing the values on lines 13, 16, 17, 21, 22 and 43.

Remarks:

SECTION 6: TRACK CLEARANCE GREEN TIME CALCULATION (IF NO GATE DOWN CIRCUIT PROVIDED)

Preempt Trap Check

Remarks

50. Warning Time Variability (Select One)

☐ Consistent Warning Times ☑ Low Warning Time Variability ☐ High Warning Time Variability

51.	APT required or provided (seconds): maximum of Line 48 or Line 49	**51.**	15
52.	Multiplier for maximum APT due to train handling	**52.**	1.25
53.	Maximum APT (seconds): multiply line 51 and 52	**53.**	18.8
54.	Minimum duration for the track clearance green interval (seconds)	**54.**	15
55.	Track Clearance Green Time to avoid Preempt Trap (seconds): add lines 53 and 54	**55.**	33.8

See Instructions for details.

Clearing of Clear Storage Distance

56.	Time waiting on left-turn truck (seconds): line 33	**56.**	0.0
57.	Time required for design vehicle to start moving (seconds): line 35	**57.**	12.0
58.	Design vehicle clearance distance (DVCD, feet): line 36	**58.**	72

If CSD ≤ DVL, you must clear the design vehicle through the entire CSD during the traffic clearance phase; however, if CSD > DVL, you should consider providing enough time to clear the design vehicle from the crossing.

Is the clear storage distance (CSD) less than or equal to the design vehicle length (DVL)?

☑ YES. The design vehicle MUST clear through the entire CSD. (CSD will be entered in Line 59).

☐ NO. The design vehicle may clear through a portion of the CSD.

Do you want to clear the design vehicle through the entire CSD?

☑ YES. Clear the entire CSD. (CSD will be entered in Line 59).

☐ NO. Clear the crossing ONLY. (DVL will be entered in Line 59).

59.	Portion of CSD to clear during track clearance phase (feet)	**59.**	157
60.	Design vehicle relocation distance (DVRD, feet): add lines 58 and 59	**60.**	229
61.	Time required to accelerate design vehicle through DVRD (seconds), level terrain:	**61.**	20.9
62.	Factor to account for slower acceleration on uphill grade	**62.**	1.00
63.	Time required to accelerate design vehicle through DVRD (seconds), adjusted for grade: multiply lines 61 and 62	**63.**	20.9
64.	Time to clear portion of clear storage distance (seconds): add lines 56, 57 and 63	**64.**	32.8
65.	**Track clearance green interval (seconds): maximum of lines 55 or 64, round up to nearest full second**	**65.**	34

Maximum Duration of Track Clearance Green after gates are down (in absence of a gate down circuit)

66.	Total time to complete track clearance green (seconds): line 27 + line 65	**66.**	45.0
67.	Total time before gates are down (seconds): subtract 5 seconds from line 44 (per AREMA Manual)	**67.**	29.1
68.	**Maximum Duration of Track Clearance Green after gates are down (seconds): Line 66 - Line 67**	**68.**	16

SECTION 7: SUMMARY OF CONTROLLER PREEMPTION SETTINGS

			Remarks
69.	Duration Time (seconds)	0	Default Value
70.	Preempt Delay Time (seconds)	0	From Line 13

Right of Way Transfer Phase

			Remarks
71.	Minimum Green Interval (seconds)	5	From Line 16
72.	Pedestrian Walk Interval (seconds)	0	From Line 21
73.	Pedestrian Clearance Interval (Flashing "DON'T WALK", seconds)	0	From Line 22
74.	Yellow Change Interval (seconds)	4.0	From Line 18
75.	All Red Vehicle Clearance (seconds)	2.0	From Line 19

Track Clearance Phase

			Remarks
76.	Green Interval (seconds) (in the absence of gate down circuit)	34	From Line 65
77.	Green Interval (seconds) with gate down circuit	23	From Line 40
78.	Yellow Change Interval (seconds)	4.0	From Line 18
79.	All Red Vehicle Clearance (seconds)	2.0	From Line 19

Exit Phase

			Remarks
80.	Dwell/Cycle Minimum Green Time (seconds)	0	Default Value
81.	Yellow Change Interval (seconds)	4.0	From Line 18
82.	All Red Vehicle Clearance (seconds)	2.0	From Line 19

Remarks:

Appendix D

BNSF Highway Rail Grade Crossing Traffic Signal Preemption Request Form (dated 8.5.22)

HIGHWAY-RAIL GRADE CROSSING
TRAFFIC SIGNAL PREEMPTION REQUEST FORM

The Road Authority traffic controller circuitry requires railroad preemption contacts to initiate the preemption sequence. Per BNSF standard, we will provide normally closed "dry" preemption relay contacts to interconnect the railroad active warning system to the Road Authority traffic signal controller assembly. These contacts are rated at 4 amps, and the source voltage from the traffic signal controller must not exceed 30 volts DC. Only DC voltage should be supplied by the Road Authority traffic signal controller assembly for preemption circuits, AC voltage will not be accepted. With no trains in the area, these contacts remain closed. The Road Authority Traffic Department will be responsible for installing the interconnection cable between the traffic signal controller and the crossing warning signal control housing.

To estimate and or design the crossing warning system, BNSF needs to know certain timing parameters.

Definitions:

"Advance Preemption" – The system will be designed to open the preemption contacts for a predetermined amount of time (Advance Preemption Time) prior to activation of the warning devices (flashing lights).

"Advance Pedestrian Preemption" – The system will be designed to open the pedestrian preemption contacts for a predetermined amount of time (Advance Pedestrian Preemption Time) prior to opening of preemption contacts (advance preemption), where advance preemption is used.

"Simultaneous Preemption" – The system will be designed to open the preemption contact at the same time the warning devices (flashing lights) are activated. Additional warning time may be requested.

"Supervised Circuit" – Supervision is an additional circuit from the grade crossing warning system that verifies the integrity of the interconnection circuits by comparing inputs to detect faults when the two circuits are in the same state. Supervision of the Advance Preemption circuit is required for single-break configurations and recommended for double-break configurations. Supervision can be requested for other circuit configurations.

"Gate Down Logic" – Per BNSF standard, we will provide normally open "dry" gate down relay contacts to interconnect the crossing warning system to the Road Authority traffic signal controller assembly. The system will be designed to close the gate down contacts upon the gates arrival in the down position. This logic is normally utilized to hold track clearance green until the gates are down since the time from preemption to gate down will vary depending upon the traffic signal cycle. In the event the gate does not descend; BNSF provides a parallel island circuit that provides input to terminate track clearance green once track occupies the crossing (island). This circuit will reduce parallel street delays by allowing the traffic signal to exit the track clearance phase after railroad gate is horizontal and providing a green indication for parallel street.

"Minimum Warning Time" – Per the MUTCD and FRA regulations, BNSF must provide at least 20 seconds of warning time for through trains (typically main track applications). However, per BNSF standards for constant warning time train detection equipment, the system will be designed to provide a "nominal" warning time of 30 seconds to ensure MUTCD/FRA minimums are met and to compensate for accelerating trains and ballast conditions.

"Minimum Track Clearance Distance" – For standard two-quadrant railroad warning devices, the minimum track clearance distance is the length along a highway at one or more railroad tracks, measured either from the railroad stop line, warning device or 12 ft. perpendicular to the far rail, along the centerline or edge line of the highway, as appropriate, to obtain the longer distance. For locations with exit gate warning devices, the minimum track clearance distance is the length along a highway at one or more railroad tracks, measured either from the railroad stop line or entrance warning device to the point clear of the exit gate. Note that in cases where the exit gate arm is parallel to the track(s) and/or not perpendicular to the roadway, clearance will be either along the centerline or edge line of the highway, as appropriate, to obtain the longer distance.

When (entrance) gates are used they are typically designed to start their decent within 3 to 5 seconds of the warning lights flashing, descend in an additional 10 to 15 seconds, and reach horizontal at least 5 seconds prior to train arrival per FRA regulations.

The length of the railroad's control circuit approach distance is directly related to the amount of requested "Advanced Preemption Time" (APT). Typically, the longer the APT requirement is, the longer the approach distance, and thus the more control equipment that will be required.

Please provide the following information in order to process your request:

Date of Request: August 5, 2022
Requesting Agency: City of Renton

Requested by: Robert Hanson, PE
Title: Transportation Design Manager

E-mail: bhanson@rentonwa.gov
Phone: 425-430-7223

Grade Crossing Information:

State: WA
City: Renton
County: King
Crossing Street Name: Park Avenue N
Parallel Street Name: Logan Avenue N/N Southport Drive

DOT #: 939302J
Agency District: Northwest
RR Subdivision: Seattle Sub Spur
Mile Post: TBD

Signalized Intersection Information:

1) Is a Crossing Active (XR) circuit being requested? ☑ Yes ☐ No

a) What is your requested circuit configuration? ☐ Single Break ☑ Double Break ☐ Supervised

b) Is this a request for simultaneous preemption? ☐ Yes ☑ No

If "Yes": What is your requested Additional Warning Time? (if needed) _____ Seconds

2) Is this request for Advance Preemption? ☑ Yes ☐ No

If "Yes": a) What is your requested Advance Preemption Time (APT)? 25 Seconds

b) What is your requested circuit configuration? ☐ Single Break ☑ Double Break ☑ Supervised

3) Is a Gate Down circuit being requested? ☑ Yes ☐ No

If "Yes": What is your requested circuit configuration? ☐ Single Break ☑ Double Break ☐ Supervised

** The purpose of the gate-down circuit is to comply with the Institute of Traffic Engineers (ITE) recommended practice to ensure that the Track Clearance Green interval remains on until gates are fully lowered to prevent a "preempt trap". Railroad will provide relay contacts for the gate down circuit.*

4) Is this request for additional time for Advance Pedestrian Preemption? ☐ Yes ☑ No

If "Yes": What is your requested additional time for Advance Pedestrian Preemption time (APPT)? _____ Seconds

** Note: The time listed above is the requested time above the requested APT time (where APT is requested).*
** Note: Double-break with supervision is not an option when using Advance Pedestrian Preemption.*
** Note: Pedestrian Detection is required when using Advance Pedestrian Preemption.*

5) Is a Traffic Signal Health circuit being requested? ☑ Yes ☐ No

** Note: A Traffic Signal Health circuit is required when requesting Advance Preemption.*

6) Indicate the interconnection wire size & number of conductors: #14 AWG 12 Conductors

Comments / Additional Info:

22 seconds maximum of the 25 second APT request will be used to serve an active pedestrian phase at the time of preemption.

The above information has been completed by the undersigned representative of the public agency responsible for the traffic signal. The public agency agrees to have all work related to the preemption of the traffic signal complete and operational prior to the activation of the railroad signal system. The public agency further agrees to not change any traffic signal design or timing parameters which may affect the preemption operation without coordinating said change with Railroad.

Signature of public agency representative

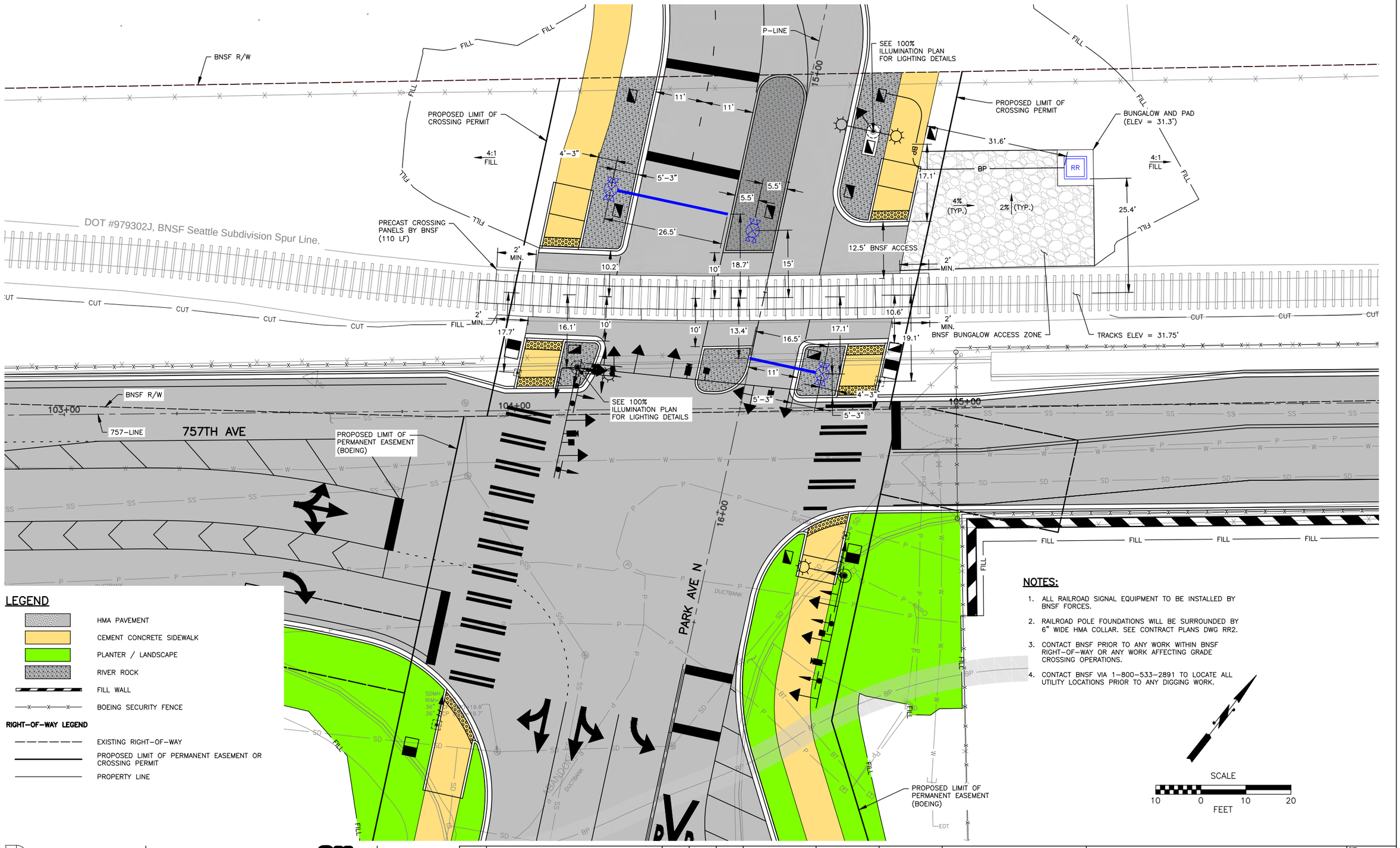
Robert M Hanson
Print or type name of public agency representative

8/5/22
Date

Please sign, scan this page, and submit electronically along with support documentation to appropriate Manager of Industry and Public Projects.

Appendix E

Agency Design Plans



LEGEND

- HMA PAVEMENT
- CEMENT CONCRETE SIDEWALK
- PLANTER / LANDSCAPE
- RIVER ROCK
- FILL WALL
- BOEING SECURITY FENCE

RIGHT-OF-WAY LEGEND

- EXISTING RIGHT-OF-WAY
- PROPOSED LIMIT OF PERMANENT EASEMENT OR CROSSING PERMIT
- PROPERTY LINE

NOTES:

1. ALL RAILROAD SIGNAL EQUIPMENT TO BE INSTALLED BY BNSF FORCES.
2. RAILROAD POLE FOUNDATIONS WILL BE SURROUNDED BY 6" WIDE HMA COLLAR. SEE CONTRACT PLANS DWG RR2.
3. CONTACT BNSF PRIOR TO ANY WORK WITHIN BNSF RIGHT-OF-WAY OR ANY WORK AFFECTING GRADE CROSSING OPERATIONS.
4. CONTACT BNSF VIA 1-800-533-2891 TO LOCATE ALL UTILITY LOCATIONS PRIOR TO ANY DIGGING WORK.

SCALE
10 0 10 20
FEET

PERTEET
801 2ND AVENUE, SUITE 302
SEATTLE, WA 98104
206.436.0515 | 800.615.9900

CONCEPTUAL EXHIBIT
PRELIMINARY
NOT FOR CONSTRUCTION

811 Know what's below. Call before you dig.

NO.	REVISION	BY	DATE	APPR

DESIGNED:
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CHECKED:
APPROVED:

SCALE: 1"=10'
ONE INCH AT FULL SCALE IF NOT ONE INCH SCALE ACCORDINGLY

VERTICAL: NAVD 1988
HORIZONTAL: CITY OF RENTON
DATUM

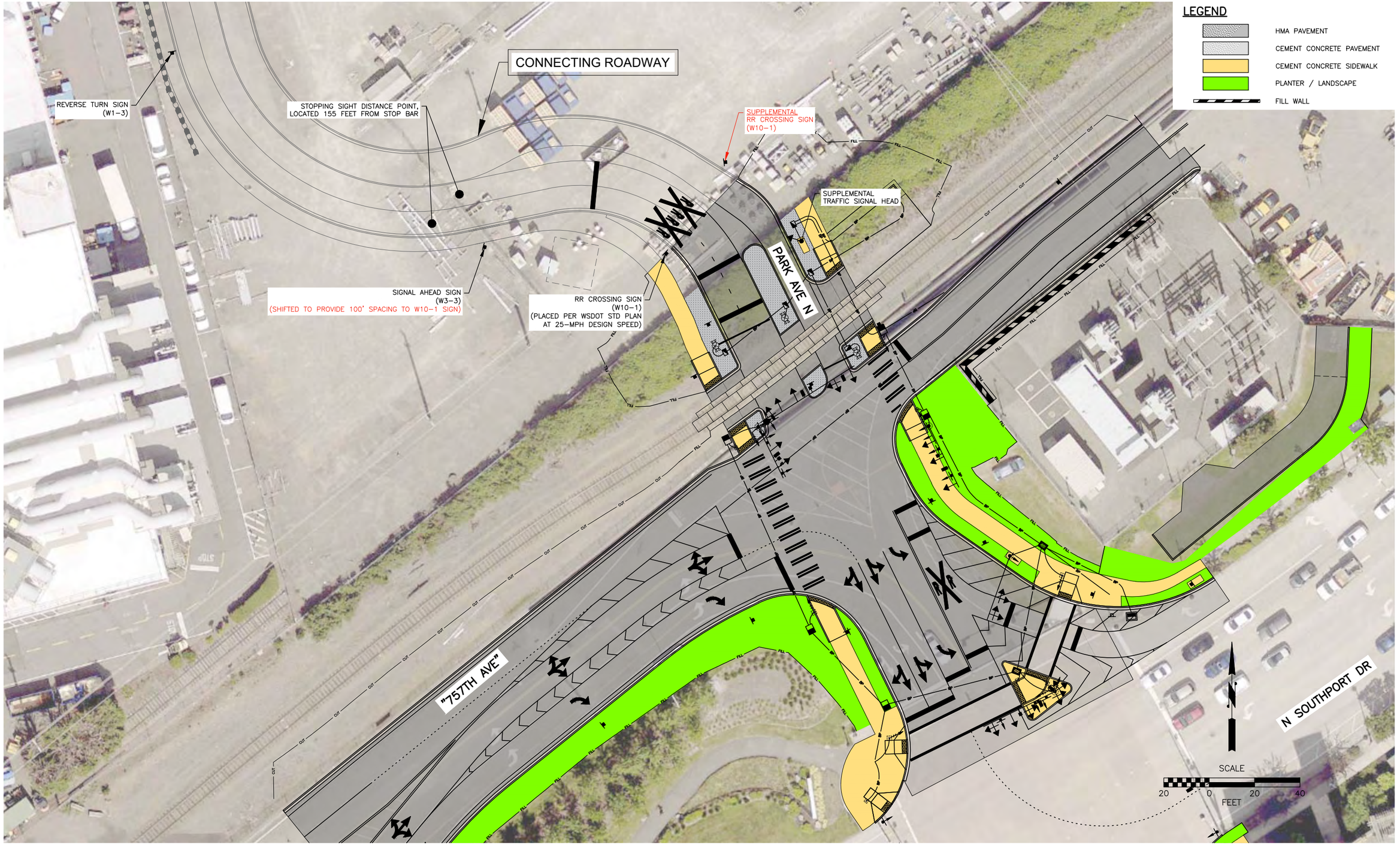
CITY OF RENTON
Planning/Building/Public Works Dept.

CITY OF RENTON
PARK AVENUE N EXTENSION

REVISED (MAR. 2022) BNSF CROSSING LAYOUT

DATE: 3/25/2022
FIELDBOOK:
PAGE:
DRAWING NO: BNSF-1
SHEET: 1 OF: 1

FILENAME: Mar 25, 2022 - 11:02am brent.powell X:\Renton, City of\Projects\20160266 - N Park Ave Extension\CAD\Exhibits\75 - BNSF Crossing Exhibit\20160266 Conceptual Layout.dwg Layout Name: BNSF-1



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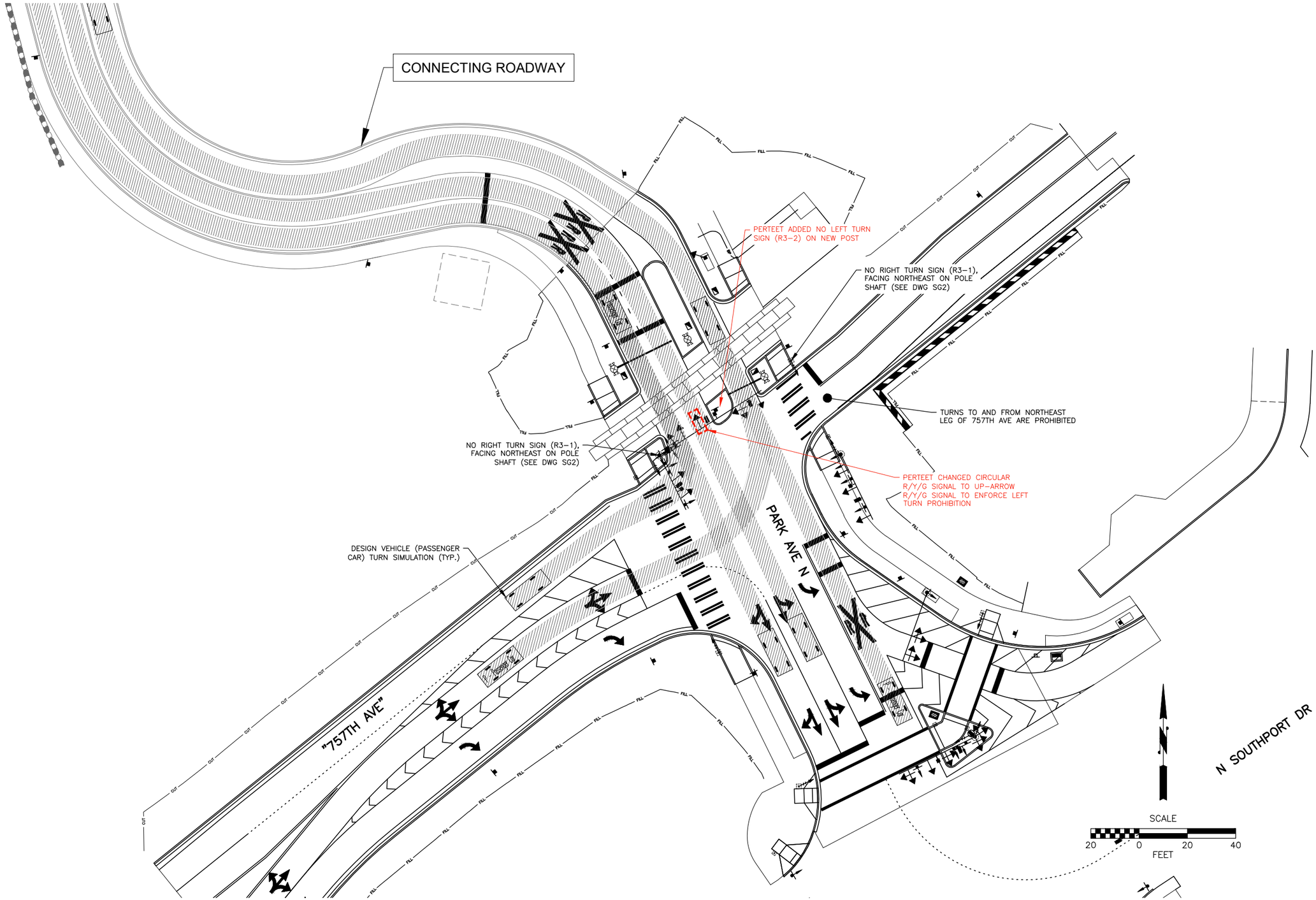
HORIZONTAL: CITY OF RENTON
DATUM

CITY OF RENTON
Planning/Building/Public Works Dept.

CITY OF RENTON
PARK AVENUE N EXTENSION

PARK AVE N EXTENSION LAYOUT

DATE: 4/1/2022
FIELDBOOK:
PAGE:
DRAWING NO: EX1
SHEET: 1 OF: 1



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SEATTLE, WA 98104
206.436.0515 | 800.615.9900

CONCEPTUAL EXHIBIT
PRELIMINARY
NOT FOR CONSTRUCTION

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NO.	REVISION	BY	DATE	APPR

DESIGNED:
DRAWN:
CHECKED:
APPROVED:

SCALE: 1"=20'
ONE INCH AT FULL SCALE IF NOT ONE INCH SCALE ACCORDINGLY

VERTICAL: NAVD 1988
HORIZONTAL: CITY OF RENTON
DATUM

CITY OF RENTON
Planning/Building/Public Works Dept.

CITY OF RENTON
PARK AVENUE N EXTENSION

TURN SIMULATIONS, MOVEMENT PERMISSIONS
PARK AVE N EXTENSION LAYOUT

DATE: 4/1/2022
FIELDBOOK:
PAGE:
DRAWING NO: EX1
SHEET: 1 OF: 1

FILENAME: Apr 01, 2022 - 6:01pm brent.powell X:\Renton, City of\Projects\20160266 - N Park Ave Extension\CADD\Exhibits\74 - RailPros Responses\Turning-Sims.dwg Layout Name: Park

PARK AVENUE N EXTENSION

RENTON PROJECT NO. CAG-17-082

CONTACTS:

CITY OF RENTON PROJECT MANAGER	HEBÉ BERNARDO	(206) 430-7232
PERTEET PROJECT MANAGER	PETER DE BOLDT, PE	(206) 436-0515
BUILDERS EXCHANGE OF WASHINGTON, INC		(425) 258-1303
1 ALLIANCE GEOMATICS		(425) 598-2200

CITY OFFICIALS:

MAYOR:

ARMANDO PAVONE

COUNCIL MEMBERS:

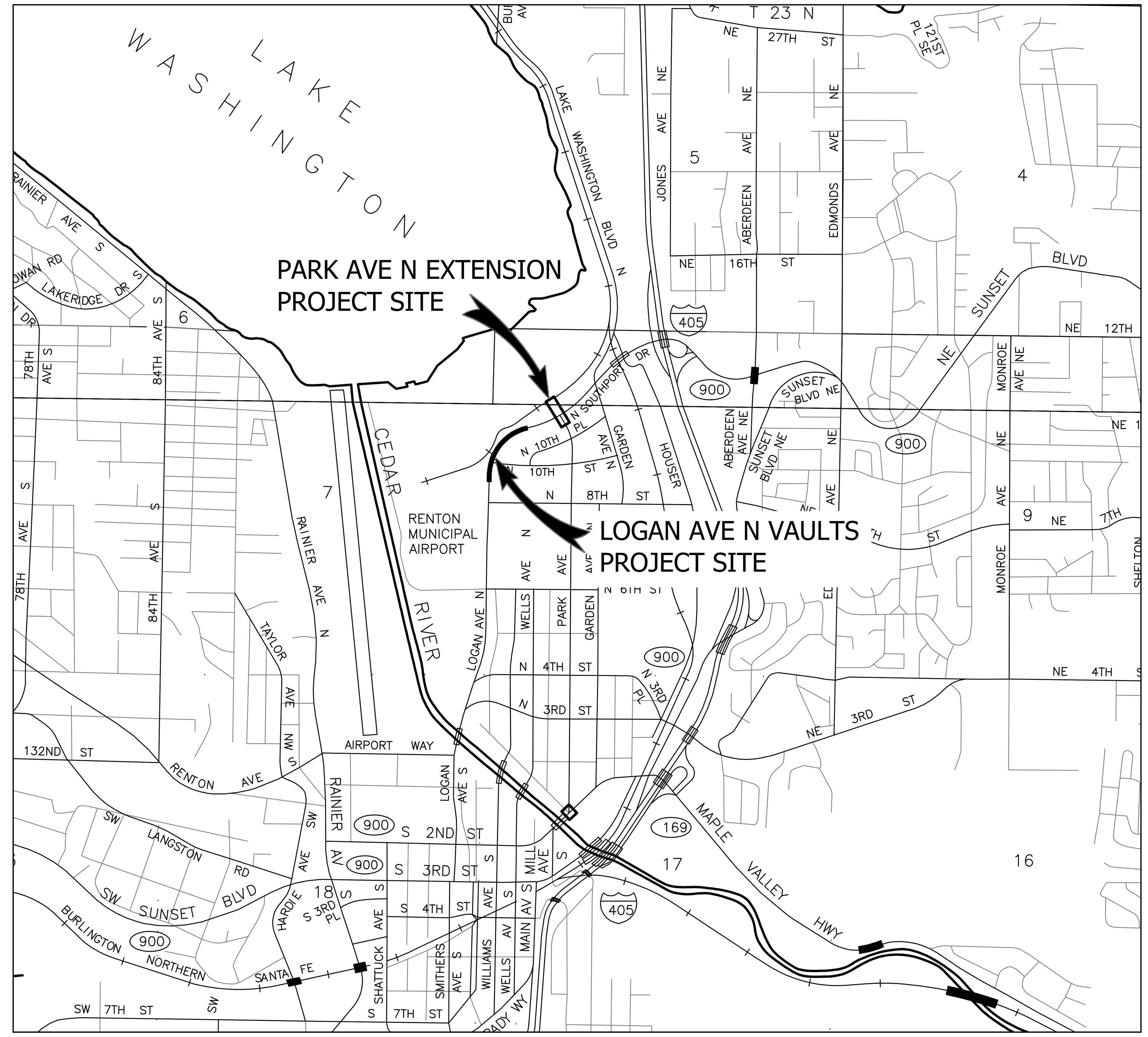
CARMEN RIVERA
RANDY CORMAN, PRESIDENT
VALERIE O'HALLORAN
RYAN McIRVIN
RUTH PÉREZ
ED PRINCE
KIM-KHÁNH VĂN

APPROVED FOR BID

CITY OF RENTON   DATE

GENERAL NOTES

1. THE EXISTING TOPOGRAPHIC AND PHYSICAL FEATURES SHOWN ON THESE PLANS ARE BASED ON A COMBINATION OF FIELD SURVEY BY 1 ALLIANCE GEOMATICS AND RECONNAISSANCE BY PERTEET.
2. EXISTING CONDITIONS SHOWN ON THESE PLANS WERE BASED ON THE BEST AVAILABLE INFORMATION AT THE TIME OF PLAN PREPARATION. ACTUAL CONDITIONS MAY BE DIFFERENT, THE CONTRACTOR MAY ENCOUNTER VARIATIONS BETWEEN ACTUAL CONDITIONS AND THOSE SHOWN. THESE VARIATIONS WILL NOT BE THE BASIS FOR A CLAIM OF EXTRA COMPENSATION.
3. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES SHOWN ARE APPROXIMATE AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER, CITY OF RENTON OR PERTEET. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
4. EXISTING UTILITY LOCATES FOR THE DESIGN PHASE OF THIS PROJECT WERE PERFORMED BY APPLIED PROFESSIONAL SERVICES, (425) 954-8436.
5. CONTACT BNSF PRIOR TO ANY WORK WITHIN BNSF RIGHT OF WAY OR ANY WORK AFFECTING GRADE CROSSING OPERATIONS.
6. CONTACT BNSF VIA 1-800-533-2891 TO LOCATE ALL UTILITY LOCATIONS PRIOR TO ANY DIGGING WITHIN BNSF RIGHT OF WAY.



VICINITY MAP

NOT TO SCALE

CITY OF Renton

SHEET INDEX

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NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

MATTHEW POWELL, STATE OF WASHINGTON, 55619 REGISTERED PROFESSIONAL ENGINEER, 8/5/2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
FILE: 20160266 GN.dwg

PERTEET
801 2ND AVENUE, SUITE 302
SEATTLE, WA 98104
800.615.9900

CITY OF RENTON
Public Works Department
APPROVED FOR CONSTRUCTION
BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

COVER, INDEX AND VICINITY MAP

DRAWING NO. CV1
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 3/2022
SHEET NO. 1 OF 56

WATER SYMBOLS

SYMBOL EXIST.	SYMBOL PROP.	DESCRIPTION
		CAP/PLUG
		COUPLING
		GUARD POST
		REDUCER
		THRUST BLOCKING
		WATER METER
		FIRE HYDRANT 2–NOZZLE
		FIRE HYDRANT 3–NOZZLE
		FLANGE/BLIND FL (FL) (BL FL)
		MECHANICAL JOINT (MJ)
		PUSH–ON/HUB
		THREAD
		AIR RELIEF VALVE
		BLOW–OFF VALVE
		BUTTERFLY VALVE
		CHECK VALVE
		GATE/GENERAL VALVE
		PLUG VALVE

GAS/POWER/TELEPHONE SYMBOLS

SYMBOL EXIST.	SYMBOL PROP.	DESCRIPTION
		GAS METER
		GAS VALVE
		PAD MOUNTED TRANSFORMER
P	P	POWER VAULT
		TRANSMISSION TOWER
		UTILITY POLE
		UTILITY POLE ANCHOR
		TELEPHONE RISER
T	T	TELEPHONE VAULT

SURVEY SYMBOLS

SYMBOL EXIST.	SYMBOL PROP.	DESCRIPTION
		ANGLE/CONTROL POINT
		BENCH MARK
		BLOCK CORNER
		IRON PIPE
		MONUMENT (IN CASE)
		MONUMENT (SURFACE)
		OWNERSHIP TIE
		SECTION CENTER
		SECTION CORNER
		QUARTER CORNER
		SIXTEENTH CORNER
		CLOSING CORNER
MC	MC	MEANDER CORNER
WC	WC	WITNESS CORNER
		SOIL BORING/POTHOLING
		SPOT ELEVATION
		TAX LOT/PARCEL NUMBER

SIGNALIZATION SYMBOLS

SYMBOL EXIST.	SYMBOL PROP.	DESCRIPTION
		BNSF POWER BUNGALOW
		EMERGENCY VEHICLE PRE–EMPTION DETECTOR
		VIDEO DETECTION CAMERA
		DIPOLE DETECTOR
		QUADRAPOLE DETECTOR
		ROUND LOOP DETECTOR
		PULL BOX
		INDICATOR LIGHT
		OPTICOM SENSOR
		OPTICOM SENSOR W/ INDICATOR LIGHTS
		FLASHING WARING SYSTEM
		JUNCTION BOXES (TYPE I, II, VIII)
		PEDESTRIAN PUSHBUTTON POST W/ PUSHBUTTON
		PEDESTRIAN SIGNAL HEAD
		PTZ CAMERA
		SIGNAL POLE NOTE
		R/R CROSSING GATE
		R/R FLASHER ASSEMBLY
		SIGNAL CONTROLLER
		SERVICE CABINET
		STREET LIGHT ASSEMBLY
		TRAFFIC SIGN–BRIDGE
		TRAFFIC SIGN–CANTILEVERED
		TRAFFIC SIGN ON SIGNAL POLE
		TRAFFIC SIGNAL POLE
		TRAFFIC SIGNAL POLE W/ LUMINAIRE
		EVP GPS
		VEHICLE SIGNAL HEAD
		VEHICLE SIGNAL HEAD W/ ARROW INDICATOR
		WIRE NOTE

SANITARY/STORM SEWER SYMBOLS

SYMBOL EXIST.	SYMBOL PROP.	DESCRIPTION
		SANITARY SEWER CLEAN OUT
		SANITARY SEWER MANHOLE
		STORM DRAIN CATCH BASIN (TYPE 1)
		STORM DRAIN CULVERT
		STORM DRAIN CATCH BASIN (TYPE 2)
		STORM DRAIN MANHOLE
		ENERGY DISSIPATOR
		OVERFLOW STRUCTURE

CHANNELIZATION SYMBOLS

SYMBOL EXIST.	SYMBOL PROP.	DESCRIPTION
		BIKE PATH
		ACCESSIBILITY SYMBOL
		H.O.V. LANE SYMBOL
ONLY	ONLY	ONLY
RXR	RXR	RAILROAD CROSSING
SCHOOL	SCHOOL	SCHOOL
STOP	STOP	STOP
		STRAIGHT ARROW
		LT.RT.STR. ARROW
		LEFT–RIGHT ARROW
		2–WAY LEFT TURN
		LEFT TURN ARROW
		RIGHT TURN ARROW
		LEFT–STRAIGHT ARROW
		RIGHT–STRAIGHT ARROW
		LANE MARKER TYPE I
		LANE MARKER TYPE II

SURFACE FEATURES/LANDSCAPING

SYMBOL EXIST.	SYMBOL PROP.	DESCRIPTION
BUS	BUS	BUS STOP
		EMBANKMENT
		MAIL BOX
		RIP RAP
		ROCKERY
		SHRUB
		SIGN
		TREE (CONIFER)
		TREE (DECIDUOUS)
		FENCE POST
		CURB RAMP
		YARD LIGHT

DATUM

DATUM

NORTH ARROW

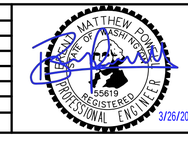
ABBREVIATIONS

ADS	ADVANCE DRAINAGE SYSTEMS
ALT	ALTERNATE
AP	ANGLE POINT
APPR	APPROVED
APPROX	APPROXIMATELY
ASPH	ASPHALT
AVE	AVENUE
AVG	AVERAGE
B	BLACK
BM	BENCH MARK
BOT	BOTTOM
BTWN	BETWEEN
BVCE	BEGIN VERTICAL CURVE ELEVATION
BVCS	BEGIN VERTICAL CURVE STATION
C	CONDUCTOR
C\L, ℄	CENTERLINE
CL	CLASS
CB	CATCH BASIN
CG	CURB & GUTTER
CKT	CIRCUIT
COM	COMMON, COMMUNICATION
CONC	CONCRETE
CONN	CONNECTION
CONT	CONTINUED / CONTINOUS
CSTC	CRUSHED SURFACING TOP COURSE
DET	DETAIL
DI	DUCTILE IRON
DIAM, DIA	DIAMETER
DR	DRIVE
DWG	DRAWING
E	EAST
EA	EACH
EL	ELEVATION
ESMT	EASEMENT
EVCE	END VERTICAL CURVE ELEVATION
EVCS	END VERTICAL CURVE STATION
EVP	EMERGENCY VEHICLE PRE–EMPTION
EX, EXIST	EXISTING
FH	FIRE HYDRANT
FT	FEET/FOOT
G	GAS LINE, GREEN
GE	GROUND ELEVATION
GPS	GLOBAL POSITIONING SYSTEM
GV	GAS VALVE
HMA	HOT MIX ASPHALT
HORIZ,H	HORIZONTAL
HT	HEIGHT
IE	INVERT ELEVATION
IN	INCH/INCHES
INCL	INCLUDING
INT,INTX	INTERSECTION
J–BOX	JUNCTION BOX
K	RATE OF CURVATURE
L	LENGTH
LB(S)	POUND(S)
LED	LIGHT EMITTING DIODE
LF	LINEAL FOOT/FEET
LT	LEFT
MAG	MAG NAIL
MAX	MAXIMUM
MB	MAILBOX
MH	MANHOLE
MIC	MONUMENT IN CASE
MIN	MINIMUM
MON	MONUMENT
MSE	MECHANICALLY STABLIZIED EARTH
MSP	SPIKE
MSX	SCRIBED "X"
N	NORTH
NA	NOT APPLICABLE
NO.	NUMBER
NTS	NOT TO SCALE
O	ORANGE
OD	OUTSIDE DIAMETER
OFF	OFFSET
OPP	OPPOSITE
OL	OVERLAP
PC	POINT OF CURVE
PCC	POINT OF COMPOUND CURVE
PE	PROFESSIONAL ENGINEER
PG	PERFORMANCE GRADE
PRC	POINT OF REVERSE CURVE
PROP	PROPOSED
PT	POINT OF TANGENT
PTZ	PAN, TILT, ZOOM
PVC	POLYVINYL CHRLORIDE / POINT OF VERTICAL CURVE
PVI	POINT OF VERTICAL INTERSECTION
PVMT	PAVEMENT
PVT	POINT OF VERTICAL TANGENT
R	RADIUS, RED
R/W, ROW	RIGHT OF WAY
RGS	RIGID GALVANIZED STEEL
REF	REFERENCE
RR, R/R	RAILROAD
RT	RIGHT
RTM	RUBBER TILE MAT
S	SOUTH
(S)	SHIELDED
S/W	SIDEWALK
SD	STORM DRAIN
SS	SANITARY SEWER
ST	STREET
STA	STATION
STD	STANDARD
TSP	TRANSIT SIGNAL PRIORITY
VDC	VIDEO DETECTION CAMERA
VERT, V	VERTICAL
W	WEST, WATER, WHITE
W/	WITH
WSDOT	WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
Y	YELLOW

LINETYPES

LINETYPE	DESCRIPTION
	SURFACE FEATURES:
	EXISTING BUILDING LINE
	PROPOSED BUILDING LINE
	EXISTING DITCH
	PROPOSED DITCH
	EXISTING CURB/PAVEMENT/SIDEWALK
	PROPOSED CURB/PAVEMENT/SIDEWALK
	EXISTING FENCE LINE
	PROPOSED FENCE LINE
	EXISTING GRAVEL
	EXISTING GUARDRAIL
	PROPOSED GUARDRAIL
	LAKE/POND
	WETLAND/SWAMP PERIMETER
	RAILROAD
	EXISTING RETAINING WALL
	PROPOSED RETAINING WALL
	RIVERBANK/SHORELINE
	VEGETATION LINE
	SURVEY:
	EXISTING CENTERLINE
	PROPOSED CENTERLINE
	EXISTING CONTOUR (INTERMEDIATE)
	EXISTING CONTOUR (INDEX)
	PROPOSED CONTOUR (INTERMEDIATE)
	PROPOSED CONTOUR (INDEX)
	EXISTING EASEMENT LINE
	PROPOSED EASEMENT LINE
	EXISTING PROPERTY LINE
	EXISTING RIGHT OF WAY CENTERLINE
	EXISTING RIGHT OF WAY
	EXISTING RIGHT OF WAY (USED)
	PROPOSED RIGHT OF WAY
	SECTION LINE
	QUARTER SECTION LINE
	16TH SECTION LINE
	UTILITIES (EXISTING)
G	EXISTING GAS LINE
OP	EXISTING AERIAL POWER
BP	EXISTING BURIED POWER
SD	EXISTING STORM DRAIN
FM	EXISTING FORCE MAIN
SS	EXISTING SANITARY SEWER
OT	EXISTING AERIAL TELEPHONE
BT	EXISTING BURIED TELEPHONE
W	EXISTING WATER LINE
	UTILITIES (PROPOSED)
G	PROPOSED GAS LINE
OP	PROPOSED AERIAL POWER
BP	PROPOSED BURIED POWER
SD	PROPOSED STORM DRAIN
FM	PROPOSED FORCE MAIN
SS	PROPOSED SANITARY SEWER
OT	PROPOSED AERIAL TELEPHONE
BT	PROPOSED BURIED TELEPHONE
W	PROPOSED WATER LINE
	CUSTOM:
CUT	CUT LINE
FILL	FILL LINE
	SILT FENCE
	CONSTRUCTION FENCE
BP	EXISTING BOEING DUCT BANK
	EXISTING DEVELOPER WATER LINE
COM	EXISTING DEVELOPER JOINT USE TRENCH
	EXISTING DEVELOPER STORM DRAIN

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE



SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
FILE: 20160266 GN.dwg

PERTEET
801 2ND AVENUE, SUITE 302
SEATTLE, WA 98104
800.615.9900

CITY OF RENTON
Public Works Department

APPROVED FOR CONSTRUCTION

BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

LEGEND AND ABBREVIATIONS

DRAWING NO. G1
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 3/2022
SHEET NO. 2 OF 56

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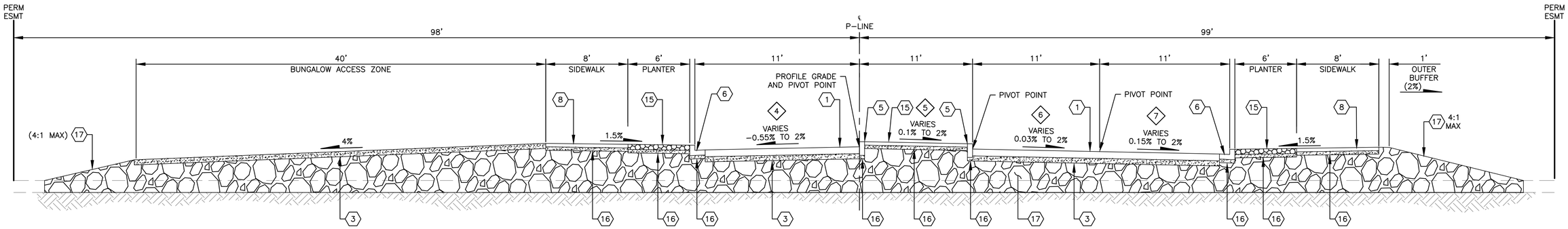
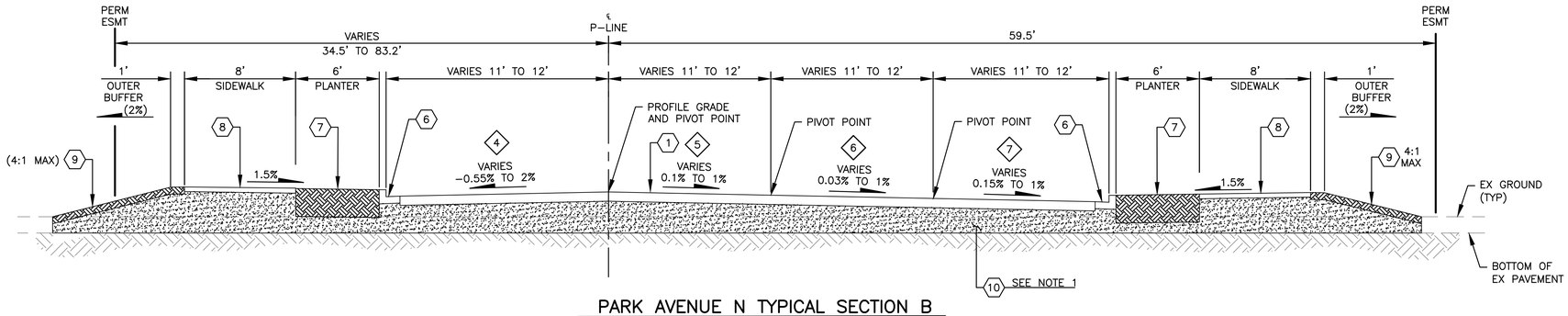


PARK AVENUE N TYPICAL SECTION A

P-LINE
15+00.22 TO 15+70

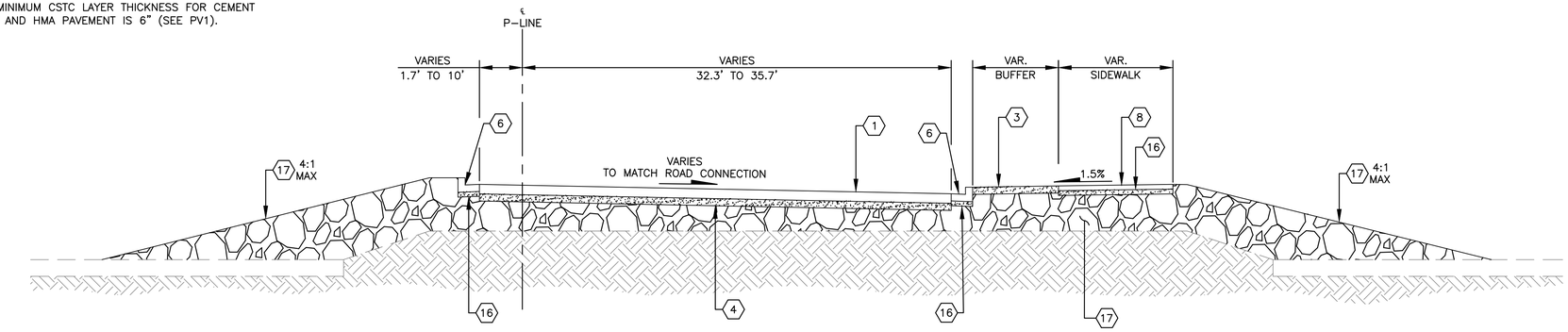
LEGEND

- TOPSOIL TYPE A
- RIVER ROCK
- CRUSHED SURFACING TOP COURSE
- GRAVEL BORROW
- EXISTING SUBGRADE
- NEW BOEING SECURITY FENCE
- EXISTING BOEING SECURITY FENCE
- (X) LANE NO. (SEE SUPERELEVATION TABLE ON DWG RP1)



PARK AVENUE N TYPICAL SECTION B

P-LINE
15+70 TO 17+25.97



PARK AVENUE N TYPICAL SECTION C

P-LINE
DEVELOPER ROADWAY (14+73) TO 15+00.22

NOTES

1. CSTC SHALL BE USED AS FILL MATERIAL TO ADJUST ROADWAY GRADES (EXCEPT AS NOTED IN THESE PLANS). MINIMUM CSTC LAYER THICKNESS FOR CEMENT CONCRETE SIDEWALK, CEMENT CONCRETE TRAFFIC CURB AND GUTTER, AND 12-INCH CEMENT CONCRETE CURB AND GUTTER IS 4". MINIMUM CSTC LAYER THICKNESS FOR CEMENT CONCRETE PAVEMENT AND HMA PAVEMENT IS 6" (SEE PV1).

