Existing Roadway Deficiency Technical Memo

Project:	Earthquake Ready Burnside Bridge NEPA
Date:	Friday, January 29, 2021
To:	Megan Neill, Multnomah County – Project Manager
From:	Heather Catron, HDR – Project Manager Steve Katko, Parametrix James Shamrell, Parametrix

1 Executive Summary

1.1 Purpose

Roadway design standards are developed to support safety and mobility goals. Roadway deficiencies have a critical impact on the safe and efficient use of the road by all travelers. Vertical clearance, for example, has a minimum standard depending on classification and use of a facility below a vertical obstruction such as a bridge. Insufficient vertical clearance can limit use of roadways to certain vehicle sizes and expose a structure to potential damage if a driver of a large vehicle does not heed warning signs for limited vertical clearance.

This memorandum highlights certain existing roadway deficiencies on and near the Burnside Bridge. Those deficiencies identified in this memo will be used to:

- Inform the project's purpose and need statement
- Document certain roadway deficiencies that will remain under a No Build scenario or the Retrofit Alternative

The deficiencies listed here are limited to those in the immediate Project Area. Roadway deficiencies outside of the Project Area could be addressed by other agencies in relation to this project.

1.2 Methodology

This analysis surveyed the existing roadway and bicycle/pedestrian conditions on and near the Burnside Bridge. For the existing lane configuration, lane widths, and bicycle lane facilities on the Burnside Bridge, the City of Portland's Central City in Motion (CCIM)/Enhanced Transit Corridor (ETC) project is assumed the existing condition. That project would restripe the existing bridge deck in spring 2020. The most recent plans are included with this memorandum (Attachment 1). The existing conditions were compared with relevant federal, state, and local standards.

1.3 Study Area

The study area has been organized into six segments, which are listed below and illustrated in Figure 1:

- **Segment 1 –** Burnside Bridge
- **Segment 2 –** W Burnside Street
- **Segment 3 –** E Burnside Street/NE Couch Street
- **Segment 4 –** I-5 Mainline and Ramps
- **Segment 5 –** Local Street Undercrossings
- **Segment 6 –** Trail Connections

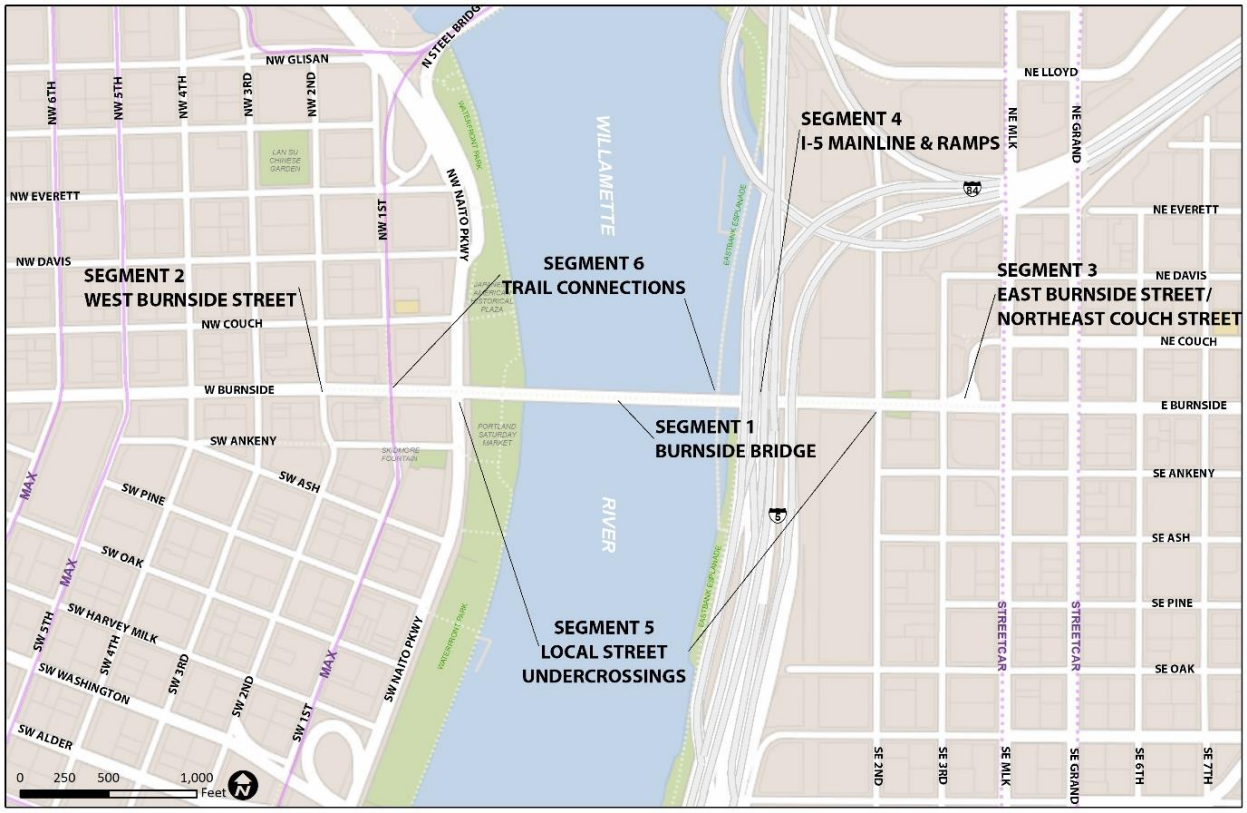


Figure 1. Study Area for Roadway Deficiencies Analysis

1.4 Summary of Findings

Numerous roadway deficiencies were identified and discussed in this memorandum. A summary of those items is listed below. These deficiencies should be included in the development and evaluation of alternatives and should be resolved or otherwise addressed through design exceptions during final design.

- **Vertical Clearance** – There is non-standard vertical clearance under the Burnside Bridge over two ramps between Interstate 5 (I-5) and Interstate 84 (I-84), NE/SE 3rd Avenue, and TriMet MAX light rail on NW/SW 1st Avenue.
- **Bicycle and Pedestrian Facilities** – There are narrow sidewalks on both sides of the Burnside Bridge. There are ADA compliance issues with the majority of the curb ramps. There are limited or no ADA-compliant and bicycle-friendly connections to existing trails/sidewalks under Burnside Bridge. These missing adequate bicycle and pedestrian

facilities create safety concerns and are barriers between elements of the local and regional bicycle and pedestrian network.

- **Horizontal Alignment and Stopping Sight Distance** – The curves from westbound NE Couch Street to the Burnside Bridge are too sharp for the design speed and have limited sight distance.
- **Vertical Alignment** – The Burnside Bridge profile includes one vertical curve that is shorter than standard. West Burnside Street has a vertical angle point that should have a vertical curve based on standards.

2 Background Report

2.1 Introduction

The purpose of this memorandum is to highlight certain existing roadway deficiencies on and near the Burnside Bridge. It is important to identify such deficiencies at the outset of the project because they have a critical impact on the safe and efficient use of the facility by all travelers: motorists, bicyclists, pedestrians, and transit riders. It is also important to plan for the resolution of such deficiencies in the new design at the beginning of design efforts, rather than attempt to address them once design has commenced. The deficiencies identified in this memo would inform the project's purpose and need statement, and document the roadway deficiencies that would remain under a No Build scenario or the Retrofit Alternative.

The deficiencies listed here are limited to those in the immediate Project Area. Roadway deficiencies outside of the Project Area could be addressed by other agencies in relation to this project.

2.2 Methodology

This analysis surveyed the existing roadway and bicycle/pedestrian conditions on and near the Burnside Bridge. For the existing lane configuration, lane widths, and bicycle lane facilities on the Burnside Bridge, the City of Portland's CCIM/ETC project is assumed to be the existing condition. That project would restripe the existing bridge deck in spring 2020. The most recent plans are included with this memorandum (Attachment 1). These current and planned conditions were compared with relevant standards/guidelines including:

Federal Standards:

- American Association of State Highway Transportation Officials (AASHTO); A *Policy on Geometric Design of Highways and Street,* 2018
- Federal Highway Administration (FHWA); *Manual on Uniform Traffic Control Devices (MUTCD),* 2009
- United States Department of Justice; *Americans with Disabilities Act Accessibility Guidelines* (ADAAG)
- United States Access Board; *Public Rights-of-Way Accessibility Guidelines* (PROWAG)

State Standards/Guidelines:

- Oregon Department of Transportation (ODOT); *Highway Design Manual,* 2012
- Oregon Department of Transportation (ODOT)*; Blueprint For Urban Design,* 2020

Local Standards/Guidelines:

- City of Portland; *Design Guide for Public Street Improvements*
- City of Portland; *Transportation System Plan*
- City of Portland; *Bicycle Master Plan, Appendix A: Bikeway Design and Engineering Guidelines*
- City of Portland; *Portland Pedestrian Design Guide*
- City of Portland; *2010 City of Portland Standard Construction Specifications*
- TriMet; *Design Criteria,* 2017

The design elements reviewed for deficiencies were limited to the Federal Highway Administration (FHWA) list of design elements that must be considered for conformance to geometric standards. Data for analysis was collected from as-built drawings, field survey, field measurements, and the City of Portland's CCIM/ETC project plans.

The design elements analyzed are listed in Table 1 below.

