

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

| | | |
|--------------------------------------|---|---------------------------------|
| |) | DOCKET NO. <u>TR-143272 - P</u> |
| The Burlington Northern and Santa Fe |) | |
| Railway Company |) | |
| _____ |) | PETITION TO CONSTRUCT OR |
| Petitioner, |) | RECONSTRUCT A HIGHWAY-RAIL |
| |) | GRADE CROSSING AND INSTALL |
| vs. |) | AN INTER-TIE BETWEEN A |
| City of Renton, Washington |) | HIGHWAY SIGNAL AND A |
| _____ |) | RAILROAD CROSSING SIGNAL |
| Respondent |) | SYSTEM |
| |) | |
| |) | USDOT CROSSING NO.: 091725B |

.....

Prior to submitting a Petition to **Construct** a highway-rail grade crossing and install an inter-tie between a Highway Signal and a Railroad Crossing Signal System to the Washington Utilities and Transportation Commission (UTC), State Environmental Protection Act (SEPA) requirements must be met. Washington Administrative Code (WAC) 197-11-865 (2) requires:

All actions of the utilities and transportation commission under statutes administered as of December 12, 1975, are exempted, except the following:

(2) Authorization of the openings or closing of any highway/railroad grade crossing, or the direction of physical connection of the line of one railroad with that of another;


Please attach sufficient documentation to demonstrate that the SEPA requirement has been fulfilled. For additional information on SEPA requirements contact the Department of Ecology.

The Petitioner asks the Washington Utilities and Transportation Commission to approve construction or reconstruction of a highway-rail grade crossing and inter-tie the highway signal with the railroad crossing signal system.

Construction Reconstruction

RECEIVED
 RECORDS MANAGEMENT
 2014 SEP -5 AM 8:49
 STATE OF WASH.
 UTIL. AND TRANSP.
 COMMISSION

Section 1 – Petitioner’s Information

| |
|---|
| The Burlington Northern and Santa Fe Railway Company |
| Petitioner |
|  |
| Signature |
| 2454 Occidental Avenue South, Suite 1-A |
| Street Address |
| Seattle WA 98134 |
| City, State and Zip Code |
| Mailing Address, if different than the street address |
| Richard W. Wagner |
| Contact Person Name |
| 206-625- 6152/6356 Richard.Wagner@BNSF.com |
| Contact Phone Number and E-mail Address |

Section 2 – Respondent’s Information

| |
|---|
| City of Renton |
| Respondent |
| 1055 South Grady Way |
| Street Address |
| Renton WA 98057 |
| City, State and Zip Code |
| Mailing Address, if different than the street address |
| James P. Wilhoit |
| Contact Person Name |
| (425) 430-7319, jwilhoit@rentonwa.gov |
| Contact Phone Number and E-mail Address |

Section 3 – Proposed or Existing Crossing Location

1. Existing highway/roadway Old Gene Coulon/Southport Boulevard

2. Existing railroad The Burlington Northern & Santa Fe Ry.

3. Location of proposed crossing:
Located in the NE 1/4 of the NW1/4 of Sec. 8, Twp. 23, Range 5 W.M.

4. GPS location, if known 47.502705, -122.200114

5. Railroad mile post (nearest tenth) 4.05

6. City Renton County King

Section 4 – Proposed or Existing Crossing Information

1. Railroad company The Burlington Northern & Santa Fe Ry.

2. Type of railroad at crossing Common Carrier Logging Industrial
 Passenger Excursion

3. Type of tracks at crossing Main Line Siding or Spur

4. Number of tracks at crossing 1

5. Average daily train traffic, freight 1
Authorized freight train speed 10 Operated freight train speed 10

6. Average daily train traffic, passenger 0
Authorized passenger train speed N/A Operated passenger train speed N/A

7. Will the proposed crossing eliminate the need for one or more existing crossings?
Yes No

8. If so, state the distance and direction from the proposed crossing.

9. Does the petitioner propose to close any existing crossings?

Yes No

Section 5 – Temporary Crossing

1. Is the crossing proposed to be temporary? Yes No

2. If so, describe the purpose of the crossing and the estimated time it will be needed

3. Will the petitioner remove the crossing at completion of the activity requiring the temporary crossing? Yes No

Approximate date of removal _____

Section 6 – Current Highway Traffic Information

1. Name of roadway/highway Old Gene Coulon/Southport Boulevard

2. Roadway classification Public City Road

3. Road authority City of Renton

4. Average annual daily traffic (AADT) 18,000

5. Number of lanes 2

6. Roadway speed 25 MPH

7. Is the crossing part of an established truck route? Yes No

8. If so, trucks are what percent of total daily traffic? _____

9. Is the crossing part of an established school bus route? Yes No

10. If so, how many school buses travel over the crossing each day? _____

11. Describe any changes to the information in 1 through 7, above, expected within ten years:

Section 7 – Alternatives to the Proposal

1. Does a safer location for a crossing exist within a reasonable distance of the proposed location?

Yes No

2. If a safer location exists, explain why the crossing should not be located at that site.

3. Are there any hillsides, embankments, buildings, trees, railroad loading platforms or other barriers in the vicinity which may obstruct a motorist's view of the crossing?

Yes No

4. If a barrier exists, describe:

- ◆ Whether petitioner can relocate the crossing to avoid the obstruction and if not, why not.
- ◆ How the barrier can be removed.
- ◆ How the petitioner or another party can mitigate the hazard caused by the barrier.

Existing trees, signal cabinets, and power poles can block sight distance

5. Is it feasible to construct an over-crossing or under-crossing at the proposed location as an alternative to an at-grade crossing?

Yes No

6. If an over-crossing or under-crossing is not feasible, explain why.

Price of grade separation underpass is very high and beyond current budget and traffic

volumes do not warrant grade separation.

7. Does the railway line, at any point in the vicinity of the proposed crossing, pass over a fill area or trestle or through a cut where it is feasible to construct an over-crossing or an under-crossing, even though it may be necessary to relocate a portion of the roadway to reach that point?

Yes No

8. If such a location exists, state:

- ◆ The distance and direction from the proposed crossing.
- ◆ The approximate cost of construction.
- ◆ Any reasons that exist to prevent locating the crossing at this site.

9. Is there an existing public or private crossing in the vicinity of the proposed crossing?

Yes No

10. If a crossing exists, state:

- ◆ The distance and direction from the proposed crossing.
- ◆ Whether it is feasible to divert traffic from the proposed to the existing crossing.

◆ 0.02 mile south- Park Drive overhead bridge- Public

0.08 mile south – Lake Washington Blvd - Public

◆ Not feasible to divert traffic from the proposed to the existing crossing

Section 8 – Sight Distance

1. Complete the following table, describing the sight distance for motorists when approaching the tracks from either direction.

a. Approaching the crossing from East, the current approach provides an unobstructed view as follows: (North, South, East, West)

| Direction of sight (left or right) | Number of feet from proposed crossing | Provides an unobstructed view for how many feet |
|------------------------------------|---------------------------------------|---|
| Right | 300 | View obstructed |
| Right | 200 | View obstructed |
| Right | 100 | 80 |
| Right | 50 | 115 |
| Right | 25 | 600+ |
| Left | 300 | View obstructed |
| Left | 200 | View obstructed |
| Left | 100 | 110 |
| Left | 50 | 500+ |
| Left | 25 | 500+ |

b. Approaching the crossing from West, the current approach provides an unobstructed view as follows: (Opposite direction-North, South, East, West)

| Direction of sight (left or right) | Number of feet from proposed crossing | Provides an unobstructed view for how many feet |
|------------------------------------|---------------------------------------|---|
| Right | 300 | View obstructed |
| Right | 200 | View obstructed |
| Right | 100 | 40 |
| Right | 50 | 135 |
| Right | 25 | 350 |
| Left | 300 | View obstructed |
| Left | 200 | View obstructed |
| Left | 100 | 35 |
| Left | 50 | 110 |
| Left | 25 | 400+ |

2. Will the new crossing provide a level approach measuring 25 feet from the center of the railway on both approaches to the crossing?

Yes X No

3. If not, state in feet the length of level grade from the center of the railway on both approaches to the crossing. _____

4. Will the new crossing provide an approach grade of not more than five percent prior to the level grade?

Yes X No

5. If not, state the percentage of grade prior to the level grade and explain why the grade exceeds five percent.

Section 9 – Illustration of Proposed Crossing Configuration

Attach a detailed diagram, drawing, map or other illustration showing the following:

- ◆ The vicinity of the proposed crossing.
- ◆ Layout of the railway and highway 500 feet adjacent to the crossing in all directions.
- ◆ Percent of grade.
- ◆ Obstructions of view as described in Section 7 or identified in Section 8.
- ◆ Traffic control layout showing the location of the existing and proposed signage.

Section 10 – Sidewalks

1. Provide the following information:

- a. Provide a description of the type of sidewalks proposed.
 - b. Describe who will maintain the sidewalks.
 - c. Attach a proposed diagram or design of the crossing including the sidewalks.
- a. & c. See attached exhibit

b. City of Renton and Southport development will maintain the sidewalks.

Section 11 – Proposed Warning Signals or Devices

1. Explain in detail the number and type of automatic signals or other warning devices planned at the proposed crossing, including a cost estimate for each. If requesting pre-emption include the type of train detection circuitry, sequencing and advanced preemption time, justification for the changes and its effects on current warning devices and warning times for drivers.

Install automatic flashing light traffic control devices (1 cantilever and 1 shoulder mounted type) with gates and constant warning time devices. Estimated cost \$141,482

2. Provide an estimate for maintaining the signals for 12 months. _____

3. Is the petitioner prepared to pay to the respondent railroad company its share of installing the warning devices as provided by law?
 Yes _____ No _____ City of Renton is funding project per agreement

Section 12 – Traffic Signal Preemption

Complete the attached Guide for Determining Time Requirements for Traffic Signal Preemption at Highway-Rail Grade Crossings.

1. Specify simultaneous or advance preemption requested.

If advance preemption, what is the preemption time.

Section 13 – Additional Information

Provide any additional information supporting the proposal, including information such as the public benefits that would be derived from constructing a new crossing as proposed or modifying an existing crossing. Provide project specific information.

Section 14 – Waiver of Hearing by Respondent

Waiver of Hearing

The undersigned represents the Respondent in the petition to construct or reconstruct a highway-railroad grade crossing and inter-tie the highway signal with the railroad crossing signal system.

USDOT Crossing No.: _____

We have investigated the conditions at the proposed or existing crossing site. We are satisfied the conditions are the same as described by the Petitioner in this docket. We agree that a crossing be installed or reconstructed and the highway signals inter-tied with the railroad crossing signal system and consent to a decision by the commission without a hearing.

Dated at _____, Washington, on the _____ day of _____, 20 ____.

Gregg Zimmerman

Printed name of Respondent

Signature of Respondent's Representative

Public Works Administrator
Title

City of Renton

Name of Company

425-430-7311 gzimmerman@rentonwa.gov

Phone number and e-mail address

City Hall, 5th Floor,

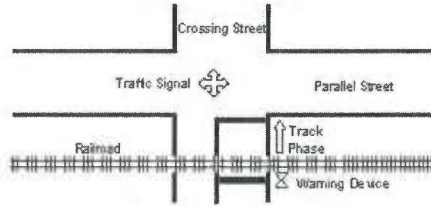
1055 South Grady Way
Renton WA 98057

Mailing address

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

City Renton, WA
 County King
 District King County

Date 06/20/14
 Completed by CTC Inc.
 District Approval _____



Parallel Street Name
Southport Boulevard
 Crossing Street Name
Lake Washington Boulevard

Railroad BNSF
 Crossing DOT# 091724J

Railroad Contact Rick Wagner
 Phone (206) 625-6152

SECTION 1: RIGHT-OF-WAY TRANSFER TIME CALCULATION

Preempt verification and response time

| | | | |
|--|----|----------------------------------|--|
| 1. Preempt delay time (seconds) | 1. | <input type="text" value="0.0"/> | Remarks Prop. Firmware 4.53a |
| 2. Controller response time to preempt (seconds) | 2. | <input type="text" value="1.0"/> | |
| 3. Preempt verification and response time (seconds): add lines 1 and 2 | 3. | <input type="text" value="1.0"/> | |

Controller type: Eagle M50

Worst-case conflicting vehicle time

| | | | |
|---|----|-----------------------------------|---|
| 4. Worst-case conflicting vehicle phase number | 4. | <input type="text"/> | Remarks _____ _____ _____ |
| 5. Minimum green time during right-of-way transfer (seconds) | 5. | <input type="text" value="5.00"/> | |
| 6. Other green time during right-of-way transfer (seconds) | 6. | <input type="text" value="0.00"/> | |
| 7. Yellow change time (seconds) | 7. | <input type="text" value="3.50"/> | |
| 8. Red clearance time (seconds) | 8. | <input type="text" value="2.00"/> | |
| 9. Worst-case conflicting vehicle time (seconds): add lines 5 through 8 | 9. | <input type="text" value="10.5"/> | |

Worst-case conflicting pedestrian time

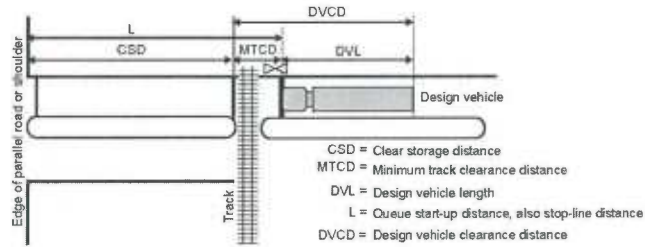
| | | | |
|---|-----|-----------------------------------|---|
| 10. Worst-case conflicting pedestrian phase number | 10. | <input type="text"/> | Remarks _____ _____ _____ |
| 11. Minimum walk time during right-of-way transfer (seconds) | 11. | <input type="text" value="0.0"/> | |
| 12. Pedestrian clearance time during right-of-way transfer (seconds) | 12. | <input type="text" value="20.0"/> | |
| 13. Vehicle yellow change time, if not included on line 12 (seconds) | 13. | <input type="text" value="3.5"/> | |
| 14. Vehicle red clearance time, if not included on line 12 (seconds) | 14. | <input type="text" value="2.0"/> | |
| 15. Worst-case conflicting pedestrian time (seconds): add lines 11 through 14 | 15. | <input type="text" value="25.5"/> | |

Worst-case conflicting vehicle or pedestrian time

| | | |
|--|-----|-----------------------------------|
| 16. Worst-case conflicting vehicle or pedestrian time (seconds): maximum of lines 9 and 15 | 16. | <input type="text" value="25.5"/> |
| 17. Right-of-way transfer time (seconds): add line 3 and 16 | 17. | <input type="text" value="26.5"/> |

SECTION 2: QUEUE CLEARANCE TIME CALCULATION

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(03/09)
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| | | | |
|--|-----|------|---|
| 18. Clear storage distance (CSD, feet) | 18. | 57 | Remarks |
| 19. Minimum track clearance distance (MTCD, feet) | 19. | 116 | |
| 20. Design vehicle length (DVL, feet) | 20. | 75 | |
| 21. Queue start-up distance, L (feet): add lines 18 and 19 | 21. | 173 | Design vehicle type: <u>Tractor-Trailer</u> |
| 22. Time required for design vehicle to start moving (seconds): calculate as $2+(L \div 20)$ | 22. | 10.7 | Remarks |
| 23. Design vehicle clearance distance, DVCD (feet): add lines 19 and 20 | 23. | 191 | |
| 24. Time for design vehicle to accelerate through the DVCD (seconds) | 24. | 19.1 | Read from Figure 2 in Instructions. |
| 25. Queue clearance time (seconds): add lines 22 and 24 | 25. | 29.8 | |

SECTION 3: MAXIMUM PREEMPTION TIME CALCULATION

| | | | |
|--|-----|------|---------|
| 26. Right-of-way transfer time (seconds): line 17 | 26. | 26.5 | Remarks |
| 27. Queue clearance time (seconds): line 25 | 27. | 29.8 | |
| 28. Desired minimum separation time (seconds) | 28. | 4.0 | |
| 29. Maximum preemption time (seconds): add lines 26 through 28 | 29. | 60.3 | |

SECTION 4: SUFFICIENT WARNING TIME CHECK

| | | | |
|--|-----|------|---------|
| 30. Required minimum time, MT (seconds): per regulations | 30. | 20.0 | Remarks |
| 31. Clearance time, CT (seconds): get from railroad | 31. | 12.0 | |
| 32. Minimum warning time, MWT (seconds): add lines | 32. | 32.0 | |
| 33. Advance preemption time, APT, if provided (seconds): get from railroad | 33. | 0.0 | |
| 34. Warning time provided by the railroad (seconds): add lines 32 and 33 | 34. | 32.0 | |
| 35. Additional warning time required from railroad (seconds): subtract line 34 from line 29, round up to nearest full second, enter 0 if less than 0 | 35. | 29 | |

If the additional warning time required (line 35) is greater than zero, additional warning time has to be requested from the railroad. Alternatively, the maximum preemption time (line 29) may be decreased after performing an engineering study to investigate the possibility of reducing the values on lines 1, 5, 6, 7, 8, 11, 12, 13 and 14.

Remarks: _____

SECTION 5: TRACK CLEARANCE GREEN TIME CALCULATION (OPTIONAL)

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(03/09)
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Preempt Trap Check

| | | | |
|---|-----|-----------------------------------|--|
| 36. Advance preemption time (APT) provided (seconds): | 36. | <input type="text" value="29.0"/> | Line 33 only valid if line 35 is zero. |
| 37. Multiplier for maximum APT due to train handling | 37. | <input type="text" value="1.00"/> | See instructions for details. |
| 38. Maximum APT (seconds): multiply line 36 and 37 | 38. | <input type="text" value="29.0"/> | Remarks |
| 39. Minimum duration for the track clearance green interval (seconds) | 39. | <input type="text" value="15.0"/> | For zero advance preemption time |
| 40. Gates down after start of preemption (seconds): add lines 38 and 39 | 40. | <input type="text" value="44.0"/> | |
| 41. Preempt verification and response time (seconds): line 3 | 41. | <input type="text" value="1.0"/> | Remarks |
| 42. Best-case conflicting vehicle or pedestrian time (seconds): usually 0 | 42. | <input type="text" value="0.0"/> | |
| 43. Minimum right-of-way transfer time (seconds): add lines 41 and 42 | 43. | <input type="text" value="1.0"/> | |
| 44. Minimum track clearance green time (seconds): subtract line 43 from line 40 | 44. | <input type="text" value="43.0"/> | |

Clearing of Clear Storage Distance

| | | | |
|---|-----|-----------------------------------|-------------------------------------|
| 45. Time required for design vehicle to start moving (seconds), line 22 | 45. | <input type="text" value="10.7"/> | |
| 46. Design vehicle clearance distance (DVCD, feet), line 23 | 46. | <input type="text" value="191"/> | Remarks |
| 47. Portion of CSD to clear during track clearance phase (feet) | 47. | <input type="text" value="57"/> | CSD* in Figure 3 in Instructions. |
| 48. Design vehicle relocation distance (DVRD, feet): add lines 46 and 47 | 48. | <input type="text" value="248"/> | |
| 49. Time required for design vehicle to accelerate through DVRD (seconds) | 49. | <input type="text" value="21.9"/> | Read from Figure 2 in Instructions. |
| 50. Time to clear portion of clear storage distance (seconds): add lines 45 and 49 | 50. | <input type="text" value="32.6"/> | |
| 51. Track clearance green interval (seconds): maximum of lines 44 and 50, round up to nearest full second | 51. | <input type="text" value="43"/> | |

SECTION 6: VEHICLE-GATE INTERACTION CHECK (OPTIONAL)

| | | | |
|---|-----|-----------------------------------|-------------------------------------|
| 52. Right-of-way transfer time (seconds): line 17 | 52. | <input type="text" value="28.5"/> | |
| 53. Time required for design vehicle to start moving (seconds), line 22 | 53. | <input type="text" value="10.7"/> | |
| 54. Time required for design vehicle to accelerate through DVL (on line 20, seconds) | 54. | <input type="text" value=""/> | Read from Table 3 in Instructions. |
| 55. Time required for design vehicle to clear descending gate (seconds): add lines 52 through 54 | 55. | <input type="text" value="37.2"/> | Remarks |
| 56. Duration of flashing lights before gate descent start (seconds): get from railroad | 56. | <input type="text" value=""/> | Remarks |
| 57. Full gate descent time (seconds): get from railroad | 57. | <input type="text" value=""/> | |
| 58. Proportion of non-interaction gate descent time | 58. | <input type="text" value=""/> | Read from Figure 5 in Instructions. |
| 59. Non-interaction gate descent time (seconds): multiply lines 57 and 58 | 59. | <input type="text" value="0.0"/> | |
| 60. Time available for design vehicle to clear descending gate (seconds): add lines 56 and 59 | 60. | <input type="text" value="0.0"/> | |
| 61. Advance preemption time (APT) required to avoid design vehicle-gate interaction (seconds): subtract line 60 from line 55, round up to nearest full second, enter 0 if less than 0 | 61. | <input type="text" value="38"/> | |



INSTRUCTIONS

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

USING THESE INSTRUCTIONS: *These instructions are designed to assist applicants in completing the Guide For Determining Time Requirements For Traffic Signal Preemption At Highway-Rail Grade Crossings. This assists in determining if additional time (advance preemption) is required for the traffic signal to move stationary vehicles out of the crossing before the arrival of the train. If you have any questions about completing the form, please contact Kathy Hunter, commission staff at (360)664-1257 or by e-mail at khunter@utc.wa.gov.*

SITE DESCRIPTIVE INFORMATION:

Enter the location for the highway-rail grade crossing including the (nearest) **City** and the **County** in which the crossing is located. Next, enter the **Date** the analysis was performed, your (the analyst's) name next to **Completed by**.

To complete the reference schematic for this site, place a **North Arrow** in the provided circle to correctly orient the crossing and roadway. Record the name of the **Parallel Street** and the **Crossing Street** in the spaces provided and remember to include any street sign or local name for the streets as well as any state or interstate highway designation. You may wish to note other details on the intersection and crossing diagram as well, including the number of lanes or turn bays on the intersection approach crossing the tracks and any adjacent land use.

Enter the **Railroad** name, **Railroad Contact** person's name and **Phone** number for the responsible railroad company and its equipment maintenance and operations contractor (if any). Finally, record the unique 7-character **Crossing USDOT#** (6 numeric plus one alphanumeric characters) for the crossing.

Note that this guide for determining warning time requirements for traffic signal preemption requires you to input many controller unit timing and phasing values. To preserve the accuracy of these values, record all values to the next highest tenth of a second (i.e., record 5.42 seconds as 5.5 seconds).

SECTION 1: RIGHT-OF-WAY TRANSFER TIME CALCULATION

Preempt Verification and Response Time

Line 1. The **preempt delay time** is the amount of time, in seconds, that the traffic signal controller is programmed to wait from the initial receipt of a preempt call until the call is "verified" and considered a viable request for transfer into preemption mode. Preempt delay time is a value entered into the controller unit for purposes of preempt call validation, and may not be available on all manufacturer's controllers.

Line 2. Unlike preempt delay time (Line 1) which is a value entered into the controller, **controller response time to preempt** is the time that elapses while the controller unit electronically registers the preempt call (i.e., it is the controller's equipment response time for the preempt call). The controller manufacturer should be consulted to find the correct value (in seconds) for use here. For future reference, you may wish to record the controller type in the **Remarks** section to the right of the controller response time to preempt value. However, note that the manufacturer's given response time may be unique for a controller unit's model and software generation; other models and/or software generations may have different response times.

Line 3. The sum of Line 1 and Line 2 is the **preempt verification and response time**, in seconds. It represents the number of seconds between the receipt at the controller unit of a preempt call issued by the railroad's grade crossing warning equipment and the time the controller software actually begins to respond to the preempt call (i.e., by transitioning into preemption mode).

Worst-Case Conflicting Vehicle Time

Line 4. **Worst-case conflicting vehicle phase number** is the number of the controller unit phase which

conflicts with the phase(s) used to clear the tracks—the track clearance phase(s)—that has the longest sum of minimum green (if provided), other (additional) green time (if provided), yellow change interval, and red clearance interval durations that may need to be serviced during the transition into preemption. Note that all of these time elements are for vehicular phases only; pedestrian phase times will be assessed in the next part of the analysis. The worst-case vehicle phase can be any phase that conflicts with the track clearance phase(s); it is not restricted to only the phases serving traffic parallel to the tracks.

Line 5. Minimum green time during right-of-way transfer is the number of seconds that the worst-case vehicle phase (see Line 4 discussion) must display a green indication before the controller unit will terminate the phase through its yellow change and red clearance intervals and transition to the track clearance green interval. The minimum green time during right-of-way transfer may be set to zero to allow as rapid a transition as possible to the track clearance green interval. However, local policies will govern the amount of minimum green time provided during the transition into preemption.

Line 6. If any additional green time is preserved beyond the preempt minimum green time for the worst-case vehicle phase (line 4), it should be entered here as **Other green time during right-of-way transfer**. Given the time-critical nature of the transition to the track clearance green interval during preempted operation, this value is usually zero except in unusual circumstances. One situation where other green time may be present is when a trailing green overlap is used on the worst-case vehicle phase, and the controller unit is set up to time out the trailing green overlap on entry into preemption.

Line 7. Yellow change time is the required yellow change interval time for the worst-case vehicle phase (line 4) given prevailing operating conditions. Yellow change time for the phase under preemption is usually the same value, in seconds, programmed for the phase under normal operating circumstances.

Line 8. Red clearance time is the required red clearance interval for the worst-case vehicle phase (line 4) given prevailing operating conditions. Red clearance time for the phase under preemption is usually the same value, in seconds, programmed for the phase under normal operating circumstances.

Line 9. Worst-case conflicting vehicle time is the sum of lines 5 through 8. It will be compared with the worst-case conflicting pedestrian time to determine whether vehicle or pedestrian phase times are the most critical in their impact on warning time requirements during the transition to the track clearance green interval.

Worst-case Conflicting Pedestrian Time

Line 10. Worst-case pedestrian phase number is the pedestrian phase number (referenced as the vehicle phase number that the pedestrian phase is associated with) that has the longest sum of walk time, pedestrian clearance (i.e., flashing don't walk) times, and associated vehicle clearance times that have to be provided during the transition into preemption. The worst-case pedestrian phase is not restricted to pedestrian phases running concurrently with vehicle phases that serve traffic parallel to the tracks. The vehicle phase associated with the worst-case pedestrian phase may even be one of the track clearance phases if the pedestrian phase is not serviced concurrently with the associated track clearance phase.

Line 11. Minimum walk time during right-of-way transfer (seconds) is the minimum pedestrian walk time for the worst-case pedestrian phase (line 10).

Line 12. Pedestrian clearance time during right-of-way transfer (seconds) is the clearance (i.e., flashing don't walk) time for the worst-case pedestrian phase.

Line 13. Enter a **Yellow change time** if the pedestrian clearance interval does not time simultaneously with the yellow change interval of the vehicular phase associated with your worst-case pedestrian phase; enter zero if does. Local policies will determine if this is allowed. Simultaneous timing of the pedestrian clearance interval and the yellow change interval (i.e. a zero value on line 13) allows for the most rapid transition to the track clearance green interval. If a non-zero value is entered, make sure to enter the yellow change time of the vehicular phase associated with your worst-case pedestrian phase. This value

may not be the same value you enter on Line 7, since the worst-case pedestrian phase may not be the same as the worst-case vehicular phase.

Line 14. Enter a **Red clearance time** if the pedestrian clearance interval does not time simultaneously with the red clearance interval of the vehicular phase associated with your worst-case pedestrian phase; enter zero if it does. Local policies will determine if this is allowed. Also, note that not all traffic signal controllers allow simultaneous timing of the pedestrian clearance interval and the red clearance interval. Simultaneous timing of the pedestrian clearance interval and the red clearance interval (i.e. a zero value on line 14) allows for the most rapid transition to the track clearance green interval. If a non-zero value is entered, make sure to enter the red clearance time of the vehicular phase associated with your worst-case pedestrian phase. This value may not be the same value you enter on Line 8, since the worst-case pedestrian phase may not be the same as the worst-case vehicular phase.

Line 15. Add lines 11 through 14 to calculate the **Worst-case conflicting pedestrian time**. This value will be compared to the worst-case conflicting vehicle time to determine whether vehicle or pedestrian phase times are the most critical in their impact on warning time requirements during the transition to the track clearance green interval.

Worst-case Conflicting Vehicle or Pedestrian Time

Line 16. Record the **Worst-case conflicting vehicle or pedestrian time** (in seconds) by comparing lines 9 and 15 and writing the larger of the two as the entry for line 16.

Line 17. Calculate the **Right-of-way transfer time** by adding lines 3 and 16. The right-of-way transfer time is the maximum amount of time needed for the worst case condition, prior to display of the track clearance green interval.

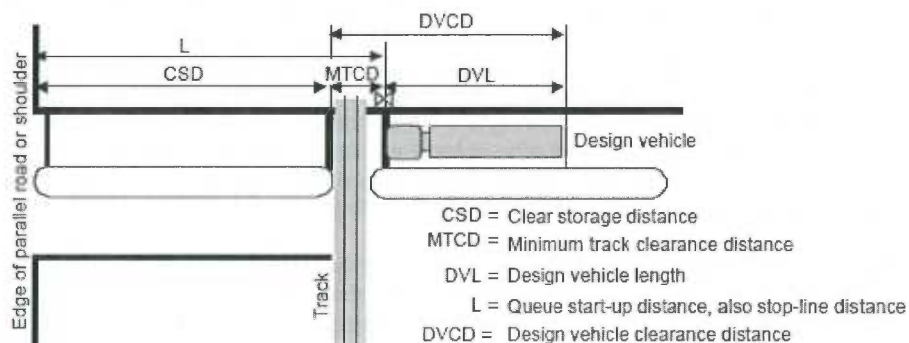


Figure 1 Queue clearance distances.

SECTION 2: QUEUE CLEARANCE TIME CALCULATION

Line 18. 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 19. **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 20. Design vehicle length (DVL in Figure 1), in feet, is the length of the design vehicle, the longest vehicle permitted by road authority statute on the subject roadway. In the **Remarks** section to the right of the data entry box for Line 20, note the design vehicle type for ease of reference. Some design vehicles from the *AASHTO Green Book (A Policy on Geometric Design of Highways and Streets)* are given in Table 1.

Table 1. AASHTO Design vehicle lengths and heights.

| Design Vehicle Type | Symbol | Length (ft) |
|---------------------------|----------|-------------|
| Passenger Car | P | 19 |
| Single Unit Truck | SU | 30 |
| Large School Bus | S-BUS 40 | 40 |
| Intermediate Semi-Trailer | WB-50 | 55 |

Line 21. Queue start-up distance (L in Figure 1), in feet, is the maximum length over which a queue of vehicles stopped for a red signal indication at an intersection downstream of the crossing must get in motion so that the design vehicle can move out of the railroad crossing prior to the train's arrival. Queue start-up distance is the sum of the clear storage distance (Line 18) and minimum track clearance distance (Line 19).

Line 22. Time required for the design vehicle to start moving (seconds) is the time elapsed between the start of the track clearance green interval and the time the design vehicle, which is located at the edge of the railroad crossing on the opposite side from the signalized intersection, begins to move. This elapsed time is based on a "shock wave" speed of 20 feet per second and a 2 second start-up time (the additional time for the first driver to recognize the signal is green and move his/her foot from the brake to the accelerator). The time required for the design vehicle to start moving is calculated, in seconds, as 2 plus the queue start-up distance, L (Line 21) divided by the wave speed of 20 feet per second. The time required for the design vehicle to start moving is a conservative value taking into account the worst-case vehicle mix in the queue in front of the design vehicle as well as a limited level of driver inattentiveness. This value may be overridden by local observation, but care must be taken to identify the worst-case (longest) time required for the design vehicle to start moving.