CONSTRUCTION NOTES

1. 8" HMA CL 1/2" PG 58H-22
2. 2" CRUSHED SURFACING TOP COURSE
3. 6" CRUSHED SURFACING TOP COURSE
4. 6" HMA CL 1/2" PG 58H-22
5. CEMENT CONCRETE TRAFFIC CURB PER CITY OF RENTON STD PLAN 101
6. CEMENT CONCRETE TRAFFIC CURB AND GUTTER PER CITY OF RENTON STD PLAN 101
7. PLANTER STRIP 2" MULCH OVER 24" TOPSOIL TYPE A
8. CEMENT CONCRETE SIDEWALK PER CITY OF RENTON STD PLAN 102
9. SOD INSTALLATION OVER 6" TOPSOIL TYPE A
10. CRUSHED SURFACING TOP COURSE (SEE NOTE 1)
11. STRUCTURAL EARTH WALL (CONCRETE BLOCK) PER WL DRAWINGS
12. CEMENT CONCRETE TRAFFIC CURB AND GUTTER WITH VARIABLE SLOPE PER DETAIL DWG MD4
13. BOEING SECURITY FENCE PER DETAILS MD5
14. 12-INCH CEMENT CONCRETE CURB AND GUTTER PER DETAIL DWG WL1 AND ST3
15. RIVER ROCK PAVING
16. 4" CRUSHED SURFACING TOP COURSE
17. GRAVEL BORROW

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

MATTHEW POWELL — STATE OF WASHINGTON — 55619 — REGISTERED PROFESSIONAL ENGINEER — 3/26/2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
FILE: 20160266 RS.dwg

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801 2ND AVENUE, SUITE 302
SEATTLE, WA 98104
800.615.9900

CITY OF RENTON
Public Works Department

APPROVED FOR CONSTRUCTION

BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

TYPICAL ROADWAY SECTIONS

DRAWING NO. RS1
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 3/2022
SHEET NO. 5 OF 56

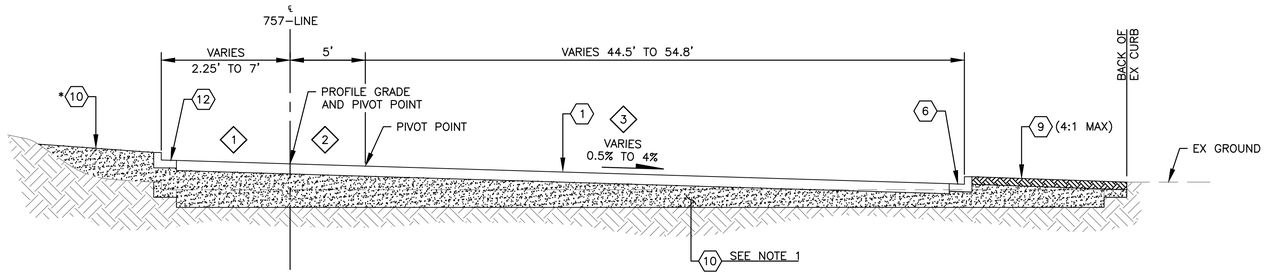
X:\Renton, City of\Projects\20160266 - N Park Ave Extension\CADD\Plan Sheets\20160266 RS.dwg 3/25/2022 1:57 PM

NOTES

1. CSTC SHALL BE USED AS FILL MATERIAL TO ADJUST ROADWAY GRADES (EXCEPT AS NOTED IN THESE PLANS). MINIMUM CSTC LAYER THICKNESS FOR CEMENT CONCRETE SIDEWALK, CEMENT CONCRETE TRAFFIC CURB AND GUTTER, AND 12–INCH CEMENT CONCRETE CURB AND GUTTER IS 4". MINIMUM CSTC LAYER THICKNESS FOR CEMENT CONCRETE PAVEMENT AND HMA PAVEMENT IS 6" (SEE PV1).

CONSTRUCTION NOTES

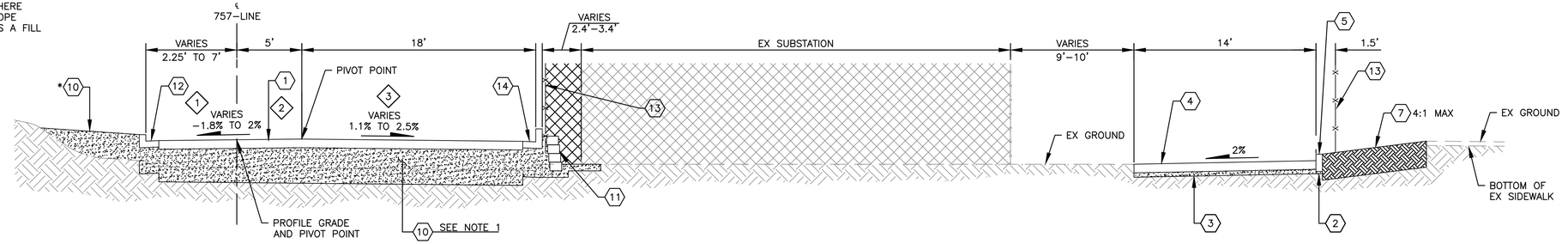
1. 8" HMA CL 1/2" PG 58H–22
2. 2" CRUSHED SURFACING TOP COURSE
3. 6" CRUSHED SURFACING TOP COURSE
4. 6" HMA CL 1/2" PG 58H–22
5. CEMENT CONCRETE TRAFFIC CURB PER CITY OF RENTON STD PLAN 101
6. CEMENT CONCRETE TRAFFIC CURB AND GUTTER PER CITY OF RENTON STD PLAN 101
7. PLANTER STRIP 2" MULCH OVER 24" TOPSOIL TYPE A
8. CEMENT CONCRETE SIDEWALK PER CITY OF RENTON STD PLAN 102
9. SOD INSTALLATION OVER 6" TOPSOIL TYPE A
10. CRUSHED SURFACING TOP COURSE (SEE NOTE 1)
11. STRUCTURAL EARTH WALL (CONCRETE BLOCK) PER WL DRAWINGS
12. CEMENT CONCRETE TRAFFIC CURB AND GUTTER WITH VARIABLE SLOPE PER DETAIL DWG MD4
13. BOEING SECURITY FENCE PER DETAILS MD5
14. 12–INCH CEMENT CONCRETE CURB AND GUTTER PER DETAIL DWG WL1 AND ST3
15. RIVER ROCK PAVING
16. 4" CRUSHED SURFACING TOP COURSE
17. GRAVEL BORROW



757TH AVENUE TYPICAL SECTION A

757–LINE
101+45.00 TO 104+50

* 10:1 CUT SLOPE SHALL BE INSTALLED WHERE POSSIBLE. WHERE BACK OF CURB ELEVATIONS EXCEED TRACK ELEVATIONS, SLOPE SHALL BE AS FLAT AS POSSIBLE AND MAY BE INSTALLED AS A FILL SLOPE WHERE NECESSARY.



757TH AVENUE TYPICAL SECTION B

757–LINE
104+50 TO 106+29.28

LEGEND

- TOPSOIL TYPE A
- RIVER ROCK
- CRUSHED SURFACING TOP COURSE
- GRAVEL BORROW
- EXISTING SUBGRADE
- NEW BOEING SECURITY FENCE
- EXISTING BOEING SECURITY FENCE
- (X) LANE NO. (SEE SUPERELEVATION TABLE ON DWG RP1)

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

DONALD MATTHEW POWELL
STATE OF WASHINGTON
155619
REGISTERED
PROFESSIONAL ENGINEER
3/26/2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
FILE: 20160266 RS.dwg

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CITY OF RENTON
Public Works Department

APPROVED FOR CONSTRUCTION

BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

TYPICAL ROADWAY SECTIONS

DRAWING NO. RS2
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 3/2022
SHEET NO. 6 OF 56

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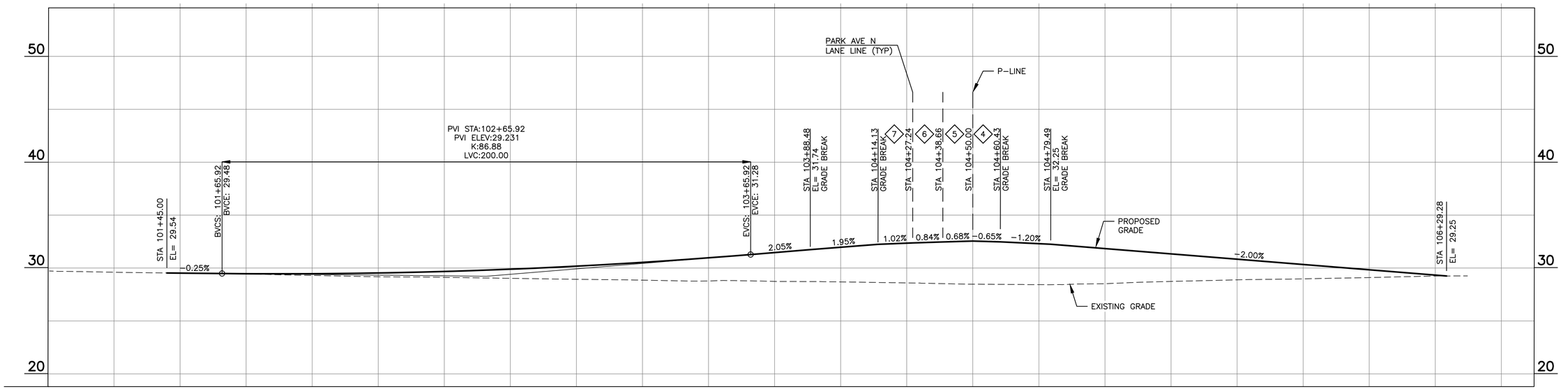
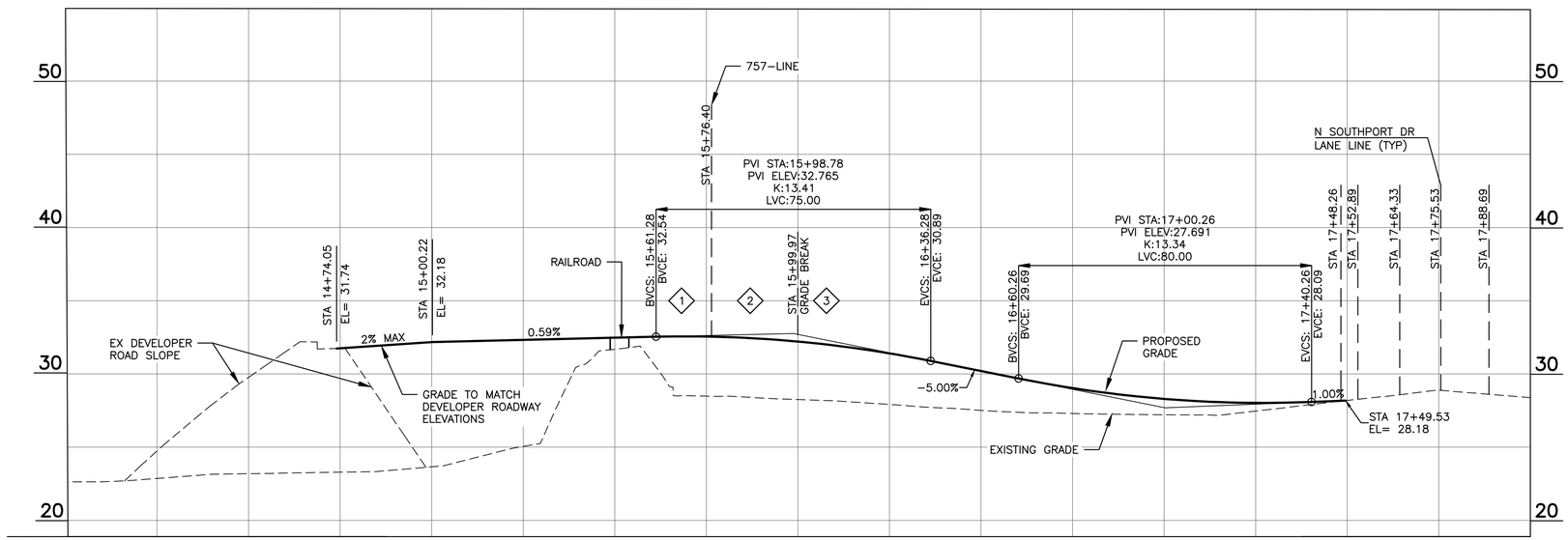
757–LINE



LT FL EL	29.58	29.57	29.62	29.71	29.85	30.06	30.35	30.70	31.13	31.61	32.03			32.33	31.87	31.33	30.75	30.20	29.70	29.24
CL EL	29.53	29.47	29.46	29.54	29.68	29.89	30.18	30.54	30.97	31.46	31.95	32.35	32.55	32.30	31.84	31.34	30.84	30.34	29.84	29.34
RT FL EL	28.77	28.66	28.57	28.62	28.77	28.98	29.27	29.58	29.82	29.79				31.94	31.42	30.97	30.53	30.06	29.56	28.97

P–LINE



LT FL EL	31.91	32.20			31.95	31.14	29.80	28.36	27.21		
CL EL	32.10	32.33	32.48	32.55	32.21	31.41	30.20	29.03	28.30	28.03	
RT FL EL	31.49	31.92		32.22			29.61	28.64	27.90	27.72	

SUPERELEVATION TABLE

STATION	LANE NO. AND CROSS SLOPE		
757–LINE	◇1	◇2	◇3
101+45.01	0.49%	−1.38%	−1.00%
102+10.38	2.00%	−2.00%	−2.00%
103+17.43			
103+88.48	1.79%	−2.24%	−2.95%
SEE NOTE 2			
104+79.49	1.25%	−1.49%	−1.42%
105+02.57	1.00%	−1.00%	−2.00%
105+61.95	−2.00%	2.00%	
106+15.46			
106+29.28	−1.07%	0.37%	−2.27%

SUPERELEVATION TABLE

STATION	LANE NO. AND CROSS SLOPE			
P–LINE	◇4	◇5	◇6	◇7
15+00.22	0.10%	−0.10%	−2.00%	−2.00%
15+08.00	−2.00%	−2.00%		
15+46.50	0.55%	0%	0%	0%
15+60.52		0.20%	0.20%	
15+76.57	−1.00%	−0.50%	−0.50%	−0.50%
15+96.70	−2.00%	−1.00%	−1.00%	−1.00%
16+17.51				
17+00.35				
17+49.53	0.44%	−0.44%	−0.36%	−0.28%

NOTES

1. LANES ARE BOUNDED BY GRADE BREAKS SHOWN ON PV1, 757–LINE, AND P–LINE.
2. P–LINE LANES GOVERN GRADES THROUGH INTERSECTION OF PARK AVE N AND 757TH AVE.
3. NEGATIVE CROSS SLOPES FLOW AWAY FROM CENTERLINE. POSITIVE CROSS SLOPES FLOW TOWARD CENTERLINE.
4. TRANSITION CROSS SLOPES LINEARLY BETWEEN STATIONS PROVIDED.

LEGEND

◇X LANE NO.

HORIZONTAL SCALE

20 0 20 40
FEET

VERTICAL SCALE

5 0 5 10
FEET

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

MATTHEW POWELL — STATE OF WASHINGTON — 25519 — REGISTERED PROFESSIONAL ENGINEER — 3/26/2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
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PROJ MGR: P. DE BOLDT
FILE: 20160266 PR.dwg

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CITY OF RENTON
Public Works Department

APPROVED FOR CONSTRUCTION

BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

ROADWAY PROFILE

DRAWING NO. RP1
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 3/2022
SHEET NO. 7 OF 56

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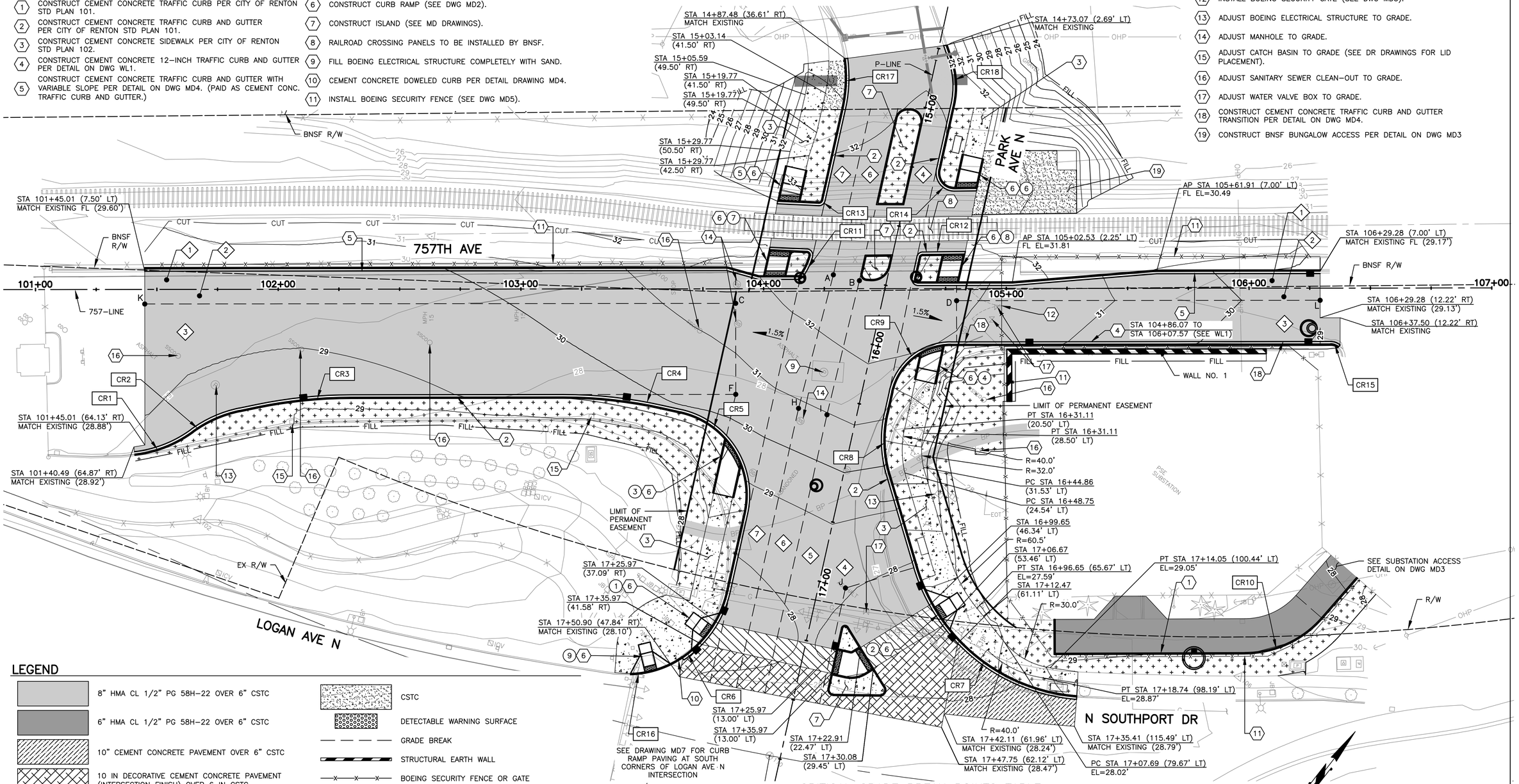
NW ¼ SEC 8, T 23 N, R 5 E, W.M.

CONSTRUCTION NOTES

1. CONSTRUCT CEMENT CONCRETE TRAFFIC CURB PER CITY OF RENTON STD PLAN 101.
2. CONSTRUCT CEMENT CONCRETE TRAFFIC CURB AND GUTTER PER CITY OF RENTON STD PLAN 101.
3. CONSTRUCT CEMENT CONCRETE SIDEWALK PER CITY OF RENTON STD PLAN 102.
4. CONSTRUCT CEMENT CONCRETE 12–INCH TRAFFIC CURB AND GUTTER PER DETAIL ON DWG WL1.
5. CONSTRUCT CEMENT CONCRETE TRAFFIC CURB AND GUTTER WITH VARIABLE SLOPE PER DETAIL ON DWG MD4. (PAID AS CEMENT CONC. TRAFFIC CURB AND GUTTER.)
6. CONSTRUCT CURB RAMP (SEE DWG MD2).
7. CONSTRUCT ISLAND (SEE MD DRAWINGS).
8. RAILROAD CROSSING PANELS TO BE INSTALLED BY BNSF.
9. FILL BOEING ELECTRICAL STRUCTURE COMPLETELY WITH SAND.
10. CEMENT CONCRETE DOWELED CURB PER DETAIL DRAWING MD4.
11. INSTALL BOEING SECURITY FENCE (SEE DWG MD5).

CONSTRUCTION NOTES (CONTINUED)

12. INSTALL BOEING SECURITY GATE (SEE DWG MD5).
13. ADJUST BOEING ELECTRICAL STRUCTURE TO GRADE.
14. ADJUST MANHOLE TO GRADE.
15. ADJUST CATCH BASIN TO GRADE (SEE DR DRAWINGS FOR LID PLACEMENT).
16. ADJUST SANITARY SEWER CLEAN–OUT TO GRADE.
17. ADJUST WATER VALVE BOX TO GRADE.
18. CONSTRUCT CEMENT CONCRETE TRAFFIC CURB AND GUTTER TRANSITION PER DETAIL ON DWG MD4.
19. CONSTRUCT BNSF BUNGALOW ACCESS PER DETAIL ON DWG MD3



LEGEND

- 8" HMA CL 1/2" PG 58H–22 OVER 6" CSTC
- 6" HMA CL 1/2" PG 58H–22 OVER 6" CSTC
- 10" CEMENT CONCRETE PAVEMENT OVER 6" CSTC
- 10 IN DECORATIVE CEMENT CONCRETE PAVEMENT (INTERSECTION FINISH) OVER 6 IN CSTC
- 10" DECORATIVE CEMENT CONCRETE PAVEMENT (CROSSWALK FINISH) OVER 6" CSTC
- CEMENT CONCRETE SIDEWALK
- LANDSCAPE OR RIVER ROCK PAVING (SEE PL DRAWINGS)
- CSTC
- DETECTABLE WARNING SURFACE
- GRADE BREAK
- STRUCTURAL EARTH WALL
- BOEING SECURITY FENCE OR GATE
- CRX — CURB RETURN (SEE TABLES ON DWG MD1)
- (X) — CURB RAMP NO. (SEE DWG MD2)
- ◇X — LANE NO. (SEE SUPERELEVATION TABLE ON DWG RP1)

CRITICAL GRADE BREAK POINTS TABLE

POINT	STATION (OFFSET)	ELEVATION	NOTES	POINT	STATION (OFFSET)	ELEVATION	NOTES
A	15+75.49 (22.00' RT)	32.45	GRADE BREAK AP	G	NOT USED		
B	15+75.49 (11.00' RT)	32.50	GRADE BREAK AP	H	16+32.32 (24.00' RT)	30.84	GRADE BREAK AP
C	103+88.48 (6.00' RT)	31.61		I	16+32.32 (12.00' RT)	30.96	GRADE BREAK AP
D	104+79.49 (5.00' RT)	32.18		J	17+00.35 (11.00' LT)	28.07	GRADE BREAK AP
E	NOT USED			K	101+45.01 (6.00' RT)	29.46	MATCH EXISTING
F	16+32.32 (50.50' RT)	30.50	GRADE BREAK AP	L	106+29.28 (5.00' RT)	29.27	MATCH EXISTING

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

MATTHEW PAUL DE BOLDT — STATE OF WASHINGTON — 55519 — REGISTERED PROFESSIONAL ENGINEER — 3/26/2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
FILE: 20160266 PV.dwg

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CITY OF RENTON
Public Works Department

APPROVED FOR CONSTRUCTION

BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

PAVING AND GRADING PLAN

DRAWING NO. PV1
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 3/2022
SHEET NO. 8 OF 56

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CURB RAMP NOTES:

(1)(2)(9) CURB RAMP TYPE PERPENDICULAR PER WSDOT STD PLAN F-40.15-03

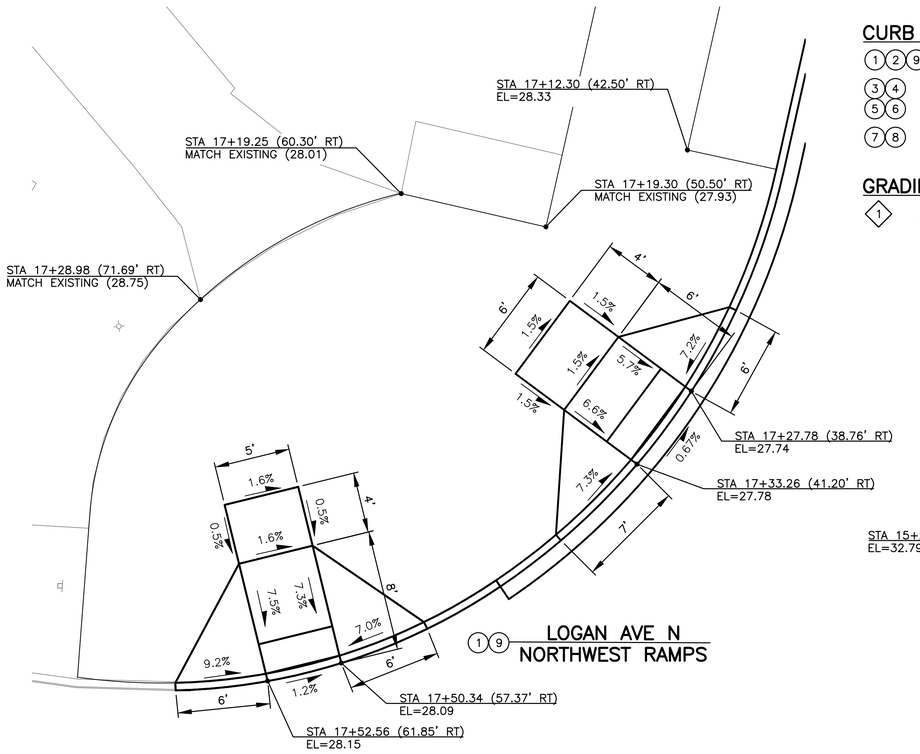
(3)(4)(5)(6) CURB RAMP TYPE SINGLE DIRECTION PER WSDOT PLAN F-40.16-03

(7)(8) CURB RAMP TYPE REFUGE ISLAND PER DRAWINGS MD3 AND MD4

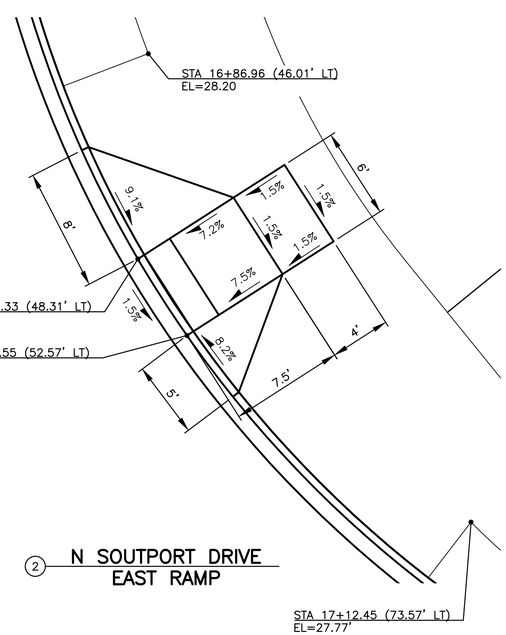
GRADING NOTES:

(1) TRANSITION PLANTER CROSS SLOPE SOUTH OF CURB RAMP AT 1%/FT UNTIL SLOPE IS 1.5% TOWARD PARK AVE N CENTERLINE

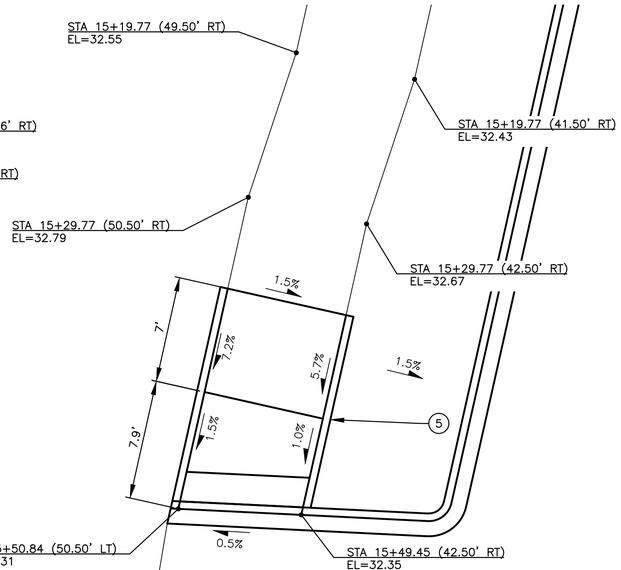
SCALE
5 0 5 10
FEET

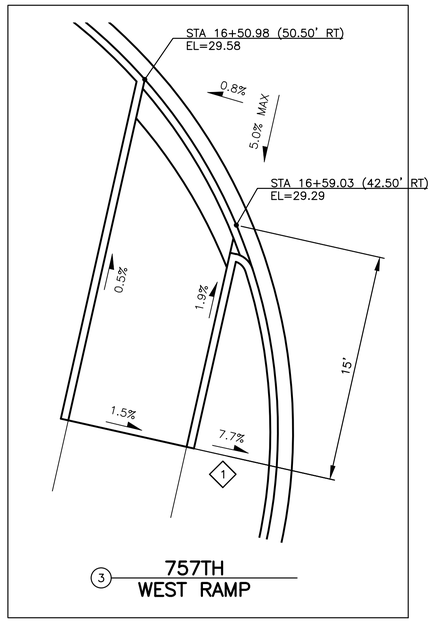


(1)(9) LOGAN AVE N NORTHWEST RAMPS

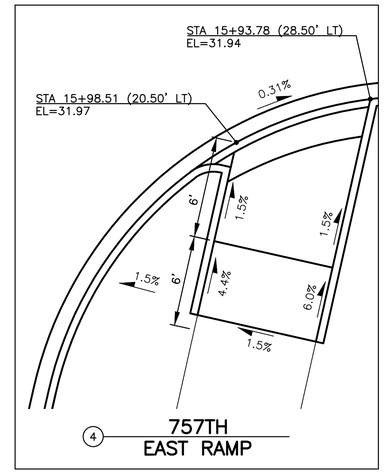


(2) N SOUTPORT DRIVE EAST RAMP

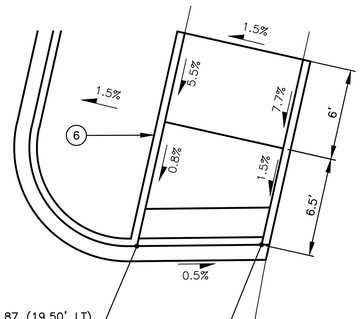


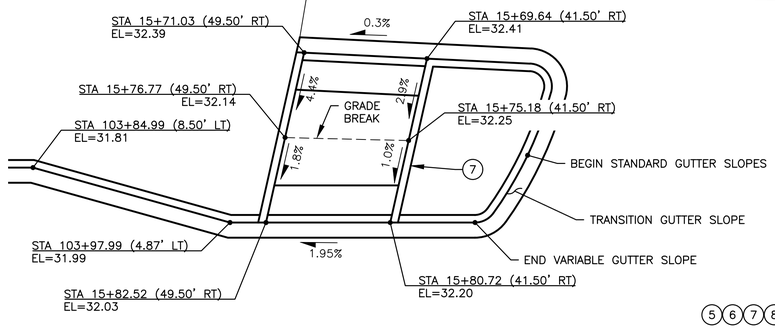


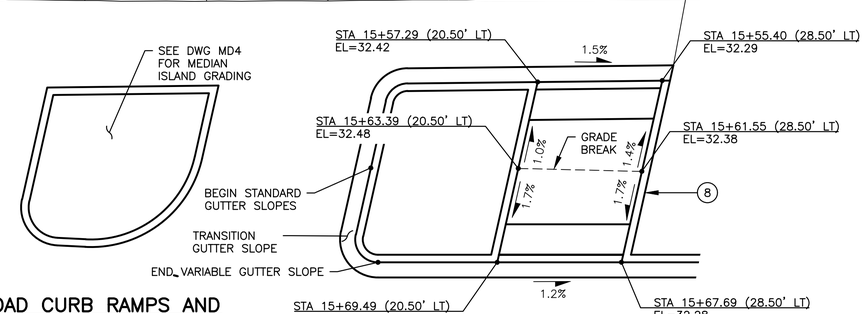
(3) 757TH WEST RAMP



(4) 757TH EAST RAMP







(5)(6)(7)(8) RAILROAD CURB RAMPS AND REFUGE ISLANDS

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

DONALD MATTHEW POWELL — STATE OF WASHINGTON — 155619 — REGISTERED PROFESSIONAL ENGINEER
3/26/2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
FILE: 20160266 MD 1-2.dwg

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CITY OF RENTON
Public Works Department

APPROVED FOR CONSTRUCTION

BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

MISCELLANEOUS DETAILS

DRAWING NO. MD2
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 3/2022
SHEET NO. 11 OF 56

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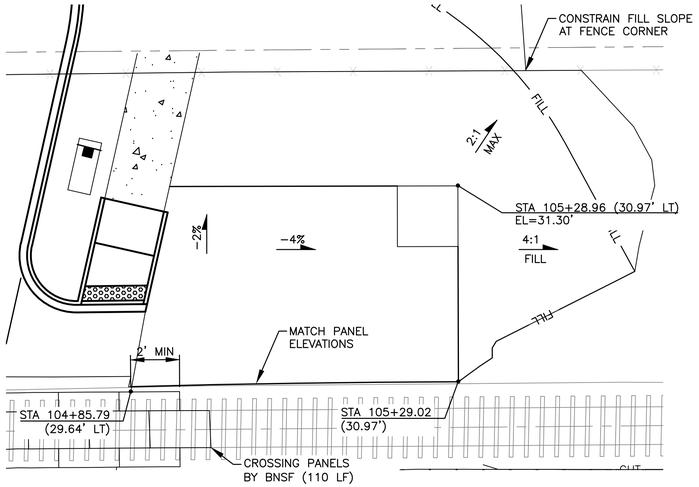
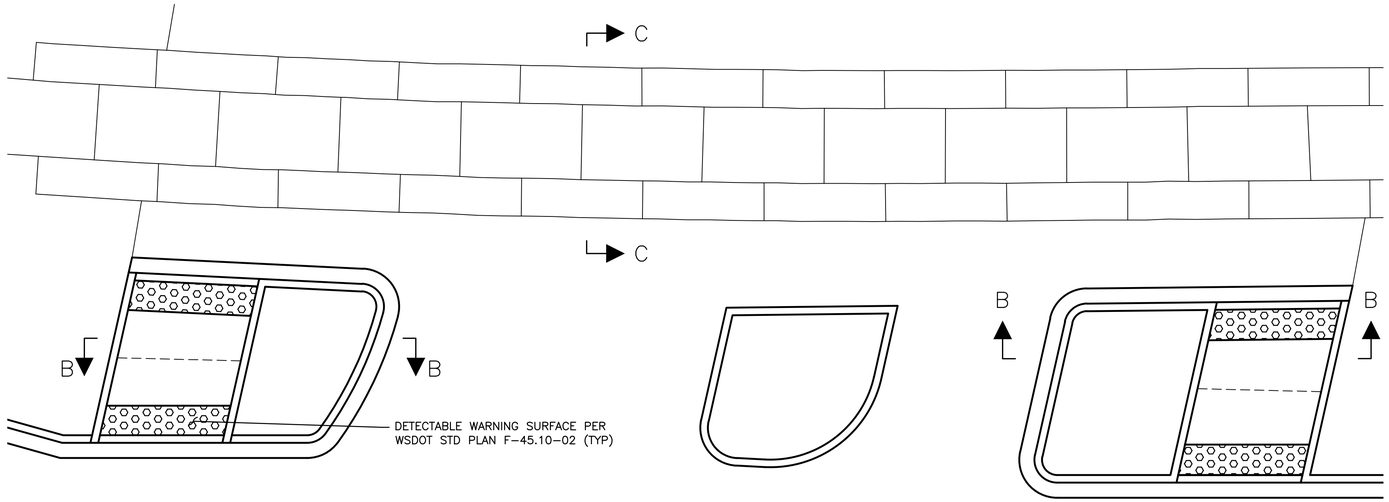


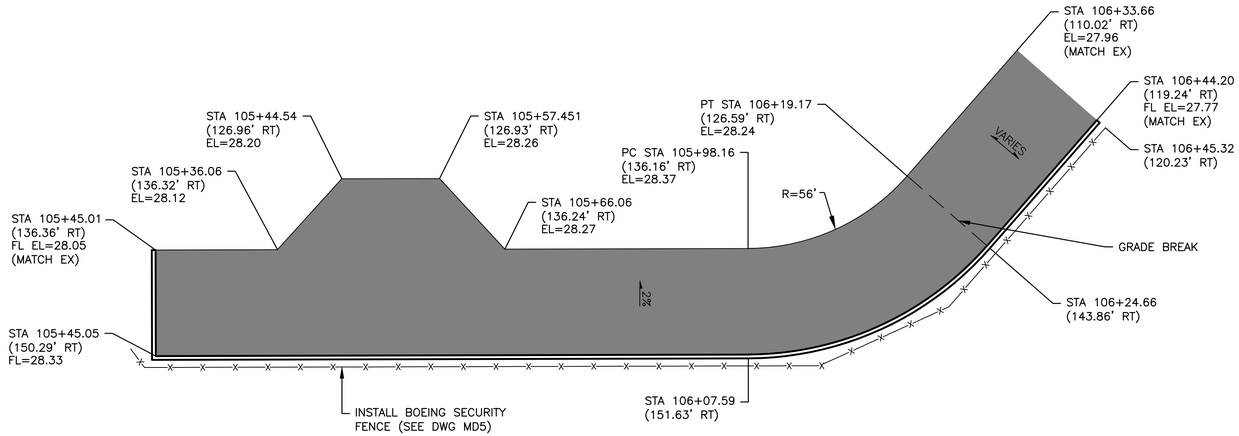
BUNGALOW ACCESS DETAIL

SCALE: 1"=10'



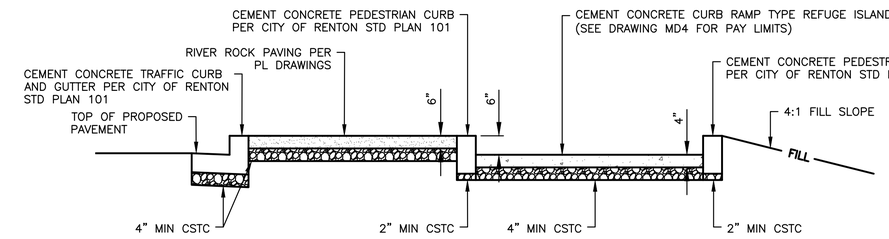
RAILROAD TRACK PAVING AND REFUGE ISLANDS

SCALE: 1"=5'



SUBSTATION ACCESS DETAIL

SCALE: 1"=10'



SECTION B-B

NTS

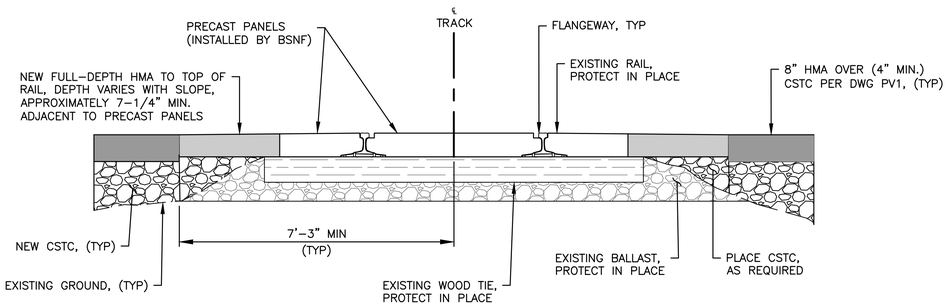
LEGEND

- HMA CL 1/2" PG 58H-22
- CRUSHED SURFACING TOP COURSE
- EXISTING BALLAST
- BOEING SECURITY FENCE

SCALE

10 0 10 20

FEET



SECTION C-C

NTS

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

MATTHEW POWELL — STATE OF WASHINGTON — 155619 — REGISTERED PROFESSIONAL ENGINEER — 3/26/2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
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FILE: 20160266 MD 3-4.dwg

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CITY OF RENTON
Public Works Department

APPROVED FOR CONSTRUCTION

BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

MISCELLANEOUS DETAILS

DRAWING NO. MD3
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 3/2022
SHEET NO. 12 OF 56

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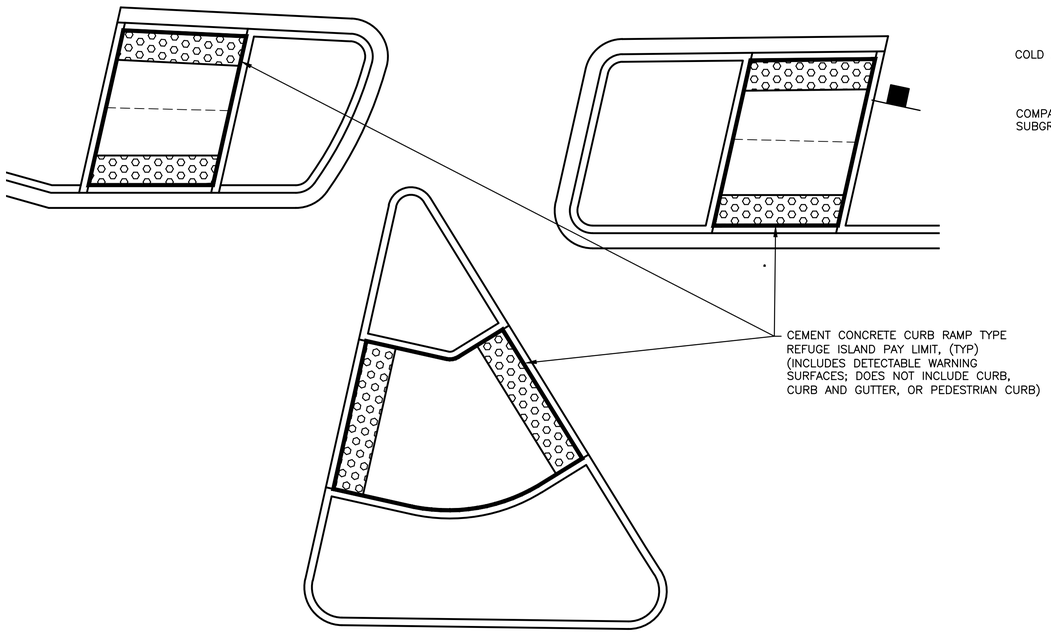
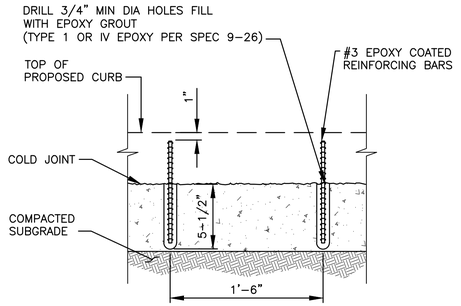


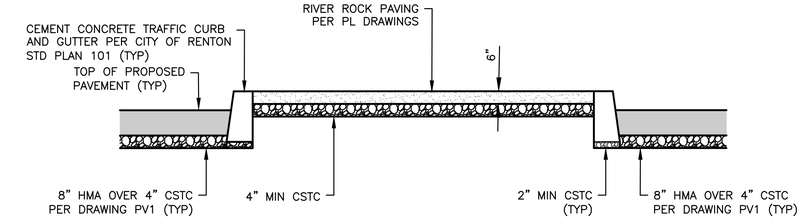
CEMENT CONCRETE CURB RAMP TYPE REFUGE ISLAND PAY LIMITS

NTS



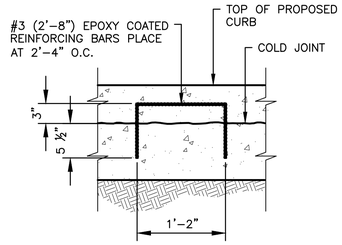
CURB DOWEL PINS ON EXISTING PAVEMENT

NTS



SECTION E–E

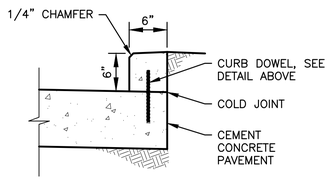
NTS



CURB DOWEL ON NEW PAVEMENT

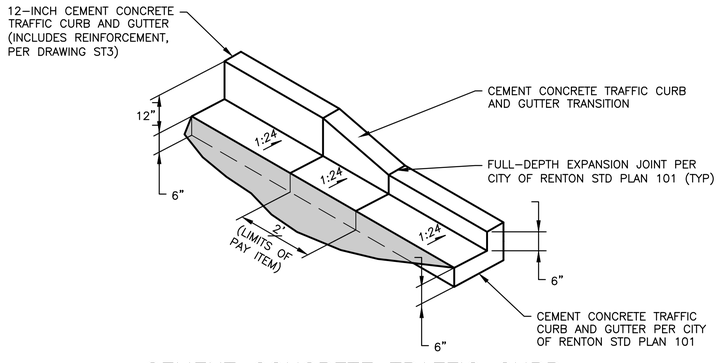
NTS

MEDIAN ISLAND POINTS				
POINT	STATION	OFFSET	FLOWLINE	DESCRIPTION
A	15+43.39	11.00' RT	32.42	AP
B	15+25.18	11.00' RT	32.21	1/2
C	15+06.97	11.00' RT	32.00	PC
D	15+02.10	7.14' RT	32.02	PT
E	15+01.87	6.14' RT	32.03	PC
F	15+06.74	0'	32.21	PT
G	15+23.86	0'	32.32	1/2
H	15+40.99	0'	32.42	AP
I	15+62.14	0'	32.55	AP
J	15+67.05	0'	32.56	PC
K	15+74.45	6.25' RT	32.53	PT
L	15+74.76	8.08' RT	32.52	PC
M	15+72.29	11.00' RT	32.53	PT
N	15+64.74	11.00' RT	32.56	AP



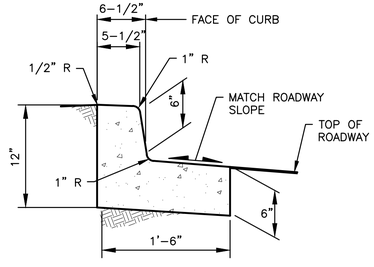
CEMENT CONCRETE DOWELED CURB

NTS



CEMENT CONCRETE TRAFFIC CURB AND GUTTER TRANSITION

NTS



CEMENT CONCRETE TRAFFIC CURB AND GUTTER W/VARIABLE SLOPE

NTS

MEDIAN ISLAND GRADING

SCALE: 1"=5'

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

MATTHEW POWELL — STATE OF WASHINGTON — 55619 — REGISTERED PROFESSIONAL ENGINEER — 3/26/2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
FILE: 20160266 MD 3-4.dwg

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CITY OF RENTON
Public Works Department
APPROVED FOR CONSTRUCTION
BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

MISCELLANEOUS DETAILS

DRAWING NO. MD4
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 3/2022
SHEET NO. 13 OF 56

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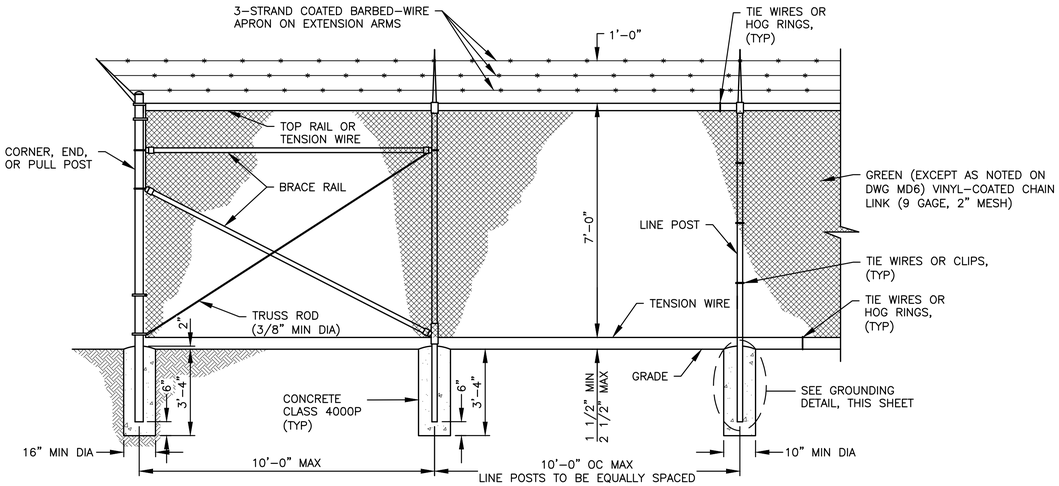
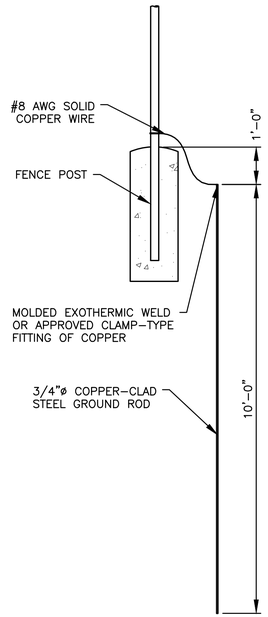
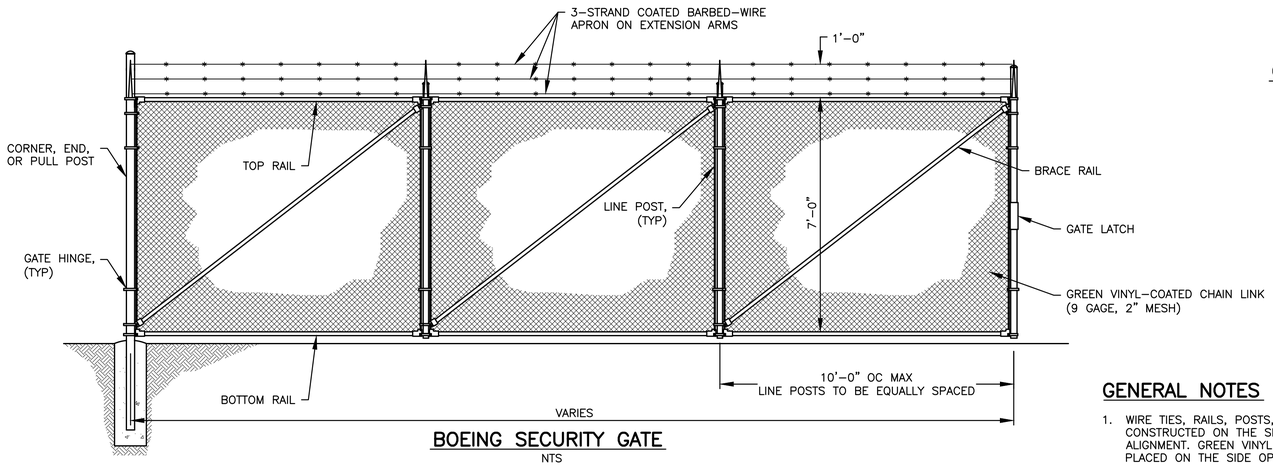


BOEING SECURITY FENCE
NTS



GROUNDING DETAIL
NTS



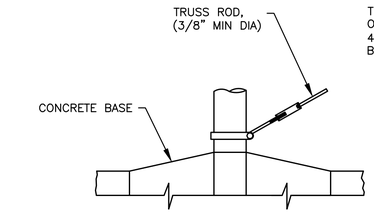
BOEING SECURITY GATE
NTS

NOTE:
TOP RAIL, BOTTOM RAIL, AND LINE POSTS OF BOEING SECURITY GATE SHALL BE PAINTED WITH ALTERNATIVE RED AND WHITE STRIPES.

