UTC
UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

The Burlington Northern and Santa Fe Railway Company Petitioner, vs. City of Renton, Washington Respondent	DOCKET NO. TR-010316 PETITION TO CONSTRUCT OR RECONSTRUCT A HIGHWAY-RAIL GRADE CROSSING AND INSTALL AN INTER-TIE BETWEEN A HIGHWAY SIGNAL AND A RAILROAD CROSSING SIGNAL SYSTEM USDOT CROSSING NO.: 91-724U

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** **X Reconstruction**

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 Lake Washington 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 47.5028364, -122.1997135
5. Railroad mile post (nearest tenth) 3.97
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 x Common Carrier ☐ Logging ☐ Industrial
   ☐ Passenger ☐ Excursion
3. Type of tracks at crossing x 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 X
8. If so, state the distance and direction from the proposed crossing.

9. Does the petitioner propose to close any existing crossings?
Yes ____ No _X_

Section 5 – Temporary Crossing

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

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 Lake Washington 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 _X_

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

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

10. If so, how many school buses travel over the crossing each day? 16

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 _X_

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 _X_ 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.

   I-405 freeway overhead, piers 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 _X_

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

   I-405 freeway overhead is too close to intersection, 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 _X_

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 _X_ 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 north - Gene Coulon Park -Public crossing

♦ 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 South , 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	130
Right	50	60
Right	25	30
Left	300	650
Left	200	780
Left	100	890
Left	50	950
Left	25	850

b. Approaching the crossing from North , 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	200
Right	100	100
Right	50	50
Right	25	30
Left	300	330
Left	200	400
Left	100	500
Left	50	620
Left	25	850

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.

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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.

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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. Total cost $128,808

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.

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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.: 91-724U

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 Renton, Washington, on the 15th day of August, 2014.

Gregg Zimmerman

Printed name of Respondent

Gregg Zimmerman

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

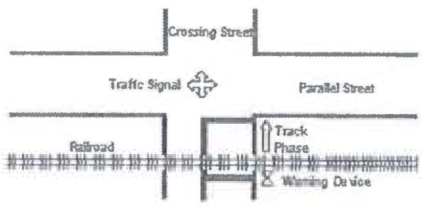
Mailing address

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 ______

Show North Arrow



Parallel Street Name
Southport Boulevard

Crossing Street Name
Lake Washington Boulevard

Railroad BNSF
Crossing DOT# 091724U

Railroad Contact Rick Wagner
Phone (206) 625-6152

SECTION 1: RIGHT-OF-WAY TRANSFER TIME CALCULATION

Preempt verification and response time

		Remarks
1. Preempt delay time (seconds) .... 1.	0.0	Prop. Firmware 4.53a
2. Controller response time to preempt (seconds) 2.	1.0	Controller type: Eagle M50
3. Preempt verification and response time (seconds), add lines 1 and 2 .... 3.	1.0	

Worst-case conflicting vehicle time

		Remarks
4. Worst-case conflicting vehicle phase number .. 4.		
5. Minimum green time during right-of-way transfer (seconds) 5.	5.00	
6. Other green time during right-of-way transfer (seconds) .... 6.	0.00	
7. Yellow change time (seconds) .... 7.	3.50	
8. Red clearance time (seconds) .... 8.	2.00	
9. Worst-case conflicting vehicle time (seconds): add lines 5 through 8 .... 9.	10.5	

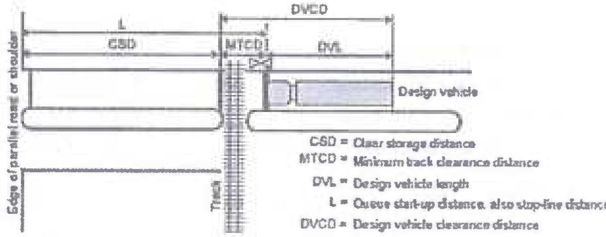
Worst-case conflicting pedestrian time

		Remarks
10. Worst-case conflicting pedestrian phase number .... 10.		
11. Minimum walk time during right-of-way transfer (seconds) .... 11.	0 0	
12. Pedestrian clearance time during right-of-way transfer (seconds) . 12.	20 0	
13. Vehicle yellow change time, if not included on line 12 (seconds) 13.	3 5	
14. Vehicle red clearance time, if not included on line 12 (seconds) .. 14.	2 0	
15. Worst-case conflicting pedestrian time (seconds) add lines 11 through 14 15.	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.	25.5
17. Right-of-way transfer time (seconds): add lines 3 and 16 .. 17.	26 5

SECTION 2: QUEUE CLEARANCE TIME CALCULATION



			Remarks
18.	Clear storage distance (CSD, feet) .... 18.	57	
19.	Minimum track clearance distance (MTCD, feet) .... 19.	116	
20.	Design vehicle length (DVL, feet) .... 20.	75	Design vehicle type: Tractor-Trailer
21.	Queue start-up distance, L (feet) add lines 18 and 19 .... 21.	173	
22.	Time required for design vehicle to start moving (seconds): calculate as 2+(L÷20) .... 22.	10.7	
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

			Remarks
26.	Right-of-way transfer time (seconds) line 17 .... 26.	26.5	
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

			Remarks
30.	Required minimum time, MT (seconds): per regulations .... 30.	20.0	
31.	Clearance time, CT (seconds) get from railroad .... 31.	12.0	Existing BNSF design
32.	Minimum warning time, MWT (seconds) add lines .... 32.	32.0	Excludes buffer time (BT)
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)

Preempt Trap Check

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

Clearing of Clear Storage Distance

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

SECTION 6: VEHICLE-GATE INTERACTION CHECK (OPTIONAL)

52.	Right-of-way transfer time (seconds): line 17	26.5	
53.	Time required for design vehicle to start moving (seconds): line 22	10.7	
54.	Time required for design vehicle to accelerate through DVL (on line 20, seconds)		Read from Table 3 in Instructions
55.	Time required for design vehicle to clear descending gate (seconds): add lines 52 through 54	37.2	Remarks
56.	Duration of flashing lights before gate descent start (seconds): get from railroad		Remarks
57.	Full gate descent time (seconds): get from railroad		
58.	Proportion of non-interaction gate descent time		Read from Figure 5 in Instructions
59.	Non-interaction gate descent time (seconds): multiply lines 57 and 58	0.0	
60.	Time available for design vehicle to clear descending gate (seconds): add lines 56 and 59	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**	38	

UTC
UTILITIES AND TRANSPORTATION COMMISSION

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 does. Local policies will determine if this is allowed. Also, note than 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.

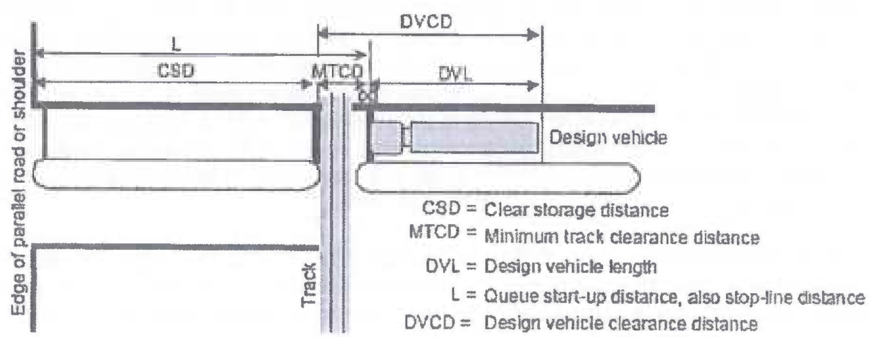


Figure 1 Queue clearance distances.

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 drive 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:

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

where

T = time to accelerate through distance X, in seconds;
X = distance over which acceleration takes place, in feet;
ln = natural logarithm function;
e = 2.17828, 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
	8%	11.84	6.198	3.652	1.554
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 a 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 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 the 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

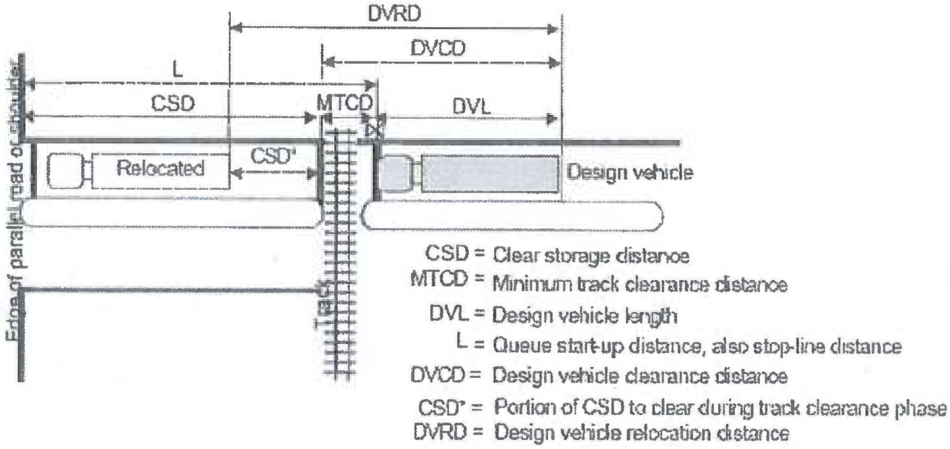


Figure 3 Relocation distances during the track clearance green interval.

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
		8%	7.0
Intermediate Semi-Trailer (WB-50)	55	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.

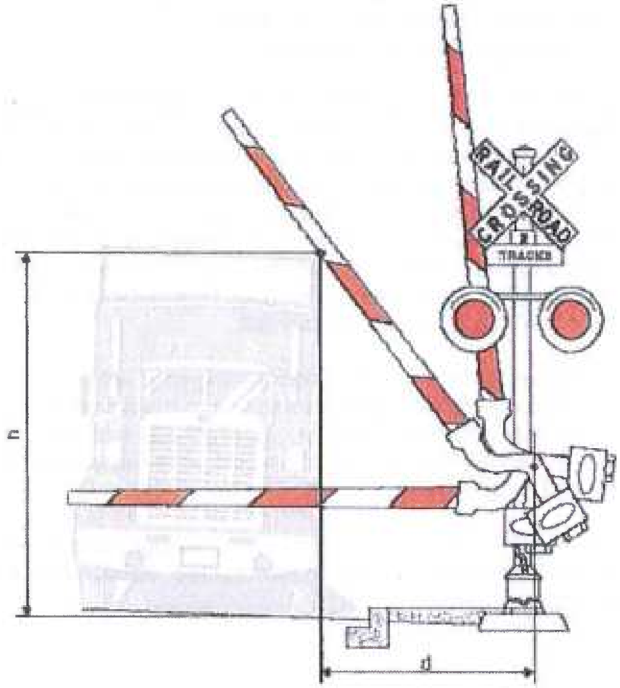


Figure 4 Gate interaction with the design vehicle.

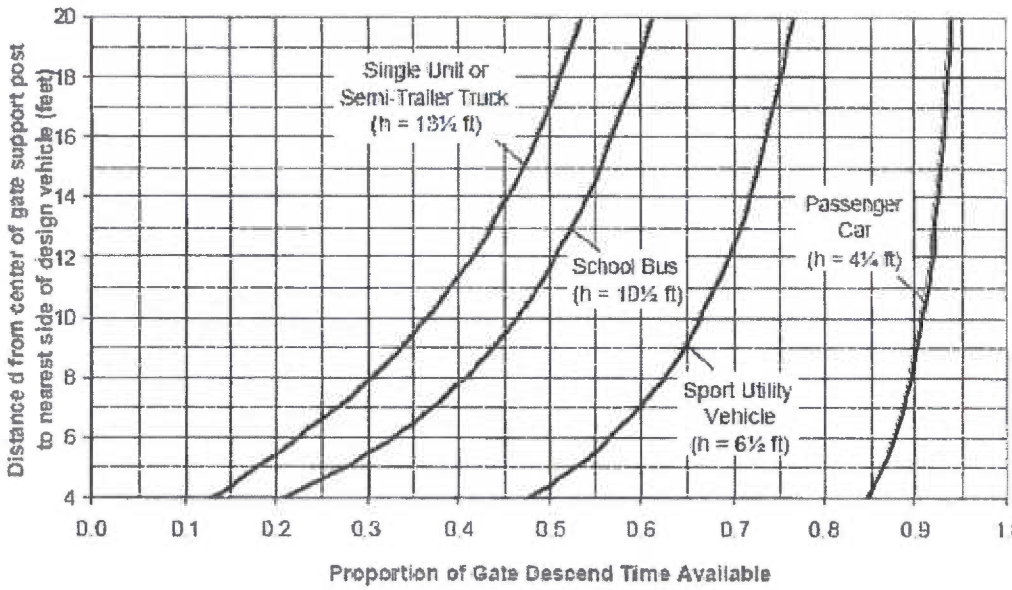


Figure 5 Proportion of gate descent time available as a function of the design vehicle height and the distance from the center of the gate mechanism to the nearest side of the design vehicle.

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 updated, and Lines 34 and 35 recomputed. Section 5 also needs to be recomputed to calculate the track clearance green time.

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

LAKE WASHINGTON BLVD. IMPROVEMENTS

for: SOUTHPORT DEVELOPMENT

HORIZONTAL DATUM:
BASED ON CITY OF RENTON LOT LINE ADJUSTMENT NO. LUA-98-179-LLA

VERTICAL DATUM:
BASED ON CITY OF RENTON DATUM.
CITY BENCHMARK NO. 2118 - 3 1/2" BRASS DISK STAMPED "CITY OF RENTON BM" IN THE S.E. CORNER OF CONC. BASE OF SOUTHERLY LEG OF POWER TOWER. TOWER LOCATED NORTH OF THE ENTRANCE ROAD TO PUGET POWER SHUFFLETON STEAM PLAN AS SHOWN ON SHEET C5.
ELEVATION = 24.09 FEET (NAVD 1988)

GENERAL ENGINEERING NOTES

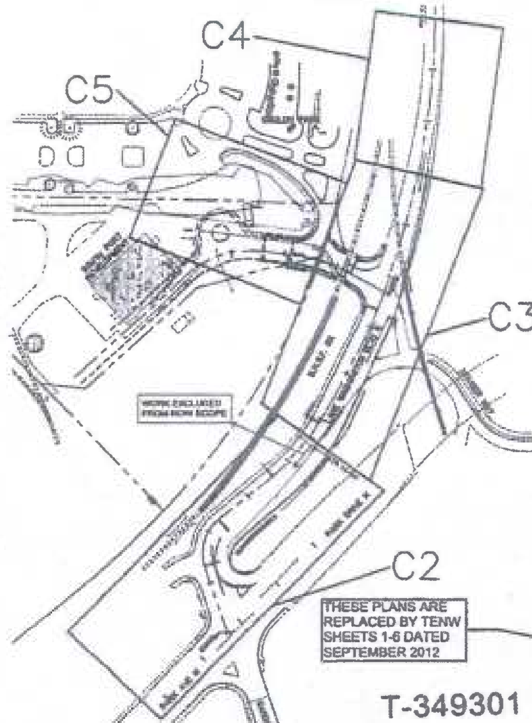
1. EXISTING UTILITIES AND UNDERGROUND STRUCTURES SHOWN ON THE PLAN ARE BASED UPON THE BEST AVAILABLE PUBLIC RECORDS AND\OR PRIVATE RECORDS AS SUPPLIED BY THE PROJECT OWNER AND\OR DATA OBTAINED VERBALLY FROM OWNERS OR OFFICIALS ASSOCIATED WITH THE PARTICULAR UTILITY. NEITHER THE OWNER NOR THE ENGINEER GUARANTEE THE ACCURACY OR COMPLETENESS OF THIS INFORMATION AND ASSUME NO RESPONSIBILITY FOR IMPROPER LOCATIONS OR FAILURE TO SHOW UTILITY LOCATIONS ON THE CONSTRUCTION PLANS. OTHER UNDERGROUND FACILITIES NOT SHOWN ON THE DRAWINGS MAY BE ENCOUNTERED DURING THE COURSE OF THE WORK. ALL INVERT ELEVATIONS SHOWN ON THE DRAWINGS SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
2. IF CHANGED CONDITIONS ARE ENCOUNTERED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER PROMPTLY OF (1) PREEXISTING SUBSURFACE CONDITIONS DIFFERING FROM THOSE INDICATED IN THE PLANS, OR (2) PREEXISTING UNKNOWN SUBSURFACE CONDITIONS, OF AN UNUSUAL NATURE, DIFFERING MATERIALLY FROM THOSE ORDINARILY ENCOUNTERED AND GENERALLY RECOGNIZED AS INHERENT IN WORK OF THE CHARACTER PROVIDED FOR IN THE CONTRACT. THE CONTRACTOR AND/OR THE OWNER SHALL MAKE NO CLAIMS TO THE ENGINEER FOR RECOMPENSATION FOR EXTRA WORK RESULTING FROM CHANGED CONDITIONS UNLESS THE ENGINEER HAS APPROVED THE WORK IN WRITING. (WSDOT SEC 1-04.7)
3. THE CONTRACTOR SHALL CALL THE UTILITIES UNDERGROUND LOCATION CENTER FOR FIELD LOCATION OF ALL UTILITIES AND SHALL NOT BEGIN EXCAVATION UNTIL ALL KNOWN UNDERGROUND FACILITIES IN THE VICINITY OF THE PROPOSED WORK HAVE BEEN LOCATED AND MARKED. IF THE UTILITY IS NOT A SUBSCRIBER OF THE UNDERGROUND LOCATION CENTER THEN THE CONTRACTOR SHALL GIVE INDIVIDUAL NOTICE TO THAT UTILITY. (WSDOT SEC. 1-07.17 APWA SUPPLEMENT)
4. THE CONTRACTOR SHALL TAKE REASONABLE PRECAUTIONS AND EXERCISE SOUND ENGINEERING AND CONSTRUCTION PRACTICES IN CONDUCTING THE WORK. THE CONTRACTOR SHALL PROTECT EXISTING PUBLIC AND PRIVATE UTILITIES FROM DAMAGE DURING CONSTRUCTION. IF EXISTING UTILITIES ARE DAMAGED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER AND THE ENGINEER. THE CONTRACTOR SHALL RESTORE THE UTILITY TO ITS EXISTING CONDITION.(WSDOT SECTION 1-07.17 APWA SUPPLEMENT). THE CONTRACTOR IS RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION FOR DESIGNS SHOWN ON THESE PLANS.
5. WHERE THE PLANS CALL FOR UTILITIES TO BE RELOCATED BY OTHERS, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANY AND COORDINATE HIS WORK SO AS TO AVOID CONFLICTS.
6. ALL EXCAVATION, TRENCHING, SUBGRADE PREPARATION, FILL PLACEMENT AND COMPACTION AND ALL SOIL WORK IN GENERAL SHALL BE CONDUCTED IN COMPLIANCE WITH THE RECOMMENDATIONS OF THE PROJECT SOIL ENGINEER AND THE CURRENT GEOTECHNICAL ENGINEERING REPORT.
7. ENGINEERING DESIGN AND APPROVAL FOR STRUCTURES SUCH AS WALLS AND VAULTS MUST BE PREPARED BY THE APPROPRIATE PROFESSIONAL ENGINEER AND IS NOT A PART OF THESE PLANS.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR HIRING PROFESSIONAL LAND SURVEYOR TO REFERENCE EXISTING MONUMENTS ON OR ADJOINING SITE PREVIOUS TO DEMOLITION OR CONSTRUCTION AND TO RE-ESTABLISH SAID POINTS AT PROJECT COMPLETION. THIS RE-ESTABLISHMENT SHALL BE DOCUMENTED BY RECORD OF SURVEY OR CORNER RECORD AS DESCRIBED IN W.A.C. 332-120.