Table 1. Design Elements Analyzed for Existing Roadways Deficiencies

Design Element	Description	Measurement	Importance
Horizontal Alignment	The curvature of a road with respect to the horizontal plane (straight vs. curved)	Radii of curves, length of horizontal curves	Affects safe vehicle operating speeds, sight distance, and capacity.
Vertical Alignment	The curvature of a road with respect to the vertical centerline plane (flat vs. mountainous)	Length of vertical crest (inclining) curves, length of vertical sag (declining) curves	Shorter crest curves can create sight problems if drivers cannot a see sufficient distance ahead of their vehicles.
Grade	The change in elevation along a given length of road	Grade is expressed as a percentage equating to the change in elevation per 100 feet of horizontal distance	Steeper grades than standard are more difficult for pedestrians (especially wheelchair users), bicycles, and vehicles (especially larger vehicles such as RVs and commercial trucks) to navigate.
Stopping Sight Distance	Distance for a vehicle traveling at design speed to stop, including an allowance for reaction time by a driver	The length (feet) of the roadway ahead that is visible to the driver	Insufficient stopping sight distance increases potential for crashes due to inadequate distance for vehicles to stop, when approaching a hazard in the roadway.
Vertical Clearance	The clear distance between the surface of a road or path and the lowest object hanging over the surface	Height (number of feet) between overhead structure and element (roadway, bicycle path, sidewalk, river) underneath	Lower than standard vertical clearance can restrict the use of roadways to a subset of smaller or shorter vehicles and restrict the use of waterways to a subset of shorter boats.

Design Element	Description	Measurement	Importance
ADA Standards	Accessibility guidelines for places of public accommodation and commercial facilities by individuals with disabilities, established under the Americans with Disabilities Act (ADA)	Presence of, width, and grade of sidewalks; placement of curb ramps and crosswalks designed to ADA standards	One of the most pertinent ADA guidelines for this project is the requirement that sidewalks and curb ramps be built to accommodate wheelchairs, and that signalized pedestrian crossings accommodate wheelchairs and persons with limited sight and hearing.
Bike Lane/ Multi-Use Path Width	Width of bicycle lane or bicycle/pedestrian multi-use lane	Presence and width in feet of bicycle and/or bicycle and pedestrian multi-use lane	On-street bicycle lanes are one-way facilities that carry bicycle. They should be sufficiently wide to enable cyclists to ride far enough from the curb to avoid debris and drainage grates, yet far enough from passing vehicles to avoid conflicts.
Sidewalk Width	Width of curbed sidewalk	Presence of and unobstructed width (number of feet) devoted to sidewalk feature	City sidewalk width standards will vary by the number of pedestrians who use them. Sidewalks provide a buffer between pedestrians and vehicles, should accommodate bicycles, wheelchairs and strollers, and allow enough room for pedestrians to pass each other.
Median Width	Width between directional travel lanes when separation exists	Presence of and width (number of feet) between travel lanes of different directions	Medians minimize head-on collisions by providing a buffer between vehicles traveling in opposite directions. Medians are of greater importance for higher-speed roadways.
Travel Lane Width	Width of travel lane	Width (number of feet) between lane markings	Adequate lane widths provide a buffer between vehicles moving in the same direction in different travel lanes, reducing potential for sideswipe crashes (especially between wider vehicles).
Shoulder Width	Width of roadway shoulder	Presence of and width (number of feet) between stripe of outer travel lane and edge of pavement	Shoulders provide an area for disabled vehicles and for emergency vehicles. Disabled vehicles cause safety and mobility concerns because they obstruct or impede the travel lane.

3 Study Area

Due to the complexity of the roadways in the study area, the remainder of the memorandum has been organized into six segments, which are listed below and illustrated in Figure 2:

- **Segment 1 –** Burnside Bridge
- **Segment 2 –** W Burnside Street
- **Segment 3 –** E Burnside Street/NE Couch Street
- **Segment 4 –** I-5 Mainline and Ramps
- **Segment 5 –** Local Street Undercrossings
- **Segment 6 –** Trail Connections

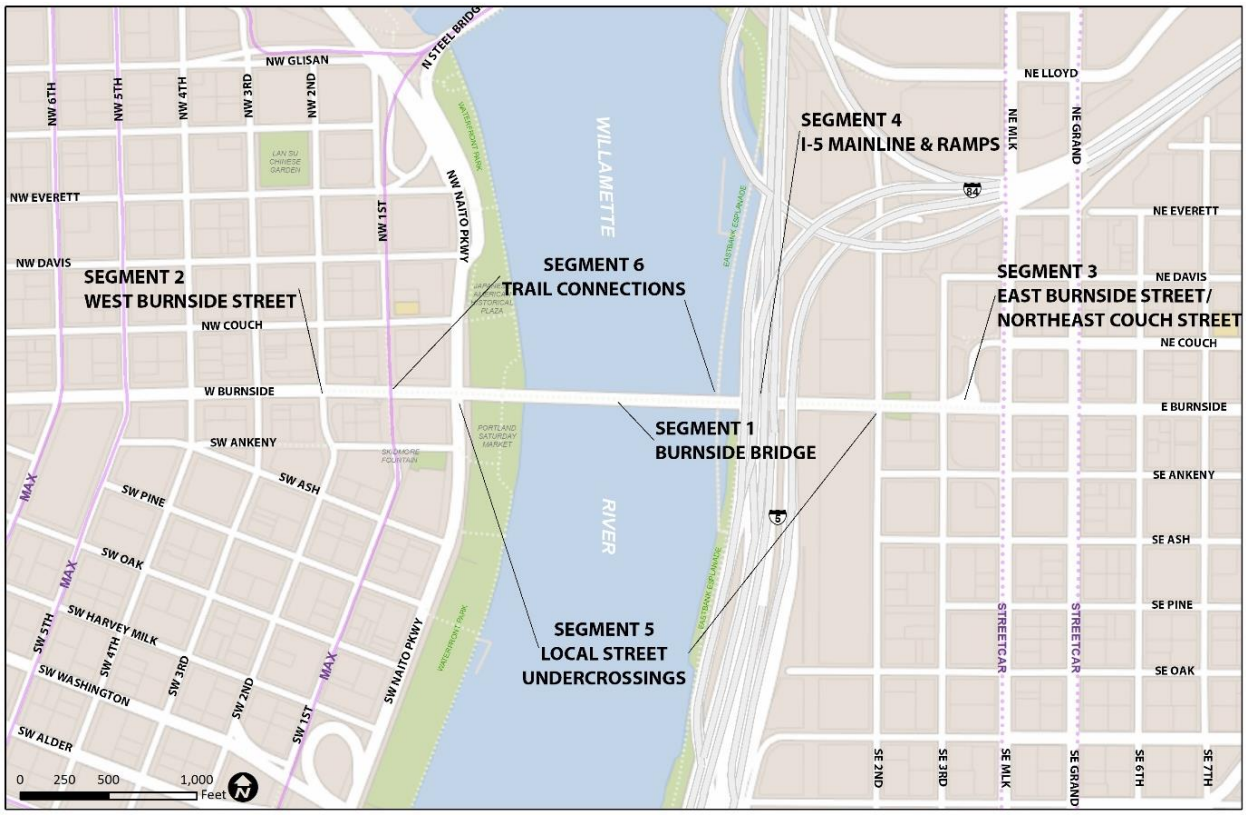


Figure 2. Study Area for Roadway Deficiencies Analysis

4 Segment 1 – Burnside Bridge

4.1 Description

The Burnside Bridge is a bascule-type movable bridge that connects downtown Portland on the west with east Portland. It is owned and maintained by Multnomah County and is classified in the City of Portland Transportation System Plan (TSP) as a Major City Traffic Street, Civic Main Street, City Walkway, Major City Bikeway, Major Emergency Response Street, and Major Transit Priority Street. The Burnside Bridge opened in 1926 and is the second bridge to carry that name. The bridge has two westbound travel lanes and three eastbound travel lanes with existing sidewalks and bike lanes on both sides (Figure 3). The City of Portland's upcoming CCIM/ETC project would restripe the bridge to add striped buffers to both bike lanes and repurpose one eastbound travel lane to be a transit-only eastbound lane.

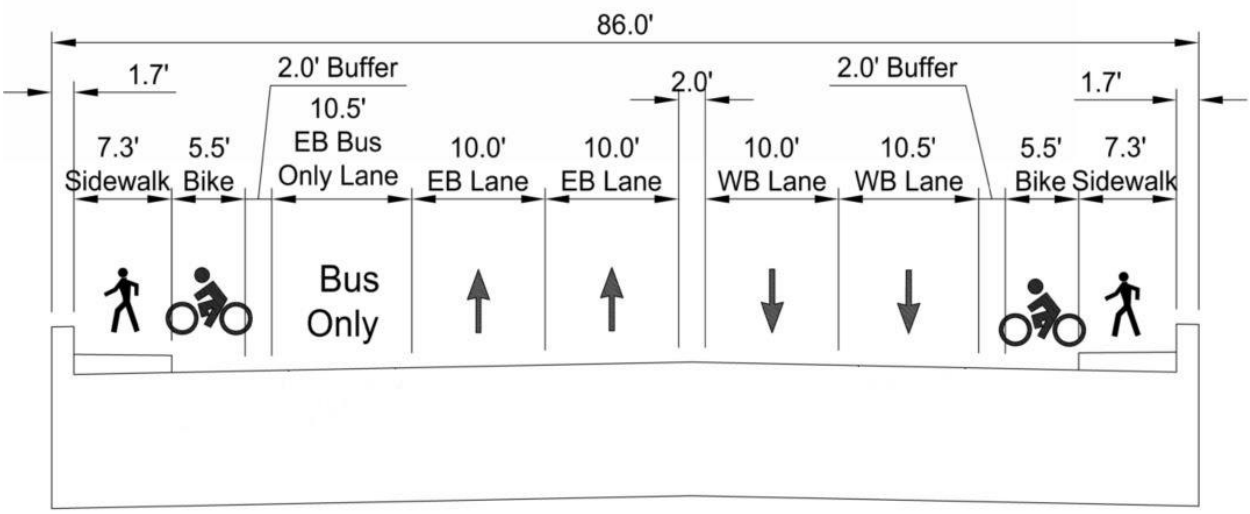


Figure 3. Typical section looking west on the Burnside Bridge

4.2 Review of Deficiencies

4.2.1 Methodology

The relevant roadway design standards for the roadway on the bridge are found in the City of Portland Design Guide for Public Street Improvements, the City of Portland TSP, Bikeway Design and Engineering Guidelines (Portland Bicycle Master Plan, Appendix A), MUTCD, and AASHTO. However, the application of standards can vary from project to project as determined through individual studies, reports, or policy decisions by the City of Portland.