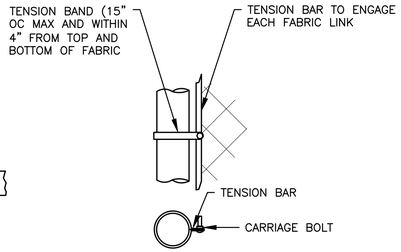
GENERAL NOTES

1. WIRE TIES, RAILS, POSTS, AND BRACES SHALL BE CONSTRUCTED ON THE SECURE SIDE OF THE FENCE ALIGNMENT. GREEN VINYL COATED CHAIN–LINK SHALL BE PLACED ON THE SIDE OPPOSITE THE SECURE AREA.

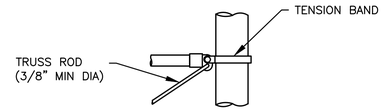
STEEL POST SCHEDULE	
MINIMUM OUTSIDE DIMENSIONS (NOMINAL)	
USE AND SECTION	FABRIC WIDTH 84" TO 96"
CORNER, END, AND PULL POSTS TUBULAR–ROUND	2.875" OD
LINE POSTS TUBULAR–ROUND	2.375" OD
TOP, BOTTOM, AND BRACE RAILS TUBULAR–ROUND	1.66" OD



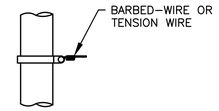
TRUSS ROD AND BAND



END OR GATE POST

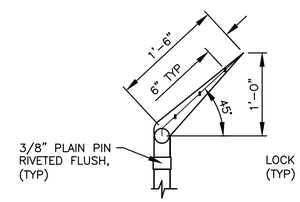


BRACE RAIL CLAMP

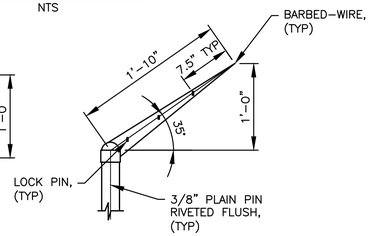


TENSION BAND

FASTENING DETAILS
NTS

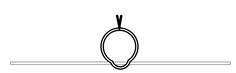


LINE POST

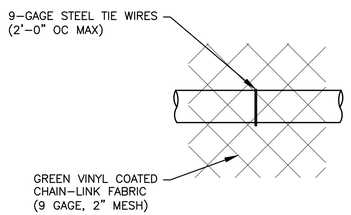


CORNER POST

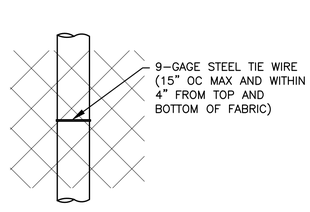
EXTENSION ARM DETAILS
NTS



TOP VIEW



TOP OR BASE RAIL



ROUND POST

ATTACHMENT DETAILS
NTS

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

MATTHEW POWELL, STATE OF WASHINGTON, 55619, REGISTERED PROFESSIONAL ENGINEER, 3/26/2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
FILE: 20160266 MD 5-6.dwg

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SEATTLE, WA 98104
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CITY OF RENTON
Public Works Department
APPROVED FOR CONSTRUCTION
BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

MISCELLANEOUS DETAILS

DRAWING NO. MD5
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 3/2022
SHEET NO. 14 OF 56

X:\Renton, City of\Projects\20160266 – N Park Ave Extension\CADD\Plan Sheets\20160266 MD 5–6.dwg 3/25/2022 2:07 PM

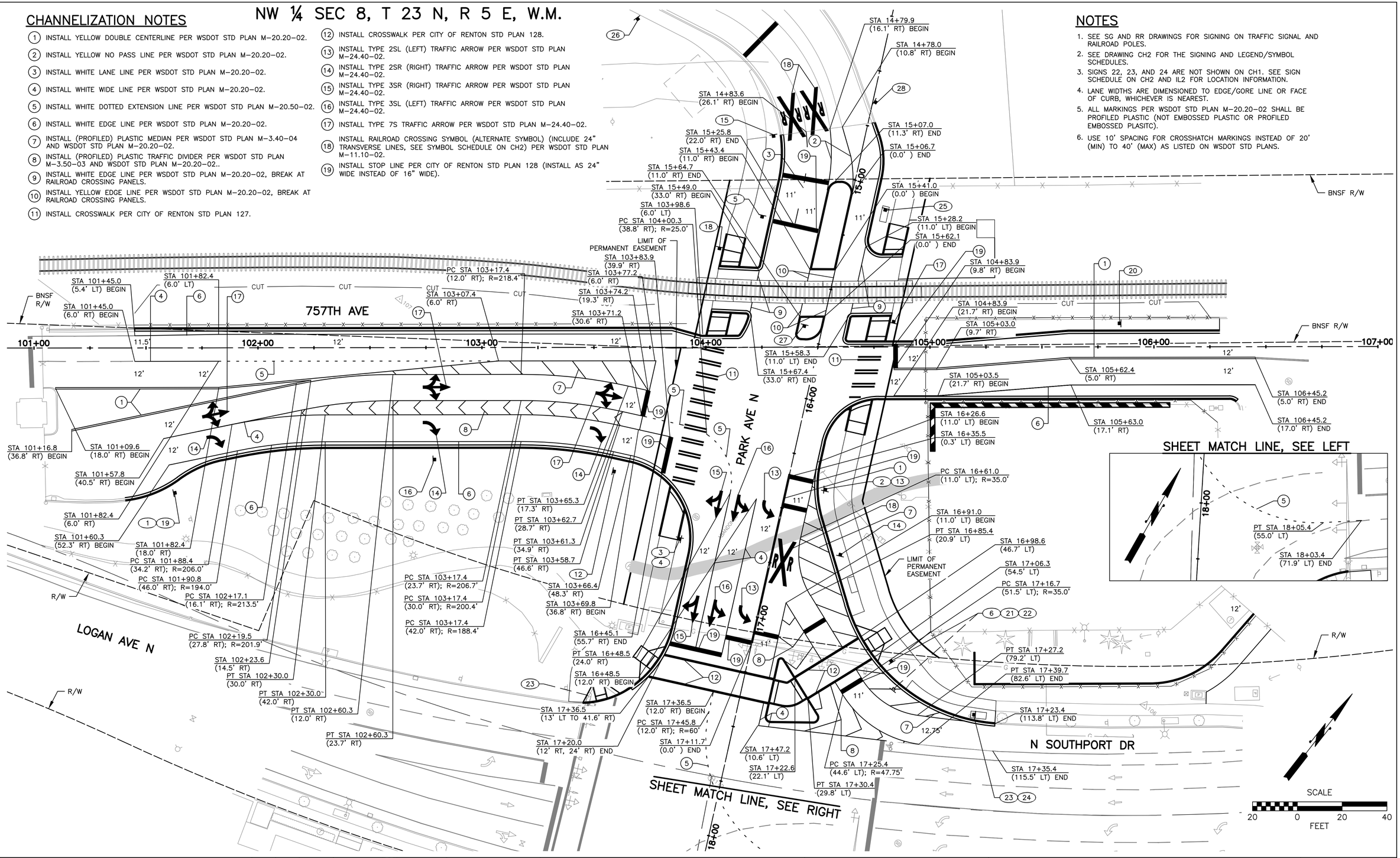
NW ¼ SEC 8, T 23 N, R 5 E, W.M.

CHANNELIZATION NOTES

1. INSTALL YELLOW DOUBLE CENTERLINE PER WSDOT STD PLAN M–20.20–02.
2. INSTALL YELLOW NO PASS LINE PER WSDOT STD PLAN M–20.20–02.
3. INSTALL WHITE LANE LINE PER WSDOT STD PLAN M–20.20–02.
4. INSTALL WHITE WIDE LINE PER WSDOT STD PLAN M–20.20–02.
5. INSTALL WHITE DOTTED EXTENSION LINE PER WSDOT STD PLAN M–20.50–02.
6. INSTALL WHITE EDGE LINE PER WSDOT STD PLAN M–20.20–02.
7. INSTALL (PROFILED) PLASTIC MEDIAN PER WSDOT STD PLAN M–3.40–04 AND WSDOT STD PLAN M–20.20–02.
8. INSTALL (PROFILED) PLASTIC TRAFFIC DIVIDER PER WSDOT STD PLAN M–3.50–03 AND WSDOT STD PLAN M–20.20–02..
9. INSTALL WHITE EDGE LINE PER WSDOT STD PLAN M–20.20–02, BREAK AT RAILROAD CROSSING PANELS.
10. INSTALL YELLOW EDGE LINE PER WSDOT STD PLAN M–20.20–02, BREAK AT RAILROAD CROSSING PANELS.
11. INSTALL CROSSWALK PER CITY OF RENTON STD PLAN 127.
12. INSTALL CROSSWALK PER CITY OF RENTON STD PLAN 128.
13. INSTALL TYPE 2SL (LEFT) TRAFFIC ARROW PER WSDOT STD PLAN M–24.40–02.
14. INSTALL TYPE 2SR (RIGHT) TRAFFIC ARROW PER WSDOT STD PLAN M–24.40–02.
15. INSTALL TYPE 3SR (RIGHT) TRAFFIC ARROW PER WSDOT STD PLAN M–24.40–02.
16. INSTALL TYPE 3SL (LEFT) TRAFFIC ARROW PER WSDOT STD PLAN M–24.40–02.
17. INSTALL TYPE 7S TRAFFIC ARROW PER WSDOT STD PLAN M–24.40–02.
18. INSTALL RAILROAD CROSSING SYMBOL (ALTERNATE SYMBOL) (INCLUDE 24" TRANSVERSE LINES, SEE SYMBOL SCHEDULE ON CH2) PER WSDOT STD PLAN M–11.10–02.
19. INSTALL STOP LINE PER CITY OF RENTON STD PLAN 128 (INSTALL AS 24" WIDE INSTEAD OF 16" WIDE).

NOTES

1. SEE SG AND RR DRAWINGS FOR SIGNING ON TRAFFIC SIGNAL AND RAILROAD POLES.
2. SEE DRAWING CH2 FOR THE SIGNING AND LEGEND/SYMBOL SCHEDULES.
3. SIGNS 22, 23, AND 24 ARE NOT SHOWN ON CH1. SEE SIGN SCHEDULE ON CH2 AND IL2 FOR LOCATION INFORMATION.
4. LANE WIDTHS ARE DIMENSIONED TO EDGE/GORE LINE OR FACE OF CURB, WHICHEVER IS NEAREST.
5. ALL MARKINGS PER WSDOT STD PLAN M–20.20–02 SHALL BE PROFILED PLASTIC (NOT EMBOSSED PLASTIC OR PROFILED EMBOSSED PLASITC).
6. USE 10' SPACING FOR CROSSHATCH MARKINGS INSTEAD OF 20' (MIN) TO 40' (MAX) AS LISTED ON WSDOT STD PLANS.



NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
FILE: 20160266 CH.dwg

STATE OF WASHINGTON · MATTHEW POWELL · 55619 · REGISTERED PROFESSIONAL ENGINEER · 3/26/2022

PERTEET
801 2ND AVENUE, SUITE 302
SEATTLE, WA 98104
800.615.9900

CITY OF RENTON
Public Works Department

APPROVED FOR CONSTRUCTION

BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

CHANNELIZATION AND SIGNING PLAN

DRAWING NO. CH1
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 3/2022
SHEET NO. 23 OF 56

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SIGN SCHEDULE

SIGN NO.	WSDOT SIGN CODE	WIDTH (IN)	HEIGHT (IN)	DESCRIPTION	STATION	OFFSET	NOTES
1	R3-802 (MOD)	36	30	[LEFT/THROUGH/RIGHT ARROW] | [RIGHT ARROW] ONLY	101+62.8	64.8' RT	INSTALL NEW SIGN AND POST
2	R10-6L	24	30	STOP HERE ON RED [DOWN-LEFT ARROW]	16+38.4	17.0' LT	INSTALL NEW SIGN AND POST
3	R3-8A (MOD)	48	30	[LEFT ARROW] ONLY | [LEFT/THROUGH ARROW] | [THROUGH/RIGHT ARROW]	16+73.5	41.6' RT	INSTALL NEW SIGN AND POST (FACING NW)
4	R9-3A	18	18	[NO PEDESTRIAN CROSSING]	16+73.5	41.6' RT	INSTALL NEW SIGN BELOW SIGN NO. 3 (FACING NE)
5	R10-6L	24	30	STOP HERE ON RED [DOWN-LEFT ARROW]	15+20.2	38.9' RT	INSTALL NEW SIGN AND POST
6	R10-6L	24	30	STOP HERE ON RED [DOWN-LEFT ARROW]	17+06.0	62.5' LT	INSTALL NEW SIGN AND POST
7*	W20-901	30	30	TRAFFIC REVISION AHEAD	N:185104 E:1301632		INSTALL NEW SIGN WITH ORANGE FLAGS ON EX LIGHT POLE WEST OF INTERSECTION
8*	W20-901	30	30	TRAFFIC REVISION AHEAD	N:185062 E:1302051		INSTALL NEW SIGN WITH ORANGE FLAGS ON EX LIGHT POLE SOUTH OF INTERSECTION
9*	W20-901	30	30	TRAFFIC REVISION AHEAD	N:185586 E:1302233		INSTALL NEW SIGN WITH ORANGE FLAGS ON EX LIGHT POLE EAST OF INTERSECTION
10**	R9-3A	18	18	[NO PEDESTRIAN CROSSING]	18+32.0	60.5' LT	INSTALL NEW SIGN AND POST (FACING NE CORNER)
11**	R9-3A	18	18	[NO PEDESTRIAN CROSSING]	18+32.0	60.5' LT	INSTALL NEW SIGN OPPOSITE SIGN NO. 10
12	R3-7R	30	30	[RIGHT LANE MUST TURN RIGHT]	103+58.9	55.4' RT	INSTALL NEW SIGN AND POST
13	R9-3A	18	18	[NO PEDESTRIAN CROSSING]	16+38.4	17.0' LT	INSTALL NEW SIGN BELOW SIGN NO. 2 (FACING SW)
14	W10-1	30ø		[RR CROSSING AHEAD]	16+64.1	30.6 LT	INSTALL NEW SIGN AND POST
15	W10-1	30ø		[RR CROSSING AHEAD]	14+88.7	39.9' RT	INSTALL NEW SIGN AND POST
16	W10-2(L)	30	30	[TRACKS LEFT OF INTERSECTION]	102+78.7	50.0' RT	INSTALL NEW SIGN AND POST
17	R15-8	36	18	[LEFT AND RIGHT ARROW] LOOK	15+57.2	31.0' LT	INSTALL NEW SIGN AND POST
18	R15-8	36	18	[LEFT AND RIGHT ARROW] LOOK	15+42.9	53.0' RT	INSTALL NEW SIGN AND POST
19	W3-3	36	36	[SIGNAL AHEAD]	101+63.8	64.8' RT	INSTALL NEW SIGN WITH ORANGE FLAGS ABOVE SIGN NO. 1
20	W3-3	36	36	[SIGNAL AHEAD]	105+84.7	10.5' LT	INSTALL NEW SIGN WITH ORANGE FLAGS AND POST
21	R9-3A	EX	EX	[NO PEDESTRIAN CROSSING]	17+06.0	62.5' LT	RELOCATE SIGN TO BELOW SIGN NO. 6; FACING SOUTH
22	R9-3BL	EX	EX	USE [LEFT ARROW] CROSSWALK	17+06.0	62.5' LT	RELOCATE SIGN TO BELOW SIGN NO. 21
23	R3-5R	EX	EX	[RIGHT TURN] ONLY	17+21.4	103.8' LT	RELOCATE SIGN FROM SIGNAL POLE 3 TO LUMINAIRE POLE IL7
24	R3-5FP	30	12	RIGHT LANE	17+21.4	103.8' LT	INSTALL BELOW SIGN NO. 23
25	R15-8	36	18	[LEFT AND RIGHT ARROW] LOOK	15+10.6	16.6' LT	INSTALL NEW SIGN ON NEW LUMINAIRE POLE IL1
26	W3-3	36	36	[SIGNAL AHEAD]	14+50.8	110.5' RT	INSTALL NEW SIGN AND POST
27	R3-2	30	30	[NO LEFT TURN]	15+68.5	8.0' RT	INSTALL NEW SIGN AND POST, ENGINEER TO CONFIRM PLACEMENT DOES NOT BLOCK VIEW OF RR FLASHERS FOR VEHICLES ON PARK AVE N (EXTENSION)
28	W10-1	30ø		[RR CROSSING AHEAD]	14+64.0	14.4' LT	INSTALL NEW SIGN AND POST
29***	W1-3	30	30	REVERSE TURN	13+13.4	196.4' RT	INSTALL NEW SIGN AND POST

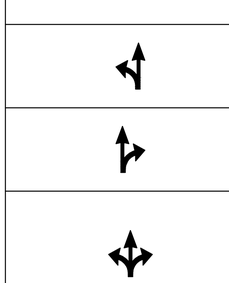
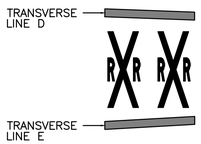
NOTE: STATIONING IS TO THE CENTER OF POST.

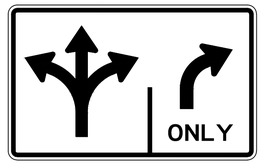
* SIGNS 7, 8, AND 9 ARE NOT SHOWN ON CH1. NORTHING/EASTING VALUES ARE APPROXIMATE. SEE WIRING DIAGRAM ON IL2 FOR SPECIFIC LOCATION INFORMATION.

** SIGNS 10 AND 11 ARE NOT SHOWN ON CH1. SEE DRAWING MD7.

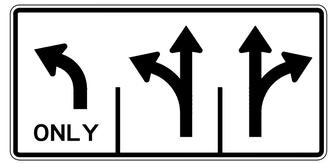
*** SIGN 29 IS NOT SHOWN ON CH1. SEE DRAWING SA1.

SYMBOL SCHEDULE

SYMBOL	STATION	OFFSET	
	16+48.5	8.4' RT	
	16+96.6	8.4' RT	
	101+77.1	40.1' RT	
	102+73.7	33.5' RT	
	103+48.4	35.9' RT	
	16+48.5	19.9' RT	
	16+96.6	19.9' RT	
	16+48.5	28.1' RT	
	16+96.6	28.1' RT	
	101+75.2	30.8' RT	
	102+73.7	17.7' RT	
	103+50.8	20.3' RT	
	16+73.7	5.5' LT	
	16+48.7	0.3' LT TO 11.0' LT	(TRANSVERSE LINE A)
	17+06.7	0.3' LT TO 11.0' LT	(TRANSVERSE LINE B)
	16+94.3 (29.7' LT) TO 17+02.0 (21.8' LT)		(TRANSVERSE LINE C)
	14+73.8	24.6' RT	
	14+78.5	34.0' RT	
	15+03.7 (11.34' RT) TO 15+04.8 (32.1' RT)		(TRANSVERSE LINE D)
	14+38.9 (49.4' RT) TO 14+56.8 (60.45' RT)		(TRANSVERSE LINE E)



R3-802 (MOD)
NTS



R3-8A (MOD)
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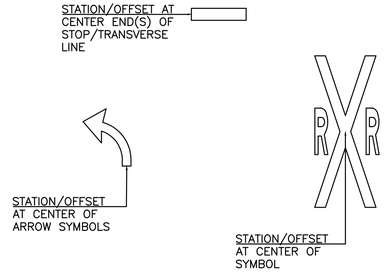

SYMBOL STATIONING
SCALE: NTS

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

MATTHEW POWELL DE BOLDT — STATE OF WASHINGTON — 155619 — REGISTERED PROFESSIONAL ENGINEER — 3/26/2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
FILE: 20160266 CH.dwg

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801 2ND AVENUE, SUITE 302
SEATTLE, WA 98104
800.615.9900

CITY OF RENTON
Public Works Department
APPROVED FOR CONSTRUCTION
BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

CHANNELIZATION AND SIGNING DETAILS

DRAWING NO. CH2
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 3/2022
SHEET NO. 24 OF 56

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GENERAL:

1. ALL WORK SHALL BE PROVIDED IN ACCORDANCE WITH THE LATEST EDITION OF THE CURRENT DRAWINGS, SPECIFICATIONS, AND STANDARDS AS SPECIFIED.
2. DURING CONSTRUCTION THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE STABILITY OF THE STRUCTURE AND FOR ENSURING THAT NO PORTION OF THE STRUCTURE IS OVERSTRESSED AS A RESULT OF CONSTRUCTION ACTIVITIES.
3. EXISTING STRUCTURES SHALL BE PROTECTED AT ALL TIMES.

DESIGN CODES, STANDARDS AND SPECIFICATIONS:

1. AASHTO STANDARD SPECIFICATION FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS, SIXTH EDITION, 2013.
2. AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SEVENTH EDITION.
3. INTERNATIONAL BUILDING CODE (IBC), 2018 EDITION WITH CITY OF SEATTLE AMENDMENTS.
4. ASCE/SEI 7-16, MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES.
5. BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE ACI 318, 2014 EDITION.
6. AISC STEEL CONSTRUCTION MANUAL, FOURTEENTH EDITION, 2011.

STRUCTURAL CONCRETE:

1. CONCRETE:

   CURB SHALL BE CLASS 4000, f'c = 4,000 PSI.
   DRILLED SHAFT SHALL BE CLASS 4000P, f'c = 4,000 PSI.

2. UNLESS NOTED OTHERWISE, MINIMUM CONCRETE COVER SHALL BE:

CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH	3"
CAST-IN-PLACE CONCRETE EXPOSED TO EARTH OR WEATHER	
PRIMARY REINFORCEMENT	2"
STIRRUPS, TIES, OR SPIRALS	1 1/2"

3. REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60.
4. ALL REINFORCING BAR BENDS AND STANDARD HOOKS SHALL CONFORM TO THE LATEST ACI STANDARDS.
5. JOINT SEALANT WHERE SPECIFIED BETWEEN NEW AND EXISTING CONCRETE SHALL BE 3/8" WIDE BY 3/4" DEEP.
6. GROUT SHALL BE NON-SHRINK WITH f'c = 6,000 PSI.

STRUCTURAL STEEL:

1. MISCELLANEOUS STEEL SHALL CONFORM TO ASTM A36, GRADE 36.

DESIGN LOADS:

1. WIND LOAD:
   IN ACCORDANCE WITH, AASHTO STANDARD SPECIFICATION FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS, SIXTH EDITION, 2013.

BASIC WIND SPEED :	85 MPH
IMPORTANCE FACTOR:	1.00
VELOCITY CONVERSION FACTOR:	1.00
HEIGHT AND EXPOSURE FACTOR:	1.00
GUST EFFECT FACTOR:	1.14

2. ICE LOAD:
   UNIFORM ICE LOAD: 3 PSF

GEOTECHNICAL:

1. FOUNDATION DESIGN IS PER GEOTECHNICAL REPORT, PARK AVENUE N EXTENSION RENTON, WASHINGTON BY HWA GEOSCIENCES, INC. DATED FEBRUARY 22, 2019

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NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

SAMIR I. CHUDGAR — STATE OF WASHINGTON — 32119 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER — 12/16/21

SURVEYED: 1 ALLIANCE
DRAWN BY: P. SRENG
DESIGN BY: P. SRENG
CHECK BY: S. CHUDGAR
PROJ MGR: S. CHUDGAR
FILE: Structural Drawing.dwg

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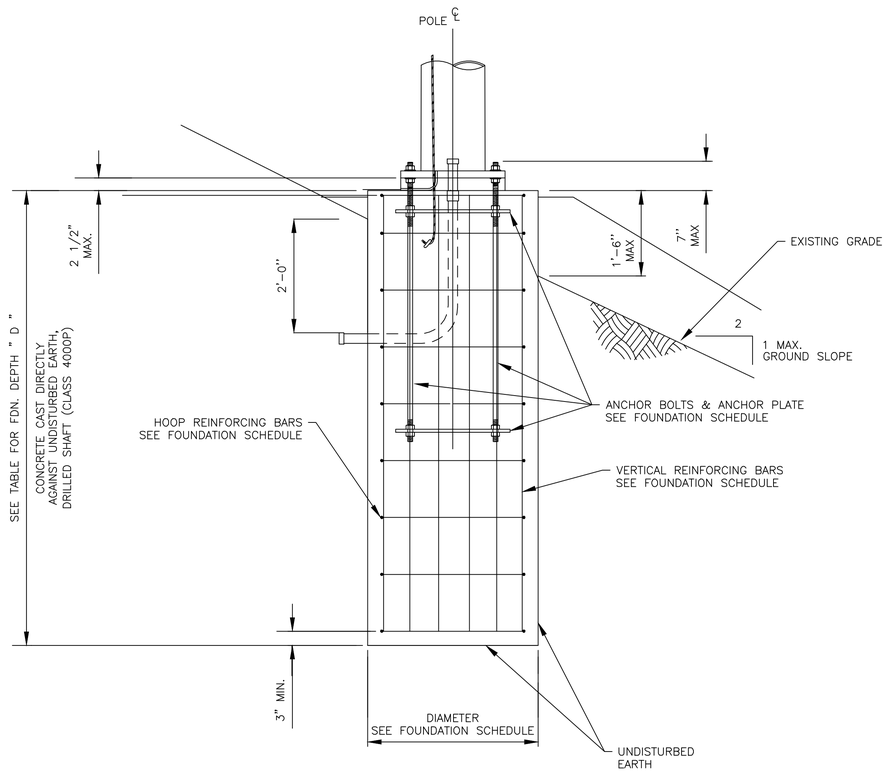
CHUDGAR

CITY OF RENTON
Public Works Department
APPROVED FOR CONSTRUCTION
BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

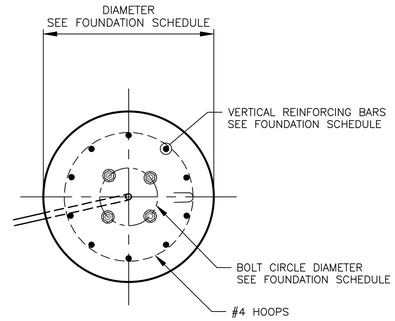
STRUCTURAL NOTES

DRAWING NO. ST1
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 12/2021
SHEET NO. 26 OF 56



DRILLED SHAFT

SCALE: 3/4"=1'



FOUNDATION PLAN VIEW

SCALE: 3/4"=1'

NOTES:

1. THIS DRAWING APPLIES TO ILLUMINATION AND SIGNAL MAST ARM POLE FOUNDATIONS.
2. FOR OTHER INFORMATION RELATED TO ILLUMINATION POLES, REFER TO CITY OF RENTON STD PLAN 117.1.
3. FOR OTHER INFORMATION RELATED TO SIGNAL POLES, REFER TO WSDOT STD PLAN J-26.10-03.
4. REFER TO THE FOLLOWING TABLE FOR POLE NUMBER CORRESPONDING TO THE DESIGNATED FOUNDATION:

POLE LISTING	
FOUNDATION DESIGNATION	POLE NUMBER
TYPE 1	IL7
TYPE 1A	IL1 , IL5
TYPE 2	5 , 6 , 7
TYPE 3	4

POLE FOUNDATION SCHEDULE

FOUNDATION DESIGNATION	POLE TYPE	POLE DESIGNATION	FOUNDATION SCHEDULE				
			DIAMETER	DEPTH	VERTICAL REINFORCING	HOOP REINFORCING	ANCHOR BOLTS
TYPE 1	PER ILLUMINATION	ILLUMINATION POLES	3' RD	8'-0"	10-#10	#4 @ 12" O.C.	PER CITY OF RENTON STD PLAN 117.1, LENGTH 60"
TYPE 1A	PER ILLUMINATION	ILLUMINATION POLES	3' RD	10'-0"	10-#10	#4 @ 12" O.C.	PER CITY OF RENTON STD PLAN 117.1A, LENGTH 60"
TYPE 2	PER SIGNAL	SIGNAL MAST ARM POLES	3' RD	19'-0"	10-#10	#4 @ 6" O.C.	PER WSDOT STD PLAN J-26.10-03
TYPE 3	PER SIGNAL	DOUBLE SIGNAL MAST ARM POLES	4' RD	18'-0"	16-#10	#4 @ 6" O.C.	PER WSDOT STD PLAN J-26.10-03

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

SAMIR I. CHUDGAR — STATE OF WASHINGTON — 52119 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER — 12/16/21

SURVEYED: 1 ALLIANCE
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-CHUDGAR-

CITY OF RENTON
Public Works Department

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BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

POLE FOUNDATIONS

DRAWING NO. ST2
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 12/2021
SHEET NO. 27 OF 56

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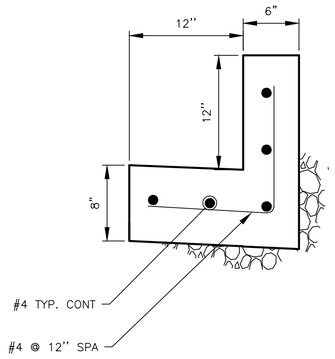

12–INCH CURB SECTION REINFORCEMENT

SCALE: 1–1/2"=1'

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

SAMIR I. CHUDGAR — STATE OF WASHINGTON — 52119 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER — 12/16/21

SURVEYED: 1 ALLIANCE
DRAWN BY: P. SRENG
DESIGN BY: P. SRENG
CHECK BY: S. CHUDGAR
PROJ MGR: S. CHUDGAR
FILE: Structural Drawing.dwg

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–CHUDGAR–

CITY OF RENTON
Public Works Department

APPROVED FOR CONSTRUCTION

BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

CURB REINFORCEMENT DETAILS

DRAWING NO. ST3
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 12/2021
SHEET NO. 28 OF 56

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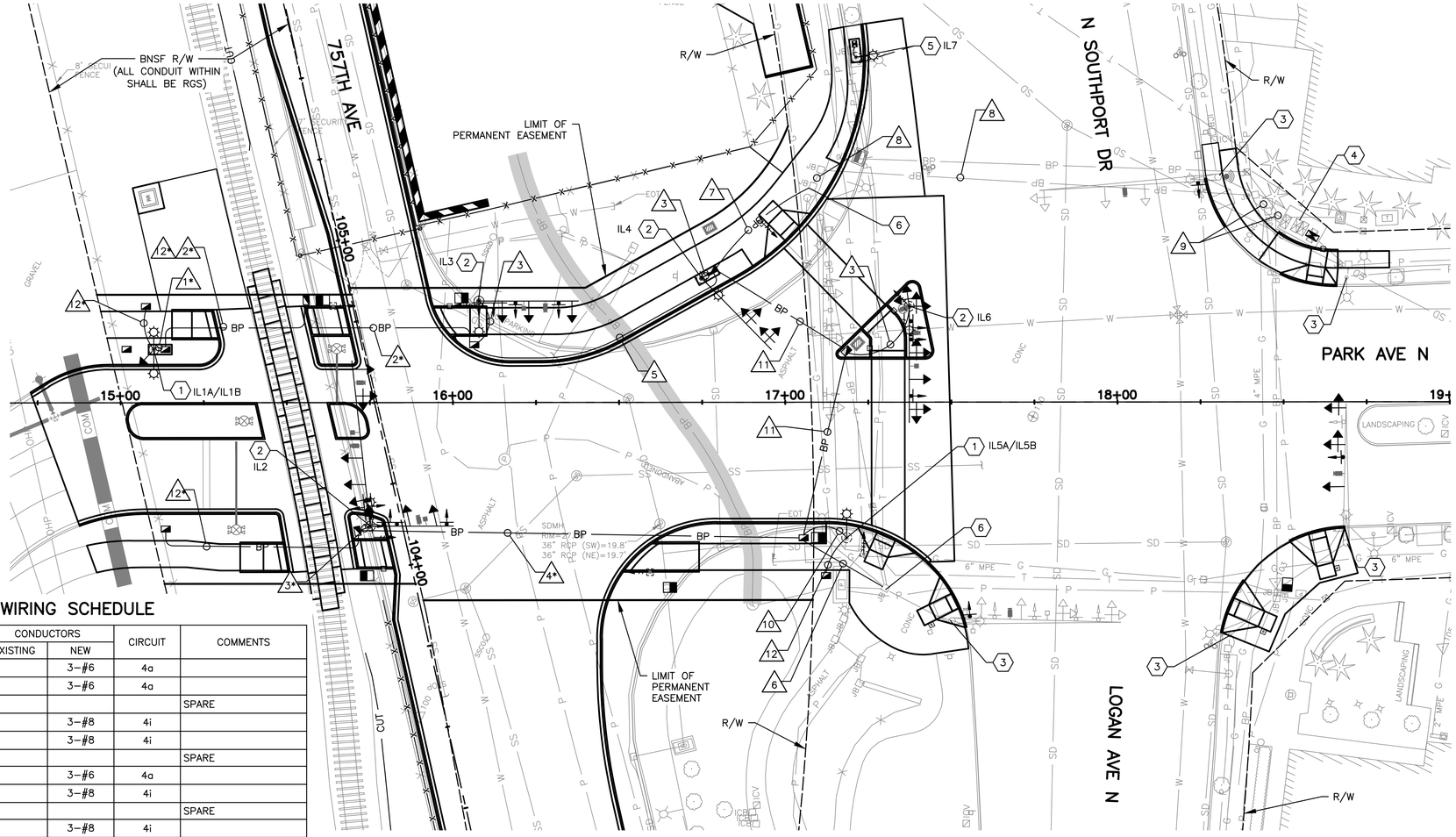

WIRING SCHEDULE

NO.	CONDUIT SIZE	CONDUCTORS EXISTING	CONDUCTORS NEW	CIRCUIT	COMMENTS
1	2"		3–#6	4a	
2	2"		3–#6	4a	
	2"				SPARE
3	2"		3–#8	4i	
4	2"		3–#8	4i	
	2"				SPARE
5	2"		3–#6	4a	
			3–#8	4i	
	2"				SPARE
6	2"		3–#8	4i	
			3–#6	4w	
	2"				SPARE
7	2"		3–#6	4a	
			3–#8	4i	
			3–#6	4w	
	2"				SPARE
8	EX 2"		3–#6	4a	
		3–#8		4i	
		3–#6		4n	
		3–#6		4w	
9	EX 2"		3–#6	4a	
		3–#8		4i	
		3–#6		4n	
		3–#6		4w	
		3–#14			PHOTOCONTROL
10	2"		3–#6	4a	
			3–#8	4i	
11	2"	3–#6		4a	
		3–#8		4i	
		3–#6		4w	
	2"				SPARE
12	2"				SPARE

NOTE: ALL CONDUITS THAT ENTER RAILROAD RIGHT–OF–WAY SHALL BE RGS. THIS IS DENOTED BY * FOLLOWING THE RUN NO.

LUMINAIRE SCHEDULE

LUMINAIRE	STATION	OFFSET	FIXTURE TYPE	POLE TYPE	ARM LENGTH	MOUNTING HEIGHT	FOUNDATION DEPTH	CIRCUIT	DECAL #	COMMENTS	NORTHING	EASTING	TOP OF FOUNDATION
IL1A	15+10.00	16.00' LT	LUMEC DMS50–135W80LED4K–G3–LE3F–240	DECORATIVE ROADWAY LUMINAIRE	6'	35'	SEE DWG ST2	4a			185512.58	1301813.82	32.56'
IL1B			LUMEC DOS–30W16LED4K–T–LE3F–240		4'	14'		4a					
IL2	SEE SG DRAWINGS		LUMEC DMS50–135W80LED4K–G3–LE3F–240	SEE SG DRAWINGS				4i			SEE SG DRAWINGS		
IL3	SEE SG DRAWINGS		LUMEC DMS50–135W80LED4K–G3–LE3F–240	SEE SG DRAWINGS				4i			SEE SG DRAWINGS		
IL4	SEE SG DRAWINGS		LUMEC DMS50–135W80LED4K–G3–LE3F–240	SEE SG DRAWINGS				4i			SEE SG DRAWINGS		
IL5A	17+18.48	40.79' RT	LUMEC DMS50–135W80LED4K–G3–LE3F–240	DECORATIVE ROADWAY LUMINAIRE	6'	35'	SEE DWG ST2	4i			185300.40	1301854.68	28.21'
IL5B			LUMEC DOS–30W16LED4K–T–LE3F–240		4'	14'		4a					
IL6	SEE SG DRAWINGS		LUMEC DMS50–135W80LED4K–G3–LE3F–240	SEE SG DRAWINGS				4i			SEE SG DRAWINGS		
IL7	17+21.41	103.78' LT	EX	EX	EX	EX	SEE DWG ST2	4n		RELOCATE EX POLE	185361.46	1301985.76	28.97'

GENERAL NOTES

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH 2022 WSDOT STANDARD PLANS & SPECIFICATIONS AND THE LATEST APWA STANDARDS AND THE CITY DEVELOPMENTAL GUIDELINES, EXCEPT AS MODIFIED BY CONTRACT PLANS AND SPECIAL PROVISIONS.
2. UTILITY LOCATION (1–800–424–5555) PRIOR TO CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. CONFLICTS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR RESOLUTION.
3. CONTACT TRANSPORTATION MAINTENANCE MANAGER ERIC CUTSHALL AT 425–430–7423 FOR POLE NUMBERS TO BE INSTALLED PER COR STD PLAN 121.
4. ALL ILLUMINATION CONDUIT WITHIN BNSF RIGHT–OF–WAY SHALL BE RIGID GALVANIZED STEEL. ALL OTHER ILLUMINATION CONDUIT SHALL BE RIGID PVC SCHEDULE 80.
5. ALL CONDUIT CONTAINING COPPER CONDUCTORS SHALL INCLUDE 1–#8 GROUND WIRE (MIN. SIZE UNLESS SPECIFIED IN WIRE SCHEDULE). ALL CONDUIT SHALL CONTAIN A PULL–LINE TAPE LABELED "CITY OF RENTON".
6. JUNCTION BOXES SHALL BE KEPT OUT OF THE SIDEWALK UNLESS APPROVED BY THE ENGINEER OR INSTRUCTED ON THE PLANS. JUNCTION BOXES INSTALLED IN SIDEWALKS SHALL HAVE SKID RESISTANT LIDS PER SPECIAL PROVISIONS. JUNCTION BOXES IN PLANTER STRIP SHALL HAVE A CONCRETE PAD PER COR STD PLAN 120. ALL JUNCTION BOXES SHALL HAVE LOCKING LIDS PER COR STD PLAN 119.
7. ALL TYPE 1 AND 2 JUNCTION BOXES SHALL BE PER WSDOT STD PLAN J–40.10–04.
8. ILLUMINATION CONDUIT AND JUNCTION BOX LOCATIONS ARE SCHEMATIC AND SHOWN FOR REFERENCE TO EASE WITH INSTALLATION. FINAL LOCATIONS SHALL BE DETERMINED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER IN THE FIELD.
9. NUMBER OF CONDUIT BENDS BETWEEN PULL POINTS SHALL NOT BE MORE THAN THE EQUIVALENT OF FOUR QUARTER BENDS (360 DEGREES TOTAL). IF NUMBER OF BENDS EXCEEDS 360 DEGREES, THE CONTRACTOR SHALL INSTALL ADDITIONAL JUNCTION BOXES AS REQUIRED.
10. SEE CITY OF RENTON STD PLAN 135 FOR TRANSPORTATION GENERAL NOTES.
11. INITIAL ANCHOR BOLT INSTALLATION SHALL EXTEND AT LEAST 12 INCHES ABOVE TOP OF FOUNDATION FOR ILLUMINATION POLES. CONTRACTOR SHALL CUT BOLTS TO REQUIRED DIMENSIONS PER RENTON STANDARD DETAILS AFTER THE POLE AND BASE PLATE ARE INSTALLED.

CONSTRUCTION NOTES

1. CONSTRUCT ILLUMINATION POLE FOUNDATION PER THE ST DRAWINGS AND CONCRETE PAD PER CITY OF RENTON STD PLAN 120. PROVIDE AND INSTALL DECORATIVE LUMINAIRE POLE PER RENTON STD PLAN 117.1. PROVIDE AND INSTALL DECORATIVE LUMINAIRE, CONDUIT, WIRING, AND ALL ASSOCIATED EQUIPMENT. APPLY DECAL NUMBERING WITH CITY OF RENTON POLE ID# TO ILLUMINATION POLE PER CITY OF RENTON STD PLAN 121.
2. INSTALL LUMINAIRE ON SIGNAL MAST ARM POLE. SEE SG DRAWINGS.
3. PROTECT EXISTING LUMINAIRE AND CONDUIT.
4. INSTALL NEW CIRCUIT 4a IN EXISTING SERVICE CABINET PER BREAKER SCHEDULE ON DWG IL2.
5. RELOCATE EXISTING POLE AND FIXTURE TO NEW LOCATION PER LUMINAIRE SCHEDULE. INSTALL NEW TYPE 1 JUNCTION BOX AND EXTEND OR INTERCEPT EXISTING CONDUITS TO RETAIN SYSTEM AND FIXTURE POWER. CONSTRUCT ILLUMINATION POLE FOUNDATION PER THE ST DRAWINGS AND CONCRETE PAD PER CITY OF RENTON STD PLAN 120. REWIRE FIXTURE TO MATCH EXISTING.
6. SPLICE NEW WIRING TO EXISTING WIRING OF THE SAME CIRCUIT PER WIRING SCHEDULE AND CIRCUIT DIAGRAM.