DEVELOPER:
SECO DEVELOPMENT, INC.
10843 NE 8TH STREET, SUITE 200
BELLEVUE, WA 98004
CONTACT: REX ALLEN
PHONE: 425-888-3085

TRANSPORTATION ENGINEER:
THE TRANSPO GROUP, INC.
11730 118TH AVENUE NE, SUITE 600
KIRKLAND, WA 98034
CONTACT: CHRIS BICKET, PE
PHONE: 425-821-3665

LEGEND

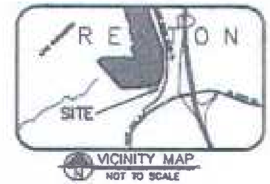
	PROPOSED	EXISTING
CONCRETE PAVING		
SPOT ELEVATION		
CONTOUR	—10—	
RIDGE LINE	—R—	
STORM SEWER	12" SD	12" SD
SANITARY SEWER	8" S	8" S
WATER PIPE	8" W	8" W
STORM DITCH		
STORM CB		
STORM MANHOLE		
RIPRAP		
CONC. RETAIN. WALL		
FINISH GRADE AT BOTTOM OF WALL	B.W.	
FINISH GRADE AT TOP OF WALL	T.W.	
ROCKERY		
WATER VALVE		
FIRE HYDRANT		
WATER METER		
UTILITY POLE		
UTILITY BOX		
SURVEY MONUMENT		
TRAFFIC SIGN		
FILTER FABRIC FENCE		
ROCK CHECK DAM		
STRAW BALES		
BARBED WIRE FENCE		
CHAIN LINK FENCE		



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

T-349301

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



VICINITY MAP
NOT TO SCALE

DRAWING INDEX:

COVER SHEET (CIVIL) ..... SHT C1
PLAN & PROFILE STA 9+96 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+96 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+96 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 CH1
LAKE WASH BLVD STA 13+25 TO 18+65 CHANNELIZATION PLAN ..... SHT CH2
LAKE WASH BLVD/SITE ACCESS CHANNELIZATION PLAN ..... SHT CH3
LAKE WASH BLVD/PARK AVE N TRAFFIC SIGNAL PLAN ..... SHT TS1
LAKE WASH BLVD STA 13+00 TO 18+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

99323.02

BUSH, ROED & HITCHINGS, INC.
CIVIL ENGINEERS & LAND SURVEYORS

CHECKED FOR COMPLIANCE TO CITY STANDARDS
Date
Date
Date

COVER SHEET
LAKE WASH. BLVD. IMPROVEMENTS
SOUTHPORT DEVELOPMENT

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

AS NOTED

NO.	REVISION	BY	DATE	APPR
2	REVISED FOR PHASING PLAN			
1	FOR CITY OF RENTON REVIEW			

LAYERSET: 99323COV
Plotted: 11/19/02 16:17
U:\99323-01\ORIGINALSET\1cv1.dwg

LUA-?? 349301

CITY OF RENTON

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

PLAN & PROFILE STA 9+95 TO STA 14+50
LAKE WASH. BLVD. IMPROVEMENTS
SOUTHPORT DEVELOPMENT

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

DATUM

NO.	REVISION	BY	DATE	APPR
1	PER CITY OF RENTON REVIEW		1/27/03	
2	PER CITY OF RENTON REVIEW		4/23/03	

LAYERSET: R01-V2
Plotted: 11/18/02 13:13

U:\99323-01\ORIGINALSET\Xrel.dwg

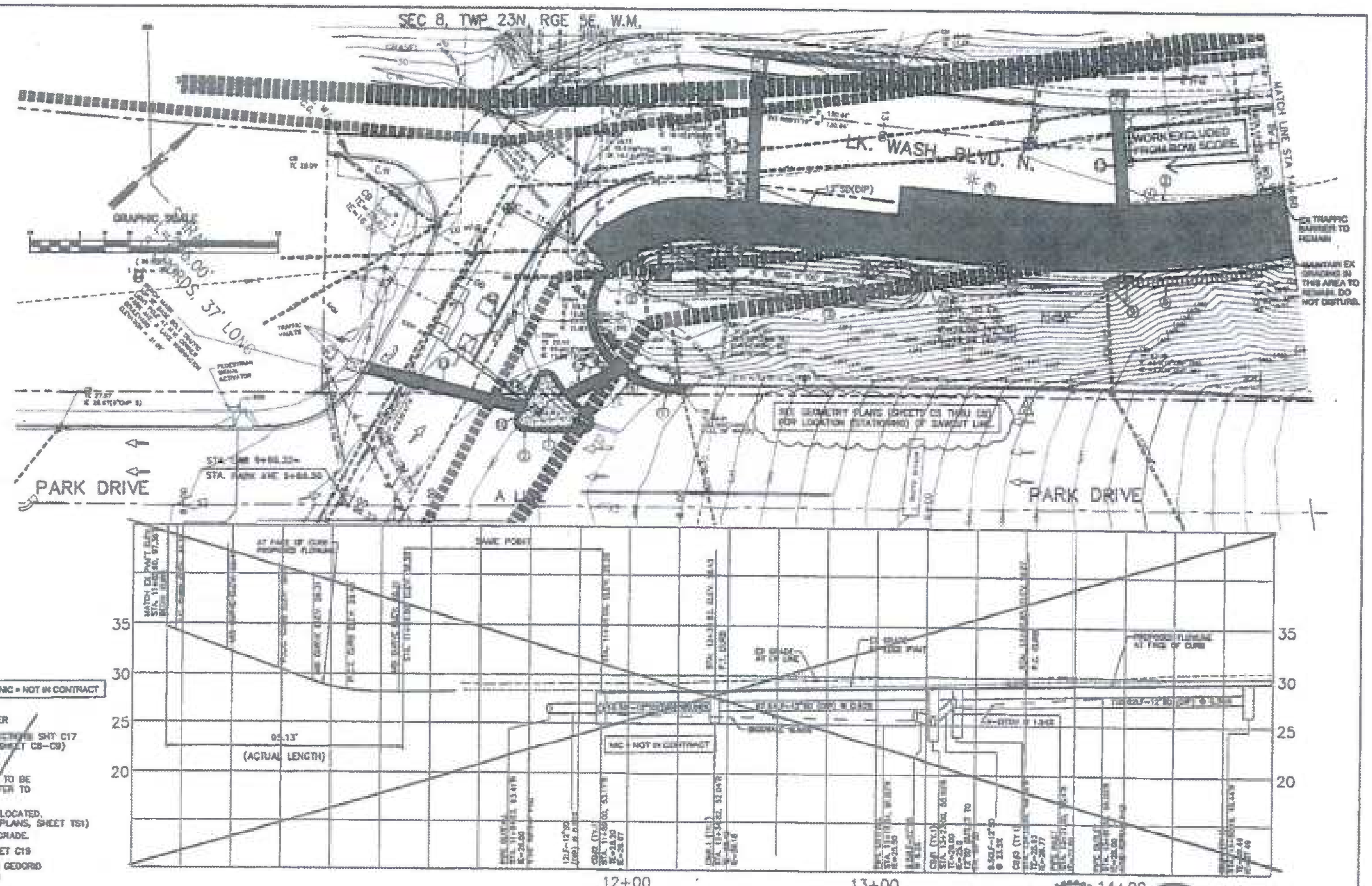
UTILITY CROSSINGS:

1. IE=23.40 (12" SD) IE=18.39 (60" SD)
2. IE=[illegible] (12" SD) IE=[illegible] (EX. 48" SD)
3. IE=26.[illegible] (12" SD) IE=23.7[illegible] (EX. 12" W)
4. IE=26.[illegible] (12" SD) IE=20.50± (EX. 12" W)
5. IE=28.72 (12" SD) IE=19.72 (EX. 12" SD)
6. IE=27.19 (12" SD) IE=19.49 (EX. 60" SD)

NIC = NOT IN CONTRACT

CONSTRUCTION NOTES:

1. CONCRETE CURB AND GUTTER
2. SAWCUT LINE. (SEE ROAD SECTIONS SHT C17 & ROAD GEOMETRY PLANS SHEET C8–C9)
3. SIDESLOPE (2H:1V MAX.)
4. EX. UTILITY POLE/GUY WIRE TO BE RELOCATED BY OTHERS (REFER TO COORDINATION PLAN)
5. EX. STREET LIGHT TO BE RELOCATED. (REFER TO TRAFFIC SIGNAL PLANS, SHEET TS1)
6. RAISE UTILITY RIM TO NEW GRADE.
7. BIOSWALE PER DTL. ON SHEET C19
8. MODULAR BLOCK WALL WITH GEOGRID (PER DETAIL ON SHEET C18)
9. 4'X6' ROCK PAD PER STORM NOTES.
10. TRAFFIC ISLAND. CONC. PAVING PER SIDEWALK SPECIFICATION. SLOPE TO DRAIN.
11. NOT USED
12. NEW CURB MEDIAN W/ DRAINAGE SLOTS. (REFER TO SHEET CH1)
13. STREET LIGHT CONDUIT TRENCH RESTORATION. (PER CITY OF RENTON STANDARD)
14. EXISTING CURB MEDIAN TO BE REMOVED. (REFER TO SHEET CH1)



PROFILE

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

T-349302

99323.02

BUSH, ROED & HITCHINGS, INC.
CIVIL ENGINEERS & LAND SURVEYORS

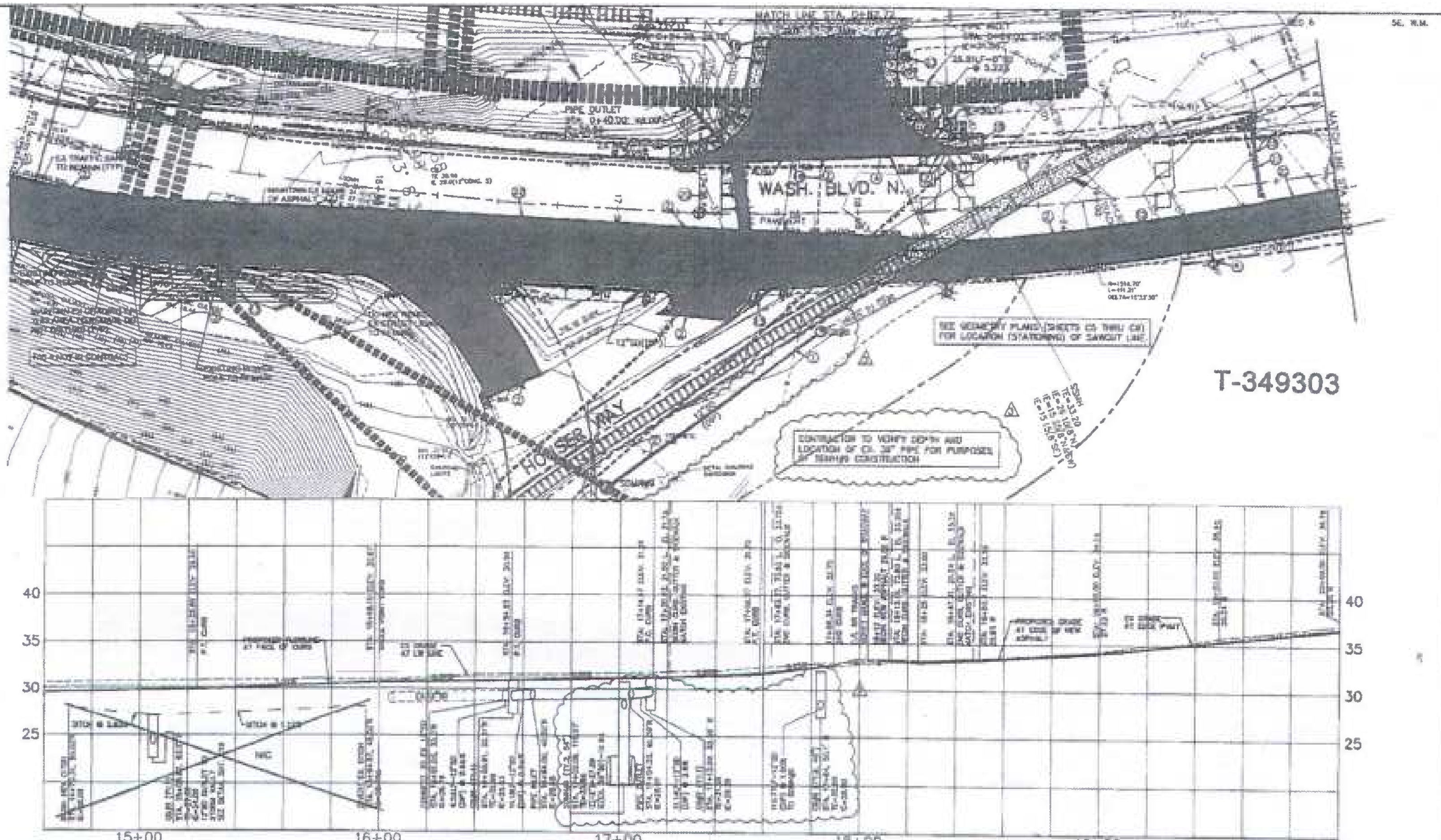
CHECKED FOR COMPLIANCE TO CITY STANDARDS

Date
Date
Date

CDJT-349302

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

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



CONSTRUCTION NOTES:

1. CONCRETE CURB AND GUTTER
2. SAWCUT LINE (SEE ROAD SECTIONS SHT C17 & ROAD GEOMETRY PLANS SHT C5–C9)
3. ~~SIDESLOPE (2H:1V MAX.)~~ NIC
4. EX. UTILITY POLE/GUY WIRE TO BE RELOCATED BY OTHERS. (REFER TO UTILITY COORDINATION PLAN)
5. EX. STREET LIGHT TO BE RELOCATED (REFER TO SHEET TS2)
6. NOT USED
7. CONCRETE SIDEWALK PER DETAIL SHT C19
8. REMOVE EXISTING CURB & GUTTER.
9. ~~NEW STORM VAULT PER DTL. ON SHT. C19~~ NIC
10. CONCRETE SIDEWALK PER DTL. ON SHT. C19
11. CONCRETE CURB RAMP PER DTL. ON SHT. C19
12. EDGE OF PAVEMENT WIDENING (NO CURB)
13. SIGNAL/LUMINAIRE POLE (REFER TO SHEET TS3)
14. ~~[illegible] CASING UNDER RAILWAY PER [illegible] REQUIREMENTS [illegible] TRAFFIC SIGNAL [illegible] TO BE INSTALLED [illegible] TO SHEET TS3).~~ OMIT (△3)
15. EX. R.R. SIGNAL TO BE REMOVED BY OTHERS (SEE SHEET TS3)
16. NEW WATERMAIN BY ON-SITE DEVELOPMENT. (DESIGN BY ON-SITE ENGINEER.)
17. CONCRETE R.R. CROSSING APRON (BY OTHERS)
18. CONCRETE RAMP PER DETAIL ON SHT C19
19. ~~REMOVE EXISTING TRAFFIC BARRIER.~~ NIC
20. ST LIGHT CONDUIT TRENCH RESTORATION (PER CITY OF RENTON STANDARD)
21. ASPHALT FLOWLINE @ 1.06% FROM CB#10 TO CB#9
22. NEW CURB MEDIAN W/ DRAINAGE SLOTS (REFER TO SHEET CH3)
23. R.R. EQUIPMENT TO BE INSTALLED BY OTHERS (SEE SHEET TS3)
24. EXIST. STREET LIGHT TO BE REMOVED (SEE SHEET TS3)

UTILITY CROSSINGS:

1. IE=29.8± (EX. TEL) TE=28.87 (12"SD)
2. IE=30.3± (EX. TEL) TE=28.11 (12"SD)
3. IE=28.8± (12" SD) IE=22.50± (EX. 12"W)

PROFILE

99323.02

BUSH, ROED & HITCHINGS, INC.
CIVIL ENGINEERS & LAND SURVEYORS

CHECKED FOR COMPLIANCE TO CITY STANDARDS
Date
Date
Date

CD-T-349303

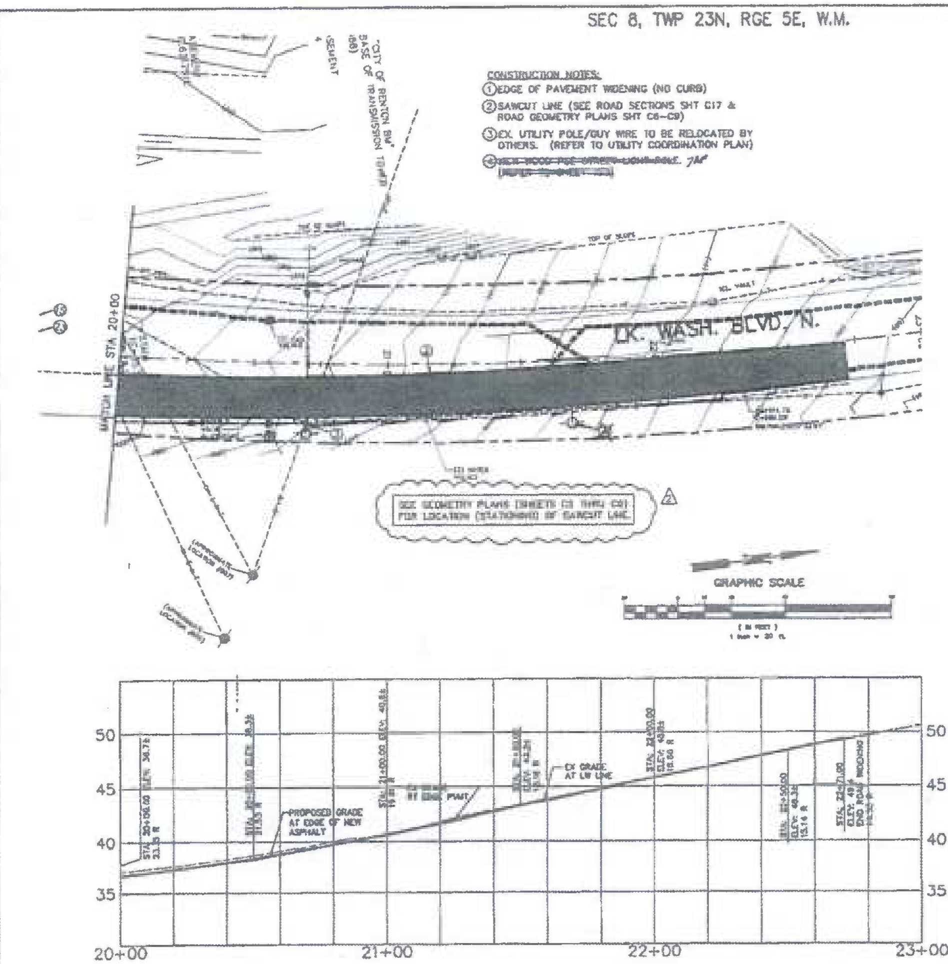
PLAN & PROFILE STA 20+00 TO STA 23+00
LAKE WASH. BLVD. IMPROVEMENTS
SOUTHPORT DEVELOPMENT

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

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

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

CONSTRUCTION NOTES:
1. EDGE OF PAVEMENT WIDENING (NO CURB)
2. SAWCUT LINE (SEE ROAD SECTIONS SHT C17 & ROAD GEOMETRY PLANS SHT C6–C9)
3. EX. UTILITY POLE/GUY WIRE TO BE RELOCATED BY OTHERS. (REFER TO UTILITY COORDINATION PLAN)