Line 23. Design vehicle clearance distance (DVCD in Figure 1) is the length, in feet, which the design vehicle must travel in order to enter and completely pass through the railroad crossing's minimum track clearance distance (MTCD). It is the sum of the minimum track clearance distance (Line 19) and the design vehicle's length (Line 20).

Line 24. The Time for design vehicle to accelerate through the design vehicle clearance distance (DVCD) is the amount of time required for the design vehicle to accelerate from a stop and travel the complete design vehicle clearance distance. This time value, in seconds, can be found through local observation or by using by Figure 2. If local observation is used, take care to identify the worst-case (longest) time required for the design vehicle to accelerate through the DVCD. If Figure 2 is used to estimate the time for the design vehicle to accelerate through the DVCD, locate the DVCD from Line 23 on the horizontal axis of Figure 2 and then draw a line straight up until that line intersects the acceleration time performance curve for your design vehicle. Then, draw a horizontal line from this point to the left until it intersects the vertical axis, and record the appropriate acceleration time. Round up to the next higher tenth of a second. For example, with a DVCD of 80 feet and a WB-50 semi-trailer design vehicle on a level surface, the time required for the design vehicle to accelerate through the DVCD will be 12.2 seconds.

If your design vehicle is a WB-50 semi-trailer, large school bus (S-BUS 40), or single unit (SU) vehicle, you may need to apply a correction factor to estimate the effect of grade on the acceleration of the vehicle. Determine the average grade over a distance equal to the design vehicle clearance distance

(DVCD), centered around the minimum track clearance distance (MTCD). If the grade is 1% uphill (+1%) or greater, multiply the acceleration time obtained from Figure 2 with the factor obtained from Table 2 and round up to the next higher tenth of a second to get an estimate of the acceleration time on the grade. For example, with a DVCD of 80 feet and a WB-50 semi-trailer design vehicle on a 4% uphill, the (interpolated) factor from Table 2 is 1.30. Therefore, the estimated time required for the design vehicle to accelerate through the DVCD will be 12.2 x 1.30 = 15.86 seconds, or 15.9 seconds rounded up to the next higher tenth of a second.

If you selected a design vehicle different from those listed in Figure 2 and Table 2, you may still be able to use Figure 2 and Table 2 if you can match your design vehicle to the weight, weight-to-power ratio, and power application characteristics of the design vehicles in Figure 2 and Table 2. The WB-50 curve and grade factors are based on an 80,000 lb vehicle with a weight-to-power ratio of 400 lb/hp accelerating at 85% of its maximum power on level grades and at 100% of its maximum power on uphill grades, and may therefore be representative of any heavy tractor-trailer combination with the same characteristics. The school bus curve and grade factors are based on a 27,000 lb vehicle with a weight-to-power ratio of 180 lb/hp accelerating at 70% of its maximum power on level grades and at 85% of its maximum power on uphill grades. The SU curve and grade factors are based on a 34,000 lb vehicle with a weight-to-power ratio of 200 lb/hp accelerating at 75% of its maximum power on level grades and at 90% of its maximum power on uphill grades.

Table 2. Factors to account for slower acceleration on uphill grades. Multiply the appropriate factor (depending on the design vehicle, grade, and acceleration distance) with the acceleration time in Figure 2 to obtain the estimated acceleration time on the grade.

| Acceleration Distance (ft) | Design Vehicle and Percentage Uphill Grade | | | | | | | | | | | | | |
|----------------------------|--|------|------|------|-----------------------------|------|------|------|------|--------------------------------------|------|------|------|------|
| | Single Unit Truck (SU) | | | | Large School Bus (S-BUS 40) | | | | | Intermediate Tractor-Trailer (WB-50) | | | | |
| | 0-2% | 4% | 6% | 8% | 0-1% | 2% | 4% | 6% | 8% | 0% | 2% | 4% | 6% | 8% |
| 25 | 1.00 | 1.06 | 1.13 | 1.19 | 1.00 | 1.01 | 1.10 | 1.19 | 1.28 | 1.00 | 1.09 | 1.27 | 1.42 | 1.55 |
| 50 | 1.00 | 1.09 | 1.17 | 1.25 | 1.00 | 1.01 | 1.12 | 1.21 | 1.30 | 1.00 | 1.10 | 1.28 | 1.44 | 1.58 |
| 75 | 1.00 | 1.10 | 1.19 | 1.29 | 1.00 | 1.02 | 1.13 | 1.23 | 1.33 | 1.00 | 1.11 | 1.30 | 1.47 | 1.61 |
| 100 | 1.00 | 1.11 | 1.21 | 1.32 | 1.00 | 1.02 | 1.14 | 1.25 | 1.35 | 1.00 | 1.11 | 1.31 | 1.48 | 1.64 |
| 125 | 1.00 | 1.12 | 1.23 | 1.34 | 1.00 | 1.03 | 1.15 | 1.26 | 1.37 | 1.00 | 1.12 | 1.32 | 1.50 | 1.66 |
| 150 | 1.00 | 1.12 | 1.24 | 1.37 | 1.00 | 1.03 | 1.16 | 1.28 | 1.40 | 1.00 | 1.12 | 1.33 | 1.52 | 1.68 |
| 175 | 1.00 | 1.13 | 1.25 | 1.38 | 1.00 | 1.03 | 1.17 | 1.29 | 1.42 | 1.00 | 1.12 | 1.34 | 1.53 | 1.70 |
| 200 | 1.00 | 1.13 | 1.26 | 1.40 | 1.00 | 1.04 | 1.17 | 1.30 | 1.43 | 1.00 | 1.13 | 1.35 | 1.54 | 1.72 |
| 225 | 1.00 | 1.14 | 1.27 | 1.42 | 1.00 | 1.04 | 1.18 | 1.32 | 1.45 | 1.00 | 1.13 | 1.35 | 1.56 | 1.74 |
| 250 | 1.00 | 1.14 | 1.28 | 1.43 | 1.00 | 1.04 | 1.19 | 1.33 | 1.47 | 1.00 | 1.13 | 1.36 | 1.57 | 1.76 |
| 275 | 1.00 | 1.14 | 1.29 | 1.44 | 1.00 | 1.05 | 1.20 | 1.34 | 1.49 | 1.00 | 1.14 | 1.37 | 1.58 | 1.77 |
| 300 | 1.00 | 1.14 | 1.30 | 1.46 | 1.00 | 1.05 | 1.20 | 1.35 | 1.50 | 1.00 | 1.14 | 1.37 | 1.59 | 1.79 |
| 325 | 1.00 | 1.15 | 1.30 | 1.47 | 1.00 | 1.05 | 1.21 | 1.36 | 1.52 | 1.00 | 1.14 | 1.38 | 1.60 | 1.81 |
| 350 | 1.00 | 1.15 | 1.31 | 1.48 | 1.00 | 1.05 | 1.22 | 1.37 | 1.54 | 1.00 | 1.15 | 1.39 | 1.61 | 1.82 |
| 375 | 1.00 | 1.15 | 1.31 | 1.49 | 1.00 | 1.06 | 1.22 | 1.38 | 1.55 | 1.00 | 1.15 | 1.39 | 1.62 | 1.84 |
| 400 | 1.00 | 1.15 | 1.32 | 1.50 | 1.00 | 1.06 | 1.23 | 1.40 | 1.57 | 1.00 | 1.15 | 1.40 | 1.63 | 1.85 |

For design vehicle clearance distances greater than 400 feet, use Equation 1 to estimate the time for the design vehicle to accelerate through the design vehicle clearance distance or any other distance:

$$T = e^{\left[a - b \sqrt{c + \frac{2}{b} \ln\left(\frac{d}{X}\right)} \right]} \quad (1)$$

where

- T = time to accelerate through distance X, in seconds;
- X = distance over which acceleration takes place, in feet;
- ln = natural logarithm function;
- e = 2.71828, the base of natural logarithms; and
- a, b, c, and d = calibration parameters from Table 3.

Note: To interpolate between grades, do not interpolate the parameters in Table 3. The correct way to interpolate is to calculate the acceleration time T using Equation 1 for the two nearest grades and then interpolate between the two acceleration times.

Line 25. Queue clearance time is the total amount of time required (after the signal has turned green for the approach crossing the tracks) to begin moving a queue of vehicles through the queue start-up distance (L, Line 21) and then move the design vehicle from a stopped position at the far side of the crossing completely through the minimum track clearance distance (MTCD, Line 19). This value is the sum of the time required for design vehicle to start moving (Line 22) and the time for design vehicle to accelerate through the design vehicle clearance distance (Line 24).

Table 3. Parameters to estimate vehicle acceleration times over distances greater than 400 feet using Equation 1.

| Design Vehicle | Grade | a | b | c | d |
|-----------------------------------|-------------|-------|-------|-------|-------|
| Through Passenger Car | Level | 7.75 | 3.252 | 5.679 | 2.153 |
| Left Turning Passenger Car | Level | 10.29 | 5.832 | 3.114 | 5.090 |
| Single Unit Truck (SU) | Level to 2% | 8.16 | 3.624 | 5.070 | 2.018 |
| | 4% | 10.39 | 4.865 | 4.560 | 1.739 |
| | 6% | 9.52 | 4.542 | 4.393 | 1.700 |
| | 8% | 9.38 | 4.597 | 4.165 | 1.668 |
| Large School Bus (S-BUS 40) | Level to 1% | 10.02 | 4.108 | 5.95 | 0.885 |
| | 2% | 11.51 | 5.254 | 4.801 | 1.300 |
| | 4% | 10.79 | 5.042 | 4.577 | 1.266 |
| | 6% | 10.61 | 5.101 | 4.329 | 1.253 |
| Intermediate Semi-Trailer (WB-50) | Level | 17.75 | 7.984 | 4.940 | 0.481 |
| | 2% | 10.26 | 4.026 | 6.500 | 0.249 |
| | 4% | 9.39 | 3.635 | 6.670 | 0.193 |
| | 6% | 9.38 | 3.732 | 6.310 | 0.188 |
| | 8% | 10.31 | 4.515 | 5.219 | 0.265 |

SECTION 3: MAXIMUM PREEMPTION TIME CALCULATION

Line 26. Right-of-way transfer time, in seconds, recorded on Line 17. The right-of-way transfer time is the maximum amount of time needed for the worst case condition, prior to display of the track clearance green interval.

Line 27. Queue clearance time, in seconds, recorded on Line 25. Queue clearance time starts simultaneously with the track clearance green interval (i.e. after right-of-way transfer), and is the time required for the design vehicle stopped just inside the minimum track clearance distance to start up and move completely out of the minimum track clearance distance.

Line 28. Desired minimum separation time is a time "buffer" between the departure of the last vehicle (the design vehicle) from the railroad crossing (as defined by the minimum track clearance distance) and the arrival of the train. Separation time is added for safety reasons and to avoid driver discomfort. If no separation time is provided, a vehicle could potentially leave the crossing at exactly the same time the train arrives, which would certainly lead to severe driver discomfort and potential unsafe behavior. The recommended value of four (4) seconds is based on the minimum recommended value found in the Institute of Transportation Engineer's *ITE Journal* (in an article by Marshall and Berg in February 1997).

Line 29. Maximum preemption time is the total amount of time required after the preempt is initiated by the railroad warning equipment to complete right-of-way transfer to the track clearance green interval, initiate the track clearance phase(s), move the design vehicle out of the crossing's minimum track

clearance distance, and provide a separation time “buffer” before the train arrives at the crossing. It is the sum of the right-of-way transfer time (Line 26), the queue clearance time (Line 27), and the desired minimum separation time (Line 28).

SECTION 4: SUFFICIENT WARNING TIME CHECK

Line 30. Minimum time (seconds) is the least amount of time active warning devices shall operate prior to the arrival of a train at a highway-rail grade crossing.

Line 31. Clearance time (seconds), typically known as CT, is the additional time that may be provided by the railroad to account for longer crossing time at wide (i.e., multi-track crossings) or skewed-angle crossings. You must obtain the clearance time from the railroad responsible for the railroad crossing. In cases where the minimum track clearance distance (Line 19) exceeds 35 feet, the railroads’ *AREMA Manual* requires clearance time of one second be provided for each additional 10 feet, or portions thereof, over 35 feet. Additional clearance time may also be provided to account for site-specific needs. Examples of extra clearance time include cases where additional time is provided for simultaneous preemption (where the preemption notification is sent to the signal controller unit simultaneously with the activation of the railroad crossing’s active warning devices), instead of providing advance preemption time.

Line 32. Minimum warning time (seconds) is the sum of the minimum time (Line 30) and the clearance time (Line 31). This value is the actual minimum time that active warning devices can be expected to operate at the crossing prior to the arrival of the train under normal, through-train conditions. The term “through-train” refers to the case where trains do not stop or start moving while near or at the crossing. Note that the minimum warning time, does not include buffer time (BT). Buffer time is added by the railroad to ensure that the minimum warning time is always provided despite inherent variations in warning times; however, it is not consistently provided and cannot be relied upon by the traffic engineer for signal preemption and/or warning time calculations.

Line 33. Advance preemption time (seconds), if provided, is the period of time that the notification of an approaching train is forwarded to the highway traffic signal controller unit or assembly prior to activating the railroad active warning devices. Only enter advance preemption time if you can verify from the railroad that advance preemption time is already being provided for your site. If you are determining whether or not you need advance preemption time, enter zero for the advance preemption time in Line 33.

Line 34. Warning time provided by the railroad is the sum of the minimum warning time (Line 32) and the advance preemption time (Line 33), in seconds. This value should be verified with the railroad, and should not include buffer time (BT).

Line 35. Additional warning time required from railroad is the additional time needed (if any), in seconds, that is required to provide safe preemption in the worst case (the maximum preemption time on Line 29), given the warning time provided by the railroad (Line 34). The additional warning time required is calculated by subtracting the warning time provided by the railroad (Line 34) from the maximum preemption time (Line 29). If the result of the subtraction is equal to or less than zero, it means that sufficient warning time is available, and you should enter zero (0) on Line 35. However, keep in mind that highly negative (-10 or less) subtraction results may indicate the potential for operational problems due to insufficient track clearance green time. Section 5 of the worksheet contains a methodology for calculating sufficient track clearance green time.

If the additional warning time is greater than zero (0), it means that the warning time provided by the railroad is insufficient, and additional warning time has to be requested from the railroad to ensure safe operation. The railroad can provide additional warning time either by providing additional clearance time (CT) (Line 30), or by providing or increasing advance preemption time (Line 33).

As an alternative, it may be possible to reduce the maximum preemption time (Line 29). To reduce the maximum preemption time, you can reduce either the preempt delay time (Line 1), if this is possible; reduce preempt minimum green time (Line 5) or other green time (Line 6), as long as you do not violate

local policies for signal timing; or, reduce yellow change time (Line 7) or red clearance time (Line 8) as long as adequate and appropriate yellow change and red clearance intervals are provided.

If pedestrian rather than vehicular phasing controls warning time requirements for preemption, it may be possible to reduce the minimum walk time (Line 11) and/or pedestrian clearance time (Line 12) as long as you do not violate local policies for signal timing. You can also let the pedestrian clearance time (flashing don't walk) time simultaneous with vehicular yellow change and red clearance and so reduce the values on Line 13 (yellow change time) and Line 14 (red clearance time) to zero (0). If local policies do not currently allow simultaneous clearance for pedestrian and vehicular phasing, you may want to consider allowing this type of operation to reduce your worst-case conflicting pedestrian time. Once you have made all of the possible adjustments to the warning time, recompute the totals in Lines 3, 9, 15, 16, 17, 26, 29, and 35. If Line 35 remains greater than zero, then you will have to request additional warning time from the railroad, as described above, to ensure safe preemption of the adjacent signalized intersection.

SECTION 5: TRACK CLEARANCE GREEN TIME CALCULATION (OPTIONAL)

Note: This section is optional and is used to calculate the duration of the track clearance green interval. If this worksheet is only used to determine if additional warning time has to be requested from the railroad, this section need not be completed. The objective of the section is to calculate the duration of the track clearance green interval to ensure safe and efficient operations at the crossing and adjacent traffic signal.

The Preempt Trap Check section (lines 36 to 44) focuses on safety by calculating the minimum duration of the track clearance green interval to ensure that the track clearance green does not terminate before the gates block access to the crossing. If the gates do not block access to the crossing before the expiration of the track clearance green, it is possible that vehicles can continue to cross the tracks and possibly stop on the tracks. However, the track clearance green interval has already expired and there will be no further opportunity to clear. This potentially hazardous condition is called the "preempt trap".

The Clearing of Clear Storage Distance section (lines 45 to 50) focuses on efficiency by calculating duration of the track clearance green interval that is needed to clear the clear storage distance (CSD in Figure 1), or a specific portion thereof.

Preempt Trap Check

Line 36. Advance preemption time provided is the duration (in seconds) the preempt sequence is active in the highway traffic signal controller before the activation of the railroad active warning devices. If Line 35 is zero (i.e. no additional warning time is required from the railroad), the value on Line 33 can be used. In other cases, use the actual value of the advance preemption time (APT) provided by the railroad. If no APT is provided, enter zero on Line 36.

Line 37. Multiplier for maximum APT due to train handling is a value that relates the maximum duration of the advance preemption time (APT) to the minimum value guaranteed by the railroad. Although the railroad guarantees a minimum duration for the APT, it is probable that in most cases the actual duration of the APT will be longer than the guaranteed duration. This variability in APT occurs due to "train handling", which is a term that describes the acceleration and deceleration of trains on their approach to the crossing. If a train accelerates or decelerates while approaching to the crossing, the railroad warning system cannot estimate the arrival time of the train at the crossing accurately, resulting in variation in the actual duration of APT provided. This variation needs to be taken into account to ensure safe operation.

To make sure that the preempt trap does not occur we need to determine the maximum value of the APT so that a sufficiently long track clearance green interval can be provided to ensure that the gates block access to the crossing before the track clearance green ends. The maximum APT can be estimated by multiplying the advance preemption time provided (and guaranteed) by the railroad (Line 36) with the multiplier for maximum APT due to train handling. This value is only significant if the value for APT on Line 36 is non-zero. If APT is zero, continue to line 38.

In the case where APT is provided, the difference between the minimum and maximum values of APT is termed excess APT. Excess APT usually occurs when the train decelerates on the approach to the crossing, or where train handling affects the accuracy of the estimated time of train arrival at the crossing so that the preempt sequence is activated earlier than expected. The amount of excess APT is increased by the following conditions:

- Increased variation in train speeds, since more trains will be speeding up and slowing down;
- Lower train speeds, since a fixed deceleration rate has a greater effect on travel time at low speeds than at higher speeds; and
- Longer warning times, because more time is available for the train to decelerate on the approach to the crossing.

The multiplier for maximum APT can be determined from field measurements as the largest advance preemption time observed (or the 95th percentile, if enough observations are available) divided by the value on Line 36. If no field observations are available, the multiplier for maximum APT can be estimated as 1.60 if warning time variability is high or 1.25 if warning time variability is low. High warning time variability can typically be expected in the vicinity of switching yards, branch lines, or anywhere low-speed switching maneuvers takes place. According to Section 16.30.10 of the *AREMA Signal Manual* the railroad can provide a “timer for constant time between APT and CWT.” The effect of such a “not to exceed” timer is to eliminate excess APT, and if provided, the multiplier on Line 37 can be set to 1.0.

Line 38. Maximum APT is largest value (in seconds) of the advance preemption time that can typically be expected, which corresponds to the earliest possible time the preemption sequence in the traffic signal controller will be activated before the activation of the railroad grade crossing warning system (flashing lights and gates). It is calculated by multiplying the APT provided by the railroad (Line 36) with the multiplier for maximum APT due to train handling (Line 37).

Line 39. Minimum duration for the track clearance green is the minimum duration (in seconds) of the track clearance green interval to ensure that the gates block access to the crossing before the track clearance green expires in the case where no advance preemption time is provided. It is necessary to block access to the crossing before the track clearance green expires to ensure that vehicles do not enter the crossing after the expiration of the track clearance green and so be subject to the preempt trap (described in the introduction to Section 5). The 15 seconds minimum duration for the track clearance green interval is calculated from federal regulations and requirements.

Line 40. Gates down after start of preemption is the maximum duration (in seconds) from when the preempt is activated in the highway traffic signal controller until the gates reach a horizontal position. Calculate this value by adding the maximum advance preemption time on Line 38 to the minimum duration for the track clearance green interval on Line 39.

Line 41. Preempt verification and response time, recorded on Line 3, is the number of seconds between the receipt at the controller unit of a preempt call issued by the railroad’s grade crossing warning equipment and the time the controller software actually begins to respond to the preempt call.

Line 42. Best-case conflicting vehicle or pedestrian time (in seconds) is the minimum time from when the preempt starts to time in the controller (i.e. after verification and response) until the track clearance green interval can start timing. In most cases, this value is zero, since the controller may already be in the track clearance phase(s) when the preempt starts timing, and therefore the track clearance green interval can start timing immediately. The best-case conflicting vehicle or pedestrian time may be greater than zero if the track clearance green interval contains phases that are not in normal operation (and conflicts with the normal phases), or where another phase or interval always has to terminate before the track clearance green interval can start timing.

Line 43. Minimum right-of-way transfer time is the minimum amount of time needed for the best case condition, prior to display of the track clearance green interval. Calculate the minimum right -of-way transfer time by adding lines 41 and 42.

Line 44. Calculate the **Minimum track clearance green time** by subtracting Line 43 from Line 40. This yields the minimum time that the track clearance green interval has to be active to avoid the preempt trap.

Clearing of Clear Storage Distance

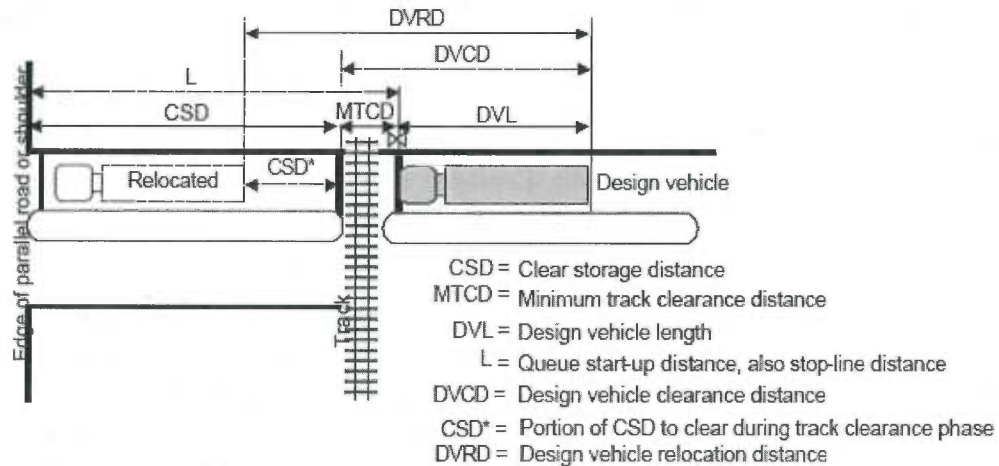


Figure 3 Relocation distances during the track clearance green interval.

Line 45. Time required for design vehicle to start moving, recorded on Line 22, is the number of seconds that elapses between the start of the track clearance green interval and the time the design vehicle, which is located at the edge of the railroad crossing on the opposite side from the signalized intersection, begins to move.

Line 46. Design vehicle clearance distance (DVCD in Figure 3) is the length, in feet, which the design vehicle must travel in order to enter and completely pass through the railroad crossing's minimum track clearance distance (MTCD). This is the same value as recorded on Line 23.

Line 47. Portion of CSD to clear during track clearance, (CSD* in Figure 3) is the portion of the clear storage distance (CSD), in feet, that must be cleared of vehicles before the track clearance green interval ends. For intersections with a CSD greater than approximately 150 feet it is desirable—but not necessary—to clear the full CSD during the track clearance green interval. In other words, it is desirable to set Line 47 to the full value of CSD (Line 18). If the full CSD is not cleared, however, vehicles will be stopped in the CSD during the preempt dwell period, and if not serviced during the preempt dwell period, will be subject to unnecessary delays which may result in unsafe behavior. For CSD values less than 150 feet the full CSD is typically cleared to avoid the driver task of crossing the tracks followed immediately by the decision to stop or go when presented by a yellow signal as the track clearance green interval terminates.

Line 48. Design vehicle relocation distance (DVRD in Figure 3) is the distance, in feet, that the design vehicle must accelerate through during the track clearance green interval. It is the sum of the design vehicle clearance distance (Line 46) and the portion of CSD to clear during the track clearance green interval (Line 47).

Line 49. The Time required for design vehicle to accelerate through DVRD is the amount of time required for the design vehicle to accelerate from a stop and travel the complete design vehicle relocation distance (DVRD). This time value, in seconds, can be found by locating your design vehicle relocation distance from Line 48 on the horizontal axis of Figure 2 and then drawing a line straight up until that line intersects the acceleration time performance curve for your design vehicle. For a WB-50 semi-trailer, large school bus (S -BUS 40), or single unit (SU) vehicle, multiply the acceleration time with a correction factor obtained from Table 2 to estimate the effect of grade on the acceleration of the vehicle. Use the average grade over the design vehicle relocation distance. For design vehicle relocation distances greater than 400 feet, use Equation 1 with the appropriate parameters listed in Table 3.

Line 50. Time to clear portion of clear storage distance, in seconds, is the total amount of time

required (after the signal has turned green for the approach crossing the tracks) to begin moving a queue of vehicles through the queue start-up distance (L in Figure 3) and then move the design vehicle from a stopped position at the far side of the crossing completely through the portion of clear storage distance that must be cleared (CSD* in Figure 3). This value is the sum of the time required for design vehicle to start moving (Line 45) and the time for the design vehicle to accelerate through the design vehicle relocation distance, DVRD (Line 49).

Line 51. The Track clearance green interval is the time required, in seconds, for the track clearance green interval to avoid the occurrence of the preempt trap and to provide enough time for the design vehicle to clear the portion of the clear storage distance specified on Line 47. The track clearance green interval time is the maximum of the minimum track clearance green time (Line 44) and the time required to clear a portion of clear storage distance (Line 50).

SECTION 6: VEHICLE-GATE INTERACTION CHECK (OPTIONAL)

Note: This section is optional and is used to calculate the required advance preemption time to avoid the automatic gates descending on a stationary or slow moving design vehicle as it moves through the minimum track clearance distance (MT CD). If this worksheet is only used to determine if additional warning time has to be requested from the railroad to ensure that vehicles have enough time to clear the crossing before the arrival of the train, this section need not be completed.

Line 52. Right-of-way transfer time, in seconds, recorded on Line 17, is the maximum amount of time needed for the worst case condition, prior to display of the track clearance green interval.

Line 53. Time required for design vehicle to start moving, recorded on Line 22, is the time (in seconds) elapsed between the start of the track clearance green interval and the time the design vehicle, which is located at the edge of the railroad crossing on the opposite side from the signalized intersection, begins to move.

Line 54. Time required for design vehicle to accelerate through the design vehicle length, DVL, is the time required for the design vehicle to accelerate through its own length. The design vehicle length is recorded on Line 20. This time value, in seconds, can be read from Figure 2 and Table 2 or looked up in Table 4 for standard design vehicles. For a WB-50 semi-trailer, large school bus, or single unit (SU) truck use the average grade over the design vehicle length at the far side of the crossing.

Line 55. Time required for design vehicle to clear the descending gates, in seconds, is the sum of the right-of-way transfer time on Line 52, the time required for design vehicle to start moving on Line 53, and the time required for design vehicle to accelerate through the design vehicle length on Line 54.

Line 56. Duration of flashing lights before gate descent start, in seconds, is the time the railroad warning lights flash before the gates start to descend. This value typically ranges from 3 to 5 seconds and must be obtained from the railroad. The value obtained from the railroad may be verified using field observation.

Table 4. Time required for the design vehicle to accelerate through the design vehicle length.

| Design Vehicle | Design Vehicle Length (feet) | Grade | Acceleration Time (seconds) |
|-----------------------------------|------------------------------|-------------|-----------------------------|
| Through Passenger Car | 19 | Level | 2.6 |
| Left Turning Passenger Car | 19 | Level | 2.7 |
| Single Unit Truck (SU) | 30 | Level to 2% | 3.8 |
| | | 4% | 4.0 |
| | | 6% | 4.3 |
| | | 8% | 4.6 |
| Large School Bus (S-BUS 40) | 40 | Level to 1% | 5.5 |
| | | 2% | 5.5 |
| | | 4% | 6.1 |
| | | 6% | 6.6 |
| Intermediate Semi-Trailer (WB-50) | 55 | 8% | 7.0 |
| | | Level | 10.0 |
| | | 2% | 11.0 |
| | | 4% | 12.8 |
| | | 6% | 14.4 |
| | | 8% | 15.8 |

Line 55. Time required for design vehicle to clear the descending gates, in seconds, is the sum of the right -of-way transfer time on Line 52, the time required for design vehicle to start moving on Line 53, and the time required for design vehicle to accelerate through the design vehicle length on Line 54.

Line 56. Duration of flashing lights before gate descent start, in seconds, is the time the railroad warning lights flash before the gates start to descend. This value typically ranges from 3 to 5 seconds and must be obtained from the railroad. The value obtained from the railroad may be verified using field observation.

Line 57. Full gate descent time, in seconds, is the time it takes for the gates to descend to a horizontal position after they start their descent. This value must be obtained from the railroad and may be verified using field observation. In the case where multiple gates descend at different speeds, use the descent time of the gate that reaches the horizontal position first.

Line 58. The Proportion of non-interaction gate descent time is the decimal proportion of the full gate descent time on Line 57 during which the gate will not interact with (i.e. not hit) the design vehicle if it is located under the gate. This value depends on the design vehicle height, h , and the distance from the center of the gate mechanism to the nearest side of the design vehicle, d , as shown in Figure 4. Figure 5 can be used to determine the proportion of non-interaction gate descent time. Select the distance from the center of the gate mechanism to the nearest side of the design vehicle, d , on the vertical axis of Figure 5, draw a horizontal line until you reach the curve that represents the design vehicle, and then draw a vertical line down to the horizontal axis and read off the value of the proportion of non-interaction gate descent time.

Line 59. Non-interaction gate descent time is time (in seconds) during gate descent that the gate will not interact with (i.e. not hit) the design vehicle if it is located under the gate. In other words, it is the time that expires after the gate starts to descend until it hits the design vehicle if it is located under the gate. This value is calculated by multiplying the full gate descent time on Line 57 with the proportion of non-interaction gate descent time on Line 58.

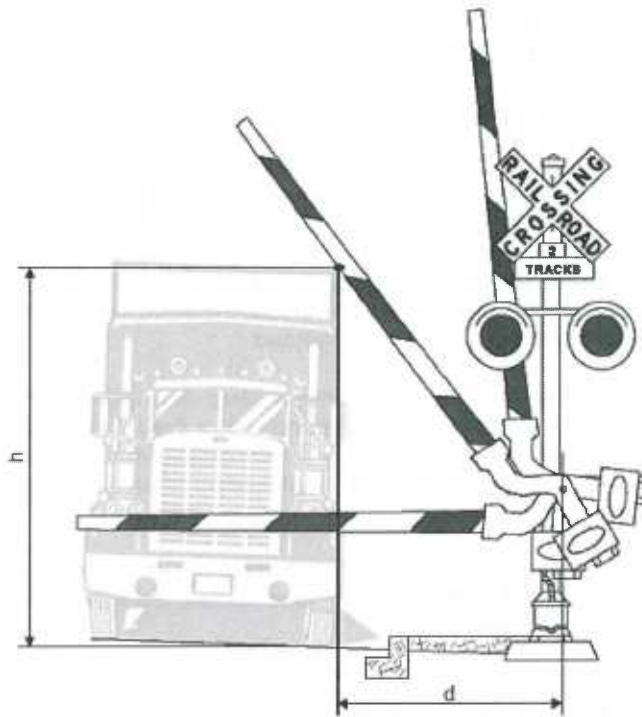


Figure 4 Gate interaction with the design vehicle.