SCALE
20 0 20 40
FEET

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

MATTHEW POWELL — STATE OF WASHINGTON — 55619 — REGISTERED PROFESSIONAL ENGINEER — 3/26/2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
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PROJ MGR: P. DE BOLDT
FILE: 20160266 IL.dwg

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CITY OF RENTON
Public Works Department
APPROVED FOR CONSTRUCTION
BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

ILLUMINATION PLAN

DRAWING NO. IL1
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 3/2022
SHEET NO. 28 OF 56

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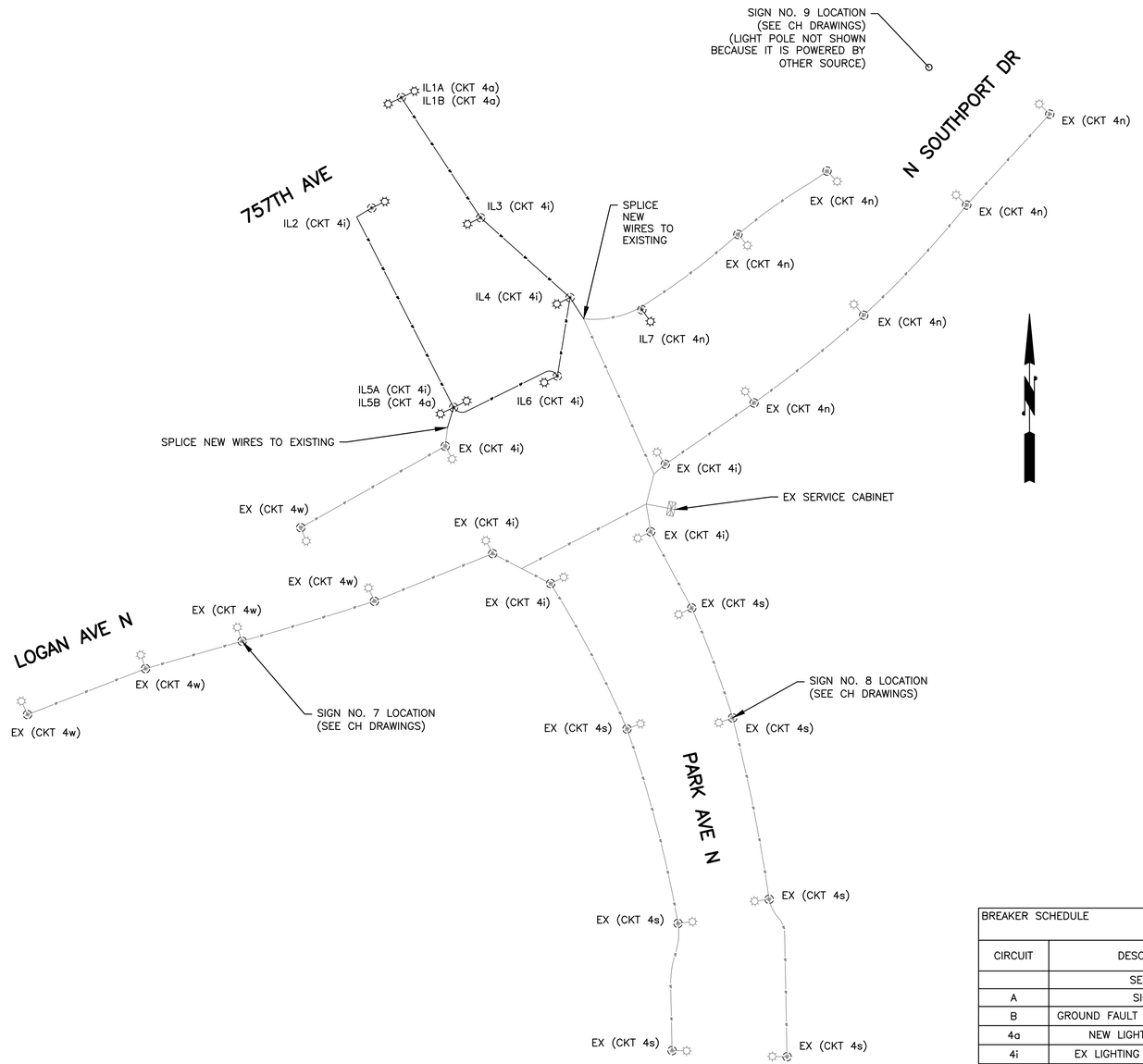

ILLUMINATION CIRCUIT DIAGRAM

NTS

BREAKER SCHEDULE — EX SERVICE CABINET @ PARK / LOGAN / SOUTHPORT — 120/240 VOLT

CIRCUIT	DESCRIPTION	BREAKER RATING	CONTACTOR RATING	VOLTAGE	LOAD (KVA)
	SERVICE	EX 100 AMP			
A	SIGNAL	EX 50 AMP		120	3.03
B	GROUND FAULT RECEPTACLE (GFR)	EX 20 AMP		120	1.80
4a	NEW LIGHTING (NORTH)	20 AMP	30 AMP	240	0.22
4i	EX LIGHTING (INTERSECTION)	EX 15 AMP	EX 30 AMP	240	1.55
4n	EX LIGHTING (EAST)	EX 20 AMP	EX 30 AMP	240	1.08
4s	EX LIGHTING (SOUTH)	EX 20 AMP	EX 30 AMP	240	1.08
4w	EX LIGHTING (WEST)	EX 20 AMP	EX 30 AMP	240	0.77
C	PHOTOCELL	EX 15 AMP		120	0.001
D	RAPIDRIDE	EX 20 AMP		120	UNKNOWN
E	RED LIGHT CAMERA	EX 20 AMP		120	UNKNOWN
			PEAK		9.53 + UNKNOWN
			CONTINUOUS		5.93 + UNKNOWN

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
FILE: 20160266 IL.dwg

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CITY OF RENTON
Public Works Department

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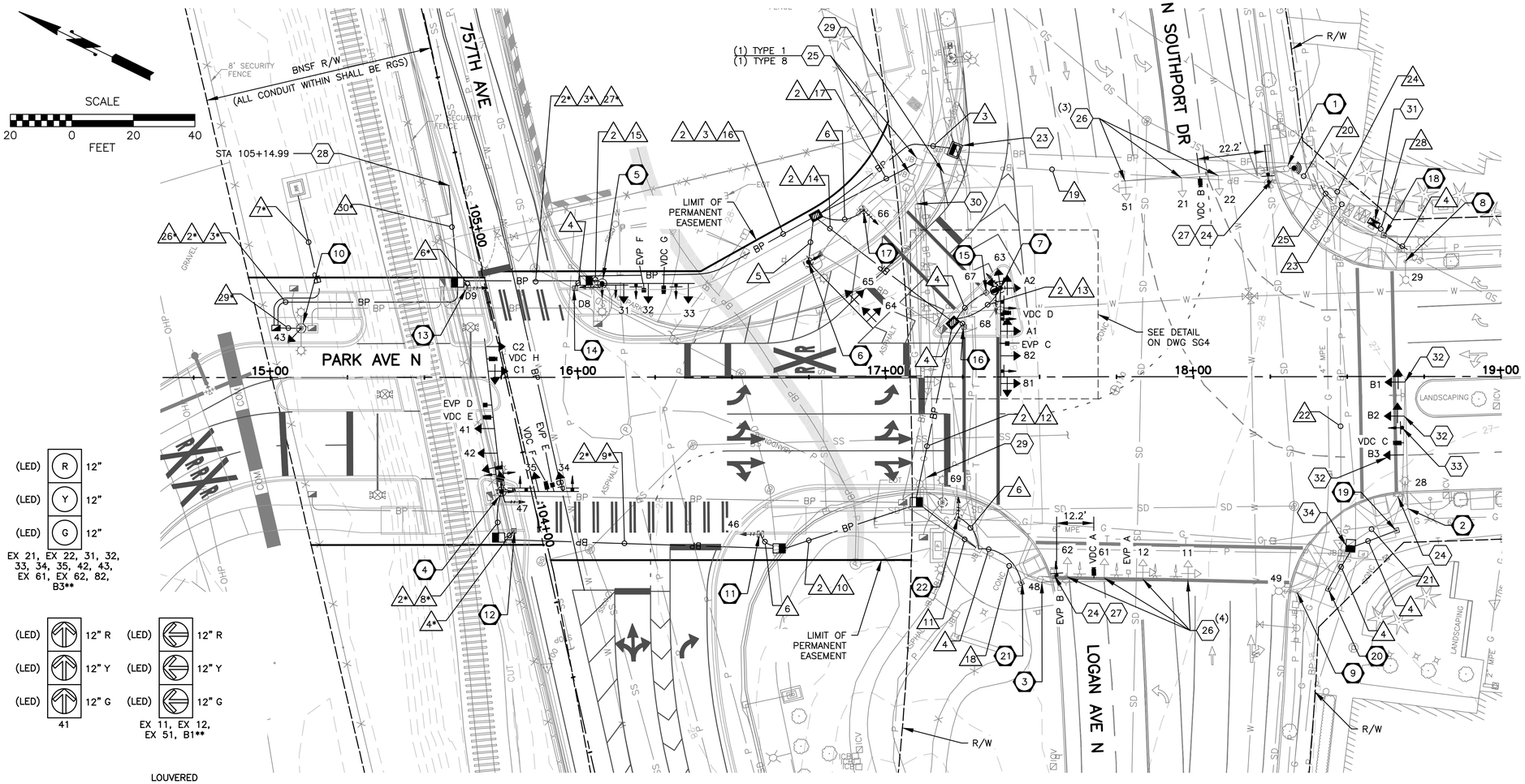
CITY OF RENTON
PARK AVENUE N EXTENSION

ILLUMINATION DETAILS

DRAWING NO. IL2
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 3/2022
SHEET NO. 29 OF 56



CONSTRUCTION NOTES

1. EXISTING DECORATIVE MAST ARM POLE TO REMAIN. INSTALL ONE EMERGENCY VEHICLE PRE-EMPTION GPS EMITTER ON POLE SHAFT. INSTALL ONE VECTOR VIDEO CAMERA ON MAST ARM WHERE SHOWN. EXISTING PTZ TO REMAIN.
2. EXISTING DECORATIVE MAST ARM POLE TO REMAIN. INSTALL ONE VECTOR VIDEO CAMERA ON MAST ARM WHERE SHOWN. REMOVE AND SALVAGE EXISTING PUSHBUTTON. REMOVE AND DISPOSE WIRING.
3. EXISTING DECORATIVE MAST ARM POLE TO REMAIN. INSTALL ONE VECTOR VIDEO CAMERA ON MAST ARM WHERE SHOWN. RELOCATE SIGN PER DWG CH1. REMOVE AND SALVAGE EXISTING PUSHBUTTON. REMOVE AND DISPOSE WIRING.
4. CONSTRUCT FOUNDATION PER DETAILS ON ST DRAWINGS. PROVIDE AND INSTALL TYPE SD SIGNAL POLE PER THE DETAILS SHOWN ON THE SIGNAL POLE DRAWING. PROVIDE AND INSTALL SIX VEHICLE SIGNAL HEADS, ONE PEDESTRIAN SIGNAL HEAD, TWO MODEL 721 OPTICOM DETECTORS, THREE RZ-4 AWDR VIDEO DETECTION CAMERAS, ONE R3-1 SIGN, ONE R9-3A SIGN, THREE D3-101 SIGNS, ONE LUMINAIRE ARM ASSEMBLY WITH LED FIXTURE PER IL DRAWINGS AND TWO TERMINAL CABINETS, INCLUDING MOUNTINGS.
5. CONSTRUCT FOUNDATION PER DETAILS ON ST DRAWINGS. PROVIDE AND INSTALL TYPE III SIGNAL POLE PER THE DETAILS SHOWN ON THE SIGNAL POLE DRAWING. PROVIDE AND INSTALL THREE VEHICLE SIGNAL HEADS, ONE PEDESTRIAN SIGNAL HEAD, ONE MODEL 721 OPTICOM DETECTOR, ONE RZ-4 AWDR VIDEO DETECTION CAMERA, ONE R3-2 LED BLANK-OUT SIGN, ONE R3-5R SIGN, ONE R3-6 (MOD) SIGN, ONE D3-101 SIGN, ONE LUMINAIRE ARM ASSEMBLY WITH LED FIXTURE PER IL DRAWINGS AND ONE TERMINAL CABINET, INCLUDING MOUNTINGS.
6. CONSTRUCT FOUNDATION PER DETAILS ON ST DRAWINGS. PROVIDE AND INSTALL TYPE III SIGNAL POLE PER THE DETAILS SHOWN ON THE SIGNAL POLE DRAWING. PROVIDE AND INSTALL TWO VEHICLE SIGNAL HEADS, ONE R9-3A SIGN, ONE W3-3 SIGN, ONE LUMINAIRE ARM ASSEMBLY WITH LED FIXTURE PER IL DRAWINGS AND ONE TERMINAL CABINET, INCLUDING MOUNTINGS.
7. CONSTRUCT FOUNDATION PER DETAILS ON ST DRAWINGS. PROVIDE AND INSTALL TYPE III SIGNAL POLE PER THE DETAILS SHOWN ON THE SIGNAL POLE DRAWING. PROVIDE AND INSTALL FIVE VEHICLE SIGNAL HEADS, TWO PEDESTRIAN SIGNAL HEADS, ONE MODEL 721 OPTICOM DETECTOR, ONE RZ-4 AWDR VIDEO DETECTION CAMERA, ONE PTZ CAMERA, ONE R3-6 SIGN, TWO R3-5R SIGNS, ONE D3-101 SIGN, ONE LUMINAIRE ARM ASSEMBLY WITH LED FIXTURE PER IL DRAWINGS AND ONE TERMINAL CABINET, INCLUDING MOUNTINGS.
8. 9. EXISTING DECORATIVE STREET LIGHT POLE TO REMAIN. REMOVE AND SALVAGE EXISTING PUSHBUTTON. REMOVE AND DISPOSE WIRING.
10. PROVIDE AND INSTALL ONE VEHICLE SIGNAL HEAD, INCLUDING MOUNTINGS, ON ILLUMINATION POLE. SEE IL DRAWINGS FOR POLE INFO.
11. 13. CONSTRUCT CURB-BASE FOUNDATION PER WSDOT STD PLAN J-20.11-03 (SHEET 2 OF 2). PROVIDE AND INSTALL TYPE PS POLE PER THE DETAILS SHOWN ON THE SIGNAL POLE DRAWING. PROVIDE AND INSTALL ONE PEDESTRIAN SIGNAL HEAD AND ONE APS PUSHBUTTON, INCLUDING MOUNTINGS.
12. 14. 15. 16. 18. CONSTRUCT CURB-BASE FOUNDATION PER WSDOT STD PLAN J-20.11-03 (SHEET 1 OF 2). PROVIDE AND INSTALL TYPE PPB POST PER THE DETAILS SHOWN ON THE SIGNAL POLE DRAWING. PROVIDE AND INSTALL ONE APS PEDESTRIAN PUSHBUTTON, INCLUDING MOUNTINGS.
19. 20. 21. CONSTRUCT FOUNDATION PER WSDOT STD PLAN J-20.10-04. PROVIDE AND INSTALL TYPE PPB POST PER THE DETAILS SHOWN ON THE SIGNAL POLE DRAWING. PROVIDE AND INSTALL ONE APS PEDESTRIAN PUSHBUTTON, INCLUDING MOUNTINGS.
22. 17. CONSTRUCT FOUNDATION PER WSDOT STD PLAN J-21.10-04 (SHEET 1 OF 2). PROVIDE AND INSTALL TYPE PS POLE PER THE DETAILS SHOWN ON THE SIGNAL POLE DRAWING. PROVIDE AND INSTALL ONE PEDESTRIAN SIGNAL HEAD AND ONE APS PEDESTRIAN PUSHBUTTON, INCLUDING MOUNTINGS. NOTE EXISTING GAS LINE (MORE THAN 5 FEET DEEP) BELOW POLE 22.
23. REMOVE EXISTING JUNCTION BOX. INSTALL TYPE 6 HEAVY DUTY JUNCTION BOX PER WSDOT STD PLAN J-40.20-03.
24. REMOVE AND SALVAGE EXISTING VIDEO DETECTION CAMERA.
25. REMOVE EXISTING JUNCTION BOX (TYPE AS NOTED) LID AND INSTALL LID WITH SLIP-RESISTANT COATING.
26. INSTALL 1" RETRO-REFLECTIVE YELLOW TAPE PER BACKPLATE DETAIL ON WSDOT STD PLAN J-75.30-02.
27. REMOVE AND SALVAGE EXISTING D3-101 SIGN AND INSTALL NEW D3-101 SIGN. SEE SG2.
28. INSTALL BOEING ACTIVATION UNIT PER DETAIL ON SG4.
29. REMOVE AND SALVAGE EXISTING DECORATIVE STREET LIGHT POLE AND ATTACHMENTS. REMOVE EXISTING WIRING AND CONDUIT. REMOVE AND DISPOSE FOUNDATION. RELOCATE SIGNS PER DWG CH1.
30. REMOVE AND SALVAGE EXISTING DECORATIVE MAST ARM POLE AND ATTACHMENTS. REMOVE EXISTING WIRING AND CONDUIT. REMOVE AND DISPOSE FOUNDATION.
31. REMOVE AND SALVAGE EXISTING CONTROLLER CABINET. COIL EXISTING WIRING TO REMAIN. FURNISH AND INSTALL ONE TS2 TYPE 1 CONTROLLER CABINET AND ALL ASSOCIATED EQUIPMENT, INCLUDING CONTROLLER PER SPECIAL PROVISIONS. RECONNECT EXISTING WIRING TO REMAIN AND CONNECT PROPOSED WIRING.
32. REMOVE AND SALVAGE EXISTING SIGNAL HEAD. INSTALL SIGNAL HEAD ON EXISTING TENON.
33. REMOVE AND SALVAGE EXISTING R3-5L SIGN. INSTALL R3-6 SIGN IN SAME LOCATION.
34. REMOVE EXISTING JUNCTION BOX. INSTALL TYPE 8 JUNCTION BOX PER WSDOT STD PLAN J-40-30.04.

SIGNAL DISPLAYS

(LED) R 12"
(LED) Y 12"
(LED) G 12"
EX 21, EX 22, 31, 32, 33, 34, 35, 42, 43, EX 61, EX 62, 82, B3**

(LED) 12" R
(LED) 12" Y
(LED) 12" G
41

(LED) 12" R
(LED) 12" Y
(LED) 12" G
EX 11, EX 12, EX 51, B1**

LOUVERED
(LED) 12" R
(LED) 12" Y
(LED) 12" G
A1, A2, 63, 64, 65

LOUVERED
(LED) R 12"
(LED) Y 12"
(LED) G 12"
C2

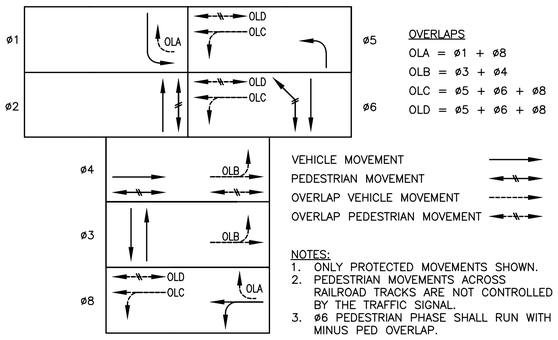
LOUVERED
(LED) R 12"
(LED) Y 12"
(LED) G 12"
81, B2**

LOUVERED
(LED) R 12"
(LED) Y 12"
(LED) G 12"
C1

COUNTDOWN
18"
EX 28, EX 29, 46, 47, EX 48, EX 49 66, 67, 68, 69, D8, D9

NOTE:
** OPTICALLY PROGRAMMABLE SIGNAL HEAD, TO BE VISIBLE TO SOUTHBOUND TRAFFIC ONLY SOUTH OF RAILROAD TRACKS.

PHASING DIAGRAM – GENERAL

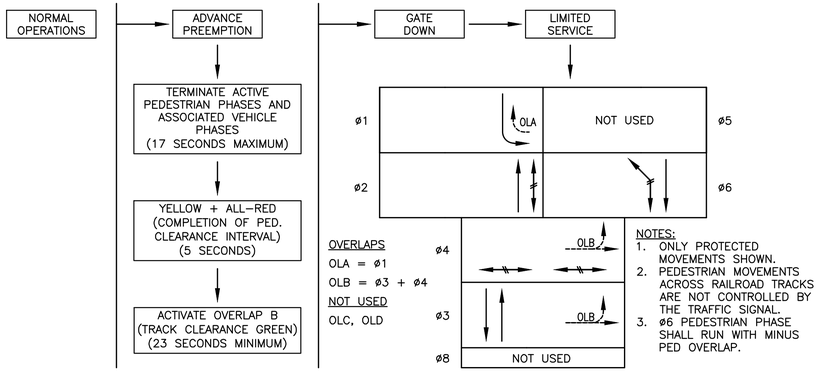


OVERLAPS
OLA = ø1 + ø8
OLB = ø3 + ø4
OLC = ø5 + ø6 + ø8
OLD = ø5 + ø6 + ø8

VEHICLE MOVEMENT
PEDESTRIAN MOVEMENT
OVERLAP VEHICLE MOVEMENT
OVERLAP PEDESTRIAN MOVEMENT

NOTES:
1. ONLY PROTECTED MOVEMENTS SHOWN.
2. PEDESTRIAN MOVEMENTS ACROSS RAILROAD TRACKS ARE NOT CONTROLLED BY THE TRAFFIC SIGNAL.
3. ø6 PEDESTRIAN PHASE SHALL RUN WITH MINUS PED OVERLAP.

RAILROAD PREEMPTION OPERATIONS



OVERLAPS
OLA = ø1
OLB = ø3 + ø4
NOT USED
OLC, OLD

NOTES:
1. ONLY PROTECTED MOVEMENTS SHOWN.
2. PEDESTRIAN MOVEMENTS ACROSS RAILROAD TRACKS ARE NOT CONTROLLED BY THE TRAFFIC SIGNAL.
3. ø6 PEDESTRIAN PHASE SHALL RUN WITH MINUS PED OVERLAP.

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

MATTHEW POWELL — STATE OF WASHINGTON — 55619 — REGISTERED PROFESSIONAL ENGINEER — 8/5/2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
FILE: 20160266 SG.dwg

PERTEET
801 2ND AVENUE, SUITE 302
SEATTLE, WA 98104
800.615.9900

CITY OF RENTON
Public Works Department
APPROVED FOR CONSTRUCTION
BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

TRAFFIC SIGNAL PLAN

DRAWING NO. SG1
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 8/2022
SHEET NO. 30 OF 56

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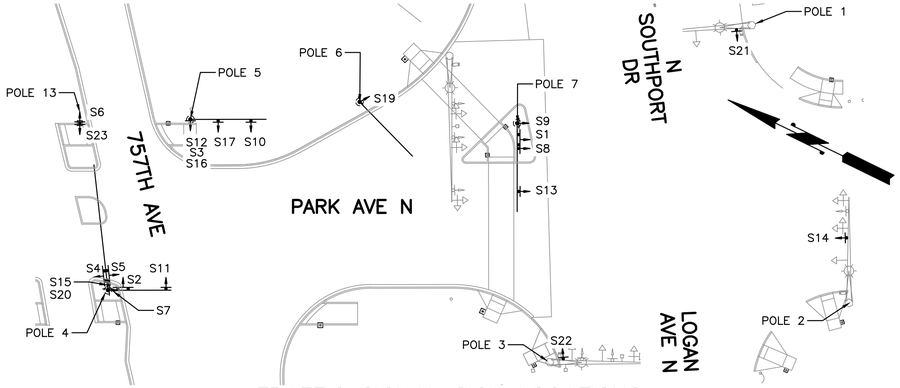
TRAFFIC SIGNAL POLE SIGNING SCHEDULE

SIGN NO.	POLE NO.	LEGEND	WSDOT SIGN CODE	WIDTH (IN)	HEIGHT (IN)	MOUNTING LOCATION	FACING	NOTES
S1	7	← Logan Ave N N Southport Dr →	D3-101	156	42	MAST ARM	SE	ADJACENT TO POLE SHAFT
S2	4	Park Ave N	D3-101	96	24	25' MAST ARM	NE	ADJACENT TO POLE SHAFT
S3	5					POLE SHAFT	SW	CANTILEVERED (SEE DETAIL ON DWG SG4)
S21	1					MAST ARM	SW	USE EXISTING MOUNTING
S22	3					MAST ARM	NE	USE EXISTING MOUNTING
S4	4	757th Ave	D3-101	90	24	50' MAST ARM	NW	ADJACENT TO POLE SHAFT
S5	4					50' MAST ARM	SE	OPPOSITE S4
S6	13		R3-1	30	30	POLE SHAFT	NE	
S20	4					POLE SHAFT	NE	ABOVE SIGN S15
S8	7	ONLY	R3-5R	30	36	MAST ARM	SE	ADJACENT TO SIGNAL HEAD A1
S9	7					POLE SHAFT	SE	ABOVE SIGNAL HEAD A2
S10	5					MAST ARM	SW	ADJACENT TO SIGNAL HEAD 33
S11	4	LEFT TURN YIELD ON GREEN	R10-12	24	30	MAST ARM	NE	ADJACENT TO SIGNAL HEAD 34
S12	5					POLE SHAFT	SW	AT MAST ARM MOUNTING HEIGHT
S13	7		R3-6	30	36	MAST ARM	SE	ADJACENT TO SIGNAL HEAD 81
S14	2					MAST ARM	NW	ADJACENT TO SIGNAL HEAD B2
S15	4		R9-3A	24	24	POLE SHAFT	NE	
S23	13					POLE SHAFT	SW	
S16	5	BLANK-OUT	R3-2	24	24	POLE SHAFT	SW	LED BLANK-OUT SIGN TO ACTIVATE DURING RR PREEMPTION BELOW SIGN S12
S17	5		R3-6 (MOD)	30	36	MAST ARM	SW	BETWEEN SIGNAL HEADS 32 AND 32
S7	4	LOOK	R15-8	36	18	POLE SHAFT	SE	
S19	6		W3-3	36	36	POLE SHAFT	SE	

NOTE: EXISTING SIGNS NOT SHOWN.
S18 IS NOT USED.



TRAFFIC SIGNAL SIGN LOCATIONS

WIRING SCHEDULE

NO.	CONDUIT SIZE	SIGNAL 5C	E.V. DETECT 3C(S)	P/V DETECT 2C(S)	VDC VIDEO	PTZ VIDEO	TSP CAT5e	RR COMM 12C	BOEING COMM 2C(S)	LED SIGN 3C	TSP POWER	NOTES
1	2"											SPARE
2	3"											SPARE
3	4"											SPARE
4	1"			1								
5	3"	1										
6	2"	1		1								
7	2"							1				BY BNSF
8	3"	5	2		3							
9	3"	5	2	1	3							
10	3"	6	2	2	3							
11	3"	3	2	2	1							
12	3"	10										
	3"		4	4	4							
13	3"	6	1		1	1						
14	4"	16										
	3"		5	6	5	1						
15	3"	3	1		1					1		
16	3"	5	1	2	1			1	1	1		
17	4"	16						1	1	1		
	4"	7	6	9	6	1						
18	EX 3"	3	2		1							REMOVE EX WIRING
19	EX 3"	16										REMOVE EX WIRING
	EX 3"		6	9	6	1		1	1	1		REMOVE EX WIRING
	EX 2"	7										EX SPARE
20	EX 3"	2 EX	1		1	1 EX						
21	EX 3"	1 2 EX			1							
22	EX 3"	1 3 EX		2	1							
23	EX 3"	7 6 EX										
	EX 2"		1	3	2	1 EX						
	EX 2"						EX				EX	EX SPARE
24	EX 3"	17										RELOCATE EX TSP WIRES TO RUN 23 AND 25
	EX 3"		6	9	6	1		1	1	1		
25	3"	6 2 EX	1		1	1 EX						
	2"						EX				EX	
26	2"	1						1				
27	2"	2		1				1	1			
28	2"	1 EX		1								
29	2"	1										
30	1"								1			

NOTE: ALL CONDUITS THAT ENTER RAILROAD RIGHT-OF-WAY SHALL BE RGS. THIS IS DENOTED BY * FOLLOWING THE RUN NO. ON DWG SG1.

GENERAL NOTES

1. UTILITY LOCATION (1-800-424-5555) PRIOR TO CONSTRUCTION WILL BE THE RESPONSIBILITY OF THE CONTRACTOR. CONFLICTS ARE TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR RESOLUTION.
2. ALL JUNCTION BOXES AND CONDUIT RUNS SHALL BE INSTALLED AS SHOWN ON THE PLANS, LOCATIONS SHOWN ARE SCHEMATIC AND THE ENGINEER WILL PROVIDE EXACT LOCATIONS. SEE WSDOT STD PLANS J-10, J-40.10-04, J-40.30-04 AND J-90.10-03.
3. COIL 8 FT. OF EACH 5C CONDUCTOR FROM EACH MAST ARM MOUNTED SIGNAL HEAD INSIDE THE SIGNAL POLE.
4. UNLESS OTHERWISE SPECIFIED, ALL PROPOSED SIGNAL CONDUIT SHALL BE PVC SCH 80 UNDER ROADWAY AND PVC SCH 40 ELSEWHERE.
5. EQUIPMENT GROUNDS SHALL BE #4 CONDUCTOR TO THE #4 HOOPS OF SIGNAL POLE OR STREET LIGHT FOUNDATION AND REBAR OF THE SERVICE FOUNDATION PER NEC. #8 CONDUCTOR SHALL CONNECT FROM J-BOX TO ELECTRICAL SERVICE CABINET. SEE WSDOT STD PLAN J-60.05-01.
6. APS PUSHBUTTONS SHALL BE MOUNTED PER MANUFACTURER REQUIREMENTS AND WSDOT STD PLAN J-20.26-01.
7. REMOVAL, AND SALVAGE IF APPLICABLE, OF EXISTING TRAFFIC SIGNAL SYSTEM ELEMENTS SHALL BE PAID AS REMOVAL OF STRUCTURES AND OBSTRUCTIONS.
8. SEE CITY OF RENTON STD PLAN 135 FOR TRANSPORTATION GENERAL NOTES.
9. PROVIDE IDENTIFICATION TAG FOR ALL POLES AND FOUNDATIONS PER CITY OF RENTON STD PLAN 139.
10. ALL POLES SHALL HAVE FIXED BASES (NOT SLIP BASES).

DISPLAY NOTES

1. ALL VEHICLE SIGNAL HEADS SHALL HAVE 12" L.E.D. LENSES. THE HOUSING SHALL BE ALUMINUM AND PAINTED TRAFFIC YELLOW ON BACK WITH A FLAT BLACK FRONT AND 1" YELLOW RETRO-REFLECTIVE BACKTAPE PER WSDOT STD PLAN J-75.30-02 AND STD SPEC 9-29.16.
2. VEHICLE HEADS ON MAST ARMS SHALL BE INSTALLED ON TYPE "M" MOUNTING PER WSDOT STD PLAN J-75.20-01. MOUNTING CONNECTION SHALL BE BETWEEN RED AND YELLOW SIGNAL INDICATIONS. VEHICLE HEADS ON POLE SHAFTS SHALL BE INSTALLED ON TYPE "H" MOUNTING PER WSDOT STD PLAN J-75.10-02.
3. ALL PEDESTRIAN SIGNAL HEADS SHALL BE COUNTDOWN TYPE AND SOLID (NOT OUTLINED) L.E.D. WITH SYMBOLIC LEGENDS AND "Z-CRATE" VISORS. THE ALUMINUM HOUSING SHALL BE PAINTED YELLOW WITH FLAT BLACK VISORS.
4. PEDESTRIAN HEADS ON PS POLES SHALL BE INSTALLED WITH TYPE "D" MOUNTING PER WSDOT STD PLAN J-75.10-02. PEDESTRIAN HEADS ON ALL OTHER POLES SHALL BE INSTALLED WITH TYPE "E" MOUNTING PER WSDOT STD PLAN J-75.10-02.
5. ALL MAST-ARM MOUNTED STREET NAME SIGNS SHALL HAVE SHEETING PER CITY OF RENTON STD PLAN 132 AND BE MOUNTED PER WSDOT STD PLAN G-30.10-04 OR THE DETAIL ON DWG SG4.

EMERGENCY VEHICLE PRE-EMPTION SCHEDULE

CIRCUIT	PHASE(S)
A	1 & 6
B	2 & 5
C	8
D	4
E	3
F	3

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

SURVEYED: 1 ALLIANCE
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Public Works Department

APPROVED FOR CONSTRUCTION

BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

TRAFFIC SIGNAL DETAILS

DRAWING NO. SG2
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 5/2022
SHEET NO. 31 OF 56

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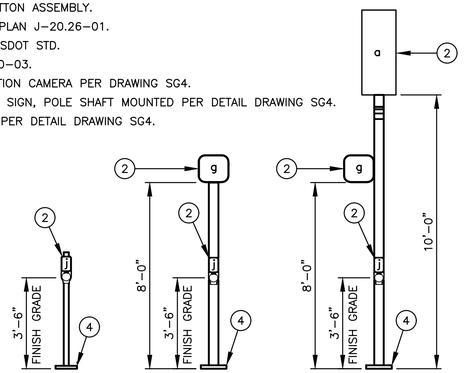
NOTES

1. MOUNTING TENON TO BE INSTALLED BY FABRICATOR AT OFFSET DISTANCES INDICATED IN CHART.
2. FIELD INSTALLED.
3. DECORATIVE LUMINAIRE ARM. SEE CITY OF RENTON STD PLAN 117.3.
4. FOUNDATIONS SHALL CONFORM TO THE WSDOT STD PLAN J-28.30-03, J-20.10-03, J-20.11-02, J-20.15-03, J-20.16-02, J-20.20-02, J-20.26-01, J-21.10-04, J-21.15-01, J-21.16-01, J-21.17-01, J-21.20-01, J-22.15-02, J-22.16-03, J-26.10-03, OR AS NOTED IN DETAIL CHART.
5. ALL TYPE III SIGNAL STANDARDS AND STREET LIGHT STANDARDS SHALL HAVE BOLT ON LUMINAIRE ARMS. THE BOLTS AND/OR NUTS SHALL BE FIELD INSTALLED AND BE ACCESSIBLE AFTER INSTALLATION FROM OUTSIDE OF POLE.

LEGEND

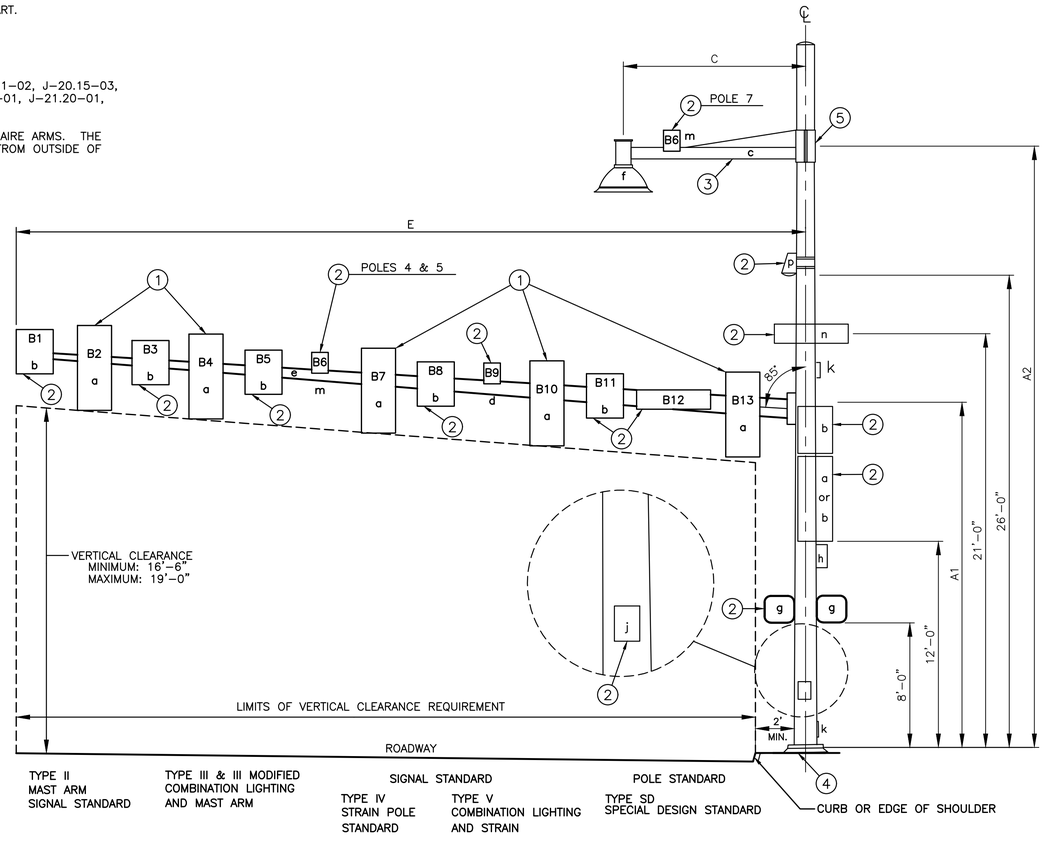
a. VEHICLE SIGNAL HEAD.
b. SIGN, WSDOT STD. PLAN G-30.10-04.
c. DECORATIVE LUMINAIRE ARM, SEE ILLUMINATION PLANS.
d. PRE-EMPT DETECTOR.
e. SIGNAL MAST ARM.
f. DECORATIVE LUMINAIRE, SEE ILLUMINATION PLANS.
g. PEDESTRIAN SIGNAL HEAD.
h. TERMINAL CABINET.
j. APS PUSHBUTTON ASSEMBLY. WSDOT STD. PLAN J-20.26-01.
k. HANDHOLE, WSDOT STD. PLAN J-28.50-03.
m. VIDEO DETECTION CAMERA PER DRAWING SG4.
n. STREET NAME SIGN, POLE SHAFT MOUNTED PER DETAIL DRAWING SG4.
p. PTZ CAMERA PER DETAIL DRAWING SG4.



TYPE PPB
PPB POST

TYPE PS
PED. HEAD
STANDARD

TYPE I
VEHICLE HEAD
STANDARD



TYPE II
MAST ARM
SIGNAL STANDARD

TYPE III & III MODIFIED
COMBINATION LIGHTING
AND MAST ARM

SIGNAL STANDARD

TYPE IV
STRAIN POLE
STANDARD

TYPE V
COMBINATION LIGHTING
AND STRAIN

POLE STANDARD

TYPE SD
SPECIAL DESIGN STANDARD

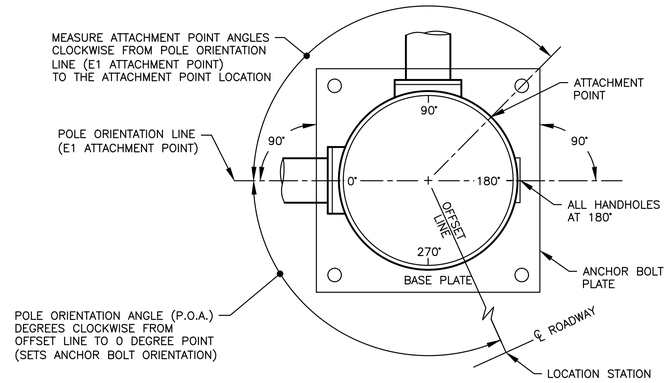
CURB OR EDGE OF SHOULDER

PUSH BUTTON SCHEDULE

PUSH BUTTON	PHASE	POLE LOCATION	ARROW DIRECTION	SIGN	SPECIAL VOICE MESSAGE
28	2	19	LEFT	R10-3E(L)	NONE
29	2	18	RIGHT	R10-3E(R)	NONE
46	4	11	RIGHT	R10-3E(R)	NONE
47	4	12	LEFT	R10-3E(L)	NONE
48	4	21	LEFT	R10-3E(L)	NONE
49	4	20	RIGHT	R10-3E(R)	NONE
66	6	17	LEFT	R10-3E(L)	NONE
67	6	15	LEFT	R10-3E(L)	NONE
68	6	16	LEFT	R10-3E(L)	NONE
69	6	22	RIGHT	R10-3E(R)	NONE
D8	OLD	14	LEFT	R10-3E(L)	NONE
D9	OLD	13	RIGHT	R10-3E(R)	NONE

NOTES:

1. SEE POLE SCHEDULE FOR MOUNTING LOCATION ON POLE.
2. PUSH BUTTONS SHALL INCLUDE LOCATOR TONE, CONFIRMATION LIGHT, AND CONFIRMATION MESSAGE UPON ACTIVATION.
3. ARROW DIRECTION ON SIGN SHALL MATCH TACTILE ARROW DIRECTION ON PUSH BUTTON.
4. SEE SPECIFICATIONS FOR FURTHER INFORMATION.



POLE ORIENTATION & ATTACHMENT POINT DETAIL

PLAN VIEW

NOTE: ELEVATIONS ARE AT FINISHED GRADE.
* EXISTING

SIGNAL STANDARD DETAIL CHART

FIELD LOCATION						POLE TYPE	MOUNTING HEIGHT (FT)		ARM LENGTH (FT)		OFFSET DISTANCES: POLE CL TO ATTACHMENT POINT (FT) (X)												WINDLOAD AREAS (FT^2) (XY)												XYZ TOTAL (FT^3)	POLE ATTACHMENT POINT ANGLES (DEG)											FOUNDATION DEPTH (FT)			REMARKS
POLE	STATION	OFFSET		ELEV.	POA		A1	A2	E	C	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13		a/b	c	d	e	g1	g2	h	j1	j2	k	m	n	p	3' RD.	3' SQ.	4' RD.	
2	18+68.79	42.38'	RT	EX	EX	EX III	18*	35*	40*	16*		39*	36*	27*	24*	20.5	15*					7.5*			9.2*	7.5*	11.6	7.5		9.2*					45.5		1601	EXISTING											EXISTING			EXISTING POLE
4	15+75.10	37.17'	RT	32.85'	0	SD	17	35	50	6		47.0		39.0		43.0						6.0			9.2		11.6								15		1368	90	90		0	270		180			180	90				FACING SOUTH LEG
														20.5		24.0	12.5		28.0			6.0				9.2			9.2					15			270		270						180	270				FACING NORTH LEG
							17		25		23.0	20.0		12.0		15.0			17.0			6.0	5.0	9.2		9.2								16		505	77		77	90			270			77					FACING EAST LEG
5	16+07.85	30.50'	LT	31.09'	270	III	17	35	30	8		28.0	24.0	15.0	11.0	20.0	7.0		13.5			0			9.2	7.5	9.2	7.5		9.2					16		723	90	90	90	0	180		180			180	90			PER ST DRAWINGS			
6	16+74.89	37.35'	LT	28.79'	315.7	III	17	35	30	6		27.0		19.0											9.2		9.2								16		423	270	0		0			180			180						
7	17+37.32	28.86'	LT	28.56'	0	III	17	35	35	6		31.0	27.0	22.0		8.0	14.0	10.0	18.0			6.5			11.6	7.5	9.2			9.2	7.5				45.5		1264	270	0	270	0			180			180	270		270			
11	16+59.26	51.06'	RT	29.93'	90	PS																																			180			270		90					WSDOT STD. J-20.11-03 (2 OF 2)	
12	15+79.04	49.96'	RT	32.62'	0	PPB																																					0								WSDOT STD. J-20.11-03 (1 OF 2)	
13	15+63.98	29.06'	LT	32.77'	90	PS																																			180			270		90					WSDOT STD. J-20.11-03 (2 OF 2)	
14	15+99.03	28.96'	LT	32.55'	0	PPB																																					0								WSDOT STD. J-20.11-03 (1 OF 2)	
15	17+32.67	27.44'	LT	28.48'	45.7	PPB																																					0								WSDOT STD. J-20.11-03 (1 OF 2)	
16	17+25.51	16.25'	LT	28.44'	0	PPB																																					270								WSDOT STD. J-20.11-03 (1 OF 2)	
17	16+92.87	54.28'	LT	27.73'	314.7	PS																																			0			270		90					WSDOT STD. J-21.10-04 (1 OF 2)	
18	18+61.91	45.95'	LT	27.26'	7.3	PPB																																					90								WSDOT STD. J-20.11-03 (1 OF 2)	
19	18+66.04	50.06'	RT	27.67'	255.7	PPB																																					0								WSDOT STD. J-20.10-04	
20	18+43.83	69.07'	RT	28.22'	23.1	PPB																																					0								WSDOT STD. J-20.10-04	
21	17+43.96	66.96'	RT	28.73'	333.6	PPB																																					0								WSDOT STD. J-20.10-04	
22	17+23.61	45.66'	RT	28.11'	24	PS																																			336			90					WSDOT STD. J-21.10-04 (1 OF 2)	

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

SURVEYED: 1 ALLIANCE
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TRAFFIC SIGNAL DETAILS

DRAWING NO. SG3
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 5/2022
SHEET NO. 32 OF 56

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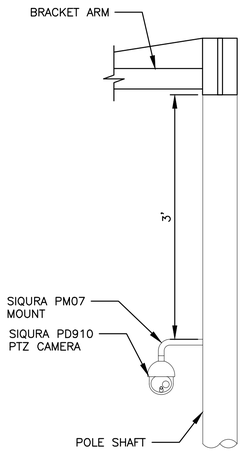
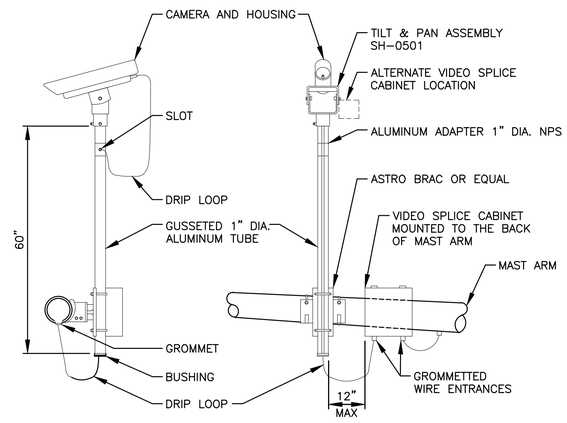


PTZ CAMERA
NTS



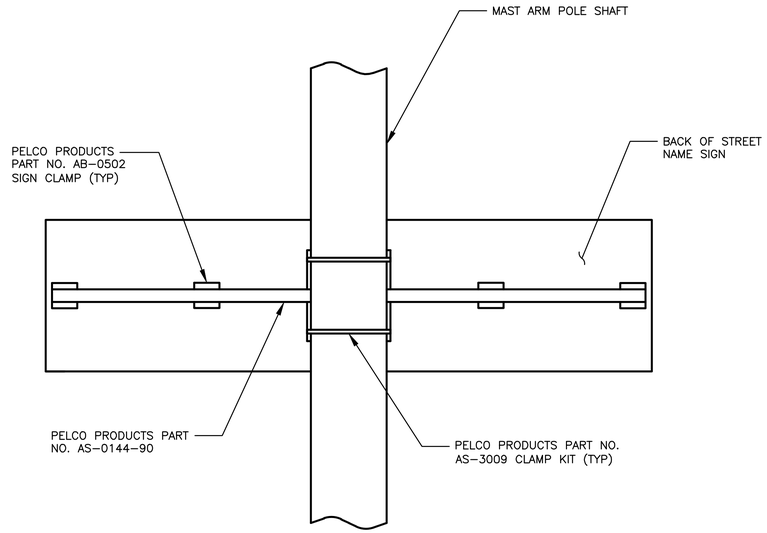
RZ-4 AWDR VIDEO DETECTION CAMERA MOUNT DETAILS
NTS

RZ-4 AWDR VIDEO DETECTION CAMERA MOUNT NOTES

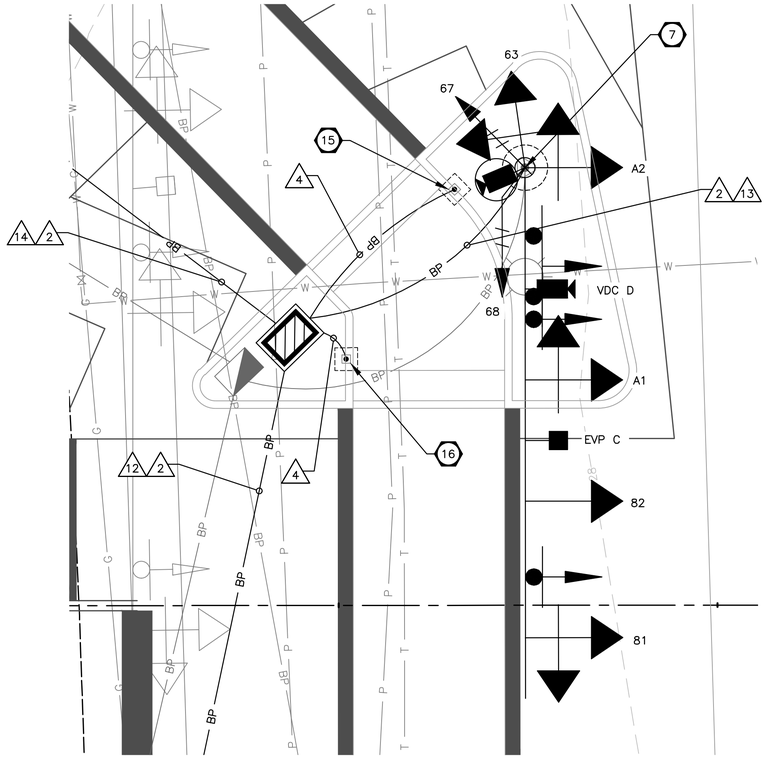
1. ALL GROMMET ENTRANCES SHALL BE SUITABLE FOR THE SIZE AND SHAPE OF CABLE.
2. CAMERA ROTATION IN HOUSINGS TO BE ADJUSTED TO PROVIDE LEVEL MONITOR PICTURE.
3. DRIP LOOP SHALL BE 6 TO 8 INCHES.
4. ALL HARDWARE FASTENERS SHALL BE STAINLESS STEEL, TORQUED TO MANUFACTURER'S RECOMMENDATIONS WITH LOCKNUTS.
5. POWER LEADS SHALL BE INSTALLED W/SUITABLE COPPER OPEN SPADES.
6. BNC CONNECTORS SHALL CONFORM TO VIDEO VENDORS RECOMMENDATION.
7. CONTRACTOR SHALL UTILIZE TOOLS AS RECOMMENDED BY VIDEO VENDOR.
8. TILT AND PAN BRACKET, SENSOR BRACKET SHALL BE ALODINED ALUMINUM.
9. THE UNIVERSAL HUB PLATE SHALL BE CAST ALUMINUM – 6063-T6.
10. ALL FASTENER PENETRATION OF CABINET SHALL BE SEALED WITH APPROVED METHOD.