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

T-349304

99323.02

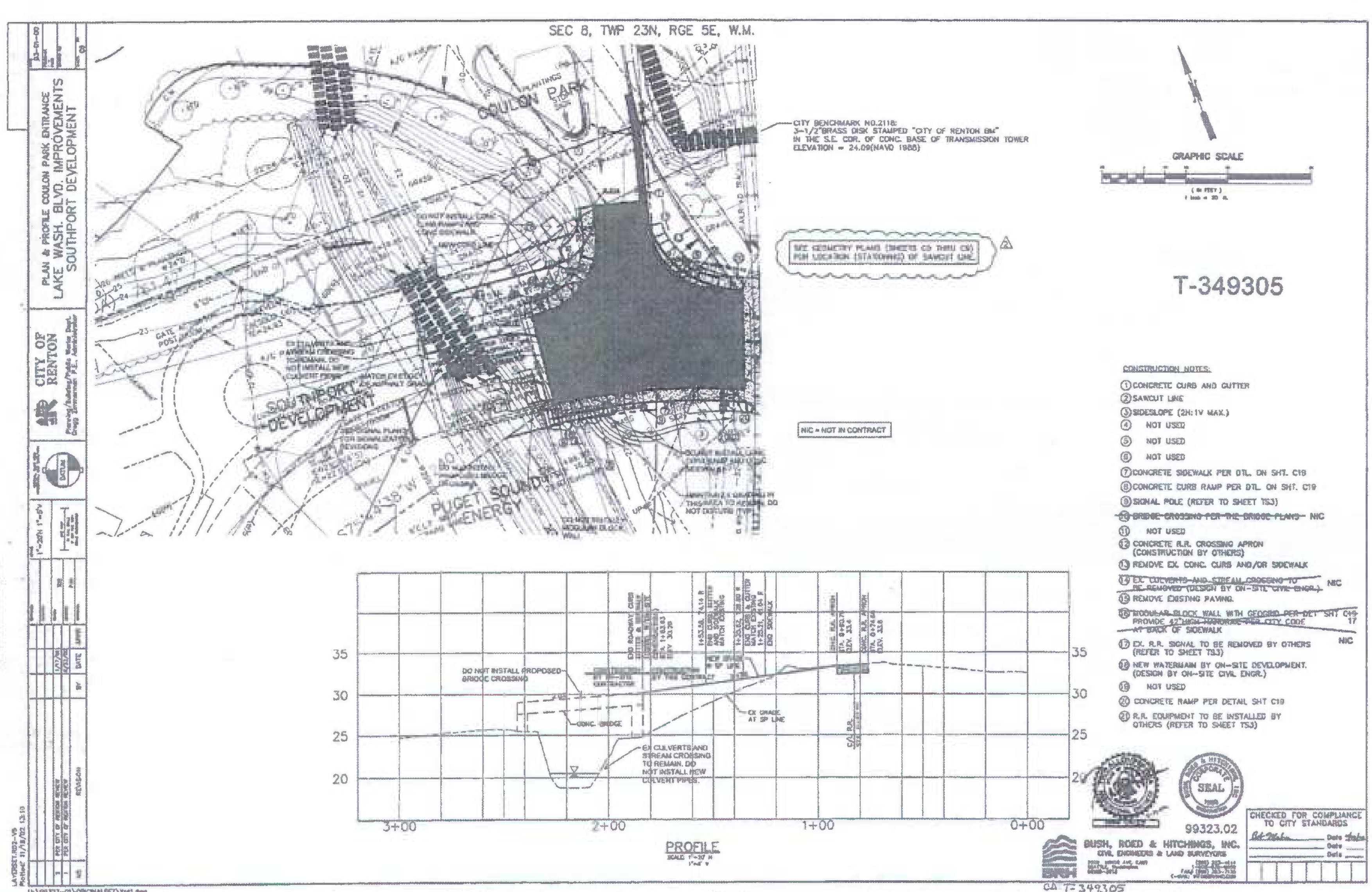
BUSH, ROED & HITCHINGS, INC.
CIVIL ENGINEERS & LAND SURVEYORS

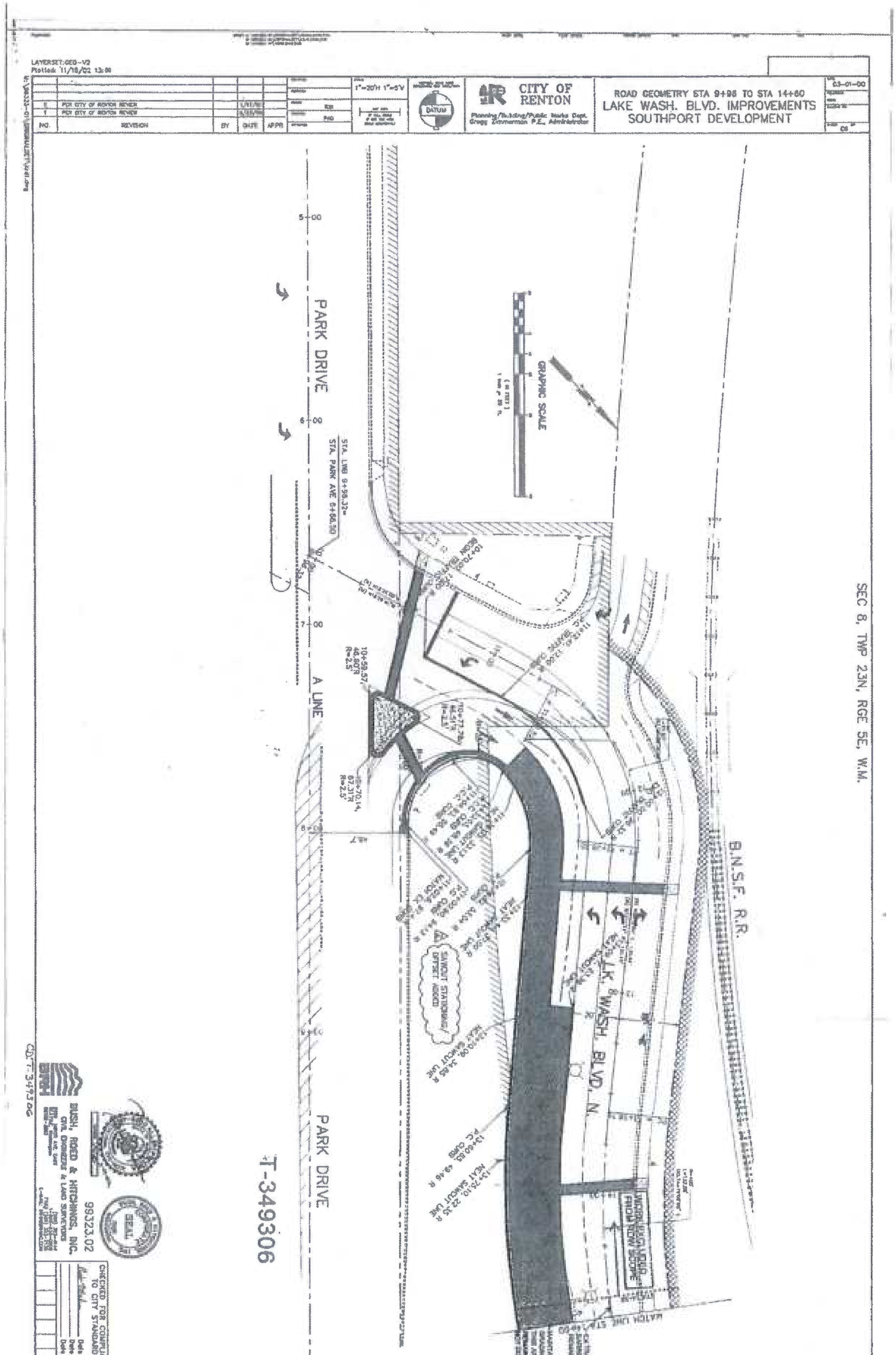
CHECKED FOR COMPLIANCE TO CITY STANDARDS
Date ____
Date ____
Date ____

CD/T-349304

NO	REVISION	BY	DATE	APPR
2	PCP CITY OF RENTON REVIEW			
1	PCP CITY OF RENTON REVIEW			

LAYERSET: R01-14
Plotted: 11/18/02 13:17


PLAN & PROFILE COULON PARK ENTRANCE
LAKE WASH. BLVD. IMPROVEMENTS
SOUTHPORT DEVELOPMENT
CITY OF RENTON
Planning/Building/Public Works Dept.
Gregg Zimmerman P.E., Administrator
DATUM
1"=20'H 1"=5'V
03-01-00
PER CITY OF RENTON REVIEW
PER CITY OF RENTON REVIEW
REVISION
BY
DATE
SEC 8, TWP 23N, RGE 5E, W.M.
COULON PARK
SOUTHPORT DEVELOPMENT
PUGET SOUND ENERGY
CITY BENCHMARK NO.2118:
3-1/2"BRASS DISK STAMPED "CITY OF RENTON BM"
IN THE S.E. COR. OF CONC. BASE OF TRANSMISSION TOWER
ELEVATION = 24.09(NAVD 1988)
GRAPHIC SCALE
SEE GEOMETRY PLANS (SHEETS C5 THRU C9) FOR LOCATION (STATIONING) OF SAWCUT LINE.
T-349305
NIC = NOT IN CONTRACT
CONSTRUCTION NOTES:
① CONCRETE CURB AND GUTTER
② SAWCUT LINE
③ SIDESLOPE (2H: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 TS3)
⑩ BRIDGE CROSSING PER THE BRIDGE PLANS NIC
⑪ NOT USED
⑫ CONCRETE R.R. CROSSING APRON (CONSTRUCTION BY OTHERS)
⑬ REMOVE EX. CONC. CURB AND/OR SIDEWALK
⑭ EX. CULVERTS AND STREAM CROSSING TO BE REMOVED (DESIGN BY ON-SITE CIVIL ENGR.) NIC
⑮ REMOVE EXISTING PAVING.
⑯ MODULAR BLOCK WALL WITH GEOGRID PER DET SHT C19 17
PROVIDE 42" HIGH HANDRAIL PER CITY CODE AT BACK OF SIDEWALK
⑰ EX. R.R. SIGNAL TO BE REMOVED BY OTHERS (REFER TO SHEET TS3) NIC
⑱ NEW WATERMAIN BY ON-SITE DEVELOPMENT. (DESIGN BY ON-SITE CIVIL ENGR.)
⑲ NOT USED
⑳ CONCRETE RAMP PER DETAIL SHT C19
㉑ R.R. EQUIPMENT TO BE INSTALLED BY OTHERS (REFER TO SHEET TS3)
DO NOT INSTALL PROPOSED BRIDGE CROSSING
CONC. BRIDGE
EX CULVERTS AND STREAM CROSSING TO REMAIN. DO NOT INSTALL NEW CULVERT PIPES.
EX GRADE AT SP LINE
C/L R.R.
35
30
25
20
3+00
2+00
1+00
0+00
PROFILE
99323.02
BUSH, ROED & HITCHINGS, INC.
CIVIL ENGINEERS & LAND SURVEYORS
CHECKED FOR COMPLIANCE TO CITY STANDARDS
Date
Date
Date
CA T-349305



LAYERSET:GEO-V2
Plotted: 11/18/02 13:00
CITY OF RENTON
Planning/Building/Public Works Dept.
Gregg Zimmerman P.E., Administrator
ROAD GEOMETRY STA 9+98 TO STA 14+60
LAKE WASH. BLVD. IMPROVEMENTS
SOUTHPORT DEVELOPMENT
03-01-00
1"=20'H 1"=5'V
DATUM
PER CITY OF RENTON REVIEW
NO.
REVISION
BY
DATE
APPR
SEC 8, TWP 23N, RGE 5E, W.M.
B.N.S.F. R.R.
PARK DRIVE
A LINE
LK. WASH. BLVD. N.
GRAPHIC SCALE
STA. LINE 9+98.32=
STA. PARK AVE 6+66.50
SAWCUT STATIONING/
OFFSET ADDED
MATCH LINE STA 14+60
T-349306
BUSH, ROED & HITCHINGS, INC.
CIVIL ENGINEERS & LAND SURVEYORS
99323.02
CHECKED FOR COMPLIANCE
TO CITY STANDARDS

LAYERSET.GED-V3
Plotted: 11/18/02 16:14

NO	REVISION	BY	DATE	APPR
2	PER CITY OF RENTON REVIEW		1/17/00	
1	PER CITY OF RENTON REVIEW		8/23/00	

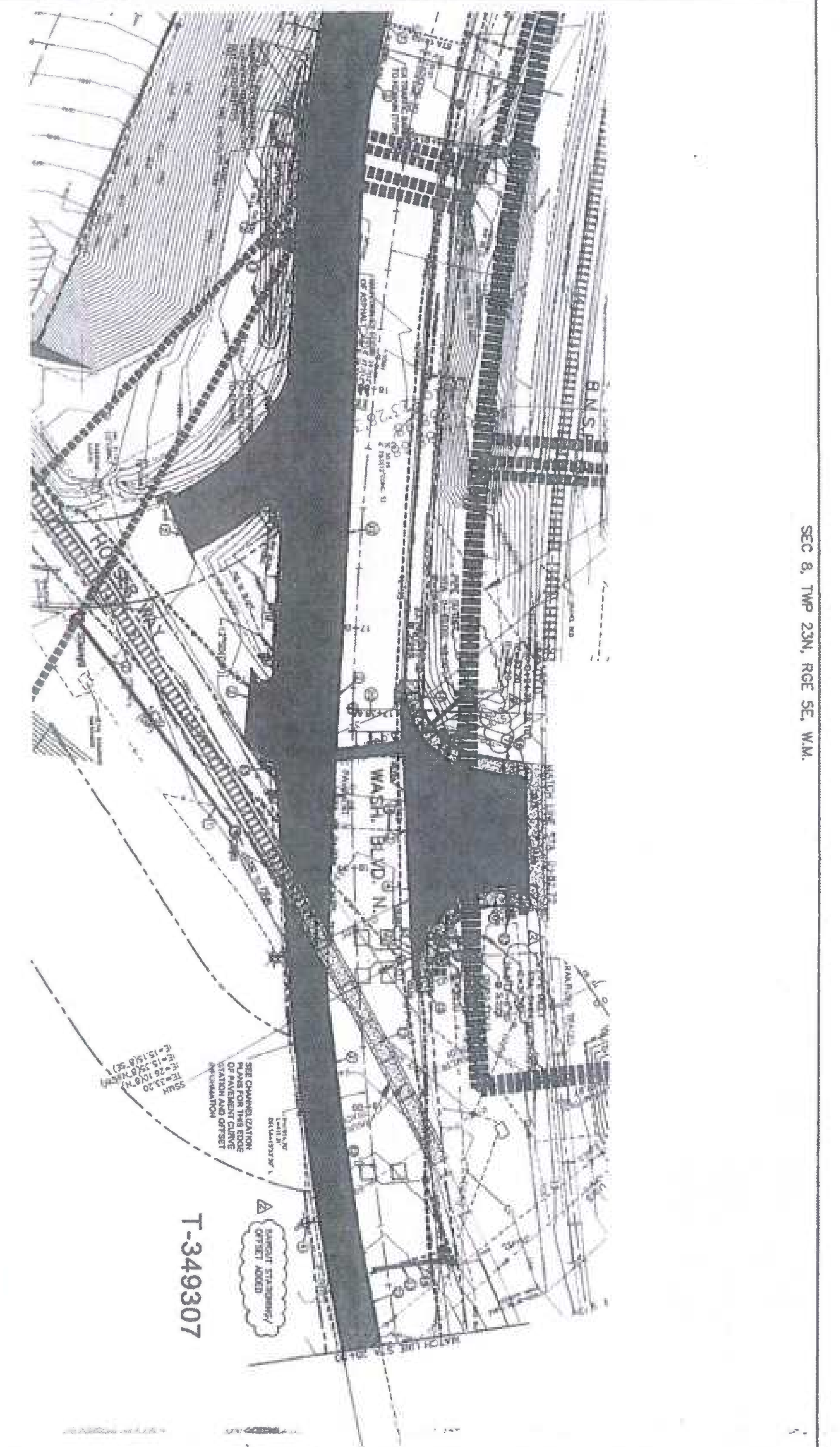
1"=20'H 1"=5'V

DATUM

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

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

03-01-00



BUSH, ROED & HITCHINGS, INC.
CIVIL ENGINEERS & LAND SURVEYORS

99323.02

CHECKED FOR COMPLIANCE TO CITY STANDARDS

T-349307

LAYERSET-CED-V4
Plotted: 11/18/02 13:04

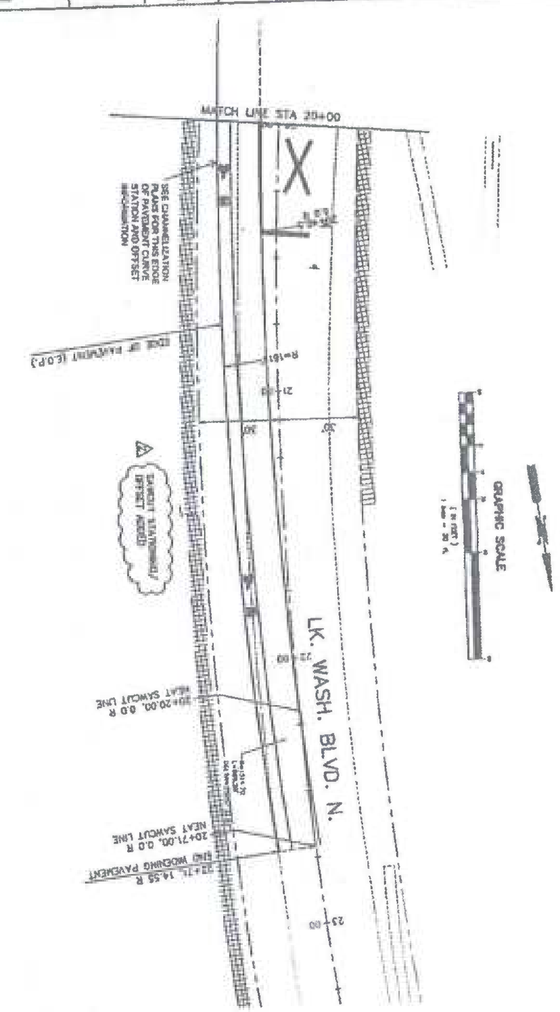
NO	REVISION	BY	DATE	APPR
1	PER CITY OF RENTON REVIEW			
2	PER CITY OF RENTON REVIEW			

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

CITY OF RENTON

Planning/Building/Public Works Dept.

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



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

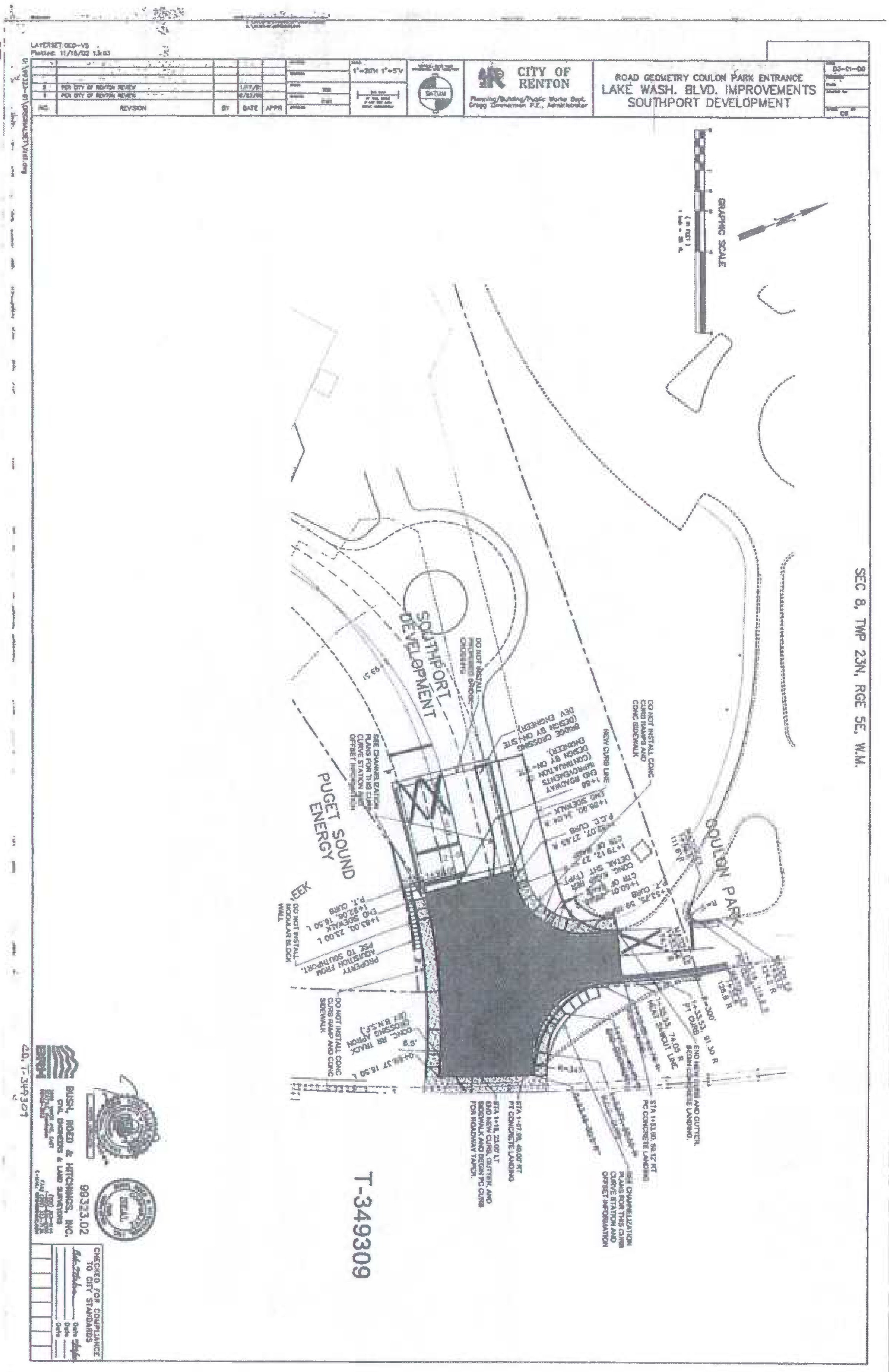
T-349308

BUSH, ROED & HITCHINGS, INC.
CIVIL ENGINEERS & LAND SURVEYORS

99323.02

CHECKED FOR COMPLIANCE TO CITY STANDARDS

T-349308



CITY OF RENTON
Planning/Building/Public Works Dept.
ROAD GEOMETRY COULON PARK ENTRANCE
LAKE WASH. BLVD. IMPROVEMENTS
SOUTHPORT DEVELOPMENT
REVISION
BY
DATE
APPR
PER CITY OF RENTON REVIEW
DATUM
GRAPHIC SCALE
SEC 8, TWP 23N, RGE 5E, W.M.
COULON PARK
SOUTHPORT DEVELOPMENT
PUGET SOUND ENERGY
T-349309
CHECKED FOR COMPLIANCE TO CITY STANDARDS
BUSH, ROED & HITCHINGS, INC.
CIVIL ENGINEERS & LAND SURVEYORS
9933.02