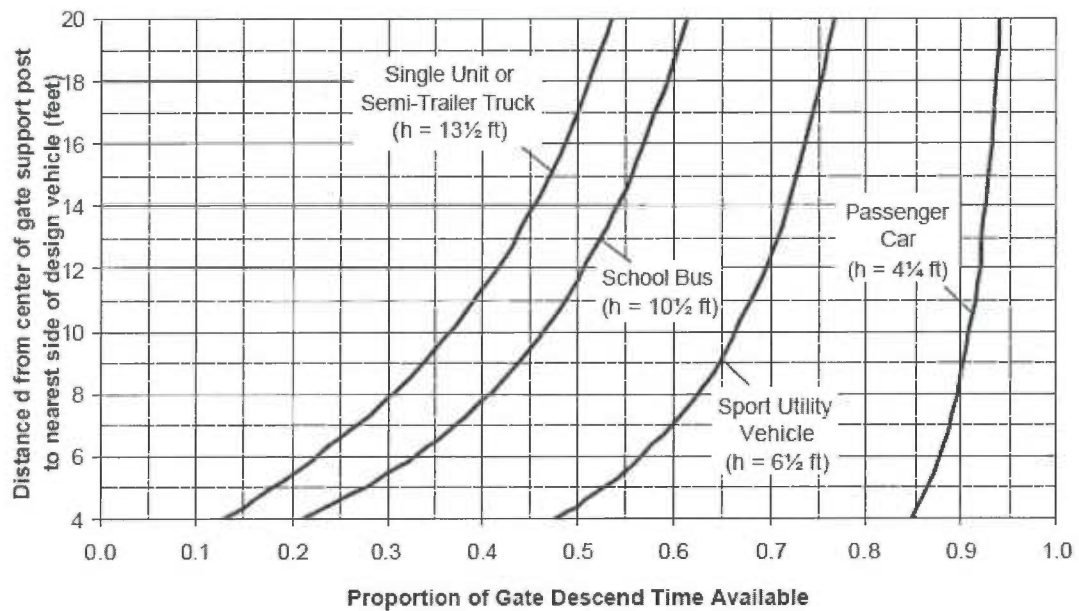


Figure 5 Proportion of gate descent time available as a function of the design vehicle height and the distance from the center of the gate mechanism to the nearest side of the design vehicle.

Line 60. Time available for design vehicle to clear descending gate, in seconds, is the time, after the railroad warning lights start to flash, that is available for the design vehicle to clear the descending gate before the gate hits the vehicle. It is the sum of the duration of the flashing lights before gate descent start (Line 56) and the non-interaction gate descent time (Line 59).

Line 61. Advance preemption time required to avoid design vehicle-gate interaction, in seconds, is calculated by subtracting the time available for the design vehicle to clear descending gate (Line 60) from the time required for the design vehicle to clear descending gate (Line 55). The result is the amount of advance preemption time that is required to avoid the gates descending on a stationary or slow-moving design vehicle. If the result of the subtraction is equal to or less than zero, it means that sufficient time is available, and you should enter zero (0) on Line 61. If the result is greater than the amount of advance preemption time provided by the railroad, as given on Line 36, there is a possibility that the gates could descend on a stationary or slow-moving design vehicle. To avoid this situation, additional advance preemption time should be requested from the railroad.

It should be kept in mind that on its own, gates descending on a vehicle is not a critical safety failure, because enough time still exists to clear the crossing before the arrival of the train, if the advance preemption time on Line 36 is provided. Therefore, local policies may vary on whether additional advance preemption time (over and above that on Line 36) should be requested solely for the purpose of prohibiting gates descending on vehicles.

If additional advance preemption time is provided to avoid design vehicle-gate interaction, Line 33 of this Worksheet has to be updated, and Lines 34 and 35 recomputed. Section 5 also needs to be recomputed to calculate the track clearance green time.

Denis Law
Mayor

City of
Renton



September 3, 2014

Public Works Department - Gregg Zimmerman, P.E., Administrator

Kathy Hunter, Deputy Assistant Director, Transportation Safety
Washington Utilities and Transportation Commission
1300 S. Evergreen Park Dr. SW
PO Box 47250
Olympia, WA 98504-7250

**Subject: Old Gene Coulon Drive/Southport Boulevard Crossing Petition
DOT#091725B, M.P. 4.05
BNSF Railway, Woodinville Subdivision, LS 0405**

STATE OF WASH.
UTIL. AND TRANS.
COMMISSION

2014 SEP -5 AM 8:49

RECEIVED
RECORDS MANAGEMENT

Dear Ms. Hunter,

Attached is a petition to WUTC for subject crossing modifications, which are to be done in conjunction with crossing modifications to Lake Washington Boulevard crossing USDOT#091724U, M.P. 3.97, for which a separate petition has also been submitted. Modifications to both crossings are part of the proposed two-phase construction of improvements to the Lake Washington Boulevard/Houser Way/Southport Site Access intersection, associated with the Southport Hotel development, which would ultimately replace the current four-way sign-controlled traffic stop at the Lake Washington Boulevard/Houser Way/Southport with a vehicular traffic signal with fully-functional Red-Yellow-Green operations.

As an interim measure, the City of Renton and Southport plan to complete all physical/hardscape improvements to the intersection now (fall of 2014), consistent with the Ultimate Conditions described herein and, in more detail, in a Transportation Engineering NorthWest (TENW) letter of July 13, 2014, which accompanied the petition for the modifications to crossing USDOT#091724U, M.P. 3.97. New vehicular traffic signals would operate in flashing-red "All Way Stop" mode until such time that BNSF can complete and make-functional new railroad gates per the Ultimate conditions (anticipated summer 2015). At that time, the vehicular traffic signal would be converted to the fully-functional Red-Yellow-Green operations.

The following justifications support the proposed two-phase approach to construction of the improvements:

H:\Division.s\TRANSPOR.TAT\DESIGN.ENG\jwilhoit\LOGANconcpant\Project Files Setup\400 Design Phase\430 Right of Way\430.3 Negotiations\Offer Letter - Boeing.doc

- Public safety would be maintained during the proposed Interim (Phase 1) plan by means of proper signage and safe and efficient movement of vehicles, pedestrians, and bikes at the railroad crossings.
- New pedestrian facilities (ADA-compliant sidewalks, ramps) as well as roadway illumination would result in immediate accessibility and safety improvements over existing conditions.
- The duration of Phase 1 is expected to be relatively short (approximately one year).
- The City of Renton supports the proposed 2-phase construction approach.
- BNSF anticipates availability of construction crews and materials no sooner than summer 2015.

Please feel free to contact me at 425-430-7319 if you need additional information

Sincerely,

TRANSPORTATION SYSTEMS DIVISION



James P. Wilhoit, P.E.
Project Manager

Attachments: Petition with attachments

cc: Doug Jacobson, Deputy Public Works Administrator, Transportation
Bob Hanson, Transportation Design Engineering Manager
James Wilhoit, Transportation Project Manager
Carolyn Currie, Transportation Administrative Secretary

BNSF endorsement of this petition submission:



Richard W. Wagner, Manager Public Projects

09.04.2014

Date

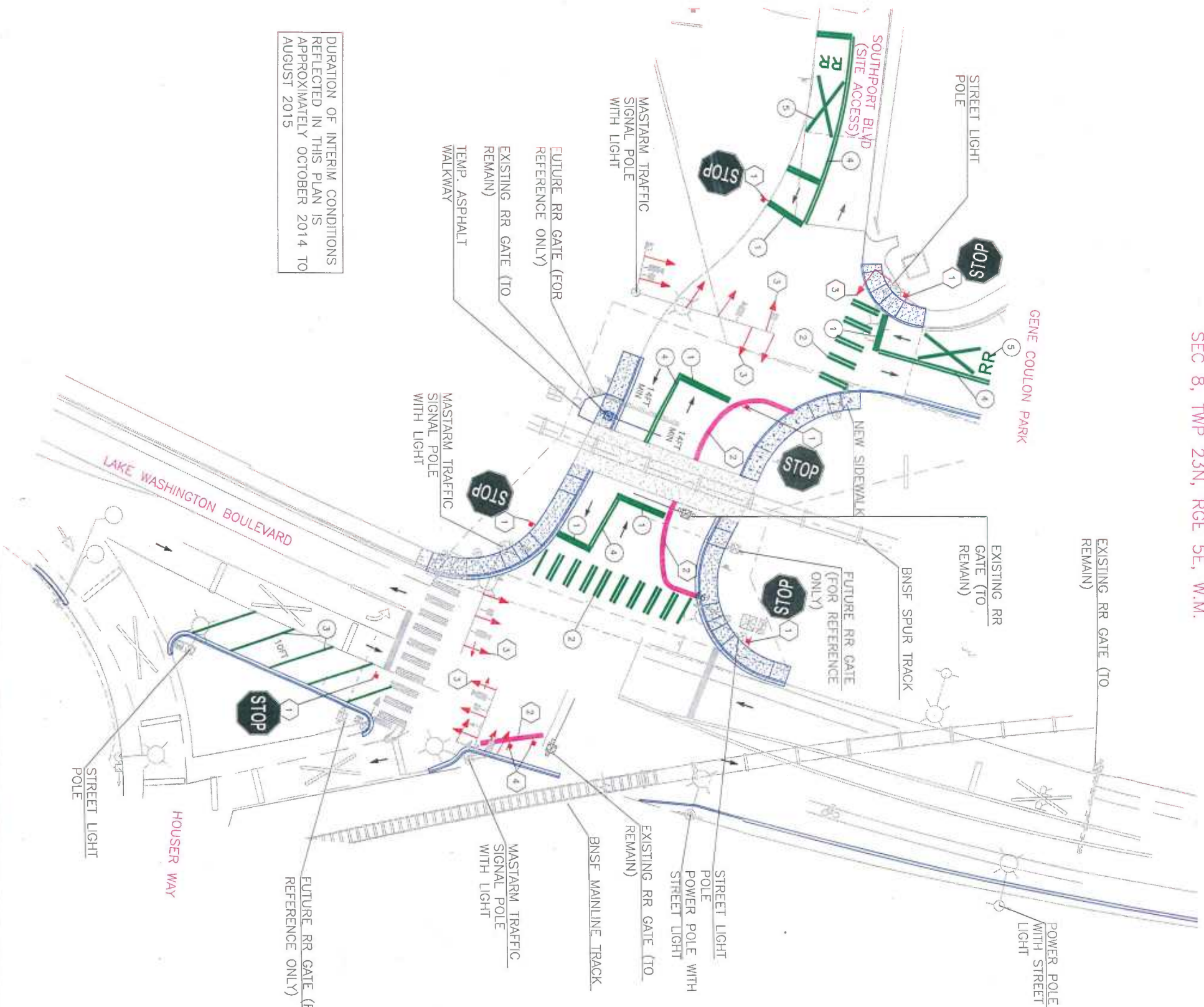
LAKE WASHINGTON BOULEVARD /
 SITE ACCESS
 INTERIM TRAFFIC PLAN

CITY OF RENTON
 Planning/Building/Public Works Dept.

TENW
 Transportation Engineering NorthWest
 Transportation Planning | Design | Traffic Impact & Operations
 11400 SE 9th Street, Suite 203, Bellevue, WA 98004 | Office (425) 889-6747
 Project Contact: Chris Bicket, P.E.
 Phone: 425-254-6202

| NO. | REVISION | BY | DATE | APPR |
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SEC 8, TWP 23N, RGE 5E, W.M.



DURATION OF INTERIM CONDITIONS REFLECTED IN THIS PLAN IS APPROXIMATELY OCTOBER 2014 TO AUGUST 2015

CONSTRUCTION NOTES

1. INSTALL R1-1 STOP SIGN AND POST PER CITY OF RENTON STANDARD PLANS, PAGE 601Z.
2. INSTALL PRECAST DUAL-FACED SLOPED MOUNTABLE CURB PER WSDOT STD. PLAN F-10-64-02.
3. OPERATE TRAFFIC SIGNAL IN FLASHING-RED MODE.
4. INSTALL OMS-R SIGN AND POST WITH SPRING LOADED SUPPORT MOUNTS PER CITY OF RENTON STANDARD PLANS, PAGE 601Z.

PAVEMENT MARKING NOTES

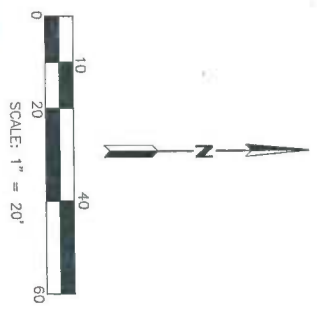
1. INSTALL 18IN THERMOPLASTIC STOP LINE BAR, PER CITY OF RENTON STANDARD PLANS, PAGE H008.
2. INSTALL THERMOPLASTIC CROSSWALK, PER CITY OF RENTON STANDARD PLANS, PAGE 127.
3. INSTALL 4IN SOLID WHITE PAINTED EDGE STRIPE, PER CITY OF RENTON STANDARD PLANS, PAGE H008.
4. INSTALL RPA DOUBLE YELLOW CENTER LINE, PER CITY OF RENTON STANDARD PLANS, PAGE H001.
5. INSTALL WHITE THERMOPLASTIC RAILROAD CROSSING SYMBOL PER CITY OF RENTON STANDARD PLANS, PAGE H009.2.

GENERAL NOTES

1. SIGNAL SHALL OPERATE IN FLASH-RED MODE FOR ALL APPROACHES.
2. PEDESTRIAN HEADS AND PEDESTRIAN PUSH BUTTONS SHALL BE BAGGED "OUT OF SERVICE"
3. ILLUMINATION SYSTEM SHALL BE OPERATIONAL.
4. THIS PLAN MAY NEED TO BE ADJUSTED TO FIT SITE CONDITIONS AS APPROVED BY THE ENGINEER.
5. ALL SIGNS AND SPACING SHALL CONFORM TO THE MUTCD AND CITY OF RENTON SPECIFICATIONS.
6. REMOVE EXISTING CONFLICTING STRIPING REMOVE WITH ASPHALT RESTORATION WORK. CONTRACTOR SHALL COORDINATE STRIPING WITH ASPHALT RESTORATION WORK.
7. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING ALL SIGNS AND CHANNELIZATION PER CITY OF RENTON STANDARDS. CONTRACTOR SHALL LAYOUT OUT ALL SIGNS AND CHANNELIZATION PER CITY OF RENTON STANDARDS IN ADVANCE OF INSTALLATION TO VERIFY LAYOUT.

SIGNAL & ILLUMINATION LEGEND

| SYMBOL | DESCRIPTION |
|--------|--|
| | VEHICLE SIGNAL HEAD |
| | PEDESTRIAN SIGNAL HEAD |
| | SIGNAL POLE TYPE III |
| | SIGNAL POLE TYPE II |
| | SIGNAL POLE TYPE PB9 |
| | MASTARM POLE MOUNTED |
| | LUMINAIRE POLE |
| | VIDEO DETECTION CAMERA |
| | MAST ARM MOUNTED SIGN |
| | PRE-EMPTION DETECTOR |
| | VEHICLE DETECTION LOOP |
| | CABINET |
| | SERVICE CABINET |
| | SIGN |
| | PRECAST DUAL-FACED CURB |
| | CONSTRUCTION NOTE |
| | PAVEMENT MARKING NOTE |
| | DIRECTION OF TRAVEL (NOT A PAVEMENT MARKING) |



CHECK FOR COMPLIANCE TO CITY STANDARDS

| | |
|------|--|
| DATE | |
| DATE | |
| DATE | |





Has Form been revised for this request?
 YES, Revision Date:
 NO

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. 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. If exit gates are utilized, the Road Authority Traffic Department will be responsible for installing and maintaining the "in pavement" vehicle detection loops from the street to the cable junction box.

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).

"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.

"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. These contacts are rated at 4 amps. 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.

"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.

With the above items in mind, please provide the following information to help us process your request:

Date: July 25, 2014

Request by (name/title): James P. Wilhoit, PE

James P. Wilhoit

Crossing Street Name: Lake Washington Boulevard

DOT #: 091724U

Parallel Street Name: Southport Boulevard

District: King County

City: Renton

County: King

State: Washington

Traffic Engineer: Chris Barnes

Phone: 4254307319

E-mail: jwilhoit@rentonwa.gov

- 1) Is this request for Simultaneous Preemption? YES NO
If "Yes" what is your requested Additional Warning Time? (if Additional Warning Time is required) _____ Seconds.
- 2) Is this request for Advanced Preemption? YES NO
If "Yes" what is your requested Advanced Preemption Time? 29 Seconds.
- 3) Will this location utilize exit gates? YES NO

The following questions should be completed if this location utilizes exit gates:

The exit gate arm(s) shall operate in one of the following modes of operation known as the EGOM (exit gate operating mode):

a. Dynamic EGOM – A mode of operation where exit gate operation is based on presence of vehicles within minimum track clearance distance (MTCD).

1) The exit gate arm(s) shall be designed to start downward motion after the vehicle detection system indicates no vehicles are located within the MTCD and any (optional) exit gate clearance time has completed timing. Note that the entrance gate arm(s) and the exit gate arm(s) may start downward motion almost simultaneously if no vehicles are located within the MTCD.

b. Timed EGOM – A mode of operation where exit gate operation is based on a predetermined time interval. This mode may be used if the vehicle detection system (Dynamic EGOM) is unhealthy.

1) The exit gate arm(s) shall be designed to start downward motion a predetermined number of seconds after the entrance gate arm(s) start downward motion. Note that the entrance gate arms(s) may or may not be fully horizontal at the time the exit gate arm(s) start downward motion. This timed value is known as the exit gate clearance time (EGCT).

- 1) The BNSF standard is to use Dynamic EGOM and revert to Timed EGOM if the vehicle detection system is unhealthy. Is this operation acceptable? YES NO
- 2) When operating in "Dynamic" exit gate operating mode, how much exit gate clearance time (optional) do you request? _____ seconds.
- 3) When operating in "Timed" exit gate operating mode how much exit gate clearance time do you request? _____ seconds.

Comments: Based on the information provided in the CTC Report of July 15, 2014 the City of Renton wishes to request the advance pre-empt single-break circuit.

Please contact the BNSF Signal Engineering office at (913) 577- 5570 with any questions or possible changes to the above requirements.



Has Form been revised for this request?

YES, Revision Date:

NO

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. 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. If exit gates are utilized, the Road Authority Traffic Department will be responsible for installing and maintaining the "in pavement" vehicle detection loops from the street to the cable junction box.

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Parallel Street Name: Lake Washington Boulevard

District: King County

City: Renton

County: King

State: Washington

Traffic Engineer: Chris Barnes

Phone: 4254307319

E-mail: jwilhoit@rentonwa.gov

- 1) Is this request for Simultaneous Preemption? YES NO
If "Yes" what is your requested Additional Warning Time? (if Additional Warning Time is required) _____ Seconds.
- 2) Is this request for Advanced Preemption? YES NO
If "Yes" what is your requested Advanced Preemption Time? 35 Seconds.
- 3) Will this location utilize exit gates? YES NO

The following questions should be completed if this location utilizes exit gates:

The exit gate arm(s) shall operate in one of the following modes of operation known as the EGOM (exit gate operating mode):

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2) When operating in "Dynamic" exit gate operating mode, how much exit gate clearance time (optional) do you request? _____ seconds.

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Comments: Based on the information provided in the CTC Report of July 15, 2014 the City of Renton wishes to request the advance pre-empt single-break circuit.

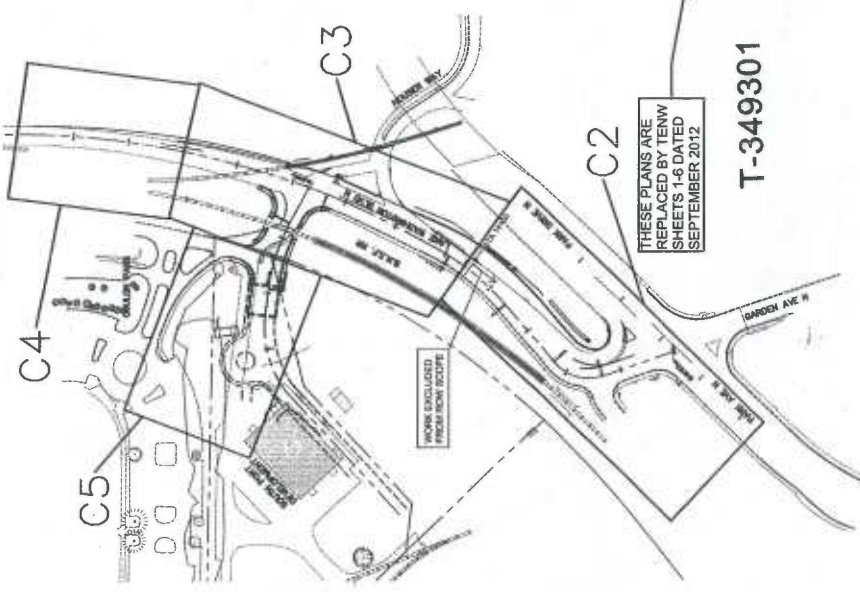
Please contact the BNSF Signal Engineering office at (913) 577- 5570 with any questions or possible changes to the above requirements.

LAKE WASHINGTON BLVD. IMPROVEMENTS

for: SOUTHPORT DEVELOPMENT



| | |
|---|--------------|
| DRAWING INDEX: | |
| COVER SHEET (CIVIL) |SHT C1 |
| PLAN & PROFILE STA 9+86 TO STA 14+60 |SHT C2 |
| PLAN & PROFILE STA 14+60 TO STA 20+00 |SHT C3 |
| PLAN & PROFILE STA 20+00 TO STA 23+00 |SHT C4 |
| PLAN & PROFILE COULON PARK ENTRANCE |SHT C5 |
| ROAD GEOMETRY STA 9+86 TO STA 14+60 |SHT C6 |
| ROAD GEOMETRY STA 14+60 TO STA 20+00 |SHT C7 |
| ROAD GEOMETRY STA 20+00 TO STA 23+00 |SHT C8 |
| ROAD GEOMETRY STA COULON PARK ENTRANCE |SHT C9 |
| EROSION CONTROL STA 9+86 TO STA 14+60 |SHT C10 |
| EROSION CONTROL STA 14+60 TO STA 20+00 |SHT C11 |
| EROSION CONTROL STA 20+00 TO STA 23+00 |SHT C12 |
| EROSION CONTROL COULON PARK ENTRANCE |SHT C13 |
| UTILITY COORDINATION PLAN |SHT C14 |
| NOT USED |SHT C15 |
| DRIVEWAY ACCESS EASEMENT |SHT C16 |
| ROAD SECTIONS |SHT C17 |
| DETAILS |SHT C18 |
| DETAILS |SHT C19 |
| DETAILS |SHT C20 |
| NOTES & SPECIFICATIONS |SHT C21 |
| LAKE WASH BLVD/PARK AVE N CHANNELIZATION PLAN |SHT C21 |
| LAKE WASH BLVD STA 13+25 TO 16+65 CHANNELIZATION PLAN |SHT C22 |
| LAKE WASH BLVD/SITE ACCESS CHANNELIZATION PLAN |SHT C23 |
| LAKE WASH BLVD/PARK AVE N TRAFFIC SIGNAL PLAN |SHT TS1 |
| LAKE WASH BLVD STA 13+00 TO 16+00 TRAFFIC SIGNAL PLAN |SHT TS2 |
| LAKE WASH BLVD/SITE ACCESS TRAFFIC SIGNAL PLAN |SHT TS3 |
| LAKE WASH BLVD/SITE ACCESS SIGNAL WIRING DIAGRAM |SHT TS4 |
| LAKE WASH BLVD/SITE ACCESS SIGNAL STANDARD DETAILS |SHT TS5 |



THESE PLANS ARE REPLACED BY TENN SHEETS 1-6 DATED SEPTEMBER 2012

T-349301

LEGEND

| PROPOSED | EXISTING |
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GENERAL ENGINEERING NOTES

- EXISTING UTILITIES AND UNDERGROUND STRUCTURES SHOWN ON THE DRAWINGS ARE BASED ON RECORD DRAWINGS AND FIELD SURVEY DATA OBTAINED VERBALLY FROM OWNERS OF THE UTILITIES AND/OR DATA OBTAINED FROM THE RECORD DRAWINGS. THE CONTRACTOR SHALL GUARANTEE THE ACCURACY OR COMPLETENESS OF THIS INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL UTILITIES AND/OR STRUCTURES BY FIELD SURVEY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL UTILITIES AND/OR STRUCTURES BY FIELD SURVEY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL UTILITIES AND/OR STRUCTURES BY FIELD SURVEY.
- IF CHANGED CONDITIONS ARE ENCOUNTERED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS.

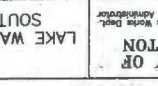
PERMIT PLAN MARKUPS INCLUDED WITHIN THE ACCOMPANYING CIVIL PLANS WERE PREPARED BY COLUGH IN PORTER LUNDEEN IN COORDINATION WITH TENN (TRAFFIC CONSULTANT), SECO DEVELOPMENT, INC. (OWNER), AND THE CITY OF RENTON FOR SITE WORK TO BE CONSTRUCTED IN PHASE 1.

DEVELOPER:
SECO DEVELOPMENT, INC.
10843 NE 8TH STREET, SUITE 200
BELLEVUE, WA 98004
CONTACT: REX ALLEN
PHONE: 425-688-3085

TRANSPORTATION ENGINEER:
THE TRANSCO GROUP, INC.
11730 118TH AVENUE NE, SUITE 600
KIRKLAND, WA 98034
CONTACT: CHRIS BICKET, PE
PHONE: 425-821-3685

| | |
|------|----------|
| NO. | 1 |
| DATE | 10/22/08 |
| BY | REVISION |

CITY OF RENTON
Engineering/Planning/Public Works Dept.
LAKE WASH. BLVD. IMPROVEMENTS
SOUTHPORT DEVELOPMENT
COVER SHEET

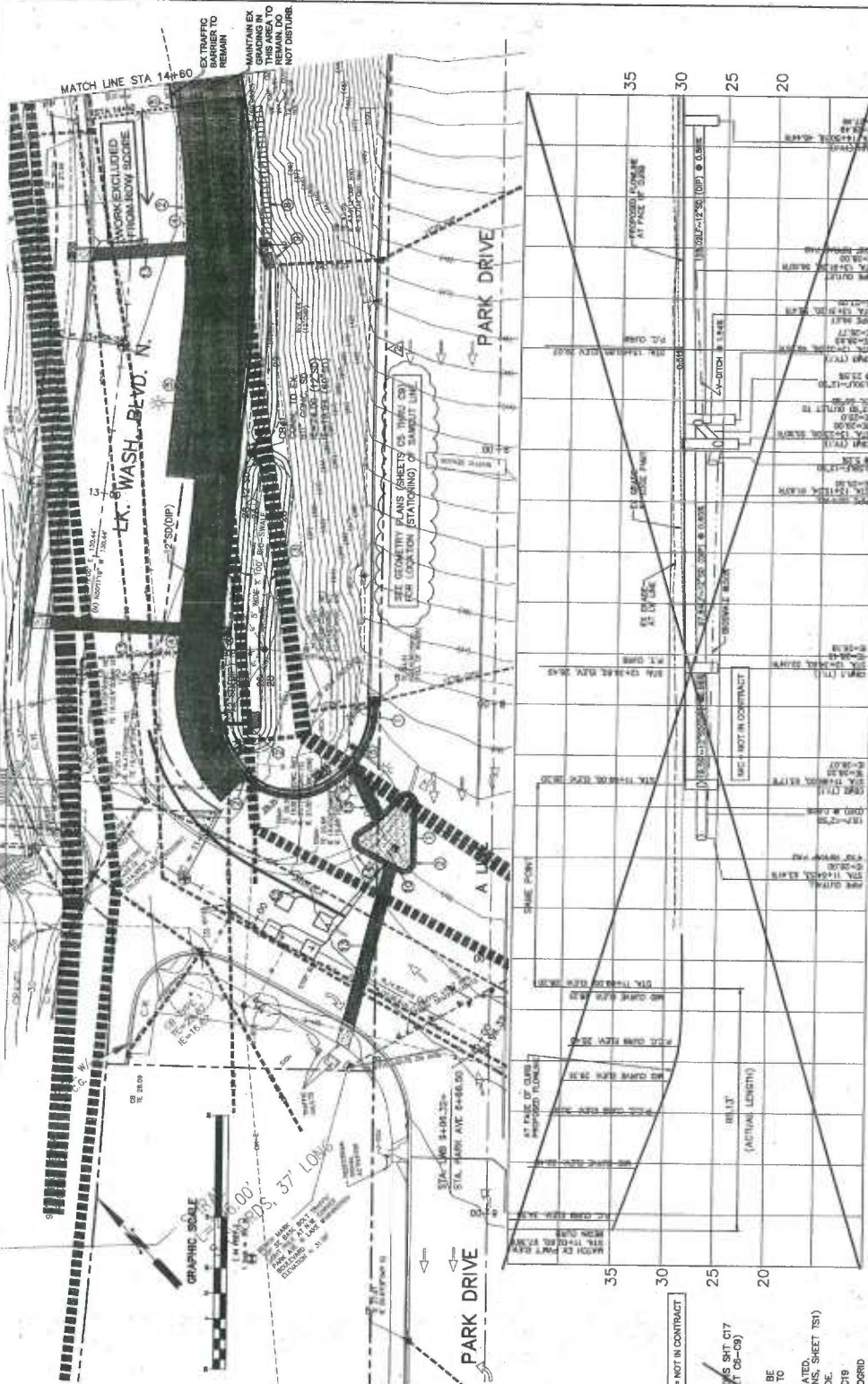


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| DATE | 10/22/08 |
| BY | REVISION |
| DATE | 11/19/08 |
| BY | REVISION |

CHECKED FOR COMPLIANCE TO CITY STANDARDS
BUSH, BOED & HUTCHINGS, INC.
CIVIL ENGINEERS & LAND SURVEYORS
99323.02
11730 118TH AVENUE NE, SUITE 600
KIRKLAND, WA 98034
PHONE: 425-821-3685

PERMIT PLAN MARKUPS INCLUDED WITHIN THE ACCOMPANYING CIVIL PLANS WERE PREPARED BY COLUGH IN PORTER LUNDEEN IN COORDINATION WITH TENN (TRAFFIC CONSULTANT), SECO DEVELOPMENT, INC. (OWNER), AND THE CITY OF RENTON FOR SITE WORK TO BE CONSTRUCTED IN PHASE 1.

SEC 8, TWP 23N, RGE 5E, W.M.