- Posted Speed: 35 mph
- Design Speed for Deficiency Review: 40 mph

4.2.2 Summary of Deficiencies

The list below summarizes geometric deficiencies for Segment 1. Design elements that meet standards are not discussed.

- **Vertical Alignment** - The length of the vertical crest curve of the Burnside Bridge near the west riverbank is approximately 97 feet. Based on existing grades, applicable standards require a minimum of 140 feet.
- **Sidewalk** - The sidewalk on both sides of the bridge is approximately 7.3 feet wide, with 6 feet of pedestrian space around light poles, 6.5 feet of pedestrian space around traffic gates, and 5.5 feet of pedestrian space around sign bridges. Sidewalks should include a 4-foot furnishing zone and 8-foot through pedestrian zone on both sides of the bridge to meet minimum City standards for sidewalks.

5 Segment 2 – W Burnside Street

5.1 Description

W Burnside Street runs in an east/west direction through downtown Portland (Figure 4). The segment of W Burnside Street within the study area is from the western terminus of the Burnside Bridge to NW/SW 5th Avenue. Burnside Street is owned and maintained by the City of Portland and is classified in the City of Portland TSP as a Major City Traffic Street, Civic Main Street, City Walkway, Major City Bikeway, Major Emergency Response Street, and Major Transit Priority Street.

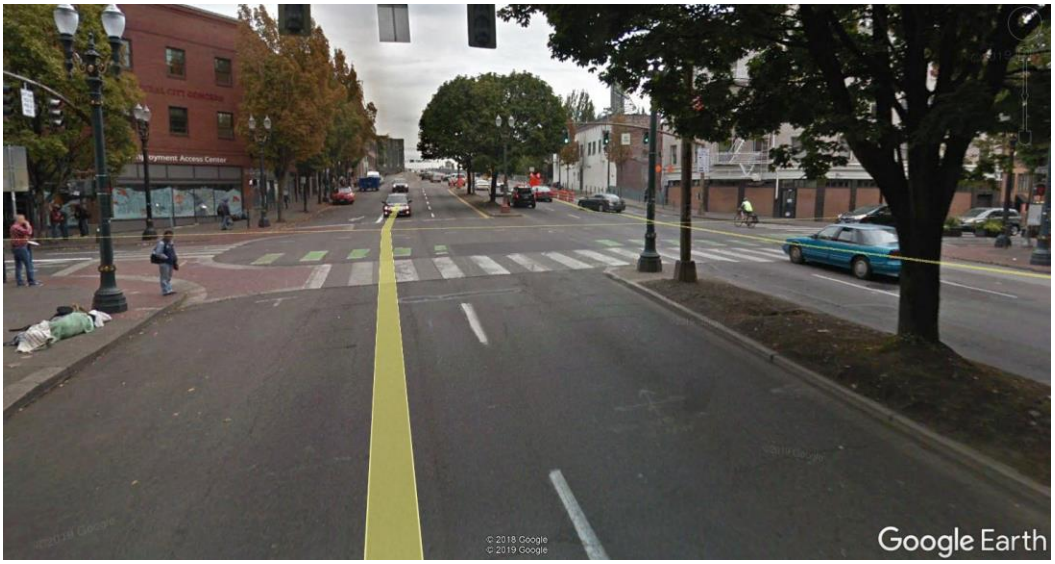


Figure 4. Looking east on W Burnside Street near NW/SW 2nd Avenue

Burnside Street between NW/SW 5th Avenue and NW/SW 3rd Avenue consists of:

- Two westbound travel lanes
- Two eastbound travel lanes
- One eastbound right turn lane
- Sidewalks on both sides
- No bike lanes

Burnside Street between NW/SW 3rd Avenue and the western terminus of the Burnside Bridge consists of:

- Two westbound travel lanes
- Three eastbound travel lanes
- One eastbound right turn lane
- Sidewalks on both sides
- Bike lanes east of NW/SW 2nd Avenue.

NW/SW 5th Avenue is one-way southbound and includes bus/train only lanes for Portland's transit mall. NW/SW 4th Avenue is one-way northbound. NW/SW 3rd Avenue is one-way

southbound and includes a buffered bike lane. NW/SW 2nd Avenue is one-way northbound and includes a parking/planter-protected bike lane.

5.2 Review of Deficiencies

5.2.1 Methodology

The relevant roadway design standards for the roadway on the bridge are found in the City of Portland Design Guide for Public Street Improvements, the City of Portland TSP, Bikeway Design and Engineering Guidelines (Portland Bicycle Master Plan, Appendix A), MUTCD, and AASHTO. However, the application of standards can vary from project to project as determined through individual studies, reports, or policy decisions by the City of Portland.

- Posted Speed: 25 mph
- Design Speed for Deficiency Review: 30 mph

5.2.2 Summary of Deficiencies

The list below summarizes geometric deficiencies for Segment 2. Design elements that meet standards are not discussed.

- **Vertical Alignment** - There is a 2.85 percent vertical grade break approximately 150 feet west of 2nd Avenue. Based on existing grades, applicable standards require a vertical sag curve with a minimum length of 110 feet.
- **ADA Standards** - No curb ramps on the existing corners of the Burnside/2nd intersection meet ADA standards for ramp quantity, placement, grades, and detectable warning surface placement. Similar issues may exist at Burnside/3rd and Burnside/4th intersections. Further study of all curb ramps within the construction footprint is required in future design phases.
- **Bicycle Facilities** - There are no bicycle lanes on Burnside west of NW/SW 2nd Avenue.

6 Segment 3 – E Burnside Street/NE Couch Street

6.1 Description

E Burnside Street and NE Couch Street run in an east/west direction through east Portland and function as a couplet between the Burnside Bridge and NE/SE 14th Avenue (Figure 5). The segment of Burnside Street and Couch Street within the study area is from the western terminus of the Burnside Bridge to NE/SE Grand Avenue. Burnside Street is owned and maintained by the City of Portland, and is classified in the City of Portland TSP as a Major City Traffic Street, Civic Main Street, City Walkway, Major City Bikeway, Major Emergency Response Street, and Major Transit Priority Street. Couch Street is owned and maintained by the City of Portland, and is classified in the City of Portland TSP as a Major City Traffic Street, Neighborhood Main Street, City Walkway, Major City Bikeway, Major Emergency Response Street, and Major Transit Priority Street.

Burnside Street has three eastbound travel lanes, one eastbound bicycle lane, and an eastbound right turn lane that ends at SE Martin Luther King Jr Boulevard. Couch Street has two westbound travel lanes and one westbound bicycle lane. The City of Portland's upcoming CCIM/ETC project would restripe Burnside Street to repurpose one eastbound travel lane to be a transit-only eastbound lane to NE/SE 12th Avenue. Both streets have sidewalks on both sides. NE/SE Martin Luther King Jr Boulevard is one-way southbound and includes streetcar sharing the right lane. NE/SE Grand Avenue is one-way northbound with streetcar sharing the right lane.

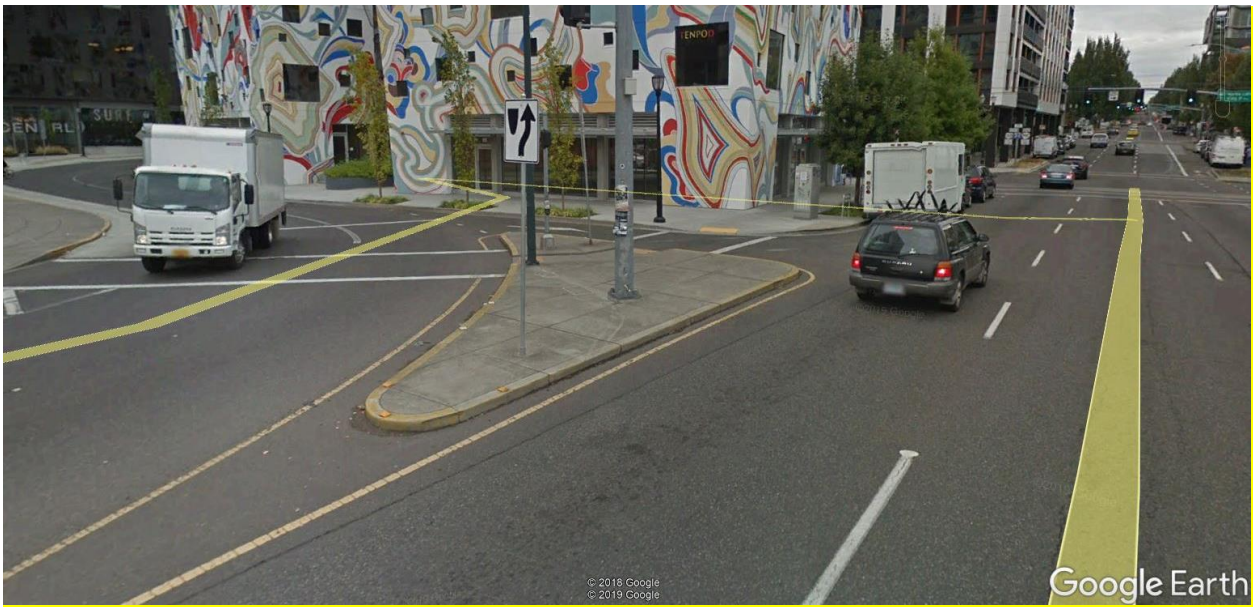


Figure 5. Looking east towards E Burnside Street and NE Couch Street

6.2 Review of Deficiencies

6.2.1 Methodology

The relevant roadway design standards for the roadway on the bridge are found in the City of Portland Design Guide for Public Street Improvements, the City of Portland TSP, Bikeway Design and Engineering Guidelines (Portland Bicycle Master Plan, Appendix A), MUTCD, and AASHTO. However, the application of standards can vary from project to project as determined through individual studies, reports, or policy decisions by the City of Portland.