VECTOR VIDEO DETECTION CAMERA MOUNT NOTES

1. MOUNT CAMERA TO MAST ARM USING MOUNTING BRACKETS AND INSTRUCTIONS INCLUDED WITH CAMERA KIT.

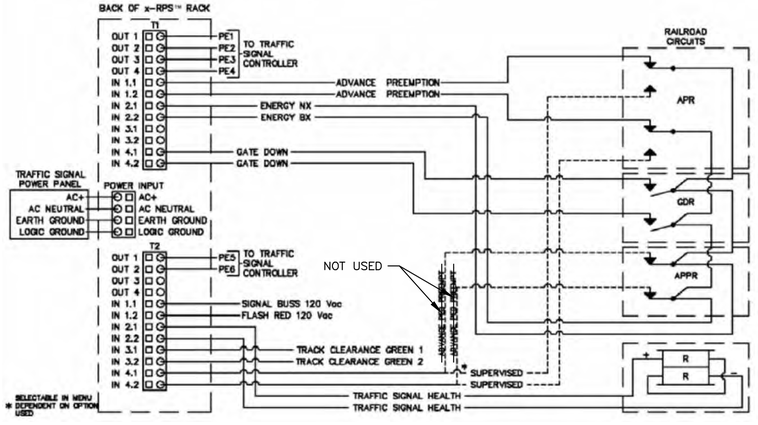


POLE SHAFT STREET NAME SIGN MOUNTING
NTS

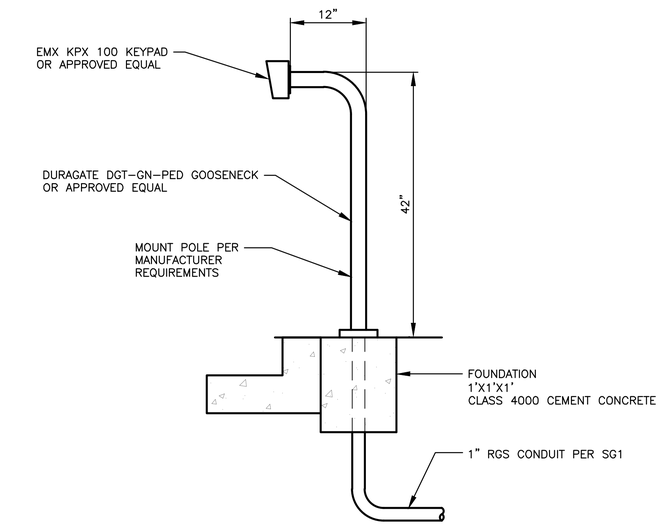


ISLAND SIGNAL EQUIPMENT
SCALE: 1"=5'

OPTION #5	PREEMPTION OUTPUTS TO TRAFFIC SIGNAL CONTROLLER
ADVANCE PEDESTRIAN PREEMPTION TIMER/INPUT	PE1 – ALL RED FLASH
ADVANCE PREEMPTION	PE2 – ADVANCE PREEMPTION
GATE DOWN	PE3 – ADVANCE PEDESTRIAN PREEMPTION
DOUBLE BREAK/SUPERVISED	PE4 – DWELL OPERATION/LIMITED SERVICE
TRAFFIC SIGNAL HEALTH	PE5 – UNUSED
	PE6 – UNUSED



RR CIRCUIT WIRING
NTS



BOEING ACTIVATION UNIT
NTS

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

STATE OF WASHINGTON MATTHEW POWELL 155619 REGISTERED PROFESSIONAL ENGINEER 8/5/2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
FILE: 20160266 SG.dwg

PERTEET
801 2ND AVENUE, SUITE 302
SEATTLE, WA 98104
800.615.9900

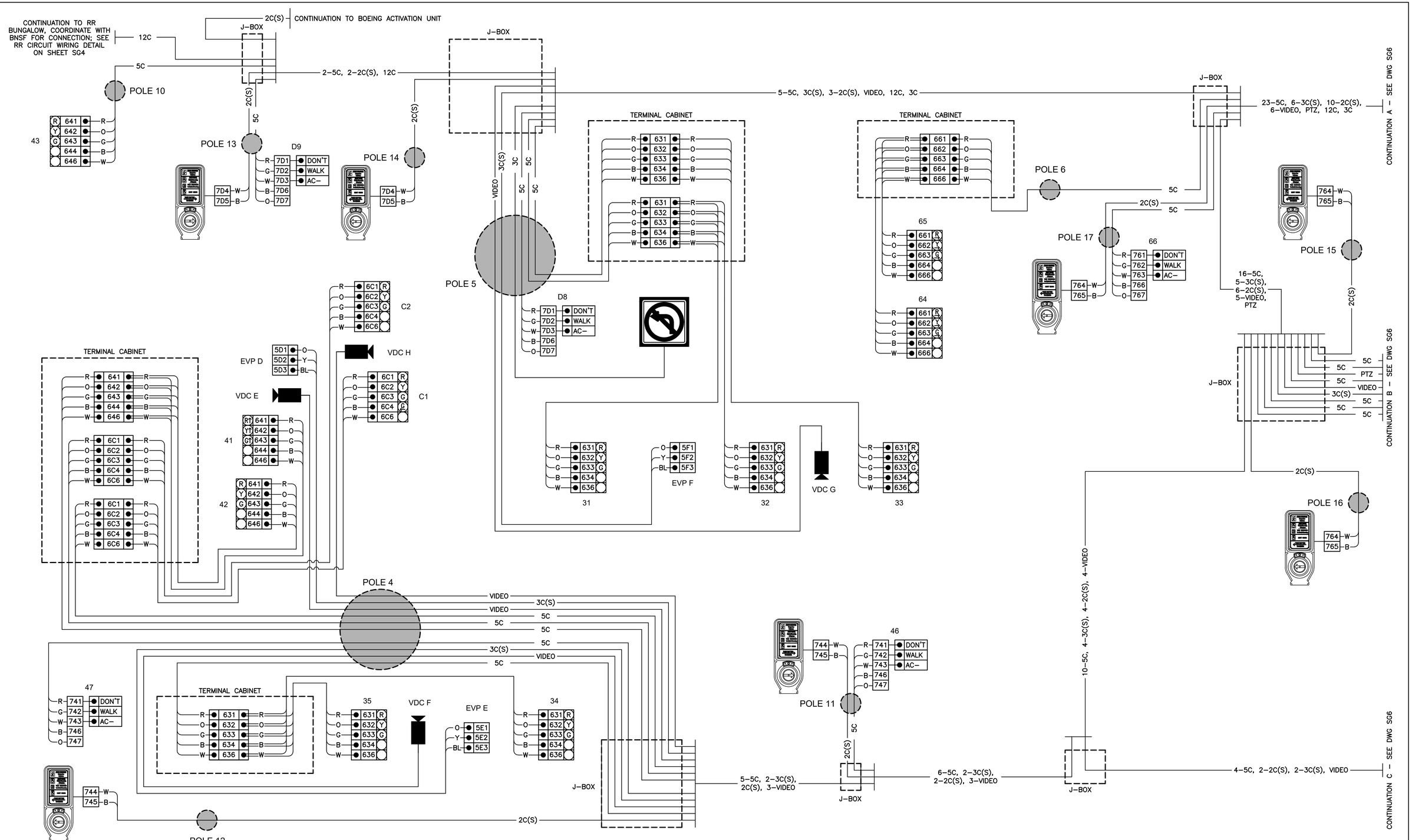
CITY OF RENTON
Public Works Department
APPROVED FOR CONSTRUCTION
BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

TRAFFIC SIGNAL DETAILS

DRAWING NO. SG4
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 8/2022
SHEET NO. 33 OF 56

X:\Renton, City of\Projects\20160266 - N Park Ave Extension\CADD\Plan Sheets\20160266 SG.dwg 8/5/2022 10:43 AM



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NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

ROBERT MATTHEW POWELL — STATE OF WASHINGTON — 55619 — REGISTERED PROFESSIONAL ENGINEER — 5/16/2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
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CITY OF RENTON
Public Works Department

APPROVED FOR CONSTRUCTION

BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

TRAFFIC SIGNAL WIRING DIAGRAM

DRAWING NO. SG5
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 5/2022
SHEET NO. 34 OF 56

CONTINUATION A – SEE DWG SG5

23–5C, 6–3C(S), 10–2C(S), 6–VIDEO, PTZ, 12C, 3C

EX J–BOX

23–5C, 6–3C(S), 10–2C(S), 6–VIDEO, PTZ, 12C, 3C

EX TSP, EX TSP POWER

TO TSP CABINET

17–5C, 6–3C(S), 10–2C(S), 6–VIDEO, PTZ, 12C, 3C

EX 2–5C, PTZ, EX TSP, EX TSP POWER

6–5C, 3C(S), VIDEO

EX J–BOX

7–5C, 3C(S), 2–VIDEO

EX 6–5C, 3–2C(S), EX PTZ, EX TSP, EX TSP POWER

TO SIGNAL CONTROLLER CABINET

EX J–BOX

67

DON'T	761	R
WALK	762	O
AC–	763	W
	766	B
	767	O

63

R	661	R
O	662	Y
G	663	G
B	664	
W	666	

PTZ

A2

R	6A1	R
O	6A2	Y
G	6A3	G
B	6A4	
W	6A6	

68

DON'T	761	R
WALK	762	O
AC–	763	W
	766	B
	767	O

POLE 7

VDC D

A1

R	6A1	R
O	6A2	Y
G	6A3	G
B	6A4	
W	6A6	

CONTINUATION B – SEE DWG SG5

5C
5C
PTZ
5C
VIDEO
3C(S)
5C
5C

TERMINAL CABINET

R	661	R
O	662	O
G	663	G
B	664	B
W	666	W

R	6A1	R
O	6A2	O
G	6A3	G
B	6A4	B
W	6A6	W

R	681	R
O	682	O
G	683	G
B	684	B
W	686	W

EVP C

O	5C1
Y	5C2
BL	5C3

82

R	681	R
O	682	Y
G	683	G
B	684	
W	686	

81

R	681	R
O	682	Y
G	683	G
B	684	
W	686	

TERMINAL CABINET

R	651	R
O	652	O
G	653	G
B	654	B
W	656	W

R	621	R
O	622	O
G	623	G
B	624	B
W	626	W

51

R	651	R
O	652	Y
G	653	G
B	654	
W	656	

21

R	621	R
O	622	Y
G	623	G
B	624	
W	626	

22

R	621	R
O	622	Y
G	623	G
B	624	
W	626	

PTZ

EX PTZ
EX 5C
EX 5C
VIDEO
3C(S)

POLE 1

VDC B

EVP GPS

EX 5C

2C(S)

EX J–BOX

2C(S)

EX 5C

POLE 18

POLE 8

724 W
725 B

29

R	721	DON'T
G	722	WALK
W	723	AC–
B	726	
O	727	

B1

R	6B1	R
Y	6B2	O
G	6B3	G
B	6B4	B
W	6B6	W

B2

R	6B1	R
Y	6B2	O
G	6B3	G
B	6B4	B
W	6B6	W

B3

R	6B1	R
Y	6B2	O
G	6B3	G
B	6B4	B
W	6B6	W

TERMINAL CABINET

R	6B1	R
O	6B2	O
G	6B3	G
B	6B4	B
W	6B6	W

R	6B1	R
O	6B2	O
G	6B3	G
B	6B4	B
W	6B6	W

EX 3–5C

5C, 2–2C(S), VIDEO

VDC A

62

R	661	R
O	662	Y
G	663	G
B	664	
W	666	

61

R	661	R
O	662	Y
G	663	G
B	664	
W	666	

EVP A

O	5A1
Y	5A2
BL	5A3

12

R	611	R
O	612	Y
G	613	G
B	614	
W	616	

11

R	611	R
O	612	Y
G	613	G
B	614	
W	616	

VDC C

724 W
725 B

28

R	721	DON'T
G	722	WALK
W	723	AC–
B	726	
O	727	

POLE 19

EVP B

O	5B1
Y	5B2
BL	5B3

764 W
765 B

69

R	761	DON'T
G	762	WALK
W	763	AC–
B	766	
O	767	

W 744
B 745

49

R	741	DON'T
G	742	WALK
W	743	AC–
B	746	
O	747	

J–BOX

48

R	741	DON'T
G	742	WALK
W	743	AC–
B	746	
O	747	

CONTINUATION C – SEE DWG SG5

4–5C, 2–2C(S), 2–3C(S), VIDEO

5C
5C
VIDEO
3C(S)
3C(S)
5C

POLE 3

POLE 22

POLE 21

744 W
745 B

EX 5C

POLE 9

POLE 20

2C(S)

EX 5C
VIDEO
5C
EX 5C

POLE 2

2C(S)

5C

2C(S)

EX J–BOX

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NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

BRENT MATTHEW POWELL
STATE OF WASHINGTON
55619
REGISTERED
PROFESSIONAL ENGINEER
5/16/2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
FILE: 20160266 SG.dwg

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CITY OF RENTON
Public Works Department

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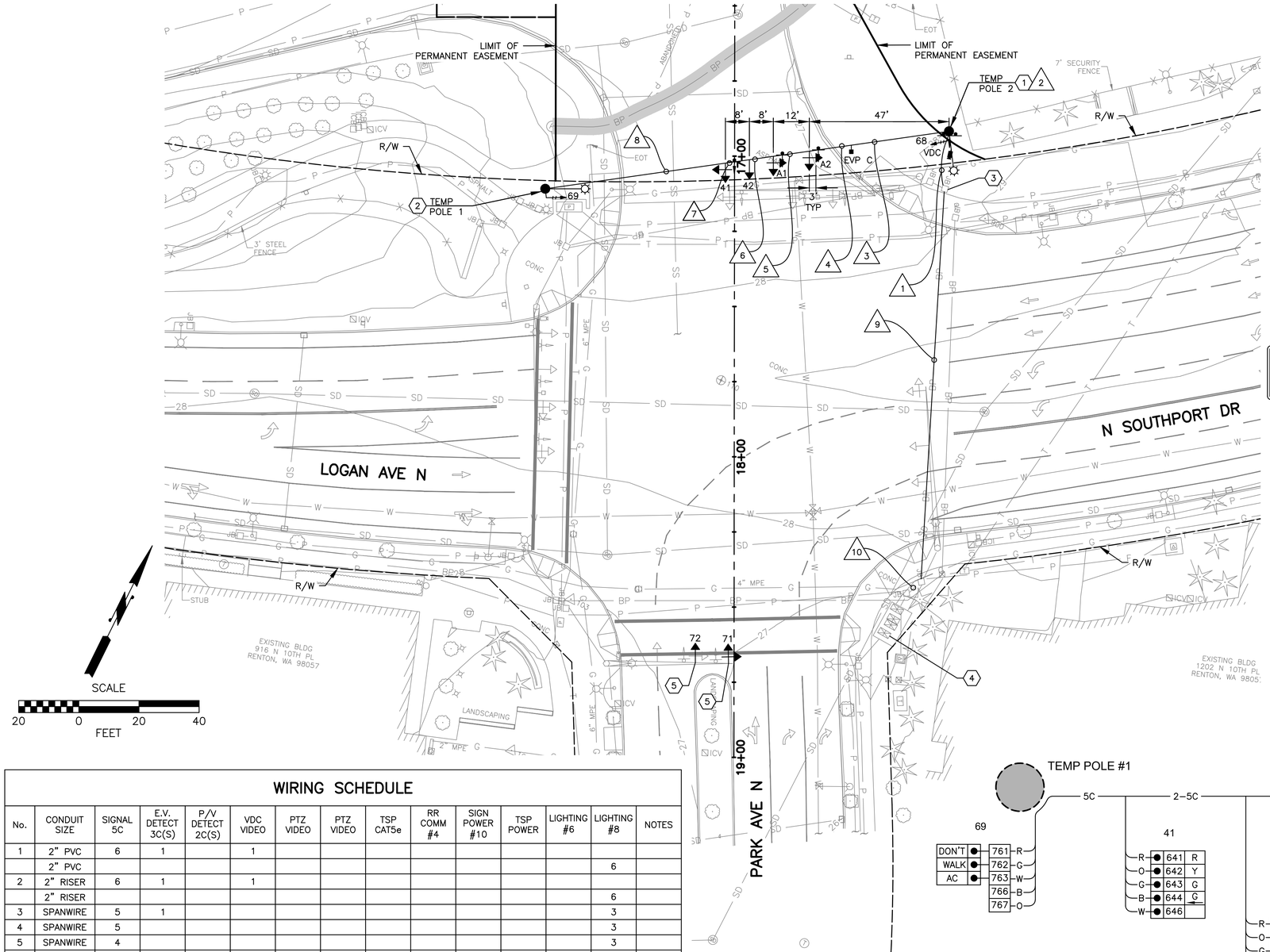
BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

TRAFFIC SIGNAL WIRING DIAGRAM

DRAWING NO. SG6
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 5/2022
SHEET NO. 35 OF 56



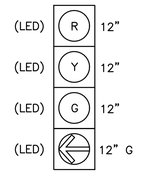
CONSTRUCTION NOTES:

1. INSTALL TEMPORARY TIMBER POLE CLASS 1 AT APPROXIMATE STATION 16+91.5 (71.5' LT). INSTALL 12–FOOT BRACKET ARM AND 135–WATT LED FIXTURE. INSTALL POLE–MOUNTED STREET NAME SIGN.
2. INSTALL TEMPORARY TIMBER POLE CLASS 1 AT APPROXIMATE STATION 17+11.0 (63.0' RT). INSTALL 12–FOOT BRACKET ARM AND 135–WATT LED FIXTURE.
3. EXTEND NEW CONDUIT PER WIRING SCHEDULE INTO EXISTING JUNCTION BOX.
4. RE–WIRE SIGNAL CONTROLLER CABINET TO REMOVE PEDESTRIAN ACTUATION FOR NORTH CROSSWALK.
5. REMOVE EXISTING SIGNAL HEAD AND STORE DURING CONSTRUCTION. INSTALL NEW SIGNAL HEAD ON EXISTING MAST TENON AND CONNECT TO EXISTING WIRING.

GENERAL NOTES:

1. CONTRACTOR MAY USE EXISTING SIGNAL POLE ATTACHMENTS INCLUDING SIGNAL HEADS, SIGNS, VIDEO DETECTION CAMERAS, EVP DETECTORS, AND TERMINAL CABINETS FROM EXISTING SIGNAL POLES AND MODIFY NECESSARY. COORDINATE WITH ENGINEER FOR APPROVAL.
2. ALL SIGNALS HEADS SHALL BE INSTALLED NO GREATER THAN 180 FEET FROM PARK AVE N NORTHBOUND STOP BAR.
3. TIMBER POLES SHALL BE PLACED OUTSIDE OF FILL LIMITS SO THAT TEMPORARY POLES CAN REMAIN OPERATIONAL UNTIL FINAL SIGNAL IMPROVEMENTS ARE OPERATIONAL.
4. SEE CITY OF RENTON STD PLAN 135 FOR TRANSPORTATION GENERAL NOTES.
5. TEMPORARY SPAN WIRE SHALL CONFORM TO REQUIREMENTS OF WSDOT STD PLAN J–15.15–02, INCLUDING MOUNTING HEIGHT REQUIREMENTS. STRAIN POLE AND GUY WIRE INSTALLATION SHALL CONFORM TO SAME WSDOT STD PLAN.
6. CONTRACTOR SHALL REMOVE TEMPORARY SIGNAL ITEMS AS DIRECTED BY THE ENGINEER ONCE PERMANENT SIGNAL IS FULLY OPERATIONAL

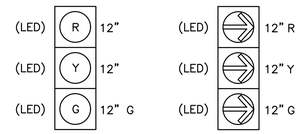
S4
POLE–MOUNTED



41, 71

S1
SPANWIRE MOUNTED
ADJACENT TO SIGNAL
HEAD NO. 41

S2, S3
SPANWIRE MOUNTED
ADJACENT TO SIGNAL
HEAD NO. A1 AND A2



42, 72 A1, A2

68, 69

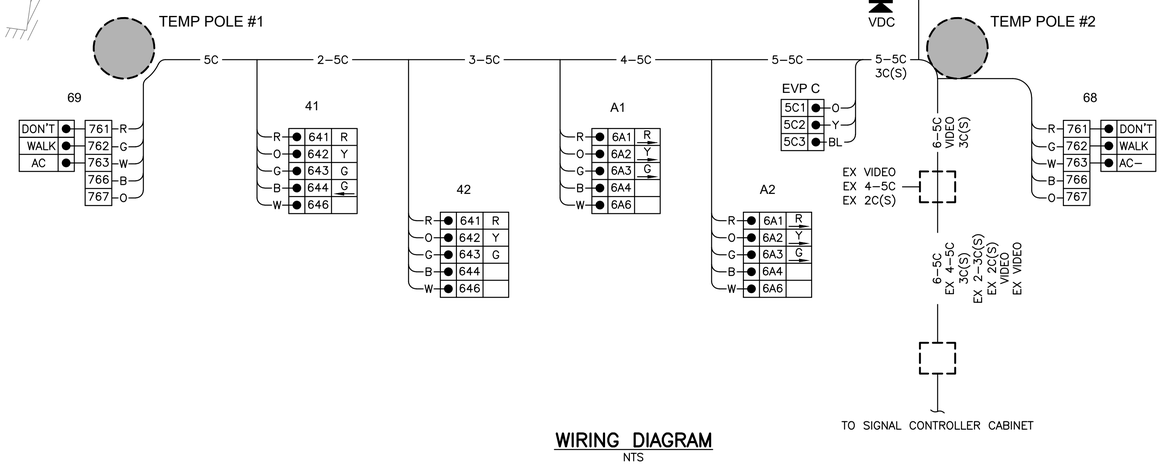
SIGNAL HEAD DISPLAY

NTS

(SEE DWG SG2 FOR SIGNAL DISPLAY NOTES)

WIRING SCHEDULE

No.	CONDUIT SIZE	SIGNAL 5C	E.V. DETECT 3C(S)	P/V DETECT 2C(S)	VDC VIDEO	PTZ VIDEO	PTZ VIDEO	TSP CAT5e	RR COMM #4	SIGN POWER #10	TSP POWER	LIGHTING #6	LIGHTING #8	NOTES
1	2" PVC	6	1		1									
	2" PVC												6	
2	2" RISER	6	1		1									
	2" RISER												6	
3	SPANWIRE	5	1										3	
4	SPANWIRE	5											3	
5	SPANWIRE	4											3	
6	SPANWIRE	3											3	
7	SPANWIRE	2											3	
8	SPANWIRE	1											3	
9	EX 3"	6 4 EX												
	EX 3"		1 2 EX		1 1 EX									
	EX 2"													
	EX 2"											6 EX	3 EX	
10	EX 3"	6 7 EX												
	EX 3"		1 3 EX		1 2 EX									



WIRING DIAGRAM

NTS

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
FILE: 20160266 TS.dwg

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800.615.9900

CITY OF RENTON
Public Works Department

APPROVED FOR CONSTRUCTION

BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

TEMPORARY TRAFFIC SIGNAL PLAN

DRAWING NO. TS1
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 3/2022
SHEET NO. 36 OF 56

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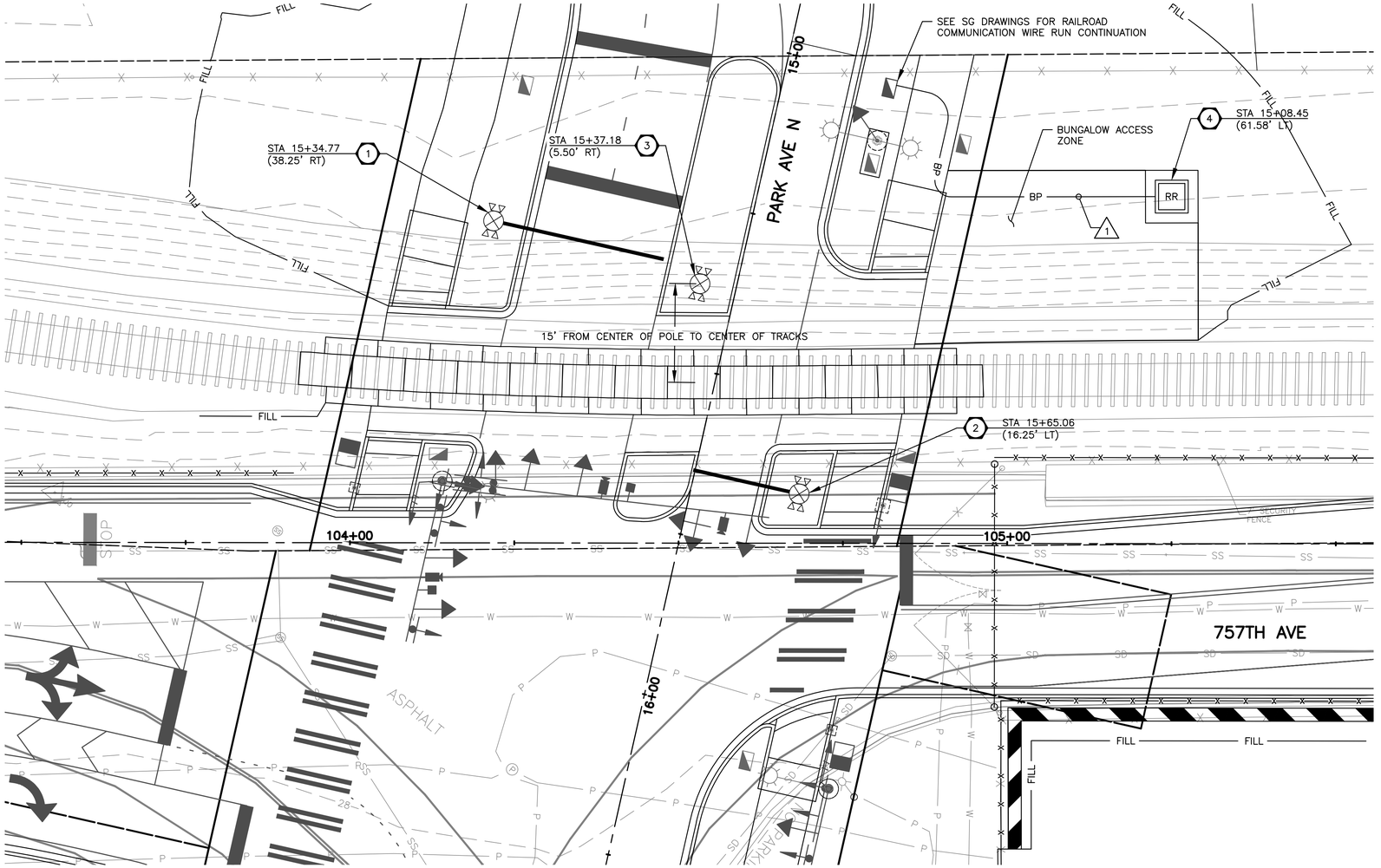

CONSTRUCTION NOTES

1. OTHERS (BNSF) TO PROVIDE AND INSTALL RAILROAD GATE ASSEMBLY WITH 26.5–FOOT GATE ARM SIMILAR TO DETAIL ON DWG RR2.
2. OTHERS (BNSF) TO PROVIDE AND INSTALL ROADWAY GATE ASSEMBLY WITH 16.5–FOOT GATE ARM SIMILAR TO DETAIL ON DWG RR2.
3. OTHERS (BNSF) TO PROVIDE AND INSTALL FLASHING LIGHT ASSEMBLY SIMILAR TO DETAIL ON DWG RR2.
4. OTHERS (BNSF) TO PROVIDE AND INSTALL BUNGALOW AND PAD. OTHERS (BNSF) TO WIRE BUNGALOW.

GENERAL NOTES

1. BNSF SHALL LOCATE, PROCURE, AND INSTALL ALL CONDUITS, JUNCTION BOXES, AND WIRING. BNSF SHALL PROCURE AND INSTALL BUNGALOW AND COORDINATE WITH PSE FOR POWER. CONDUITS AND JUNCTION BOX LOCATIONS SHOWN SCHEMATICALLY, TO BE PLACED BY BNSF.
2. STATION AND OFFSET INFORMATION IS TO CENTER OF POLE/BUNGALOW.
3. BNSF TO PROCURE AND INSTALL ALL RAILROAD GATE ASSEMBLIES AND FOUNDATIONS.

WIRING NOTES

1. 2–#4 PRE–EMPTION COMMUNICATION WIRE RUN IN 1–2" RGS CONDUIT. WIRE RUN CONTINUES AS PART OF SIGNAL SYSTEM, SEE SG DRAWINGS. COORDINATE WITH OTHERS (BNSF) FOR CONNECTION TO BUNGALOW. WIRING AND CONDUIT BY OTHERS (BNSF).

NOTE:

ALL WORK ON THIS SHEET TO BE COMPLETED BY OTHERS (BNSF). CONTRACTOR SHALL INSTALL HMA COLLARS PER DETAIL ON SHEET RR2.

SCALE
10 0 10 20
FEET

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

MATTHEW PENN — STATE OF WASHINGTON — 55619 — REGISTERED PROFESSIONAL ENGINEER — 3/26/2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
FILE: 20160266 RR.dwg

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800.615.9900

CITY OF RENTON
Public Works Department

APPROVED FOR CONSTRUCTION
BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

RAILROAD CROSSING PLAN

DRAWING NO. RR1
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 3/2022
SHEET NO. 37 OF 56

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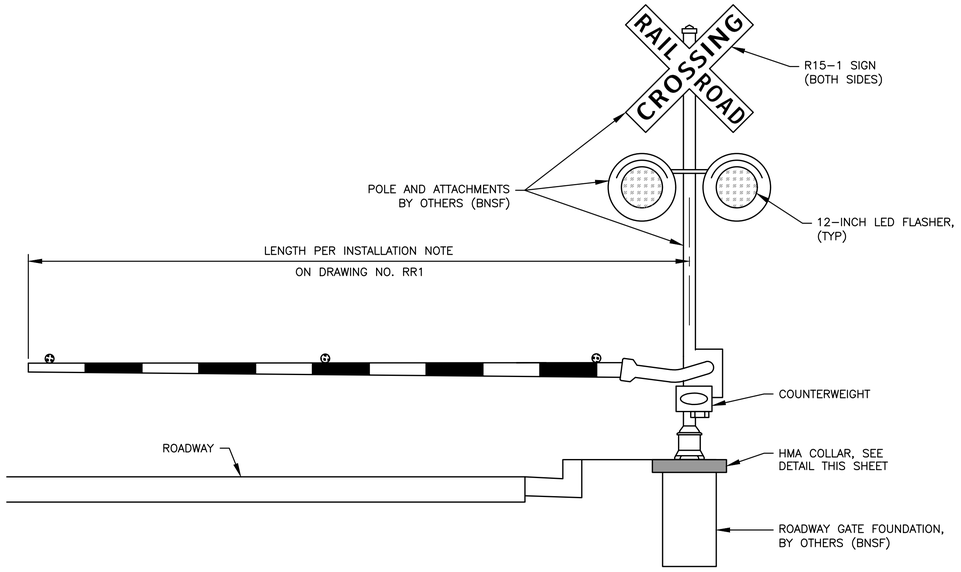
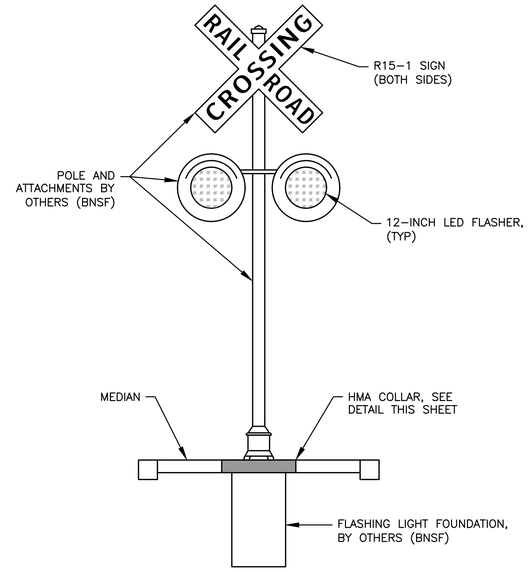
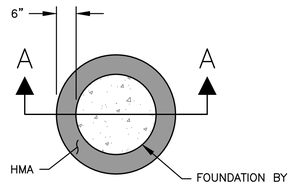


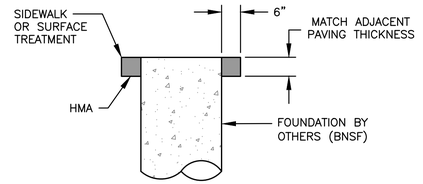
ROADWAY GATE ASSEMBLY
NTS



FLASHING LIGHT ASSEMBLY
NTS



PLAN VIEW



SECTION A–A

HMA COLLAR
NTS

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

LICENSED MATTHEW POWELL STATE OF WASHINGTON 55619 REGISTERED PROFESSIONAL ENGINEER 3/26/2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
FILE: 20160266 RR.dwg

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CITY OF RENTON
Public Works Department

APPROVED FOR CONSTRUCTION

BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

RAILROAD CROSSING DETAILS

DRAWING NO. RR2
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 3/2022
SHEET NO. 38 OF 56

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NW ¼ SEC 8, T 23 N, R 5 E, W.M.

FOR BNSF PLANTING STRIPS, HOLD SUBGRADE 6" BELOW CURB TOP. PROVIDE 6" DEPTH OVERSIZED RIVER ROCK

BNSF R/W

757TH AVE

101+00 102+00 103+00 104+00 105+00 106+00 107+00

757–LINE

15+00

16+00

17+00

P–LINE

PARK AVE N

LOGAN AVE N

N SOUTHPORT DR

RESTORE SOD LAWN TO DISTURBANCE LIMITS. SEE PLANT SCHEDULE AND NOTES, DRAWING PL2

LIMIT OF PERMANENT EASEMENT

EX R/W

DOUBLE CHECK VALVE ASSEMBLY (DCVA) PER CITY OF RENTON STD PLAN 340.8. CONNECT TO WATER LINE, SEE WA DRAWINGS. SIZE AND LOCATION OF DCVA TO BE DETERMINED BY CONTRACTOR IRRIGATION DESIGN, SEE SPECIAL PROVISIONS SECTION 8–03

INSTALL TREES 5' MIN FROM EDGE OF BOEING DUCT BANK

IRRIGATION CONTROLLER, SIZE AND LOCATION TO BE DETERMINED BY CONTRACTOR IRRIGATION DESIGN, SEE SPECIAL PROVISIONS SECTION 8–03

PSE TRANSFORMER (ANTICIPATED IRRIGATION POWER SOURCE)

APPROXIMATE EXISTING CITY IRRIGATION LATERAL

MATCH LINE STA 18+00, SEE DWG PL2

SCALE
20 0 20 40
FEET

GENERAL NOTE

1. SEE DWG PL2 FOR LEGEND, NOTES, AND DETAILS
2. ALL PLANTING AREAS WITHIN PROPOSED LIMITS OF PERMANENT EASEMENT AND EXISTING RIGHT–OF–WAY LINES SHALL BE IRRIGATED. SEE SPECIAL PROVISION 8–03 FOR CONTRACTOR–DESIGNED IRRIGATION SYSTEM REQUIREMENTS.

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

STATE OF WASHINGTON
REGISTERED LANDSCAPE ARCHITECT
JASON TODD WALKER
CERTIFICATE NO. 766
March 28, 2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: J. WALKER
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
FILE: 20160266 PL.dwg

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801 2ND AVENUE, SUITE 302
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CITY OF RENTON
Public Works Department

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BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

PLANTING PLAN

DRAWING NO. PL1
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 3/2022
SHEET NO. 39 OF 56

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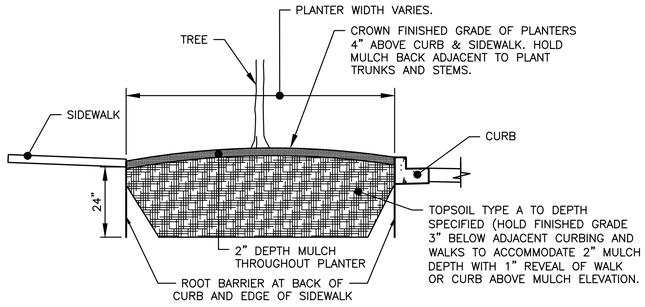
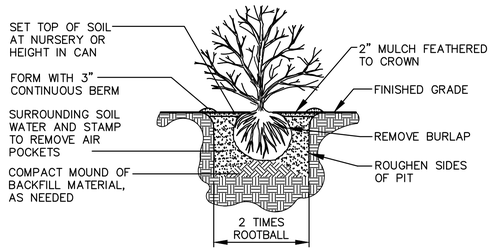


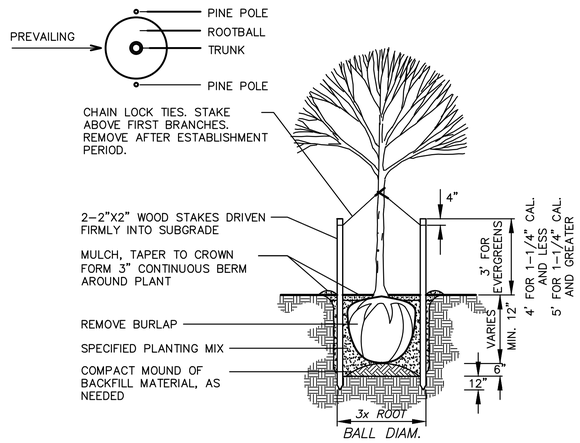
TYPICAL PLANTING BED DETAIL

NTS



TYPICAL SHRUB PLANTING DETAIL

NTS



TYPICAL TREE PLANTING DETAIL

NTS

GENERAL PLANTING NOTES

1. ON-SITE SOIL MIXING OR PLACEMENT NOT ALLOWED WHEN SOIL IS SATURATED, FROZEN, OR IN THE OPINION OF THE ENGINEER, IN A CONDITION DETRIMENTAL TO THE WORK.
2. LANDSCAPE PLANTING AREAS (ALL SHRUB AND TREE AREAS) SHALL RECEIVE 24" DEPTH TOPSOIL TYPE A AND MIN. 2" DEPTH OF MEDIUM BARK MULCH ON FINISHED GRADE OF SOIL.
3. SOD AREAS SHALL RECEIVE 6" DEPTH FINE GRADED TOPSOIL TYPE A. GRADE AND ROLL SMOOTH PRIOR TO PLACING SOD.
4. AFTER PLANTING, IMMEDIATELY SATURATE ALL PLANTING PITS TO ELIMINATE AIR POCKETS AND FACILITATE SETTLING OF BACKFILL MATERIAL.
5. ROOT MASSES OF CONTAINERIZED STOCK SHOULD BE "SCORED" WITH A SHARP OBJECT TO INSURE THE PLANTS WILL NOT BECOME ROOT BOUND.
6. ANY PLANT SUBSTITUTIONS SHALL BE APPROVED BY LANDSCAPE ARCHITECT.
7. LANDSCAPE PLANTING SHALL BE INSTALLED AFTER SITE WORK IS DONE, INCLUDING ROADS, UTILITIES, DRIVEWAYS, ETC.
8. SEE SPEC FOR BIDDER PROVIDED IRRIGATION OF SHRUBS, TREES, AND SOD LAWN AREAS. AUTOMATIC IRRIGATION TO BE PROVIDED BY BIDDER DESIGN AND SHALL REQUIRE BACKFLOW PROTECTION OR CONNECTION TO EXISTING IRRIGATION SYSTEM(S) IF CAPACITY EXISTS. SLEEVES SHALL BE COORDINATED AND PROVIDED BY GENERAL CONTRACTOR. SEE SPEC 8-03. IRRIGATION SHALL BE OPERATIONAL FOR AT LEAST TWO YEARS.
9. ALL LANDSCAPING MAY BE INSPECTED AND REVIEWED FOR POTENTIAL ACCEPTANCE BY THE OWNER AND BY PERMIT AGENCIES AS WELL AS THE PROJECT ENGINEER.
10. ALL TREES PLANTED NEAR SIDEWALKS AND ROADWAYS SHALL INCLUDE A ROOT BARRIER PER SPEC.

PLANT SCHEDULE – PARK AVE N EXTENSION

TREES

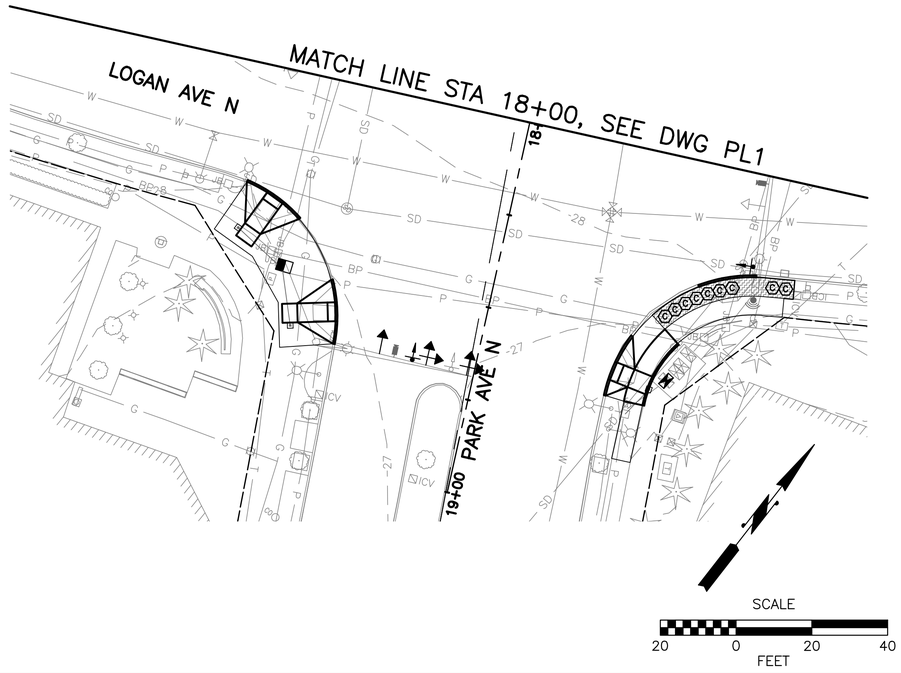
SYMBOL	SCIENTIFIC NAME	COMMON NAME	SPACING	QTY.	SIZE (MIN.)	NOTES
	ACER GRISEUM	PAPERBARK MAPLE	AS SHOWN	2	2" CAL.	B&B, SINGLE STRAIGHT TRUNK, MATCHED, 6' CLEAR CANOPY

SHRUBS

SYMBOL	SCIENTIFIC NAME	COMMON NAME	SPACING	QTY.	SIZE (MIN.)	NOTES
RB	RHODODENDRON AUGUSTINII X 'INTRAFAST'	BLUE DIAMOND RHODODENDRON	2' O.C.	29	15"-18", 1 GAL.	FULL
PJM	RHODODENDRON X 'P.J.M COMPACTA'	DWARF PJM RHODODENDRON	4' O.C.	19	18"-21" 2 GAL.	FULL
MC	MYRICA CALIFORNICA	PACIFIC WAX MYRTLE	4' O.C.	43	5 GAL.	FULL
C	COTONEASTER DAMMERI 'CORAL BEAUTY'	CORAL BEAUTY COTONEASTER	3' O.C.	13	2 GAL.	FULL

GROUNDCOVERS

	COMMON NAME	AREA (SF)	NOTES
	SOD LAWN ON TOPSOIL	5,430	OUTSIDE OF PLANTING AREAS AS INDICATED ON 6" DEPTH FINE GRADED TOPSOIL
	MULCH AT PLANTING AREAS	3,023	2" DEPTH IN PLANTING STRIPS
	4-6" RIVER ROCK PAVING	1,190	6" DEPTH IN MORTAR IN UNMAINTAINED PLANTING STRIP AT BNSF RIGHT-OF-WAY



NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

STATE OF WASHINGTON REGISTERED LANDSCAPE ARCHITECT
JASON TODD WALKER CERTIFICATE NO. 766
March 28, 2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: J. WALKER
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
FILE: 20160266 PL.dwg

PERTEET
801 2ND AVENUE, SUITE 302
SEATTLE, WA 98104
800.615.9900

CITY OF RENTON
Public Works Department

APPROVED FOR CONSTRUCTION

BY: DATE:

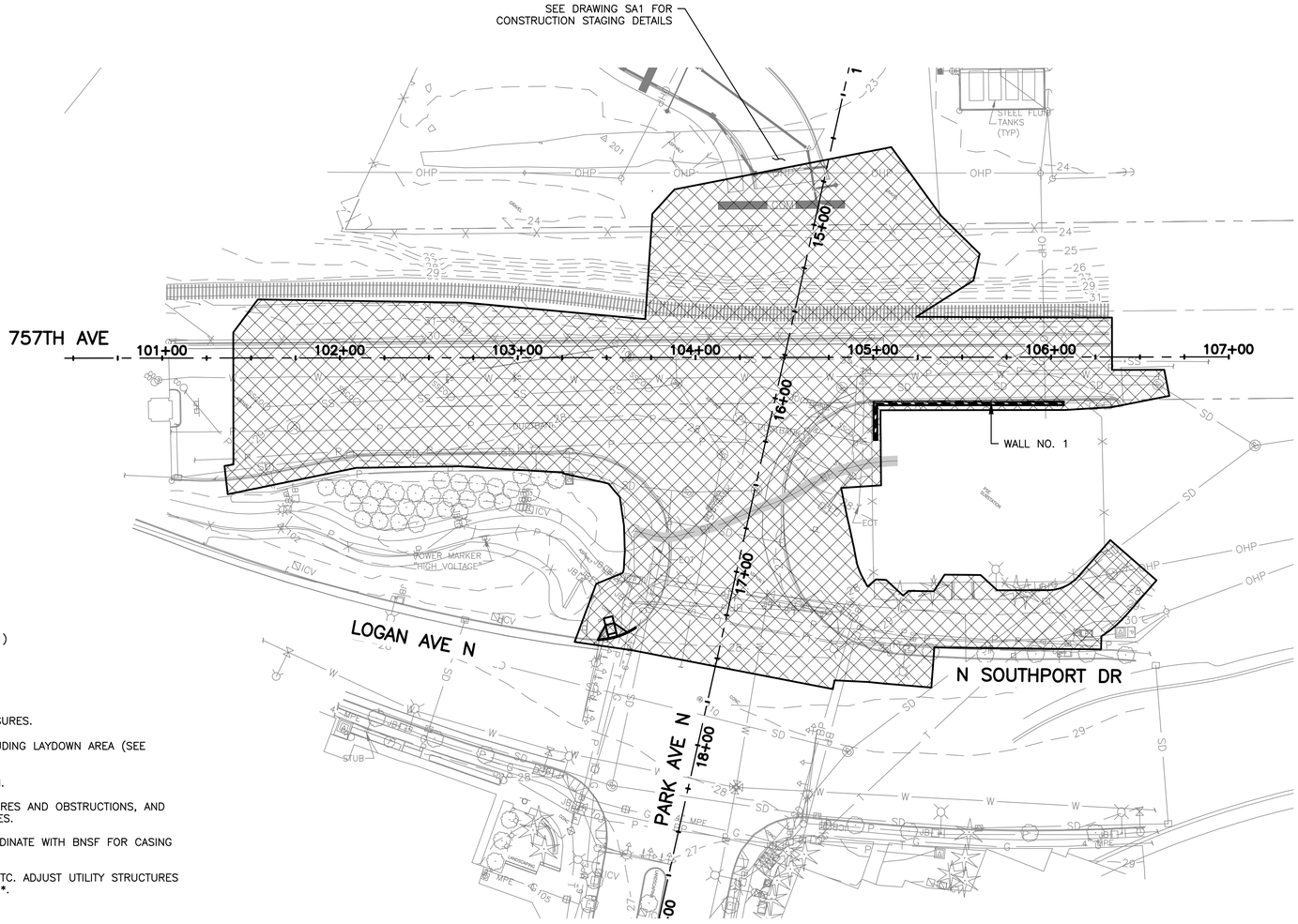
CITY OF RENTON
PARK AVENUE N EXTENSION

PLANTING DETAILS

DRAWING NO. PL2
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 3/2022
SHEET NO. 40 OF 56

X:\Renton, City of\Projects\20160266 - N Park Ave Extension\CADD\Plan Sheets\20160266 PL.dwg 3/25/2022 2:26 PM

NW ¼ SEC 8, T 23 N, R 5 E, W.M.