LAYERSET: ERO-V2
Plotted: 11/18/02 13:02

NO	REVISION	BY	DATE	APPR
1	PER CITY OF RENTON REVIEW		8/13/00	

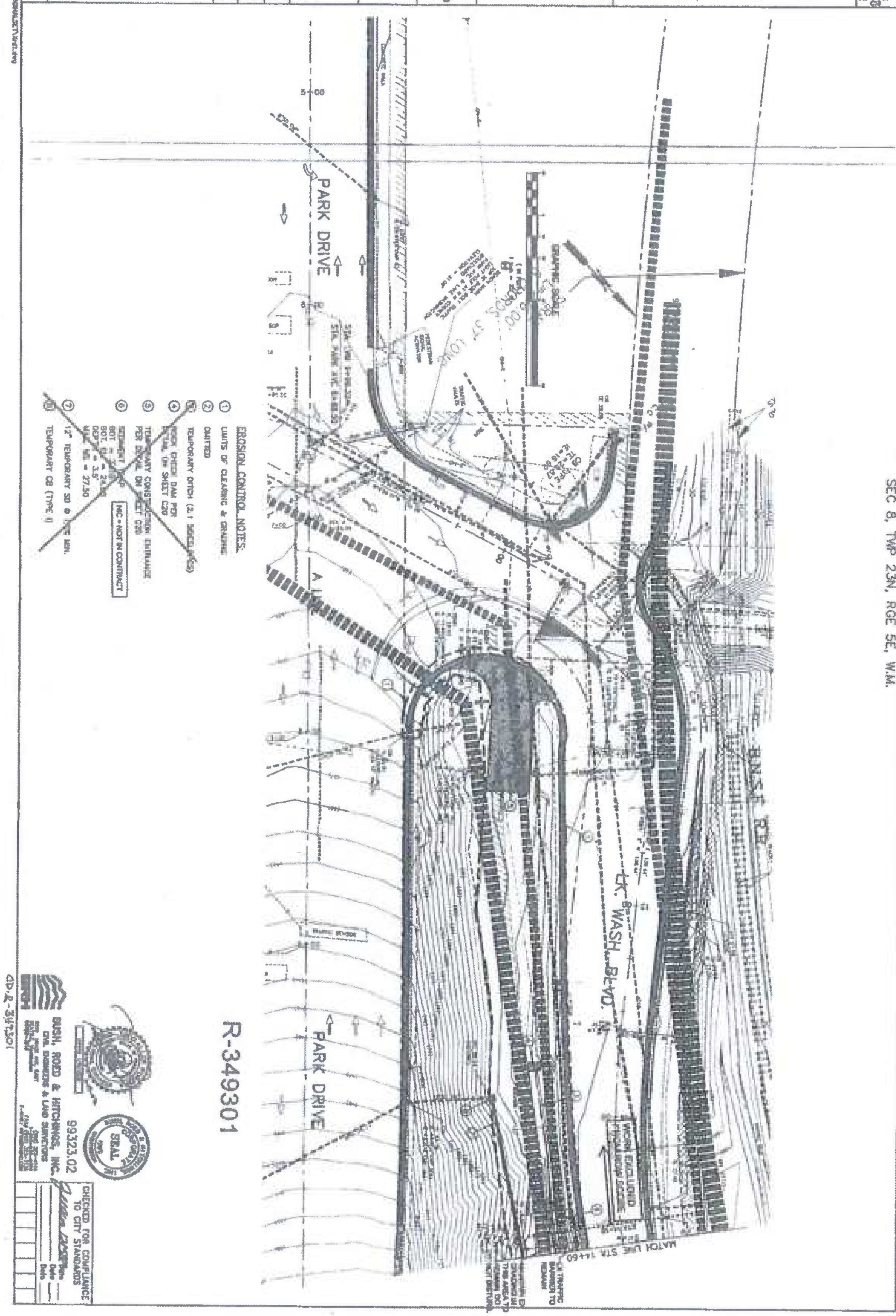
1"=20'H 1"=5'V

DATUM

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

EROSION CONTROL STA 9+96 TO STA 14+60
LAKE WASH. BLVD. IMPROVEMENTS
SOUTHPORT DEVELOPMENT

3/1/00



LAYERSET:ERO-V3
Plotted 11/18/02 12:58

NO	REVISION	BY	DATE	APPR
1	PER CITY OF RENTON REVIEW		8/21/00	

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

DATUM

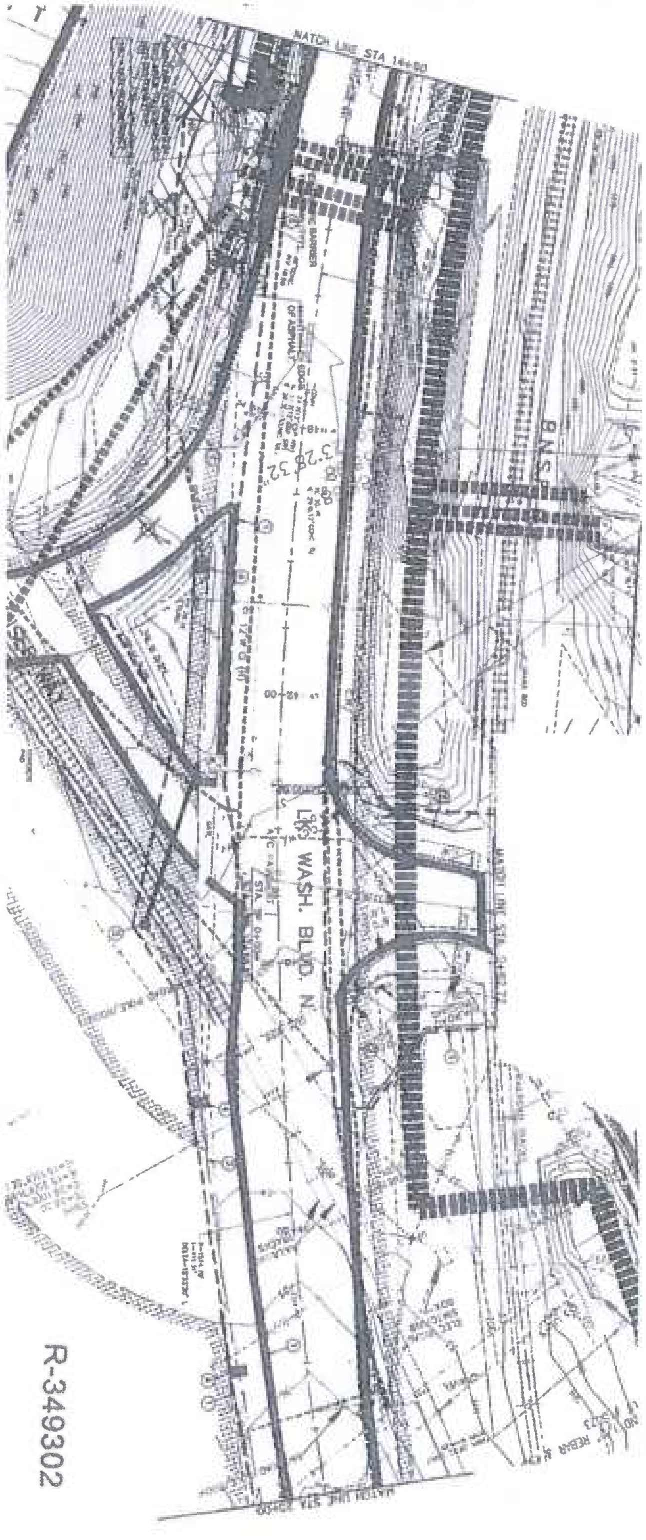
CITY OF RENTON
Planning/Building/Public Works Dept.
Gregg Zimmerman P.E., Administrator

EROSION CONTROL STA 14+80 TO STA 20+00
LAKE WASH. BLVD. IMPROVEMENTS
SOUTHPORT DEVELOPMENT

3/1/00

C11

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



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 LADEN RUNOFF SHALL NOT BE DISCHARGED TO CULVERTS.

BUSH, ROED & HITCHINGS, INC.
CIVIL ENGINEERS & LAND SURVEYORS

9923.02

CHECKED FOR COMPLIANCE TO CITY STANDARDS

CD: R-349302

LAYERSET:ERO-V4
Plotted: 11/16/02 12:57

NO.	REVISION	BY	DATE	APPR
1	FOR CITY OF RENTON REVIEW			

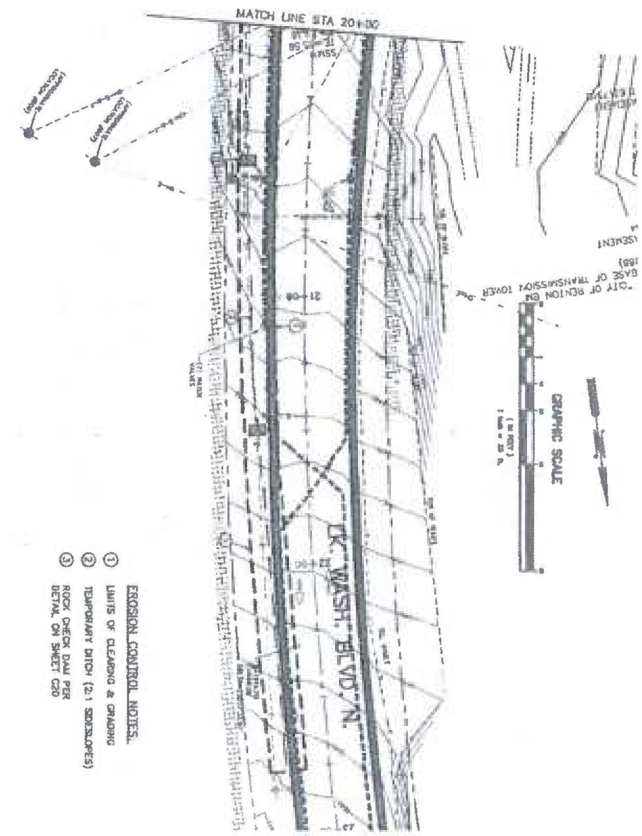
1"=20'H 1"=5'V

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

EROSION CONTROL STA 20+00 TO STA 23+00
LAKE WASH. BLVD. IMPROVEMENTS
SOUTHPORT DEVELOPMENT

3/1/00

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

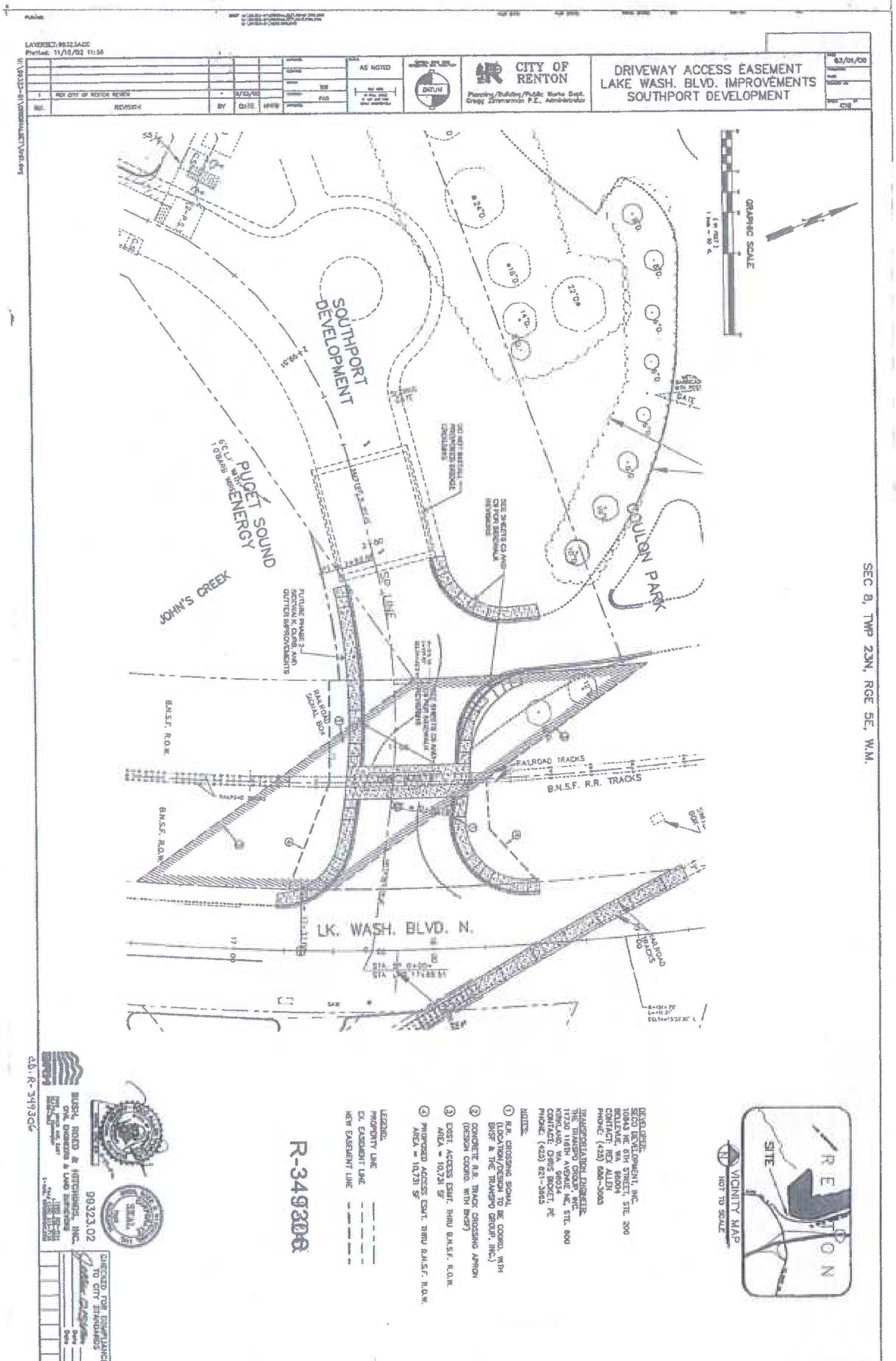
R-349303

BUSH, ROED & HITCHINGS, INC.
CIVIL ENGINEERS & LAND SURVEYORS

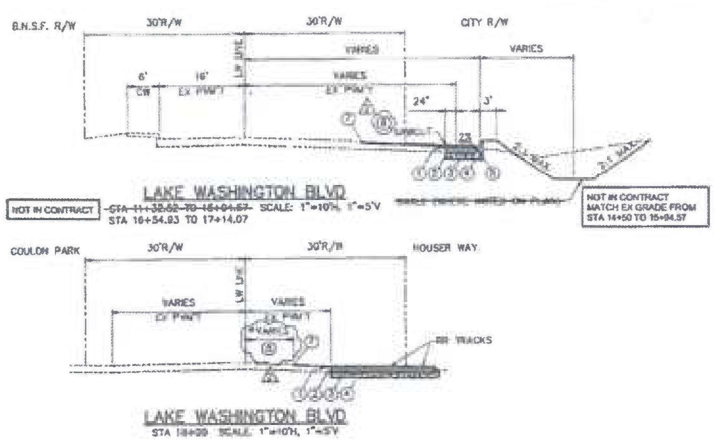
99323.02

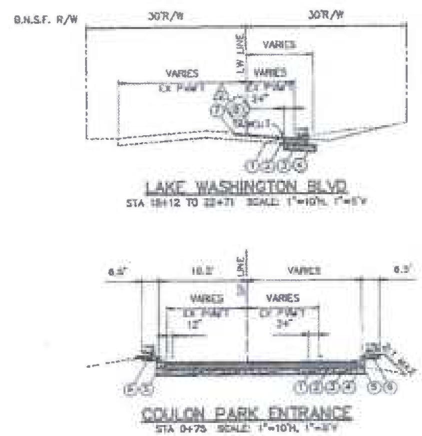
CHECKED FOR COMPLIANCE TO CITY STANDARDS
Date
Date

CD. R-349303

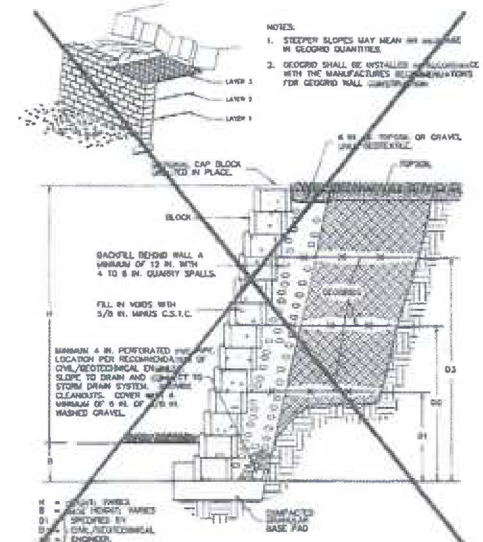

CITY OF RENTON
Planning/Building/Public Works Dept.
Gregg Zimmerman P.E., Administrator
DRIVEWAY ACCESS EASEMENT
LAKE WASH. BLVD. IMPROVEMENTS
SOUTHPORT DEVELOPMENT
AS NOTED
DATUM
REVISION
BY
DATE
SEC 8, TWP 23N, RGE 5E, W.M.
GRAPHIC SCALE
SOUTHPORT DEVELOPMENT
PUGET SOUND ENERGY
JOHN'S CREEK
COULON PARK
GATE
RAILROAD TRACKS
B.N.S.F. R.R. TRACKS
B.N.S.F. R.O.W.
RAILROAD SIGNAL BOX
LK. WASH. BLVD. N.
VICINITY MAP
NOT TO SCALE
SITE
RENTON
NOTES:
LEGEND:
PROPERTY LINE
EX. EASEMENT LINE
NEW EASEMENT LINE
R-349306
99323.02
BUSH, ROED & HITCHINGS, INC.
CIVIL ENGINEERS & LAND SURVEYORS
CHECKED FOR COMPLIANCE TO CITY STANDARDS
c.d. R-349306

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





1. 2" COMPT. DEPTH CLASS B ASPH/CONC PAVEMENT
2. 6" COMPT. DEPTH ASPHALT TREATED BASE
3. 8" COMPT. DEPTH CRUSHED SURFACING BASE COURSE
4. SUBGRADE OR GRAVEL BORROW COMPACTED TO 95%
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 & GRIND FULL LANE 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

GEOGRID REINFORCED BLOCK WALL
NO SCALE

NOT IN CONTRACT (FUTURE PHASE 2 WORK)

ROAD SECTIONS
LAKE WASH. BLVD. IMPROVEMENTS
SOUTHPORT DEVELOPMENT

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

AS NOTED

DATUM

NO.	REVISION	BY	DATE	APPR
1	PER CITY OF RENTON REVIEW		6/22/01	
2	PER CITY OF RENTON REVIEW		1/17/01	

3/1/00

C17

99323.02

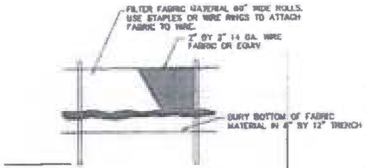
BUSH, ROED & HITCHINGS, INC.
CIVIL ENGINEERS & LAND SURVEYORS

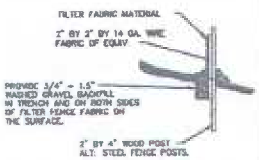
CHECKED FOR COMPLIANCE TO CITY STANDARDS
Date
Date
Date

LAYERSET: 99323DET
Plotted: 10/18/02 11:38

CD: T-349310

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

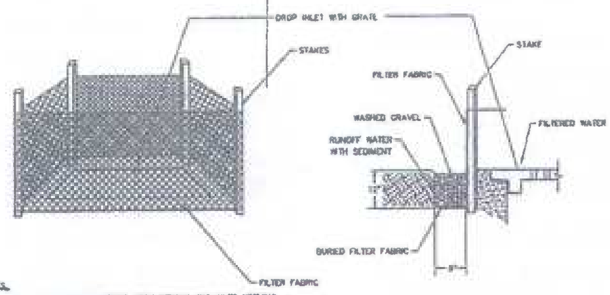




BRUSH BARRIER
NTS

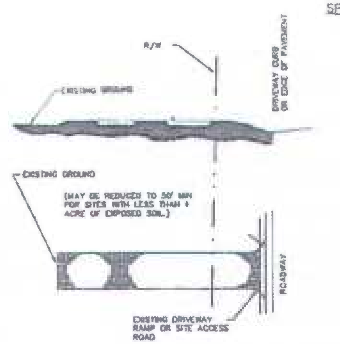
NOTES:
1. FOR SHEET RUNOFF OR FOLLOWING DISCHARGE FROM A SEDIMENT TRAP OR POND.
2. MAXIMUM SLOPE STEEPNESS PERPENDICULAR TO FENCE LINE IS 1:1.
3. MAXIMUM SHEET OR OVERLAND FLOW PATH LENGTH TO THE FENCE OF 100 FT.
4. IF 50% OR LESS OF THE SOIL, BY WEIGHT, IS FINE PARTICLES SMALLER THAN THE U.S. STANDARD SIEVE NO. 200, THE DOS SHOULD BE EQUAL TO OR SMALLER THAN THE SIEVE SIZE THAT 85% OF THE SOIL CAN PASS THROUGH.
5. THE TRENCH SHALL BE BACKFILLED WITH 3/4" MINIMUM DIAMETER WASHED GRAVEL.
5. FILTER FABRIC FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED
6. FILTER FABRIC FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS SHALL BE MADE IMMEDIATELY

FILTER FABRIC FENCE
NO SCALE



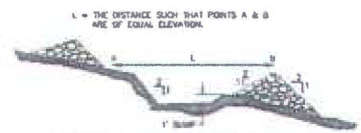
NOTES:
1. EXTEND THE FILTER FENCE/WIRE MESH BEYOND THE INLET OPENING AT LEAST 18" ON ALL SIDES.
2. PLACE 3/4" TO 3" GRAVEL OVER THE FILTER FABRIC/WIRE MESH. THE DEPTH OF GRAVEL SHOULD BE AT LEAST 12" OVER THE ENTIRE INLET OPENING.
3. IF THE GRAVEL FILTER BECOMES CLOGGED WITH SEDIMENT, THE GRAVEL MUST BE PULLED AWAY FROM THE INLET AND CLEANED OR REPLACED. AN ALTERNATIVE APPROACH WOULD BE TO USE THE CLOGGED GRAVEL AS FILL AND PUT FRESH GRAVEL AROUND THE INLET

CATCH BASIN SEDIMENT TRAP
NO SCALE



1. Use 4" to 8" quarry spalls or crushed rock for surfacing as shown. Material with "fines" 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.