- Posted Speed: 25 mph
- Design Speed for Deficiency Review: 30 mph

6.2.2 Summary of Deficiencies

The list below summarizes geometric deficiencies for Segment 3. Design elements that meet standards are not discussed.

- **Horizontal Alignment** - The minimum radii of the northern and southern horizontal curves between westbound Couch Street and westbound Burnside Bridge are both approximately 72 feet. Applicable standards require a minimum of 333 feet based on

30 mph. The curves do have an advisory speed sign for 15 mph, along with turning roadway advisory signs, which would allow for a minimum curve radius of 50 feet.

- **Stopping Sight Distance** - The sight distance for the northern and southern horizontal curves between westbound Couch Street and westbound Burnside Bridge are approximately 100 feet and 115 feet, respectively. The stopping sight distance should be 200 feet based on 30 mph, and 80 feet based on 15 mph. The line of sight is blocked by a building for the northern curve and a railing for the southern curve.
- **ADA Standards** - No curb ramps on the existing corners of the Burnside/2nd intersection meet ADA standards for ramp quantity, placement, grades, and detectable warning surface placement. Curb ramps may not meet ADA standards for ramp quantity, placement, grades, and detectable warning surface placement at Burnside/Martin Luther King and Couch/Martin Luther King intersections. Further study of all curb ramps within the construction footprint is required in future design phases.

7 Segment 4 – I-5 Mainline and Ramps

7.1 Description

I-5 freeway mainline and three freeway ramps cross under the east approach spans of the Burnside Bridge. In the study area, mainline I-5 has two southbound lanes and two northbound lanes. Two of the ramps connect I-5 to I-84 and have two lanes each (westbound I-84 to southbound I-5 and northbound I-5 to eastbound I-84). The third single-lane ramp is an I-5 southbound off-ramp to westbound Morrison Bridge and eastbound SE Belmont Street. These freeway facilities are owned and maintained by the Oregon Department of Transportation (ODOT). The study area includes only the segment of these freeway facilities that is directly under and immediately adjacent to the Burnside Bridge. This memorandum is limited to reviewing I-5 mainline and ramp deficiencies that are directly influenced by the Burnside Bridge (vertical clearances). Documenting additional I-5 mainline and ramp roadway deficiencies unrelated to the Burnside Bridge are outside the scope of the Earthquake Ready Burnside Bridge Project. Mainline I-5 and the three ramps are all on bridges directly under the Burnside Bridge (Figure 6).

Figure 6. Looking north on I-5 with I-5/I-84 ramps on left and right

7.2 Review of Deficiencies

7.2.1 Methodology

The relevant roadway design standards for I-5 are the ODOT HDM, Chapter 4 (Cross Section Elements), Chapter 5 (Urban and Rural Freeway Design), and Chapter 9 (Grade Separations & Interchanges):

- Posted Speed: 50 mph
- Standard Design Speed Range: 50 mph to 70 mph
- Design Speed for Deficiency Review: 60 mph

7.2.2 Summary of Deficiencies

The list below summarizes geometric deficiencies for Segment 4. Design elements that meet standards are not discussed influenced by the Burnside Bridge.

- **Vertical Clearance** – The vertical clearance under the Burnside Bridge over the ramp from northbound I-5 to eastbound I-84 is 16.5 feet. The vertical clearance under the Burnside Bridge over the ramp from westbound I-84 to southbound I-5 is 17.2 feet. The minimum allowable vertical clearance over I-5, I-84, and their connection ramps is 17 feet, 4 inches because all interstate freeways are designated “High Routes” by ODOT (HDM 4.5.1 and 5.2.8).

8 Segment 5 – Local Street Undercrossings

8.1 Description

Four north/south local streets cross under the Burnside Bridge. All four streets are owned by the City of Portland. NW/SW 1st Avenue and NW/SW Naito Parkway cross under the west approach bridge. NE/SE 2nd Avenue and NE/SE 3rd Avenue cross under the east approach bridge. NE/SE 1st Avenue is used only for Blue/Red MAX light rail. The study area includes only the segment of these four streets that is directly under and immediately adjacent to the Burnside Bridge (Figure 7 and Figure 8).

Figure 7. Looking north at limited vertical clearance over NE/SE 3rd Avenue

Figure 8. Looking north at limited vertical clearance over TriMet MAX Light Rail on NW/SW 1st Avenue

8.2 Review of Deficiencies

8.2.1 Methodology

The relevant roadway design standards for the roadway on the bridge are found in the City of Portland Design Guide for Public Street Improvements, the City of Portland TSP, Bikeway Design and Engineering Guidelines (Portland Bicycle Master Plan, Appendix A), MUTCD, and AASHTO. However, the application of standards can vary from project to project as determined through individual studies, reports, or policy decisions by the City of Portland.

- Posted Speed: 25 mph
- Design Speed for Deficiency Review: 30 mph

8.2.2 Summary of Deficiencies

The list below summarizes geometric deficiencies for Segment 5. Design elements that meet standards are not discussed.

- **Vertical Clearance** – The vertical clearance beneath Burnside Bridge for NE/SE 3rd Avenue is as low as 13 feet, 7 inches. The City of Portland prefers at least 18 feet and requires at least 16 feet for vertical clearance over city streets.

  The vertical clearance beneath Burnside Bridge for NW/SW 1st Avenue is as low as 16.8 feet. TriMet requires at least 21 feet clearance over light rail.

9 Segment 6 – Trail Connections

9.1 Description

Burnside Bridge crosses over two major multi-use paths in the Central City: Tom McCall Waterfront Park Trail and the Eastbank Esplanade. There are no connections between the bridge and the Waterfront Park Trail. There are stairs from the bridge's southern sidewalk to the Eastbank Esplanade, but no equivalent connection from the bridge's northern sidewalk. There are also stairs from the north and south sidewalks to TriMet's MAX Light Rail and NW/SW 1st Avenue. There are also newly-constructed privately-owned stairs from the north sidewalk to NE 3rd Avenue. The study area only includes the trails directly under the bridge, the connection between the bridge and Eastbank Esplanade, the stairs to NW/SW 1st Avenue, and the stairs to NE 3rd Avenue (Figure 9).

Figure 9. Looking south on Eastbank Esplanade

9.2 Review of Deficiencies

9.2.1 Methodology

The relevant design standards for the trail connections are found in the City of Portland Pedestrian Design Guide, ADA Standards for Accessible Design, and AASHTO.

9.2.2 Summary of Deficiencies

The list below summarizes geometric deficiencies for Segment 6. Design elements that meet standards are not discussed.

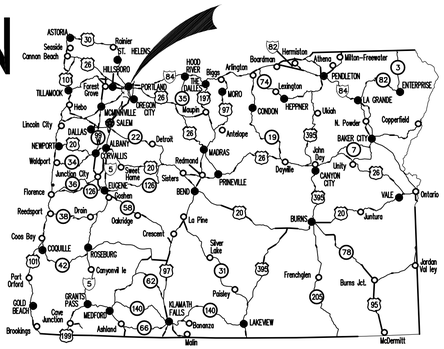
- **ADA** – There are existing stairs from the south sidewalk of the Burnside Bridge to the Eastbank Esplanade, but there is no ADA-compliant connection between the bridge and trail at this location. The existing stairs near NW/SW 1st Avenue and NE 3rd Avenue do not have any ADA accommodation. ADA requires either an elevator or a pedestrian pathway that has a maximum grade of 5 percent. Grades can be increased to 8.3 percent, but require level landings every 30 feet.
- **Bicycle Facilities** – All existing stairways do not accommodate bicycles. Portland's Bikeway Design and Engineering Guidelines recommend including a "wheel gutter" to allow cyclists to roll their bicycles up and down the stairs. The gutter should have dimensions of no less than 3 inches x 3 inches x 0.5 inch. The gutter should be flush with all landings. There is no bicycle ramp between the sidewalk and bicycle lanes at the existing stair connection points. There is no bicycle connection between the Eastbank Esplanade and the Burnside Bridge's westbound bike lane.

Attachment 1. City of Portland's Central City in Motion/Enhanced Transit Corridor Project Plans (DRAFT Version, Received April 2019)

PLANS FOR PROPOSED PROJECT

CITY OF PORTLAND BUREAU OF TRANSPORTATION
ENHANCED TRANSIT CORRIDOR
BURNSIDE ST - W 2ND AVE TO E MLK BLVD
PAVEMENT SIGNING & STRIPING PLAN
MULTNOMAH COUNTY
APRIL 2019