LEGEND

CONSTRUCTION ZONE (PHASE 1)

PHASE 1 WORK ELEMENTS:

1. INSTALL SITE TEMPORARY EROSION CONTROL MEASURES.
2. CONSTRUCT STAGING AREA PLAN ELEMENTS, INCLUDING LAYDOWN AREA (SEE DRAWING SA1).
3. INSTALL AND ACTIVATE TEMPORARY SIGNAL SYSTEM.
4. DEMOLISH EXISTING PAVEMENTS, REMOVE STRUCTURES AND OBSTRUCTIONS, AND PERFORM NECESSARY SITE PREPARATION ACTIVITIES.
5. INSTALL WATER LINE AND UTILITY CASINGS*. COORDINATE WITH BNSF FOR CASING INSTALLATION TIMING.
6. ADJUST GRADES TO PROPOSED SUBBASE WITH CSTC. ADJUST UTILITY STRUCTURES AS NECESSARY. INSTALL STORM DRAINAGE SYSTEM*.
7. CONSTRUCT WALL NO. 1.
8. CONSTRUCT BOTH NEW CEMENT CONC PAVEMENT AND SIDEWALKS ON THE NORTHWEST AND NORTHEAST CORNERS OF PARK AVE N/LOGAN AVE N/N SOUTHPORT INTERSECTION IN THIS PHASE TO ALLOW PEDESTRIAN MOVEMENTS ACROSS THE NORTH SIDE OF LOGAN AVENUE N/N SOUTHPORT DR IN PHASE 2.
9. TRAFFIC CONTROL FOR EACH SUB-PHASE OF PHASE 1 IS ILLUSTRATED ON DWGS TC1, TC2, AND TC3.

* THE CONTRACTOR HAS THE OPTION TO INSTALL THE WATER AND STORM SYSTEMS IN PHASE 2, IF DESIRED OR IF REQUIRED DUE TO BNSF SCHEDULING.

CONSTRUCTION SEQUENCING NOTES:

1. ALL EXISTING AND FUTURE IMPROVEMENTS, INCLUDING UTILITIES, ARE NOT SHOWN ON THIS DRAWING. FOR ADDITIONAL INFORMATION, SEE THE APPLICABLE CONTRACT DRAWINGS.
2. IN ALL CASES, UNDERGROUND UTILITIES SHALL BE CONSTRUCTED PRIOR TO START OF FINAL SURFACE IMPROVEMENTS SUCH AS, BUT NOT LIMITED TO, PAVEMENT BASE MATERIAL, SIDEWALKS, CURBS AND GUTTERS, PAVEMENTS, ETC.
3. CONSTRUCTION SEQUENCING SHOWN ON THESE PLANS IS THE AGENCY'S PREFERRED COURSE OF ACTION. ALTERNATIVE SEQUENCING MAY BE DEVELOPED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR APPROVAL. ACCEPTANCE OF ALTERNATIVE SEQUENCING CONCEPTS SHALL BE AT THE SOLE DISCRETION OF THE ENGINEER AND THE CONTRACTOR SHALL NOT PRESUME THAT ALTERNATIVES WILL BE ACCEPTED. THE CONTRACTOR SHALL USE THESE CONSTRUCTION SEQUENCING PLANS AS THE BASIS FOR THE CONTRACT BID.
4. CONSTRUCTION ACTIVITIES NOT SPECIFICALLY SEQUENCED HEREON SHALL BE CONDUCTED IN A MANNER TO MINIMIZE PUBLIC IMPACT. FULL PROGRESS SCHEDULES IN ACCORDANCE WITH SECTION 1-08.3 OF THE STANDARD SPECIFICATIONS ARE STILL NECESSARY.
5. WHEN WORKING ON CURB RAMPS AND SIDEWALK SEGMENTS, PROVIDE A 5 FOOT WIDTH ADA PEDESTRIAN ACCESS DETOUR PER WSDOT TRAFFIC CONTROL PLAN TC16. PROVIDE THIS DETOUR DURING WORKING HOURS ONLY. DURING NON-WORKING HOURS PROVIDE ADA PEDESTRIAN ACCESS THROUGH THE WORK ZONE BY THE USE OF TEMPORARY MEASURES SUCH AS STEEL PLATES, CRUSHED SURFACING, COLD MIX ASPHALT, OR OTHER MEASURES APPROVED BY THE ENGINEER.
6. A FLAGGER MUST BE PROVIDED AT ALL TIMES WHILE WORK IS OCCURRING ON A CURB RAMP TO SERVE AS A PEDESTRIAN ESCORT THRU SIDEWALK DETOURS.
7. CONTRACTOR SHALL REMOVE OR COVER CONFLICTING EXISTING CHANNELIZATION OR SIGNS.
8. SIGN PLACEMENT IS SUBJECT TO REVISION BY THE ENGINEER ON-SITE IF NEEDED TO ADDRESS TRAFFIC OR PEDESTRIAN SAFETY OR TRAVEL.
9. CONTRACTOR IS REQUIRED TO COMPLETE A CITY OF RENTON TRAFFIC CONTROL PLAN FORM AND LAYOUT FOR EACH CONSTRUCTION PHASE.
10. CONTRACTOR SHALL INSTALL UTILITY CONNECTIONS/EXTENSIONS OUTSIDE THE CONSTRUCTION ZONE AS NECESSARY TO PROVIDE FULLY FUNCTIONING UTILITY SYSTEMS FOR THE ENTIRE CONSTRUCTION DURATION. ANY PAVEMENT CUTS OUTSIDE THE CONSTRUCTION ZONE FOR A PARTICULAR PHASE SHALL BE PATCHED WITH HOT MIX ASPHALT. FULL ROAD CLOSURES ARE NOT ALLOWED OUTSIDE THOSE SHOWN ON THE PLANS.
11. CONTRACTOR SHALL MAINTAIN ONE LANE OF ACCESS IN EACH DIRECTION TO BOEING AT ALL TIMES.
12. SEE CONSTRUCTION STAGING PLAN (DRAWING SA1) FOR DETAILS ON LAYDOWN AREA.
13. CONTRACTOR SHALL COORDINATE THEIR WORK WITH THAT OF BNSF PER SPECIAL PROVISION 1-07.18.
14. CONTRACTOR SHALL COORDINATE WORK NORTH OF THE BNSF RIGHT-OF-WAY WITH SECO PER SPECIAL PROVISION 1-07.18.
15. WORK RELATED TO LOGAN VAULTS SHALL NOT START UNTIL PHASE 1 AND PHASE 2 WORK IS COMPLETED.
16. CONTACT BNSF PRIOR TO ANY WORK WITHIN BNSF RIGHT OF WAY OR ANY WORK AFFECTING GRADE CROSSING OPERATIONS.
17. CONTACT BNSF VIA 1-800-533-2891 TO LOCATE ALL UTILITY LOCATIONS PRIOR TO ANY DIGGING WORK.

SCALE
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FEET

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

MATTHEW POWELL — STATE OF WASHINGTON — 55619 — REGISTERED PROFESSIONAL ENGINEER — 3/26/2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
FILE: 20160266 CS.dwg

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CITY OF RENTON
Public Works Department
APPROVED FOR CONSTRUCTION
BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

CONSTRUCTION SEQUENCING PLAN

DRAWING NO. CS1
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 3/2022
SHEET NO. 41 OF 56

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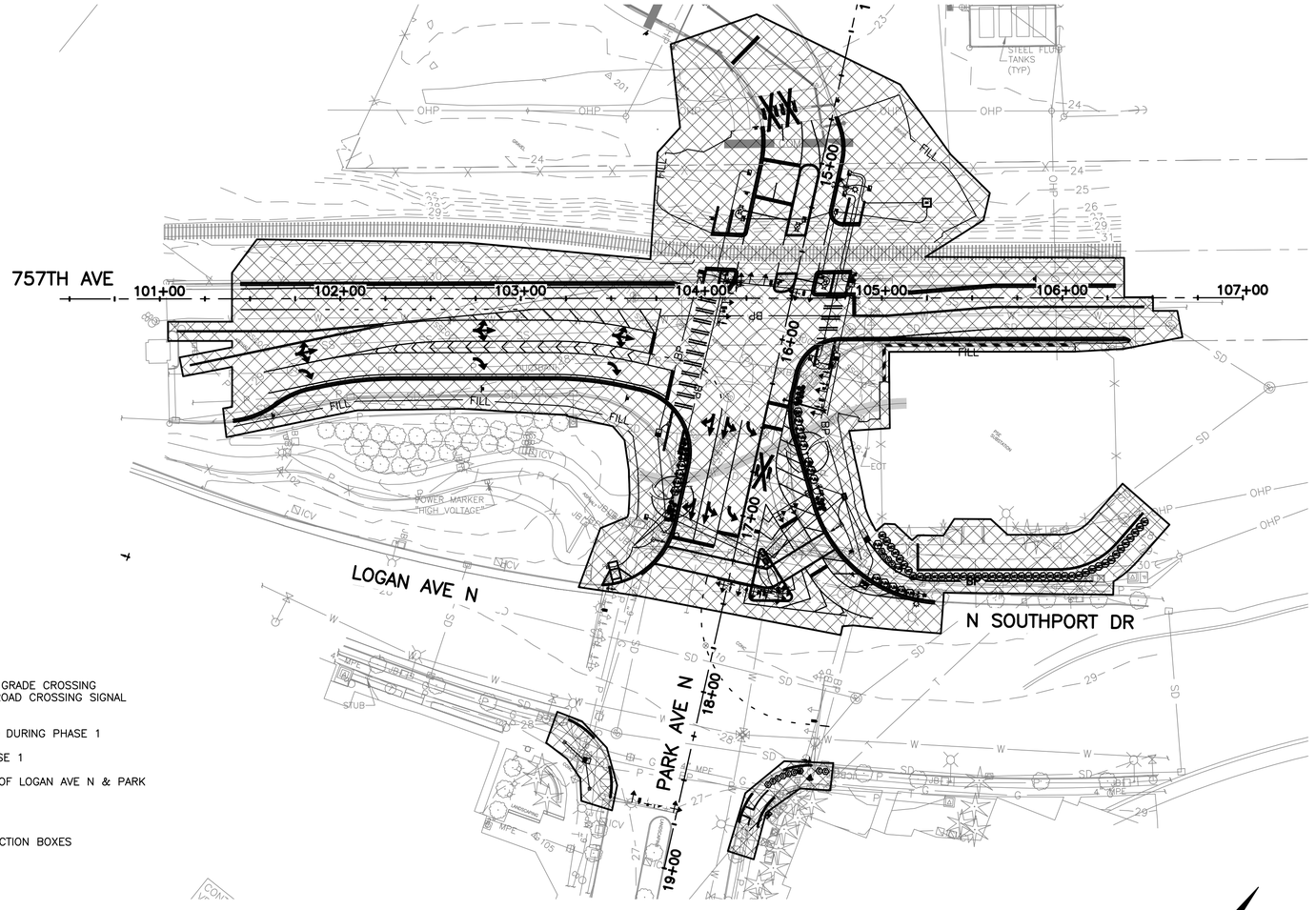

LEGEND

CONSTRUCTION ZONE (PHASE 2)

PHASE 2 WORK ELEMENTS:

1. COORDINATE WITH BNSF FOR BNSF TO INSTALL NEW GRADE CROSSING BALLAST, TIES, PRECAST PANELS, TRACKS, AND RAILROAD CROSSING SIGNAL CONTROL ELEMENTS
2. INSTALL STORM DRAINAGE SYSTEM, IF NOT INSTALLED DURING PHASE 1
3. INSTALL WATER LINE, IF NOT INSTALLED DURING PHASE 1
4. DEMO AND REBUILD SOUTH INTERSECTION CORNERS OF LOGAN AVE N & PARK AVE N
5. CONSTRUCT SIGNAL AND ILLUMINATION FOUNDATIONS
6. PLACE SIGNAL AND ILLUMINATION CONDUITS AND JUNCTION BOXES
7. CONSTRUCT CURBS AND GUTTERS
8. ADJUST UTILITY STRUCTURES AS NECESSARY
9. PAVE ROADWAYS, SIDEWALKS, AND CURB RAMPS
10. ERECT SIGNAL AND ILLUMINATION POLES
11. WIRE SIGNAL AND ILLUMINATION SYSTEMS
12. REMOVE TEMPORARY SIGNAL
13. INSTALL FINAL CHANNELIZATION
14. INSTALL LANDSCAPING
15. REMOVE LAYDOWN AREA
16. TRAFFIC CONTROL FOR EACH SUB–PHASE OF PHASE 2 IS ILLUSTRATED ON DWGS TC4, TC5, AND TC6

CONSTRUCTION SEQUENCING NOTES:

1. ALL EXISTING AND FUTURE IMPROVEMENTS, INCLUDING UTILITIES, ARE NOT SHOWN ON THIS DRAWING. FOR ADDITIONAL INFORMATION, SEE THE APPLICABLE CONTRACT DRAWINGS.
2. IN ALL CASES, UNDERGROUND UTILITIES SHALL BE CONSTRUCTED PRIOR TO START OF FINAL SURFACE IMPROVEMENTS SUCH AS, BUT NOT LIMITED TO, PAVEMENT BASE MATERIAL, SIDEWALKS, CURBS AND GUTTERS, PAVEMENTS, ETC.
3. CONSTRUCTION SEQUENCING SHOWN ON THESE PLANS IS THE AGENCY'S PREFERRED COURSE OF ACTION. ALTERNATIVE SEQUENCING MAY BE DEVELOPED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR APPROVAL. ACCEPTANCE OF ALTERNATIVE SEQUENCING CONCEPTS SHALL BE AT THE SOLE DISCRETION OF THE ENGINEER AND THE CONTRACTOR SHALL NOT PRESUME THAT ALTERNATIVES WILL BE ACCEPTED. THE CONTRACTOR SHALL USE THESE CONSTRUCTION SEQUENCING PLANS AS THE BASIS FOR THE CONTRACT BID.
4. CONSTRUCTION ACTIVITIES NOT SPECIFICALLY SEQUENCED HEREON SHALL BE CONDUCTED IN A MANNER TO MINIMIZE PUBLIC IMPACT. FULL PROGRESS SCHEDULES IN ACCORDANCE WITH SECTION 1–08.3 OF THE STANDARD SPECIFICATIONS ARE STILL NECESSARY.
5. WHEN WORKING ON CURB RAMPS AND SIDEWALK SEGMENTS, PROVIDE A 5 FOOT WIDTH ADA PEDESTRIAN ACCESS DETOUR PER WSDOT TRAFFIC CONTROL PLAN TC16. PROVIDE THIS DETOUR DURING WORKING HOURS ONLY. DURING NON–WORKING HOURS PROVIDE ADA PEDESTRIAN ACCESS THROUGH THE WORK ZONE BY THE USE OF TEMPORARY MEASURES SUCH AS STEEL PLATES, CRUSHED SURFACING, COLD MIX ASPHALT, OR OTHER MEASURES APPROVED BY THE ENGINEER.
6. A FLAGGER MUST BE PROVIDED AT ALL TIMES WHILE WORK IS OCCURRING ON A CURB RAMP TO SERVE AS A PEDESTRIAN ESCORT THRU SIDEWALK DETOURS.
7. CONTRACTOR SHALL REMOVE OR COVER CONFLICTING EXISTING CHANNELIZATION OR SIGNS.
8. SIGN PLACEMENT IS SUBJECT TO REVISION BY THE ENGINEER ON–SITE IF NEEDED TO ADDRESS TRAFFIC OR PEDESTRIAN SAFETY OR TRAVEL.
9. CONTRACTOR IS REQUIRED TO COMPLETE A CITY OF RENTON TRAFFIC CONTROL PLAN FORM AND LAYOUT FOR EACH CONSTRUCTION PHASE.
10. CONTRACTOR SHALL INSTALL UTILITY CONNECTIONS/EXTENSIONS OUTSIDE THE CONSTRUCTION ZONE AS NECESSARY TO PROVIDE FULLY FUNCTIONING UTILITY SYSTEMS FOR THE ENTIRE CONSTRUCTION DURATION. ANY PAVEMENT CUTS OUTSIDE THE CONSTRUCTION ZONE FOR A PARTICULAR PHASE SHALL BE PATCHED WITH HOT MIX ASPHALT. FULL ROAD CLOSURES ARE NOT ALLOWED OUTSIDE THOSE SHOWN ON THE PLANS.
11. CONTRACTOR SHALL MAINTAIN ONE LANE OF ACCESS IN EACH DIRECTION TO BOEING AT ALL TIMES.
12. SEE CONSTRUCTION STAGING PLAN (DRAWING SA1) FOR DETAILS ON LAYDOWN AREA.
13. CONTRACTOR SHALL COORDINATE THEIR WORK WITH THAT OF BNSF PER SPECIAL PROVISION 1–07.18.
14. CONTRACTOR SHALL COORDINATE WORK NORTH OF THE BNSF RIGHT–OF–WAY WITH SECO PER SPECIAL PROVISION 1–07.18.
15. WORK RELATED TO LOGAN VAULTS SHALL NOT START UNTIL PHASE 1 AND PHASE 2 WORK IS COMPLETED.
16. CONTACT BNSF PRIOR TO ANY WORK WITHIN BNSF RIGHT OF WAY OR ANY WORK AFFECTING GRADE CROSSING OPERATIONS.
17. CONTACT BNSF VIA 1–800–533–2891 TO LOCATE ALL UTILITY LOCATIONS PRIOR TO ANY DIGGING WORK.

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

MATTHEW POWELL — STATE OF WASHINGTON — 55619 — REGISTERED PROFESSIONAL ENGINEER — 3/26/2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
FILE: 20160266 CS.dwg

PERTEET
801 2ND AVENUE, SUITE 302
SEATTLE, WA 98104
800.615.9900

CITY OF RENTON
Public Works Department
APPROVED FOR CONSTRUCTION
BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

CONSTRUCTION SEQUENCING PLAN

DRAWING NO. CS2
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 3/2022
SHEET NO. 42 OF 56

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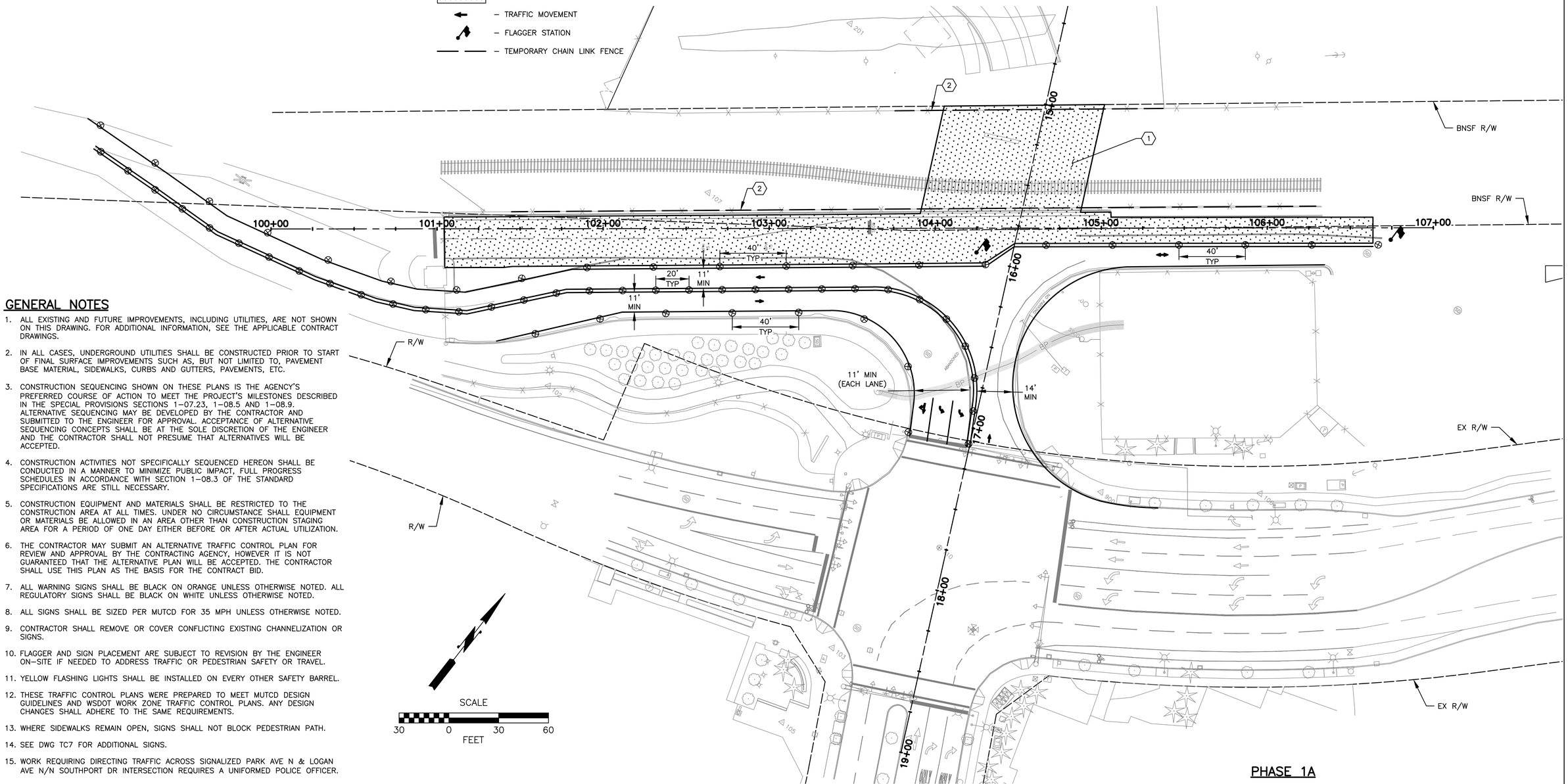
CONSTRUCTION NOTES

1. EXCAVATION, FILL, AND PAVING WORK WITH BNSF RIGHT-OF-WAY MUST BE DONE WITHIN A 7 CALENDAR DAY WINDOW. WRITTEN REQUEST FOR WORK MUST BE PROVIDED TO THE ENGINEER, AND APPROVED PROVIDED BY THE ENGINEER, AT LEAST 30 CALENDAR DAYS IN ADVANCE OF THE WORK. CONSTRUCTION ACTIVITIES ACROSS BNSF TRACKS SHALL REQUIRE BNSF FLAGGERS, SEE SPECIAL PROVISIONS 1-07.18.

2. PROVIDE TEMPORARY CHAIN LINK FENCING ALONG BNSF R/W BOUNDARIES. TEMPORARY CHAIN LINK FENCING SHALL BE IN PLACE TO RESTRICT ACCESS TO BNSF R/W AT ALL TIMES OUTSIDE OF WORKING HOURS. SEE SPECIAL PROVISIONS 8-12.

LEGEND

- ⊗ – SAFETY BARREL
- ⧖ – TRIPOD MOUNTED SIGN
- – CONSTRUCTION ZONE
- ← – TRAFFIC MOVEMENT
- – FLAGGER STATION
- —— —— – TEMPORARY CHAIN LINK FENCE



GENERAL NOTES

1. ALL EXISTING AND FUTURE IMPROVEMENTS, INCLUDING UTILITIES, ARE NOT SHOWN ON THIS DRAWING. FOR ADDITIONAL INFORMATION, SEE THE APPLICABLE CONTRACT DRAWINGS.
2. IN ALL CASES, UNDERGROUND UTILITIES SHALL BE CONSTRUCTED PRIOR TO START OF FINAL SURFACE IMPROVEMENTS SUCH AS, BUT NOT LIMITED TO, PAVEMENT BASE MATERIAL, SIDEWALKS, CURBS AND GUTTERS, PAVEMENTS, ETC.
3. CONSTRUCTION SEQUENCING SHOWN ON THESE PLANS IS THE AGENCY'S PREFERRED COURSE OF ACTION TO MEET THE PROJECT'S MILESTONES DESCRIBED IN THE SPECIAL PROVISIONS SECTIONS 1-07.23, 1-08.5 AND 1-08.9. ALTERNATIVE SEQUENCING MAY BE DEVELOPED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR APPROVAL. ACCEPTANCE OF ALTERNATIVE SEQUENCING CONCEPTS SHALL BE AT THE SOLE DISCRETION OF THE ENGINEER AND THE CONTRACTOR SHALL NOT PRESUME THAT ALTERNATIVES WILL BE ACCEPTED.
4. CONSTRUCTION ACTIVITIES NOT SPECIFICALLY SEQUENCED HEREON SHALL BE CONDUCTED IN A MANNER TO MINIMIZE PUBLIC IMPACT, FULL PROGRESS SCHEDULES IN ACCORDANCE WITH SECTION 1-08.3 OF THE STANDARD SPECIFICATIONS ARE STILL NECESSARY.
5. CONSTRUCTION EQUIPMENT AND MATERIALS SHALL BE RESTRICTED TO THE CONSTRUCTION AREA AT ALL TIMES. UNDER NO CIRCUMSTANCE SHALL EQUIPMENT OR MATERIALS BE ALLOWED IN AN AREA OTHER THAN CONSTRUCTION STAGING AREA FOR A PERIOD OF ONE DAY EITHER BEFORE OR AFTER ACTUAL UTILIZATION.
6. THE CONTRACTOR MAY SUBMIT AN ALTERNATIVE TRAFFIC CONTROL PLAN FOR REVIEW AND APPROVAL BY THE CONTRACTING AGENCY, HOWEVER IT IS NOT GUARANTEED THAT THE ALTERNATIVE PLAN WILL BE ACCEPTED. THE CONTRACTOR SHALL USE THIS PLAN AS THE BASIS FOR THE CONTRACT BID.
7. ALL WARNING SIGNS SHALL BE BLACK ON ORANGE UNLESS OTHERWISE NOTED. ALL REGULATORY SIGNS SHALL BE BLACK ON WHITE UNLESS OTHERWISE NOTED.
8. ALL SIGNS SHALL BE SIZED PER MUTCD FOR 35 MPH UNLESS OTHERWISE NOTED.
9. CONTRACTOR SHALL REMOVE OR COVER CONFLICTING EXISTING CHANNELIZATION OR SIGNS.
10. FLAGGER AND SIGN PLACEMENT ARE SUBJECT TO REVISION BY THE ENGINEER ON-SITE IF NEEDED TO ADDRESS TRAFFIC OR PEDESTRIAN SAFETY OR TRAVEL.
11. YELLOW FLASHING LIGHTS SHALL BE INSTALLED ON EVERY OTHER SAFETY BARREL.
12. THESE TRAFFIC CONTROL PLANS WERE PREPARED TO MEET MUTCD DESIGN GUIDELINES AND WSDOT WORK ZONE TRAFFIC CONTROL PLANS. ANY DESIGN CHANGES SHALL ADHERE TO THE SAME REQUIREMENTS.
13. WHERE SIDEWALKS REMAIN OPEN, SIGNS SHALL NOT BLOCK PEDESTRIAN PATH.
14. SEE DWG TC7 FOR ADDITIONAL SIGNS.
15. WORK REQUIRING DIRECTING TRAFFIC ACROSS SIGNALIZED PARK AVE N & LOGAN AVE N/N SOUTHPORT DR INTERSECTION REQUIRES A UNIFORMED POLICE OFFICER.

SCALE
30 0 30 60
FEET

PHASE 1A

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

MATTHEW POWELL — STATE OF WASHINGTON — 55619 — REGISTERED PROFESSIONAL ENGINEER — 5/16/2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
FILE: 20160266 TC.dwg

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SEATTLE, WA 98104
800.615.9900

CITY OF RENTON
Public Works Department
APPROVED FOR CONSTRUCTION
BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

TRAFFIC CONTROL PLAN

DRAWING NO. TC1
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 5/2022
SHEET NO. 43 OF 56

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NW ¼ SEC 8, T 23 N, R 5 E, W.M.

CONSTRUCTION NOTES

1. REMOVAL OF EXISTING PORTLAND CEMENT CONCRETE PAVEMENT (PCCP) AND PLACEMENT OF NEW PCCP IN THIS AREA MUST BE DONE WITHIN A 7 CALENDAR DAY WINDOW. WRITTEN REQUEST FOR WORK MUST BE PROVIDED TO THE ENGINEER, AND APPROVED PROVIDED BY THE ENGINEER, AT LEAST 10 WORKING DAYS IN ADVANCE OF THIS WORK.
2. THIS SIGN SHALL ONLY BE IN PLACE DURING REMOVAL OF EXISTING PCCP AND PLACEMENT OF NEW PCCP.
3. RIGHT–TURN MOVEMENT FOR LARGE BOEING TRUCKS MUST BE MAINTAINED IN THE AREA, EXCEPT FOR THE TIME PERIOD COVERED BY NOTE 1.
4. PROVIDE TEMPORARY CHAIN LINK FENCING ALONG BNSF R/W BOUNDARIES. TEMPORARY CHAIN LINK FENCING SHALL BE IN PLACE TO RESTRICT ACCESS TO BNSF R/W AT ALL TIMES OUTSIDE OF WORKING HOURS. SEE SPECIAL PROVISIONS 8–12.

LEGEND

- ⊗ – SAFETY BARREL
- ⧖ – TRIPOD MOUNTED SIGN
- ▭ – CONSTRUCTION ZONE
- ← – TRAFFIC MOVEMENT
- ↗ – FLAGGER STATION
- — — – TEMPORARY CHAIN LINK FENCE

GENERAL NOTES

1. ALL EXISTING AND FUTURE IMPROVEMENTS, INCLUDING UTILITIES, ARE NOT SHOWN ON THIS DRAWING. FOR ADDITIONAL INFORMATION, SEE THE APPLICABLE CONTRACT DRAWINGS.
2. IN ALL CASES, UNDERGROUND UTILITIES SHALL BE CONSTRUCTED PRIOR TO START OF FINAL SURFACE IMPROVEMENTS SUCH AS, BUT NOT LIMITED TO, PAVEMENT BASE MATERIAL, SIDEWALKS, CURBS AND GUTTERS, PAVEMENTS, ETC.
3. CONSTRUCTION SEQUENCING SHOWN ON THESE PLANS IS THE AGENCY'S PREFERRED COURSE OF ACTION TO MEET THE PROJECT'S MILESTONES DESCRIBED IN THE SPECIAL PROVISIONS SECTIONS 1–07.23, 1–08.5 AND 1–08.9. ALTERNATIVE SEQUENCING MAY BE DEVELOPED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR APPROVAL. ACCEPTANCE OF ALTERNATIVE SEQUENCING CONCEPTS SHALL BE AT THE SOLE DISCRETION OF THE ENGINEER AND THE CONTRACTOR SHALL NOT PRESUME THAT ALTERNATIVES WILL BE ACCEPTED.
4. CONSTRUCTION ACTIVITIES NOT SPECIFICALLY SEQUENCED HEREON SHALL BE CONDUCTED IN A MANNER TO MINIMIZE PUBLIC IMPACT, FULL PROGRESS SCHEDULES IN ACCORDANCE WITH SECTION 1–08.3 OF THE STANDARD SPECIFICATIONS ARE STILL NECESSARY.
5. CONSTRUCTION EQUIPMENT AND MATERIALS SHALL BE RESTRICTED TO THE CONSTRUCTION AREA AT ALL TIMES. UNDER NO CIRCUMSTANCE SHALL EQUIPMENT OR MATERIALS BE ALLOWED IN AN AREA OTHER THAN CONSTRUCTION STAGING AREA FOR A PERIOD OF ONE DAY EITHER BEFORE OR AFTER ACTUAL UTILIZATION.
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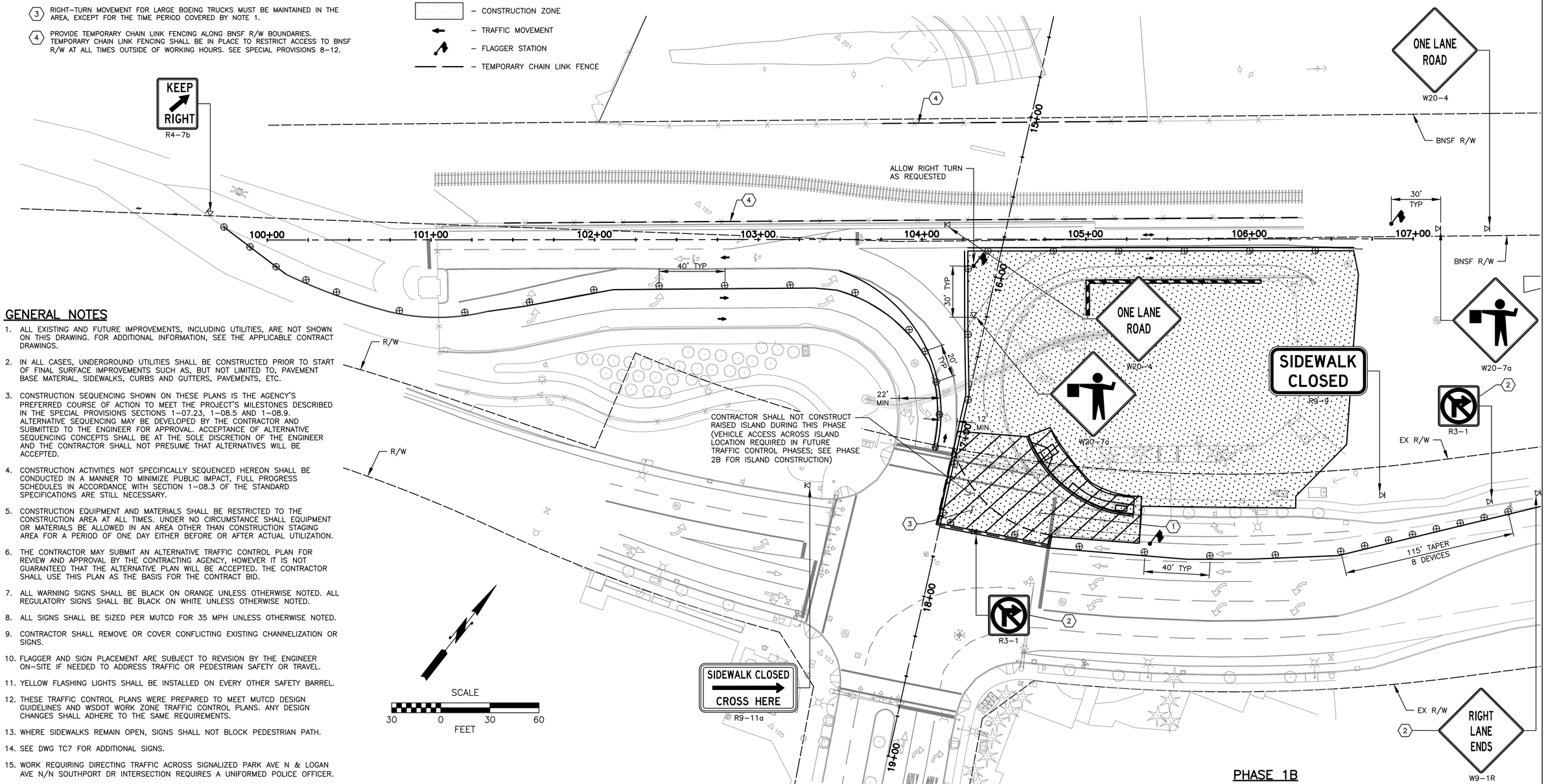
7. ALL WARNING SIGNS SHALL BE BLACK ON ORANGE UNLESS OTHERWISE NOTED. ALL REGULATORY SIGNS SHALL BE BLACK ON WHITE UNLESS OTHERWISE NOTED.
8. ALL SIGNS SHALL BE SIZED PER MUTCD FOR 35 MPH UNLESS OTHERWISE NOTED.
9. CONTRACTOR SHALL REMOVE OR COVER CONFLICTING EXISTING CHANNELIZATION OR SIGNS.
10. FLAGGER AND SIGN PLACEMENT ARE SUBJECT TO REVISION BY THE ENGINEER ON–SITE IF NEEDED TO ADDRESS TRAFFIC OR PEDESTRIAN SAFETY OR TRAVEL.
11. YELLOW FLASHING LIGHTS SHALL BE INSTALLED ON EVERY OTHER SAFETY BARREL.
12. THESE TRAFFIC CONTROL PLANS WERE PREPARED TO MEET MUTCD DESIGN GUIDELINES AND WSDOT WORK ZONE TRAFFIC CONTROL PLANS. ANY DESIGN CHANGES SHALL ADHERE TO THE SAME REQUIREMENTS.
13. WHERE SIDEWALKS REMAIN OPEN, SIGNS SHALL NOT BLOCK PEDESTRIAN PATH.
14. SEE DWG TC7 FOR ADDITIONAL SIGNS.
15. WORK REQUIRING DIRECTING TRAFFIC ACROSS SIGNALIZED PARK AVE N & LOGAN AVE N/N SOUTHPORT DR INTERSECTION REQUIRES A UNIFORMED POLICE OFFICER.



PHASE 1B

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

MATTHEW POWELL — STATE OF WASHINGTON — 55619 — REGISTERED PROFESSIONAL ENGINEER — 5/16/2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
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FILE: 20160266 TC.dwg

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CITY OF RENTON
Public Works Department

APPROVED FOR CONSTRUCTION

BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

TRAFFIC CONTROL PLAN

DRAWING NO. TC2
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 5/2022
SHEET NO. 44 OF 56

X:\Renton, City of\Projects\20160266 – N Park Ave Extension\CADD\Plan Sheets\20160266 TC.dwg 5/15/2022 10:50 PM

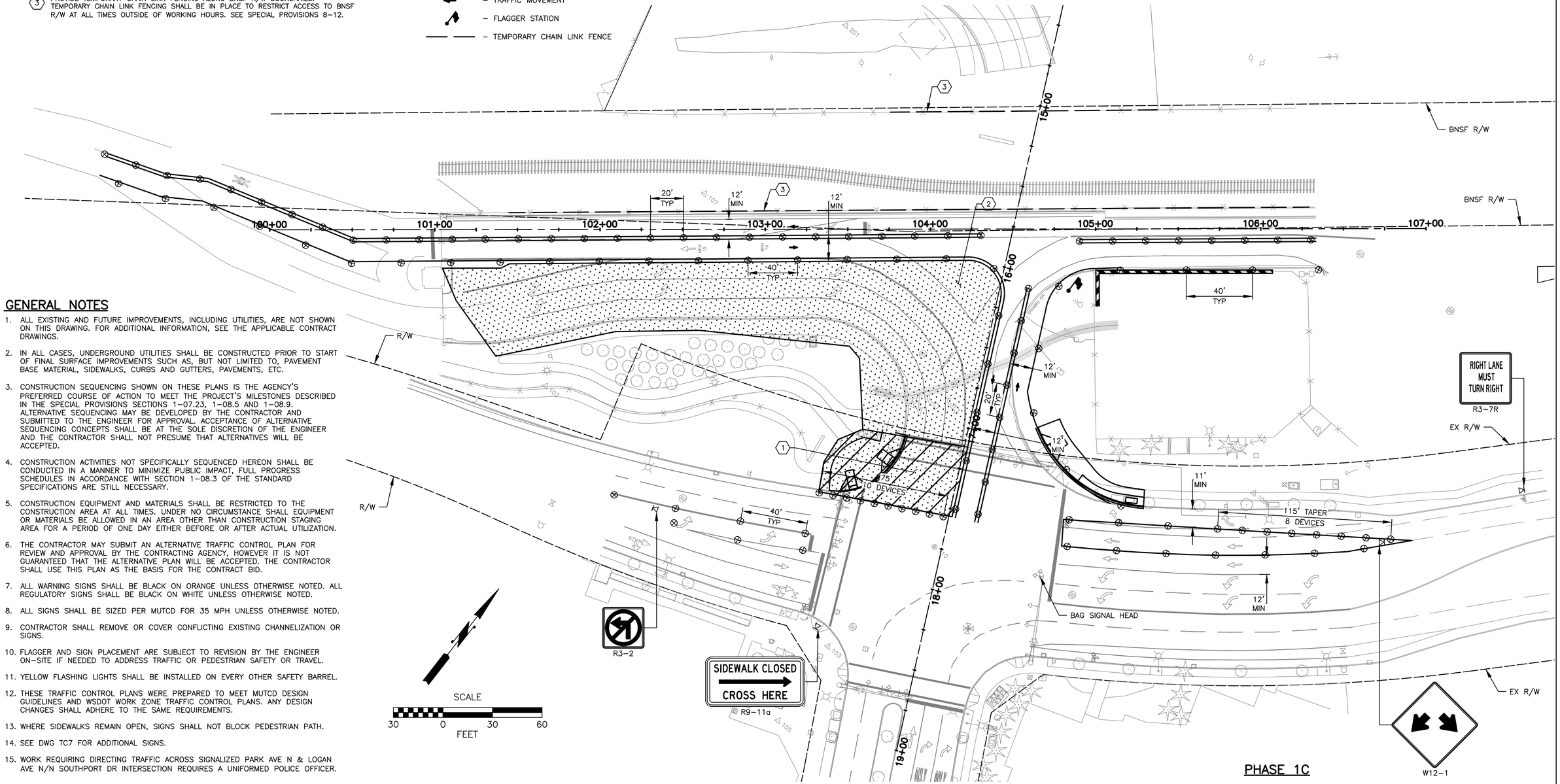
NW ¼ SEC 8, T 23 N, R 5 E, W.M.

CONSTRUCTION NOTES

1. REMOVAL OF EXISTING PORTLAND CEMENT CONCRETE PAVEMENT (PCCP) AND PLACEMENT OF NEW PCCP IN THIS AREA MUST BE DONE WITHIN A 7 CALENDAR DAY WINDOW. WRITTEN REQUEST FOR WORK MUST BE PROVIDED TO THE ENGINEER, AND APPROVED PROVIDED BY THE ENGINEER, AT LEAST 10 WORKING DAYS IN ADVANCE OF THIS WORK.
2. RIGHT–TURN MOVEMENT FOR LARGE BOEING TRUCKS MUST BE MAINTAINED IN THE AREA, EXCEPT FOR THE TIME PERIOD COVERED BY NOTE 1.
3. PROVIDE TEMPORARY CHAIN LINK FENCING ALONG BNSF R/W BOUNDARIES. TEMPORARY CHAIN LINK FENCING SHALL BE IN PLACE TO RESTRICT ACCESS TO BNSF R/W AT ALL TIMES OUTSIDE OF WORKING HOURS. SEE SPECIAL PROVISIONS 8–12.

LEGEND

- ⊗ – SAFETY BARREL
- ⧖ – TRIPOD MOUNTED SIGN
- ▭ – CONSTRUCTION ZONE
- ← – TRAFFIC MOVEMENT
- – FLAGGER STATION
- — — – TEMPORARY CHAIN LINK FENCE



GENERAL NOTES

1. ALL EXISTING AND FUTURE IMPROVEMENTS, INCLUDING UTILITIES, ARE NOT SHOWN ON THIS DRAWING. FOR ADDITIONAL INFORMATION, SEE THE APPLICABLE CONTRACT DRAWINGS.
2. IN ALL CASES, UNDERGROUND UTILITIES SHALL BE CONSTRUCTED PRIOR TO START OF FINAL SURFACE IMPROVEMENTS SUCH AS, BUT NOT LIMITED TO, PAVEMENT BASE MATERIAL, SIDEWALKS, CURBS AND GUTTERS, PAVEMENTS, ETC.
3. CONSTRUCTION SEQUENCING SHOWN ON THESE PLANS IS THE AGENCY'S PREFERRED COURSE OF ACTION TO MEET THE PROJECT'S MILESTONES DESCRIBED IN THE SPECIAL PROVISIONS SECTIONS 1–07.23, 1–08.5 AND 1–08.9. ALTERNATIVE SEQUENCING MAY BE DEVELOPED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR APPROVAL. ACCEPTANCE OF ALTERNATIVE SEQUENCING CONCEPTS SHALL BE AT THE SOLE DISCRETION OF THE ENGINEER AND THE CONTRACTOR SHALL NOT PRESUME THAT ALTERNATIVES WILL BE ACCEPTED.
4. CONSTRUCTION ACTIVITIES NOT SPECIFICALLY SEQUENCED HEREON SHALL BE CONDUCTED IN A MANNER TO MINIMIZE PUBLIC IMPACT, FULL PROGRESS SCHEDULES IN ACCORDANCE WITH SECTION 1–08.3 OF THE STANDARD SPECIFICATIONS ARE STILL NECESSARY.
5. CONSTRUCTION EQUIPMENT AND MATERIALS SHALL BE RESTRICTED TO THE CONSTRUCTION AREA AT ALL TIMES. UNDER NO CIRCUMSTANCE SHALL EQUIPMENT OR MATERIALS BE ALLOWED IN AN AREA OTHER THAN CONSTRUCTION STAGING AREA FOR A PERIOD OF ONE DAY EITHER BEFORE OR AFTER ACTUAL UTILIZATION.
6. THE CONTRACTOR MAY SUBMIT AN ALTERNATIVE TRAFFIC CONTROL PLAN FOR REVIEW AND APPROVAL BY THE CONTRACTING AGENCY, HOWEVER IT IS NOT GUARANTEED THAT THE ALTERNATIVE PLAN WILL BE ACCEPTED. THE CONTRACTOR SHALL USE THIS PLAN AS THE BASIS FOR THE CONTRACT BID.
7. ALL WARNING SIGNS SHALL BE BLACK ON ORANGE UNLESS OTHERWISE NOTED. ALL REGULATORY SIGNS SHALL BE BLACK ON WHITE UNLESS OTHERWISE NOTED.
8. ALL SIGNS SHALL BE SIZED PER MUTCD FOR 35 MPH UNLESS OTHERWISE NOTED.
9. CONTRACTOR SHALL REMOVE OR COVER CONFLICTING EXISTING CHANNELIZATION OR SIGNS.
10. FLAGGER AND SIGN PLACEMENT ARE SUBJECT TO REVISION BY THE ENGINEER ON–SITE IF NEEDED TO ADDRESS TRAFFIC OR PEDESTRIAN SAFETY OR TRAVEL.
11. YELLOW FLASHING LIGHTS SHALL BE INSTALLED ON EVERY OTHER SAFETY BARREL.
12. THESE TRAFFIC CONTROL PLANS WERE PREPARED TO MEET MUTCD DESIGN GUIDELINES AND WSDOT WORK ZONE TRAFFIC CONTROL PLANS. ANY DESIGN CHANGES SHALL ADHERE TO THE SAME REQUIREMENTS.
13. WHERE SIDEWALKS REMAIN OPEN, SIGNS SHALL NOT BLOCK PEDESTRIAN PATH.
14. SEE DWG TC7 FOR ADDITIONAL SIGNS.
15. WORK REQUIRING DIRECTING TRAFFIC ACROSS SIGNALIZED PARK AVE N & LOGAN AVE N/N SOUTHPORT DR INTERSECTION REQUIRES A UNIFORMED POLICE OFFICER.