TEMPORARY CONSTRUCTION ENTRANCE
NO SCALE

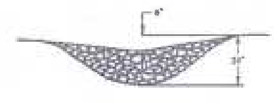


SPACING BETWEEN CHECK DAMS

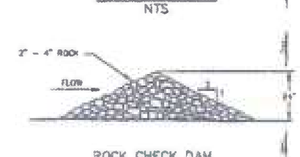
CHECK DAM
NO SCALE

CHECK DAMS ADOPTED CITY OF RENTON

DWG. NAME: ER20 SP PAGE: E067

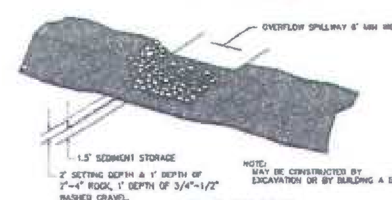


ROCK CHECK DAM
NTS



ROCK CHECK DAM
NTS

CROSS SECTION
NTS



SEDIMENT TRAP OUTLET
NTS

SEDIMENT TRAP
NO SCALE

R-349308

99323.02

BUSH, ROED & HITCHINGS, INC.
CIVIL ENGINEERS & LAND SURVEYORS

CHECKED FOR COMPLIANCE TO CITY STANDARDS
Date ____
Date ____
Date ____

CD. R-349308

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

EROSION CONTROL DETAILS
LAKE WASH. BLVD. IMPROVEMENTS
SOUTHPORT DEVELOPMENT

AS NOTED

DATUM

3/1/00

NO	REVISION	BY	DATE	APPR
1	PER CITY OF RENTON REVIEW		6/23/00	

LAYERSET 99323DCT
Plotted: 10/16/02 11:35

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LAYERSET 99323NOT
Plotted: 11/18/02 11:48

NO	REVISION	BY	DATE	APPR
1	PER CITY OF RENTON REVIEW			

AS NOTED

DATUM

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

CONSTRUCTION NOTES
LAKE WASH. BLVD. IMPROVEMENTS
SOUTHPORT DEVELOPMENT

3/1/00

C23

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

SURFACE WATER DRAINAGE NOTES & SPECIFICATIONS

1. BEFORE ANY CONSTRUCTION OR DEVELOPMENT ACTIVITY OCCURS, A PRE-CONSTRUCTION MEETING MUST BE HELD WITH THE CITY OF RENTON PLAN REVIEWER.
2. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE "1994 STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION" PREPARED BY W.S.D.O.T., AND THE AMERICAN PUBLIC WORKS ASSOCIATION (APWA), AS AMENDED BY THE CITY OF RENTON DEPARTMENT OF PUBLIC WORKS.
3. THE SURFACE WATER DRAINAGE SYSTEM SHALL BE CONSTRUCTED ACCORDING TO THE APPROVED PLANS WHICH ARE ON FILE IN THE DEPARTMENT OF PUBLIC WORKS. ANY DEVIATION FROM THE APPROVED PLANS WILL REQUIRE WRITTEN APPROVAL FROM THE CITY OF RENTON DEPARTMENT OF PUBLIC WORKS OR SURFACE WATER UTILITY.
4. A COPY OF THESE APPROVED PLANS MUST BE ON THE JOB SITE WHENEVER CONSTRUCTION IS IN PROGRESS.
5. DATUM SHALL BE NAVD 88, UNLESS OTHERWISE APPROVED BY CITY OF RENTON DEPARTMENT OF PUBLIC WORKS. REFERENCE BENCHMARK AND ELEVATION ARE NOTED ON THE PLANS.
6. ALL SEDIMENTATION/EROSION FACILITIES MUST BE IN OPERATION PRIOR TO CLEARING AND BUILDING CONSTRUCTION, AND THEY MUST BE SATISFACTORILY MAINTAINED UNTIL CONSTRUCTION IS COMPLETED AND THE POTENTIAL FOR ON-SITE EROSION HAS PASSED.
7. ALL RETENTION/DETENTION FACILITIES MUST BE INSTALLED AND IN OPERATION PRIOR TO OR IN CONJUNCTION WITH ALL CONSTRUCTION ACTIVITY UNLESS OTHERWISE APPROVED BY THE DEPARTMENT OF PUBLIC WORKS, SURFACE WATER UTILITY.
8. GRASS SEED MAY BE APPLIED BY HYDROSEEDING. THE GRASS SEED MIXTURE, OTHER THAN CITY OF RENTON APPROVED STANDARD MIXES, SHALL BE SUBMITTED BY A LANDSCAPE ARCHITECT AND APPROVED BY THE DEPARTMENT OF PUBLIC WORKS, SURFACE WATER UTILITY.
9. ALL PIPE AND APPURTENANCES SHALL BE LAID ON A PROPERLY PREPARED FOUNDATION IN ACCORDANCE WITH SECTION 7-02.3(1) OF THE CURRENT STATE OF WASHINGTON STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION. THIS SHALL INCLUDE NECESSARY LEVELING OF THE TRENCH BOTTOM OR THE TOP OF THE FOUNDATION MATERIAL AS WELL AS PLACEMENT AND COMPACTION OF REQUIRED BEDDING MATERIAL TO UNIFORM GRADE SO THAT THE ENTIRE LENGTH OF THE PIPE WILL BE SUPPORTED ON A UNIFORMLY DENSE UNYIELDING BASE. ALL PIPE BEDDING SHALL BE APWA CLASS "C", WITH THE EXCEPTION OF PVC PIPE. ALL TRENCH BACKFILL SHALL BE COMPACTED TO MINIMUM 95% FOR PAVEMENT AND STRUCTURAL FILL AND 90% OTHERWISE PER ASTM D-1557-78. PEA GRAVEL BEDDING SHALL BE 6" OVER AND UNDER P.V.C. PIPE.
10. GALVANIZED STEEL PIPE AND ALUMINIZED STEEL PIPE FOR ALL DRAINAGE FACILITIES SHALL HAVE ASPHALT TREATMENT #1 OR BETTER INSIDE AND OUTSIDE.
11. STRUCTURES SHALL NOT BE PERMITTED WITHIN 10 FEET OF THE SPRING LINE OF ANY STORM DRAINAGE PIPE, OR 10 FEET FROM THE TOP OF ANY CHANNEL BANK.
12. ALL CATCH BASIN GRATES SHALL BE DEPRESSED 0.10 FEET BELOW PAVEMENT LEVEL.
13. OPEN CUT ROAD CROSSINGS THROUGH EXISTING PUBLIC RIGHT OF WAY WILL NOT BE ALLOWED UNLESS SPECIFICALLY APPROVED BY THE CITY OF RENTON ADMINISTRATOR, DEPARTMENT OF PLANNING/BUILDING/PUBLIC WORKS.
14. ROCK FOR EROSION PROTECTION OF ROADSIDE DITCHES, WHERE REQUIRED, SHALL BE OF SOUND QUARRY ROCK PLACED TO A DEPTH OF 1 FOOT AND MUST MEET THE FOLLOWING SPECIFICATIONS: 4"-8"/40%-70% PASSING; 2"-4" ROCK/30%-40% PASSING; AND -2" ROCK/10%-20% PASSING.
15. ~~ALL BUILDING DOWNSPOUTS AND FOOTING DRAINS SHALL BE CONNECTED TO THE STORM DRAINAGE SYSTEM, UNLESS APPROVED BY THE DEPARTMENT OF DEVELOPMENT SERVICES PLAN REVIEWER OR SURFACE WATER UTILITY. AN ACCURATELY DIMENSIONED CERTIFIED AS-BUILT DRAWING OF THE DRAINAGE SYSTEM WILL BE SUBMITTED TO THE CITY OF RENTON UPON COMPLETION.~~
16. ISSUANCE OF THE BUILDING OR CONSTRUCTION PERMIT BY THE CITY OF RENTON DOES NOT RELIEVE THE OWNER OF THE CONTINUING LEGAL OBLIGATION AND/OR LIABILITY CONNECTED WITH STORM SURFACE WATER DISPOSITION. FURTHER, THE CITY OF RENTON DOES NOT ACCEPT ANY OBLIGATION FOR THE PROPER FUNCTIONING AND MAINTENANCE OF THE SYSTEM PROVIDED DURING CONSTRUCTION.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADEQUATE SAFEGUARD, SAFETY DEVICES, PROTECTIVE EQUIPMENT, FLAGGERS, AND ANY OTHER NEEDED ACTIONS TO PROTECT THE LIFE, HEALTH, AND SAFETY OF THE PUBLIC, AND TO PROTECT PROPERTY IN CONNECTION WITH THE PERFORMANCE OF WORK COVERED BY THE CONTRACT. ANY WORK WITHIN THE TRAVELED RIGHT OF WAY THAT MAY INTERRUPT NORMAL TRAFFIC FLOW SHALL REQUIRE AN APPROVED TRAFFIC CONTROL PLAN BY THE TRAFFIC ENGINEERING DIVISION OF THE DEPARTMENT OF PUBLIC WORKS. ALL SECTIONS OF THE W.S.D.O.T. STANDARD SPECIFICATIONS 1-07-23, TRAFFIC CONTROL, SHALL APPLY.
18. SPECIAL DRAINAGE MEASURES WILL BE REQUIRED IF THE PROJECT LOCATION IS WITHIN THE AQUIFER PROTECTION AREA (APA).

EROSION CONTROL NOTES

1. BEFORE ANY CONSTRUCTION OR DEVELOPMENT ACTIVITY OCCURS, A PRE-CONSTRUCTION MEETING MUST BE HELD WITH THE CITY OF RENTON DEPARTMENT OF PUBLIC WORKS, DESIGN ENGINEER.
2. 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.
3. ALL REQUIRED SEDIMENTATION/EROSION CONTROL FACILITIES MUST BE CONSTRUCTED AND IN OPERATION PRIOR TO LAND CLEARING AND/OR OTHER CONSTRUCTION TO INSURE THAT SEDIMENT LADEN WATER DOES NOT ENTER THE NATURAL DRAINAGE SYSTEM. ALL EROSION AND SEDIMENT FACILITIES SHALL BE MAINTAINED IN A SATISFACTORY CONDITION UNTIL SUCH TIME THAT CLEARING AND/OR CONSTRUCTION IS COMPLETED AND POTENTIAL FOR ON-SITE EROSION HAS PASSED. THE IMPLEMENTATION, MAINTENANCE, REPLACEMENT AND ADDITIONS TO EROSION/SEDIMENTATION CONTROL SYSTEMS SHALL BE THE RESPONSIBILITY OF THE PERMITTEE.
4. THE EROSION AND SEDIMENTATION CONTROL SYSTEMS DEPICTED ON THIS DRAWING ARE INTENDED TO BE MINIMUM REQUIREMENTS TO MEET ANTICIPATED SITE CONDITIONS. AS CONSTRUCTION PROGRESSES AND UNEXPECTED OR SEASONAL CONDITIONS DICTATE, THE PERMITTEE SHALL ANTICIPATE THAT MORE EROSION AND SEDIMENTATION CONTROL FACILITIES WILL BE NECESSARY TO INSURE COMPLETE SILTATION CONTROL ON THE PROPOSED SITE. DURING THE COURSE OF CONSTRUCTION, IT SHALL BE THE OBLIGATION AND RESPONSIBILITY OF THE PERMITTEE TO ADDRESS ANY NEW CONDITIONS THAT MAY BE CREATED BY HIS ACTIVITIES AND TO PROVIDE ADDITIONAL FACILITIES, OVER AND ABOVE MINIMUM REQUIREMENTS, AS MAY BE NEEDED TO PROTECT ADJACENT PROPERTIES AND WATER QUALITY OF THE RECEIVING DRAINAGE SYSTEM.
5. APPROVAL OF THIS PLAN IS FOR EROSION/SEDIMENTATION CONTROL ONLY. IT DOES NOT CONSTITUTE AN APPROVAL OF STORM DRAINAGE DESIGN, SIZE NOR LOCATION OF PIPES, RESTRICTORS, CHANNELS, OR RETENTION FACILITIES.
6. DURING THE TIME PERIOD OF NOVEMBER 1 THROUGH MARCH 31, ALL PROJECT DISTURBED SOIL AREAS GREATER THAN 5,000 SQUARE FEET, THAT ARE TO BE LEFT UNWORKED FOR MORE THAN TWELVE (12) HOURS, SHALL BE COVERED BY MULCH, SODDING, OR PLASTIC COVERING.
7. IN ANY AREA WHICH HAS BEEN STRIPPED OF VEGETATION AND WHERE NO FURTHER WORK IS ANTICIPATED FOR A PERIOD OF 30 DAYS OR MORE, ALL DISTURBED AREAS MUST BE IMMEDIATELY STABILIZED WITH MULCHING, GRASS PLANTING OR OTHER APPROVED EROSION CONTROL TREATMENT APPLICABLE TO THE TIME OF YEAR IN QUESTION. GRASS SEEDING ALONE WILL BE ACCEPTABLE ONLY DURING THE MONTHS OF APRIL THROUGH SEPTEMBER INCLUSIVE. SEEDING MAY PROCEED, HOWEVER, WHENEVER IT IS IN THE INTEREST OF THE PERMITTEE, BUT MUST BE AUGMENTED WITH MULCHING, NETTING, OR OTHER TREATMENT APPROVED BY THE CITY OF RENTON, OUTSIDE THE SPECIFIED TIME PERIOD.
8. FOR ALL EROSION/SEDIMENTATION CONTROL PONDS WHERE THE DEAD STORAGE DEPTH EXCEEDS 6 INCHES, A FENCE, A MINIMUM OF 3 FEET HIGH IS REQUIRED, WITH 3:1 SIDE SLOPES.
9. A TEMPORARY GRAVEL CONSTRUCTION ENTRANCE, 24' X 50' X 8" OF 4- TO 8- INCH QUARRY SPALLS SHALL BE LOCATED AT ALL POINTS OF VEHICULAR INGRESS AND EGRESS TO THE CONSTRUCTION SITE.

CONSTRUCTION SEQUENCE

1. ATTEND PRECONSTRUCTION MEETING WITH THE CITY OF RENTON.
2. FLAG OR FENCE CLEARING AND GRADING LIMITS.
3. POST SIGN WITH NAME AND PHONE NUMBER OF T.E.S.C. SUPERVISOR.
4. INSTALL CATCH BASIN PROTECTION AS NOTED ON THE PLANS.
5. GRADE AND INSTALL CONSTRUCTION ENTRANCE(S).
6. INSTALL PERIMETER PROTECTION (SILT FENCE, BRUSH BARRIER, ETC.).
7. CONSTRUCT SEDIMENT PONDS AND TRAPS.
8. GRADE AND STABILIZE CONSTRUCTION ROADS.
9. CONSTRUCT SURFACE WATER CONTROLS (INTERCEPTOR DIKES, PIPE SLOPE DRAINS, ETC.) SIMULTANEOUSLY WITH CLEARING AND GRADING FOR PROJECT DEVELOPMENT.
10. BEGIN SITE DEMOLITION, GRADING, UTILITY AND PAVING WORK.
11. MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH AGENCY STANDARDS AND MANUFACTURE'S RECOMMENDATIONS.
12. RELOCATE SURFACE WATER CONTROLS AND EROSION CONTROL MEASURES OR INSTALL NEW MEASURES SO THAT AS SITE CONDITIONS CHANGE THE EROSION AND SEDIMENT CONTROL IS ALWAYS IN ACCORDANCE WITH THE AGENCY'S EROSION AND SEDIMENT CONTROL STANDARDS.
13. COVER ALL AREAS THAT WILL BE UNWORKED FOR MORE THAN SEVEN DAYS DURING THE DRY SEASON OR TWO DAYS DURING THE WET SEASON WITH STRAW, WOOD FIBER MULCH, COMPOST, PLASTIC SHEETING OR EQUIVALENT.
14. STABILIZE ALL AREAS THAT REACH FINAL GRADE WITHIN SEVEN DAYS.
15. SEED OR SOD ANY AREAS TO REMAIN UNWORKED FOR MORE THAN 30 DAYS.
16. UPON COMPLETION OF THE PROJECT, ALL DISTURBED AREAS MUST BE STABILIZED AND BMP'S REMOVED IF APPROPRIATE.

GENERAL ENGINEERING NOTES

1. EXISTING UTILITIES AND UNDERGROUND STRUCTURES SHOWN ON THE PLAN ARE BASED UPON THE BEST AVAILABLE PUBLIC RECORDS AND\OR PRIVATE RECORDS AS SUPPLIED BY THE PROJECT OWNER AND\OR DATA OBTAINED VERBALLY FROM OWNERS OR OFFICIALS ASSOCIATED WITH THE PARTICULAR UTILITY. NEITHER THE OWNER NOR THE ENGINEER GUARANTEE THE ACCURACY OR COMPLETENESS OF THIS INFORMATION AND ASSUME NO RESPONSIBILITY FOR IMPROPER LOCATIONS OR FAILURE TO SHOW UTILITY LOCATIONS ON THE CONSTRUCTION PLANS. OTHER UNDERGROUND FACILITIES NOT SHOWN ON THE DRAWINGS MAY BE ENCOUNTERED DURING THE COURSE OF THE WORK. ALL INVERT ELEVATIONS SHOWN ON THE DRAWINGS SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
2. IF CHANGED CONDITIONS ARE ENCOUNTERED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER PROMPTLY OF (1) PREEXISTING SUBSURFACE CONDITIONS DIFFERING FROM THOSE INDICATED IN THE PLANS, OR (2) PREEXISTING UNKNOWN SUBSURFACE CONDITIONS, OF AN UNUSUAL NATURE, DIFFERING MATERIALLY FROM THOSE ORDINARILY ENCOUNTERED AND GENERALLY RECOGNIZED AS INHERENT IN WORK OF THE CHARACTER PROVIDED FOR IN THE CONTRACT. THE CONTRACTOR AND/OR THE OWNER SHALL MAKE NO CLAIMS TO THE ENGINEER FOR RECOMPENSATION FOR EXTRA WORK RESULTING FROM CHANGED CONDITIONS UNLESS THE ENGINEER HAS APPROVED THE WORK IN WRITING. (WSDOT SEC 1-04.7)
3. THE CONTRACTOR SHALL CALL THE UTILITIES UNDERGROUND LOCATION CENTER FOR FIELD LOCATION OF ALL UTILITIES AND SHALL NOT BEGIN EXCAVATION UNTIL ALL KNOWN UNDERGROUND FACILITIES IN THE VICINITY OF THE PROPOSED WORK HAVE BEEN LOCATED AND MARKED. IF THE UTILITY IS NOT A SUBSCRIBER OF THE UNDERGROUND LOCATION CENTER THEN THE CONTRACTOR SHALL GIVE INDIVIDUAL NOTICE TO THAT UTILITY. WSDOT SEC. 1-07.17 APWA SUPPLEMENT)
4. THE CONTRACTOR SHALL TAKE REASONABLE PRECAUTIONS AND EXERCISE SOUND ENGINEERING AND CONSTRUCTION PRACTICES IN CONDUCTING THE WORK. THE CONTRACTOR SHALL PROTECT EXISTING PUBLIC AND PRIVATE UTILITIES FROM DAMAGE DURING CONSTRUCTION. IF EXISTING UTILITIES ARE DAMAGED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER AND THE ENGINEER. THE CONTRACTOR SHALL RESTORE THE UTILITY TO ITS EXISTING CONDITION.(WSDOT SECTION 1-07.17 APWA SUPPLEMENT). THE CONTRACTOR IS RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION FOR DESIGNS SHOWN ON THESE PLANS.
5. WHERE THE PLANS CALL FOR UTILITIES TO BE RELOCATED BY OTHERS, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANY AND COORDINATE HIS WORK SO AS TO AVOID CONFLICTS.
6. ALL EXCAVATION, TRENCHING, SUBGRADE PREPARATION, FILL PLACEMENT AND COMPACTION AND ALL SOIL WORK IN GENERAL SHALL BE CONDUCTED IN COMPLIANCE WITH THE RECOMMENDATIONS OF THE PROJECT SOIL ENGINEER AND THE CURRENT GEOTECHNICAL ENGINEERING REPORT.
7. ENGINEERING DESIGN AND APPROVAL FOR STRUCTURES SUCH AS WALLS AND VAULTS MUST BE PREPARED BY THE APPROPRIATE PROFESSIONAL ENGINEER AND IS NOT A PART OF THESE PLANS.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR HIRING PROFESSIONAL LAND SURVEYOR TO REFERENCE EXISTING MONUMENTS ON OR ADJOINING SITE PREVIOUS TO DEMOLITION OR CONSTRUCTION AND TO RE-ESTABLISH SAID POINTS AT PROJECT COMPLETION. THIS RE-ESTABLISHMENT SHALL BE DOCUMENTED BY RECORD OF SURVEY OR CORNER RECORD AS DESCRIBED IN W.A.C. 332-120.