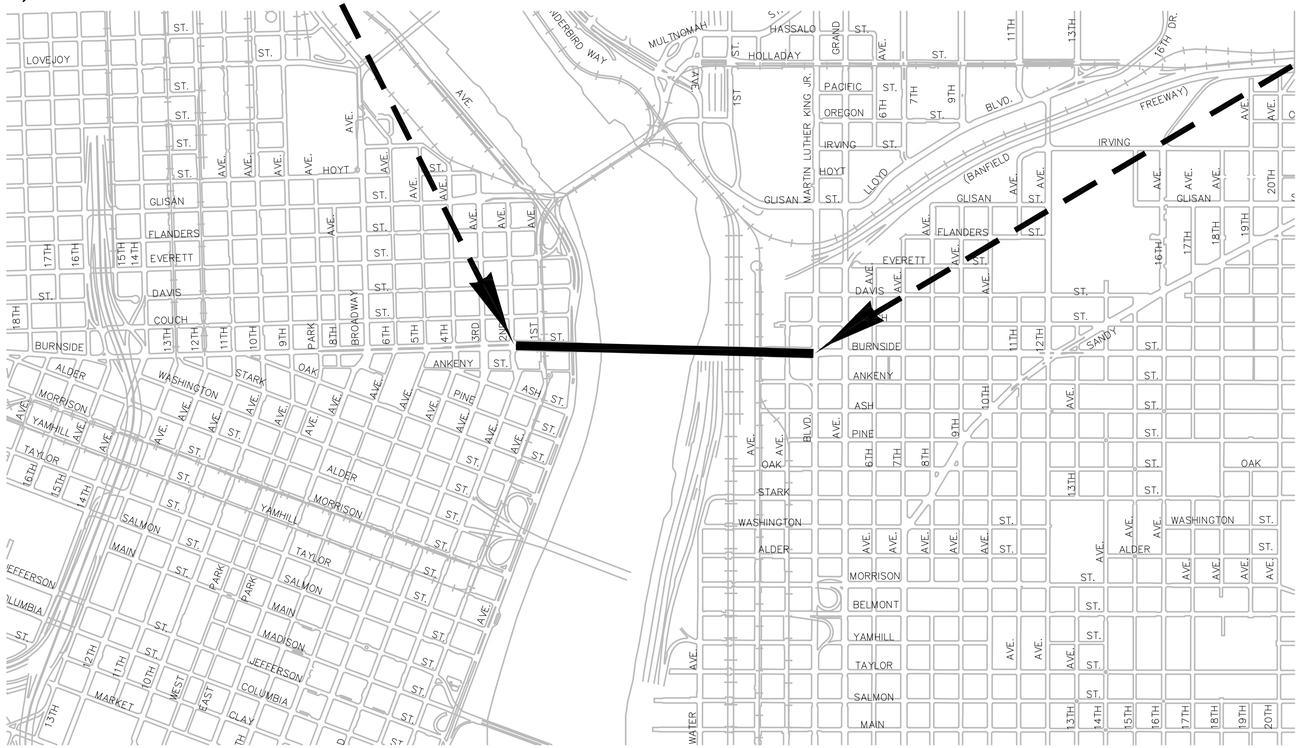
INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	COVER SHEET
3-7	SIGNING AND STRIPING
8-11	SIGNING AND STRIPING DETAILS



Overall Length of Project - 2,670 Feet

BEGINNING OF PROJECT
STA. '1+00'
M.P. (X.XX)

END OF PROJECT
STA. '27+70
M.P. (X.XX)



NOTICE TO EXCAVATORS:
ATTENTION: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER.
RULES ARE ALSO LOCATED AT WWW.DIGSAFELYOREGON.COM NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS (503)-232-1987.

POTENTIAL UNDERGROUND FACILITY OWNERS

Dig Safely.

Website: http://www.callbeforeyoudig.org/
Call the Oregon One-Call Center
DIAL 811 or 1-800-332-2344

EMERGENCY TELEPHONE NUMBERS

NW NATURAL GAS	
M-F 7am-6pm	503-226-4211 Ext.4313
AFTER HOURS	503-226-4211
PGE	503-464-7777
CENTURYLINK	1-800-573-1311
BUREAU OF TRANS./MAINT. OPERATIONS	503-823-1700
CITY WATER	503-823-4874
VERIZON	1-800-483-1000

NOTE TO REVIEWERS:
THIS SET IS FOR REVIEW OF DESIGN INFORMATION ONLY. THE NOMENCLATURE AND PRESENTATION WILL BE DRAFTED AND DELIVERED BY THE MULTNOMAH COUNTY ENGINEER OF RECORD. THE EOR WILL PREPARE THE INFORMATION PROVIDED HEREIN FOR USE BY COUNTY CONTRACTOR CURRENTLY ON SITE.

ATTENTION :
OREGON LAW REQUIRES YOU TO FOLLOW RULES
ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER.
THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH
OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES FROM THE CENTER,
OR ANSWERS TO QUESTIONS ABOUT THE RULES BY CALLING (503)232-1987.

LET'S ALL WORK TOGETHER TO MAKE THIS JOB SAFE

T. 1 S., R. 1 E., W.M.

OREGON TRANSPORTATION COMMISSION

TAMMY BANEY	COMMISSIONER CHAIR
DAVID LOHMAN	COMMISSIONER
PAULA BROWN	COMMISSIONER
ALANDO SIMPSON	COMMISSIONER
SEAN O'HOLLAREN	COMMISSIONER
MATTHEW L. GARRETT	DIRECTOR OF TRANSPORTATION

These plans were developed using ODOT design standards. Exceptions to these standards, if any, have been submitted and approved by the ODOT Chief Engineer or their delegated authority.

Approving Authority: _____
Signature & date

NAMES - PROJECT MANAGER
Print name and title

MULTNOMAH COUNTY CONCURRENCE

MULTNOMAH PROGRAM MANAGER DATE

CONNECTING COMMERCE AND COMMUNITY
MULTNOMAH COUNTY BRIDGES

JACOBS

CITY OF PORTLAND BUREAU OF TRANSPORTATION
ENHANCED TRANSIT CORRIDOR
CENTRAL CITY IN MOTION

DESIGN TEAM LEADER - S. DALEO
DESIGNED BY - J. CLARK
DRAFTER - N VANWAGONER

BURNSIDE SIGNING & STRIPING PLAN
COVER SHEET

SHEET NO. 1

MULTCO_XREF_RD-BORDER.dwg
420510

PLOT DATE:4/2/2019 PLOT TIME:12:36 PM USER:nv057473

NW 2ND AVE

NW 1ST AVE (LRT ONLY)

WHITE STAG BUILDING

MERCY CORPS BUILDING

'BRS' LINE

W BURNSIDE ST.

1+00 2+00 3+00 4+00 5+00 6+00

MATCHLINE – STA. 6+75.00

Sta. 1+.06 RA
Sta. 1+16 BS
Sta. 1+06 SA
Sta. 1+06
Sta. 1+17 BUS
Sta. 1+37 ON
Sta. 1+75 BS
Sta. 2+67 BS
Sta. 3+64 RA
Sta. 3+64 BS
Sta. 4+46 BS
Sta. 5+30 ON
Relocate existing bus stop
Sta. 5+40 BUS
Sta. 5+95 BS
Sta. 5+95 ON
Sta. 6+13 BUS
Sta. 6+50 LRA

WB W-2 W BLE-G W WD 1 M W GRN WB D BS W-2 WB W-2 W DLL Y

11′ 5′-6″ 2′ 11′ 11′ 11′ 11′ 11′ 50′ 12′ 10′ 6′-5″

N / M Install new sign (n) on new (m) sign support

Refer to stripe detail table on sheet no. 11.

ATTENTION :
OREGON LAW REQUIRES YOU TO FOLLOW RULES
ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER.
THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH
OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES FROM THE CENTER,
OR ANSWERS TO QUESTIONS ABOUT THE RULES BY CALLING (503)232-1987.

20' 0' 20' 40'
1"=20'

CONNECTING COMMERCE AND COMMUNITY
MULTNOMAH COUNTY BRIDGES

JACOBS

CITY OF PORTLAND BUREAU OF TRANSPORTATION
ENHANCED TRANSIT CORRIDOR
CENTRAL CITY IN MOTION

DESIGN TEAM LEADER – S. DALEO
DESIGNED BY – J. CLARK
DRAFTER – N VANWAGONER

BURNSIDE SIGNING & STRIPING PLAN
W 2ND AVE TO STA 6+75

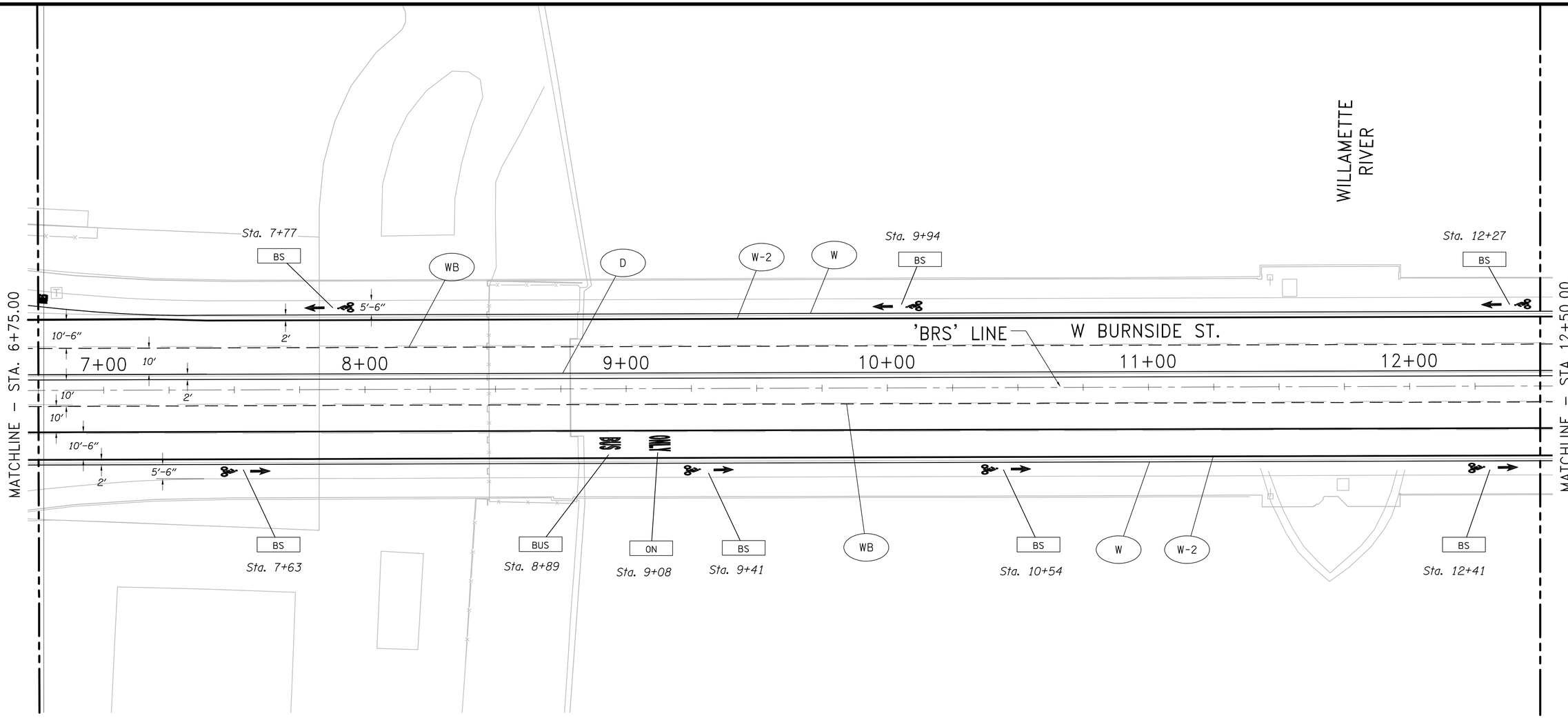
SHEET NO. 3

420510

MULTCO_XREF_RD-BORDER.dwg

PLOT DATE:4/2/2019 PLOT TIME:11:33 AM USER:nv057473

C:\pw_workdir\den003\ch2mhill_nv057473\d0472389\706773-ETC-CCIM-MULTCO-BURN-PLAN.dwg, 4/2/2019 11:33:25 AM