12+00 13+00 14+00

PROFILLE
SCALE 1" = 4'

T-349302

99323.02

BUSH, ROED & HITCHINGS, INC.
3000 W. 10th Ave., Suite 100
Renton, WA 98057
TEL: (206) 881-1111
FAX: (206) 881-1112

CHECKED FOR COMPLIANCE TO CITY STANDARDS
By: *[Signature]*
Date: _____

SEAL

SEAL

497 T-349302

PLAN & PROFILE STA 9+96 TO STA 14+60
LAKE WASH. BLVD. IMPROVEMENTS
SOUTHPORT DEVELOPMENT

CITY OF RENTON
Public Works Dept.
Engineering & Planning



| NO. | REVISION | DATE | BY |
|-----|---------------------------|---------|-----|
| 1 | FOR CITY OF RENTON REVIEW | 1/25/08 | TMS |
| 2 | | | |

CONSTRUCTION NOTES:

1. CONCRETE CURBS AND GUTTER
2. TRAILBLAZE LINE (SEE ROAD SECTION & SUR. CITY ROAD GEOMETRY PLANS SHEET 08-08)
3. SIDEWALK (24" IV MAX.)
4. EX. UTILITY POLE (S/L) MAY BE RELOCATED BY OTHERS REFER TO COORDINATION PLAN
5. EX. STREET LIGHT TO BE RELOCATED. (REFER TO AFFIC SIGNAL PLANS, SHEET T51)
6. RAISE UTILITY FROM TO NEW GRADE.
7. BROWSALE PERK ON SHEET C18
8. MODULAR BLOCK WALL WITH GEORGRID (PER DETAIL ON SHEET C19)
9. 4"x6" ROCK AD PEA STORM NOTES.
10. TRAFFIC LAND. CONC. PAVING PER SIDEWALK SPECIFICATION. SLOPE TO DRAIN.
11. NOT USED
12. NEW CURB MEDIAN W/ DRAINAGE SLOTS. (REFER TO SHEET CH1)
13. TREE LIGHT CONDUIT TRENCH RESTORATION. (PER CITY OF RENTON STANDARD)
14. EXISTING CURB MEDIAN TO BE REMOVED. (REFER TO SHEET CH)

DATE: 1/25/08
SCALE: 1" = 40'

02-01-00

PLAN & PROFILE STA 14+60 TO STA 20+00
LAKE WASH. BLVD. IMPROVEMENTS
SOUTHPORT DEVELOPMENT

CITY OF RENTON
Planning/Building/Public Works Dept.
Gregg Zimmerman, P.E., Administrator



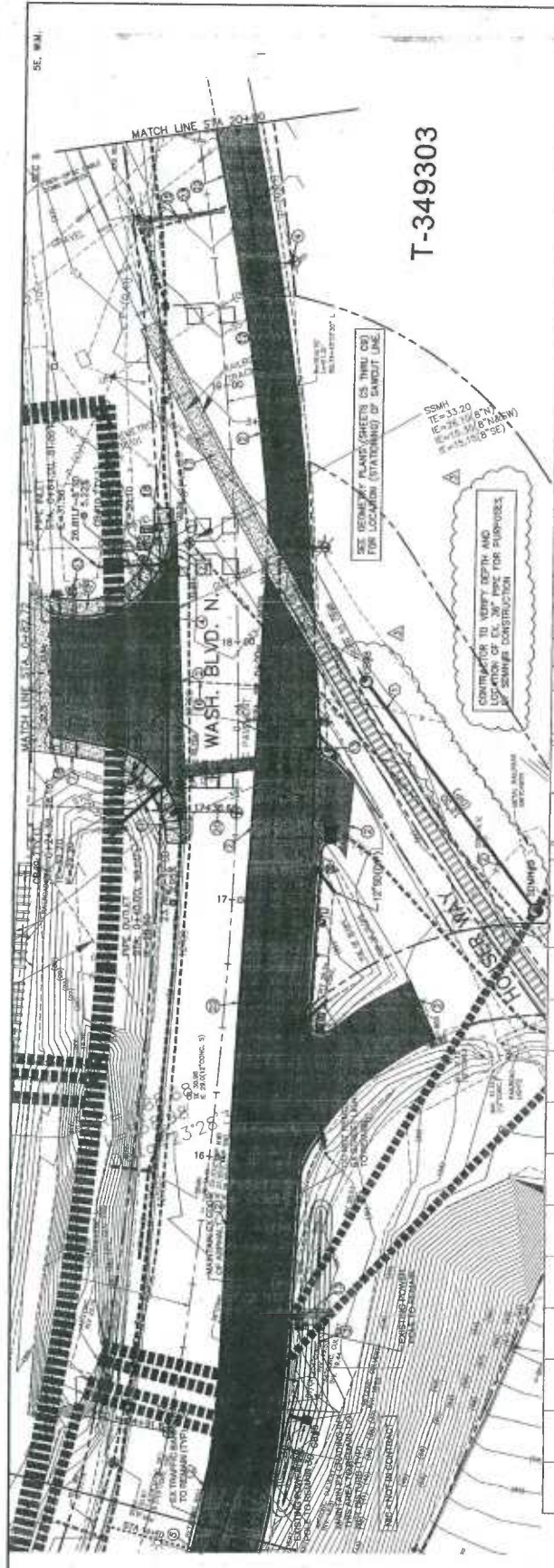
1"=20' HORIZ.
1"=5' VERT.

| NO. | DATE | BY | APP. |
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| 1 | 1/17/01 | | |
| 2 | 1/17/01 | | |
| 3 | 1/17/01 | | |

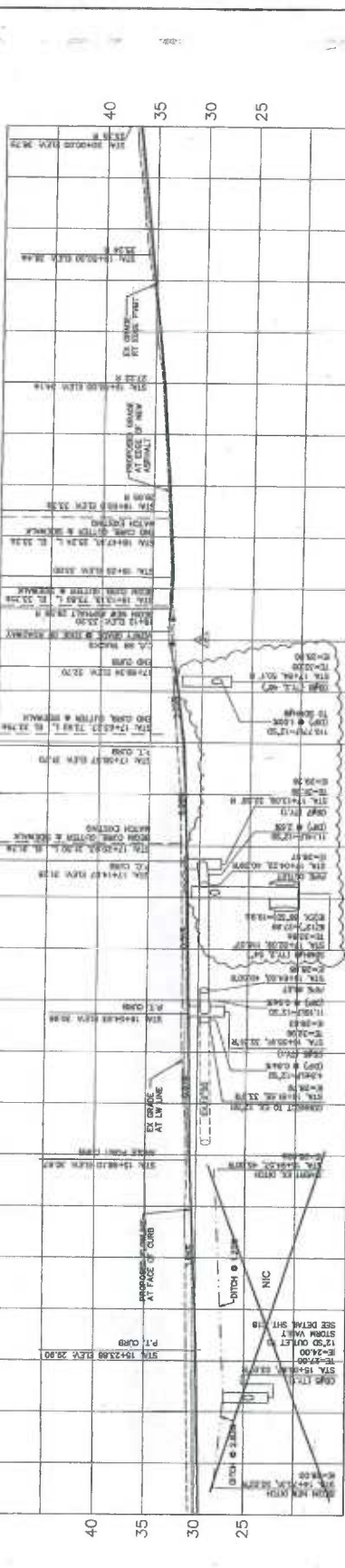
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| 1 | 1/17/01 | | |
| 2 | 1/17/01 | | |
| 3 | 1/17/01 | | |

| NO. | DATE | BY | APP. |
|-----|---------|----|------|
| 1 | 1/17/01 | | |
| 2 | 1/17/01 | | |
| 3 | 1/17/01 | | |

LAURENCE, R01-13
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T-349303



- CONSTRUCTION NOTES:**
- CONCRETE CURB AND GUTTER
 - SAWCUT LINE (SEE ROAD SECTIONS SHIT C17 & ROAD GEOMETRY PLANS SHIT C8-C9)
 - RELOCATE EXISTING UTILITY POLES (REFER TO UTILITY COORDINATION PLAN)
 - EX. UTILITY POLE/WIRE TO BE RELOCATED
 - EX. STREET LIGHT TO BE RELOCATED
 - NOT USED
- UTILITY CROSSINGS:**
- IE=28.64 (EX. TEL)
 - IE=26.67 (12" SD)
 - IE=30.54 (EX. TEL)
 - IE=28.11 (12" SD)
 - IE=28.64 (12" SD)
 - IE=22.504 (EX. 12" W)
- ST. LIGHT CONDUIT TRENCH RESTORATION (PER CITY OF RENTON STANDARD)**
- ASPHALT FLOWLINE @ 1.08% FROM CB#10 TO CB#9
 - NEW CURB MEDIAN W/ DRAINAGE SLOTS (REFER TO SHEET C13)
 - R.R. EQUIPMENT TO BE INSTALLED BY OTHERS (SEE SHEET T33)
 - EXIST. STREET LIGHT TO BE REMOVED (SEE SHEET T33)
- EX. R.R. SIGNAL TO BE REMOVED BY OTHERS (SEE SHEET T33)**
- NEW WATERMAIN BY ON-SITE DEVELOPMENT (DESIGN BY ON-SITE ENGINEER)
 - CONCRETE R.R. CROSSING APRON (BY OTHERS)
 - CONCRETE RAMP PER DETAIL ON SHIT C18
 - REMOVE EXISTING TRAFFIC SIGNAL (SEE SHEET T33)
- CONCRETE SIDEWALK PER DETAIL SHIT C18**
- REMOVE EXISTING CURB & GUTTER
 - CONCRETE SIDEWALK PER DTL. ON SHIT. C18
 - CONCRETE CURB RAMP PER DTL. ON SHIT. C18
 - EDGE OF PAVEMENT WOODING (NO CURB)
 - SIGNAL/ALUMINUM POLE (REFER TO SHEET T32)
 - STEEL PILING UNDER RAILWAY PER 02 TRAFFIC SIGNAL DETAIL (SEE SHEET T33)
 - TRAFFIC SIGNAL DETAIL (SEE SHEET T33)
- EX. GRADE AT LW LINE**
- CONTRACTOR TO VERIFY DEPTH AND LOCATION OF EX. 36" PIPE FOR PURPOSES OF SEWER CONSTRUCTION**
- SEE OTHER PLANS (SHEETS IS thru C19) FOR LOCATION (STATIONING) OF SAWCUT LINE**
- SMH IE=33.20 IE=24.76 (6" N) IE=24.76 (8" W) IE=15.15 (6" SE)**
- PROPOSED GRADE AT FACE OF NEW ASPHALT**
- PROPOSED GRADE AT FACE OF NEW ASPHALT**

PROFILE
Scale: 1"=5' V

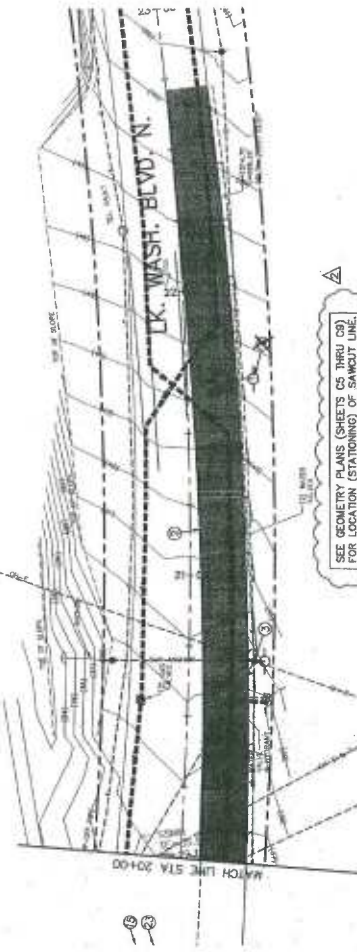
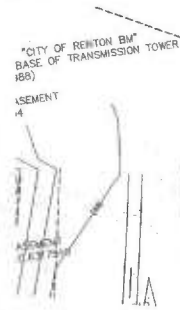
SEAL

BUSH, ROED & HITCHINGS, INC.
Professional Engineers & Land Surveyors
900 Pine St. 1st Fl.
Seattle, WA 98101
99323.02
Date: _____

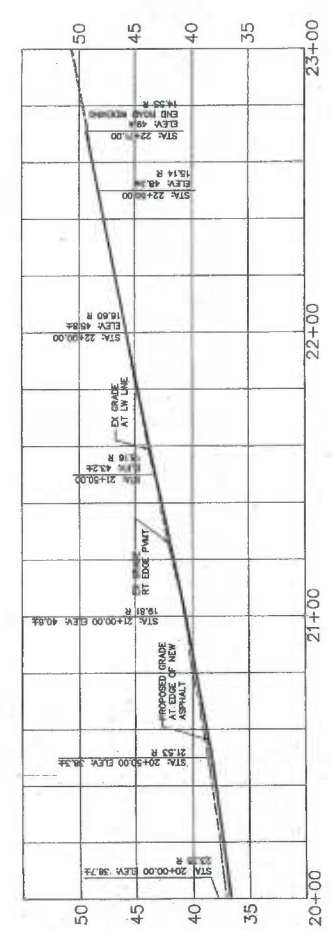
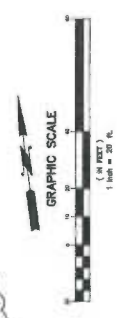
CD-14-241303

SEC 8, TWP 23N, RGE 5E, W.M.

- CONSTRUCTION NOTES:
- ① EDGE OF PAVEMENT WIDENING (NO CURB)
 - ② SAWCUT LINE (SEE ROAD SECTIONS SHIT C17 & ROAD GEOMETRY PLANS SHIT C9-C8)
 - ③ EX. UTILITY POLE/PIPE TO BE RELOCATED BY OTHERS. (REFER TO UTILITY COORDINATION PLAN)
 - ④ ~~EXISTING WOOD-POST-SPRINGS-UNDER-PAVEMENT~~ (REFER TO SECTIONS)



SEE GEOMETRY PLANS (SHEETS C5 THRU C9) FOR LOCATION (STATIONING) OF SAWCUT LINE.



PROFILE
SCALE 1"=4'

| | | | |
|--|---|--|--|
| <p>PLAN & PROFILE STA 20+00 TO STA 23+00 LAKE WASH. BLVD. IMPROVEMENTS SUPPORT DEVELOPMENT</p> | <p>CITY OF RENTON Planning/Engineering/Public Works Dept. Project Administrator: P.C. Administrator</p> | <p>DATE: 1/17/21 BY: [Signature]</p> | <p>REVISION</p> |
| <p>03-01-00</p> | <p>1"=20H 1"=5V</p> | <p>1/17/21</p> | <p>NO. 1 REV. CITY OF RENTON WORKS</p> |

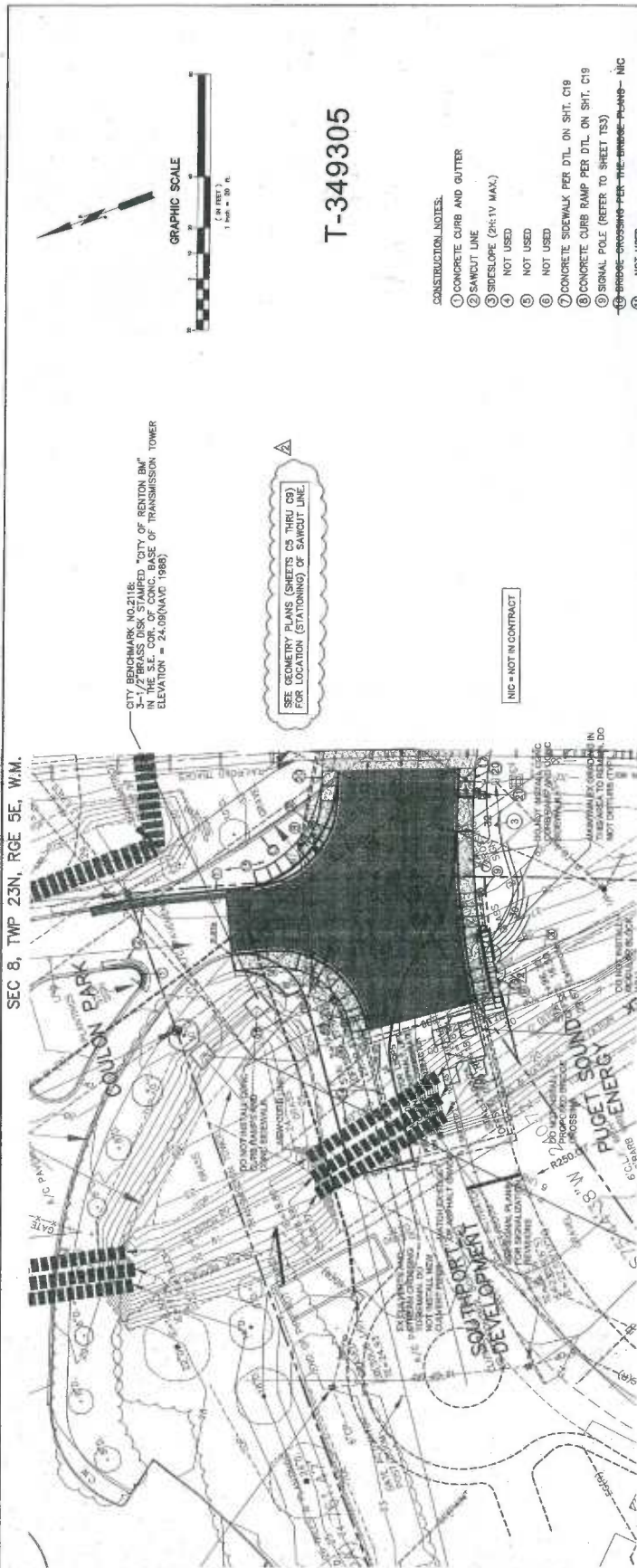
99323.02
BUSH, ROED & HITCHINGS, INC.
CIVIL ENGINEERS & LAND SURVEYORS
200 N. W. 10th Ave., Fort Lauderdale, FL 33304
Tel: 754-546-1111
Fax: 754-546-1112

CHECKED FOR COMPLIANCE TO CITY STANDARDS
DATE: 1/17/21
BY: [Signature]

CD: T-349304

T-349304

SEC 8, TWP 23N, RGE 5E, W.M.



SEE GEOMETRY PLANS (SHEETS C8, T8, U8) FOR LOCATION (STATIONING) OF SAWBUT LINE

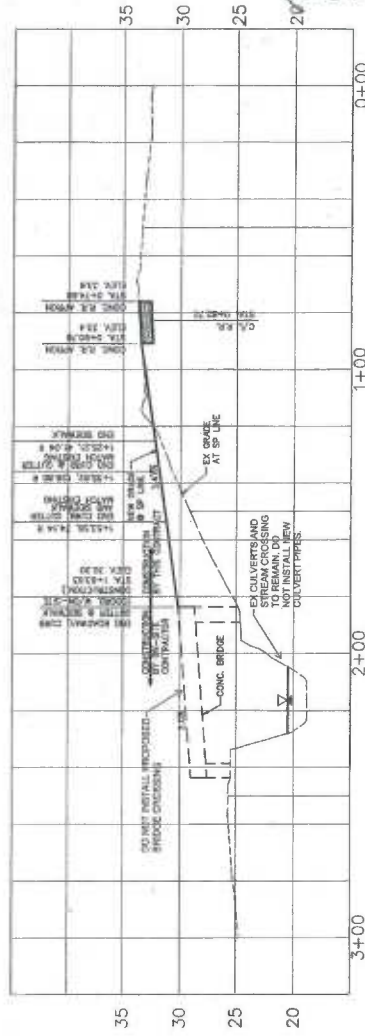
SEE GEOMETRY PLANS (SHEETS C8, T8, U8) FOR LOCATION (STATIONING) OF SAWBUT LINE

NIC = NOT IN CONTRACT

T-349305

CONSTRUCTION NOTES:

- 1 CONCRETE CURB AND GUTTER
- 2 SAWBUT LINE
- 3 SIDESLOPE (24:1V MAX.)
- 4 NOT USED
- 5 NOT USED
- 6 NOT USED
- 7 CONCRETE SIDEWALK PER DTL. ON SHT. C19
- 8 CONCRETE CURB RAMP PER DTL. ON SHT. C19
- 9 SIGNAL POLE (REFER TO SHEET T33)
- 10 BRIDGE CROSSING PER THE UTILITY PLANS - NIC
- 11 NOT USED
- 12 CONCRETE R.R. CROSSING APRON (CONSTRUCTION BY OTHERS)
- 13 REMOVE EX. CONC. CURB AND/OR SIDEWALK
- 14 REMOVE EXISTING PAVING
- 15 REMOVE EXISTING PAVING
- 16 REMOVE EXISTING PAVING
- 17 REMOVE EXISTING PAVING
- 18 EX. R.R. SIGNAL TO BE REMOVED BY OTHERS (REFER TO SHEET T33)
- 19 NEW WATERMAIN BY ON-SITE DEVELOPMENT (DESIGN BY ON-SITE CIVIL ENGR.)
- 20 NOT USED
- 21 CONCRETE RAMP PER DETAIL SHT C19
- 22 R.R. EQUIPMENT TO BE INSTALLED BY OTHERS (REFER TO SHEET T33)



PROFILE
1" = 4' V
1" = 40' H

99323.02
BUSH, ROED & HITCHINGS, INC.
 CIVIL ENGINEERS & LAND SURVEYORS
 505 1/2 BROADWAY, SUITE 200
 SEASIDE, CALIFORNIA 92082
 (949) 441-1111
 FAX (949) 441-1112

CHECKED FOR COMPLIANCE TO CITY STANDARDS
 Date: _____
 Date: _____
 Date: _____

SEC 8, TWP 23N, RGE 5E, W.M.

B.N.S.F. R.R.

MATCH LINE STA 14+60

WORK EXCLUDED FROM ROW SCOPE

BY REMAINING TO MAINTAIN EX THIS AREA TO REMAIN. DO NOT DISTURB.

13+75 TO 22+35 R NEAR SAWTOOTH LINE

13+65 TO 49+45 R P.C. CURB

11+10 TO 34+55 R NEAR SAWTOOTH LINE

11+00 TO 91+15 R SAWTOOTH STATIONING OFFSET ADDED

11+00 TO 91+15 R P.C. CURB

11+00 TO 91+15 R P.C. CURB

10+68.57 TO 87+31R R=2.5

10+68.57 TO 87+31R R=2.5

10+68.57 TO 87+31R R=2.5

10+68.57 TO 87+31R R=2.5

10+68.57 TO 87+31R R=2.5

10+68.57 TO 87+31R R=2.5

10+68.57 TO 87+31R R=2.5

10+68.57 TO 87+31R R=2.5

10+68.57 TO 87+31R R=2.5

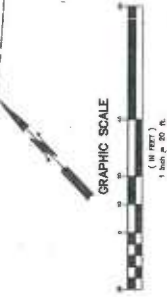
10+68.57 TO 87+31R R=2.5

PARK DRIVE

A LINE

PARK DRIVE

T-349306



| NO. | DATE | BY | REVISION |
|-----|---------|----|---------------------------|
| 1 | 1/17/02 | MM | PER CITY OF RENTON REVIEW |
| 2 | 6/22/02 | MM | PER CITY OF RENTON REVIEW |
| 3 | APR 02 | MM | REVISION |

CITY OF RENTON
 Planning/Building/Public Works Dept.
 Greg Zimmerman P.E., Administrator

ROAD GEOMETRY STA 9+96 TO STA 14+60
 LAKE WASH. BLVD. IMPROVEMENTS
 SOUTHPORT DEVELOPMENT

02-01-00



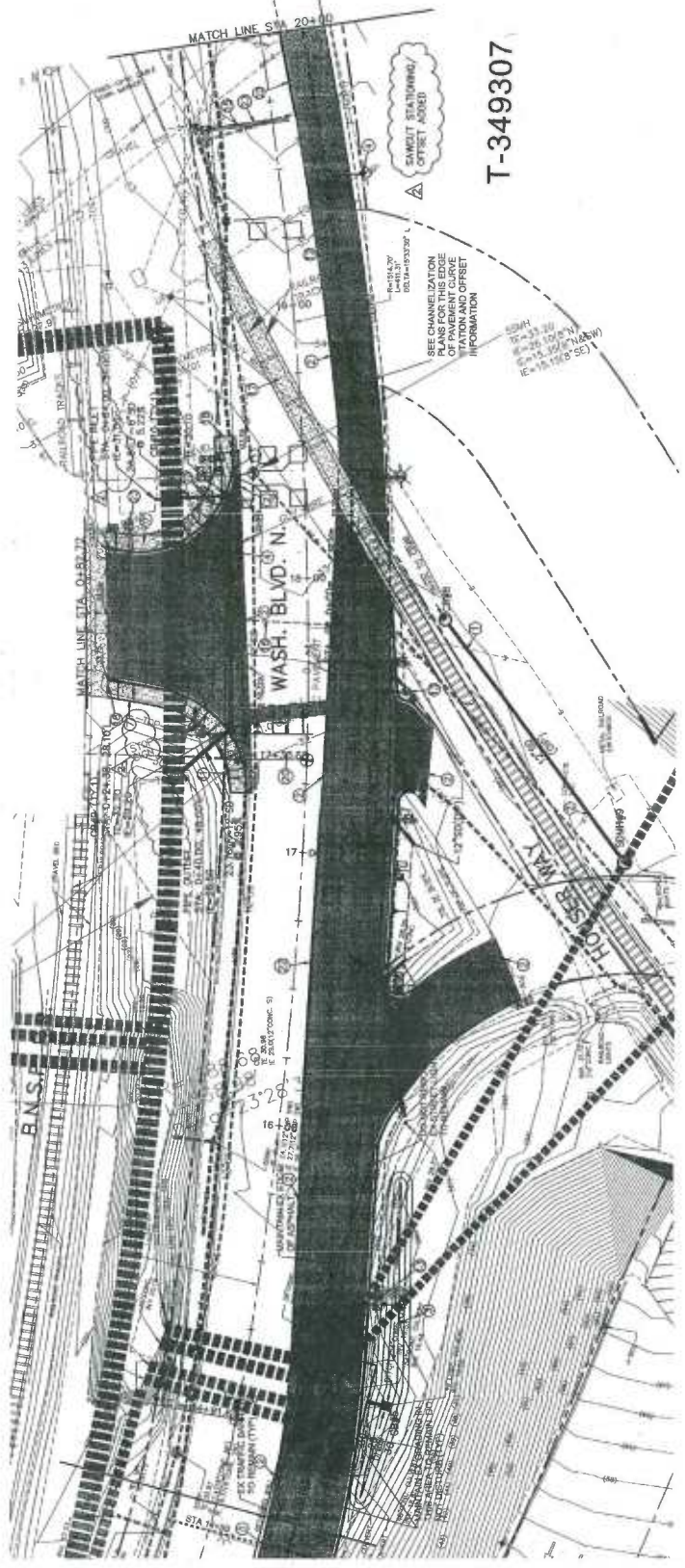
BUSH, REED & HITCHINGS, INC.
 CIVIL ENGINEERS & LAND SURVEYORS
 99323.02
 10000 1/2 AVENUE, SUITE 200
 RENTON, WA 98057
 TEL: 206.875.3333
 FAX: 206.875.3334

CHECKED FOR COMPLIANCE TO CITY STANDARDS
 Date: 11/19/02
 Date: 11/19/02

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SEC 8, TWP 23N, RCE 5E, W.M.



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| NO. | REVISION | BY | DATE |
| 1 | POST CITY OF RENTON REVIEW | TRB | 1/17/02 |
| 2 | POST CITY OF RENTON REVIEW | TRB | 1/17/02 |
| 3 | POST CITY OF RENTON REVIEW | TRB | 1/17/02 |
| 4 | POST CITY OF RENTON REVIEW | TRB | 1/17/02 |
| 5 | POST CITY OF RENTON REVIEW | TRB | 1/17/02 |
| 6 | POST CITY OF RENTON REVIEW | TRB | 1/17/02 |
| 7 | POST CITY OF RENTON REVIEW | TRB | 1/17/02 |
| 8 | POST CITY OF RENTON REVIEW | TRB | 1/17/02 |
| 9 | POST CITY OF RENTON REVIEW | TRB | 1/17/02 |
| 10 | POST CITY OF RENTON REVIEW | TRB | 1/17/02 |

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CITY OF RENTON
 Gregg Zimmerman P.E., Administrator
 George Zimmerman Public Works Chief



1"=20' 1"=5'

ROAD GEOMETRY STA 14+60 TO STA 20+00
 LAKE WASH. BLVD. IMPROVEMENTS
 SOUTHPORT DEVELOPMENT

99323.02
 BUSH, ROED & HITCHINS, INC.
 CIVIL ENGINEERS & LAND SURVEYORS
 2020 14TH AVE. S.W.
 SEATTLE, WA 98148
 P: 206.461.1100
 F: 206.461.1101
 www.bushroed.com

CHECKED FOR COMPLIANCE TO CITY STANDARDS
 Date: 1/17/02
 Date: 1/17/02

SEAL
 BRH

SEC 8, TWP 23N, RGE 5E, W.M.