R-349309

SEAL

99323.02

BUSH, ROED & HITCHINGS, INC.
CIVIL ENGINEERS & LAND SURVEYORS

CHECKED FOR COMPLIANCE TO CITY STANDARDS
Date
Date
Date

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CDI R-349309

LAKE WASHINGTON BOULEVARD/ SITE ACCESS
CHANNELIZATION PLAN

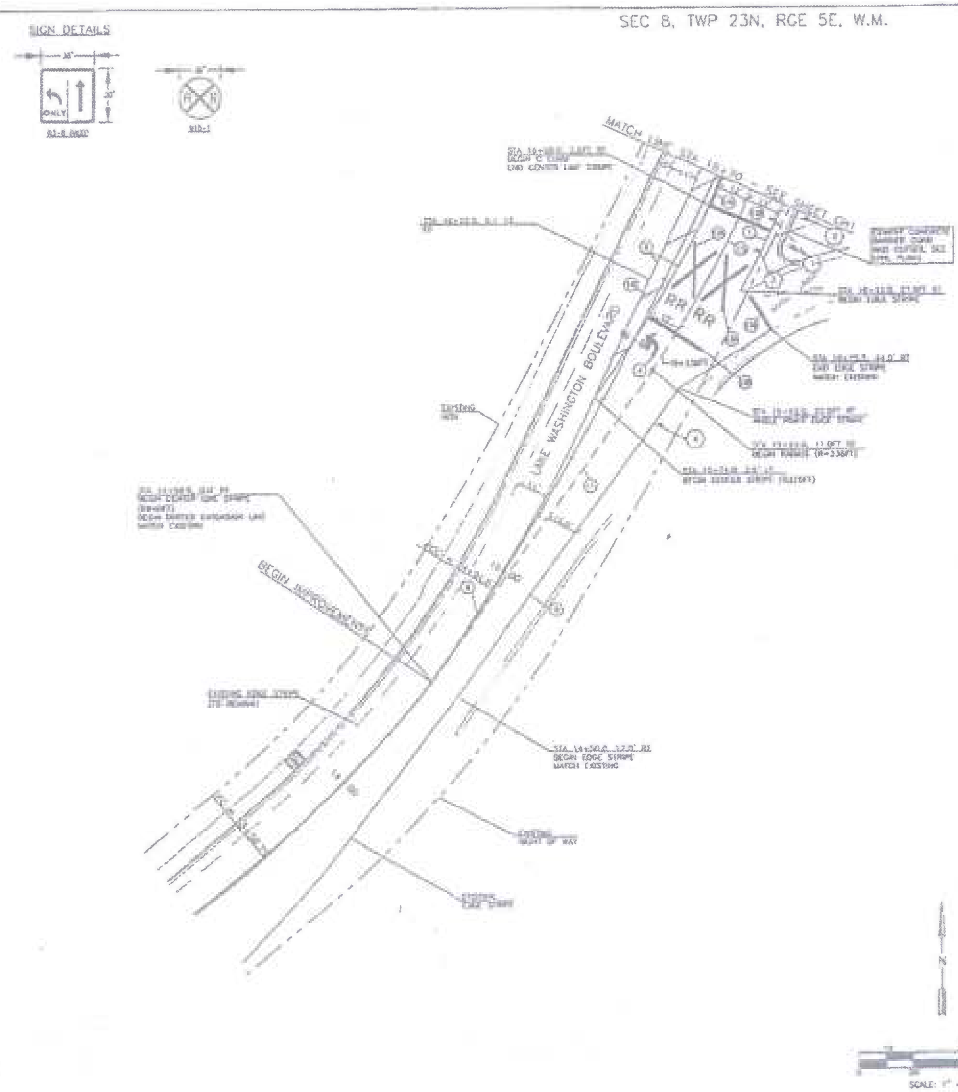
TENW — Transportation Engineering NorthWest

CITY OF RENTON — Planning/Building/Public Works Dept

CH2

NO	REVISION	BY	DATE	APPR

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



GENERAL NOTES

FOR GENERAL NOTES, SEE SHEET CH1

CHANNELIZATION NOTES

(1) INSTALL 8IN SOLID WHITE PAINTED WIDE LINE, PER CITY OF RENTON STANDARD PLANS

(4) INSTALL TYPE 2L METHYLMETHACRYLATE PAVEMENT ARROW, PER CITY OF RENTON STANDARD PLANS, PAGE H009.

(8) INSTALL 4IN SOLID WHITE PAINTED EDGE STRIPE, PER CITY OF RENTON STANDARD PLANS, PAGE H008

(9) INSTALL RPM DOUBLE YELLOW CENTER LINE, PER CITY OF RENTON STANDARD PLANS, PAGE H001

(11) INSTALL 8IN WHITE PAINTED DOTTED EXTENSION LINE PER DETAIL A, SHEET CH1

(13A) INSTALL WHITE THERMOPLASTIC RAILROAD CROSSING SYMBOL PER CITY OF RENTON STANDARD PLANS, PAGE H009.2.

(13B) INSTALL 24" WHITE THERMOPLASTIC TRANSVERSE LINE PER CITY OF RENTON STANDARD PLANS, PAGE H009.2.

(14) INSTALL TYPE "C" BLOCK PRECAST TRAFFIC CURB, PER CITY OF RENTON STANDARD PLANS, PAGE H007

(15) INSTALL RPM APPROACH LINE, PER CITY OF RENTON STANDARD PLANS, PAGE H002.

(15) INSTALL HACHURE STRIPING PER DETAIL B, SHEET CH1

CONSTRUCTION NOTES (THIS SHEET ONLY)

(1) RELOCATE EXISTING "OVERWEIGHT VEHICLES PROHIBITED" SIGN TO APPROXIMATE LOCATION SHOWN ON NEW 4IN X 4IN WOOD POST PER CITY OF RENTON STANDARD PLANS, PAGE G010.

(2) INSTALL R3-8(MOD) 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 G010.

(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 G010.

CHECK FOR COMPLIANCE TO CITY STANDARDS

DATE
DATE
DATE

LAKE WASHINGTON BOULEVARD/
SITE ACCESS
CHANNELIZATION PLAN

CH2

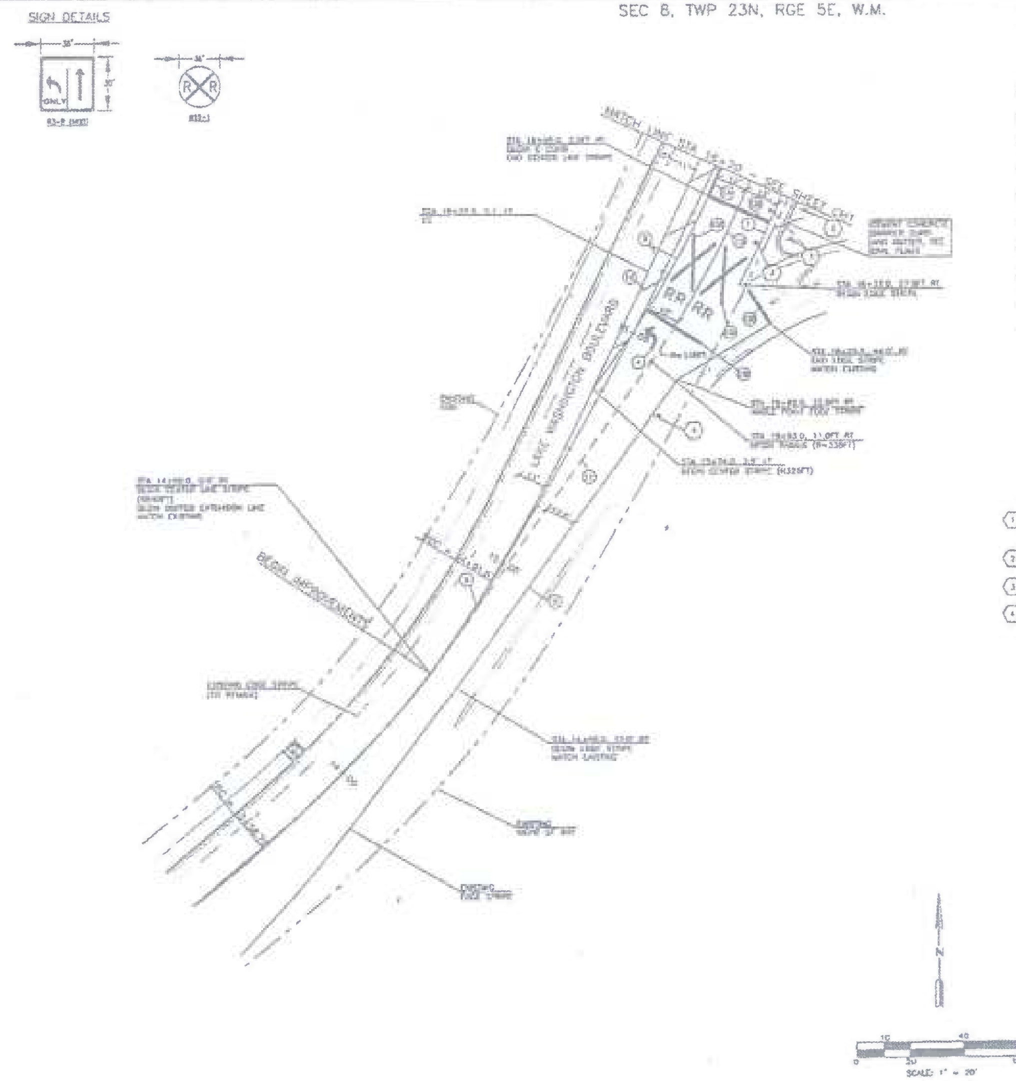
CITY OF RENTON

Planning/Building/Public Works Dept.

TENW
Transportation Engineering NorthWest

REVISION	BY	DATE	APPR

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



GENERAL NOTES

FOR GENERAL NOTES, SEE SHEET CH1

CHANNELIZATION NOTES

(1) INSTALL 8IN SOLID WHITE PAINTED WIDE LINE, PER CITY OF RENTON STANDARD PLANS.

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(6) INSTALL 4IN SOLID WHITE PAINTED EDGE STRIPE, PER CITY OF RENTON STANDARD PLANS, PAGE H005.

(8) INSTALL RPM DOUBLE YELLOW CENTER LINE, PER CITY OF RENTON STANDARD PLANS, PAGE H001

(11) INSTALL 8IN WHITE PAINTED DOTTED EXTENSION LINE PER DETAIL A, SHEET CH1.

(12) INSTALL WHITE THERMOPLASTIC RAILROAD CROSSING SYMBOL PER CITY OF RENTON STANDARD PLANS, PAGE H009.2.

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(15) INSTALL RPM APPROACH LINE, PER CITY OF RENTON STANDARD PLANS, PAGE H002.

(18) INSTALL HACHURE STRIPING PER DETAIL B, SHEET CH1

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LAKE WASHINGTON BOULEVARD/ SITE ACCESS

TRAFFIC SIGNAL PLAN

CITY OF RENTON
Planning/Building/Public Works Dept.

TENW

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

SIGNAL PHASING

- VEHICLE MOVEMENT
- PEDESTRIAN MOVEMENT
- PROTECTED LEFT TURN
- PERMISSIVE LEFT TURN

PREEMPT SCHED.	
DEVICE	PHASES
A	2,5, OLB
B	4, OLA
C	1,6, OLB
D	3, OLA

RAILROAD PREEMPT SCHED

PREEMPT 1	PREEMPT 2
OLB #1 #6	OLB #7 OLA
(MAIN-LINE TRAIN)	(SPUR TRAIN)

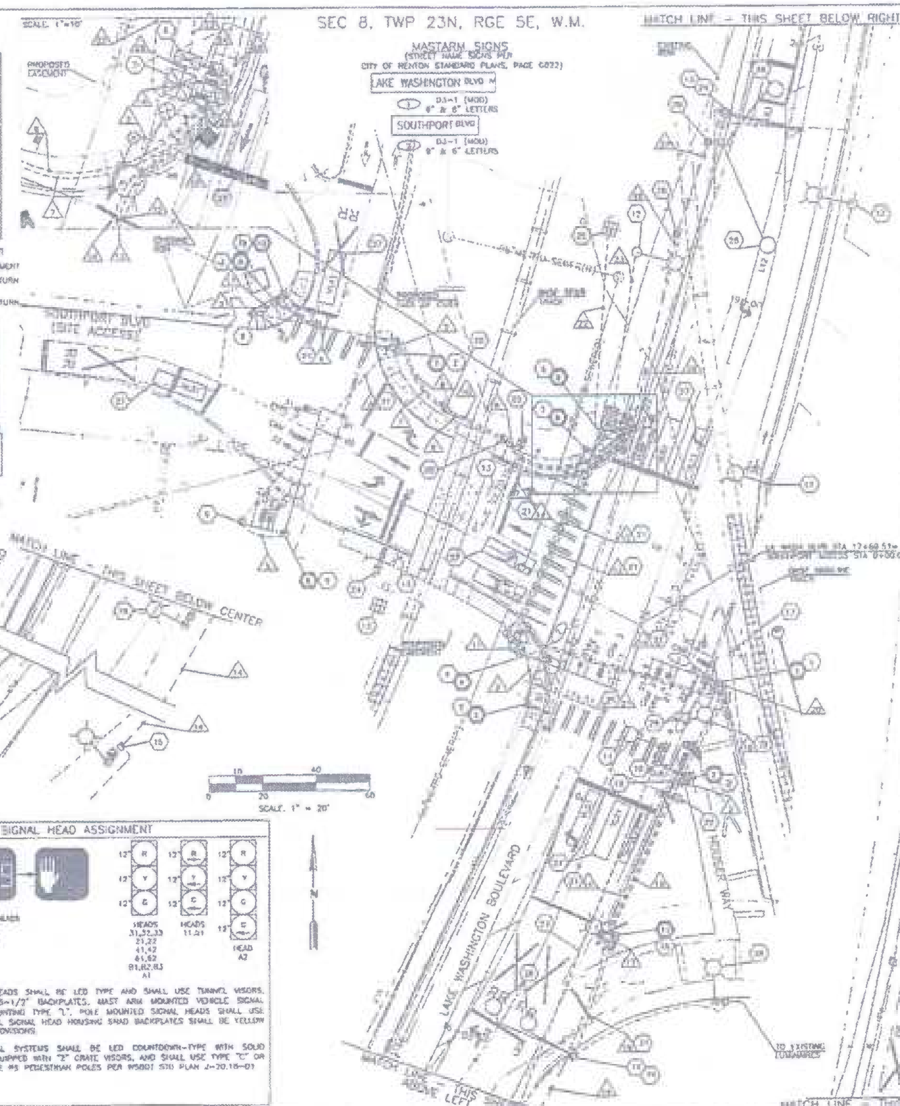
(ALL OTHER PHASES RED)

MASTARM SIGNS

(STREET NAME SIGNS PER CITY OF RENTON STANDARD PLANS, PAGE 0022)

LAKE WASHINGTON BLVD N — D3-1 (MOD) 8" & 6" LETTERS

SOUTHPORT BLVD — D3-1 (MOD) 8" & 6" LETTERS



CONSTRUCTION NOTES

1. CONSTRUCT FOUNDATION AND INSTALL TYPE SD SIGNAL POLE WITH 30FT MASTARM FOR NORTHBOUND TRAFFIC AND 15FT MASTARM FOR EASTBOUND TRAFFIC. INSTALL THREE VEHICULAR SIGNAL HEADS, ONE VIDEO DETECTION CAMERA, ONE TYPE M711 PREEMPTION DETECTOR, AND ONE STREET NAME SIGN ON THE MASTARM FOR NORTHBOUND TRAFFIC. INSTALL ONE VEHICULAR SIGNAL HEAD AND ONE VIDEO DETECTION CAMERA ON THE MASTARM FOR EASTBOUND TRAFFIC. INSTALL ONE LED DECORATIVE LUMINAIRE WITH PHOTOCELL PER THE LUMINAIRE POLE SCHEDULE SHEET TS2 AND CITY OF RENTON STD PLAN 117.3, ONE VEHICULAR SIGNAL HEAD WITH TYPE K SIDE MOUNT, ONE STREET NAME SIGN, AND ONE TERMINAL CABINET ON THE POLE.
2. CONSTRUCT FOUNDATION AND INSTALL TYPE PS PEDESTRIAN SIGNAL POLE WITH ONE PEDESTRIAN SIGNAL HEAD AND ONE POLARA NAVIGATOR APS PEDESTRIAN PUSHBUTTON ASSEMBLY. USE TYPE D TOP MOUNT PER WSDOT STANDARD PLAN J-20.15-01
3. CONSTRUCT FOUNDATION AND INSTALL TYPE I PEDESTRIAN SIGNAL POLE WITH ONE VEHICULAR SIGNAL HEAD, ONE PEDESTRIAN SIGNAL HEAD AND ONE POLARA NAVIGATOR APS PEDESTRIAN PUSHBUTTON ASSEMBLY
4. CONSTRUCT FOUNDATION AND INSTALL TYPE II SIGNAL POLE WITH 40FT MASTARM. INSTALL THREE VEHICULAR SIGNAL HEADS, ONE VIDEO DETECTION CAMERA, ONE TYPE M711 PREEMPTION DETECTOR, AND ONE STREET NAME SIGN ON THE MASTARM. INSTALL ONE PEDESTRIAN SIGNAL HEAD, ONE PEDESTRIAN PUSHBUTTON ASSEMBLY, AND ONE TERMINAL CABINET ON THE POLE. INSTALL ONE LED DECORATIVE LUMINAIRE WITH PHOTOCELL PER THE LUMINAIRE POLE SCHEDULE SHEET TS2 AND CITY OF RENTON STD PLAN 117.3. CONTACT THE KING COUNTY WATER TREATMENT DIVISION AT (206) 684-1707 REGARDING ADJACENT 96IN METRO SEWER PRIOR TO DRILLING FOR FOUNDATION.
5. CONSTRUCT FOUNDATION AND INSTALL TYPE SD SIGNAL POLE WITH 15FT MASTARM FOR SOUTHBOUND TRAFFIC AND 30FT MASTARM FOR EASTBOUND AND WESTBOUND TRAFFIC. INSTALL TWO VEHICULAR SIGNAL HEADS, ONE VIDEO DETECTION CAMERA, AND ONE TYPE M711 PREEMPTION DETECTOR ON THE MASTARM FOR SOUTHBOUND TRAFFIC. INSTALL FIVE VEHICULAR SIGNAL HEADS, ONE VIDEO DETECTION CAMERA, AND ONE TYPE M711 PREEMPTION DETECTOR ON THE MASTARM FOR EASTBOUND AND WESTBOUND TRAFFIC. INSTALL ONE TERMINAL CABINET ON THE POLE. INSTALL ONE LED DECORATIVE LUMINAIRE WITH PHOTOCELL PER THE LUMINAIRE POLE SCHEDULE SHEET TS2 AND CITY OF RENTON STD PLAN 117.3
6. CONSTRUCT FOUNDATION AND INSTALL LUMINAIRE POLE WITH LED DECORATIVE LUMINAIRE AND PHOTOCELL PER THE LUMINAIRE POLE SCHEDULE SHEET TS2 AND CITY OF RENTON STD PLAN 117.3. CONTACT THE KING COUNTY WATER TREATMENT DIVISION AT (206) 684-1707 REGARDING ADJACENT 96IN METRO SEWER PRIOR TO DRILLING FOR FOUNDATION
7. CONSTRUCT COMBINATION TRAFFIC SIGNAL CONTROLLER/EPS/SERVICE CABINET FOUNDATION PER CITY OF RENTON STANDARD PLAN 128.2. INSTALL TYPE P-PLUS TS2 TYPE 1 CONTROLLER CABINET WITH SIEMENS M50 CONTROLLER AND ALL ASSOCIATED COMPONENTS (SPECIFICATIONS AND CONTROLLER SOFTWARE TO BE PROVIDED BY THE CITY) WITH SIX PREEMPTION PHASES (4 VEHICLE AND 2 RAILROAD). THE CABINET DOOR SHALL OPEN TO THE WEST. INSTALL ALPHA BATTERY BACKUP. INSTALL SERVICE CABINET WITH 120/240V SINGLE PHASE POWER A. PROVIDE A 60 AMP SIGNAL CIRCUIT BREAKER, THREE 15 AMP ILLUMINATION CIRCUIT BREAKERS, AND OTHER CIRCUIT BREAKERS/COMPONENTS PER THE STANDARD PLAN 122.2. LOCATE THE CABINET WITHIN THE EASEMENT LIMITS.
8. DELETED
9. COIL 20FT OF EXTRA CONDUCTOR FOR EXTENSION TO FUTURE PEDESTRIAN POLES
10. RELOCATE EXISTING MAILBOXES. COORDINATE WITH THE POSTMASTER REGARDING NEW LOCATIONS.
11. REMOVE EXISTING LUMINAIRE POLE AND RETURN TO THE CITY. REMOVE EXISTING JUNCTION BOX AND FOUNDATION. REMOVE EXISTING CONDUCTORS AND ABANDON EXISTING CONDUIT. REMOVE EXISTING STOP SIGN AND RELOCATE EXISTING "GENE COULON MEMORIAL BEACH PARK" SIGN PER SHEET CH1
12. APPROXIMATE LOCATION OF POWER SOURCE. CONTRACTOR SHALL FURNISH AND INSTALL ALL CONDUIT AND CONDUCTORS TO THE POWER SOURCE. CONTRACTOR SHALL LEAVE SUFFICIENT SLACK IN CONDUCTORS FOR FINAL CONNECTION BY PSE. THE CONTRACTOR SHALL COORDINATE WITH PSE TO MAKE THE FINAL CONNECTION TO THE POWER SOURCE, INCLUDING COMPLETING/SUBMITTING ALL FORMS AND PROVIDING ALL FEES
13. EXISTING BNSF EQUIPMENT TO BE REMOVED BY OTHERS.
14. INTERCEPT EXISTING ILLUMINATION CONDUIT AND CONDUCTORS AT THE NEW JUNCTION BOX. SPLICE EXISTING CONDUCTORS FOR HOUSER WAY LUMINAIRES INTO NEW ILLUMINATION CONDUCTORS
15. INSTALL INTERCONNECT CONDUIT TO THE EXISTING JUNCTION BOX. INSTALL SINGLE MODE 48-COUNT FIBER STRANDS TO EX. PARK/GARDEN CONTROLLER.
16. CONSTRUCT FOUNDATION AND INSTALL LUMINAIRE POLE WITH LED DECORATIVE LUMINAIRE AND PHOTOCELL PER THE LUMINAIRE POLE SCHEDULE SHEET TS2 AND CITY OF RENTON STD PLAN 117.3.
17. PSE TO REPLACE EXISTING HPS LUMINAIRE WITH LED LUMINAIRE
18. EXISTING LUMINAIRE POLE TO REMAIN
19. INTERCONNECT CONDUIT SHALL BY-PASS THIS JUNCTION BOX.
20. INTERCEPT EXISTING CONDUIT UNDER RAILROAD TRACKS. INSTALL JUNCTION BOX AND EXTEND NEW CONDUIT
21. COORDINATE TRENCHING LIMITS WITH ASPHALT RESTORATION.
22. BNSF SHOULDER-MOUNT CROSSING GATE TO BE INSTALLED BY OTHERS.
23. REMOVE EXISTING CONDUCTORS AND CONDUIT
24. BNSF CANTILEVER WITH GATE TO BE INSTALLED BY OTHERS.
25. INSTALL CONDUIT AND CONDUCTORS TO BASE OF EXISTING RAILROAD CONTROLLER. BNSF TO MAKE CONNECTION. COORDINATE WITH BNSF
26. DELETED.
27. VIDEO DETECTION ZONE, APPROXIMATE LOCATION ONLY
28. INSTALL TYPE 2 LOOP DETECTOR PER WSDOT STD PLANS J-50.12-00 AND J-50.15-00
29. REMOVE EXISTING GATE AND BOLLARDS