N
M
Install new sign (n) on new (m) sign support

#
Refer to stripe detail table on sheet no. 11.

ATTENTION :
OREGON LAW REQUIRES YOU TO FOLLOW RULES
ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER.
THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH
OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES FROM THE CENTER,
OR ANSWERS TO QUESTIONS ABOUT THE RULES BY CALLING (503)232-1987.

20' 0' 20' 40'
1"=20'

CONNECTING COMMERCE AND COMMUNITY
MULTNOMAH COUNTY BRIDGES

JACOBS

CITY OF PORTLAND BUREAU OF TRANSPORTATION
ENHANCED TRANSIT CORRIDOR
CENTRAL CITY IN MOTION

DESIGN TEAM LEADER – S. DALEO
DESIGNED BY – J. CLARK
DRAFTER – N VANWAGONER

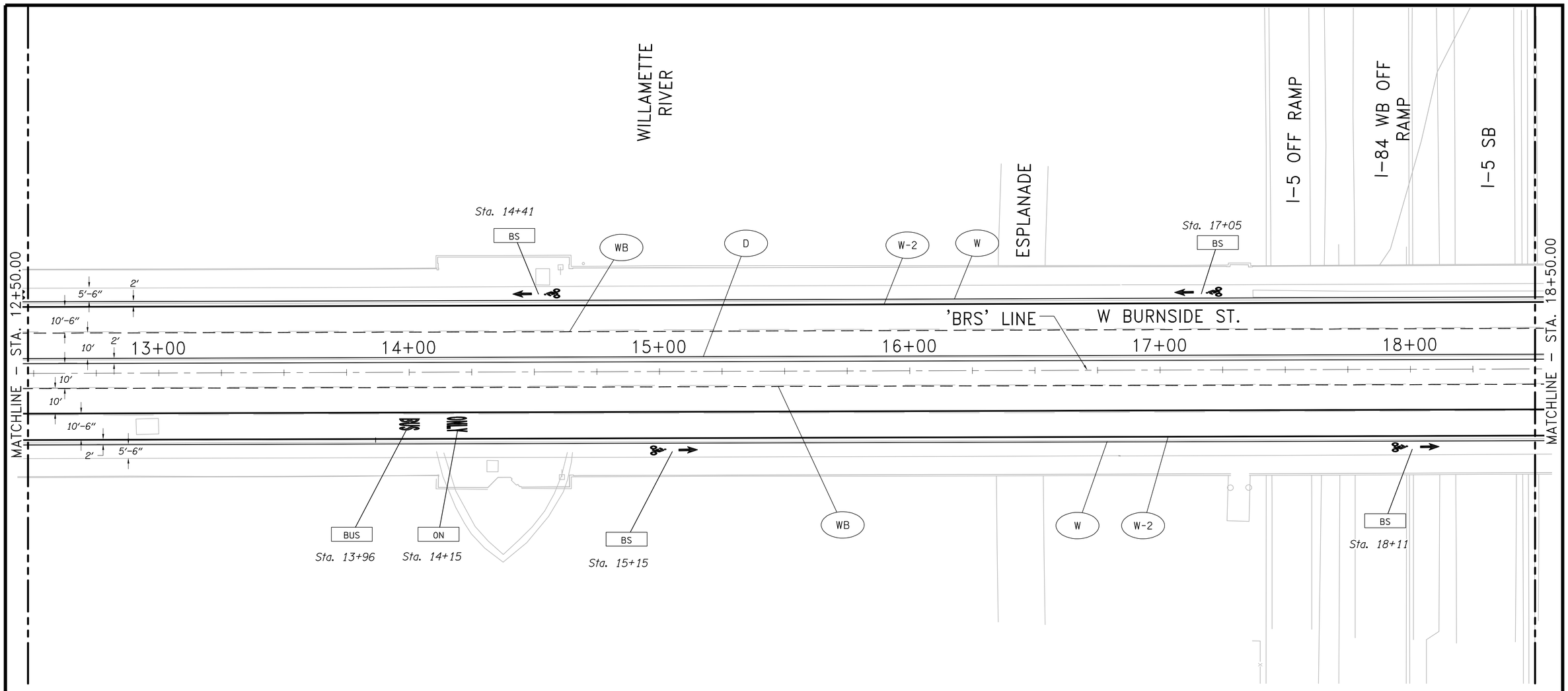
BURNSIDE SIGNING & STRIPING PLAN
STA 6+75 TO STA 12+50

SHEET NO. 4

MULTCO_XREF_RD-BORDER.dwg
420510

PLOT DATE:4/2/2019 PLOT TIME:11:33 AM USER:nv057473

C:\pw_workdir\den003\ch2mhill_nv057473\d0472389\706773-ETC-CCIM-MULTCO-BURN-PLAN.dwg, 4/2/2019 11:33:38 AM



N
M
Install new sign (n) on new (m) sign support

#
Refer to stripe detail table on sheet no. 11.

20' 0' 20' 40'
1"=20'

ATTENTION :
OREGON LAW REQUIRES YOU TO FOLLOW RULES
ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER.
THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH
OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES FROM THE CENTER,
OR ANSWERS TO QUESTIONS ABOUT THE RULES BY CALLING (503)232-1987.

CONNECTING COMMERCE AND COMMUNITY
MULTNOMAH COUNTY BRIDGES

JACOBS

CITY OF PORTLAND BUREAU OF TRANSPORTATION
ENHANCED TRANSIT CORRIDOR
CENTRAL CITY IN MOTION

DESIGN TEAM LEADER – S. DALEO
DESIGNED BY – J. CLARK
DRAFTER – N VANWAGONER

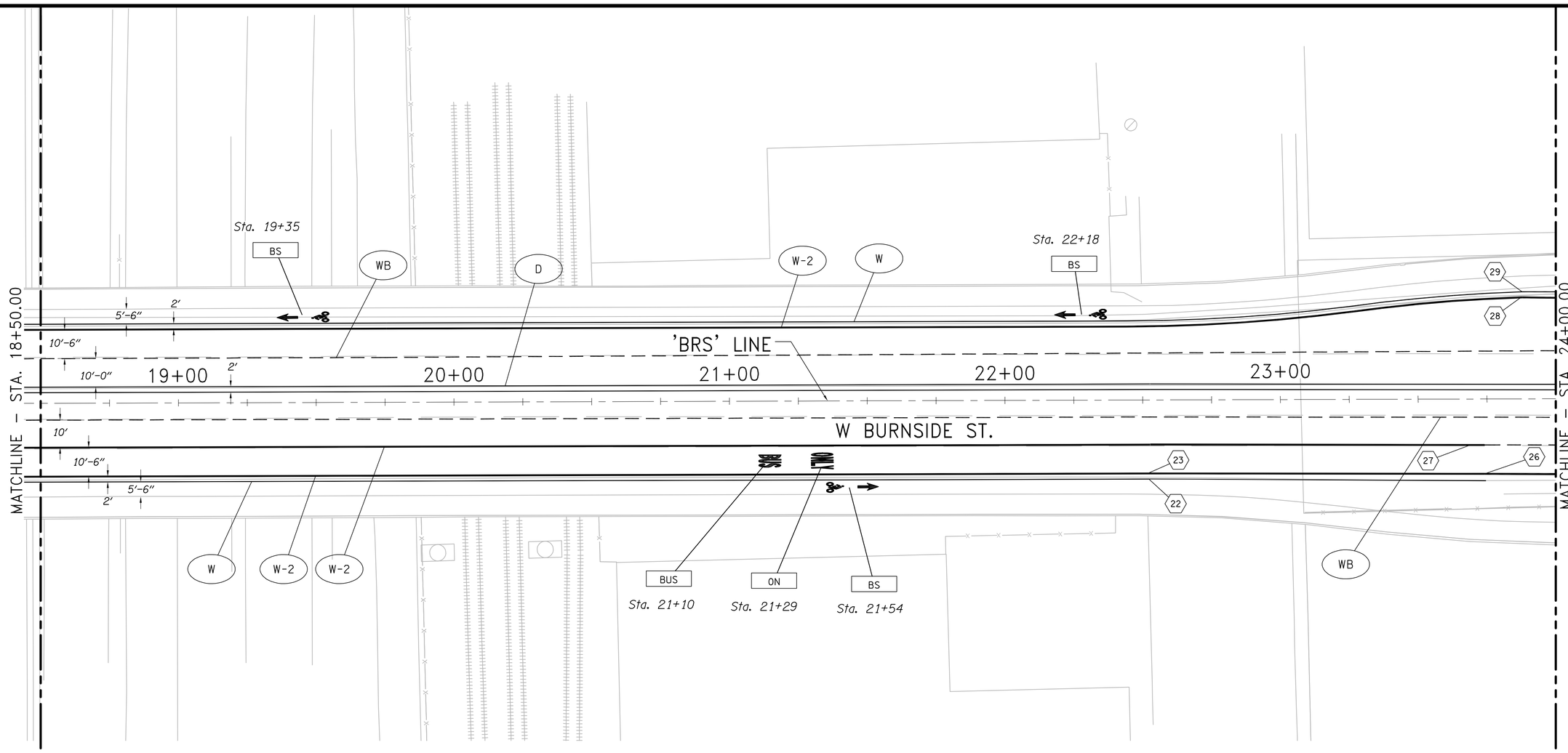
BURNSIDE SIGNING & STRIPING PLAN
BURNSIDE BRIDGE WEST
STA 12+50 TO 18+50

SHEET NO. 5

MULTCO_XREF_RD-BORDER.dwg
420510

PLOT DATE:4/2/2019 PLOT TIME:11:33 AM USER:nv057473

C:\pw_workdir\den003\ch2mhill_nv057473\d0472389\706773-ETC-CCIM-MULTCO-BURN-PLAN.dwg, 4/2/2019 11:33:51 AM