ROAD GEOMETRY STA 20+00 - STA 23+00
LAKE WASH. BLVD. IMPROVEMENTS
SOUTHPORT DEVELOPMENT

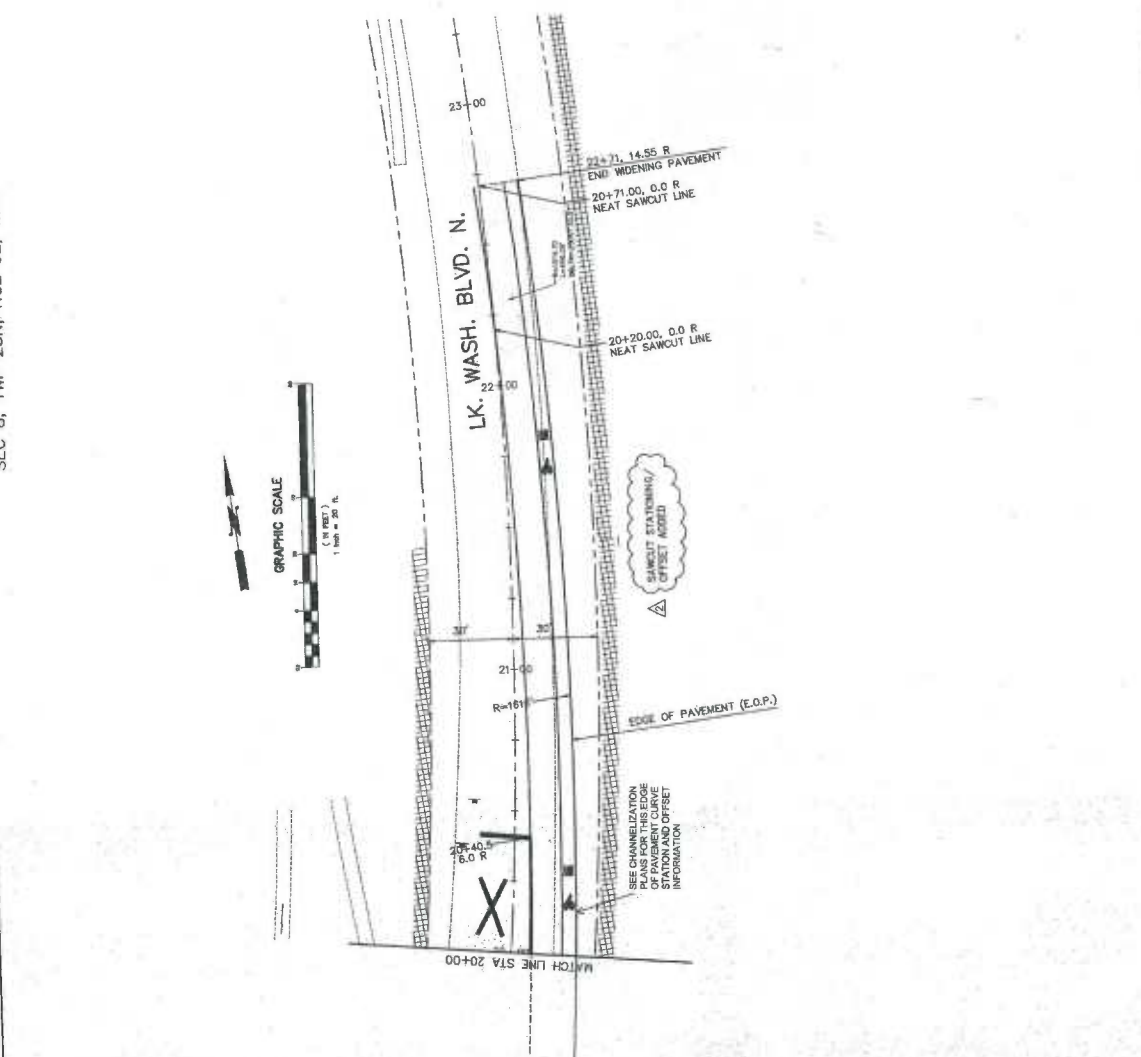
CITY OF RENTON
Planning/Building/Finance Works Dept.
Engineering/Information P.E. Administrator



| NO. | REVISION | BY | DATE |
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| 1 | FOR CITY OF RENTON REVIEW | | 9/23/03 |
| 2 | | | |
| 3 | | | |

| DATE | BY | DATE |
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| 11/15/02 | | 12/04 |

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99323.02
BUSH, ROED & HITCHINGS, INC.
 CIVIL ENGINEERS & LAND SURVEYORS
 10000 1st Avenue, Suite 200
 Everett, WA 98203
 P: 425.336.3333
 F: 425.336.3334
 www.bushroedhitchings.com

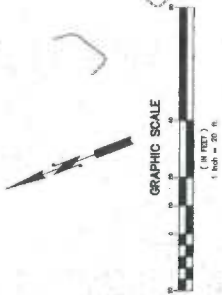
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 STATE OF WASHINGTON
 CIVIL ENGINEER
 No. 10000
 Exp. 12/31/04

SEAL
 STATE OF WASHINGTON
 LAND SURVEYOR
 No. 10000
 Exp. 12/31/04

CHECKED FOR COMPLIANCE TO CITY STANDARDS
 Date: 11/15/02
 Date: 11/15/02

CD-TT-349308

SEC 8, TWP 23N, RGE 5E, W.M.



| NO. | REVISION | DATE | BY | APP'D |
|-----|--------------------|----------|----|-------|
| 1 | PER CITY OF RENTON | 11/18/02 | | |
| 2 | PER CITY OF RENTON | 06/23/00 | | |

CITY OF RENTON
 Planning/Building/Public Works Dept.
 Gregg Zimmerman P.E., Administrator

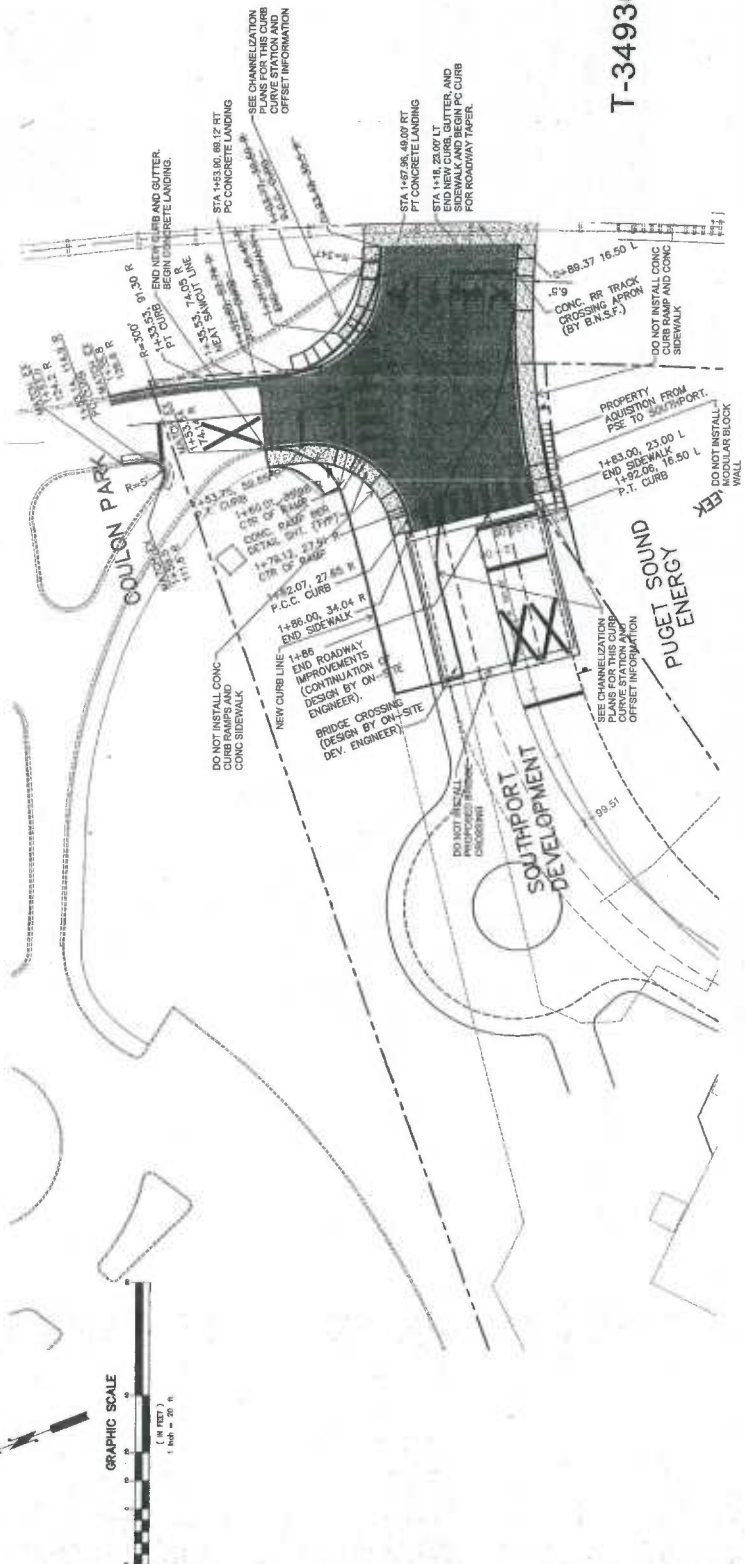


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 TIME: 1:55 PM
 DRAWN BY: [Signature]

PROJECT: LAKE WASH. BLVD. IMPROVEMENTS
 SHEET: SOUTHPORT DEVELOPMENT

03-01-00

ROAD GEOMETRY COULON PARK ENTRANCE
 LAKE WASH. BLVD. IMPROVEMENTS
 SOUTHPORT DEVELOPMENT



T-349309

BUSH, ROED & HITCHINGS, INC.
 CIVIL ENGINEERS & LAND SURVEYORS
 1000 1st Avenue, Suite 100
 Renton, WA 98057
 Phone: (206) 881-1111
 Fax: (206) 881-1112
 E-Mail: info@bushroedhitchings.com

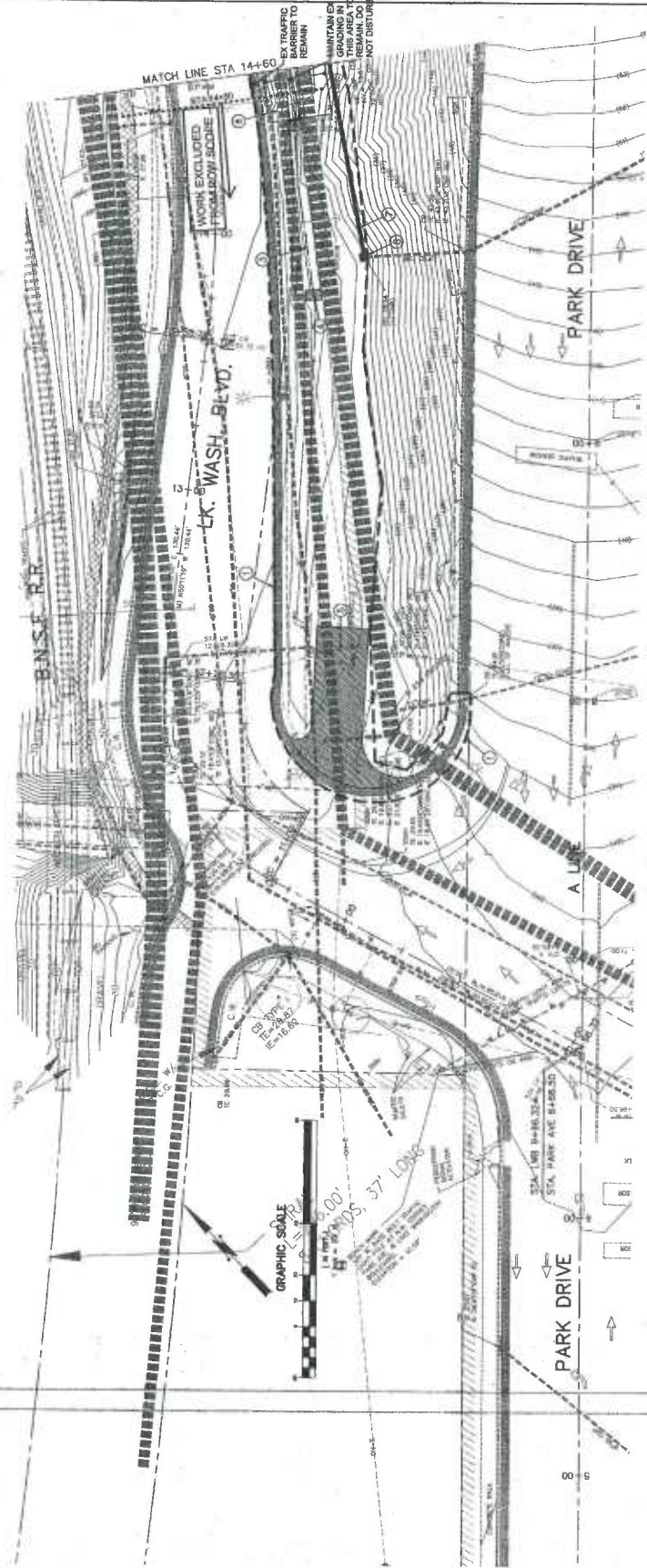
98323.02
 Date of Issue: 11/18/02
 Date of Plan: 11/18/02

CHECKED FOR COMPLIANCE TO CITY STANDARDS
 Date: 11/18/02
 By: [Signature]

20, T-349309

SEC 8, TWP 23N, RGE 5E, W.M.

| | | | |
|---|------------------------------|--|--|
| <p>3/1/00</p> <p>DATE</p> <p>BY</p> <p>FOR CITY OF KENTON ENGINEER</p> <p>DATE</p> <p>BY</p> <p>FOR CITY OF KENTON ENGINEER</p> | <p>1"=200'</p> <p>1"=50'</p> | <p>CITY OF KENTON Planning/Building/Public Works Dept. Craig Zimmerman P.E. Administrator</p> | <p>EROSION CONTROL STA 9+98 TO STA 14+60 LAKE WASH. BLVD. IMPROVEMENTS SOUTHPORT DEVELOPMENT</p> |
|---|------------------------------|--|--|



R-349301

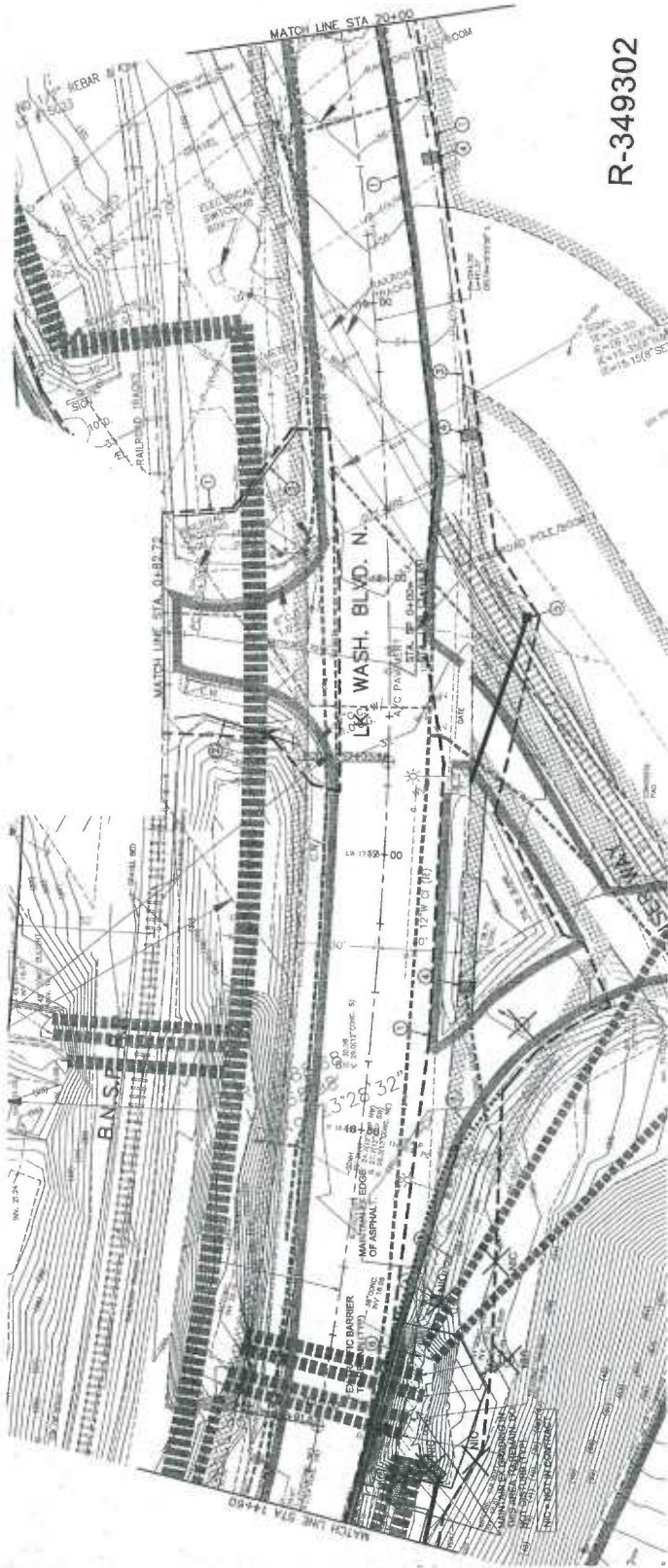
- EROSION CONTROL NOTES:**
- 1 LIMITS OF CLEARING & GRADING
 - 2 OMITTED
 - 3 TEMPORARY DITCH (2:1 SLOPES) SEE
 - 4 ROCK CHECK DAM PER TAIL ON SHEET C20
 - 5 TEMPORARY CONSTRUCTION ENTRANCE PER CHAIN ON SHEET C20
 - 6 SEDIMENT TRAP
BOT. E = 271.50
TOP. E = 271.50
DEPT. = 3.5'
DITCH W/S = 27'-50'
 - 7 12" TEMPORARY SD @ 4" MIN.
 - 8 TEMPORARY OS (TYPE 1)
- ~~9 NIC - NOT IN CONTRACT~~

BUSH, REED & HITCHINGS, INC.
 CIVIL ENGINEERS & LAND SURVEYORS
 1000 W. 12th St., Ste. 200
 Columbus, OH 43260
 614.261.1234
 FAX: 614.261.1235

99323.02
 CHECKED FOR COMPLIANCE TO CITY STANDARDS
 DATE: 11/19/02
 BY: [Signature]

CD R-349301

SEC 8, TWP 23N, RGE 5E, W.M.



R-349302

- EROSION CONTROL NOTES:**
- ① LIMITS OF CLEARING & GRADING
 - ② FILTER FABRIC FENCE PER DETAIL ON SHEET C20
 - ③ TEMPORARY DITCH (2:1 SIDESLOPES)
 - ④ ROCK CHECK DAM PER DETAIL ON SHEET C20
 - ⑤ CB & STORM DRAIN PER SHEET C3
 - ⑥ SILT LOADED RUNOFF SHALL NOT BE DISCHARGED TO CULVERTS.



CHECKED FOR COMPLIANCE TO CITY STANDARDS

99323.02

BUSH, ROED & HITCHINGS, INC.
 CIVIL ENGINEERS & LAND SURVEYORS
 1000 N. WASHINGTON ST., SUITE 200
 CHICAGO, ILLINOIS 60610
 TEL: 312.329.1100 FAX: 312.329.1101
 E-MAIL: BUSH@BRHINC.COM

Date: _____
 Date: _____

5/1/00

EROSION CONTROL STA 14+00 TO STA 20+00
 LAKE WASH. BLVD. IMPROVEMENTS
 SOUTHPORT DEVELOPMENT

CITY OF RENTON

Gregg Zimmerman P.E., Administrator



| NO. | REVISION | BY | DATE |
|-----|--------------------------|----|--------|
| 1 | ISSUE FOR PERMITS REVIEW | BR | 5/1/00 |
| 2 | | | |
| 3 | | | |

1"=20'H 1"=5'V

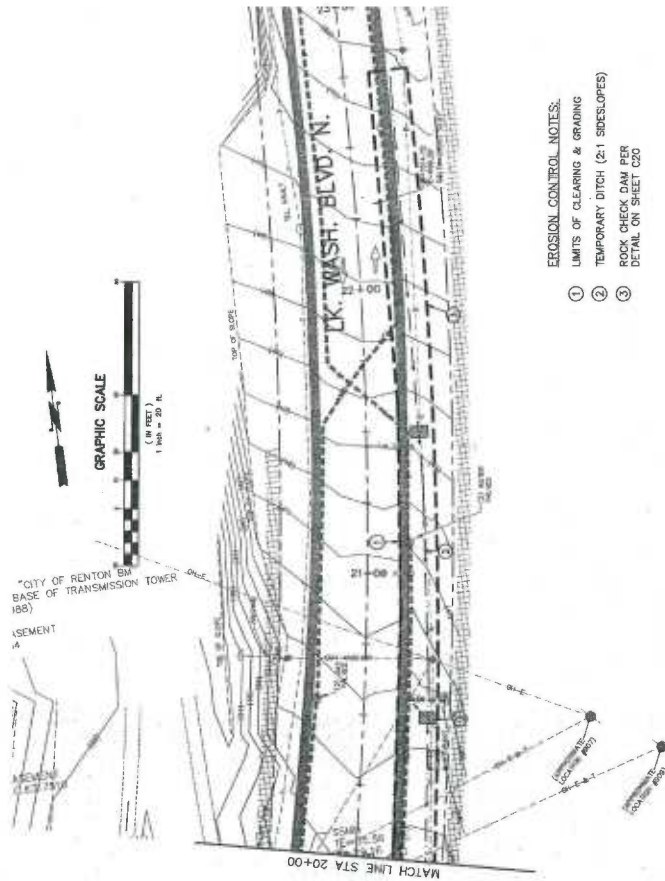
DATE: 5/1/00

PROJECT: SOUTHPORT DEVELOPMENT

SCALE: 1"=20'H 1"=5'V

LA98323-01 ORIGINAL SET PLAN 4/99

SEC 8, TWP 23N, RGE 5E, W.M.



- EROSION CONTROL NOTES:**
- ① LIMITS OF CLEARING & GRADING
 - ② TEMPORARY DITCH (2:1 SIDESLOPES)
 - ③ ROCK CHECK DAM PER DETAIL ON SHEET C20

R-349303

BUSH, ROED & HITCHINGS, INC.
CIVIL ENGINEERS & LAND SURVEYORS
2000 W. WASHINGTON AVE. SUITE 200
SEASIDE, WA 98138
509.323.0200
FAX: 509.323.0201

CHECKED FOR COMPLIANCE TO CITY STANDARDS
Colleen J. Smith
Date: _____
Title: _____

98323.02
CD: R-349303

| 3/1/09 | <p>CITY OF RENTON Planning/Building/Public Works Dept. Craig Zimmerman, P.E., Administrator</p> | <p>1"=20' H. 1"=5' V.</p> | | <p>PROJECT: LAKE WASH. BLVD. IMPROVEMENTS SOUTHPORT DEVELOPMENT</p> | <p>DATE: 11/16/02 12:57</p> | | | | | | | | | | |
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| 3/1/09 | | | | <p>REVISION</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 5%;">NO.</th> <th style="width: 45%;">DESCRIPTION</th> <th style="width: 10%;">BY</th> <th style="width: 10%;">DATE</th> <th style="width: 10%;">APPROVED</th> </tr> <tr> <td>1</td> <td>PER CITY OF RENTON REVIEW</td> <td></td> <td>3/23/09</td> <td></td> </tr> </table> | NO. | DESCRIPTION | BY | DATE | APPROVED | 1 | PER CITY OF RENTON REVIEW | | 3/23/09 | | |
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| 1 | PER CITY OF RENTON REVIEW | | 3/23/09 | | | | | | | | | | | | |

SEC 8, TWP 23N, RGE 5E, W.M.



VICINITY MAP
NOT TO SCALE

OWNER:
SECO DEVELOPMENT, INC.
10643 NE 8TH STREET, STE. 200
RENTON, WA 98056
CONTACT: REX ALLEN
PHONE: (425) 688-3085

TRANSPORTATION ENGINEER:
THE TRANSPO GROUP, INC.
11720 118TH AVENUE NE, STE. 600
RENTON, WA 98056
CONTACT: CHRIS BROCKETT, PE
PHONE: (425) 821-3865

NOTES:

- 1 R.R. CROSSING SIGNAL (LOCATION/DESIGN TO BE COORD. WITH BNSF & THE TRANSPO GROUP, INC.)
- 2 CONCRETE R.R. TRACK CROSSING APRON (DESIGN COORD. WITH BNSF)
- 3 EXIST. ACCESS ESMT. THRU B.N.S.F. R.O.W. AREA = 10,731 SF
- 4 PROPOSED ACCESS ESMT. THRU B.N.S.F. R.O.W. AREA = 10,731 SF

LEGEND:
PROPERTY LINE
EX. EASEMENT LINE
NEW EASEMENT LINE

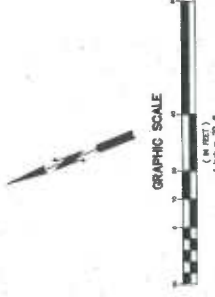
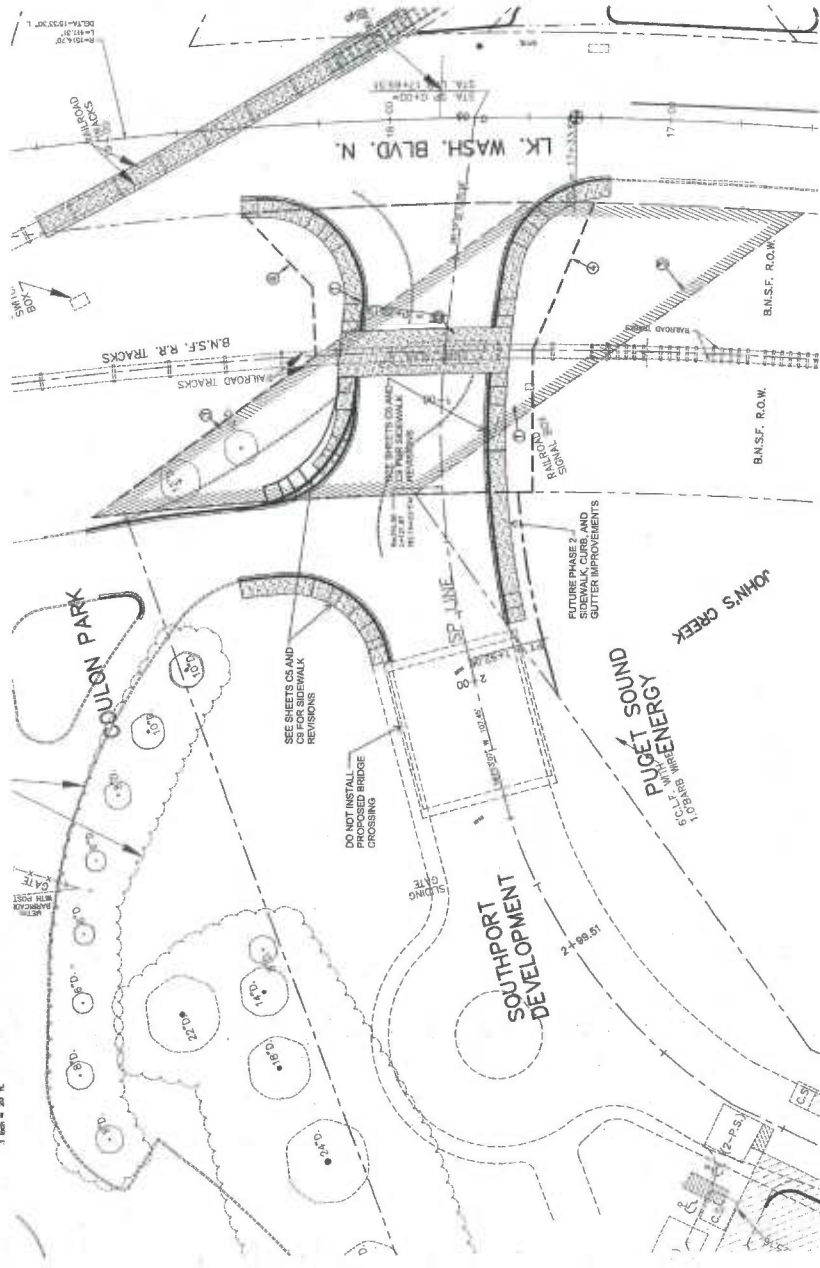
R-349306

CHECKED FOR COMPLIANCE TO CITY STANDARDS
[Signature]
Date: _____

99323.02
BUSH, ROED & HITCHINGS, INC.
CIVIL ENGINEERS & LAND SURVEYORS
1000 1ST AVE. S.W.
SEATTLE, WA 98108
PH: 206-461-1100
FAX: 206-461-1101
E-MAIL: RHB@RHSURV.COM

SEAL

SEAL



| NO. | REVISION | BY | DATE | APP. | DATE | APP. | DATE | APP. |
|-----|---------------------------|----|---------|------|------|------|------|------|
| 1 | PER CITY OF RENTON REVIEW | | 9/13/08 | | | | | |
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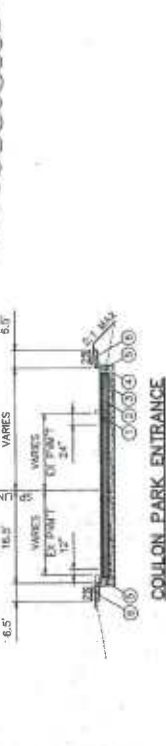
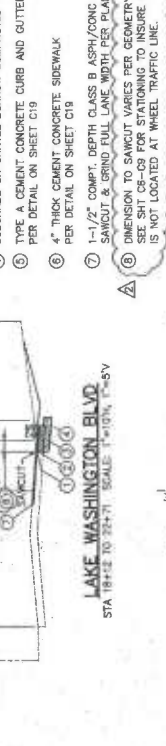
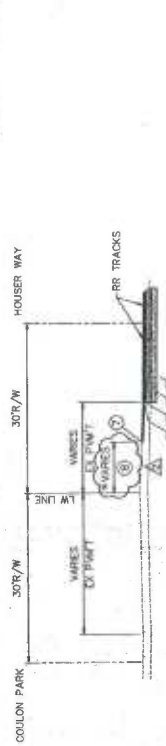
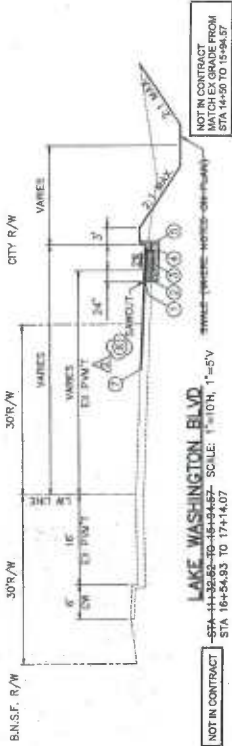
CITY OF RENTON
Planning/Building/Public Works Dept.
City Administrator: Greg Zimmerman

DRIVEWAY ACCESS EASEMENT
LAKE WASH. BLVD. IMPROVEMENTS
SOUTHPORT DEVELOPMENT

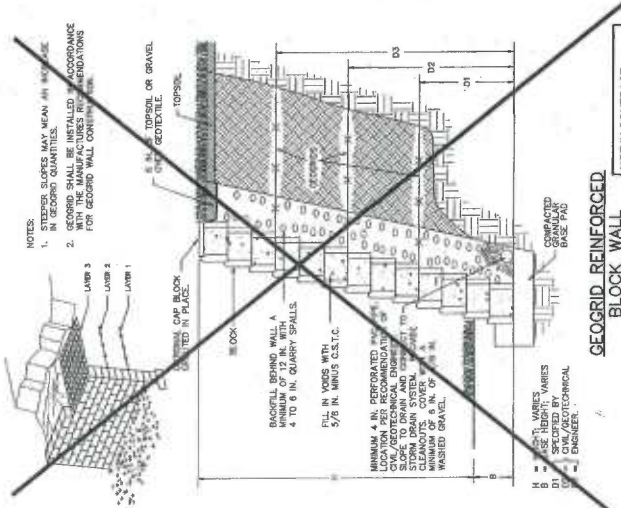
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 99323-01 (ORIGINAL) (REV. DWG)
 CLW-R-349306

SEC 8, TWP 23N, RGE 5E, W.M.



- ① 2" COMPT. DEPTH CLASS B ASPH/CONC PAINTMENT
- ② 6" COMPT. DEPTH ASPHALT TREATED BASE
- ③ 8" COMPT. DEPTH CRUSHED SURFACING BASE COURSE
- ④ SUBGRADE OR GRAVEL BORROW COMPACTED TO 95% PER DETAIL ON SHEET C19
- ⑤ TYPE A CEMENT CONCRETE CURB AND GUTTER PER DETAIL ON SHEET C19
- ⑥ 4" THICK CEMENT CONCRETE SIDEWALK PER DETAIL ON SHEET C19
- ⑦ 1-1/2" COMPT. DEPTH CLASS B ASPH/CONC OVERLAY SAWCUT & BRIND FULL LINE WIDTH PER PLANS
- ⑧ DIMENSION TO SAWCUT VARIES PER GEOMETRY PLANS SEE SHT C8-C9 FOR STATIONING TO INSURE SAWCUT IS NOT LOCATED AT WHEEL TRAFFIC LINE.



T-349310

CITY OF RENTON
 Planning/Engineering/Public Works Dept.
 Engineering/Planning/P.E. Administrator

DINATA
 CONSULTING ENGINEERS

AS NOTED
 DATE: 10/19/2011
 BY: [Signature]
 CHECKED: [Signature]
 DATE: 10/19/2011
 BY: [Signature]

RATION: [Blank]
 PER CITY OF RENTON [Blank]
 PER CITY OF RENTON [Blank]

LAYER: 99320E1
 PLOT: 10/19/2011 11:38

ROAD SECTIONS
 LAKE WASH. BLVD. IMPROVEMENTS
 SOUTHPORT DEVELOPMENT

CHECKED FOR COMPLIANCE
 TO CITY STANDARDS
 Date: 10/19/11
 Date: 10/19/11

99323.02
BUSH, ROED & HITCHINGS, INC.
 CIVIL ENGINEERS & LAND SURVEYORS
 2201 140th Ave. East
 Suite 200
 Everett, WA 98201
 P: 425.336.4444
 F: 425.336.4444
 E: BUSH@BRHINC.COM

99323-01 ORIGINAL SET (USE 1)

SEC 8, TWP 23N, RGE 5E, W.M.

3/1/00

LAKE WASH. BLD. IMPROVEMENTS
SOUTHPORT DEVELOPMENT

CITY OF RENTON
Planning/Building/Public Works Dept.