SIGNAL & ILLUMINATION LEGEND

SIGNAL HEAD ASSIGNMENT

PEDESTRIAN HEADS: 24, 2T; 66, 6T; 8S, 8T

HEADS 31,32,33; 21,22; 41,42; 61,62; 81,82,83; A1

HEADS 11,21

HEAD A2

NOTES:

ALL VEHICLE SIGNAL HEADS SHALL BE LED TYPE AND SHALL USE TUNNEL VISORS, SQUARE DOORS AND 5-1/2" BACKPLATES. MAST ARM MOUNTED VEHICLE SIGNAL HEADS SHALL USE MOUNTING TYPE "L". POLE MOUNTED SIGNAL HEADS SHALL USE MOUNTING TYPE "K". ALL SIGNAL HEAD HOUSING AND BACKPLATES SHALL BE YELLOW COLOR PER SPECIAL PROVISIONS.

ALL PEDESTRIAN SIGNAL SYSTEMS SHALL BE LED COUNTDOWN-TYPE WITH SOLID SYMBOLS, SHALL BE EQUIPPED WITH "Z" CRATE VISORS, AND SHALL USE TYPE "C" OR "D" MOUNTINGS ON TYPE PS PEDESTRIAN POLES PER WSDOT STD PLAN J-20.15-01

CHECK FOR COMPLIANCE TO CITY STANDARDS

DATE ______
DATE ______
DATE ______

LAKE WASHINGTON BOULEVARD/
SITE ACCESS
TRAFFIC SIGNAL PLAN

CITY OF RENTON
Planning/Building/Public Works Dept

TENW

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

SIGNAL & ILLUMINATION GENERAL NOTES

1. THE LOCATION OF ALL CONDUIT, JUNCTION BOXES, AND CABINETS 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 WSDOT 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 48 HOURS 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 WHITMARSH AT (425) 430-7423.

SERVICE #0145 BREAKER SCHEDULE

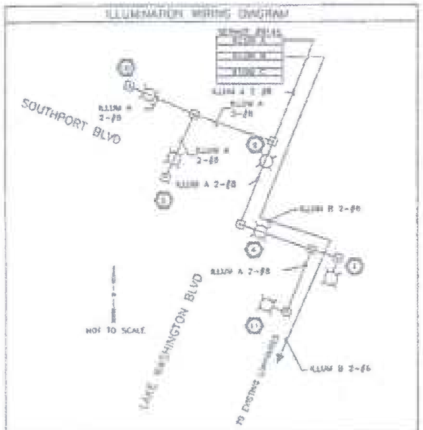
CIRCUIT	BREAKER	CONTACTOR
MAIN	2P-100 AMP	
SIGNAL	1P-[illegible] AMP	---
ILLUM A	2P-[illegible] AMP	30 AMP
ILLUM B	2P-[illegible] AMP	30 AMP
ILLUM C (SPARE)	2P-20 AMP	30 AMP

REF STD PLAN 122.2 FOR ADDITIONAL REQUIREMENTS

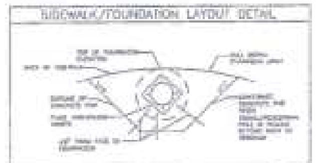
LUMINAIRE POLE SCHEDULE

LUMINAIRE POLE NO.	LUM. TYPE	MOUNTING HEIGHT	ARM LENGTH	SERVICE/ CIRCUIT	POLE TYPE	COR POLE ID #
1	DOMUS DMS50 135W 60LED4K-ES-LE3	30FT	12FT	NEW HOUSER SERVICE CKT B	MASTARM SIGNAL POLE	8045N
4	DOMUS DMS50 135W 60LED4K-ES-LE3	35FT	12FT	NEW HOUSER SERVICE CKT B	MASTARM SIGNAL POLE	8042N
6	DOMUS DMS50 135W 60LED4K-ES-LE3	35FT	12FT	NEW HOUSER SERVICE CKT B	MASTARM SIGNAL POLE	8046N
8	DOMUS DMS50 135W 60LED4K-ES-LE3	35FT	10FT	NEW HOUSER SERVICE CKT B	LUMINAIRE POLE	8044N
10	DOMUS DMS50 135W 60LED4K-ES-LE3	35FT	10FT	NEW HOUSER SERVICE CKT B	LUMINAIRE POLE	8047N
11	DOMUS DMS50 135W 60LED4K-ES-LE3	30FT	10FT	NEW HOUSER SERVICE CKT B	LUMINAIRE POLE	8043N

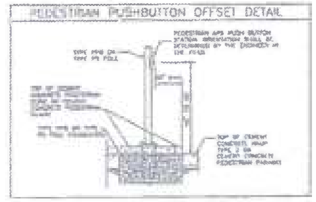
ILLUMINATION WIRING DIAGRAM



SIDEWALK/FOUNDATION LAYOUT DETAIL



PEDESTRIAN PUSHBUTTON OFFSET DETAIL



WIRING SCHEDULE

[illegible]	[illegible]

(1) INCLUDES 1-5C #14 FOR FUTURE PED POLE. COIL 10-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 #8 AWG OR AS NOTED OTHERWISE IN THE WIRE NOTES). CONDUITS THAT DO NOT CONTAIN ELECTRICAL CONDUCTORS SHALL INCLUDE A DETACHABLE PULL TAPE. SPARE/EMPTY CONDUIT SHALL BE LABELED "CITY OF RENTON" AND SHALL CONTAIN DETECTABLE PULL TAPE.
2. ALL CONDUIT SHALL BE PVC SCH 40, EXCEPT UNDER ROADWAY USE PVC SCHEDULE 80 CONDUIT.

CHECK FOR COMPLIANCE TO CITY STANDARDS
DATE
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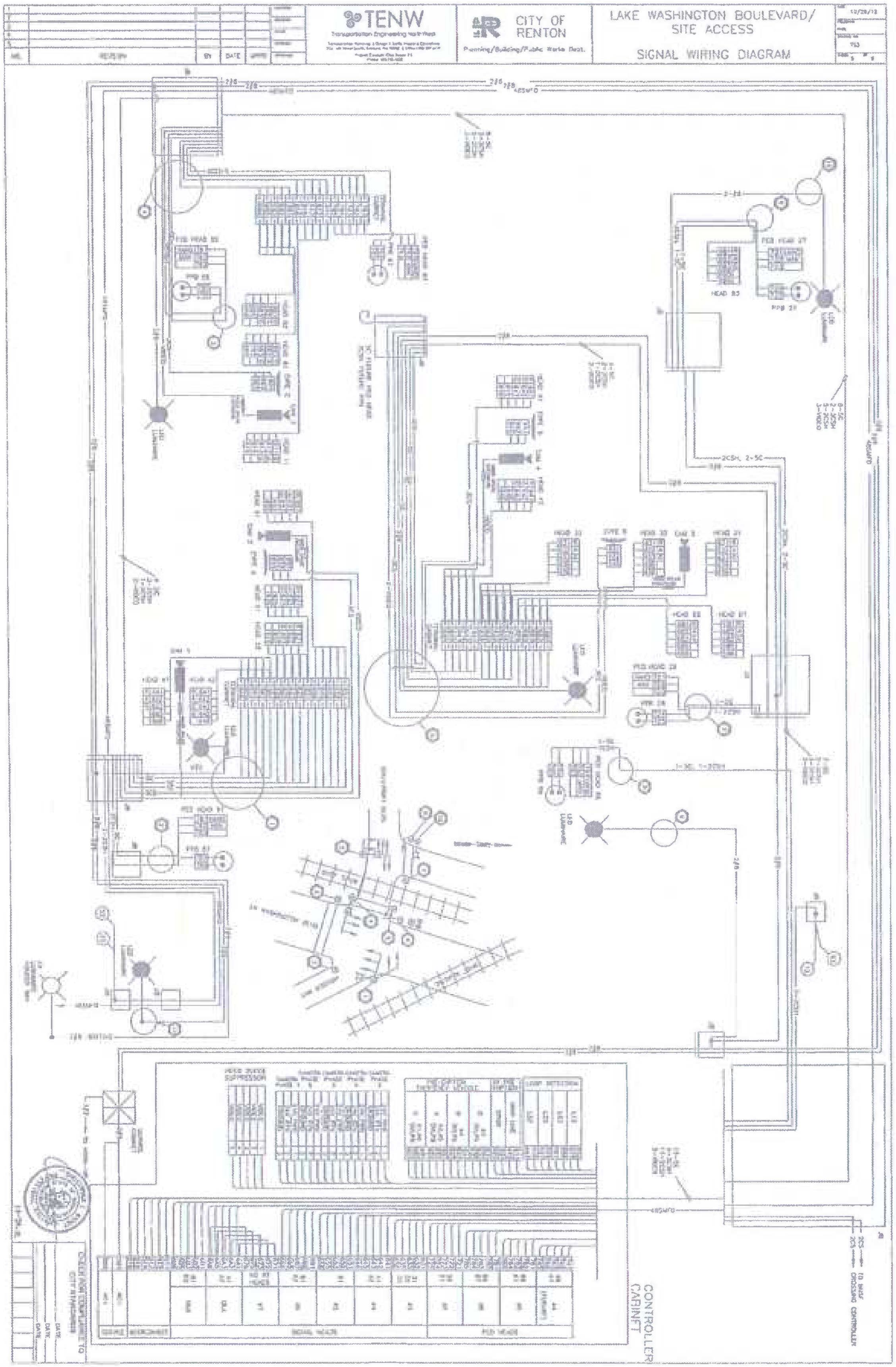
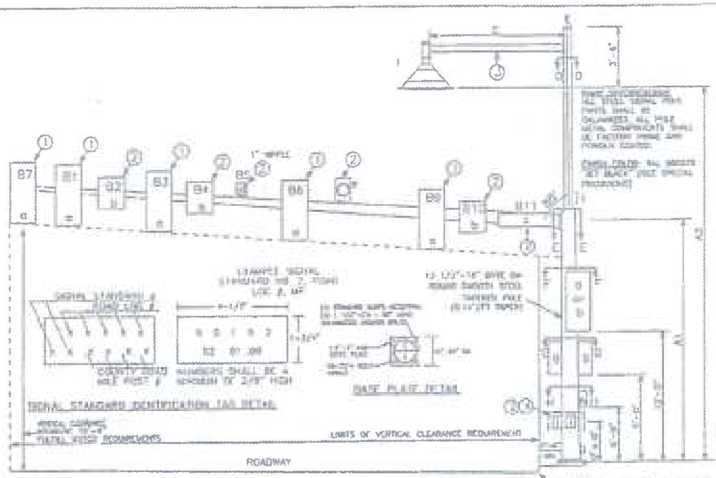

TENW
Transportation Engineering NorthWest
CITY OF RENTON
Planning/Building/Public Works Dept.
LAKE WASHINGTON BOULEVARD/
SITE ACCESS
SIGNAL WIRING DIAGRAM
10/29/13
CONTROLLER CABINET
TO BNSF CROSSING CONTROLLER
NO. REVISION BY DATE



TYPE II
MAST ARM
SIGNAL STANDARD

TYPE III
COMBINATION LIGHTING
AND MAST ARM
SIGNAL STANDARD

TYPE IV
STRAIN POLE
STANDARD

TYPE V
COMBINATION LIGHTING
AND STRAIN
POLE STANDARD

TYPE SD
SPECIAL DESIGN STANDARD

LEGEND

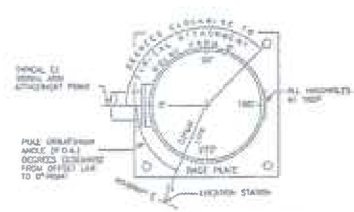
a. Vehicle Signal Head
b. Sign
c. Street Name Sign
d. Pre-Empt Detector
e. Video Detection Camera
f. Luminaire
g. Pedestrian Signal Head
h. Cabinet
Pedestrian Push Button Assembly
j. Handhole

FOUNDATION DEPTH TABLE

Allowable Lateral Bearing Pressure (psf)	Foundation Type	XYZ (Cubic feet) 600	800	1,200	1,500	1,800	2,300
1,000	3' SQ. / 3' RD. / 4' RD.	10' / 8' / 8'	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1,500	3' RD. / 3' SQ. / 4' RD	8' / 7' / 7'	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2,500	3' RD. / 3' SQ. / 4' RD	6' / 6' / 6'	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

NOTES:

1. MOUNTING COUPLING INSTALLED AT OFFSET DISTANCE INDICATED IN CHART. IF TYPE "N" MOUNTING IS USED, DRILL 1" DIA HOLE IN MAST ARM AND INSTALL PLASTIC SPLIT BUSHING FOR CABLE ENTRANCE.
2. FIELD INSTALLED.
3. FOR DECORATIVE ARM DETAILS, SEE STANDARD DETAILS SHEETS TS5 AND TS6.
4. THE CONTRACTOR SHALL MAINTAIN 10" MAX HORIZONTAL CLEARANCE BETWEEN FACE OF CURB AND FACE OF PUSHBUTTON. THE CLEARANCE SHALL BE VERIFIED BY THE ENGINEER IN THE FIELD PRIOR TO CONSTRUCTION OF FOUNDATION.



POLE ORIENTATION AND ATTACHMENT POINT DETAIL

SIGNAL STANDARD DETAIL CHART

STD NO.	COR POLE ID #	STATION	OFFSET	LT	RT	P.O.A.	POLE TYPE	A1	A2	SIGNAL MAST ARM DATA / POLE ATTACHMENT POINT ANGLES / FOUNDATION / REMARKS
1	[illegible]	LK WASH BLVD 17+59.0	NB 33.5 FT EB	[illegible]	[illegible]	[illegible]	SD	[illegible]	[illegible]	[illegible]
2		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	PS	–	–	[illegible]
3		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	PS	–	–	[illegible]
4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	[illegible]	[illegible]	SB [illegible] EB	[illegible]	[illegible]	[illegible]	SD	[illegible]	[illegible]	[illegible]
6		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	–	–	[illegible]
7		[illegible]	[illegible]	[illegible]	[illegible]	–	PPB		–	[illegible]
8		[illegible]	[illegible]	[illegible]	[illegible]	–	PPB		–	[illegible]
9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	LIGHTING POLE	–	[illegible]	[illegible]
10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	–	LIGHTING POLE	–	[illegible]	[illegible]
11	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	–	LIGHTING POLE		[illegible]	[illegible]

(1) CLOCKWISE FROM NB MASTARM ATTACHMENT POINT
(2) CLOCKWISE FROM EB MASTARM ATTACHMENT POINT
(3) SUMMATION OF NB AND EB WIND LOADS USED BASED UPON [illegible] ANGLE BETWEEN MASTARMS
(4) BACK-SIDE OF MASTARM
(5) POLE-MOUNT

NOTE: CONTRACTOR SHALL STAKE ALL POLE LOCATIONS FOR APPROVAL BY THE ENGINEER PRIOR TO FOUNDATION EXCAVATION.
SEE CITY OF RENTON STANDARD PLANS 117.1, 117.2, 117.3, 120, 121, 124, AND 125 FOR FOUNDATION AND POLE DETAILS.
PS POLE FOUNDATION PER WSDOT STANDARD PLAN J-21.10-02.
PPB POLE FOUNDATION PER WSDOT STANDARD PLAN J-20.11-00.

CHECK FOR COMPLIANCE TO CITY STANDARDS

LAKE WASHINGTON BOULEVARD/
SITE ACCESS

SIGNAL STANDARD DETAILS

CITY OF RENTON
Planning/Building/Public Works Dept.

TENW
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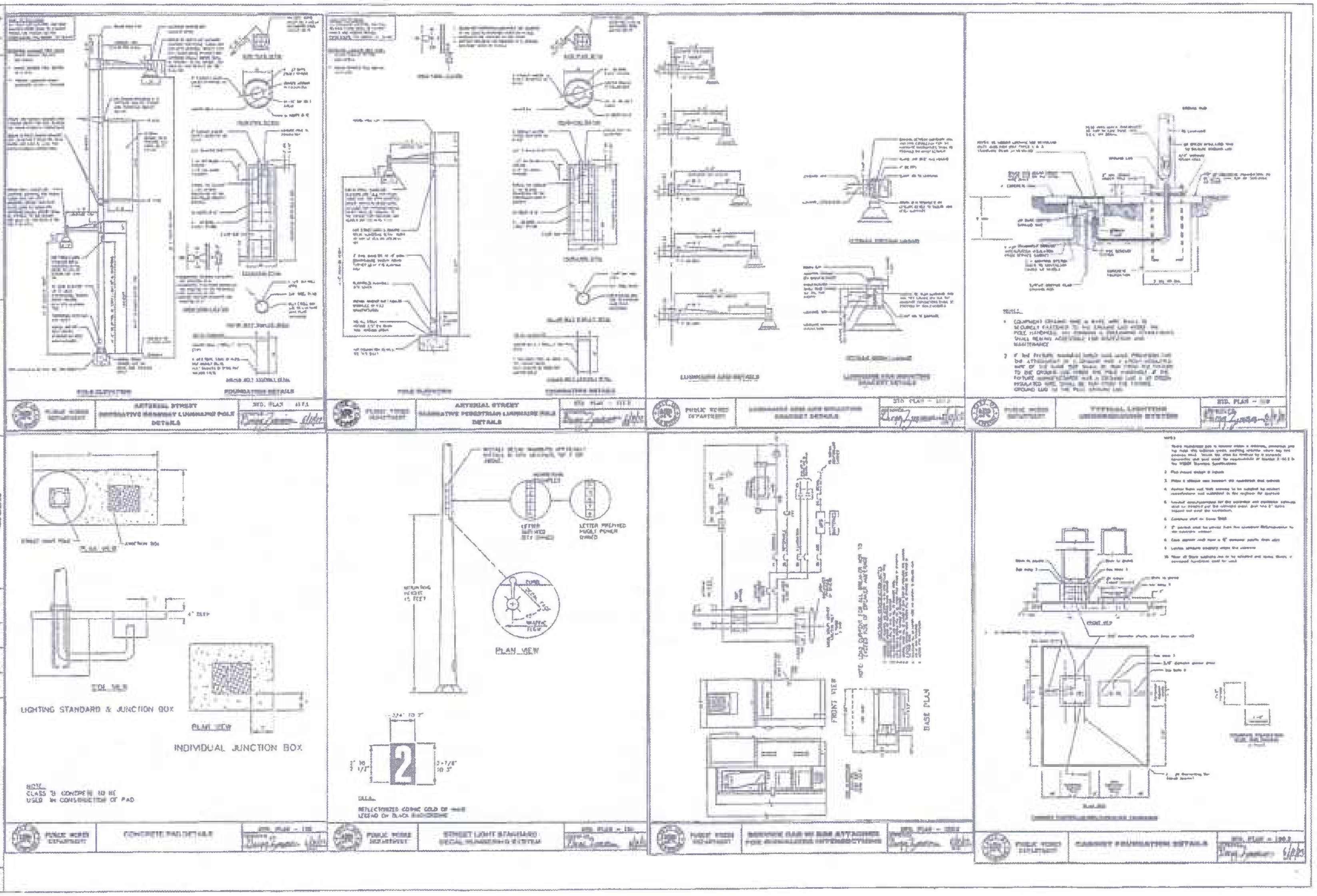
LAKE WASHINGTON BOULEVARD/
SITE ACCESS

SIGNAL STANDARD PLANS

CITY OF RENTON
Planning/Building/Public Works Dept.