N
M
Install new sign (n) on new (m) sign support

#
Refer to stripe detail table on sheet no. 11.

EB pavement markings east of sta. 22+50 be placed as temporary markings.

20' 0' 20' 40'
1"=20'

ATTENTION :
OREGON LAW REQUIRES YOU TO FOLLOW RULES
ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER.
THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH
OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES FROM THE CENTER,
OR ANSWERS TO QUESTIONS ABOUT THE RULES BY CALLING (503)232-1987.

CONNECTING COMMERCE AND COMMUNITY
MULTNOMAH COUNTY
BRIDGES

JACOBS

CITY OF PORTLAND BUREAU OF TRANSPORTATION
ENHANCED TRANSIT CORRIDOR
CENTRAL CITY IN MOTION

DESIGN TEAM LEADER – S. DALEO
DESIGNED BY – J. CLARK
DRAFTER – N VANWAGONER

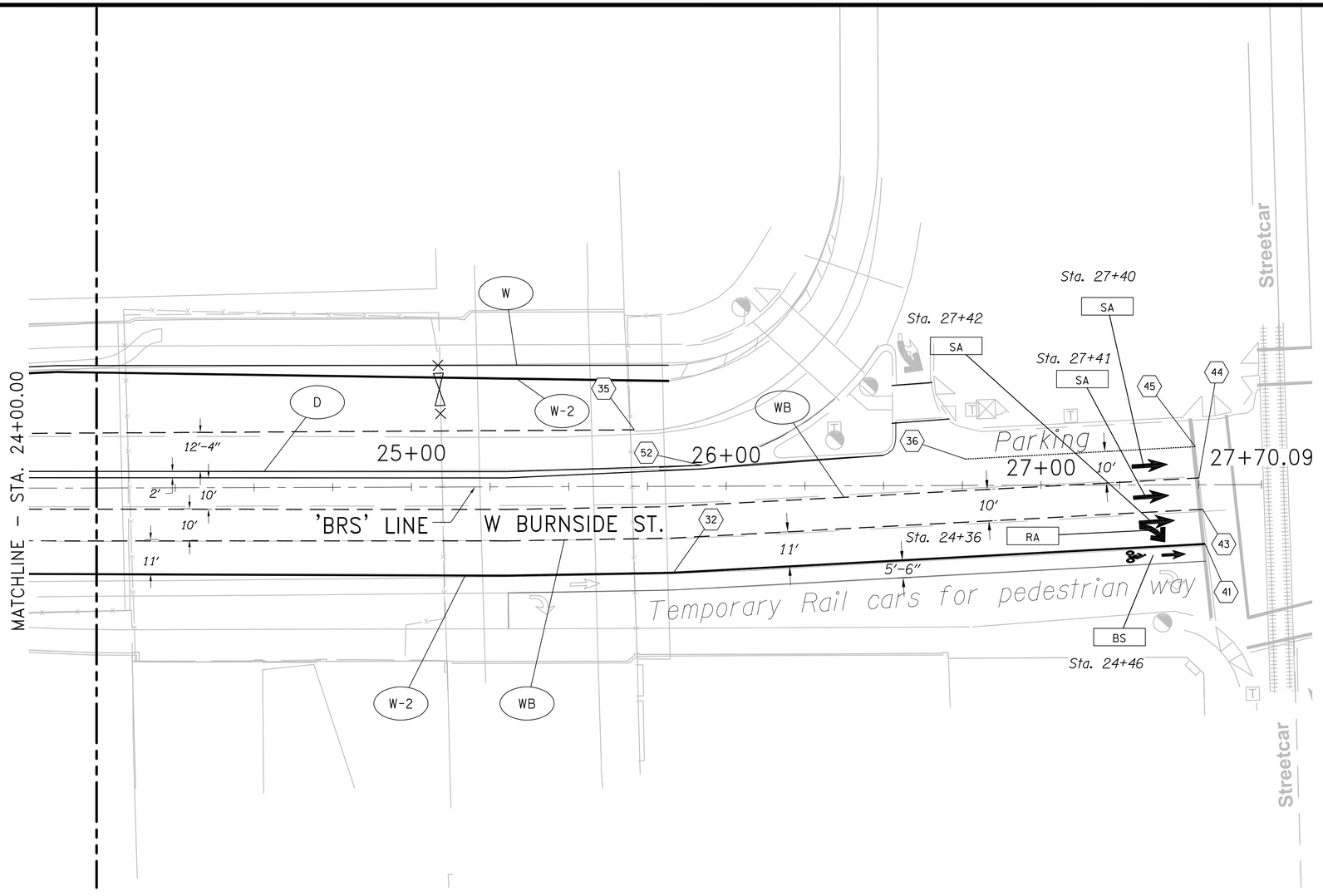
BURNSIDE SIGNING & STRIPING PLAN
STA 18+50 TO 24+00

SHEET NO. 6

MULTCO_XREF_RD-BORDER.dwg

420510

PLOT DATE:4/2/2019 PLOT TIME:12:04 PM USER:nv057473



N
M — *Install new sign (n) on new (m) sign support*

\# — *Refer to stripe detail table on sheet no. 11.*

All EB pavement markings east of Sta. 22+50 shall be placed as temporary markings

ATTENTION :
OREGON LAW REQUIRES YOU TO FOLLOW RULES
ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER.
THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH
OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES FROM THE CENTER,
OR ANSWERS TO QUESTIONS ABOUT THE RULES BY CALLING (503)232-1987.

20' 0' 20' 40'
1"=20'

CONNECTING COMMERCE AND COMMUNITY
MULTNOMAH COUNTY BRIDGES

JACOBS

CITY OF PORTLAND BUREAU OF TRANSPORTATION
ENHANCED TRANSIT CORRIDOR
CENTRAL CITY IN MOTION

DESIGN TEAM LEADER – S. DALEO
DESIGNED BY – J. CLARK
DRAFTER – N VANWAGONER

BURNSIDE SIGNING & STRIPING PLAN
STA 12+50 TO MLK

SHEET NO. 7

MULTCO_XREF_RD-BORDER.dwg
420510

PLOT DATE:4/2/2019 PLOT TIME:12:04 PM USER:nv057473

1

R4-4

ATTENTION :
OREGON LAW REQUIRES YOU TO FOLLOW RULES
ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER.
THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH
OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES FROM THE CENTER,
OR ANSWERS TO QUESTIONS ABOUT THE RULES BY CALLING (503)232-1987.

CONNECTING COMMERCE AND COMMUNITY
MULTNOMAH COUNTY
BRIDGES

JACOBS

CITY OF PORTLAND BUREAU OF TRANSPORTATION
ENHANCED TRANSIT CORRIDOR
CENTRAL CITY IN MOTION

DESIGN TEAM LEADER – S. DALEO
DESIGNED BY – J. CLARK
DRAFTER – N VANWAGONER

BURNSIDE SIGNING AND STRIPING PLANS
SIGN DETAILS

SHEET NO. 8

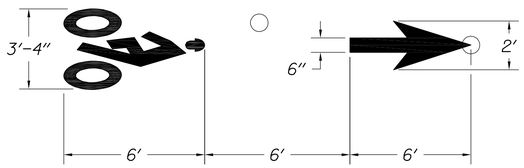
420510

MULTCO_XREF_RD-BORDER.dwg

PLOT DATE:4/2/2019 PLOT TIME:11:32 AM USER:nv057473

C:\pw_workdir\den003\ch2mhill_nv057473\d0472389\706773-ETC-CCIM-BURN-MULTCO-SIGN-DET.dwg, 4/2/2019 11:32:01 AM

BS



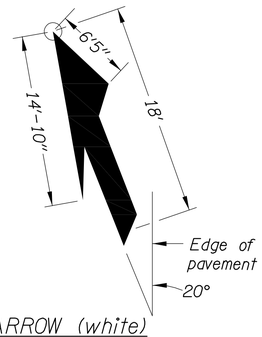
BIKE LANE STANDARD STENCIL (white)

Center marking within lane width
For proportion details, see current version of Standard Highway Signs

LRA

Arrow orientation shown is used for right lane ends.

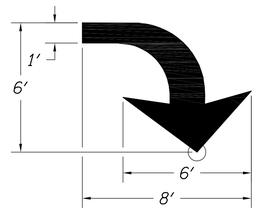
For left lane ends, use the mirror image.