PHASE 1C

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

MATTHEW POWELL – STATE OF WASHINGTON – 55619 – REGISTERED PROFESSIONAL ENGINEER – 5/16/2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
FILE: 20160266 TC.dwg

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CITY OF RENTON
Public Works Department

APPROVED FOR CONSTRUCTION

BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

TRAFFIC CONTROL PLAN

DRAWING NO. TC3
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 5/2022
SHEET NO. 45 OF 56

X:\Renton, City of\Projects\20160266 – N Park Ave Extension\CADD\Plan Sheets\20160266 TC.dwg 5/15/2022 10:50 PM

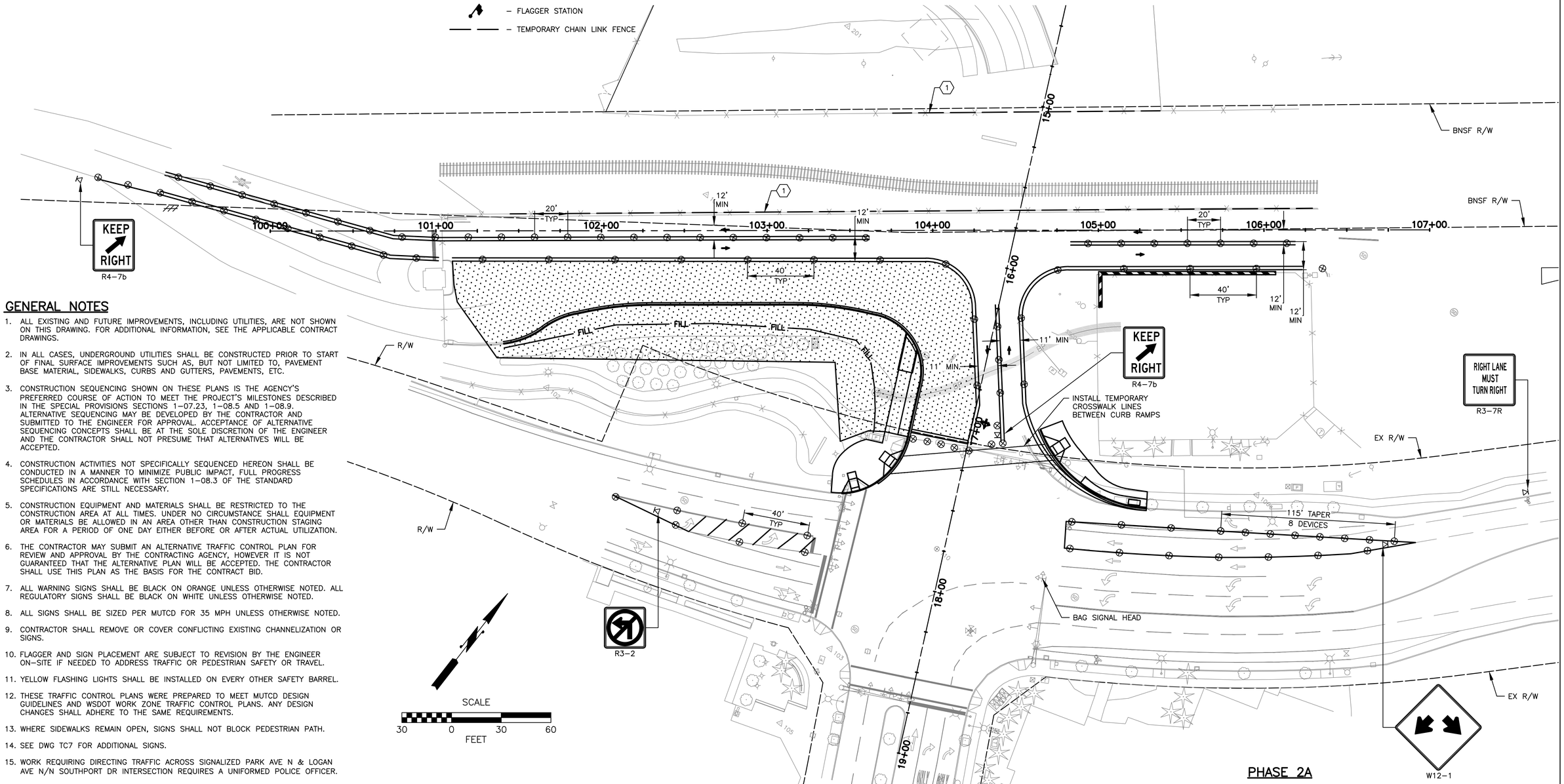
NW ¼ SEC 8, T 23 N, R 5 E, W.M.

CONSTRUCTION NOTES

(1) PROVIDE TEMPORARY CHAIN LINK FENCING ALONG BNSF R/W BOUNDARIES. TEMPORARY CHAIN LINK FENCING SHALL BE IN PLACE TO RESTRICT ACCESS TO BNSF R/W AT ALL TIMES OUTSIDE OF WORKING HOURS. SEE SPECIAL PROVISIONS 8–12.

LEGEND

- ⊗ – SAFETY BARREL
- ⧖ – TRIPOD MOUNTED SIGN
- – CONSTRUCTION ZONE
- – TRAFFIC MOVEMENT
- – FLAGGER STATION
- —— —— – TEMPORARY CHAIN LINK FENCE



GENERAL NOTES

1. ALL EXISTING AND FUTURE IMPROVEMENTS, INCLUDING UTILITIES, ARE NOT SHOWN ON THIS DRAWING. FOR ADDITIONAL INFORMATION, SEE THE APPLICABLE CONTRACT DRAWINGS.
2. IN ALL CASES, UNDERGROUND UTILITIES SHALL BE CONSTRUCTED PRIOR TO START OF FINAL SURFACE IMPROVEMENTS SUCH AS, BUT NOT LIMITED TO, PAVEMENT BASE MATERIAL, SIDEWALKS, CURBS AND GUTTERS, PAVEMENTS, ETC.
3. CONSTRUCTION SEQUENCING SHOWN ON THESE PLANS IS THE AGENCY'S PREFERRED COURSE OF ACTION TO MEET THE PROJECT'S MILESTONES DESCRIBED IN THE SPECIAL PROVISIONS SECTIONS 1–07.23, 1–08.5 AND 1–08.9. ALTERNATIVE SEQUENCING MAY BE DEVELOPED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR APPROVAL. ACCEPTANCE OF ALTERNATIVE SEQUENCING CONCEPTS SHALL BE AT THE SOLE DISCRETION OF THE ENGINEER AND THE CONTRACTOR SHALL NOT PRESUME THAT ALTERNATIVES WILL BE ACCEPTED.
4. CONSTRUCTION ACTIVITIES NOT SPECIFICALLY SEQUENCED HEREON SHALL BE CONDUCTED IN A MANNER TO MINIMIZE PUBLIC IMPACT, FULL PROGRESS SCHEDULES IN ACCORDANCE WITH SECTION 1–08.3 OF THE STANDARD SPECIFICATIONS ARE STILL NECESSARY.
5. CONSTRUCTION EQUIPMENT AND MATERIALS SHALL BE RESTRICTED TO THE CONSTRUCTION AREA AT ALL TIMES. UNDER NO CIRCUMSTANCE SHALL EQUIPMENT OR MATERIALS BE ALLOWED IN AN AREA OTHER THAN CONSTRUCTION STAGING AREA FOR A PERIOD OF ONE DAY EITHER BEFORE OR AFTER ACTUAL UTILIZATION.
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7. ALL WARNING SIGNS SHALL BE BLACK ON ORANGE UNLESS OTHERWISE NOTED. ALL REGULATORY SIGNS SHALL BE BLACK ON WHITE UNLESS OTHERWISE NOTED.
8. ALL SIGNS SHALL BE SIZED PER MUTCD FOR 35 MPH UNLESS OTHERWISE NOTED.
9. CONTRACTOR SHALL REMOVE OR COVER CONFLICTING EXISTING CHANNELIZATION OR SIGNS.
10. FLAGGER AND SIGN PLACEMENT ARE SUBJECT TO REVISION BY THE ENGINEER ON–SITE IF NEEDED TO ADDRESS TRAFFIC OR PEDESTRIAN SAFETY OR TRAVEL.
11. YELLOW FLASHING LIGHTS SHALL BE INSTALLED ON EVERY OTHER SAFETY BARREL.
12. THESE TRAFFIC CONTROL PLANS WERE PREPARED TO MEET MUTCD DESIGN GUIDELINES AND WSDOT WORK ZONE TRAFFIC CONTROL PLANS. ANY DESIGN CHANGES SHALL ADHERE TO THE SAME REQUIREMENTS.
13. WHERE SIDEWALKS REMAIN OPEN, SIGNS SHALL NOT BLOCK PEDESTRIAN PATH.
14. SEE DWG TC7 FOR ADDITIONAL SIGNS.
15. WORK REQUIRING DIRECTING TRAFFIC ACROSS SIGNALIZED PARK AVE N & LOGAN AVE N/N SOUTHPORT DR INTERSECTION REQUIRES A UNIFORMED POLICE OFFICER.

SCALE
30 0 30 60
FEET

PHASE 2A

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

MATTHEW POWELL — STATE OF WASHINGTON — 55619 — REGISTERED PROFESSIONAL ENGINEER — 5/16/2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
FILE: 20160266 TC.dwg

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CITY OF RENTON
Public Works Department

APPROVED FOR CONSTRUCTION

BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

TRAFFIC CONTROL PLAN

DRAWING NO. TC4
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 5/2022
SHEET NO. 46 OF 56

X:\Renton, City of\Projects\20160266 – N Park Ave Extension\CADD\Plan Sheets\20160266 TC.dwg 5/15/2022 10:51 PM

NW ¼ SEC 8, T 23 N, R 5 E, W.M.

CONSTRUCTION NOTES

1. RIGHT–TURN MOVEMENT FOR LARGE BOEING TRUCKS MUST BE MAINTAINED IN THE AREA, EXCEPT FOR THE TIME PERIOD COVERED BY NOTE 1.
2. PROVIDE TEMPORARY CHAIN LINK FENCING ALONG BNSF R/W BOUNDARIES. TEMPORARY CHAIN LINK FENCING SHALL BE IN PLACE TO RESTRICT ACCESS TO BNSF R/W AT ALL TIMES OUTSIDE OF WORKING HOURS. SEE SPECIAL PROVISIONS 8–12.

LEGEND

- ⊗ – SAFETY BARREL
- ⧖ – TRIPOD MOUNTED SIGN
- – CONSTRUCTION ZONE
- ← – TRAFFIC MOVEMENT
- – FLAGGER STATION
- — — — – TEMPORARY CHAIN LINK FENCE

GENERAL NOTES

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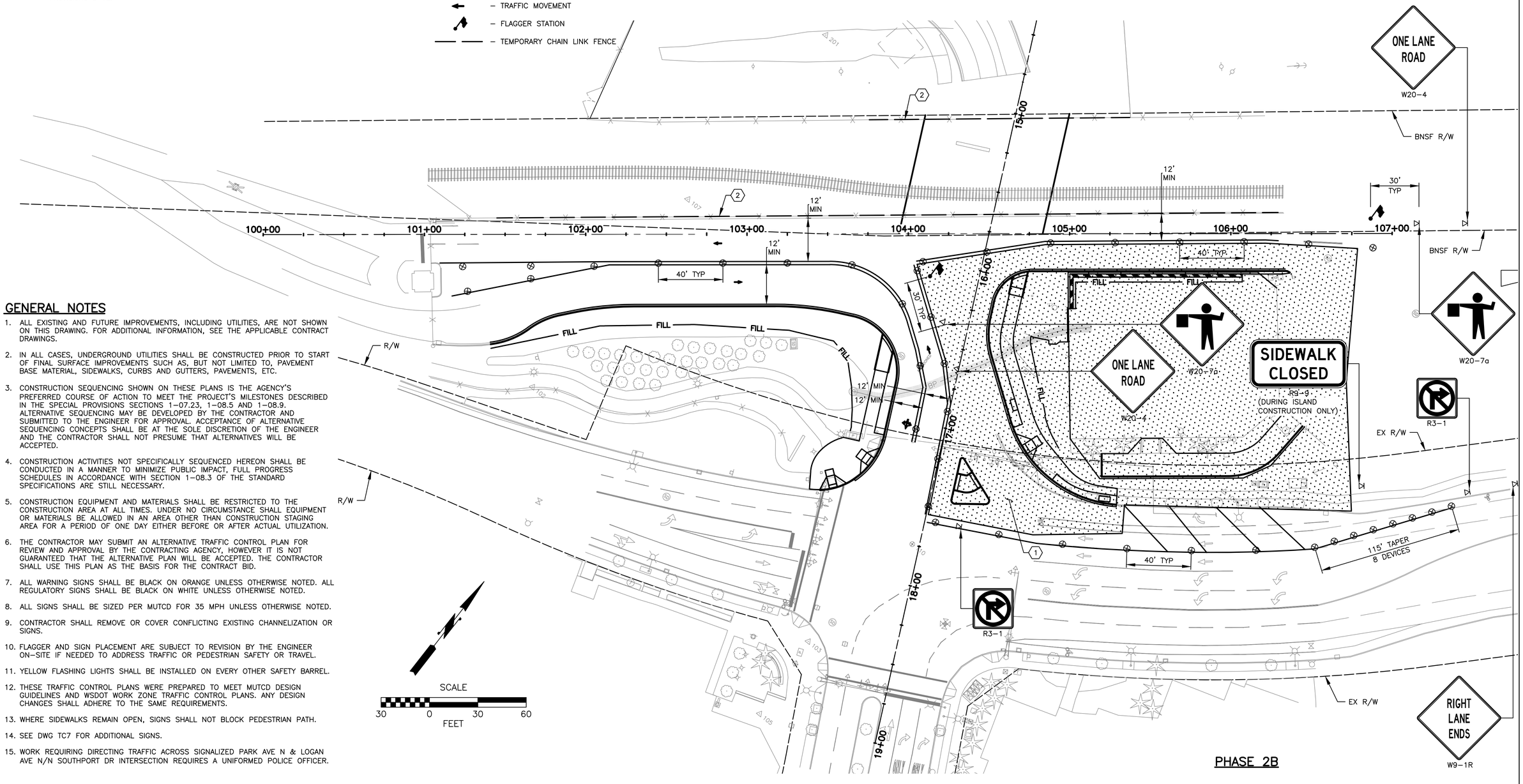

PHASE 2B

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

MATTHEW POWELL — STATE OF WASHINGTON — 55619 — REGISTERED PROFESSIONAL ENGINEER — 5/16/2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
FILE: 20160266 TC.dwg

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800.615.9900

CITY OF RENTON
Public Works Department

APPROVED FOR CONSTRUCTION

BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

TRAFFIC CONTROL PLAN

DRAWING NO. TC5
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 5/2022
SHEET NO. 47 OF 56

X:\Renton, City of\Projects\20160266 – N Park Ave Extension\CADD\Plan Sheets\20160266 TC.dwg 5/15/2022 10:52 PM

NW ¼ SEC 8, T 23 N, R 5 E, W.M.

CONSTRUCTION NOTES

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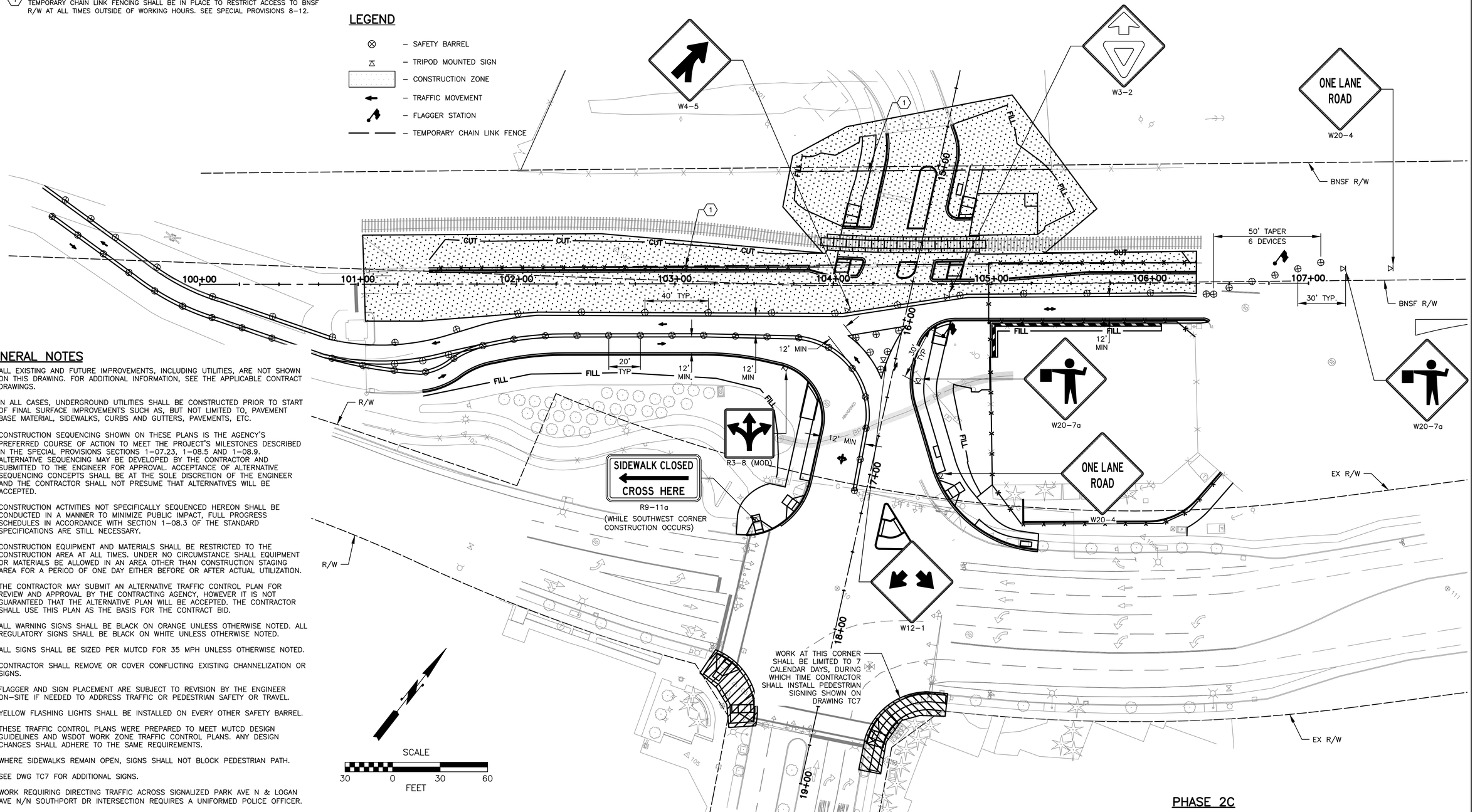
LEGEND

- SAFETY BARREL
- TRIPOD MOUNTED SIGN
- CONSTRUCTION ZONE
- TRAFFIC MOVEMENT
- FLAGGER STATION
- TEMPORARY CHAIN LINK FENCE



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7. ALL WARNING SIGNS SHALL BE BLACK ON ORANGE UNLESS OTHERWISE NOTED. ALL REGULATORY SIGNS SHALL BE BLACK ON WHITE UNLESS OTHERWISE NOTED.
8. ALL SIGNS SHALL BE SIZED PER MUTCD FOR 35 MPH UNLESS OTHERWISE NOTED.
9. CONTRACTOR SHALL REMOVE OR COVER CONFLICTING EXISTING CHANNELIZATION OR SIGNS.
10. FLAGGER AND SIGN PLACEMENT ARE SUBJECT TO REVISION BY THE ENGINEER ON-SITE IF NEEDED TO ADDRESS TRAFFIC OR PEDESTRIAN SAFETY OR TRAVEL.
11. YELLOW FLASHING LIGHTS SHALL BE INSTALLED ON EVERY OTHER SAFETY BARREL.
12. THESE TRAFFIC CONTROL PLANS WERE PREPARED TO MEET MUTCD DESIGN GUIDELINES AND WSDOT WORK ZONE TRAFFIC CONTROL PLANS. ANY DESIGN CHANGES SHALL ADHERE TO THE SAME REQUIREMENTS.
13. WHERE SIDEWALKS REMAIN OPEN, SIGNS SHALL NOT BLOCK PEDESTRIAN PATH.
14. SEE DWG TC7 FOR ADDITIONAL SIGNS.
15. WORK REQUIRING DIRECTING TRAFFIC ACROSS SIGNALIZED PARK AVE N & LOGAN AVE N/N SOUTHPORT DR INTERSECTION REQUIRES A UNIFORMED POLICE OFFICER.

SCALE
30 0 30 60
FEET

PHASE 2C

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

MATTHEW POWELL — STATE OF WASHINGTON — 55619 — REGISTERED PROFESSIONAL ENGINEER — 5/16/2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
FILE: 20160266 TC.dwg

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800.615.9900

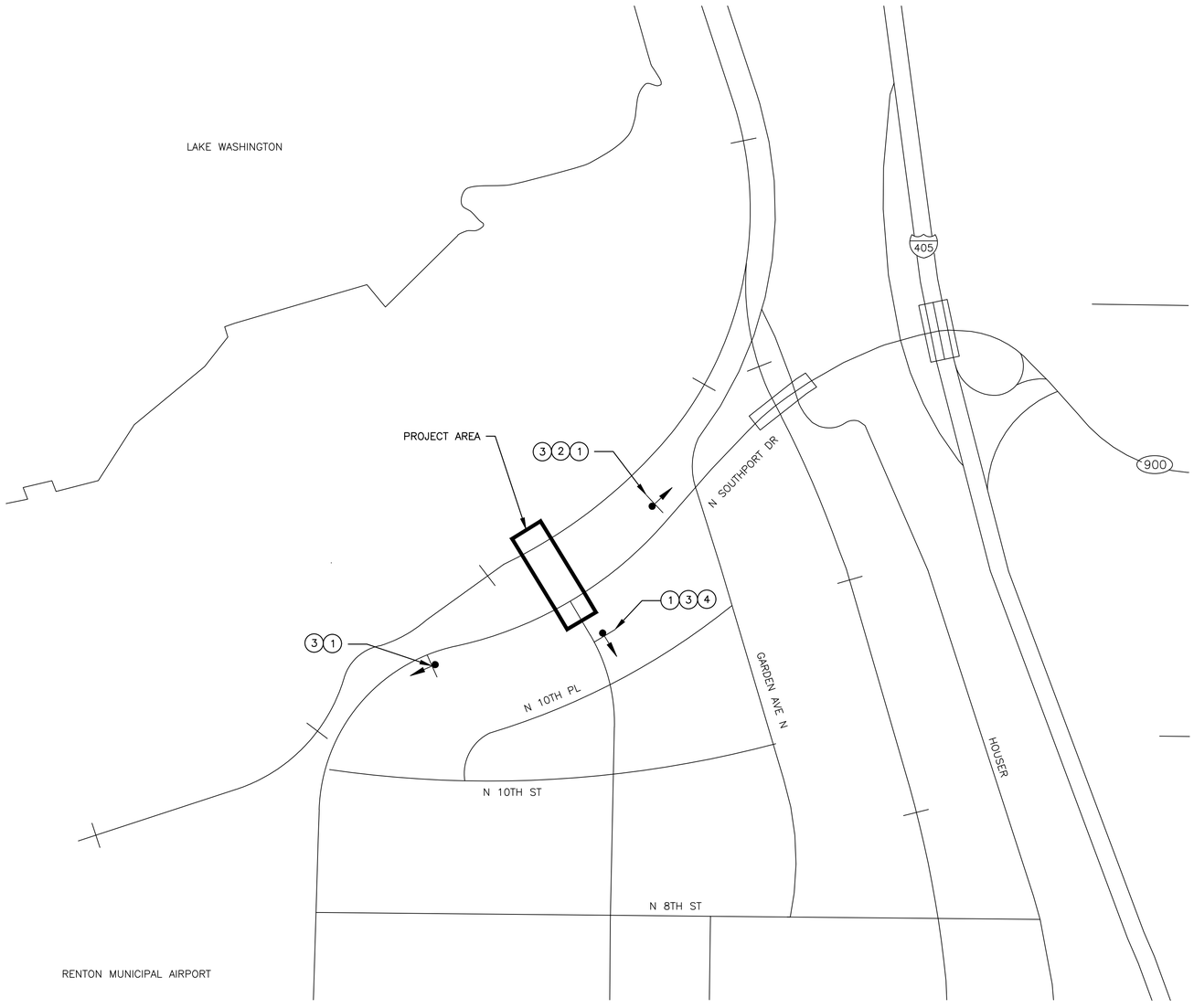
CITY OF RENTON
Public Works Department
APPROVED FOR CONSTRUCTION
BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

TRAFFIC CONTROL PLAN

DRAWING NO. TC6
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 5/2022
SHEET NO. 48 OF 56

X:\Renton, City of\Projects\20160266 - N Park Ave Extension\CADD\Plan Sheets\20160266 TC.dwg 5/15/2022 10:53 PM



ADVANCED SIGNING PLAN

SCALE: 1"=300'

LEGEND

- SIGN, SEE SIGN TABLE THIS SHEET
- (X) SIGN NUMBER
- PROJECT LIMITS

NOTES

1. SIGN LOCATIONS ARE SCHEMATIC. SIGN LOCATIONS SHALL BE INSTALLED TO NOT CONFLICT WITH OTHER CONSTRUCTION SIGNS AS REQUIRED BY THE TC PLANS.

GENERAL NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR MODIFYING THESE TRAFFIC CONTROL PLANS TO MATCH THE CONTRACTOR'S CHOSEN METHOD OF WORK IN ACCORDANCE WITH SECTION 1-10.2(2) OF THE STANDARD SPECIFICATIONS. ALL COSTS ASSOCIATED WITH THE CONTRACTOR'S DEVELOPMENT OF TRAFFIC CONTROL PLANS, AND FOR THE IMPLEMENTATION OF THE TRAFFIC CONTROL PLANS NECESSARY TO SUPPORT THE CONTRACTOR'S CHOSEN METHOD OF WORK SHALL BE INCLUDED IN THE CONTRACTOR'S VARIOUS INDIVIDUAL BID ITEMS RELATED TO TEMPORARY TRAFFIC CONTROL AT THE TIME OF BID SUBMITTAL. THERE WILL BE NO ADJUSTMENTS MADE TO THE BID ITEMS RELATED TO TEMPORARY TRAFFIC CONTROL AFTER THE TIME OF BID SUBMITTAL, THE CONTRACTOR'S ORIGINAL BID SUBMITTAL SHALL BE FULL PAYMENT FOR ALL TEMPORARY TRAFFIC CONTROL ELEMENTS NECESSARY TO SUPPORT THE CONTRACTOR'S CHOSEN METHOD OF WORK.
2. ALL EXISTING AND FUTURE IMPROVEMENTS, INCLUDING UTILITIES, ARE NOT SHOWN ON THIS DRAWING. FOR ADDITIONAL INFORMATION, SEE THE APPLICABLE CONTRACT DRAWINGS.
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5. ALL SIGNS SHALL BE SIZED PER MUTCD FOR 35 MPH UNLESS OTHERWISE NOTED.
6. CONTRACTOR SHALL REMOVE OR COVER CONFLICTING EXISTING CHANNELIZATION OR SIGNS.
7. FLAGGER AND SIGN PLACEMENT ARE SUBJECT TO REVISION BY THE INSPECTOR ON-SITE IF NEEDED TO ADDRESS TRAFFIC OR PEDESTRIAN SAFETY OR TRAVEL.
8. YELLOW FLASHING LIGHTS SHALL BE INSTALLED ON EVERY OTHER SAFETY BARREL.

SIGN TABLE

SIGN #	MUTCD CODE	DESCRIPTION
(1)	W20-1	ROAD WORK AHEAD
* (2)	R9-11	SIDEWALK CLOSED AHEAD [LEFT ARROW] CROSS HERE
(3)	W21-1701P	MOTORCYCLES USE EXTREME CAUTION
** (4)	R9-11	SIDEWALK CLOSED AHEAD[LEFT ARROW] CROSS HERE

* THIS SIGN SHALL ONLY BE DISPLAYED FOR PHASES 1B, 1C, AND, AS NEEDED, 2B.

** THIS SIGN SHALL ONLY BE DISPLAYED DURING PHASE 2C WHILE SOUTHEAST CORNER CONSTRUCTION IS OCCURRING.

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

MATTHEW POWELL — STATE OF WASHINGTON — 55619 — REGISTERED PROFESSIONAL ENGINEER — 5/16/2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
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PROJ MGR: P. DE BOLDT
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801 2ND AVENUE, SUITE 302
SEATTLE, WA 98104
800.615.9900

CITY OF RENTON
Public Works Department

APPROVED FOR CONSTRUCTION

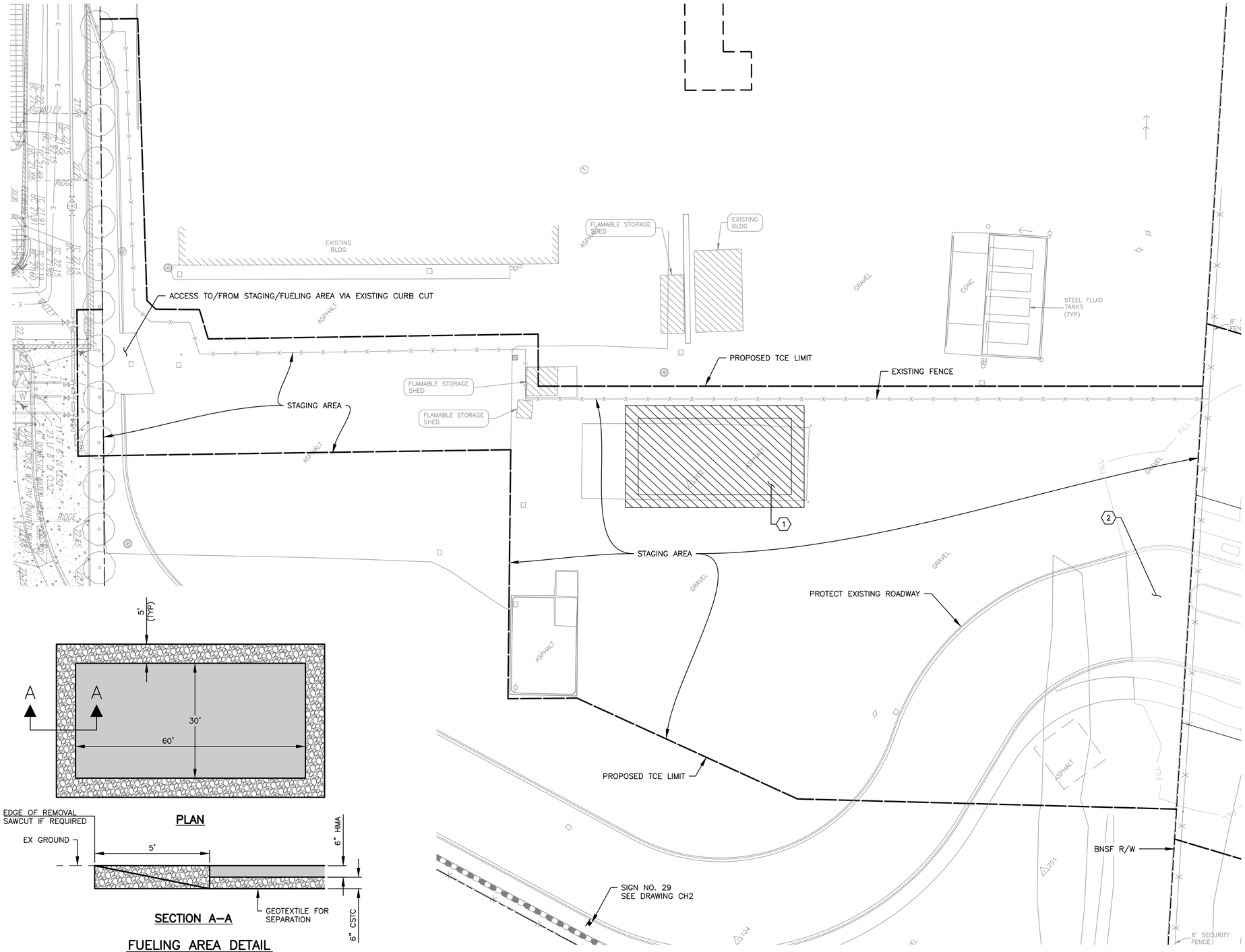
BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

TRAFFIC CONTROL PLAN

DRAWING NO. TC7
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 5/2022
SHEET NO. 49 OF 56

X:\Renton, City of\Projects\20160266 - N Park Ave Extension\CADD\Plan Sheets\20160266 TC.dwg 5/15/2022 10:53 PM



PLAN

SECTION A–A

FUELING AREA DETAIL

CONSTRUCTION NOTES

1. CONSTRUCT FUELING AREA PER DETAIL ON THIS DRAWING. AT PROJECT CLOSE–OUT, WHEN FUELING AREA IS NO LONGER REQUIRED, REMOVE AND DISPOSE OF CONSTRUCTION GEOTEXTILE FOR SEPARATION, HMA, AND ANY CONTAMINATED CSTC (PAID FOR AS ROADWAY EXCAVATION INCLUDING HAUL). FILL WITH CSTC TO RESTORE GRADE.
2. FILL AND PAVE AREA BETWEEN EXISTING PRIVATE ROADWAY END AND BNSF RAILROAD TRACKS TO FACILITATE ACCESS. SEE PAVING AND GRADING PLANS.

NOTES

1. THIS PLAN DEFINES AREAS WHERE THE CONTRACTOR MAY STAGE CONSTRUCTION ACTIVITIES. THE CONTRACTOR HAS FLEXIBILITY IN HOW TO STAGE ACTIVITIES WITHIN THE DEFINED AREAS WITHOUT REQUIRED APPROVAL FROM THE ENGINEER. HOWEVER, THE CONFIGURATION SHOWN ON THIS PLAN SHALL BE THE BASIS FOR THE CONTRACT BID.
2. THE CONTRACTOR SHALL LOCATE THE FUELING AREA IN THE STAGING AREA AS SHOWN ON THIS PLAN. THE CONTRACTOR MAY NOT PERFORM ANY FUELING ACTIVITIES ON ANY BOEING PARCEL. THE CONTRACTOR MAY, WITH APPROVAL BY THE ENGINEER, MODIFY THE FUELING AREA TO MEET THE CONTRACTOR'S NEEDS. HOWEVER, THE FUELING AREA DESIGN AS SHOWN ON THIS PLAN SHALL BE THE BASIS FOR THE CONTRACT BID.
3. THE CONTRACTOR STAGING OPERATIONS SHALL BE BOUND BY THE TCE LIMIT AS SHOWN ON THIS PLAN. THE CONTRACTOR MAY USE SOUTHPORT DEVELOPMENT INTERNAL ROADWAYS TO ACCESS THE STAGING AREA AND THE PARK AVENUE N EXTENSION PROJECT SITE

LEGEND

- FUELING AREA PER DETAIL THIS SHEET
- 6" HMA CL 1/2" PG 58H–22 OVER 6" CSTC
- CSTC

SCALE
20 0 20 40
FEET

NUMBER	REVISION DESCRIPTION	BY	APP.	DATE

MATTHEW POWELL — STATE OF WASHINGTON — 55619 — REGISTERED PROFESSIONAL ENGINEER — 3/26/2022

SURVEYED: 1 ALLIANCE
DRAWN BY: N. EATON
DESIGN BY: B. POWELL
CHECK BY: P. DE BOLDT
PROJ MGR: P. DE BOLDT
FILE: 20160266 SA.dwg

PERTEET
801 2ND AVENUE, SUITE 302
SEATTLE, WA 98104
800.615.9900

CITY OF RENTON
Public Works Department

APPROVED FOR CONSTRUCTION

BY: DATE:

CITY OF RENTON
PARK AVENUE N EXTENSION

CONSTRUCTION STAGING SITE PLAN

DRAWING NO. SA1
PROJECT NO. CAG-17-082
FED AID NO. N/A
DATE: 3/2022
SHEET NO. 50 OF 56

X:\Renton, City of\Projects\20160266 – N Park Ave Extension\CADD\Plan Sheets\20160266 SA.dwg 3/25/2022 2:33 PM

Appendix F

Reference Standards and Guidelines

Reference Documents for Interconnected Traffic Signals

AREMA C&S Manual (2021)

FHWA Highway-Rail Grade Crossing Handbook (2019)

FRA Safety Advisory 2010-02 (2010)

FRA Technical Bulletin S-12-01 (2012)

ITE Recommended Practice: Preemption of Traffic Signals Near Railroad Crossings (2021)

ITE Traffic Control Devices Handbook (2013)

Manual on Traffic Control Devices (MUTCD) (2009)

TXDOT Preemption Calculation Instructions (2017)

Washington Department of Transportation (WSDOT) Standard Plan M-11.10-03 (2019)

AREMA C&S Manual (2021)

Part 1.1.1

CLEAR STORAGE DISTANCE

The distance available for vehicle storage measured 6 ft. from the rail nearest the intersection to the intersection Stop Bar or the normal stopping point on the highway. At skewed crossings and intersections, the 6 ft. distance shall be measured perpendicular to the nearest rail either along the centerline, or edge line of the highway as appropriate to obtain the shorter clear distance.

Where exit gates are used, the distance available for vehicle storage is measured from the point where the rear of the vehicle would be clear of the exit gate arm. In cases where the exit gate arm is parallel to the track(s) and is not perpendicular to the highway, the distance is measured either along the center line or edge line of the highway, as appropriate, to obtain the shorter distance. (MUTCD)

MINIMUM TRACK CLEARANCE DISTANCE (MTCD)

For grade crossing warning systems without exit gates, the minimum track clearance distance is the length along a highway at one or more railroad tracks, measured either from the stop line, warning device or 12 ft. perpendicular to the track centerline to 6 ft. beyond the track(s) measured perpendicular to the far rail, along the centerline or edge line of the highway, as appropriate, to obtain the longer distance.

For Four-Quadrant Gate systems, the minimum track clearance distance is the length along a highway at one or more railroad or light rail transit tracks, measured either from the highway stop line or entrance warning device, to the point where the rear of the vehicle would be clear of the exit gate arm. In cases where the exit gate arm is parallel to the track(s) and is not perpendicular to the highway, the distance is measured either along the center line or edge line of the highway, as appropriate, to obtain the longer distance. (MUTCD)

AREMA C&S Manual (2021) (continued)

Part 3.1.10

C. General

4. When a traffic control signal or other traffic control device is interconnected to a grade crossing warning system, a label should be installed in the traffic signal controller cabinet and the railroad warning system enclosure advising maintenance personnel of the interconnection. The label should provide contact information for both the public agency responsible for the traffic signal and the railroad maintenance facility. An example of such a label was developed by the USDOT Technical Working Group and is depicted in Figure 3110-1.

Figure 3110-1: WARNING LABEL (from Appendix E – *Implementation Report of the USDOT Grade Crossing Safety Task Force*, June 1, 1997, USDOT)

Part 3.2.5

C. General

7. The highway motorists' view of flashing-light signal units shall not be obstructed by signs or structural members.

FHWA Highway-Rail Grade Crossing Handbook (2019)

Preemption of Traffic Signals (pg. 76-77)

To understand the concept of preemption, the practitioner should be familiar with two fundamental terms which are depicted in Figure 38. The Clear Storage Distance (CSD) is the space between the crossing and a downstream intersection where vehicles may safely queue and the Minimum Track Clearance Distance (MTCD) is the area which must be clear of roadway vehicles to avoid a collision with a train. These are defined as follows:

Clear Storage Distance. Per the MUTCD definitions, (Part 1A.13), the distance available for vehicle storage measured between 6 feet from the rail nearest the intersection to the intersection stop line or the normal stopping point on the highway. At skewed crossings and intersections, the 6-foot distance is measured perpendicular to the nearest rail either along the center line or edge line of the highway, as appropriate to obtain the shorter distance. Where exit gates are used, the distance available for vehicle storage is measured from the point where the rear of the vehicle would be clear of the exit gate arm. In cases where the exit gate arm is parallel to the track(s) and is not perpendicular to the highway, the distance is measured either along the center line or edge line of the highway, as appropriate, to obtain the shorter distance.

Minimum Track Clearance Distance. For standard two-quadrant warning devices, the MTCD is the length along a highway at one or more railroad tracks or LRT tracks. Where flashing-light signals with automatic gates are used, the MTCD is measured from the portion of the gate arm farthest from the near rail. Where flashing-light signals are used without automatic gates, the MTCD is measured from the stop line. Where passive traffic control devices are used, the MTCD is measured from the stop line. Where the roadway is not paved, the MTCD is measured from 10 feet perpendicular to the near rail. The MTCD ends 6 feet beyond the track(s) measured perpendicular to the near rail. The MTCD ends 6 feet beyond the track(s) measured perpendicular to the far rail, along the center line or edge line of the highway, as appropriate, to obtain the longer distance. For Four-Quadrant Gate systems (where exit gates are used), the MTCD is extended to the point where a vehicle is clear of the exit gate arm. In cases where the exit gate arm is parallel to the track(s) and is not perpendicular to the highway, the distance is measured either along the center line or edge line of the highway, as appropriate, to obtain the longer distance.

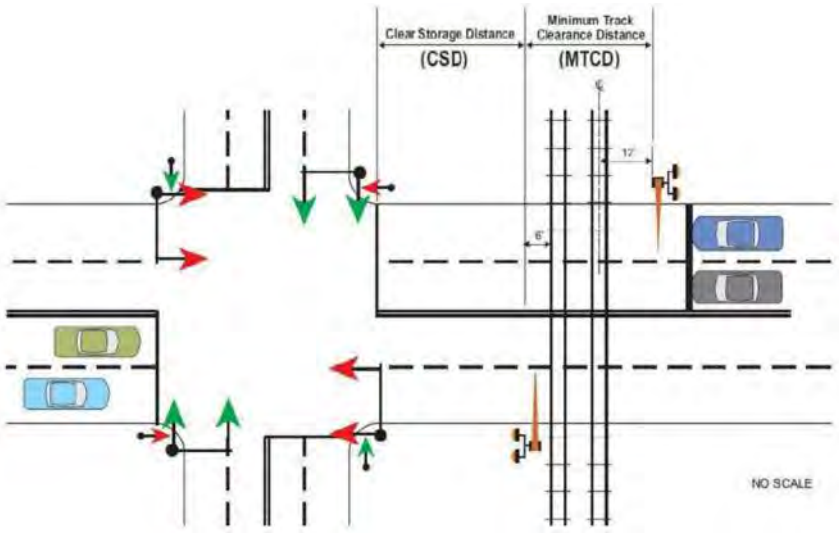


Figure 38. Clear Storage and Minimum Track Clearance Distance
Source: AECOM, Inc.

FRA Safety Advisory 2010-02 (2010)

name of the individual submitting the comment (or signing the comment, if submitted on behalf of an association, business, labor union, etc.). You may review DOT's complete Privacy Act Statement in the **Federal Register** published on April 11, 2000 (Volume 65, Number 70; Pages 19477–78).

By Order of the Maritime Administrator.
Dated: September 21, 2010.

Christine Gurland,

Secretary, Maritime Administration.

[FR Doc. 2010–24693 Filed 9–30–10; 8:45 am]
BILLING CODE 4910–81–P

DEPARTMENT OF TRANSPORTATION

Federal Railroad Administration

Safety Advisory 2010–02

AGENCY: Federal Railroad Administration (FRA), Department of Transportation (DOT).

ACTION: Notice of Safety Advisory; Signal Recording Devices for Highway-Rail Grade Crossing Active Warning Systems that are Interconnected with Highway Traffic Signal Systems.

SUMMARY: FRA is issuing Safety Advisory 2010–02 to address Safety Recommendations I–96–10 and I–96–11, issued by the National Transportation Safety Board (NTSB) that relate to railroad and highway signal recording devices at highway-rail grade crossings equipped with active warning systems that are interconnected with highway traffic signal systems. This safety advisory recommends that States, local highway authorities, and railroads install, maintain, and upgrade railroad and highway traffic signal recording devices at these types of grade crossings. This safety advisory also recommends that States, local highway authorities, and railroads conduct comprehensive periodic joint inspections of highway traffic signal pre-emption interconnections and use information obtained from any railroad and highway traffic signal recording devices during those inspections.

FOR FURTHER INFORMATION CONTACT: Ron Ries, Staff Director, Highway-Rail Grade Crossing & Trespasser Prevention Division, FRA, RRS–23, Mail Stop 25, 1200 New Jersey Avenue, SE., Washington, DC 20590 (telephone: (202) 493–6285); Thomas McFarlin, Staff Director, Signal & Train Control Division, FRA, RRS–13, Mail Stop 25, 1200 New Jersey Avenue, SE., Washington, DC 20590 (telephone: (202) 493–6203); or Kathy Shelton, Office of Chief Counsel, FRA, RCC–11, Mail Stop 10, 1200 New Jersey Avenue, SE., Washington, DC 20590 (telephone: (202) 493–6063).

SUPPLEMENTARY INFORMATION: In Safety Recommendation I–96–10, the NTSB recommended that DOT require the use and maintenance of railroad and highway traffic signal recording devices at all new and improved highway-rail grade crossings equipped with active warning systems that are interconnected with highway traffic signal systems. These devices should be capable of recording sufficient parameters to allow railroad and highway personnel to readily determine that the highway traffic signals and railroad active warning systems are operating properly and in a coordinated manner. The NTSB further recommended that DOT require the use of information obtained from these railroad and highway traffic signal recording devices during comprehensive and periodic joint inspections.

In Safety Recommendation I–96–11, the NTSB recommended that DOT require the retention or upgrading of existing recording devices installed at highway-rail grade crossings equipped with active railroad warning systems that are interconnected with highway traffic signal systems. In addition, the NTSB recommended that DOT require maintenance of these recording devices and the use of information obtained from the devices during comprehensive and periodic joint inspections.

Highway traffic signal pre-emption interconnections, when present, play a critical role in the proper functioning of a highway-rail grade crossing active warning system. By changing the sequence of the traffic signal to allow highway traffic to exit the crossing prior to the arrival of a train, they can prevent vehicle entrapment on the highway-rail grade crossing. Also, the changed traffic signal sequence prevents conflicting visual traffic control messages for motorists approaching highway-rail grade crossings located in close proximity to highway traffic control signals (*i.e.*, a proceed highway traffic signal display into a nearby highway-rail grade crossing active warning system which is activated to indicate the approach or occupancy of a train).

In order to facilitate the proper functioning of the highway traffic signal pre-emption interconnection, 49 CFR 234.261 requires that railroads test each highway traffic signal pre-emption interconnection at least once each month. Therefore, States, local highway authorities, and railroads should identify which highway-rail grade crossings are equipped, or intended to be equipped, with a highway traffic signal pre-emption interconnection. If so equipped, railroads should ensure that the circuit plan shows the actual interconnection and the designed pre-emption time. Railroads should also ensure that the interconnection is in place and the train detection device (or equivalent) is programmed or equipped to provide the appropriate designed pre-emption function.