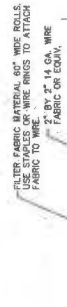


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REVISION
REV CITY OF RENTON REVIEW

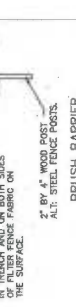
LAKE WASH. BLD. IMPROVEMENTS SOUTHPORT DEVELOPMENT



1. FILTER FABRIC MATERIAL 64" MESH ROLLS USE STAPLES OR WIRE RINGS TO ATTACH FABRIC TO WIRE FABRIC OR EDG.



2. BURY BOTTOM OF FABRIC MATERIAL IN 6" BY 12" TRENCH



3. FILTER FABRIC MATERIAL 2" BY 2" BY 14 GA. WIRE FABRIC OR EDG.



4. BRUSH BARRIER 2" BY 4" WOOD POSTS A.L. STEEL FENCE POSTS



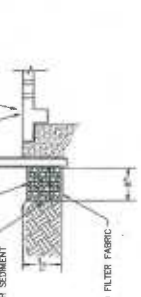
5. FILTER FABRIC FENCE NO SCALE

- FOR SHEET RUNOFF OR FOLLOWING DISCHARGE FROM A SEDIMENT TRAP OR POND.
- MAXIMUM SLOPE STEEPNESS PERPENDICULAR TO FENCE LINE IS 1:1.
- MAXIMUM SHEET PILE OVERLAND FLOW PATH LENGTH TO FENCE IS 100 FEET.
- IF 60% OR LESS OF THE SOIL BY WEIGHT IS FINE SANDS/CLAYS SMALLER THAN THE U.S. STANDARD SEIVE NO. 200, THE EGGS SHOULD BE EQUAL TO OR SMALLER THAN THE SEIVE SIZE THAT 60% OF THE SOIL CAN PASS THROUGH.
- EGGS SHALL BE MANUFACTURED WITH 3/4" MINIMUM DIAMETER WASHED GRAVEL.
- FILTER FABRIC FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPGRADE AREA HAS BEEN PERMANENTLY STABILIZED.
- FILTER FABRIC FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL EVENT. ANY REPAIRS SHALL BE MADE IMMEDIATELY.

EXISTING GROUND
ROADWAY CURB OR EDGE OF PAVEMENT
R/W



EXISTING DRIVEWAY ROAD OR SITE ACCESS



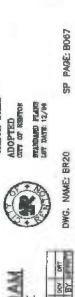
1. Use 15" x 15" mesh with 1/4" diameter rock for surfacing as shown.
Material with "fine" is not acceptable.
2. The 100' minimum length shall be lengthened as necessary to insure material is not tracked into the public right-of-way.



BLOCK CHECK DAM
NTS



ROCK CHECK DAM
NTS



SPACING BETWEEN CHECK DAMS
CHECK DAM
NO SCALE



CHECK DAM
NO SCALE



CHECK DAM
NO SCALE



SEDIMENT TRAP
NO SCALE



SEDIMENT TRAP
NO SCALE

R-349308

TEMPORARY CONSTRUCTION ENTRANCE
NO SCALE

CHECKED FOR COMPLIANCE TO CITY STANDARDS



99323.02
BUSH, ROED & HITCHINGS, INC.
Professional Engineers & Land Surveyors
1000 1st Avenue, Suite 1000
Seattle, WA 98101
P: 206.461.8800
F: 206.461.8801

CD: R-349308

LAKE WASH. BLD. IMPROVEMENTS SOUTHPORT DEVELOPMENT

PROJECT: 10/18/02 11:30
DWG#: 99323001

CONSTRUCTION NOTES
LAKE WASH. BLVD. IMPROVEMENTS
SOUTHPORT DEVELOPMENT



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AS NOTED

LAWSER 99323NOT
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LA 99323-01 (REVISED) V.02 (08)

SURFACE WATER DRAINAGE NOTES & SPECIFICATIONS

- BEFORE ANY CONSTRUCTION OR DEVELOPMENT ACTIVITY OCCURS, A PRE-CONSTRUCTION MEETING MUST BE HELD WITH THE CITY OF RENTON PLANNING DEPARTMENT.
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE 1984 STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL UTILITIES, AS AMENDED BY THE CITY OF RENTON PLANNING DEPARTMENT.
- THE SURFACE WATER DRAINAGE SYSTEM SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF RENTON PLANNING DEPARTMENT'S SURFACE WATER UTILITY DESIGN MANUAL. REQUIRE WRITTEN APPROVAL FROM THE CITY OF RENTON PLANNING DEPARTMENT FOR SURFACE WATER UTILITY.
- A COPY OF THESE SPECIFICATIONS IS TO BE ON THE JOB SITE. WHICHEVER CONSTRUCTION IS IN PROGRESS.
- DATUM SHALL BE NAVD 83 UNLESS OTHERWISE APPROVED BY CITY OF RENTON PLANNING DEPARTMENT. REFERENCE BENCHMARK AND ELEVATION ARE NOTED ON THE PLANS.
- ALL SEWAGE/STORMWATER FACILITIES MUST BE IN OPERATION AND SATISFACTORILY MAINTAINED UNTIL CONSTRUCTION IS COMPLETED AND THE POTENTIAL FOR ON-SITE EROSION HAS PASSED.
- ALL RETENTION/ATTENTION FACILITIES MUST BE INSTALLED AND IN OPERATION BEFORE ANY CONSTRUCTION ACTIVITY UNLESS OTHERWISE APPROVED BY THE DEPARTMENT OF PUBLIC WORKS, SURFACE WATER UTILITY.
- GRASS SEED MAY BE APPLIED BY HYDROSEEDING. THE GRASS SEED SHALL BE SUBMITTED BY A LANDSCAPE ARCHITECT AND APPROVED BY THE DEPARTMENT OF PUBLIC WORKS, SURFACE WATER UTILITY.
- ALL PIPE AND APPURTENANCES SHALL BE Laid ON A PROPERLY PREPARED ROAD AND BRIDGE CONSTRUCTION. THIS SHALL INCLUDE NECESSARY MATERIAL AS WELL AS PLACEMENT AND COMPACTATION OF REQUIRED BEDS. ALL PIPE BEDDING SHALL BE A PPA CLASS "C" WITH THE LENGTH OF THE PIPE WILL BE SUPPORTED ON A 30" MIN. ENTIRE LENGTH BASE. ALL PIPE BEDDING SHALL BE A PPA CLASS "C" WITH THE LENGTH COMPACTED TO MINIMUM AASHTO FOR PAVEMENT AND STRUCTURAL FILL AND BE 6" OVER AND UNDER 100% PER FEET.
- GRAVENEED BEDDING SHALL HAVE ASPHALT TREATMENT #1 OR BETTER INSIDE AND OUTSIDE.
- STRUCTURES SHALL NOT BE PERMITTED WITHIN 10 FEET OF THE TOP OF ANY CHANNEL BANK, DRAINAGE PIPE, OR 15 FEET FROM THE PAVEMENT LEVEL.
- OPEN CUT ROAD CROSSINGS THROUGH EXISTING PUBLIC RIGHT OF WAY WILL NOT BE ALLOWED UNLESS SPECIFICALLY APPROVED BY THE CITY PLANNING/ENGINEERING DEPARTMENT.
- ROCK FOR EROSION PROTECTION OF PARALLEL DITCHES, WHERE REQUIRED, SHALL BE OF SOUND QUARRY ROCK PLACED TO A DEPTH OF 24" OVER AND UNDER 100% PER FEET. ROCK PASSING 2" - 4" ROCK/50% PASSING, AND 2" ROCK/10% PASSING.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL NECESSARY SAFEGUARD, SAFETY DEVICES, PROTECTIVE EQUIPMENT, FLAGGERS, AND SIGNAGE TO PROTECT THE LIFE, HEALTH, AND SAFETY OF THE PUBLIC AND TO PROTECT THE UTILITY, HEALTH, AND SAFETY OF THE PERFORMANCE OF WORK COVERED BY THE CONTRACT. ANY NORMAL TRAFFIC FLOW SHALL REQUIRE AN APPROVED TRAFFIC CONTROL PLAN. PUBLIC WORKS TRAFFIC ENGINEERING DIVISION OF THE DEPARTMENT OF PUBLIC WORKS SHALL SUPERSEDE ANY TRAFFIC CONTROL PLAN. SPECIFICATIONS 11-07-23, TRAFFIC CONTROL SHALL APPLY.
- SPECIAL DRAINAGE MEASURES WILL BE REQUIRED IF THE PROJECT LOCATION IS WITHIN THE AQUIFER PROTECTION AREA (APA).

EROSION CONTROL NOTES

- BEFORE ANY CONSTRUCTION OR DEVELOPMENT ACTIVITY OCCURS, A PRE-CONSTRUCTION MEETING MUST BE HELD WITH THE CITY OF RENTON PLANNING DEPARTMENT.
- ALL LIMITS OF CLEARING AND AREAS OF VEGETATION PRESERVATION AS PRESCRIBED ON THE PLAN SHALL BE CLEARLY FLAGGED IN THE FIELD AND OBSERVED DURING CONSTRUCTION.
- ALL REQUIRED SEDIMENTATION/EROSION CONTROL FACILITIES MUST BE INSTALLED AND OPERATIONAL BEFORE ANY CONSTRUCTION ACTIVITY. ALL EROSION AND SEDIMENT FACILITIES SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION UNTIL SUCH TIME THAT CLEANING AND/OR CONSTRUCTION OF THE FACILITIES IS COMPLETED AND THE POTENTIAL FOR ON-SITE EROSION HAS PASSED. THE IMPLEMENTATION, MAINTENANCE, REPLACEMENT AND THE RESPONSIBILITY OF THE EROSION CONTROL SYSTEM SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- THE EROSION AND SEDIMENTATION CONTROL SYSTEMS DESCRIBED ON THIS DRAWING ARE INTENDED TO BE MINIMUM REQUIREMENTS TO PREVENT UNDESIRABLE EROSION AND SEDIMENTATION PROBLEMS AND UNDESIRABLE CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL ANTICIPATE THAT MORE EROSION AND SEDIMENTATION CONTROL MEASURES WILL BE REQUIRED TO PROTECT ADJACENT PROPERTIES AND WATER QUALITY OF THE RECEIVING DRAINAGE SYSTEM.
- APPROVAL OF THIS PLAN IS FOR EROSION/SEDIMENTATION CONTROL DESIGN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING APPROVAL OF STORM DRAINAGE DESIGN, SIZE, LOCATION, OF PIPES, RESTRICTIONS, CHANNELS, OR RETENTION FACILITIES.
- DURING THE TIME PERIOD OF NOVEMBER 1 THROUGH MARCH 31, ALL EXPOSED SOIL AREAS GREATER THAN 5,000 SQUARE FEET, THAT ARE COVERED BY MULCH, SEEDING, OR PLASTIC COVERING, MUST BE MAINTAINED THROUGHOUT CONSTRUCTION. MULCH AND SEEDING SHALL BE APPLIED TO ALL EXPOSED SOIL AREAS GREATER THAN 5,000 SQUARE FEET, OR MORE, WITHIN 14 DAYS OF EXPOSURE. MULCH SHALL BE APPLIED TO ALL EXPOSED SOIL AREAS GREATER THAN 5,000 SQUARE FEET, OR MORE, WITHIN 14 DAYS OF EXPOSURE. SEEDING SHALL BE APPLIED TO ALL EXPOSED SOIL AREAS GREATER THAN 5,000 SQUARE FEET, OR MORE, WITHIN 14 DAYS OF EXPOSURE. MULCH AND SEEDING SHALL BE APPLIED TO ALL EXPOSED SOIL AREAS GREATER THAN 5,000 SQUARE FEET, OR MORE, WITHIN 14 DAYS OF EXPOSURE. MULCH AND SEEDING SHALL BE APPLIED TO ALL EXPOSED SOIL AREAS GREATER THAN 5,000 SQUARE FEET, OR MORE, WITHIN 14 DAYS OF EXPOSURE.
- FOR ALL EROSION/SEDIMENTATION CONTROL BARRIERS, THE DEAD STORAGE DEPTH EXCEEDS 6 INCHES, A MINIMUM OF 3 FEET HIGH IS REQUIRED, WITH 3:1 SIDE SLOPES.
- A TEMPORARY GRAVEL CONSTRUCTION ENTRANCE, 24" X 50" X 8" OF 4-7.5" GRAVEL SHALL BE INSTALLED AT ALL POINTS OF VEHICULAR ACCESS AND EGRESS TO THE CONSTRUCTION SITE.

GENERAL ENGINEERING NOTES

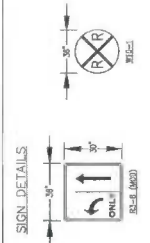
- EXISTING UTILITIES AND UNDERGROUND STRUCTURES SHOWN ON THE PLAN ARE BASED UPON THE BEST AVAILABLE PUBLIC RECORDS AND/OR OBTAINED FROM THE CITY OF RENTON PLANNING DEPARTMENT. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF ALL UTILITIES AND STRUCTURES BEFORE CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF RENTON PLANNING DEPARTMENT AND THE DEPARTMENT OF PUBLIC WORKS, SURFACE WATER UTILITY.
- IF CHANGED CONDITIONS ARE ENCOUNTERED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER PROMPTLY OF (1) EXISTING SURFACE CONDITIONS, (2) EXISTING UNDERGROUND CONDITIONS, (3) EXISTING UTILITIES, AND (4) EXISTING STRUCTURES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF RENTON PLANNING DEPARTMENT AND THE DEPARTMENT OF PUBLIC WORKS, SURFACE WATER UTILITY.
- THE CONTRACTOR SHALL TAKE REASONABLE PRECAUTIONS AND CONDUCT SOUND ENGINEERING AND CONSTRUCTION PRACTICES IN ORDER TO PROTECT ADJACENT PROPERTIES AND WATER QUALITY OF THE RECEIVING DRAINAGE SYSTEM. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF RENTON PLANNING DEPARTMENT AND THE DEPARTMENT OF PUBLIC WORKS, SURFACE WATER UTILITY.
- ALL EXCAVATION, TRENCHING, OR GRADE PREPARATION SHALL BE ACCORDING TO THE CITY OF RENTON PLANNING DEPARTMENT AND THE DEPARTMENT OF PUBLIC WORKS, SURFACE WATER UTILITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF RENTON PLANNING DEPARTMENT AND THE DEPARTMENT OF PUBLIC WORKS, SURFACE WATER UTILITY.
- ENGINEERING DESIGN AND APPROVAL FOR STRUCTURES SUCH AS WALLS, RETAINMENT WALLS, AND OTHER STRUCTURES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF RENTON PLANNING DEPARTMENT AND THE DEPARTMENT OF PUBLIC WORKS, SURFACE WATER UTILITY.
- CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF RENTON PLANNING DEPARTMENT AND THE DEPARTMENT OF PUBLIC WORKS, SURFACE WATER UTILITY.

R-349309

99323.02
BUSH, ROED & HUTCHINGS, INC.
CIVIL ENGINEERS & LAND SURVEYORS
1200 1st Ave. East
Renton, WA 98057
Phone: (206) 332-2444
Fax: (206) 332-2444
E-Mail: bhr@bushroedhutchings.com

CHECKED FOR COMPLIANCE TO CITY STANDARDS
Date: 12/20/00

CD: R-349309

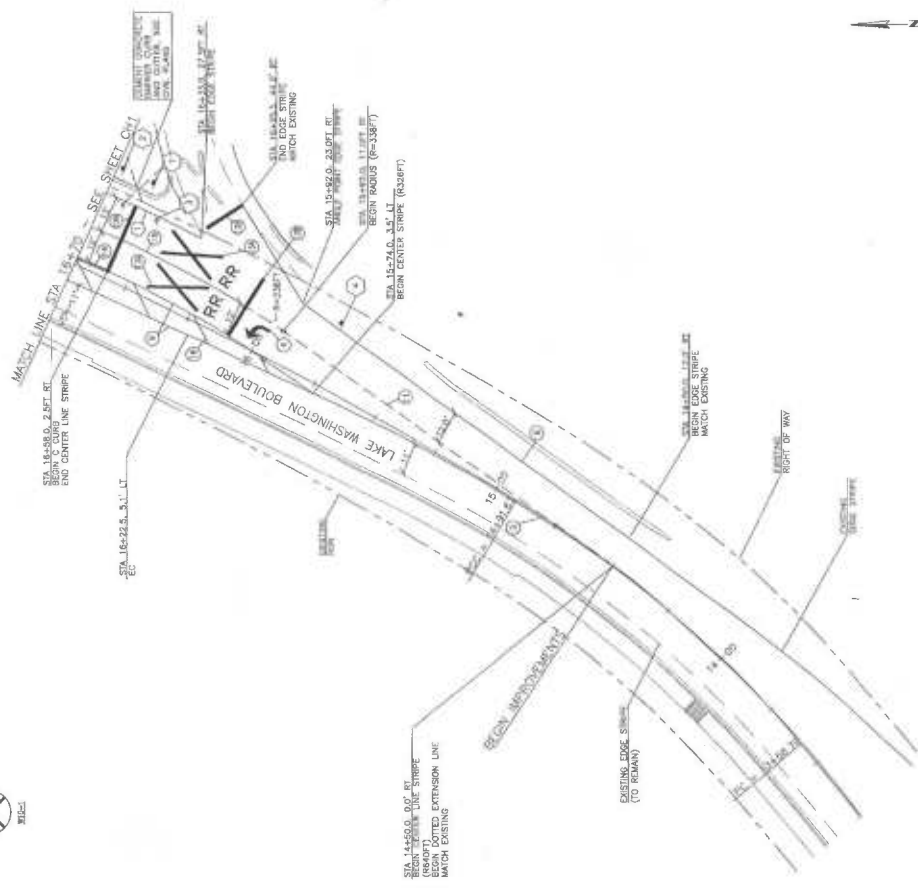


SEC B, TWP 23N, RGE 5E, W.M.

GENERAL NOTES
FOR GENERAL NOTES, SEE SHEET CH1.

CHANNELIZATION NOTES

- ① INSTALL BIN SOLID WHITE PAINTED WIDE LINE, PER CITY OF RENTON STANDARD PLANS.
- ② INSTALL TYPE 2L METHYLMETHACRYLATE PAVEMENT ARROW, PER CITY OF RENTON STANDARD PLANS, PAGE 1003.
- ③ INSTALL SOLID WHITE PAINTED EDGE STRIPE, PER CITY OF RENTON STANDARD PLANS, PAGE 1001.
- ④ INSTALL BIN DOUBLE YELLOW CENTER LINE, PER CITY OF RENTON STANDARD PLANS, PAGE 1001.
- ⑤ INSTALL BIN WHITE PAINTED DOTTED EXTENSION LINE PER DETAIL A, SHEET CH1.
- ⑥ INSTALL WHITE THERMOPLASTIC TRANSVERSE LINE PER CITY OF RENTON STANDARD PLANS, PAGE 1002.2.
- ⑦ INSTALL 24" WHITE THERMOPLASTIC TRANSVERSE LINE PER CITY OF RENTON STANDARD PLANS, PAGE 1002.2.
- ⑧ INSTALL 18" THERMOPLASTIC TYPIC CURB, PER CITY OF RENTON STANDARD PLANS, PAGE 1002.
- ⑨ INSTALL ROW APPROACH LINE, PER CITY OF RENTON STANDARD PLANS, PAGE 1002.
- ⑩ INSTALL MACHIRE STRIPING PER DETAIL B, SHEET CH1.



CONSTRUCTION NOTES (THIS SHEET ONLY)

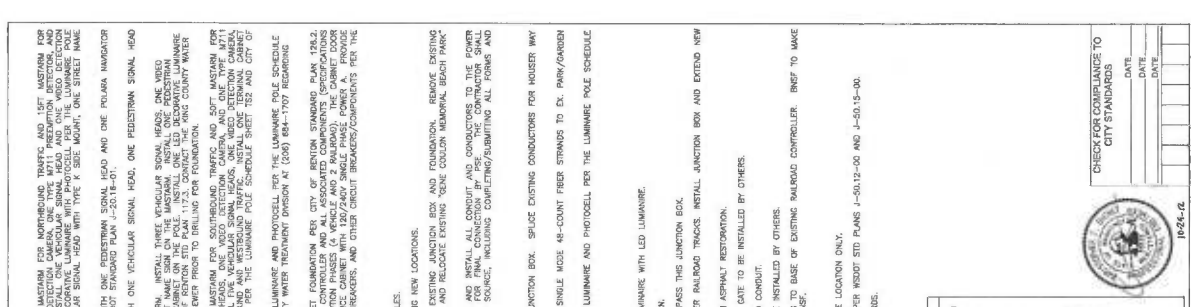
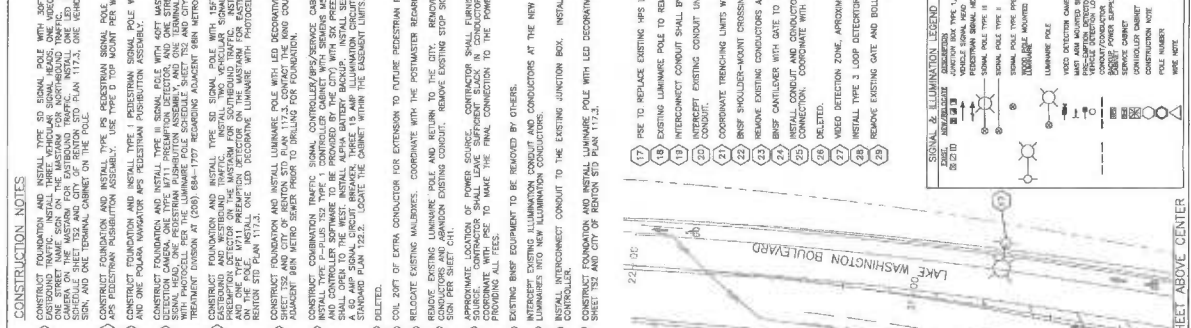
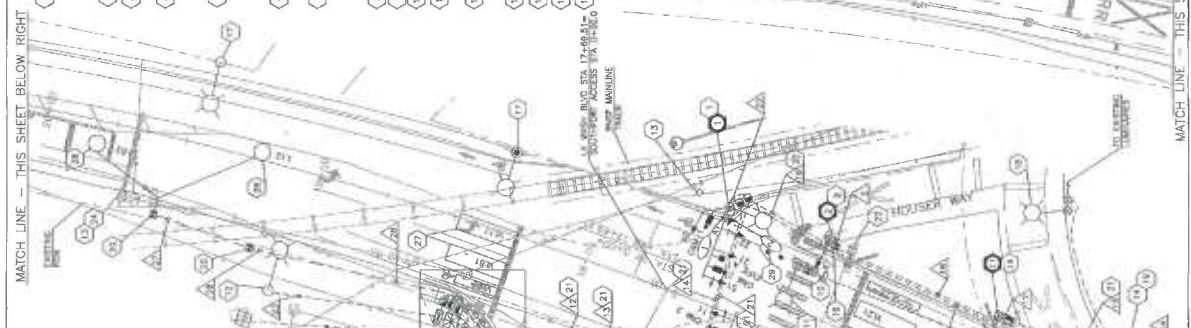
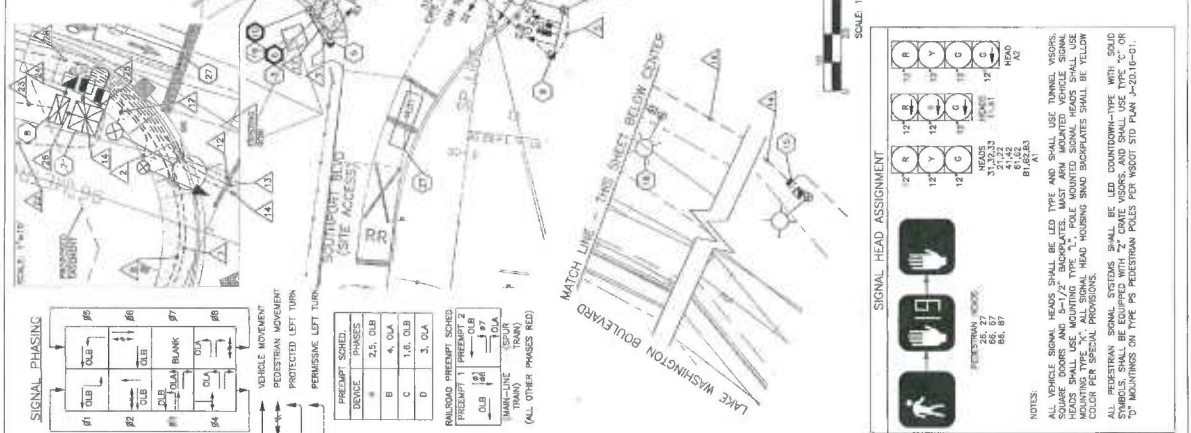
- ① RELOCATE EXISTING "OVERWEIGHT VEHICLES PROHIBITED" SIGN TO APPROXIMATE LOCATION PER NEW 4IN X 4IN WOOD POST PER CITY OF RENTON STANDARD PLANS, PAGE 1012.
- ② INSTALL 12"-RADIUS LANE USE SIGN, PER THE SIGN DETAILS ON THIS SHEET, ON A 4IN X 4IN WOOD POST AT THE APPROXIMATE LOCATION SHOWN, PER CITY OF RENTON STANDARD PLANS, PAGE 1012.
- ③ REMOVE EXISTING RAILROAD CROSSING AND NO PARKING SIGNS.
- ④ INSTALL W10-1 RAILROAD CROSSING SIGN, PER THE SIGN DETAILS ON THIS SHEET, ON A 4IN X 4IN WOOD POST AT THE APPROXIMATE LOCATION SHOWN, PER CITY OF RENTON STANDARD PLANS, PAGE 1012.



CHECK FOR COMPLIANCE TO CITY STANDARDS

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CHECK FOR COMPLIANCE TO CITY STANDARDS

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1024-G

SIGNAL & ILLUMINATION LEGEND

SIGNAL POLE TYPE 1, 1A, 1B, 1C, 1D, 1E, 1F, 1G, 1H, 1I, 1J, 1K, 1L, 1M, 1N, 1O, 1P, 1Q, 1R, 1S, 1T, 1U, 1V, 1W, 1X, 1Y, 1Z, 1AA, 1AB, 1AC, 1AD, 1AE, 1AF, 1AG, 1AH, 1AI, 1AJ, 1AK, 1AL, 1AM, 1AN, 1AO, 1AP, 1AQ, 1AR, 1AS, 1AT, 1AU, 1AV, 1AW, 1AX, 1AY, 1AZ, 1BA, 1BB, 1BC, 1BD, 1BE, 1BF, 1BG, 1BH, 1BI, 1BJ, 1BK, 1BL, 1BM, 1BN, 1BO, 1BP, 1BQ, 1BR, 1BS, 1BT, 1BU, 1BV, 1BW, 1BX, 1BY, 1BZ, 1CA, 1CB, 1CC, 1CD, 1CE, 1CF, 1CG, 1CH, 1CI, 1CJ, 1CK, 1CL, 1CM, 1CN, 1CO, 1CP, 1CQ, 1CR, 1CS, 1CT, 1CU, 1CV, 1CW, 1CX, 1CY, 1CZ, 1DA, 1DB, 1DC, 1DD, 1DE, 1DF, 1DG, 1DH, 1DI, 1DJ, 1DK, 1DL, 1DM, 1DN, 1DO, 1DP, 1DQ, 1DR, 1DS, 1DT, 1DU, 1DV, 1DW, 1DX, 1DY, 1DZ, 1EA, 1EB, 1EC, 1ED, 1EE, 1EF, 1EG, 1EH, 1EI, 1EJ, 1EK, 1EL, 1EM, 1EN, 1EO, 1EP, 1EQ, 1ER, 1ES, 1ET, 1EU, 1EV, 1EW, 1EX, 1EY, 1EZ, 1FA, 1FB, 1FC, 1FD, 1FE, 1FF, 1FG, 1FH, 1FI, 1FJ, 1FK, 1FL, 1FM, 1FN, 1FO, 1FP, 1FQ, 1FR, 1FS, 1FT, 1FU, 1FV, 1FW, 1FX, 1FY, 1FZ, 1GA, 1GB, 1GC, 1GD, 1GE, 1GF, 1GG, 1GH, 1GI, 1GJ, 1GK, 1GL, 1GM, 1GN, 1GO, 1GP, 1GQ, 1GR, 1GS, 1GT, 1GU, 1GV, 1GW, 1GX, 1GY, 1GZ, 1HA, 1HB, 1HC, 1HD, 1HE, 1HF, 1HG, 1HH, 1HI, 1HJ, 1HK, 1HL, 1HM, 1HN, 1HO, 1HP, 1HQ, 1HR, 1HS, 1HT, 1HU, 1HV, 1HW, 1HX, 1HY, 1HZ, 1IA, 1IB, 1IC, 1ID, 1IE, 1IF, 1IG, 1IH, 1II, 1IJ, 1IK, 1IL, 1IM, 1IN, 1IO, 1IP, 1IQ, 1IR, 1IS, 1IT, 1IU, 1IV, 1IW, 1IX, 1IY, 1IZ, 1JA, 1JB, 1JC, 1JD, 1JE, 1JF, 1JG, 1JH, 1JI, 1JJ, 1JK, 1JL, 1JM, 1JN, 1JO, 1JP, 1JQ, 1JR, 1JS, 1JT, 1JU, 1JV, 1JW, 1JX, 1JY, 1JZ, 1KA, 1KB, 1KC, 1KD, 1KE, 1KF, 1KG, 1KH, 1KI, 1KJ, 1KK, 1KL, 1KM, 1KN, 1KO, 1KP, 1KQ, 1KR, 1KS, 1KT, 1KU, 1KV, 1KW, 1KX, 1KY, 1KZ, 1LA, 1LB, 1LC, 1LD, 1LE, 1LF, 1LG, 1LH, 1LI, 1LJ, 1LK, 1LL, 1LM, 1LN, 1LO, 1LP, 1LQ, 1LR, 1LS, 1LT, 1LU, 1LV, 1LW, 1LX, 1LY, 1LZ, 1MA, 1MB, 1MC, 1MD, 1ME, 1MF, 1MG, 1MH, 1MI, 1MJ, 1MK, 1ML, 1MN, 1MO, 1MP, 1MQ, 1MR, 1MS, 1MT, 1MU, 1MV, 1MW, 1MX, 1MY, 1MZ, 1NA, 1NB, 1NC, 1ND, 1NE, 1NF, 1NG, 1NH, 1NI, 1NJ, 1NK, 1NL, 1NM, 1NO, 1NP, 1NQ, 1NR, 1NS, 1NT, 1NU, 1NV, 1NW, 1NX, 1NY, 1NZ, 1OA, 1OB, 1OC, 1OD, 1OE, 1OF, 1OG, 1OH, 1OI, 1OJ, 1OK, 1OL, 1OM, 1ON, 1OO, 1OP, 1OQ, 1OR, 1OS, 1OT, 1OU, 1OV, 1OW, 1OX, 1OY, 1OZ, 1PA, 1PB, 1PC, 1PD, 1PE, 1PF, 1PG, 1PH, 1PI, 1PJ, 1PK, 1PL, 1PM, 1PN, 1PO, 1PP, 1PQ, 1PR, 1PS, 1PT, 1PU, 1PV, 1PW, 1PX, 1PY, 1PZ, 1QA, 1QB, 1QC, 1QD, 1QE, 1QF, 1QG, 1QH, 1QI, 1QJ, 1QK, 1QL, 1QM, 1QN, 1QO, 1QP, 1QQ, 1QR, 1QS, 1QT, 1QU, 1QV, 1QW, 1QX, 1QY, 1QZ, 1RA, 1RB, 1RC, 1RD, 1RE, 1RF, 1RG, 1RH, 1RI, 1RJ, 1RK, 1RL, 1RM, 1RN, 1RO, 1RP, 1RQ, 1RR, 1RS, 1RT, 1RU, 1RV, 1RW, 1RX, 1RY, 1RZ, 1SA, 1SB, 1SC, 1SD, 1SE, 1SF, 1SG, 1SH, 1SI, 1SJ, 1SK, 1SL, 1SM, 1SN, 1SO, 1SP, 1SQ, 1SR, 1SS, 1ST, 1SU, 1SV, 1SW, 1SX, 1SY, 1SZ, 1TA, 1TB, 1TC, 1TD, 1TE, 1TF, 1TG, 1TH, 1TI, 1TJ, 1TK, 1TL, 1TM, 1TN, 1TO, 1TP, 1TQ, 1TR, 1TS, 1TT, 1TU, 1TV, 1TW, 1TX, 1TY, 1TZ, 1UA, 1UB, 1UC, 1UD, 1UE, 1UF, 1UG, 1UH, 1UI, 1UJ, 1UK, 1UL, 1UM, 1UN, 1UO, 1UP, 1UQ, 1UR, 1US, 1UT, 1UU, 1UV, 1UW, 1UX, 1UY, 1UZ, 1VA, 1VB, 1VC, 1VD, 1VE, 1VF, 1VG, 1VH, 1VI, 1VJ, 1VK, 1VL, 1VM, 1VN, 1VO, 1VP, 1VQ, 1VR, 1VS, 1VT, 1VU, 1VV, 1VW, 1VX, 1VY, 1VZ, 1WA, 1WB, 1WC, 1WD, 1WE, 1WF, 1WG, 1WH, 1WI, 1WJ, 1WK, 1WL, 1WM, 1WN, 1WO, 1WP, 1WQ, 1WR, 1WS, 1WT, 1WU, 1WV, 1WW, 1WX, 1WY, 1WZ, 1XA, 1XB, 1XC, 1XD, 1XE, 1XF, 1XG, 1XH, 1XI, 1XJ, 1XK, 1XL, 1XM, 1XN, 1XO, 1XP, 1XQ, 1XR, 1XS, 1XT, 1XU, 1XV, 1XW, 1XX, 1XY, 1XZ, 1YA, 1YB, 1YC, 1YD, 1YE, 1YF, 1YG, 1YH, 1YI, 1YJ, 1YK, 1YL, 1YM, 1YN, 1YO, 1YP, 1YQ, 1YR, 1YS, 1YT, 1YU, 1YV, 1YW, 1YX, 1YY, 1YZ, 1ZA, 1ZB, 1ZC, 1ZD, 1ZE, 1ZF, 1ZG, 1ZH, 1ZI, 1ZJ, 1ZK, 1ZL, 1ZM, 1ZN, 1ZO, 1ZP, 1ZQ, 1ZR, 1ZS, 1ZT, 1ZU, 1ZV, 1ZW, 1ZX, 1ZY, 1ZZ

VEHICLE SIGNAL PHASING

| | | | | |
|-------|-------|-------|-------|-------|
| PHASE | PHASE | PHASE | PHASE | PHASE |
| P1 | P2 | P3 | P4 | P5 |

RAILROAD PREEMPT SCHED

| | |
|-----------|-----------|
| PREEMPT 1 | PREEMPT 2 |
| 0.5 | 1.0 |
| 1.5 | 2.0 |
| 2.5 | 3.0 |

MARKING

| | |
|---------|------|
| MARKING | SPUR |
| 0.5 | 1.0 |
| 1.5 | 2.0 |
| 2.5 | 3.0 |

NOTES

ALL VEHICLE SIGNAL HEADS SHALL BE LED TYPE AND SHALL USE TUNNEL VISORS, SQUARE DOORS AND 5-1/2" BACKPLATES. MUST ARM INDICATED VEHICLE SIGNAL MOUNTING TYPE "X". ALL SIGNAL HEAD HOUSING SIGN BACKPLATES SHALL BE YELLOW COLOR PER SPECIAL PROVISIONS.