LANE REDUCTION ARROW (white)

For arrow proportion details, see current version of Standard Highway Signs

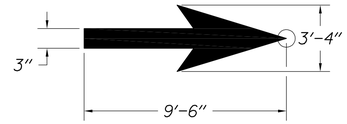
RA



RIGHT TURN ARROW (white)

For arrow proportion details, see current version of Standard Highway Signs

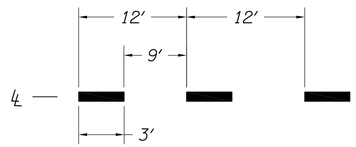
SA



STRAIGHT ARROW (white)

For arrow proportion details, see current version of Standard Highway Signs

DLL



4′ WHITE DOTTED LANE LINE

ATTENTION :
OREGON LAW REQUIRES YOU TO FOLLOW RULES
ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER.
THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH
OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES FROM THE CENTER,
OR ANSWERS TO QUESTIONS ABOUT THE RULES BY CALLING (503)232-1987.

LEGEND:

XX — Pavement striping

XX — Pavement symbols & legends

Connecting Commerce and Community
MULTNOMAH COUNTY BRIDGES

JACOBS

CITY OF PORTLAND BUREAU OF TRANSPORTATION
ENHANCED TRANSIT CORRIDOR
CENTRAL CITY IN MOTION

DESIGN TEAM LEADER – S. DALEO
DESIGNED BY – J. CLARK
DRAFTER – N VANWAGONER

BURNSIDE SIGNING AND STTRIPING PLANS
STRIPING DETAILS

SHEET NO. 9

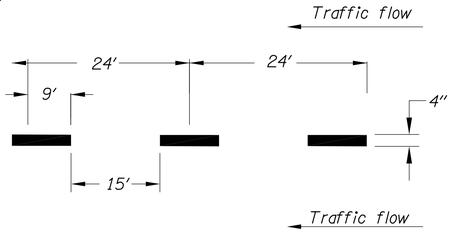
420510

MULTCO_XREF_RD-BORDER.dwg

PLOT DATE:4/2/2019 PLOT TIME:11:31 AM USER:nv057473

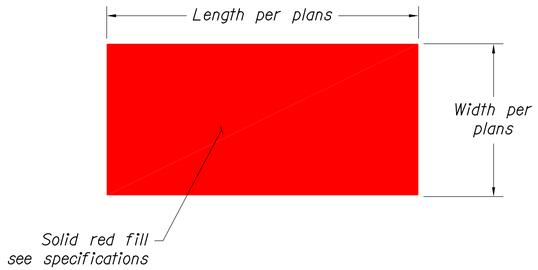
C:\pw_workdir\den003\ch2mhill_nv057473\d0472389\706773-ETC-CCIM-BURN-MULTCO-STRIPING-DET.dwg, 4/2/2019 11:31:17 AM

WB



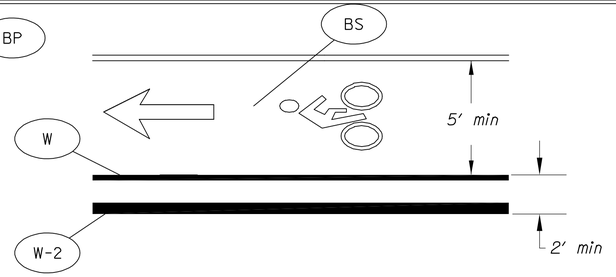
4″ WHITE BROKEN LINE

BUS-RP



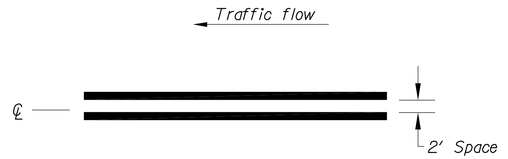
BUS RED PAINT

BP



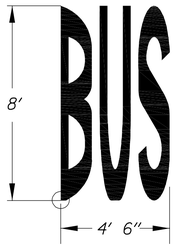
BIKE LANE

D



DOUBLE NO PASS
TWO 4″ YELLOW LINES
2″ SEPARATION

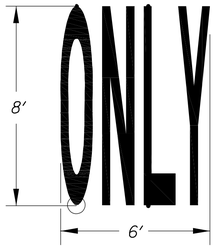
BUS



BUS - (WHITE)

Center marking within land width or track for letter proportion details, see current version of 'Standard Highway Signs'

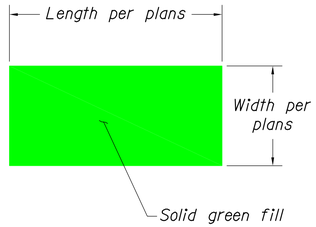
ON



ONLY - (WHITE)

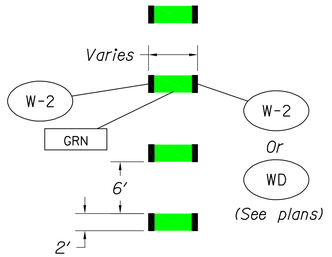
Center marking within land width or track for letter proportion details, see current version of 'Standard Highway Signs'

GRN



GREEN PAVMENT MARKING

BLE-G



BIKE LANE STANDARD
STENCIL (WHITE)

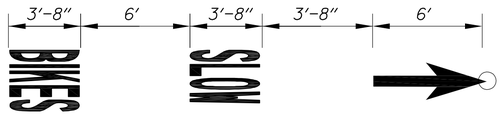
W

4″ WHITE LINE

W-2

8″ WHITE LINE

SB



SLOW BIKE

Y

4″ YELLOW LINE

ATTENTION :
OREGON LAW REQUIRES YOU TO FOLLOW RULES
ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER.
THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH
OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES FROM THE CENTER,
OR ANSWERS TO QUESTIONS ABOUT THE RULES BY CALLING (503)232-1987.

LEGEND:

XX Pavement striping

XX Pavement symbols & legends

Connecting Commerce and Community
MULTNOMAH COUNTY BRIDGES

JACOBS

CITY OF PORTLAND BUREAU OF TRANSPORTATION
ENHANCED TRANSIT CORRIDOR
CENTRAL CITY IN MOTION

DESIGN TEAM LEADER – S. DALEO
DESIGNED BY – J. CLARK
DRAFTER – N VANWAGONER

BURNSIDE SIGNING AND STRIPING PLANS
STRIPING DETAILS

SHEET NO. 10

420510

MULTCO_XREF_RD-BORDER.dwg

PLOT DATE:4/2/2019 PLOT TIME:11:32 AM USER:nv057473

C:\pw_workdir\den003\ch2mhill_nv057473\d0472389\706773-ETC-CCIM-BURN-MULTCO-STRIPING-DET.dwg, 4/2/2019 11:32:48 AM

SHT. NO.	SIGN NO.	SIGN LOCATION STATION OFFSET	SIGN DIMENSIONS WIDTH	SIGN DIMENSIONS HEIGHT	BORDER WIDTH	RADIUS	ARROW SIZE	SIGN TYPE	SIGN POST
3	1	STA: 4+88.24 OFF: 46.70'L						R4-4	M

SIGN POST MATERIAL:
M = METAL
SSC = STAINLESS STEEL CLAMP

Stripe Data

X Point No.	Pt. Desc.	STATION	OFFSET	Stripe Type
1		1+02.12	34.15'L	
2		1+02.40	28.68'L	
3		1+02.50	26.68'L	
4		1+03.05	15.68'L	
5		1+03.61	4.68'L	
6		1+03.84	3.84'R	
7		1+04.59	14.83'R	
8		1+05.31'	25.80'R	
9		2+44.79	3.89'R	
10		2+73.82	24.44'R	
11		3+64.42	4.67'L	
12		4+25.12	38.70'R	
13		4+87.43	28.60'L	
14		4+87.43	34.12'L	
15		5+14.43	39.20'L	
16		4+75.95	4.01'L	
17		5+96.33	38.39'R	
18		6+57.93	28.51'R	
19		6+57.51	26.28'R	
20		6+57.49	16.13'R	
21		6+56.51	6.13'R	
22		22+52.38	28.44'R	
23		22+52.38	26.44'R	
24		NOT USED	NOT USED	
25		NOT USED	NOT USED	
26		23+74.04	27.19'R	

Stripe Data

X Point No.	Pt. Desc.	STATION	OFFSET	Stripe Type
27		23+74.11	16.75'R	
28		23.87.92	36.88'L	
29		23+87.87	38.87'L	
30		NOT USED	NOT USED	
31		NOT USED	NOT USED	
32		25+83.25	27.70'R	
33		NOT USED	NOT USED	
34		NOT USED	NOT USED	
35		25+70.88	17.96'L	
36		26+76.08	8.35'R	
37		NOT USED	NOT USED	
38		NOT USED	NOT USED	
39		NOT USED	NOT USED	
40		NOT USED	NOT USED	
41		27+52.05	18.80'R	
42		NOT USED	NOT USED	
43		27+51.31	7.82'R	
44		27+50.17	2.14'L	
45		27+49.02	12.09'L	
46		NOT USED	NOT USED	
47		6+50.02	34.76'R	
48		4+25.63	15.85'L	
49		5+26.29	16.06'L	
50		3+87.43	28.61'L	
51		3+87.43	34.11'L	
52		26.76.08	8.35'L	

ATTENTION :
OREGON LAW REQUIRES YOU TO FOLLOW RULES
ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER.
THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH
OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES FROM THE CENTER,
OR ANSWERS TO QUESTIONS ABOUT THE RULES BY CALLING (503)232-1987.

CONNECTING COMMERCE AND COMMUNITY
MULTNOMAH COUNTY BRIDGES

JACOBS

CITY OF PORTLAND BUREAU OF TRANSPORTATION
ENHANCED TRANSIT CORRIDOR
BURNSIDE SIGN TABLE

DESIGN TEAM LEADER – S. DALEO
DESIGNED BY – J. CLARK
DRAFTER – N VANWAGONER

BURNSIDE SIGNING & STRIPING PLANS
SIGNING & STRIPING DATA TABLES

SHEET NO. 11