While FRA regulations require the testing of highway traffic signal pre-emption interconnections at least once a month, this requirement has historically only been applicable to the proper functioning of the railroad's control circuit to the highway traffic controller. While inspecting the highway traffic signal pre-emption interconnection, the actual operation of the highway traffic signal should be observed. Railroads should not rely solely on the operation of a relay or the opening of a control circuit to the traffic signal control housing. In fact, the preferred method of testing highway traffic signal pre-emption is by observation of a train movement and of the actual pre-emption function. Therefore, FRA recommends that railroads conduct comprehensive joint inspections of the highway traffic signal pre-emption interconnection with State and local highway authorities. These comprehensive joint inspections should be conducted when the highway-rail grade crossing active warning system is placed in service, whenever any portion of the system which may affect the proper function of the interconnection is modified or disarranged, and at least once every 12 months, during which observation of the actual pre-emption function and its effect on the highway traffic signal system can be made. These comprehensive periodic joint inspections should also include an inspection of the timing and operation of highway traffic signal systems that are interconnected with highway-rail grade crossing active warning devices, in order to ensure that the highway traffic signal system responds appropriately to the railroad control circuit and as designed. By conducting comprehensive periodic joint inspections, the railroad and State and local highway authorities can work together to observe and verify proper functioning of all necessary components of the highway traffic signal pre-emption upon activation of the highway-rail grade crossing active warning system.

Neither the Federal Highway Administration (FHWA) nor FRA require the retention or installation of railroad or highway signal recording devices at highway-rail grade crossings

FRA Technical Bulletin S-12-01 (2012)

Introduction

The preferred method of testing the pre-emption circuitry consists of observation of a train movement and of the actual pre-emption function. This should include observation that the preemption control was received when sent by the railroad equipment, the track clearance interval was displayed within the RWTT, the TCG interval was displayed for at least the minimum design time, and the pre-emption function was cancelled when the crossing gates started to rise or, in the case of flashing light only warning devices, when those devices were deactivated. In the event that a train movement is not available, alternative methods of testing may be used while observing the pre-emption function. Where a railroad has installed pre-emption operation recording and monitoring equipment, as addressed in FRA Safety Advisory 2010-02, the inspector may be able to rely on this equipment in order to verify that the pre-emption operation and interconnection functions properly.

In some cases, a gate-down circuit may be included as a part of the interconnection. If a gate-down circuit is present, it should prevent the traffic control signal from leaving the TCG interval until the gate controlling vehicular access over the crossing is fully lowered to a preset position. This function can be tested by simulating that the specified gate is not fully lowered. In this scenario, the highway traffic signal should remain in TCG until the gate-down input is received or the train occupies the crossing. The presence of a traffic signal representative will greatly assist in validating this test.

Where multiple tracks are present, and a second train may appear shortly after the first train, the inspector should have the railroad conduct a test where the pre-emption circuit is restored to its normal state following a test for the first train and then reactivated within 1 to 2 seconds to simulate the approach of the second train. The traffic signal should either remain in the track clearance interval or, if the sequence has left the track clearance interval, return to the track clearance interval. The RWTT and TCG values should again apply to the traffic signal sequence. In some cases, other interconnect circuits may be present based on site-specific needs. Where present, the inspector should consult the circuit plan in order to determine how these additional interconnect circuits are used and how their proper operation can best be verified.

The intent of this preferred testing method is to verify that the highway traffic signal pre-emption is actually working as intended in connection with the activation of the highway-rail grade crossing warning system, as opposed to mere observation of the railroad's portion of the preemption interconnection.

The U.S. Department of Transportation (DOT) task force that was assembled following the Fox River Grove incident recommended the installation of a warning label in both the railroad equipment enclosure and the traffic control signal enclosure. The purpose of the warning label was to identify the presence of the interconnection and the need for the parties to contact one another in the event of pre-emption failure, or prior to initiating any changes or modification to either system. While not federally required, it is recommended that a check for the warning labels be performed and, if one or both are missing, to remind the appropriate party or parties of the DOT task force recommendation.

FRA Technical Bulletin S-12-01 (2012) (continued)

The preferred method of testing the pre-emption circuitry consists of observation of a train movement and of the actual pre-emption function. This should include observation that the preemption control was received when sent by the railroad equipment, the track clearance interval was displayed within the RWTT, the TCG interval was displayed for at least the minimum design time, and the pre-emption function was cancelled when the crossing gates started to rise or, in the case of flashing light only warning devices, when those devices were deactivated. In the event that a train movement is not available, alternative methods of testing may be used while observing the pre-emption function. Where a railroad has installed pre-emption operation recording and monitoring equipment, as addressed in FRA Safety Advisory 2010-02, the inspector may be able to rely on this equipment in order to verify that the pre-emption operation and interconnection functions properly.

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ITE Recommended Practice: Preemption of Traffic Signals Near Railroad Crossings (2021)

Part 1.1 Background (Page 2)

It is important that the traffic engineer responsible for designing the preemption system understand with sufficient detail how the traffic signal controller unit operates in response to a call for a preemption sequence. The traffic engineer should also consider whether the traffic signal controller unit is capable of performing all of the functions required under all possible rail movements in order to provide proper functioning of the preemption operation. Rail operations such as multiple train movements, stops within the approach circuitry, and re-starts of stopped trains within the approach circuitry can result in insufficient queue clearance time from the train detection circuitry. The traffic engineer should consult with railroad personnel who are responsible for railroad signal design and operations to ensure that appropriate equipment is specified and that both highway and railroad signal installations operate properly and with full compatibility. Continuous cooperation between highway and railroad personnel is essential for safe operation. Information concerning the type of railroad signal equipment that can be used is available from the operating railroad and from AREMA. In addition, state and local regulations should be consulted.

Part 2.2.1 Warning Devices (Page 17)

Back-Up Power Supply

The 2009 MUTCD (Section 4.27) recommends that except for traffic signals interconnected with light rail transit systems, traffic signals with railroad preemption or coordinated with flashing-light signals systems should be provided with a back-up power supply. When a back-up power supply is installed for a traffic control signal that is interconnected with a grade crossing, the back-up power supply should provide for a minimum operating period sufficient to allow the implementation of alternative traffic control measures during a power outage. At LRT grade crossings where LRT vehicles operate without electricity or are powered by a remote source and can use the grade crossing with a local power outage, consideration should be given to installation of a backup power supply. With the low-power LED signal indications that are not widely used, it is practical to provide full traffic signal operation for several hours.

Part 2.3.1 Pre-Signals (Page 29)

Downstream Signal Visibility

The downstream traffic signal faces at the roadway intersection that control the same approach as the pre-signal should be equipped with visibility-limited signal faces as appropriate for the location. The purpose of the visibility-limited signal faces is to limit visibility of the downstream signal faces to the area from the intersection stop line to the grade crossing. Motorists upstream of the crossing should only be able to see the pre-signal vehicle head indications. This is to prevent vehicles stopped at the grade crossing stop line from seeing the distant green signal indication during the PCI. An engineering study should be conducted to review the specific site conditions, including the eye heights of drivers of vehicles likely to use the crossing, and to establish the final design necessary to meet the visibility requirements.

ITE Recommended Practice: Preemption of Traffic Signals Near Railroad Crossings (2021) (continued)

Part 2.4.1 Warning Device Timing (Pages 33-34)

Prescribed (Minimum) Warning Time

The following items should be considered when designing time elements for a preemption operation:

- Long right-of-way transfer times caused by pedestrian clearance intervals, minimum green times, high-speed highway approaches, or unusual intersection geometry.

Part 2.4.2 Maximum Preemption Timing Parameters

Right-of-way Transfer Time (Pages 34-35)

Right-of-way transfer time (RTT, or RWTT) in the traffic signal system is the maximum amount of time needed prior to the preemption clearance interval (PCI) once the call for preemption has been initiated. RTT (RWTT) typically includes time for the traffic signal control equipment to react to a preemption call (equipment response time), any minimum green time (for any green indication that may have just started when preemption is initiated or other green clearance times), any pedestrian walk, clearance times, yellow change intervals, and red clearance intervals. The MUTCD does not permit shortening or omission of the yellow change interval or any red clearance interval during the transition into preemption. Section 2.2.9 ADA Considerations and Section 2.4.5 Pedestrian Timing address the potential shortening or omission of any pedestrian walk interval and/or pedestrian change interval in order to reduce the worst case RTT (RWTT). The decision to modify pedestrian intervals should be based on agency policy and an engineering study in consultation with the diagnostic team. Pedestrian volumes (especially young, elderly, and disabled pedestrians), nearby schools, parks, and playgrounds, transit stops, and vehicle turning movements should all be considered as part of the engineering study.

Although, RTT (RWTT) is calculated as a fixed maximum value as described above, it is a variable under actual operation of the traffic signal controller, depending on the phase timing that is active at the time of the preempt. When an active traffic signal controller phase meets the conditions used to calculate RTT (RWTT) and a call for preemption is received, the full RTT (RWTT) will be required prior to the display of the PCI. However, in other cases the RTT (RWTT) may be zero or near zero. For example, if the track clearance phase happens to be green when the call for preemption is received, the RTT (RWTT) is zero, and the controller unit begins to time the fixed PCI. The reality is that the RTT (RWTT) can vary from its calculated maximum to zero (or near zero) based on the phase of the traffic signal being displayed when a train is detected. The time difference between the maximum and minimum RTT (RWTT) is a variable that should be addressed (this is explained in more detail in the NCHRP Report 812 and Section 2.4.4 Dynamic Strategies for Right-of-Way Transfer Time Variability).

ITE Recommended Practice: Preemption of Traffic Signals Near Railroad Crossings (2021) (continued)

Part 2.4.6 Turns Across Tracks (Page 43)

At a signalized intersection where the distance to a grade crossing is 100 ft. (30 m) or less and the intersection traffic control signals are preempted by the approach of a train, all movements from the signalized intersection approaching the grade crossing should be prohibited during the signal preemption sequences. All movements toward the track may be prohibited at a signalized intersection that has a clear storage distance of more than 100 ft. (30 m).

A part-time regulatory sign and/or appropriate highway traffic signal indication or other similar type sign may be used to prohibit movements toward the grade crossing during preemption. The MUTCD R3-1 and R3-2 signs may be used for this purpose. In this situation, turn lanes to store turning vehicles out of the through traffic lanes may be desirable.

A supplemental part-time legend which displays “TRAIN” or “TRAIN COMING” or which displays the symbol for a train or a light-rail transit vehicle may be included as a part of the part-time sign. Including “TRAIN” or “TRAIN COMING” or a symbol for a train or light-rail transit vehicle as part of the part-time sign emphasizes the importance of the turn prohibition to road users by advising them that the turn prohibition is in effect due to the presence of a train approaching or on a nearby rail grade crossing.

As an alternative, appropriate highway traffic signal indications may be used to prohibit turns toward the tracks. This is discussed in Section 8B.08 of the 2009 MUTCD.

Figure 11. Example of Turn Prohibition Part-Time Sign With Supplemental Legend

Source: Lancaster Engineering

ITE Traffic Control Devices Handbook (2013)

Page 467-468

Pre-Signal. Pre-signals control traffic approaching the grade crossing toward the nearby highway intersection and are operated as part of the highway intersection traffic signal system. A pre-signal is intended for locations where there is minimal CSD downstream from the grade crossing such that vehicles stopping upstream from the intersection stop line may block the MTCD.

The operational concept of a pre-signal is to require vehicles to stop ahead of the grade crossing rather than stopping within the CSD and possibly queuing up into the MTCD. This is accomplished by providing a "green extension" for the traffic signals at the intersection so vehicles just crossing the stop line ahead of the grade crossing will have additional green time to enter and clear from the downstream intersection during the yellow display at that location.

MUTCD (2009)

Table 2C-4 Guidelines for Advance Placement of Warning Signs

Posted or 85th-Percentile Speed	Advance Placement Distance[1]								
	Condition A: Speed reduction and lane changing in heavy traffic[2]	Condition B: Deceleration to the listed advisory speed (mph) for the condition							
		0[3]	10[4]	20[4]	30[4]	40[4]	50[4]	60[4]	70[4]
20 mph	225 ft	100 ft[6]	N/A[5]	—	—	—	—	—	—
25 mph	325 ft	100 ft[6]	N/A[5]	N/A[5]	—	—	—	—	—
30 mph	460 ft	100 ft[6]	N/A[5]	N/A[5]	—	—	—	—	—
35 mph	565 ft	100 ft[6]	N/A[5]	N/A[5]	N/A[5]	—	—	—	—
40 mph	670 ft	125 ft	100 ft[6]	100 ft[6]	N/A[5]	—	—	—	—
45 mph	775 ft	175 ft	125 ft	100 ft[6]	100 ft[6]	N/A[5]	—	—	—
50 mph	885 ft	250 ft	200 ft	175 ft	125 ft	100 ft[6]	—	—	—
55 mph	990 ft	325 ft	275 ft	225 ft	200 ft	125 ft	N/A[5]	—	—
60 mph	1,100 ft	400 ft	350 ft	325 ft	275 ft	200 ft	100 ft[6]	—	—
65 mph	1,200 ft	475 ft	450 ft	400 ft	350 ft	275 ft	200 ft	100 ft[6]	—
70 mph	1,250 ft	550 ft	525 ft	500 ft	450 ft	375 ft	275 ft	150 ft	—
75 mph	1,350 ft	650 ft	625 ft	600 ft	550 ft	475 ft	375 ft	250 ft	100 ft[6]

[1] The distances are adjusted for a sign legibility distance of 180 feet for Condition A. The distances for Condition B have been adjusted for a sign legibility distance of 250 feet, which is appropriate for an alignment warning symbol sign. For Conditions A and B, warning signs with less than 6-inch legend or more than four words, a minimum of 100 feet should be added to the advance placement distance to provide adequate legibility of the warning sign.

[2] Typical conditions are locations where the road user must use extra time to adjust speed and change lanes in heavy traffic because of a complex driving situation. Typical signs are Merge and Right Lane Ends. The distances are determined by providing the driver a PRT of 14.0 to 14.5 seconds for vehicle maneuvers (2005 AASHTO Policy, Exhibit 3-3, Decision Sight Distance, Avoidance Maneuver E) minus the legibility distance of 180 feet for the appropriate sign.

[3] Typical condition is the warning of a potential stop situation. Typical signs are Stop Ahead, Yield Ahead, Signal Ahead, and Intersection Warning signs. The distances are based on the 2005 AASHTO Policy, Exhibit 3-1, Stopping Sight Distance, providing a PRT of 2.5 seconds, a deceleration rate of 11.2 feet/second^2, minus the sign legibility distance of 180 feet.

[4] Typical conditions are locations where the road user must decrease speed to maneuver through the warned condition. Typical signs are Turn, Curve, Reverse Turn, or Reverse Curve. The distance is determined by providing a 2.5 second PRT, a vehicle deceleration rate of 10 feet/second^2, minus the sign legibility distance of 250 feet.

[5] No suggested distances are provided for these speeds, as the placement location is dependent on site conditions and other signing. An alignment warning sign may be placed anywhere from the point of curvature up to 100 feet in advance of the curve. However, the alignment warning sign should be installed in advance of the curve and at least 100 feet from any other signs.

[6] The minimum advance placement distance is listed as 100 feet to provide adequate spacing between signs.

Section 3B.08 Extensions Through Intersections or Interchanges

Guidance:

03 Where highway design or reduced visibility conditions make it desirable to provide control or to guide vehicles through and intersection or interchange, such as at offset, complex, or multi-legged intersection, on curved roadways, where multiple turn lanes are used, or where offset left turn lanes might cause driver confusion, dotted line extension markings consisting of 2-foot line segments and 2- to 6-foot gaps should be used to extend longitudinal line markings through an intersection or interchange area.

07 Where a double line is extended through an intersection, a single line equal width to one of the lines of the double line should be used.

MUTCD (2009) (continued)

Section 4D.02 Responsibility for Operation and Maintenance

Guidance:

01 Prior to installing any traffic control signal, the responsibility for the maintenance of the signal and all of the appurtenances, hardware, software, and the timing plan(s) should be clearly established. The responsible agency should provide for the maintenance of the traffic control signal and all of its appurtenances in a competent manner.

Section 4D.27 Preemption and Priority Control of Traffic Control Signals

Guidance:

11 Except for traffic control signals interconnected with light rail transit systems, traffic control signals with railroad preemption or coordinated with flashing-light signal systems should be provided with a back-up power supply.

Section 8B.06 Grade Crossing Advance Warning Signs (W10 Series)

Standard:

05 If the distance between the tracks and a parallel highway, from the edge of the tracks to the edge of the parallel roadway, is less than 100 feet, W10-2, W10-3, or W10-4 signs (see Figure 8B-4) shall be installed on each approach of the parallel highway to warn road users making a turn that they will encounter a grade crossing soon after making a turn, and a W10-1 sign for the approach to the tracks shall not be required to be between the tracks and the parallel highway.

06 If the W10-2, W10-3, or W10-4 signs are used, sign placement in accordance with the guidelines for Intersection Warning signs in Table 2C-4 using the speed of through traffic shall be measured from the highway intersection.

Section 8B.08 Turn Restrictions During Preemption

Guidance:

01 At a signalized intersection that is located within 200 feet of a highway-rail grade crossing, measured from the edge of the track to the edge of the roadway, where the intersection traffic control signals are preempted by the approach of a train, all existing turning movements toward the highway-rail grade crossing should be prohibited during the signal preemption sequences.

Option:

02 A blank-out or changeable message sign and/or appropriate highway traffic signal indication or other similar type sign may be used to prohibit turning movements toward the highway-rail grade crossing during preemption. The R3-1a and R3-2a signs shown in Figure 8B-1 may be used for this purpose.

Section 8B.27 Pavement Markings

Standard:

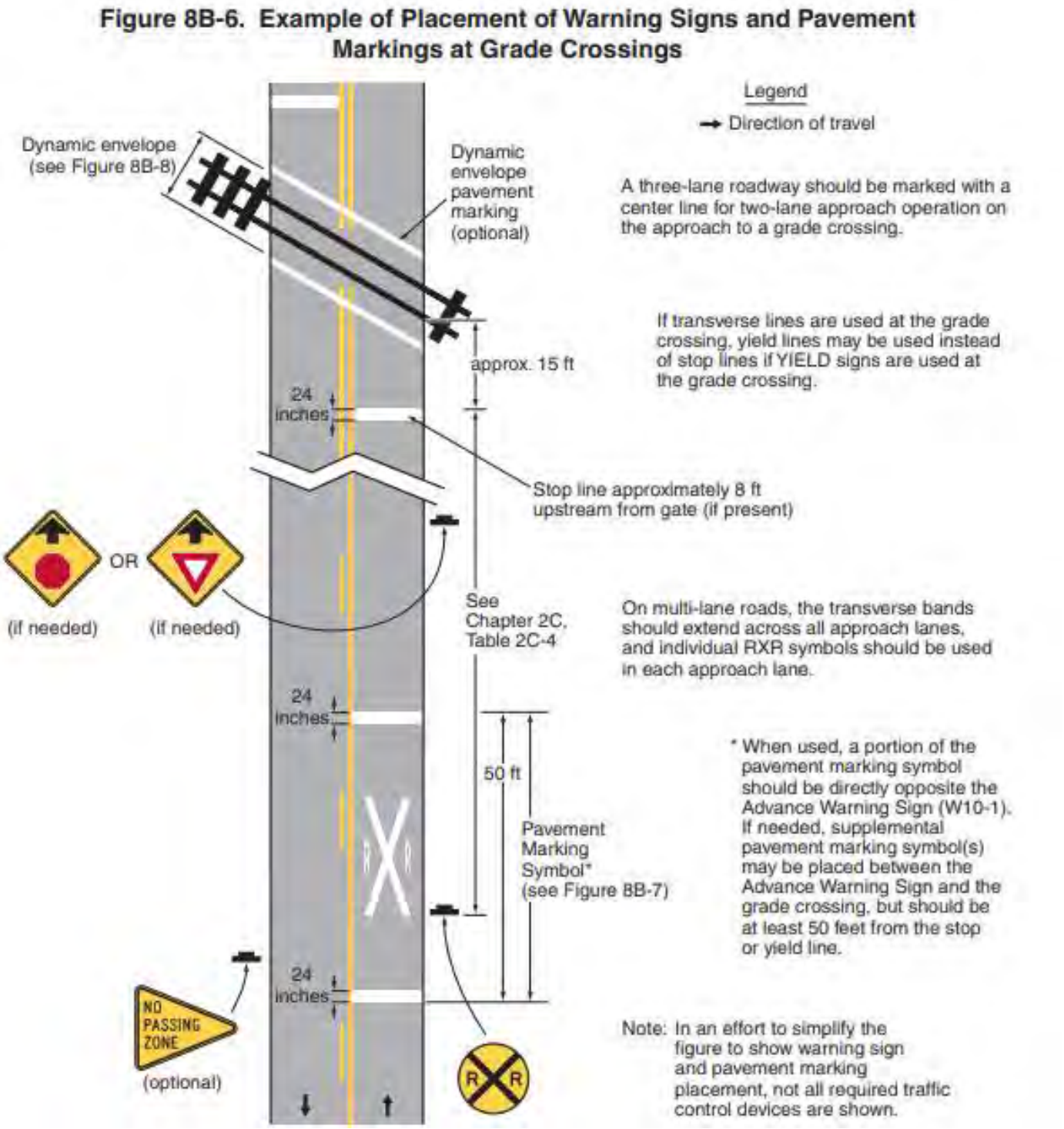
02 On paved roadways, pavement markings in advance of a grade crossing shall consist of an X, the letters RR, a no-passing zone marking (on two-lane, two-way highways with center line markings in compliance with Section 3B.01), and certain transverse lines as shown in Figures 8B-6 and 8B-7.

Guidance:

05 When pavement markings are used, a portion of the X symbol should be directly opposite the Grade Crossing Advance Warning sign. The X symbol and letters should be elongated to allow for the low angle at which they will be viewed.

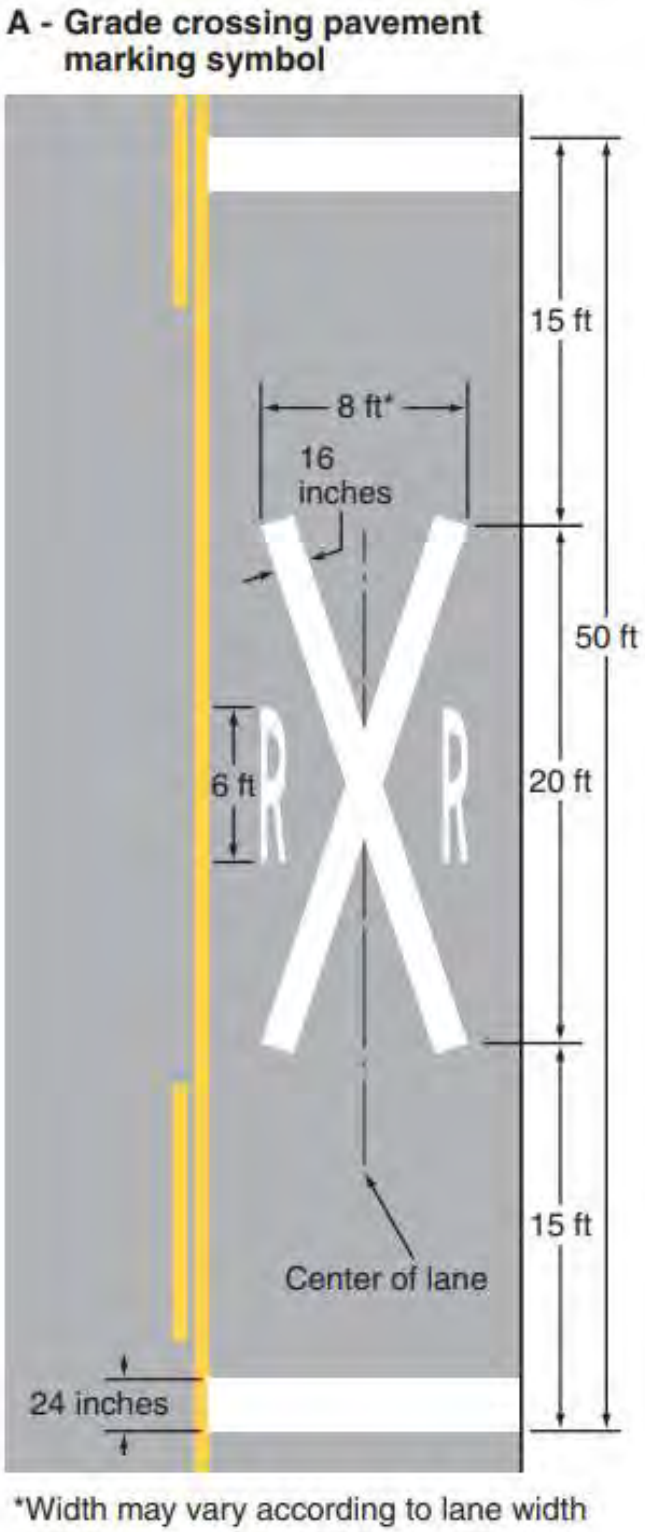
MUTCD (2009) (continued)

Figure 8B-6 Example of Placement of Warning Signs and Pavement Markings at Grade Crossings



MUTCD (2009) (continued)

Figure 8B-7A Grade Crossing Pavement Markings



MUTCD (2009) (continued)

Section 8B.17 LOOK Sign (R15-8)

Option:

01 At grade crossings, the LOOK (R15-8) sign (see Figure 8B-1) may be mounted as a supplemental plaque on the Crossbuck support, or on a separate post in the immediate vicinity of the grade crossing on the railroad or LRT right-of-way.

Section 8B.27 Pavement Markings

Standard:

02 On paved roadways, pavement markings in advance of a grade crossing shall consist of an X, the letters RR, a no-passing zone marking (on two-lane, two-way highways with center line markings in compliance with Section 3B.01), and certain transverse lines as shown in Figures 8B-6 and 8B-7.

Guidance:

05 When pavement markings are used, a portion of the X symbol should be directly opposite the Grade Crossing Advance Warning sign. The X symbol and letters should be elongated to allow for the low angle at which they will be viewed.

Section 8C.09 Traffic Control Signals at or Near Highway-Rail Grade Crossings

Standard:

08 **Information regarding the type of preemption and any related timing parameters shall be provided to the railroad company so that they can design the appropriate train detection circuitry.**

Guidance:

13 Consideration should be given to using visibility-limited signal faces (see definition in Section 1A.13) at the intersection for the downstream signal faces that control the approach that is equipped with pre-signals.

Section 8D.04 Stop Lines, Edge Lines, and Detectable Warnings

Option:

02 Edge lines (see Section 3B.06) may be used on approach to and across the tracks at a pathway grade crossing, a sidewalk at a highway-rail or highway-LRT grade crossing, or a station crossing to delineate the designated pathway user route.

TXDOT Preemption Calculation Instructions (2017)

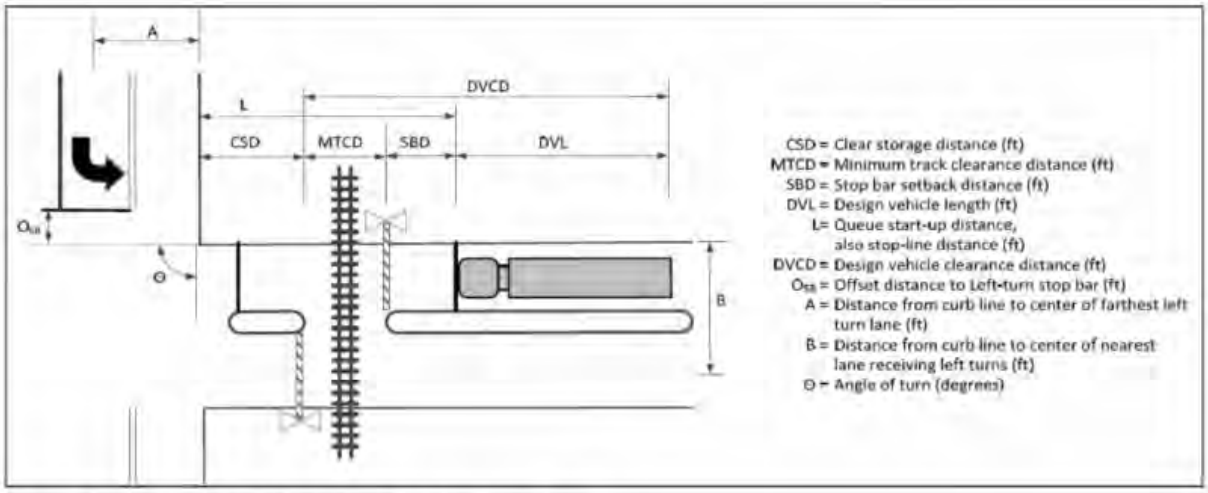


Figure 1. Geometric Data at the Grade Crossing.

Line 1. Record the **Clear storage distance** (CSD in Figure 1), in feet, as the shortest distance along the crossing street between the edge of the grade crossing nearest the signalized intersection—identified by a line parallel to the rail 6 feet (2 m) from the rail nearest to the intersection—and the edge of the street or shoulder of street that parallels the tracks. If the normal stopping point on the crossing street is significant different from the edge or shoulder of parallel street, measure the distance to the normal stopping point. For angled (i.e., non-perpendicular) railroad crossings, always measure the distance along the inside (centerline) edge of the leftmost lane or the distance along the outside (shoulder) edge of the rightmost lane, as appropriate, to determine the shortest clear storage distance and record that value.

Line 2. Minimum track clearance distance (MTCD in Figure 1), in feet, is the length along the highway at one or more railroad tracks, measured from the railroad crossing stop line, warning device, or 12 feet (4 m) perpendicular to the track centerline—whichever is further away from the tracks, to 6 feet (2 m) beyond the tracks measured perpendicular to the far rail. For angled (i.e., non-perpendicular) railroad crossings, always measure the distance along the inside (centerline) edge of the leftmost lane or the distance along the outside (shoulder) edge of the rightmost lane, as appropriate, to determine the longest minimum track clearance distance and record that value.

Line 28. Are there left-turns towards the tracks?: The user has to select a box 'Yes' or 'No' to indicate whether to consider a left turn design vehicle turning left onto the tracks. If the user selects 'Yes', values for boxes 29, 31, and 32 are automatically calculated and filled in. In some cases, a value of 'No' may be selected in order to minimize the amount of preemption time requested from the railroad.

TXDOT Preemption Calculation Instructions (2017) (continued)

Line 29. Distance travelled by the truck during left-turn towards the tracks: This is the distance (LTL) travelled by the truck while making the turn. This calculation is used later in Line 31 and is a function o the centerline turning radius of the left turn design vehicle and the angle of the street from which the left turn design vehicle is making the left turn and is illustrated in the equation below and in Figure 2:

$$\mathrm{LTL} = \pi \mathrm{R} \emptyset / 180$$

Where:
R = the centerline turning radius of the left turning design vehicle (line 11), and
Ø = angle of the street from which the left turn design vehicle is making the left turn (line 7)

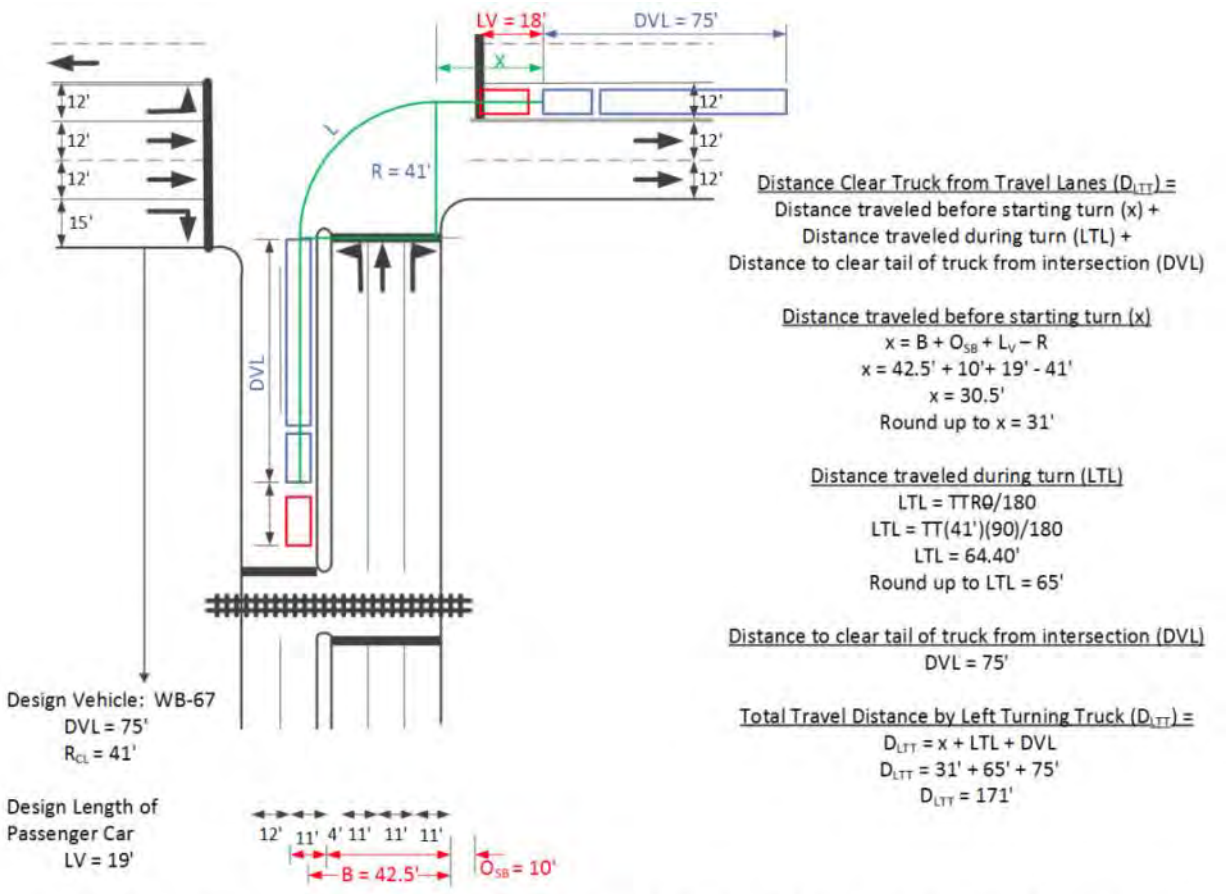
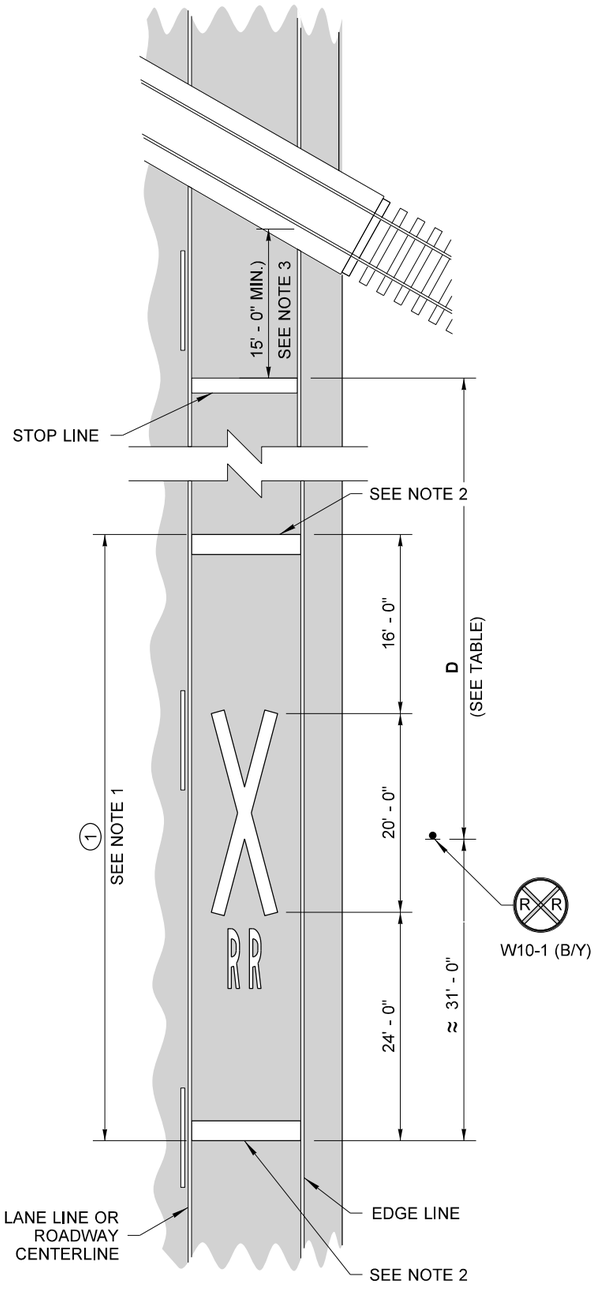


Figure 2. Sample calculation of the distance required to clear left-turning truck from travel lanes on track clearance phase.

WSDOT Standard Plan M-11.10-03 (2019)

(see next page)

DRAWN BY: FERN LIDDELL



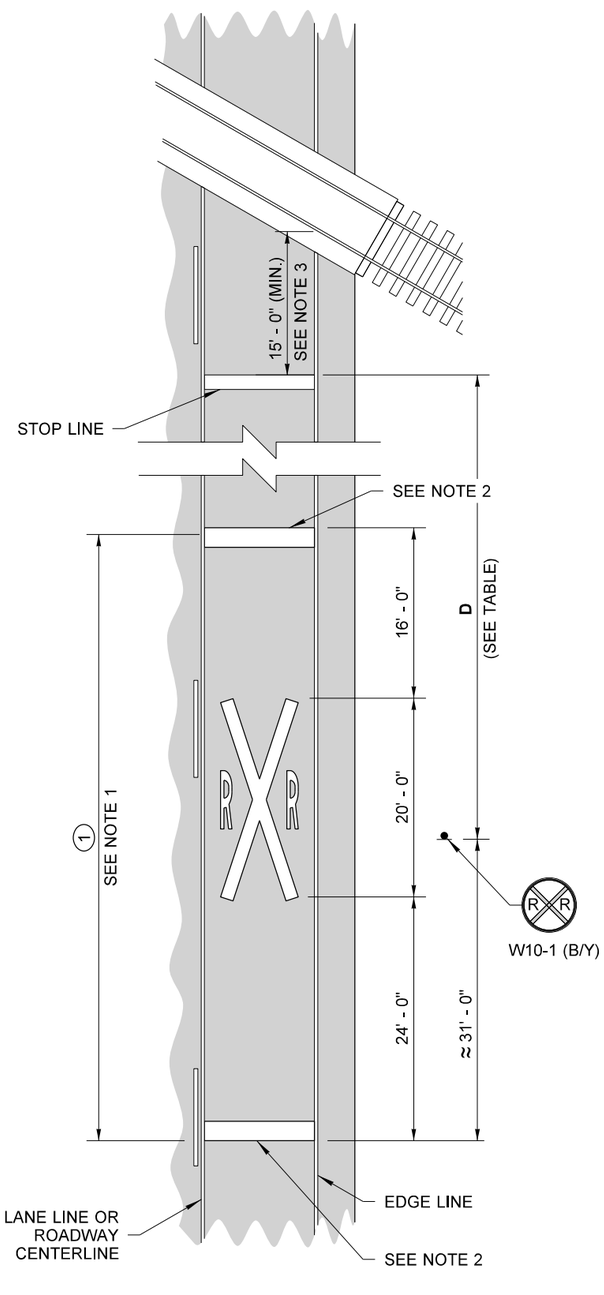
MPH	D*
25	50 Ft.
30	100 Ft.
35	150 Ft.
40	225 Ft.
45	300 Ft.
50	375 Ft.
55	450 Ft.
60	550 Ft.
65	650 Ft.

* DIMENSIONS SHOWN ARE APPROXIMATE (SEE CONTRACT)

① TOTAL MARKING AREA (PER 12' (FT) WIDE LANE) = 109.75 SQ.FT.

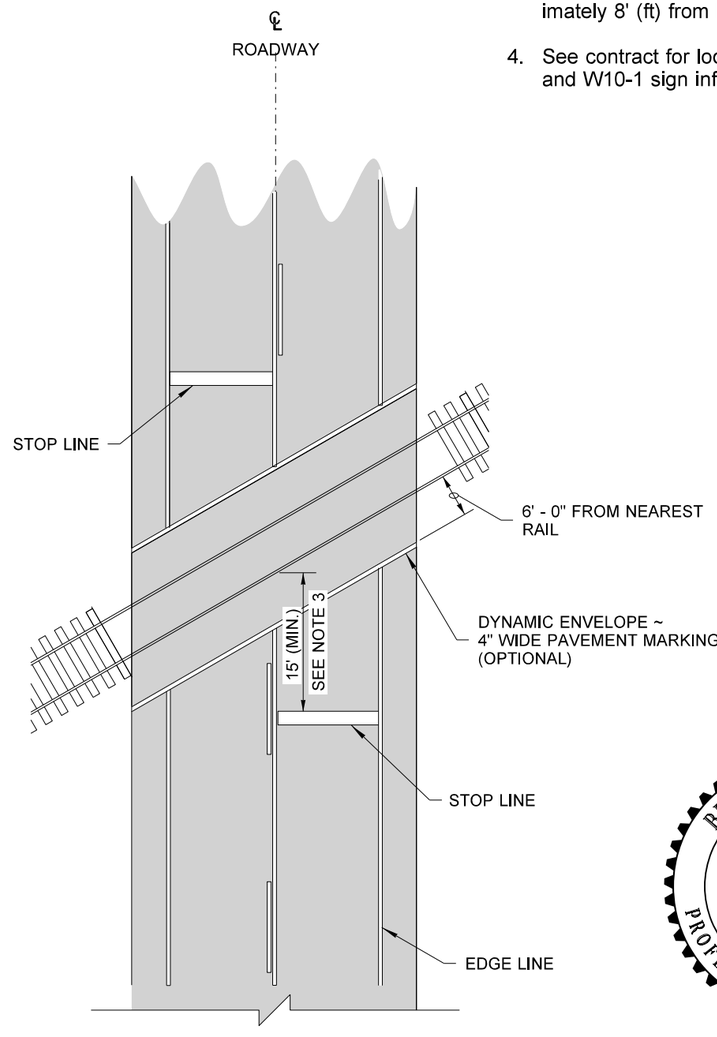
LAYOUT

STANDARD SYMBOL



① TOTAL MARKING AREA (PER 12' (FT) WIDE LANE) = 111.59 SQ.FT.

ALTERNATIVE LAYOUT



RR CROSSING DETAIL
(TRACKS OMITTED FOR CLARITY)

GENERAL NOTES

1. Bid Item "Railroad Crossing Symbol" includes "X" symbol, letters, and two 24" (in) white transverse lines.
2. 24" (in) white transverse line.
3. Place Stop Line 15' (ft) minimum from nearest rail. If gate is present, place stop line approximately 8' (ft) from RR gate.
4. See contract for location, material requirements, and W10-1 sign information

BRIAN J. WALSH
STATE OF WASHINGTON
36103
REGISTERED
PROFESSIONAL ENGINEER

RAILROAD CROSSING LAYOUT

STANDARD PLAN M-11.10-03

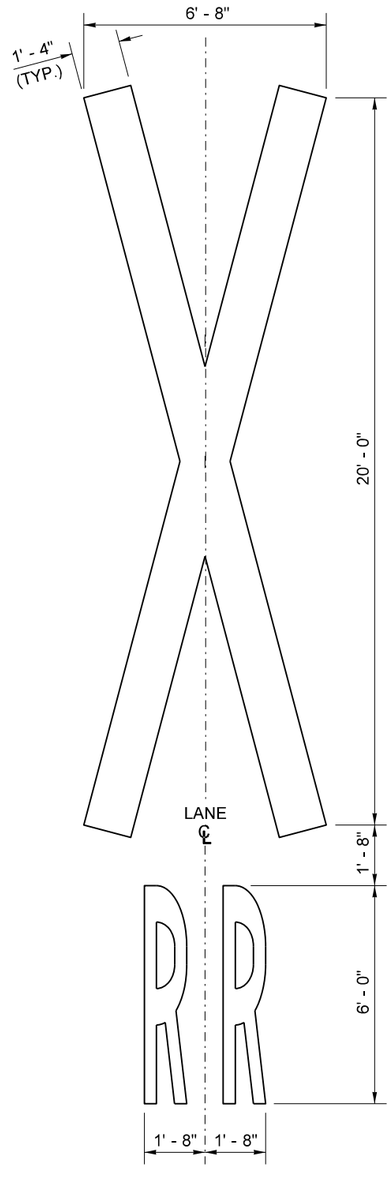
SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION

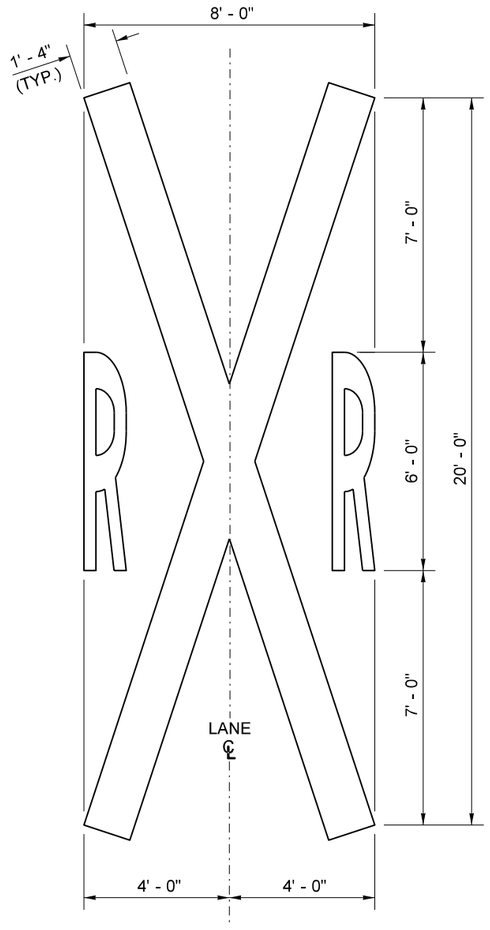
STATE DESIGN ENGINEER

Washington State Department of Transportation

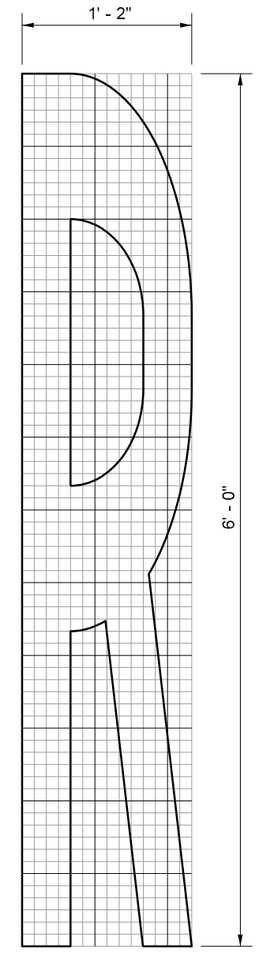
DRAWN BY: FERN LIDDELL



SYMBOL DETAIL



ALTERNATIVE SYMBOL DETAIL



GRID IS 1" (IN) SQUARE

"R" DETAIL

STANDARD SYMBOL DETAILS

BRIAN J. WALSH
STATE OF WASHINGTON
36103
REGISTERED
PROFESSIONAL ENGINEER

RAILROAD CROSSING LAYOUT

STANDARD PLAN M-11.10-03

SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION

STATE DESIGN ENGINEER

Washington State Department of Transportation

Appendix G

RR Preemption Circuit Sample

BNSF Standard Interconnect Wiring Diagram