ALL PEDESTRIAN SIGNAL SYSTEMS SHALL BE LED, COUNTERDOWN-TYPE WITH SOLID STATE LED INDICATORS. ALL PEDESTRIAN SIGNAL SYSTEMS SHALL BE TYPE PS OR TYPE PS MOUNTINGS ON TYPE PS PEDESTRIAN POLES PER WSDOT STD PLAN J-303.16-C1.

TRAFFIC SIGNAL PLAN
LAKE WASHINGTON BOULEVARD/
SITE ACCESS
CITY OF RENTON
Pumpkin/Planting/Public Works Dept.
10/29/12

NO. 4
DATE
BY
APPR
REVISION

SIGNAL & ILLUMINATION GENERAL NOTES

1. THE LOCATION OF ALL CONDUIT, LUMINAIRE BOWS AND CEMENTS SHOWN ON THIS PLAN ARE APPROXIMATE ONLY. FINAL LOCATION SHALL BE DETERMINED BY THE CONTRACTOR AND CONFIRMED IN THE FIELD BY THE ENGINEER.
2. ALL WORK SHALL BE IN ACCORDANCE WITH THESE PLANS, THE PROJECT SPECIAL PROVISIONS, CITY OF RENTON STANDARDS AND MSDOT STANDARDS AND SPECIFICATIONS.
3. THE LOCATIONS OF FEATURES SHOWN ARE APPROXIMATE AND SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR AS NECESSARY.
4. THE CONTRACTOR SHALL SUBMIT A REQUEST TO THE CITY OF RENTON FOR MATERIALS APPROVAL AT THE EARLIEST POSSIBLE DATE.
5. ALL WORK SHALL BE CONSISTENT WITH UTILITY AGENCY REQUIREMENTS. THE CONTRACTOR SHALL CONTACT ALL PERTINENT UTILITY AGENCIES AS SOON AS POSSIBLE BEFORE COMMENCING WORK, AND SHALL COORDINATE WITH AFFECTED UTILITY AGENCIES THROUGHOUT THE PROJECT.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO EXISTING UTILITIES. THE CONTRACTOR SHALL NOTIFY THE AFFECTED UTILITY COMPANY AND THE CITY OF RENTON IMMEDIATELY UPON DAMAGE.
7. POLE FOUNDATIONS SHALL NOT BE EXCAVATED AND POURED BEFORE POLE LOCATIONS ARE APPROVED BY THE ENGINEER.
8. THE CONTRACTOR SHALL CONFIRM THAT 10 FEET MINIMUM CIRCUMFERENTIAL CLEARANCE IS PROVIDED BETWEEN LUMINAIRE POLES AND OVERHEAD POWER LINES. IF A CONFLICT IS DISCOVERED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO FOUNDATION INSTALLATION.
9. FOR SIGNAL SYSTEM COORDINATION WITH THE CITY OF RENTON, CONTRACTOR SHALL CONTACT TRANSPORTATION MAINTENANCE DEPARTMENT SUPERVISOR DAVE WINNISH AT (425) 430-7425.

SEC 8, TWP 23N, RGE 5E, W.M.

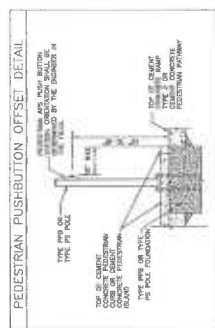
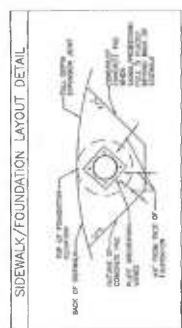
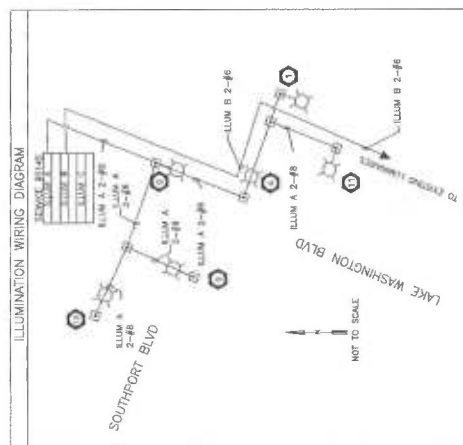
SERVICE #0145 BREAKER SCHEDULE

| CIRCUIT | BREAKER | CONTRACTOR |
|-----------------|------------|------------|
| MAN | 2P-100 AMP | |
| SIGNAL | 1P-30 AMP | |
| ILLUM A | 2P-20 AMP | 30 AMP |
| ILLUM B | 2P-20 AMP | 30 AMP |
| ILLUM C (SPARE) | 2P-20 AMP | 30 AMP |

SEE STD PLAN 1212L FOR ADDITIONAL REQUIREMENTS

LUMINAIRE POLE SCHEDULE

| LUMINAIRE POLE NO. | LUM. TYPE | ARM LENGTH | SERVICE/CIRCUIT | POLE TYPE | POLE D # | CONTRACTOR |
|--------------------|---------------------------------|------------|--------------------------|---------------------|----------|------------|
| 1 | DONUS DM550 135W BOLEB4K-C5-LED | 30FT | NEW HOUSER SERVICE OCT B | MASTARM SIGNAL POLE | 6045N | 6045N |
| 4 | DONUS DM550 135W BOLEB4K-C5-LED | 35FT | NEW HOUSER SERVICE OCT B | MASTARM SIGNAL POLE | 6042N | 6042N |
| 5 | DONUS DM550 135W BOLEB4K-C5-LED | 35FT | NEW HOUSER SERVICE OCT B | SIGNAL POLE | 6046N | 6046N |
| 9 | DONUS DM550 135W BOLEB4K-C5-LED | 35FT | NEW HOUSER SERVICE OCT B | LUMINAIRE POLE | 6044N | 6044N |
| 10 | DONUS DM550 135W BOLEB4K-C5-LED | 35FT | NEW HOUSER SERVICE OCT B | LUMINAIRE POLE | 6047N | 6047N |
| 11 | DONUS DM550 135W BOLEB4K-C5-LED | 35FT | NEW HOUSER SERVICE OCT B | LUMINAIRE POLE | 6043N | 6043N |



| CONTRACTOR | 30 FT OR MORE (900 MM OR MORE) | 25 FT (7620 MM) | 20 FT OR MORE (6000 MM) | 15 FT (4500 MM) | 12 FT (3600 MM) | 10 FT (3000 MM) | 8 FT (2400 MM) | 6 FT (1800 MM) | 4 FT (1200 MM) | 3 FT (900 MM) | 2 FT (600 MM) | 1 FT (300 MM) |
|------------|--------------------------------|-----------------|-------------------------|-----------------|-----------------|-----------------|----------------|----------------|----------------|---------------|---------------|---------------|
| NOT USED | | | | | | | | | | | | |
| 1. SCHED | | | | | | | | | | | | |
| 2. SCHED | | | | | | | | | | | | |
| 3. SCHED | | | | | | | | | | | | |
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| 5. SCHED | | | | | | | | | | | | |
| 6. SCHED | | | | | | | | | | | | |
| 7. SCHED | | | | | | | | | | | | |
| 8. SCHED | | | | | | | | | | | | |
| 9. SCHED | | | | | | | | | | | | |
| 10. SCHED | | | | | | | | | | | | |
| 11. SCHED | | | | | | | | | | | | |
| 12. SCHED | | | | | | | | | | | | |
| 13. SCHED | | | | | | | | | | | | |
| 14. SCHED | | | | | | | | | | | | |
| 15. SCHED | | | | | | | | | | | | |
| 16. SCHED | | | | | | | | | | | | |
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| 22. SCHED | | | | | | | | | | | | |
| 23. SCHED | | | | | | | | | | | | |
| 24. SCHED | | | | | | | | | | | | |
| 25. SCHED | | | | | | | | | | | | |
| 26. SCHED | | | | | | | | | | | | |
| 27. SCHED | | | | | | | | | | | | |
| 28. SCHED | | | | | | | | | | | | |
| 29. SCHED | | | | | | | | | | | | |
| 30. SCHED | | | | | | | | | | | | |

10. INCLUDES 1-50 & 1-20 FOR FUTURE PFD POLE. CON. 20-FT OF CONDUCTOR IN POLE & JUNCTION BOX

WIRING NOTES

1. ALL CONDUITS CONTAINING COPPER CONDUCTORS SHALL INCLUDE GROUND WIRE. GROUND WIRE SIZE SHALL MATCH THE LARGEST CONDUCTOR (MIN #6 AWG OR AS NOTED OTHERWISE IN THE WIRE NOTES). CONDUITS SHALL BE IDENTIFIED BY COLOR AND SHALL CONTAIN IDENTIFIABLE MARKING. CONDUITS SHALL BE LABELED "CITY OF RENTON" AND SHALL CONTAIN IDENTIFIABLE MARKING.
2. ALL CONDUIT SHALL BE PVC SCH 40, EXCEPT UNDER ROADWAY USE PVC SCHEDULE 80 CONDUIT.

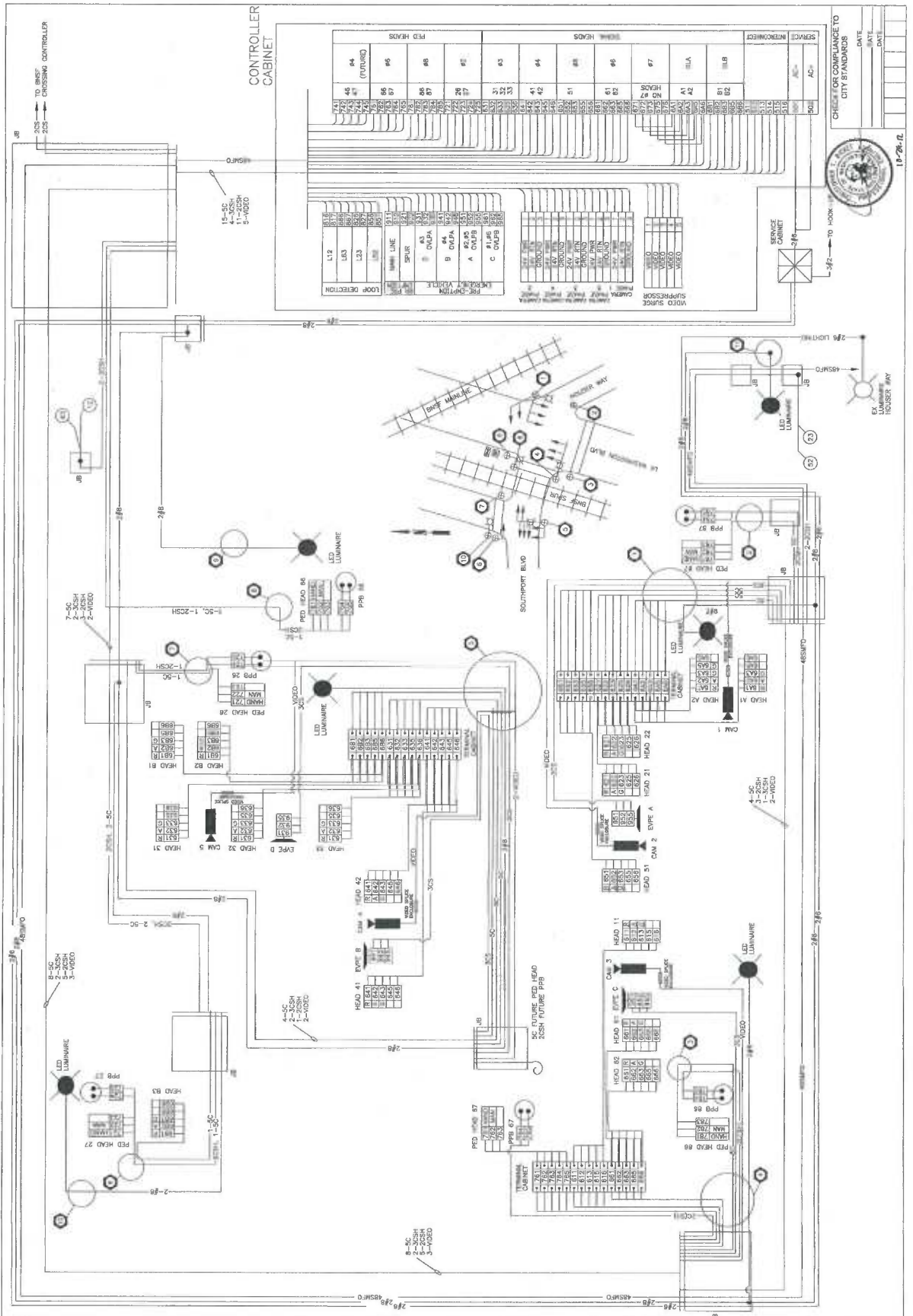


CHECK FOR COMPLIANCE TO CITY STANDARDS

DATE: _____

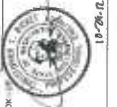
DATE: _____

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CHECK FOR COMPLIANCE TO CITY STANDARDS

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LAKE WASHINGTON BOULEVARD/SITE ACCESS

10/24/12

153

SIGNAL WIRING DIAGRAM

BY DATE

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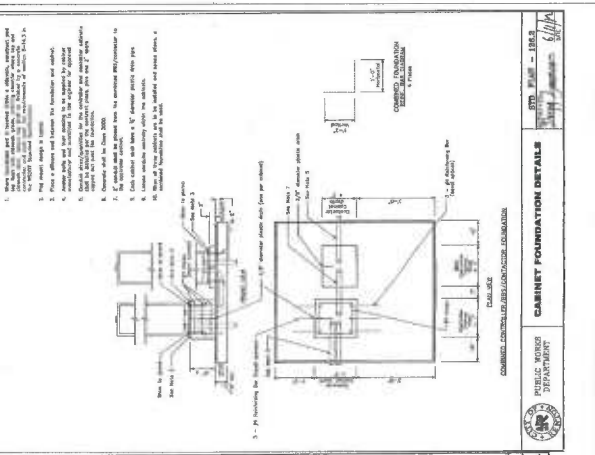
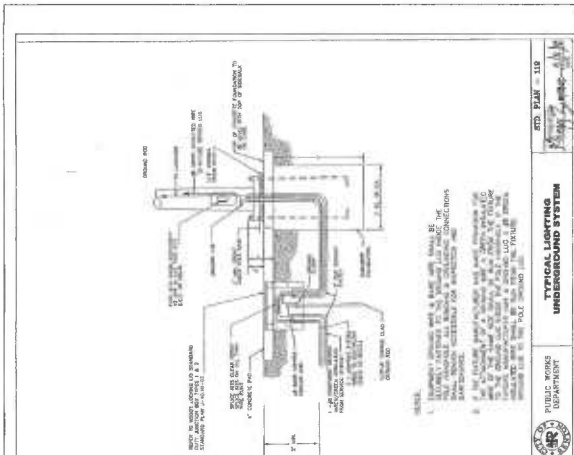
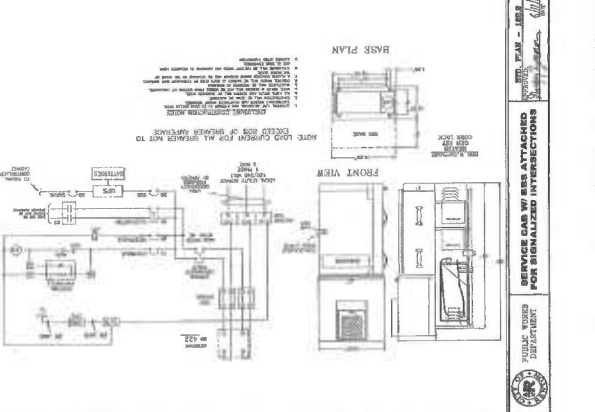
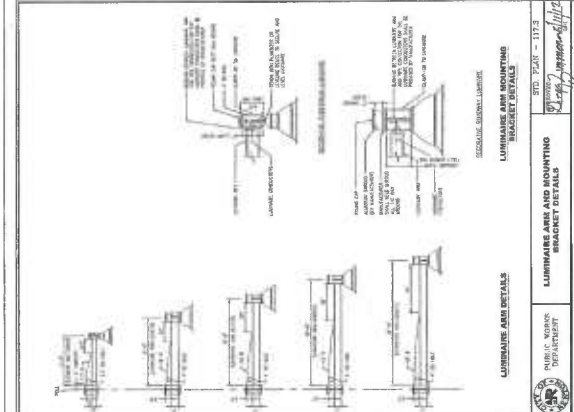
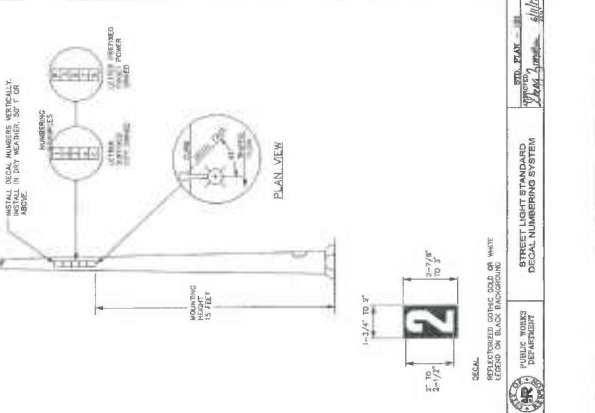
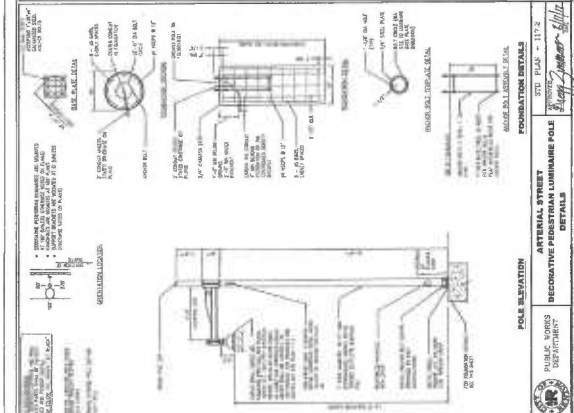
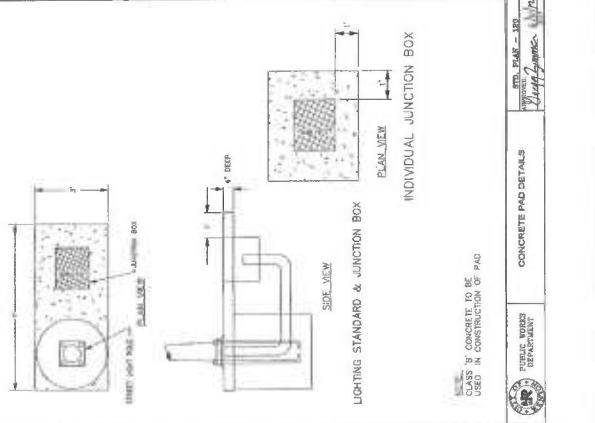
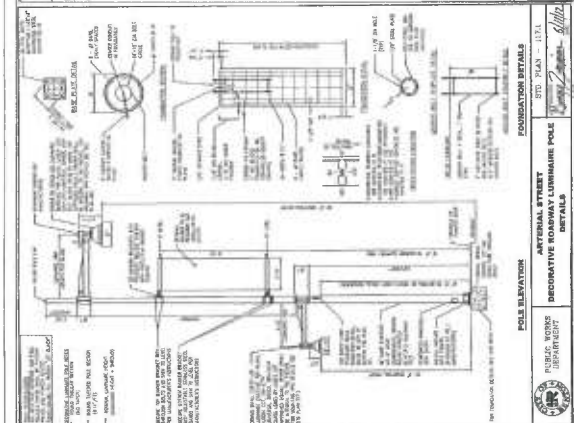
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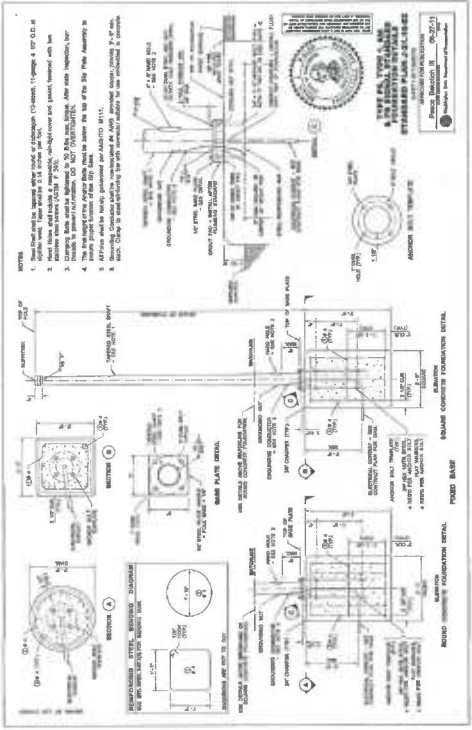
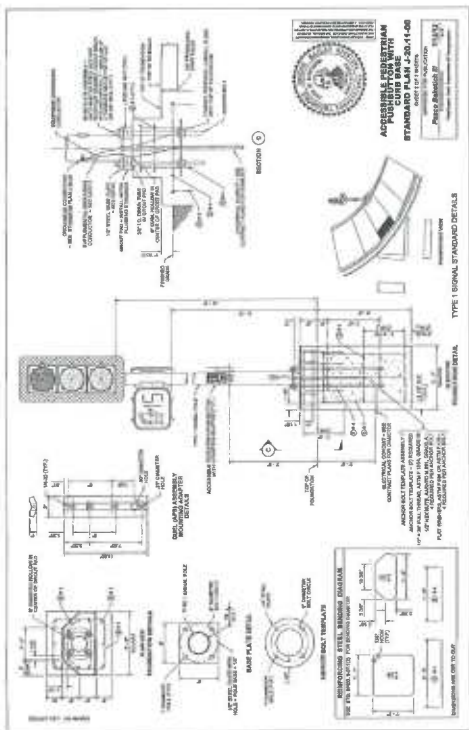
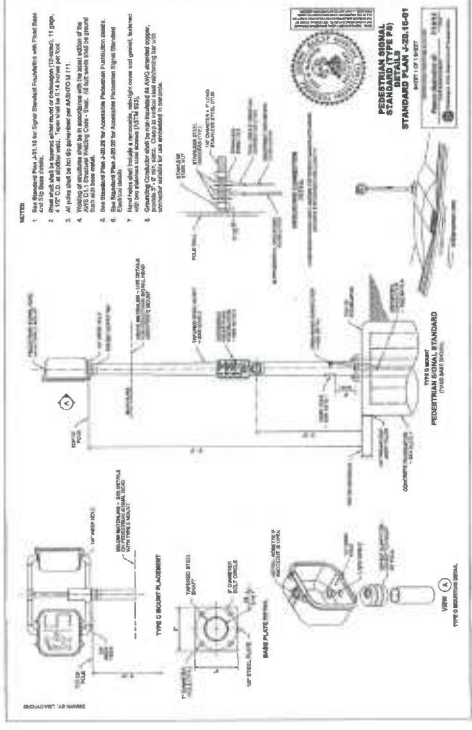
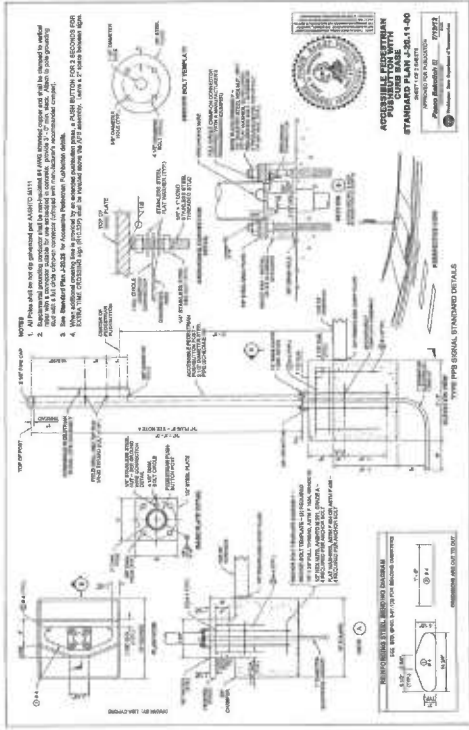
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 Transportation Engineering Northwest
 10000 1st Avenue, Suite 1000, Seattle, WA 98104
 Phone: 206.261.1100
 Fax: 206.261.1101
 www.tenw.com

CITY OF RENTON
 Planning/Building/Public Works Dept.

19/24/12

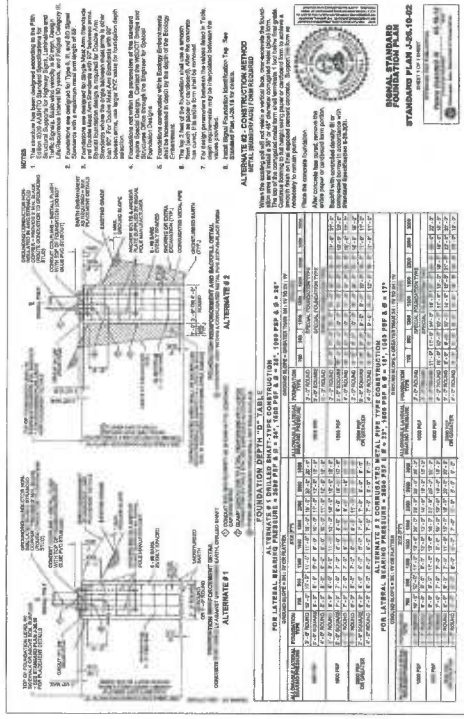
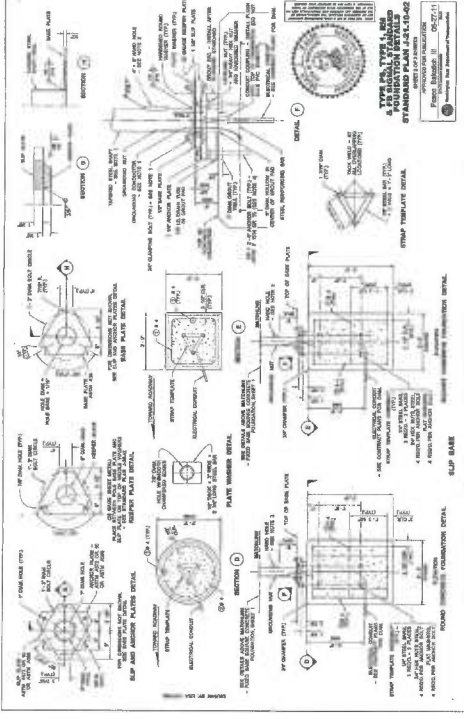
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TENW
 TRANSPORTATION ENGINEERING NORTHWEST
 11115 Greenwood Avenue, Suite 300
 Seattle, WA 98148
 Phone: (206) 445-3300
 Fax: (206) 445-3301
 Email: info@tenw.com



Hunter, Kathy (UTC)

From: Wagner, Richard W <Richard.Wagner@BNSF.com>
Sent: Wednesday, September 3, 2014 12:20 PM
To: Hunter, Kathy (UTC)
Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - Old Gene Coulon/Southport Track Petition

Yes, the Inventory Sheet lists WCRW as an operator but they have been long gone.

Rick Wagner
BNSF Mgr Public Projects
O – 206.625.6152
F – 206.625.6356

From: Hunter, Kathy (UTC) [mailto:khunter@utc.wa.gov]
Sent: Wednesday, September 03, 2014 11:12 AM
To: Wagner, Richard W
Subject: FW: WUTC for Lake Washington Blvd (Southport) Crossing - Old Gene Coulon/Southport Track Petition

Rick – Does BNSF own this line that the Southport crossing is located on?