TENW
Transportation Engineering NorthWest



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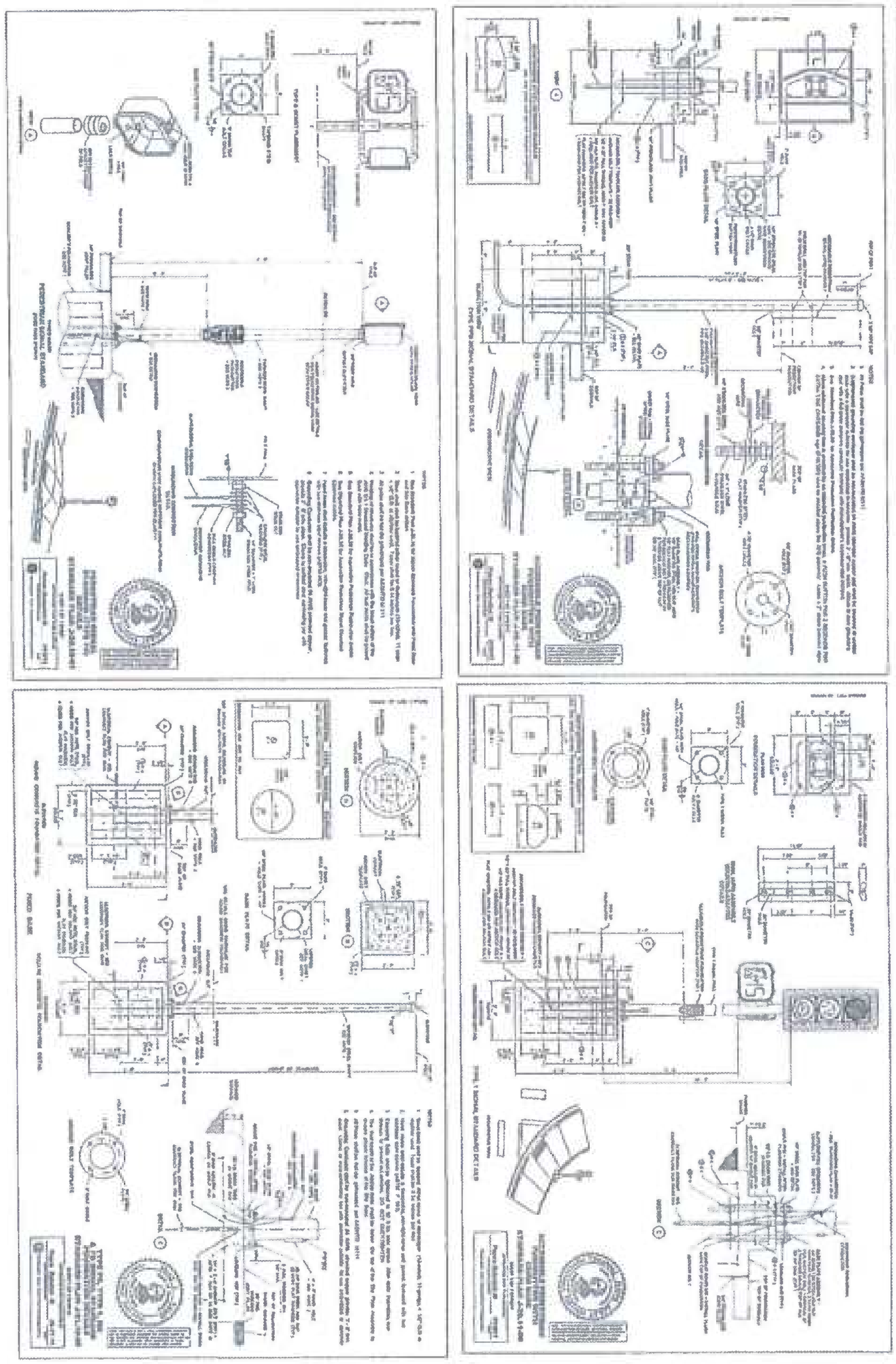
SIGNAL STANDARD PLANS



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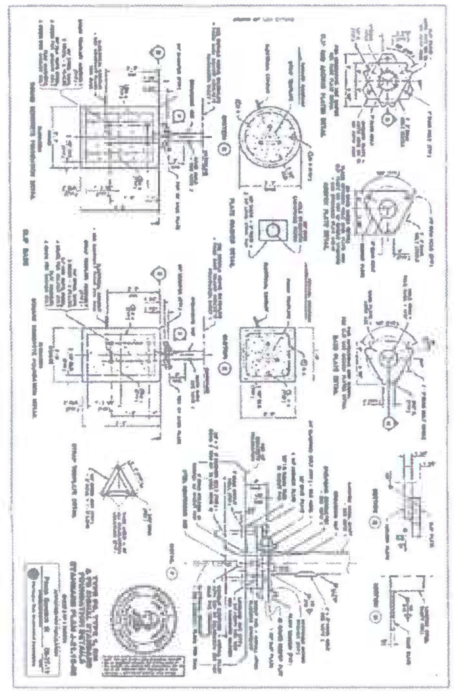
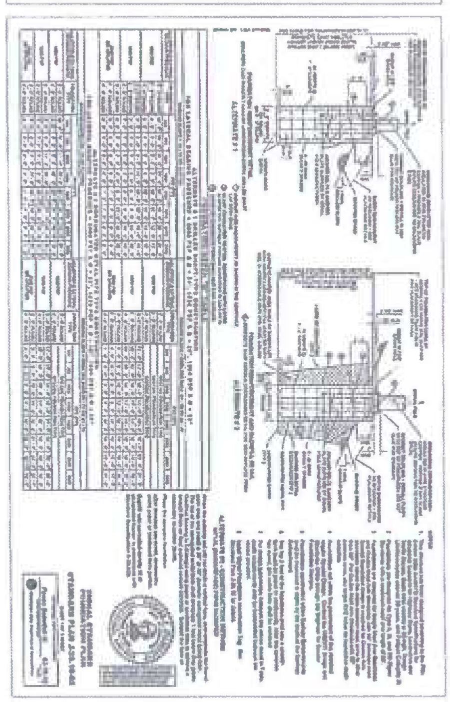
CITY OF RENTON

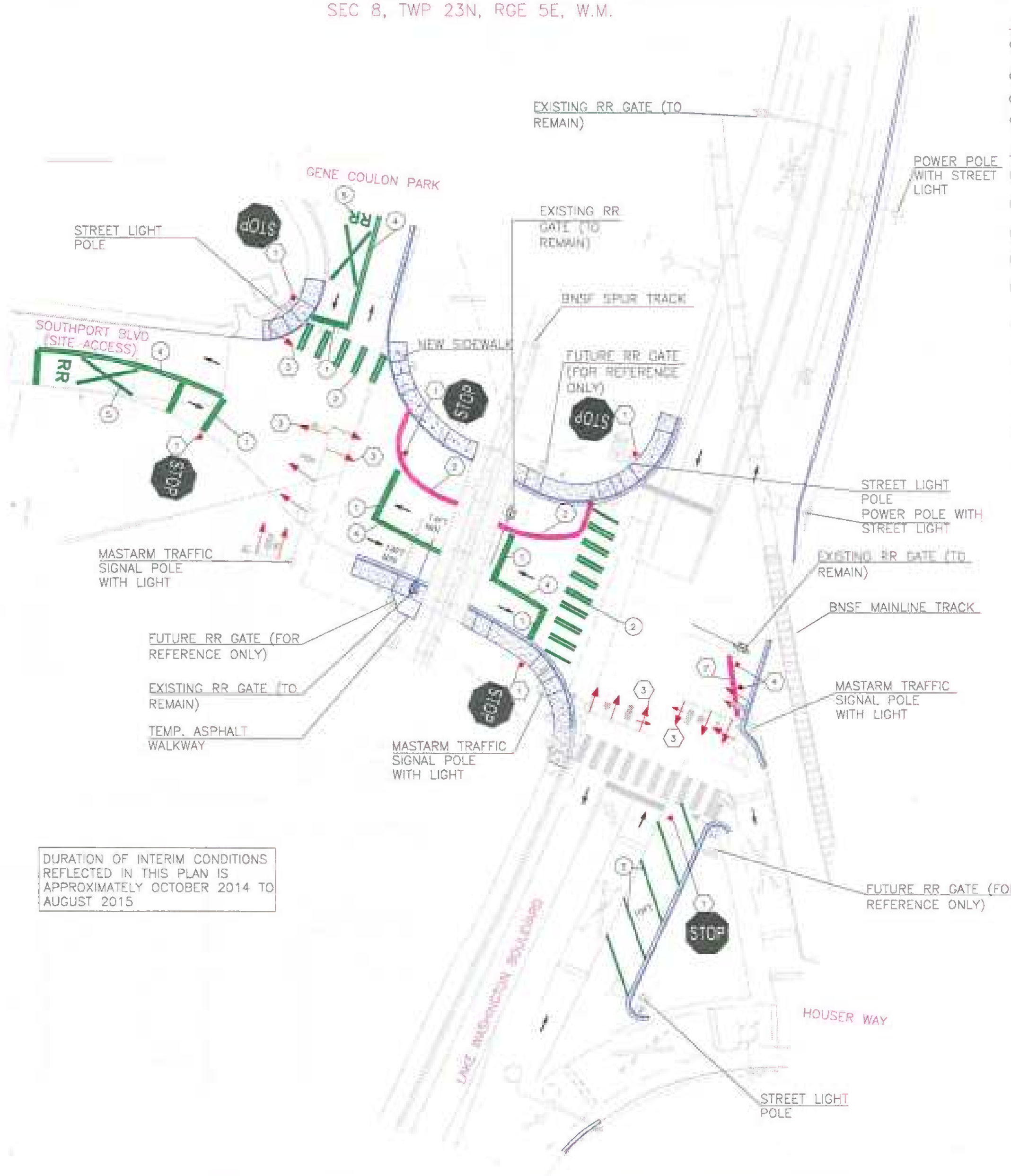
LAKE WASHINGTON BOULEVARD/ S TE ACCESS

SIGNAL STANDARD PLANS





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 G012.
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 OM3-R SIGN AND POST WITH SPRING LOADED SUPPORT MOUNTS PER CITY OF RENTON STANDARD PLANS, PAGE G012.

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 RPM 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 AS NECESSARY TO ACCOMMODATE NEW STRIPING. CONTRACTOR SHALL COORDINATE STRIPING REMOVE 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, AND THEN CONTACT THE APPROPRIATE CITY ENGINEER 48-HOURS 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 PPB
	WOOD POLE MOUNTED LUMINAIRE
	LUMINAIRE POLE
	VIDEO DETECTION CAMERA
	MAST ARM MOUNTED SIGN
	PRE-EMPTION DETECTOR
	VEHICLE DETECTION LOOP
	BACKUP POWER SUPPLY CABINET
	SERVICE CABINET
	CONTROLLER CABINET
	SIGN
	PRECAST DUAL-FACED SLOPED MOUNTABLE CURB
	CONSTRUCTION NOTE
	PAVEMENT MARKING NOTE
	DIRECTION OF TRAVEL (NOT A PAVEMENT MARKING)

N

0 10 20 40 60

SCALE: 1" = 20'

07-13-14

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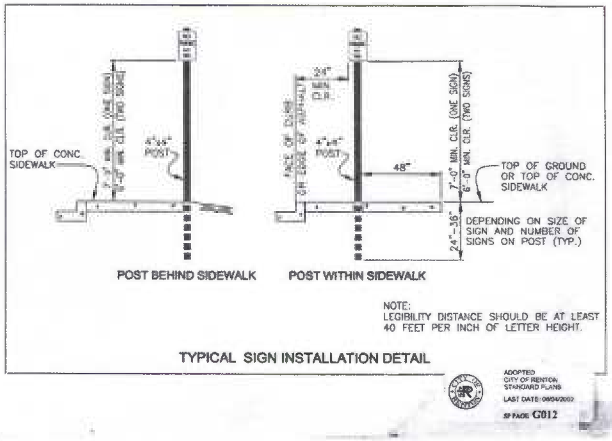
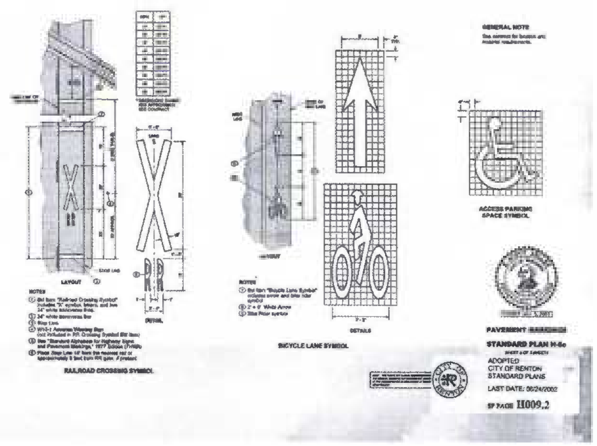
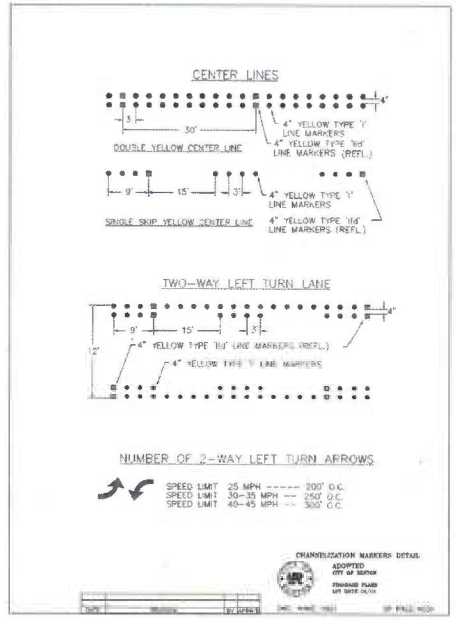
Planning/Building/Public Works Dept.

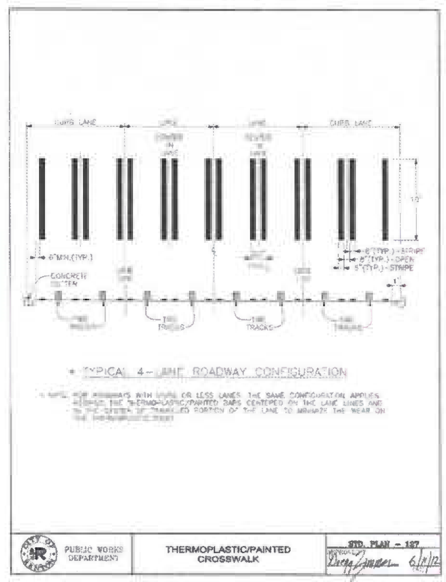
LAKE WASHINGTON BOULEVARD/ SITE ACCESS
INTERIM TRAFFIC PLAN

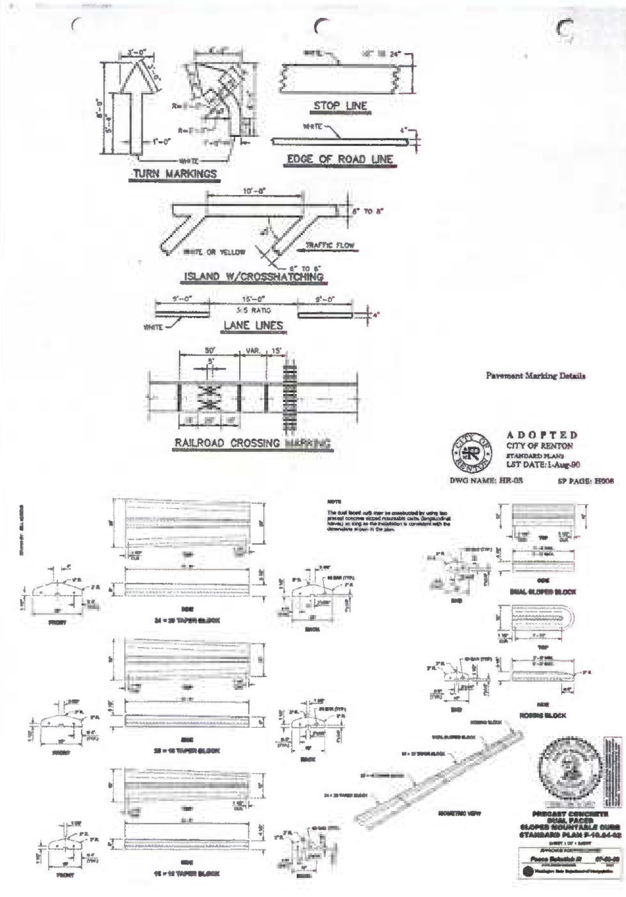
DATE 07/13/14
TC1
SHEET 1 OF 2











CHECK FOR COMPLIANCE TO CITY STANDARDS
DATE
DATE
DATE

NO.	REVISION	BY	DATE	APPR

TENW Transportation Engineering NorthWest

CITY OF RENTON
Planning/Building/Public Works Dept.

LAKE WASHINGTON BOULEVARD/ SITE ACCESS
INTERIM TRAFFIC PLAN

07/13/14
TC2
2

July 13, 2014

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: Lake Washington Boulevard/Houser Way/Southport – Interim Conditions
DOT#091724U, M.P. 3.97
DOT#091725B, M.P. 4.05
BNSF Railway, Woodinville Subdivision, LS 0405

Dear Ms. Hunter,

The following is a narrative describing the proposed two-phase construction of improvements to the Lake Washington Boulevard/Houser Way/Southport Site Access intersection, associated with the Southport Hotel development. The Southport development is required to mitigate its traffic impacts by widening, realigning, and signalizing the existing intersection. The purpose of this narrative is to demonstrate that a safe, effective Interim (Phase 1) traffic control plan can be operated in conjunction with existing BNSF Mainline and Spur Railroad crossings until full vehicular traffic signal and associated Railroad Signal improvements are made functional in 2015 (Phase2).

The City of Renton and Southport desire to complete all physical/hardscape improvements to the intersection now (summer/fall of 2014), consistent with the Ultimate Conditions described below. 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 fully-functional Red-Yellow-Green operations.

Existing Conditions at Railroad Crossings:

The existing Mainline track crosses Lake Washington Boulevards immediately north of Houser Way/Southport Boulevard at an approximate 45-degree angle. Lake Washington Boulevard consists of single northbound and southbound vehicular lanes at the crossing, with adjacent bike lanes. The existing intersection operates as an all-way stop. The existing Spur track crosses Southport Boulevard immediately west of Lake Washington Boulevard at an approximate 90-degree angle. Southport Boulevard consists of single eastbound and westbound vehicular lanes at the crossing.

Flashing-light railroad signals with gates are provided at all approaches to the mainline and spur crossings. An overhead cantilever structure is provided for the southbound approach to the mainline crossing of Lake Washington Boulevard.

Ultimate Conditions at Railroad Crossings:
Lake Washington Boulevard would consist of single northbound and dual-southbound vehicular lanes at the crossing, with adjacent bike lanes. Southport Boulevard would consist of dual eastbound and westbound vehicular lanes at the Spur crossing, with adjacent sidewalks.

Proposed Interim Conditions at Railroad Crossings
Proposed interim conditions would include construction of all ultimate improvements, with minor modifications as reflected in 7-13-14 Interim Traffic Plan. The intersection would operate as an all-way stop consistent with existing conditions, with vehicular traffic signal heads functioning in flashing-red mode, and associated stop signs for all approaches. Existing railroad gates would remain functional. Protective barrier would be provided to protect existing gates, and to channelize vehicles through interim striping. Roadway illumination via new stand-alone luminaire poles and traffic signal pole-mounted luminaires would be provided, which would significantly improve nighttime safety.

Summary
In summary, the following justifications support the proposed two-phase approach to construction of improvements:

- Public safety would be maintained. The proposed Interim (Phase 1) plan would provide for safe and efficient movement of vehicles, pedestrians, and bikes at the railroad crossings. Signage, pavement markings, and protective barriers would be implemented to protect railroad gates and channelize vehicles at railroad crossings consistent with existing operations/alignments.
- New pedestrian facilities (ADA-compliant sidewalks, ramps) as well as roadway illumination would result in immediate accessibility and safety improvements over existing conditions.
- Gene Coulon Park Seasonal restrictions do not allow for construction for the majority of summer (approximately June through August). Because this is a significant roadway improvement project with along construction duration, there is substantial benefit in constructing improvements in two phases.
- 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.

We appreciate your review of the attached materials. Please feel free to call me with any questions at (425) 250-5002

Sincerely,
Transportation Engineering NorthWest

Chis Bicket, PE, Design Manager
bicket@tenw.com