Kathy Hunter, Deputy Assistant Director, Transportation Safety
Washington Utilities and Transportation Commission
1300 S. Evergreen Park Dr. SW
PO Box 47250
Olympia, WA 98504-7250

Office Telephone: (360) 664-1257
Cell: (360) 701-1612
Fax: (360) 586-1150

From: Wagner, Richard W [mailto:Richard.Wagner@BNSF.com]
Sent: Wednesday, September 3, 2014 10:52 AM
To: James P Wilhoit; Hunter, Kathy (UTC)
Cc: 'Jeff Schramm'; Bob M Hanson; 'Jeff Haynie'; 'Derek Janke (djanke@secodev.com)'; 'Chris Bicket'
Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - Old Gene Coulon/Southport Track Petition

As we discussed, please edit as indicated for 091725B.

Rick Wagner
BNSF Mgr Public Projects
O – 206.625.6152
F – 206.625.6356

From: James P Wilhoit [mailto:jwilhoit@Rentonwa.gov]
Sent: Wednesday, September 03, 2014 10:23 AM
To: Wagner, Richard W; 'Hunter, Kathy (UTC)'

Cc: 'Jeff Schramm'; Bob M Hanson; 'Jeff Haynie'; 'Derek Janke (djanke@secodev.com)'; 'Chris Bicket'
Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - Old Gene Coulon/Southport Track Petition

See my last e-mail.

James P. Wilhoit, PE
Project Manager
Transportation Design
City of Renton WA
(425) 430-7319
(206) 818-9357 cell

From: Wagner, Richard W [<mailto:Richard.Wagner@BNSF.com>]
Sent: Wednesday, September 03, 2014 10:12 AM
To: James P Wilhoit; 'Hunter, Kathy (UTC)'
Cc: 'Jeff Schramm'; Bob M Hanson; 'Jeff Haynie'; 'Derek Janke (djanke@secodev.com)'; 'Chris Bicket'
Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - Old Gene Coulon/Southport Track Petition

The attached do not contain my edits.

Rick Wagner
BNSF Mgr Public Projects
O – 206.625.6152
F – 206.625.6356

From: James P Wilhoit [<mailto:jwilhoit@Rentonwa.gov>]
Sent: Wednesday, September 03, 2014 10:04 AM
To: 'Hunter, Kathy (UTC)'; Wagner, Richard W
Cc: 'Jeff Schramm'; Bob M Hanson; 'Jeff Haynie'; 'Derek Janke (djanke@secodev.com)'; 'Chris Bicket'
Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - Old Gene Coulon/Southport Track Petition

Done.

Rick-

Here it is, ready for your signature which, as with the one before, goes on the second page up near the top, the Signature blank in between "The Burlington Northern and Santa Fe Railway Company/Petitioner" and "2454 Occidental Avenue South, Suite 1-A/Street Address". As soon as I get it back from you, I'll get the waiver signed, the submit to Kathy. I will call you tomorrow (Thurs. 9/4) to follow up with you if I haven't heard back from you by then.

James P. Wilhoit, PE
Project Manager
Transportation Design
City of Renton WA
(425) 430-7319
(206) 818-9357 cell

From: Hunter, Kathy (UTC) [<mailto:khunter@utc.wa.gov>]
Sent: Wednesday, September 03, 2014 9:48 AM
To: James P Wilhoit; 'Chris Bicket'; 'Wagner, Richard W'

Cc: 'Jeff Schramm'; Bob M Hanson; 'Jeff Haynie'; 'Derek Janke (djanke@secodev.com)'

Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - Old Gene Coulon/Southport Track Petition

Jim – A new docket number will be assigned so please leave it blank.

Thanks -

Kathy Hunter, Deputy Assistant Director, Transportation Safety
Washington Utilities and Transportation Commission
1300 S. Evergreen Park Dr. SW
PO Box 47250
Olympia, WA 98504-7250

Office Telephone: (360) 664-1257

Cell: (360) 701-1612

Fax: (360) 586-1150

From: James P Wilhoit [<mailto:jwilhoit@Rentonwa.gov>]

Sent: Wednesday, September 3, 2014 9:45 AM

To: 'Chris Bicket'; Hunter, Kathy (UTC); 'Wagner, Richard W'

Cc: 'Jeff Schramm'; Bob M Hanson; 'Jeff Haynie'; 'Derek Janke (djanke@secodev.com)'

Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - Old Gene Coulon/Southport Track Petition

I updated the RR Milepost and crossing cost, also the USDOT number, which you had not changed, Chris.

Kathy, should we use the same DOCKET NO. TR-010316? Leave it blank? Or do you have a new NO. to use?

James P. Wilhoit, PE
Project Manager
Transportation Design
City of Renton WA
(425) 430-7319
(206) 818-9357 cell

From: Chris Bicket [<mailto:bicket@tenw.com>]

Sent: Wednesday, September 03, 2014 8:59 AM

To: Hunter, Kathy (UTC); Wagner, Richard W; James P Wilhoit

Cc: Jeff Schramm; Bob M Hanson; Jeff Haynie; Chris Bicket; Derek Janke (djanke@secodev.com)

Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - Old Gene Coulon/Southport Track Petition

Second petition attached. Items highlighted in yellow have been updated. Items in red need verification by others (RR Milepost and crossing cost)

Thanks

Chris Bicket, P.E. | Design Manager

TENW 11400 SE 8th Street, Suite 200, Bellevue, WA 98004

bicket@tenw.com | Cell: 206-817-9400 | Direct: 425-250-5002

From: Hunter, Kathy (UTC) [<mailto:khunter@utc.wa.gov>]
Sent: Friday, August 29, 2014 11:02 AM
To: Wagner, Richard W; James P Wilhoit
Cc: Chris Bicket; Jeff Schramm; Bob M Hanson; Jeff Haynie
Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - 5-14-14 Meeting Summary

Thank you for the explanation and update on the Old Gene Coulon/Southport Boulevard petition.

Kathy Hunter, Deputy Assistant Director, Transportation Safety
Washington Utilities and Transportation Commission
1300 S. Evergreen Park Dr. SW
PO Box 47250
Olympia, WA 98504-7250

Office Telephone: (360) 664-1257
Cell: (360) 701-1612
Fax: (360) 586-1150

From: Wagner, Richard W [<mailto:Richard.Wagner@BNSF.com>]
Sent: Friday, August 29, 2014 10:50 AM
To: James P Wilhoit; Hunter, Kathy (UTC)
Cc: 'Chris Bicket (bicket@tenw.com)'; 'Jeff Schramm'; Bob M Hanson; 'Jeff Haynie (haynie@tenw.com)'
Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - 5-14-14 Meeting Summary

Thanks James!

Rick Wagner
BNSF Mgr Public Projects
O – 206.625.6152
F – 206.625.6356

From: James P Wilhoit [<mailto:jwilhoit@Rentonwa.gov>]
Sent: Friday, August 29, 2014 10:26 AM
To: 'Hunter, Kathy (UTC)'
Cc: 'Chris Bicket (bicket@tenw.com)'; 'Jeff Schramm'; Wagner, Richard W; Bob M Hanson; 'Jeff Haynie (haynie@tenw.com)'
Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - 5-14-14 Meeting Summary

Generated by Southport:

8,000 ADT increase at the Old Gene Coulon/Southport Boulevard crossing USDOT no. 91-725B (subsequent to your e-mail below you sent the one attached advising we need to a second petition for this crossing)

400 ADT increase at the LWB (Lake Washington Blvd) crossing (based on 5% of the 8,000 ADT)

However, I need to point out some things:

You will see in the attached "COR&TENW Emails of 08272014.pdf" that the overall 8,000 ADT future estimated traffic to be generated by (i. e. to increase due to) Southport is applied to a current estimated traffic at the LWB/Coulon intersection of 11,000 ADT. However, in the petition I prepared, (attached as "wutc finalsigned-petition-annotated.pdf"), I indicated that the Current Average annual daily traffic (AADT) is 18,000 (see Section 6- Current Highway Traffic Information Item 4. on page 4). Using the number 18,000 was a result of my going as much as possible by what had been put in the original petition in 2001 (attached as "TR-010316 Petition -annotated.pdf"), prior to my becoming involved with the project. But as you can see, the questions or INTERROGATORIES are formatted/phrased somewhat differently on the current petition form than they were on the 2001 form. On the latter form I found in numbers that were hand-written (I'm pretty sure by Mike Cowles, Rick Wagner's predecessor two people back, who signed the petition for BNSF), filling in INTERROGATORY [3] Character of Roadway: Item (f) Estimated vehicle traffic in 24 hours (on page 2): the following:

Current total 10100... Projected traffic in 4 years: total 18000

I don't know just where these numbers come from, but you can see that they are not too far off from the numbers TENW had in its e-mail to me, so they were probably valid. Even though 18000 was the Projected number and the Current number was a lower one, I went ahead and used 18000 for the Current number because unlike on the old form, the new form didn't have a place to indicate a Projected increase and I thought I should be conservative. I don't know whether that was right thinking or not for these type of petitions, and I hope it hasn't caused any problems. At any rate, I thought I should make clear that it would not be valid to add the projected increase of 8,000 ADT for the Old Gene Coulon/Southport Boulevard crossing and LWB I/S to 18,000 to get a new total of 26,000 ADT.

Chris Bicket is putting the Old Gene Coulon/Southport Boulevard crossing petition together and we should have it ready to get signatures next week.

James P. Wilhoit, PE
Project Manager
Transportation Design
City of Renton WA
(425) 430-7319
(206) 818-9357 cell

From: Hunter, Kathy (UTC) [<mailto:khunter@utc.wa.gov>]
Sent: Monday, August 25, 2014 12:05 PM
To: James P Wilhoit
Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - 5-14-14 Meeting Summary

Hi James,

I'm working on drafting the order authorizing the modifications to the Lake Washington Boulevard crossing and have a question. Do you know what the predicted increase in traffic will be once the Southport development is complete.

Thanks -

Kathy Hunter, Deputy Assistant Director, Transportation Safety
Washington Utilities and Transportation Commission
1300 S. Evergreen Park Dr. SW
PO Box 47250
Olympia, WA 98504-7250

Office Telephone: (360) 664-1257

Cell: (360) 701-1612

Fax: (360) 586-1150

From: James P Wilhoit [<mailto:jwilhoit@Rentonwa.gov>]

Sent: Monday, August 18, 2014 3:37 PM

To: Hunter, Kathy (UTC)

Cc: Bob M Hanson; Jan Illian; Chris Barnes; 'Tim Oster'; Eric Cutshall; Asma Tuly; 'Chris Bicket'; 'Wagner, Richard W'

Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - 5-14-14 Meeting Summary

Kathy-

Attached are:

- WUTC Petition signed by BNSF including Railroad preemption calculation worksheet and Section 14 – Waiver of Hearing by Respondent signed by the City.
- TENW-prepared interim and ultimate conditions plan to address traffic control after completion of intersection/traffic signal improvements but before BNSF work, with narrative/justification for the interim (all way stop) condition in support of the WUTC Petition, and support statement from BNSF

You have previously received CTC's preemption operation review/report.

Do you need to have any of these documents with original signatures mailed to you? Please advise and keep me informed on the status.

Thanks for your patience and assistance with all this,

James P. Wilhoit, PE
Project Manager
Transportation Design
City of Renton WA
(425) 430-7319
(206) 818-9357 cell

From: Hunter, Kathy (UTC) [<mailto:khunter@utc.wa.gov>]

Sent: Tuesday, July 15, 2014 2:24 PM

To: James P Wilhoit

Cc: 'djanke@secodev.com'; 'Barney7860@comcast.net'; 'Elyse Hanson'; 'bartb@cplinc.com'; Bob M Hanson; Jan Illian; Chris Barnes; 'Tim Oster'; Eric Cutshall; Asma Tuly; 'Nicole Jackson PE PTOE'; 'Chris Bicket'

Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - 5-14-14 Meeting Summary

James,

I don't have a preference on petitioner/respondent.

Thanks for the additional preemption information.

Kathy Hunter, Deputy Assistant Director, Transportation Safety
Washington Utilities and Transportation Commission
1300 S. Evergreen Park Dr. SW
PO Box 47250

Olympia, WA 98504-7250

Office Telephone: (360) 664-1257
Cell: (360) 701-1612
Fax: (360) 586-1150

From: James P Wilhoit [<mailto:jwilhoit@Rentonwa.gov>]
Sent: Tuesday, July 15, 2014 2:03 PM
To: Hunter, Kathy (UTC)
Cc: 'djanke@secodev.com'; 'Barney7860@comcast.net'; 'Elyse Hanson'; 'bartb@cplinc.com'; Bob M Hanson; Jan Illian; Chris Barnes; 'Tim Oster'; Eric Cutshall; Asma Tuly; 'Nicole Jackson PE PTOE'; 'Chris Bicket'
Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - 5-14-14 Meeting Summary

The past ones were sent in with BNSF as petitioner BNSF and the City as Respondent. Do you want us to do it differently this time?

Attached is the e-mail received today (Tues. 7/15/2014) from CTC with its preemption operation review/report.

James P. Wilhoit, PE
Project Manager
Transportation Design
City of Renton WA
(425) 430-7319
(206) 818-9357 cell

From: Hunter, Kathy (UTC) [<mailto:khunter@utc.wa.gov>]
Sent: Tuesday, July 15, 2014 1:54 PM
To: James P Wilhoit; 'Chris Bicket'
Cc: 'djanke@secodev.com'; 'Barney7860@comcast.net'; 'Elyse Hanson'; 'bartb@cplinc.com'; Bob M Hanson; Jan Illian; Chris Barnes; 'Tim Oster'; Eric Cutshall; Asma Tuly; 'Nicole Jackson PE PTOE'
Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - 5-14-14 Meeting Summary

James,

The city is the petitioner, so BNSF will need to sign the Waiver of Hearing by Respondent.

Yes, please include a copy of the preemption operation review documentation.

Kathy Hunter, Deputy Assistant Director, Transportation Safety
Washington Utilities and Transportation Commission
1300 S. Evergreen Park Dr. SW
PO Box 47250
Olympia, WA 98504-7250

Office Telephone: (360) 664-1257
Cell: (360) 701-1612
Fax: (360) 586-1150

From: James P Wilhoit [<mailto:jwilhoit@Rentonwa.gov>]
Sent: Tuesday, July 15, 2014 1:34 PM
To: Hunter, Kathy (UTC); 'Chris Bicket'

Cc: 'djanke@secodev.com'; 'Barney7860@comcast.net'; 'Elyse Hanson'; 'bartb@cplinc.com'; Bob M Hanson; Jan Illian; Chris Barnes; 'Tim Oster'; Eric Cutshall; Asma Tuly; 'Nicole Jackson PE PTOE'
Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - 5-14-14 Meeting Summary

Kathy, I'm getting ready to send you in the next few days all of the following:

- WUTC Petition including Railroad preemption calculation worksheet and Section 14 – Waiver of Hearing by Respondent to be signed by the City.
- TENW-prepared interim and ultimate conditions plan to address traffic control after completion of intersection/traffic signal improvements but before BNSF work, with narrative/justification for the interim (all way stop) condition in support of the WUTC Petition, and support statement from BNSF

Is that everything you will need to get?

Also, do you wish to receive the preemption operation review of the highway-rail crossings with report outlining recommendations to enhance the preemption operation of the proposed traffic signal, prepared by CTC?

James P. Wilhoit, PE
Project Manager
Transportation Design
City of Renton WA
(425) 430-7319
(206) 818-9357 cell

From: Hunter, Kathy (UTC) [<mailto:khunter@utc.wa.gov>]

Sent: Monday, June 30, 2014 3:44 PM

To: Chris Bicket

Cc: 'djanke@secodev.com'; 'Barney7860@comcast.net'; Elyse Hanson; 'bartb@cplinc.com'; Bob M Hanson; Jan Illian; Chris Barnes; Tim Oster; Eric Cutshall; Asma Tuly; James P Wilhoit; Nicole Jackson PE PTOE

Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - 5-14-14 Meeting Summary

Chris,

Yes, please include a detailed narrative justification on why the interim plan is needed and how public safety will be maintained until the permanent changes are implemented. Also, include how long the interim plan will be in place.

Thanks -

Kathy Hunter, Deputy Assistant Director, Transportation Safety
Washington Utilities and Transportation Commission
1300 S. Evergreen Park Dr. SW
PO Box 47250
Olympia, WA 98504-7250

Office Telephone: (360) 664-1257

Cell: (360) 701-1612

Fax: (360) 586-1150

From: Chris Bicket [<mailto:bicket@tenw.com>]

Sent: Monday, June 30, 2014 3:28 PM

To: Hunter, Kathy (UTC)

Cc: 'djanke@secodev.com'; 'Barney7860@comcast.net'; Elyse Hanson; 'bartb@cplinc.com'; Bob M Hanson; Jan Illian; Chris Barnes; Tim Oster; Eric Cutshall; Asma Tuly; James P Wilhoit; Nicole Jackson PE PTOE
Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - 5-14-14 Meeting Summary

Hi Katherine – We are wrapping up our materials, and I thought I'd check if you have any specific format you'd like to see for the interim conditions (all way stop) narrative? It will be accompanied by a plan, which should help illustrate the interim proposed conditions. Thanks

Chris Bicket, P.E. | Design Manager

TENW 11400 SE 8th Street, Suite 200, Bellevue, WA 98004
bicket@tenw.com | Cell: 206-817-9400 | Direct: 425-250-5002

From: Nicole Jackson PE PTOE [<mailto:njackson@ctcinc.com>]

Sent: Monday, June 09, 2014 2:32 PM

To: James P Wilhoit

Cc: 'djanke@secodev.com'; 'Barney7860@comcast.net'; Elyse Hanson; 'bartb@cplinc.com'; Bob M Hanson; Jan Illian; Chris Barnes; Tim Oster; Chris Bicket; 'Katherine Hunter (khunter@wutc.wa.gov) (khunter@wutc.wa.gov)'; Eric Cutshall; Asma Tuly

Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - 5-14-14 Meeting Summary

James –

Please see the attached preemption calculation forms for the 2 crossings in Renton, Washington.

One thing to note is that while Asma had originally indicated the City wanted to truncate pedestrian walk time to zero seconds (which will also be our preferred option), the limitations of the Eagle M50 controller with the firmware specified only has one input for the minimum green time (for vehicles) and the minimum walk time (for pedestrians) combined. Siemens has recently come out with a new firmware that allows two independent values which would eliminate this problem or there are various other brands of controllers that could be used. If the Agency intends to continue with the controller and firmware as indicated, then that is fine as well but it will extend the amount of preemption time needed from the railroad to accommodate the additional during right-of-way transfer time (5 seconds of walk time on line 11 of the form). I have included the additional walk time in the preemption calculations attached.

Once you have a chance to review, I would be happy to discuss them further if you have additional questions. Otherwise, in order for us to proceed forward with finalizing of our report, we will need concurrence from the City that the preemption calculations are acceptable.

Feel free to contact me at any time if you have any questions. Thanks!

Nicole L. Jackson, PE, PTOE | Traffic Engineer

CTC, Inc.

T +1 682 730 8147

M +1 913 240 6469

njackson@ctcinc.com

From: James P Wilhoit [<mailto:jwilhoit@Rentonwa.gov>]

Sent: Thursday, June 05, 2014 1:35 PM

To: Nicole Jackson PE PTOE

Cc: 'djanke@secodev.com'; 'Barney7860@comcast.net'; 'Elyse Hanson'; 'bartb@cplinc.com'; Bob M Hanson; Jan Illian; Chris Barnes; Tim Oster; 'Chris Bicket'; 'Katherine Hunter (khunter@wutc.wa.gov) (khunter@wutc.wa.gov)'; Eric Cutshall; Asma Tuly
Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - 5-14-14 Meeting Summary

OK, Will do. Thank you

James P. Wilhoit, PE
Project Manager
Transportation Design
City of Renton WA
(425) 430-7319
(206) 818-9357 cell

From: Nicole Jackson PE PTOE [<mailto:njackson@ctcinc.com>]
Sent: Thursday, June 05, 2014 11:33 AM
To: James P Wilhoit
Cc: 'djanke@secodev.com'; 'Barney7860@comcast.net'; Elyse Hanson; 'bartb@cplinc.com'; Bob M Hanson; Jan Illian; Chris Barnes; Tim Oster; Chris Bicket; 'Katherine Hunter (khunter@wutc.wa.gov) (khunter@wutc.wa.gov)'; Eric Cutshall; Asma Tuly
Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - 5-14-14 Meeting Summary

James –

Yes I am. I sent an email to Chris Bicket yesterday requesting some proposed approach grade information on Southport and am simply waiting on that information to finalize the preemption calculations. We have also begun writing our report in the meantime so as to keep the project moving forward on our end and be able to submit the report shortly after approval of the preemption calculations.

Please let me know if you have any additional questions.

Nicole L. Jackson, PE, PTOE | Traffic Engineer
CTC, Inc.
T +1 682 730 8147
M +1 913 240 6469
njackson@ctcinc.com

From: James P Wilhoit [<mailto:jwilhoit@Rentonwa.gov>]
Sent: Thursday, June 05, 2014 12:25 PM
To: Nicole Jackson PE PTOE
Cc: 'djanke@secodev.com'; 'Barney7860@comcast.net'; Elyse Hanson; 'bartb@cplinc.com'; Bob M Hanson; Jan Illian; Chris Barnes; Tim Oster; Chris Bicket; 'Katherine Hunter (khunter@wutc.wa.gov) (khunter@wutc.wa.gov)'; Eric Cutshall; Asma Tuly
Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - 5-14-14 Meeting Summary

Nicole, are you making progress on the preemption calculation forms?

James P. Wilhoit, PE
Project Manager
Transportation Design

City of Renton WA
(425) 430-7319
(206) 818-9357 cell

From: Asma Tuly
Sent: Wednesday, May 28, 2014 11:40 AM
To: James P Wilhoit; 'Nicole Jackson PE PTOE'
Cc: 'djanke@secodev.com'; 'Barney7860@comcast.net'; Elyse Hanson; 'bartb@cplinc.com'; Bob M Hanson; Jan Illian; Chris Barnes; Tim Oster; Chris Bicket; 'Katherine Hunter (khunter@wutc.wa.gov) (khunter@wutc.wa.gov)'; Eric Cutshall
Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - 5-14-14 Meeting Summary

Hi Nicole,

- Please use minimum green vehicle time 5.0 sec.
- Pedestrian walk time can be zero (0.0 sec) but we do not want to truncate the FDW time.

Thanks
Asma Tuly

Asma H Tuly
Civil Engineer II
City Of Renton
5th Floor - Transportation
1055 S. Grady Way
Renton, WA 98057
425-430-7222
atuly@rentonwa.gov
www.rentonwa.gov

From: James P Wilhoit
Sent: Wednesday, May 28, 2014 9:25 AM
To: 'Nicole Jackson PE PTOE'
Cc: Asma Tuly; 'djanke@secodev.com'; 'Barney7860@comcast.net'; Elyse Hanson; 'bartb@cplinc.com'; Bob M Hanson; Jan Illian; Chris Barnes; Tim Oster; Chris Bicket; 'Katherine Hunter (khunter@wutc.wa.gov) (khunter@wutc.wa.gov)'; Eric Cutshall
Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - 5-14-14 Meeting Summary

Nicole,

I don't think Asma is in today (Wed. 5/28). She will probably be in tomorrow and can answer your other questions then.

James P. Wilhoit, PE
Project Manager
Transportation Design
City of Renton WA
(425) 430-7319
(206) 818-9357 cell

From: Eric Cutshall
Sent: Wednesday, May 28, 2014 9:06 AM

To: 'Nicole Jackson PE PTOE'; Chris Bicket; James P Wilhoit; 'Katherine Hunter (khunter@wutc.wa.gov)' (khunter@wutc.wa.gov)'

Cc: Asma Tuly; 'djanke@secodev.com'; 'Barney7860@comcast.net'; Elyse Hanson; 'bartb@cplinc.com'; Bob M Hanson; Jan Illian; Chris Barnes; Tim Oster

Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - 5-14-14 Meeting Summary

Nicole,

We will be using a Eagle M50 Sepac controller using firmware 3.51.

Thanks,

Eric Cutshall

Transportation Maintenance Assistant Manager

City Of Renton, WA

O:(425)-430-7423

F:(425)-430-7407

Ecutshall@rentonwa.gov

From: Nicole Jackson PE PTOE [<mailto:njackson@ctcinc.com>]

Sent: Wednesday, May 28, 2014 7:39 AM

To: Chris Bicket; James P Wilhoit; 'Katherine Hunter (khunter@wutc.wa.gov)' (khunter@wutc.wa.gov)'

Cc: Eric Cutshall; Asma Tuly; 'djanke@secodev.com'; 'Barney7860@comcast.net'; Elyse Hanson; 'bartb@cplinc.com'; Bob M Hanson; Jan Illian; Chris Barnes; Tim Oster

Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - 5-14-14 Meeting Summary

Asma –

Can you please confirm the values presented? In particular, the following items:

- No minimum green vehicle time was indicated on the clearance time outline provided. It is recommended that a minimum green time of 4-7 seconds be provided during the right-of-way transfer in accordance with FHWA guidelines to meet driver expectancy.
- Please confirm the pedestrian walk time value you wish to provide. We would recommend that the pedestrian walk time be truncated to 0 upon preemption in order to get to the track clearance interval as quickly as possible and not encourage pedestrians to start crossing when a train is approaching.
- Can you confirm what type of traffic signal controller that you anticipate using? Each controller has its own little quirks as to how it operates during preemption and handles the right-of-way transfer.

Thanks in advance for your time! Once I receive your confirmation on the values, I will prepare the preemption calculation forms for your approval.

Nicole L. Jackson, PE, PTOE | Traffic Engineer

CTC, Inc.

T +1 682 730 8147

M +1 913 240 6469

njackson@ctcinc.com

From: Chris Bicket [<mailto:bicket@tenw.com>]

Sent: Wednesday, May 28, 2014 9:06 AM

To: Nicole Jackson PE PTOE; James P Wilhoit; 'Katherine Hunter (khunter@wutc.wa.gov)' (khunter@wutc.wa.gov)'

Cc: Eric Cutshall; Asma Tuly; 'djanke@secodev.com'; 'Barney7860@comcast.net'; Elyse Hanson; 'bartb@cplinc.com'; Bob M Hanson; Jan Illian; Chris Barnes; Tim Oster; Chris Bicket
Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - 5-14-14 Meeting Summary

Hi Nicole – see attached email from the City. Let us know if you have any more questions. Thanks.

Chris Bicket, P.E. | Design Manager

TENW 11400 SE 8th Street, Suite 200, Bellevue, WA 98004
bicket@tenw.com | Cell: 206-817-9400 | Direct: 425-250-5002

From: Nicole Jackson PE PTOE [<mailto:njackson@ctcinc.com>]
Sent: Tuesday, May 27, 2014 3:16 PM
To: Chris Bicket; James P Wilhoit; 'Katherine Hunter (khunter@wutc.wa.gov) (khunter@wutc.wa.gov)'
Cc: Eric Cutshall; Asma Tuly; 'djanke@secodev.com'; 'Barney7860@comcast.net'; Elyse Hanson; 'bartb@cplinc.com'; Bob M Hanson; Jan Illian; Chris Barnes; Tim Oster
Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - 5-14-14 Meeting Summary

Chris –

Just wanted to follow-up with you to see if any determination had been made regarding the clearance time values to be used for the preemption calculations? Please let me know if there is anything I can do to assist you in keeping this moving along. Thanks!

Nicole L. Jackson, PE, PTOE | Traffic Engineer
CTC, Inc.
T +1 682 730 8147
M +1 913 240 6469
njackson@ctcinc.com

From: Chris Bicket [<mailto:bicket@tenw.com>]
Sent: Thursday, May 15, 2014 10:55 AM
To: James P Wilhoit; Nicole Jackson PE PTOE; 'Katherine Hunter (khunter@wutc.wa.gov) (khunter@wutc.wa.gov)'
Cc: Eric Cutshall; Asma Tuly; 'djanke@secodev.com'; 'Barney7860@comcast.net'; Elyse Hanson; 'bartb@cplinc.com'; Bob M Hanson; Jan Illian; Chris Barnes; Chris Bicket
Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing - 5-14-14 Meeting Summary

Hello all, thanks for meeting yesterday. Here is a quick summary of tasks moving forward, please edit/comment:

- TENW to prepare “interim” plan to address traffic control after completion of intersection/traffic signal improvements but before BNSF work. Likely 6 months from late 2014 to mid 2015. Includes stop-sign/flashing red conditions.
- TENW/City to provide traffic signal clearance requirements (ped phase clearance, tallow, all red) to CTC
- CTC to complete Railroad preemption calculation worksheet
- City/TENW to provide narrative/justification for the interim (all way stop) condition in support of the WUTC Petition
- City to obtain support statement from BNSF for interim and ultimate conditions for the petition

Other Notes:

- Intersection construction scheduled to start Sept 2014.
- WUTC will take about 30 days to process petition after receipt.

Thanks

Chris Bicket, P.E. | Design Manager

TENW 11400 SE 8th Street, Suite 200, Bellevue, WA 98004
bicket@tenw.com | Cell: 206-817-9400 | Direct: 425-250-5002

From: Chris Bicket

Sent: Wednesday, May 14, 2014 6:46 AM

To: James P Wilhoit; 'njackson@ctcinc.com'; 'Katherine Hunter (khunter@wutc.wa.gov) (khunter@wutc.wa.gov)'

Cc: Eric Cutshall; Asma Tuly; 'djanke@secodev.com'; 'Barney7860@comcast.net'; Elyse Hanson; 'bartb@cplinc.com'; Bob M Hanson; Jan Illian; Chris Barnes; Chris Bicket

Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing

For discussion today, attached are cleaned up versions of the preemption phases. I will bring hard copies as well. Thx.

Chris Bicket, P.E. | Design Manager

TENW 11400 SE 8th Street, Suite 200, Bellevue, WA 98004
bicket@tenw.com | Cell: 206-817-9400 | Direct: 425-250-5002

From: James P Wilhoit [<mailto:jwilhoit@Rentonwa.gov>]

Sent: Tuesday, May 13, 2014 3:55 PM

To: 'njackson@ctcinc.com'; 'Katherine Hunter (khunter@wutc.wa.gov) (khunter@wutc.wa.gov)'

Cc: Eric Cutshall; Asma Tuly; 'djanke@secodev.com'; 'Barney7860@comcast.net'; Elyse Hanson; 'bartb@cplinc.com'; Chris Bicket; Bob M Hanson; Jan Illian; Chris Barnes

Subject: FW: WUTC for Lake Washington Blvd (Southport) Crossing

FYI

James P. Wilhoit, PE
Project Manager
Transportation Design
City of Renton WA
(425) 430-7319
(206) 818-9357 cell

From: Chris Bicket [<mailto:bicket@tenw.com>]

Sent: Monday, May 12, 2014 8:27 PM

To: Bob M Hanson; Jan Illian; Chris Barnes; James P Wilhoit

Cc: Eric Cutshall; Asma Tuly; 'djanke@secodev.com'; 'Barney7860@comcast.net'; Chris Bicket; Elyse Hanson; bartb@cplinc.com

Subject: RE: WUTC for Lake Washington Blvd (Southport) Crossing

Hello all – At the field meeting this week, we'd like to discuss the potential "interim" condition at the intersection. This would follow completion of all Southport improvements (civil/traffic signal), but prior to BNSF completion of their improvements/gates, since we must turn on the traffic signal and railroad signals concurrently. One option would be to run the signals as Flashing-all-red, and supplement with all-way stop signs. Pedestrian heads and PPB's could either be bagged, or not installed until the signal turn on.

Let's discuss at the meeting, just wanted to put the thought out there.

Thx

Chris Bicket, P.E. | Design Manager

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